

device. For example, a few pushbuttons are usually provided to perform all of the device's control functions. Using such a compact user interface to navigate and select among hundreds of songs is inefficient and often frustrating. The display screen can only show a few song titles at one time, and the limited controls make it difficult for a user to arbitrarily select, or move among,
5 the songs.

The creation of playlists is one technique to organize the playing of songs. A set of songs can be included in a playlist which is given a name and stored. When the playlist is accessed, the set of songs can be played utilizing various formats such as sequential play or shuffle.

10 However, the creation of playlists itself becomes problematic as the number of songs increases, since the user often arbitrarily selects songs from a large number of tracks to form a playlist. This selection mechanism: can be fairly tedious; does not necessarily produce playlists that are of interest to the user over the course of time; may not remain up-to-date if new songs are added that logically fit into a previously created playlist (e.g. "Favorites by Band X"
15 might become out of date if a new favorite by Band X is added after the playlist was created); and leads to "lost" songs that are not members of any playlist.

Accordingly, improved techniques for organizing and grouping tracks useful in a portable music player are needed. Further, it is desirable to provide a user interface suitable for a small device. The user interface should allow a user to efficiently navigate among, and select
20 from, many items stored in the device.

SUMMARY OF THE INVENTION

The present invention provides an efficient user interface for a small portable music player. The
25 invention is suitable for use with a limited display area and small number of controls to allow a user to efficiently and intuitively navigate among, and select, songs to be played. By using the invention, very large numbers of songs can be easily accessed and played.

One aspect of the invention includes an overlapping hierarchy of categories. Categories include items that can also be included in other categories so that the categories
30 "overlap" with each other. Thus, a song title can be accessed in multiple different ways by starting with different categories. For example, a preferred embodiment of the invention uses the

5 top-level categories "Albums", "Artists", "Genres" (or styles), and "Play Lists". Within the Albums category are names of different albums of songs stored in the device. Within each album are the album tracks, or songs, associated with that album. Similarly, the Artists category includes names of artists which are, in turn, associated with their albums and songs. The Genre category includes types of categories of music such as "Rock", "Hip Hop", "Rap", "Easy Listening", etc. Within these sub-categories are found associated songs. Finally, the "Play Lists" category includes collections of albums and/or songs which are typically defined by the user.

10 Advantageous use is made of the overlapping hierarchy to allow the user to quickly designate a song for playback. The device uses three "soft" pushbuttons that have assignable functions. The interface maintains consistent button functionality whenever possible and uses uniform command names and operations on different types of items so that the interface is more intuitive. For example, the user can open and queue both albums and songs with predictable results.

15 The interface also provides for multiple functions for a single control. For example, a "Play" button can act, in a first function, to play a currently-selected song. The Play button can act, in a second function, to cycle through different playback modes. The modes can be, e.g., (1) playback of songs from a hard disk; (2) playback of music from a radio receiver built into the device; and (3) playback of voice messages. The first function for the Play button can be
20 activated by momentarily depressing the Play button for a short period of time. The second function is invoked by depressing the Play button for a longer period of time whereupon the device cycles through the different modes. Other ways of invoking the functions are possible such as where the second function is automatically entered from a powered-down state.

25 In one embodiment, the invention provides a method for selecting songs to be played in an electronic audio device, wherein the device includes a display and one or more user input controls, wherein songs are organized into categories, albums, wherein songs and albums are associated with artist names. The method includes steps of displaying categories on the display; accepting signals from a user input control to select a category; displaying one or more
30 songs in the selected category on the display; accepting signals from a user input control to select a displayed song; and entering selected songs into a playlist queue, wherein the device plays back songs in the playlist queue.

According to one aspect of the present invention, a technique is provided for organizing tracks on a portable music player by automatically filing tracks in a hierarchical order based on attributes of the tracks.

5 According to another aspect of the invention, metadata is associated with each track that is used to automatically define the track's appropriate place in the hierarchy.

According to another aspect of the invention, the hierarchy is displayed on the portable music player so that a user can traverse the organizational hierarchy to find individual tracks or find playlists composed of logical groups of tracks.

10 According to another aspect of the invention, the hierarchy is derived by using metadata associated with the audio content that was obtained through any source of metadata (e.g. CDDDB metadata, id3v2 metadata, other obtainable metadata) and subsequently stored with or alongside the file that stores the track.

15 According to another aspect of the invention, a file is formatted so that an unaltered track is stored as file data and information about the track is stored in file attribute files.

Other features and advantages of the invention will be apparent in view of the following detailed description and appended drawings.

20 **BRIEF DESCRIPTION OF THE DRAWINGS**

Fig. 1 is a schematic diagram of a tree structure for hierarchical filing of tracks;

Fig. 2 is a definition file that specifies the hierarchy depicted in Fig. 1;

Fig. 3 is a user's view of the hierarchy;

25 Fig. 4 is a schematic diagram of a user interface displaying the hierarchical category structure;

Fig. 5 is a diagram of a file format for storing filed data and file attributes;

Fig. 6 is a flow chart depicting steps for filing tracks according to the hierarchical tree structure;

Fig. 7 depicts a tree resulting from searching the tracks; and

30 Fig. 8 depicts a format for a user interface[.];

Fig. 9 illustrates the NOMAD Jukebox and its user interface controls;

Fig. 10 illustrates a sequence of display screens describing how to navigate to

lower levels;

Fig. 11 illustrates associations among items;

Fig. 12 shows display screens used to search for a song or other item;

5

Fig. 13 illustrates details of different items; and

Fig. 14 illustrates a playback device coupled to a host computer system.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

A preferred embodiment of the invention will now be described in the context of a portable personal player that plays audio files stored in memory. The files may be in MP3, wav, or other digital formats.

5 In the presently described embodiment, users are able to see the tracks on their player in some organized fashion other than as a single list of tracks. As will be described in more detail below, in one embodiment tracks are sorted utilizing a tree structure having branches labeled according to types of metadata associated with the tracks

 For example, a track recorded as "Golden Slumbers" by the Beatles that appears
10 on their album "Hey Jude" might appear as a track under the album "Abbey Road" as well as a track under the list of tracks by the Beatles. It might appear as a track under the genre "Pop Rock" as well as "Songs from the 60's." Furthermore, the organization can have more complex hierarchies. For example, the category of "Pop Rock" might contain subcategories "British Musicians," "American Musicians" and "Other Musicians". In all cases, the track is
15 automatically filed into all appropriate locations without requiring user interaction.

 In the currently defined embodiment, a tree structure is defined by a file having the following structure.

 The first line of a TreeDef.inf file contains a version number:

 V1.0

20 Each subsequent line (at least in v1.0) contains lines of the following format:
 CATEGORY_NAME|TRACK_TYPE_MASK|CATEGORY_STRUCTURE

 CATEGORY_NAMES are the top-level names of the branch under which tracks are sorted. They include things like "Album," "Artist," "Voice Tracks," "All Tracks," etc.

 TRACK_TYPE_MASKs tell which types of tracks are to be filed under this
25 particular branch. The actual value is a hexadecimal numerical value (in '0x' format, e.g. 0x01) generated by ORing the following flags together as appropriate:

 enum tTrackType

 {

30 kTTNothing=0x00,

```
    kTTSong=0x01,  
    kTTVoice=0x02,  
    kTTBook=0x04,  
    kTTMacro=0x08,  
5    kTTPlaylist=0x10  
};
```

So, for example, the "Album" branch has a TRACK_TYPE_MASK of kTTSong,
because only songs are filed under that branch, but the "All Tracks" branch has a
10 TRACK_TYPE_MASK of (kTTSong | kTTVoice | kTTBook).

Other elements might be added to tTrackType (e.g. kTTVideo) as appropriate.

CATEGORY_STRUCTUREs tell how to file the songs based on their metadata
information. The CATEGORY_STRUCTURE is a string of characters that tell, from left to
right, the order of hierarchy. The characters come from the following enum constants:

```
15  
enum tFileTag  
{  
    kFTNone='@',  
    kFTTrackType='T',  
20    kFTTitle='N',  
    kFTAudioFile='F',  
    kFTArtist='M',  
    kFTAlbum='L',  
    kFTGenre='G',  
25    kFTSource='S',  
    kFTYear='Y',  
    kFTArtistCountry='C'  
};
```

30 Thus, a CATEGORY_STRUCTURE of LN tells to create a subcategory that is a
list of Albums, each of which contains a list of Tracks.

In total, a line like:

```
Album|0x01|LN
```

Says to create a branch called "Album" which contains tracks of type kTTSong organized first by album name, and then by track name.

5 The following is an example of a tree definition file similar (though not identical) to the hierarchy presented in the Nomad Jukebox product (the 'B' before each FileTag was used to identify that these are basic tags so that we wouldn't run out of letters in the alphabet as we included more complex metadata – thus each group of two letters represents a level in the hierarchy):

10

```
V1.0
Album|0x01|BLBN
Artist|0x01|BMBN
Genre|0x01|BGBN
15 Voice Tracks|0x02|BSBGBN
Playlists|0x10|BN
Macros|0x08|BN
All Tracks|0x07|BN
```

20

Fig. 1 depicts a hypothetical organization hierarchy. The tree shows how tracks might be listed (as leaves in the tree) after having been organized. Example values for nodes in the tree are shown as well. The same track may appear more than once as a leaf in the tree, as described above, if it fits into multiple categories (e.g. a song that appears on the Abbey Road branch would also appear in the Beatles branch). In the example shown, the first branch contains tracks organized by album. As shown in the example, this music collection contains three tracks from "Abbey Road" and three tracks from "Hits from the 60's". The second branch contains tracks organized by artist, and sub organized by where the artist is from. Thus, a user browsing would first select the "Artists" branch and then choose between "British Artists" and "American Artists". Finally, they would select the particular artist. In the third branch, all tracks are shown.

25

30

The tree definition file that would specify the hierarchy shown in Figure 1 is shown in Figure 2.

The first line identifies the version of the tree definition file.

The second line defines the "Albums" branch. The first part of the line, "Albums" defines the name of the branch. The second part, "0x01," defines that all musical tracks should be categorized on this branch. The third part, "BLBN," defines that the branch
5 lists first the names of all albums (BL) and then tracks on those albums (BN).

The third line defines the "Artists" branch. The first part of the line "Artists" defines the name of the branch. The second part, "0x01," defines that all musical tracks should be categorized on this branch. The third part, "BCBMBN," defines that the branch lists first the names of all countries where artists in this collection come from (BC) and under those items, the
10 artists' names (BM), and then tracks by those artists (BN).

Fig. 3 shows what a user's view of this hierarchy might be if he/she were shown a fully expanded view of the 6-song tree. Notice that each song appears three times, once in each branch.

In consumer products the tree define file is not edited directly but through a user
15 interface, one example of which is depicted in Fig. 4. An example of a user interface for viewing songs by category and editing the tree structure is depicted in Fig. 4.

An embodiment of the invention is utilized in the Nomad® Jukebox, manufactured by the assignee of the present invention, and described more fully in the copending application, filed on the same date as the present application, entitled "System for Selecting and
20 Playing Songs in a Playback Device with a Limited User Interface," (Attny. Docket No. 17002-020800).

In a preferred embodiment, metadata is associated with each track and includes such information as title, genre, artist name, type, etc. In the preferred embodiment, software stored in a portable player and executed by the onboard processor automatically files each track
25 in the correct category utilizing the associated metadata and the tree define file. The program code can be stored in any computer readable medium including magnetic storage, CD ROM, optical media, or digital data encoded on an electromagnetic signal.

Thus, the user is automatically provided with a powerful and flexible tool for organizing and categorizing the tracks stored on the portable player.

30 If the tracks are formatted in MP3 format the metadata can be stored in ID3 tags included in the MP3 file. In one embodiment of the invention, the tracks are stored in alternate

file format including file data and file attributes. The file data is the music track itself and the file attributes part of the file includes fields of arbitrary size which are used to store metadata characterizing the track stored as the file data. Again this metadata includes information about the track such as title, genre, artist name, type, etc.

5 There are several advantages to using the alternate file format. Metadata of types not easily included in an ID3 tag can be utilized. Further, the original track format is not changed, so that error correction data such as checksums are valid. Finally, any file format can be used (e.g. WAV, WMA, etc.) because the metadata is stored separately, and thus audio formats that have limited support for metadata can still be stored on the portable player in native
10 format without transcoding. The formatted files are formed by software stored in the portable music player and executed by an on-board processor.

The metadata for each track is utilized to file each track, using the categories defined in the hierarchical structure as described above, without any input from the user.

15 Fig. 5 is a schematic diagram of the alternative file format including file data in the form of an MP3 track, and metadata fields for holding data indicating the name of the album the track is from, the name of the song, the genre of the song, and the type of track.

A particular embodiment of a file format will now be described. All tracks are created with some set of attributes as shown below:

20 Definition of TrackInfo Data Field

Field	Offset	Size	Description
Attribute Count	0	2	The number of attribute follow for the track
Attr 1 type	2	2	Binary = 0, ASCII = 1
Attr 1 name len	4	2	Length of attribute name string
Attr 1 data len	6	4	Length of attribute data
Attr 1 Name	10	N	Attribute name string
Attr 1 Data	10+N	M	Attribute data
....			

....			
Attr N type			
Attr l name len			
Attr l data len			
Attr l Name			
Attr l Data			

Required Attributes

Attribute Name	Value(s)	Remarks
TITLE	ASCII string	Required By Jukebox
CODEC	"MP3", "WMA", "WAV"	Required By Jukebox
TRACK ID	DWORD	Set By Jukebox
ALBUM	ASCII string	Optional
ARTIST	ASCII string	Optional
GENRE	ASCII string	Optional
LENGTH	In seconds	Optional
TRACK SIZE	In bytes	Optional
TRACK NUM	1-n (track within album)	Optional

These attributes can be subsequently changeable via a host application,
5 running on a personal computer connected to the portable music player.

Fig. 6 shows a flow chart of an embodiment the process used to build the
hierarchical database of tracks. It starts by iterating through each track, and, for each track,
iterating through each branch to find if the track belongs on the branch, and, if so, where. In this
case, the term track could refer to any content, e.g. a music track, a spoken word track, or even a
10 video track.

Also, the hierarchical catalog of tracks can be used to form playlists in a structured manner. For example, if a user wants to hear Jazz and Blues the entire sub-categories can be selected to form one playlist.

An alternative hierarchical catalog generation technique will now be described.

5 In this alternative embodiment, at system startup and as tracks are added or changed, the hierarchy is generated as an in-memory tree structure. Each track is added to the tree using the categories ALBUM, ARTIST and GENRE.

The following example shows the algorithm for adding a track. For clarity, only the attributes used by the tree are shown.

10

TITLE	"Free Falling"
ALBUM	"Full Moon Fever"
ARTIST	"Tom Petty"
GENRE	"Rock"
TRACK NUM	1

The following function is executed to build the in-memory memory tree.

Build Tree ()

15 For each track,

Add Track To Category(Album, Track)

Add Track To Category(Artist, Track)

Add Track To Category(Genre, Track)

End of Build Tree

20

Fig. 7 depicts a tree which could result from implementing Build Tree() function. Note that "Stardust" does not have any entries for Album or Artist. The host software running on a computer connected to the portable music player could be utilized to add missing attributes to the "Stardust" track and, optionally, edit the title attribute. The Build Tree() function would
25 then reinsert this track in the correct location in the tree.

Fig. 8 is an embodiment of a user interface according to another embodiment of the invention. In this example the root node is labeled "My Configuration" and the Playlist category has been selected and the Playlist subcategory "Meddle" has been selected. Note that the types of Metadata, in this example, Track Name, Artist, Album, Tempo and

5 Dance, are listed across the top of the screen, and the attribute values for each track are listed in a row across the screen. Various control buttons are displayed to the right of configuration window that facilitate quickly invoking selected processing on a selected track.

As noted above, a preferred embodiment of the present invention is incorporated into a product manufactured and distributed by Creative Technology, Ltd. The product is called
10 the "NOMAD Jukebox." The following description describes further details of the display screens and interface controls.

Fig. 9 illustrates the NOMAD Jukebox and its user interface controls.

In Fig. 9, electronic audio device 100 measures about 5.5" wide by 5.5" tall by 1" thick. Display screen 102 is about 2" wide by 1" tall. Display screen 102 includes different
15 regions such as main region 104 and soft button function description region 106.

Three soft buttons are located at 108; including buttons 110, 112 and 114. The specific command, or function, that any of the soft buttons perform when depressed is indicated by the label in soft button function description region 106. Thus, the function of soft button 112
(as shown in Fig. 9) is "open," the function of soft button 114 is "search" while soft button 110 is
20 currently not assigned a function.

The other eight buttons on device 100 perform essentially the same functions at all times. In other words, they are not subject to function changes according to soft button function description area 106. These buttons include Library button 116, EAX and System
button 118, Skip Backward button 120, Play button 122, Stop button 124, Skip Forward button
25 126, Scroll Up button 128 and Scroll Down button 130. However, as discussed below, these buttons (or any type of controls used with the device) can include alternate functionality that is invoked in different ways.

The device uses visual cues, or indicators, in the display. When an item is highlighted it indicates that the item is the "current" item, or currently-selected item, which is
susceptible to be operated on by a subsequent user action - such as playback, or expansion of the
30 item. In Fig. 1, screen 102 shows that the item, "ALBUMS," is highlighted. The highlighted

item can be acted upon by using the soft buttons, or another button, as discussed below. The current item can be changed by using Scroll Up button 128 and Scroll Down button 130 to move the highlight up or down, respectively, throughout a list of displayed items.

5 Icons are used to provide additional visual cues for an item. In Fig. 1, each of the categories has a category icon to the left of it. The category icon, which may not be distinctly visible in the Figure, illustrates a first box connected by lines to additional boxes below the first box. The icon depicts a hierarchy and illustrates the property of categories, i.e., that categories can contain additional categories, songs or other items.

10 Fig. 10 illustrates a sequence of display screens describing how to navigate to lower levels.

In Fig. 10, library category screen 150 shows the display as it appears when the user depresses library button 116 of Fig. 9. A preferred embodiment of the device uses 4 first-level categories. These are "Albums", "Artists," "Styles" and "Play Lists". Each of these categories can "contain," or be associated with, other categories, songs, or items.

15 Note that in library category screen 150 ALBUMS is currently highlighted. By depressing soft button 112 of Fig. 9, the "open" command is performed on the highlighted category, as indicated by the labeling of soft button 112 and soft button function description area 152 of Fig. 10.

20 Lists screen 154 is displayed as a result of a user opening the Albums category of library category screen 150. Lists screen 154 shows items within the Albums category such as commercial albums of multiple songs from a record label, pre-made lists or collections created by a user, or other predefined lists or collections of songs or recordings.

25 In Fig. 10, lists screen 154 shows each item as a list of songs. This is shown visually by the icon to the left of each item which depicts a miniature list. Possible soft button commands are "Close", "Open" and "Queue". These commands correspond to soft buttons 110, 112 and 114, respectively. If the user selects the Close command, the display reverts to library category screen 150. If the user selects the Open command, the display shows tracks screen 156. Alternatively, the user can select the Queue command to instruct the device to place all the songs from the selected (i.e., highlighted) list into the play list for eventual playback. Yet another
30 option allows the user to press play button 122 of Fig. 9 to cause any currently-selected songs or a list of songs (e.g., an album) to immediately be played.

Returning to Fig. 10, tracks screen 156 shows that a single song called "JukeBox Demo" is in the list. The list is also called JukeBox Demo as shown in lists screen 154. Tracks screen 156 shows possible soft commands assigned to buttons, namely "Close", "Details" and "Queue." The Close button performs the same function as before – it returns the user to the previous screen which, in this case, is lists screen 154. The user can also select the Details command to cause details of the song JukeBox Demo to be displayed in details screen 158 as shown in Fig. 10. The user can select the Queue command by soft button 114 to enter the selected song into the play list queue. As before, the user can also depress play button 122 of Fig. 9 to cause immediate playback of the selected song.

10 Details screen 158 shows information about the selected song including the name of the song, album (or list) name containing the song; the track number, if applicable, and track duration. Note that other information can be included. The user can preview the song, close the Details screen to return to the Tracks screen or queue the song on the play list queue.

15 The device provides the ability to "preview" audio files even while a current song, or playlist, is being played. When a user chooses to preview an audio file, the audio file is played for about 10 seconds while any currently-played file or playlist is suspended. After previewing is complete, the suspended file or playlist resumes playback. In other embodiment, the preview duration can vary, or be stopped by user selection.

Fig. 11 illustrates associations among items.

20 In Fig. 11, song 168 is one of many songs stored in the device. Categories such as albums 160, artists 162, play lists 164 and genres 166 each include sub-categories. For example, albums 160 includes the names of various albums. Songs are associated with albums, genres and playlists. Such association can be by using pointers, a data structure including items to be associated, etc. "Association" as used herein, includes a first item associated with a second item; and the second item associated with the first item. In other words, albums can be associated with one or more songs in the database of the device so that an automated search to find all songs associated with an album is easier. The direction of arrow pointers in Fig. 11 is not intended to limit the manner of associations among items in the present invention.

30 Similar to albums, the category of artists 162 includes names of artists, or performers, of songs. Each artist name is associated with one or more songs in the database. Playlists 164 includes names of playlists. These are collections of songs that can be defined by

the user, the device manufacturer, or others. Each playlist can be associated with one or more songs. Genres 166 includes various styles of music which are associated with one or more songs in the database. Note that items can exist without being associated with a song. Also, items can be associated with other items as where an artist name is associated with the albums containing the songs that the artist has created.

Although not shown in Fig. 11, items can have additional information, such as properties, details, etc., associated with the item. For example, a song can have information such as play time, artist name, artist album, copyright owner, etc., associated with the song.

Fig. 12 illustrates display screens used to search for a song or other item.

In Fig. 12, screen 180 is the initial library screen, as discussed above. If the user invokes the Search command (via the appropriate soft button) with Albums selected then screen 182 is displayed. Note that the search function can be applied to any of the categories. The user can depress the Plus or Minus soft buttons to cycle through the alphabet and change the character in the current location as indicated by the cursor. The cursor position is changed by using the scroll up/scroll down buttons 128 and 130, respectively, of Fig. 9. As each letter is entered the letters are compared and the nearest match of the stored albums' names is displayed as shown in screen 184. When the desired match is displayed the user selects the Go! command.

Screen 186 shows the result of selecting the Go! command. A list of albums is displayed with the matched album centered and selected. The user can close, open or queue the album as discussed above.

Fig. 13 illustrates details of different items.

In Fig. 13, screen 200 illustrates details displayed as a result of selecting the "Details" command from soft button 1A track is selected. Screen 200 shows that details of the track "Jukebox Demo" shows the name of the album that the track resides on, the creator, or copyright owner, of the track, and the playing time of the track.

Screen 202 illustrates details of an item on the active queue list. Items are placed onto the active queue list by selecting the "Queue" command when an album, song, track, or other item is selected, as discussed above. For example, screen 204 shows the active queue list where the track "Jukebox Demo" is selected. By invoking the "Details" command screen 202 is brought up to show details of the Jukebox Demo track.

As shown in screen 202, the Detail screen shows what track number the selected track is, which album the track is from; the creator, or copyright owner, of the track, and the title of the track. Additionally, the details for an item on the queue list also show playback settings. These are shown by two-letter abbreviations at the bottom of the screen. The settings are as

5 show in Table I, below.

<u>EA</u>	<u>Environmental Preset</u>
<u>EQ</u>	<u>Parametric EQ</u>
<u>HS</u>	<u>Headphone Spatialization</u>
<u>TS</u>	<u>Time Scaling</u>
<u>4S</u>	<u>Four Channel Speaker Sound</u> <u>(only if speakers are connected)</u>

TABLE I

These settings have their common meanings, as is known in the art. Note that the setting 4S is not shown in screen 202 as it is not currently active.

Fig. 14 illustrates the Nomad Jukebox coupled to a host computer system.

In Fig. 14, device 300 (e.g., the Nomad Jukebox) is coupled to host system 302.

5 In a preferred embodiment host system 302 is a personal computer, such as an IBM-PC compatible computer. Host system 302 includes a user interface having display 304 and user input devices such as keyboard 306 and mouse 308. In other embodiments the host system need not be a full computer system. Any type of processing system having a user interface is possible. For example, it is possible to couple the device to a laptop computer, game console, web-enabled
10 television, or any consumer electronic device or digital platform, in general. The host user interface need not provide a display and can be much more minimal than the keyboard and mouse shown in Fig. 14. A preferred embodiment of the invention uses a Universal Synchronous Bus (USB) connection but any type of connection such as IEEE 1394 (FireWire), Ethernet, Serial Port, etc. can be used. A wireless (i.e., optical or radio frequency) connection
15 can be used.

Once device 300 is coupled to host system 302, a user of host system 302 can launch a bridge interface to allow for the transfer of files between device 300 and host system 302. In a preferred embodiment, once the bridge interface is launched, the controls of device 300 are inoperable. The user interface of host system 302 is used to operate the bridge interface
20 to transfer files.

The invention has now been described with reference to the preferred embodiments. Alternatives and substitutions will now be apparent to persons of skill in the art.

WHAT IS CLAIMED IS:

AUTOMATIC HIERARCHICAL CATEGORIZATION OF MUSIC BY METADATA

ABSTRACT OF THE DISCLOSURE

A method, performed by software executing on the processor of a portable music playback device, that automatically files tracks according to hierarchical structure of categories to organize tracks in a logical order. A user interface is utilized to change the hierarchy, view track names, and select tracks for playback or other operations. The user interface uses an overlapping hierarchy of categories. A song title can be accessed in multiple different ways by starting with different categories. A preferred embodiment of the invention uses the top-level categories "Albums", "Artists", "Genres" (or styles), and "Play Lists". Within the Albums category are names of different albums of songs stored in the device. Within each album are the album tracks, or songs, associated with that album. Navigation is performed by presenting a sequence of display screens for each level of the hierarchy.

SF 1174923 v2



REPLACEMENT SHEET

REPLA

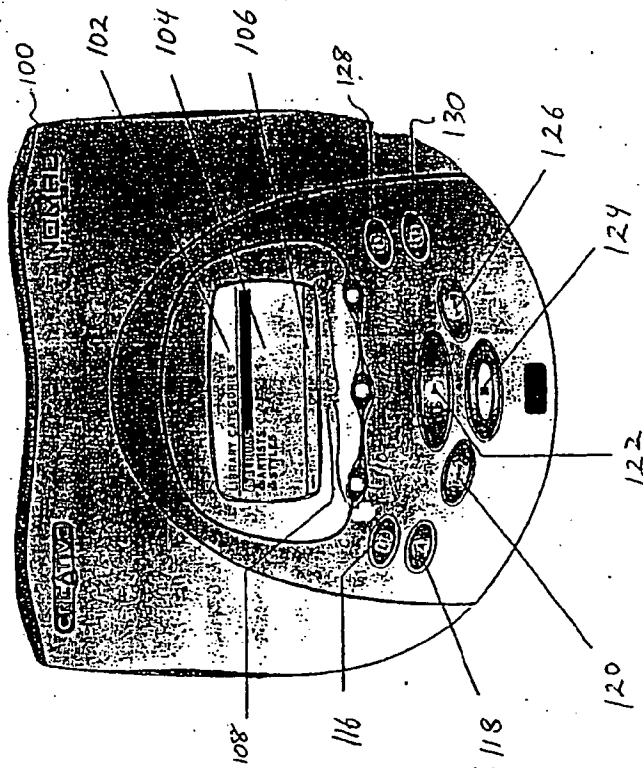
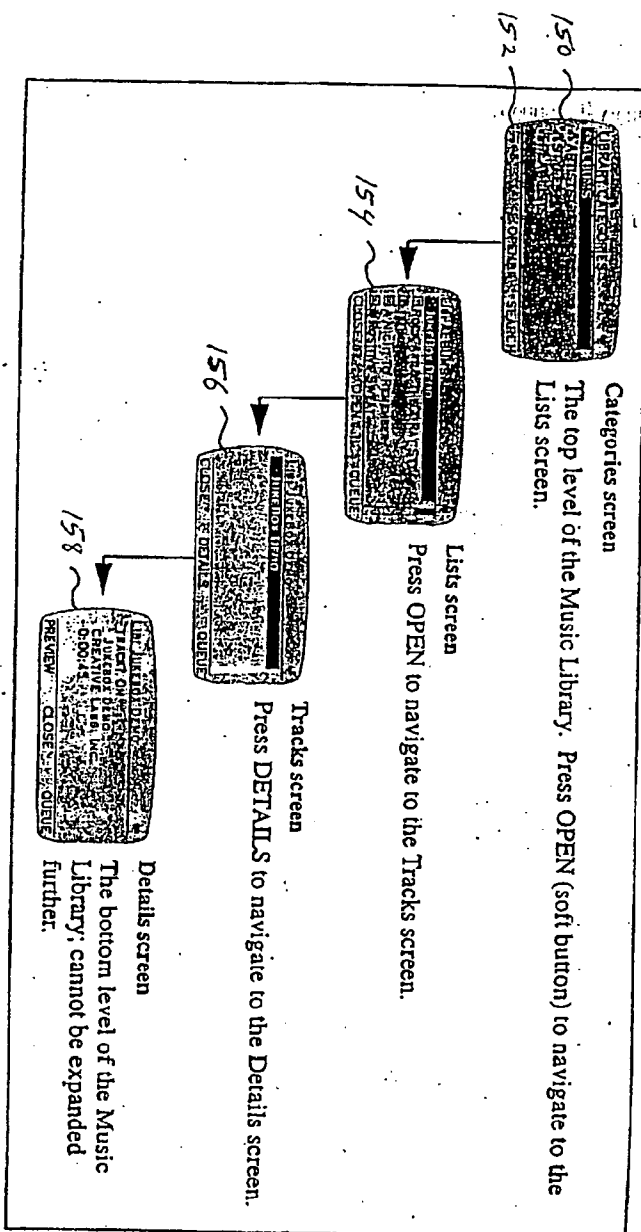


Fig. 9



REPLACEMENT SHEET

Fig. 10



REPLACEMENT SHEET

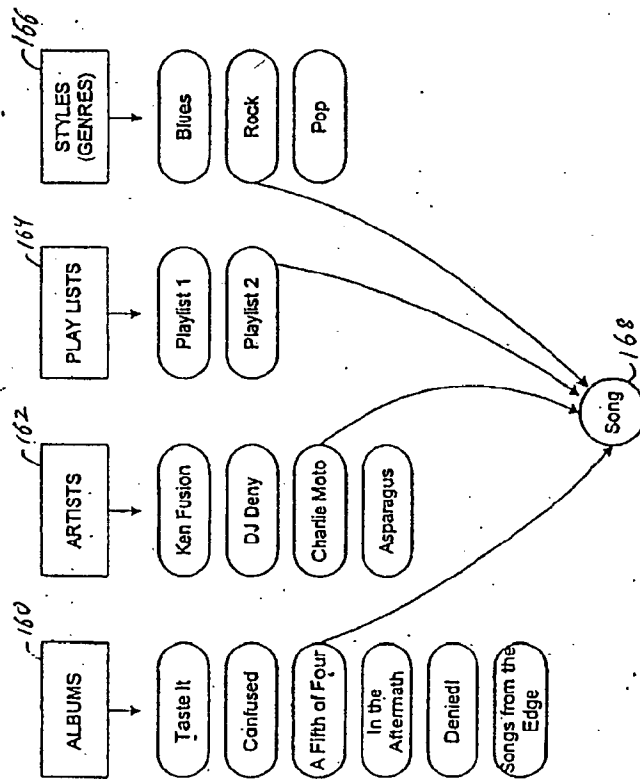


Fig. 11

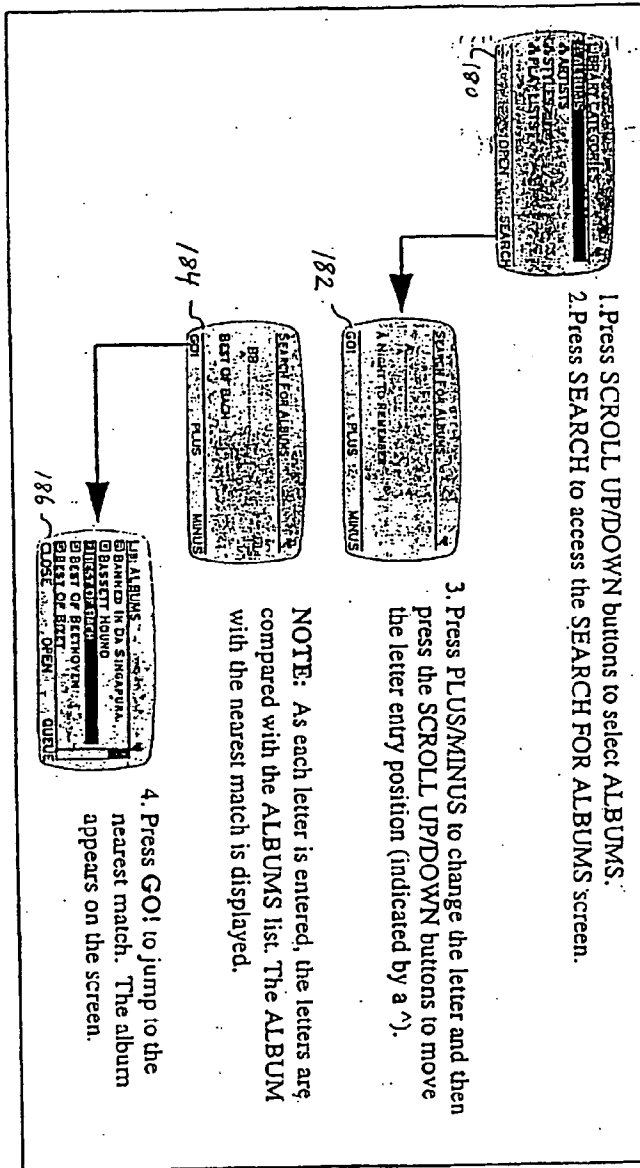
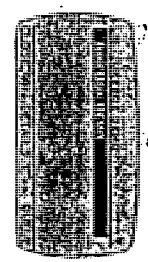


Fig. 12

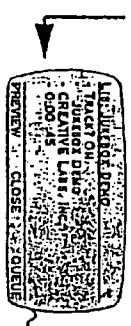
REPLACEMENT SHEET



View DETAILS accessed from the TRACKS screen:

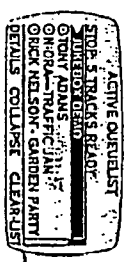


1. Press DETAILS. The DETAILS screen displays the Track Order, Album, Artist, and duration of the track.

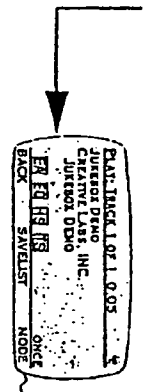


2. Press CLOSE to return to the TRACKS screen.

Viewing DETAILS accessed from the ACTIVE QUEUE LIST screen:



1. Press DETAILS. The DETAILS screen displays the Track Title, Artist, and Album together with Audio Playback settings (see note below) and Play Mode (see "Setting Play Mode" on page 16).



2. Press BACK to return to the ACTIVE QUEUE LIST screen.

REPLACEMENT SHEET

Fig. 13

REPLACEMENT SHEET.

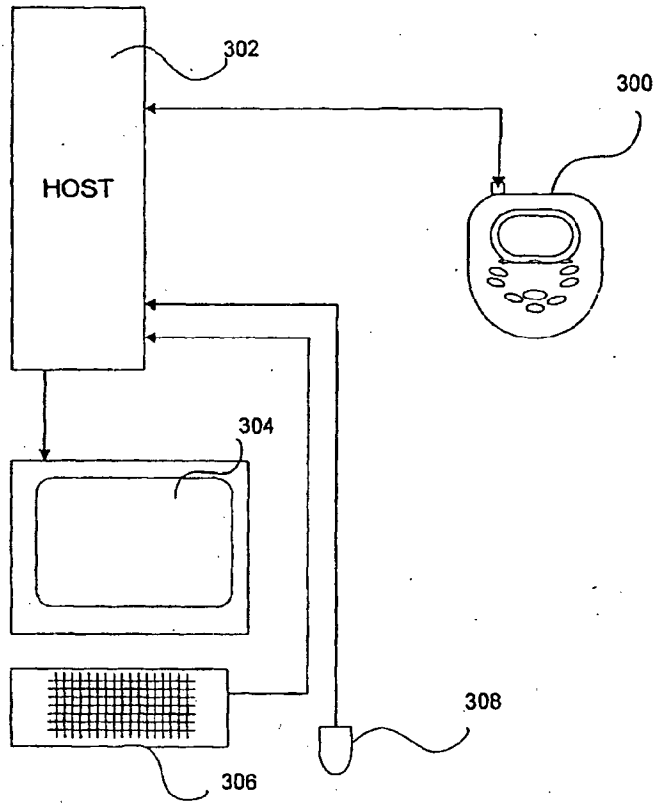


Fig. 14

SONY ELECTRONICS INC.
16535 Via Arroyo, San Diego, CA 92128
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Exhibit 18



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/733,723	01/05/2001	Ron Goodman	017002022500	3728

8791 7590 03/30/2004
BLAKELY SOKOLOFF TAYLOR & ZAFMAN
12400 WILSHIRE BOULEVARD, SEVENTH FLOOR
LOS ANGELES, CA 90025

EXAMINER

RONES, CHARLES

ART UNIT PAPER NUMBER

2175

DATE MAILED: 03/30/2004

17

Please find below and/or attached an Office communication concerning this application or proceeding.

1

Office Action Summary	Application No.	Applicant(s)	
	09/755,723	GOODMAN ET AL	
	Examiner	Art Unit	
	Charles L. Ronas	2175	

- The MAILING DATE of this communication appears on the cover sheet with the correspondence address -

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(e). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 03 February 2004.

2a) This action is FINAL. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-4 and 6-23 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) _____ is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claim(s) 21 and 22 are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) <input type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date: _____
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
Paper No(s)/Mail Date: _____	6) <input checked="" type="checkbox"/> Other: <u>Restriction/Election</u>

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claim 1-4, 6-20, and 23, drawn to a method/computer program for filing media tracks, classified in class 707, subclass 7.
- II. Claims 21-22, drawn to a method of displaying on a display screen, classified in class 707, subclass 526.

The inventions are distinct, each from the other because of the following reasons:

Inventions in Group I and Group II are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because a method of filing media tracks and a method of displaying are distinct and does not require the particulars of the other. The subcombination has separate utility such as method of filing and a displaying.

Application/Control Number: 09/755,723
Art Unit: 2175

Page 3

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

Conclusion

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

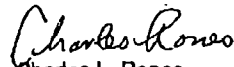
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles L. Roncs whose telephone number is 703-306-3030. The examiner can normally be reached on Monday-Thursday 8am-4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dov Popovici can be reached on 703-305-3830. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Application/Control Number: 09/755,723
Art Unit: 2175

Page 4

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Charles L. Ronos
Primary Examiner
Art Unit 2175

March 29, 2004

Exhibit 19



#19
6/3/04
A.W.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:
GOODMAN, et al
Application No.: 09/755,723
Filed: January 5, 2001
For: AUTOMATIC HIERARCHICAL
CATEGORIZATION OF MUSIC BY
METADATA

Examiner: RONES, Charles L.
Art Unit: 2175

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MAY 06 2004

Technology Center 2100

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

Sir:

Enclosed is a copy of Information Disclosure Citation Form PTO-1449 or PTO/SB/08 together with copies of the documents cited on that form. It is respectfully requested that the cited documents be considered and that the enclosed copy of Information Disclosure Citation Form PTO-1449 or PTO/SB/08 be initialed by the Examiner to indicate such consideration and a copy thereof returned to applicant(s).

Pursuant to 37 C.F.R. § 1.97, the submission of this Information Disclosure Statement is not to be construed as a representation that a search has been made and is not to be construed as an admission that the information cited in this statement is material to patentability.

Pursuant to 37 C.F.R. § 1.97, this Information Disclosure Statement is being submitted under one of the following (as indicated by an "X" to the left of the appropriate paragraph):

37 C.F.R. §1.97(b).

37 C.F.R. §1.97(c). If so, then enclosed with this Information Disclosure Statement is one of the following:



- () A statement pursuant to 37 C.F.R. §1.97(e) or
- () A check for \$180.00 for the fee under 37 C.F.R. § 1.17(p).
- () 37 C.F.R. §1.97(d). If so, then enclosed with this Information Disclosure Statement are the following:
 - (1) A statement pursuant to 37 C.F.R. §1.97(e); and
 - (2) A check for \$180.00 for the fee under 37 C.F.R. §1.17(p) for submission of the Information Disclosure Statement.

Respectfully submitted,

Russell N. Swerdon
Reg. No. 36,943

Date: 4.30.04

Creative Labs, Inc.
1901 McCarthy Blvd.
Milpitas, CA 95035
(408) 428-6600

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Technology Center 2100

Substitute for Form 1449/PTO

OPEN INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(use as many sheets as necessary)

Complete If Known

Application Number	09/755,723
Filing Date	01/05/2001
First Named Inventor	GOODMAN, Ron
Art Unit	2175
Examiner Name	RONES, Charles L.
Attorney Docket Number	6407P212

Sheet 1 of 2

U.S. PATENT DOCUMENTS						
Examiner Initials*	Cite No. ¹	Document Number		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Country Code ²	Number-Kind Code ³ (if known)			
AR	1	US-	6,377,530-B1	04-23-2002	BURROWS	
		US-				
		US-				
		US-				
		US-				
		US-				
		US-				
		US-				
		US-				
		US-				
		US-				
		US-				

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MAY 06 2004
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FOREIGN PATENT DOCUMENTS								
Examiner Initials*	Cite No. ¹	Foreign Patent Document			Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T*
		Country Code ²	Number ³	Kind Code ⁴ (if known)				

Examiner Signature: <i>C. Rones</i>	Date Considered: <i>6-8-04</i>
-------------------------------------	--------------------------------

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. Applicant's unique citation designation number (optional). ²See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. ³Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴For Japanese patent documents, the indication of the year of reign of the Emperor must precede the serial number of the patent document. ⁵Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ⁶Applicant is to place a check mark here if English language translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-785-9199) and select option 2.

Based on Form PTO/SB/06A (04-03) as modified by BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP on 05/09/03

Substitute for Form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(use as many sheets as necessary)

Complete if Known

	Application Number	09/755,723
	Filing Date	01/05/2001
	First Named Inventor:	GOODMAN, Ron
	Art Unit	2175
	Examiner Name	RONES, Charles L.
	Attorney Docket Number	6407P212

2 of 2



NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T ²
CR	1	Web page, MENTA, RICHARD, "1200 Song MP3 Portable is a Milestone Player," MP3 newswire.net, 01/11/00, 5 pages, http://pjbox.com/newswire/	
CR	2	Web page on "MusicMatch Jukebox 4.0: Screen Shot 1," PC Magazine, June 17, 1999, 2 pages, http://web.archive.org/web/20000226113655/www.zdnet.com/products/stories/reviews/0,4161,2277814,00.html	
CR	3	Web page, NORTON, PATRICK, "MusicMatch Jukebox 4.1, the Ultimate MP3 Utility," techtv, 9/17/1999, 2 pages, http://www.techtv.com/freshgear/print0,23102,2324631,00.html	
CR	4	Web page on "Can you carry your CD collection in your pocket? Yes, you can." Compaq web site, 3 pages, http://research.compaq.com/SRC/pjb/ , printed on April 30, 2004.	
<p style="font-size: 2em; margin: 0;">RECEIVED</p> <p style="margin: 0;">MAY-06 2004</p> <p style="margin: 0;">Technology Center 2100</p>			

Examiner Signature	<i>C. Rones</i>	Date Considered	6-8-04
--------------------	-----------------	-----------------	--------

*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 809. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ¹Applicant's unique citation designation number (optional). ²Applicant is to place a check mark here if English translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1460, Alexandria, Virginia 22313-1450. If you need assistance in completing the form, call 1-800-PTO-3199 (1-800-785-9199) and select option 2.

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2178

PTO/SB/21 (03-02)

Approved for use through 04/30/2005, OMB 033-1-0031

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TRANSMITTAL FORM <small>(to be used for all correspondence after initial filing)</small>	Application Number	09755,723	
	Filing Date	01/05/2001	
	First Named Inventor	GOODMAN, Ron	
	Art Unit	2176	
	Examiner Name	RONES, Charles L.	
Total Number of Pages in This Submission	62	Attorney Docket Number	6407P212

ENCLOSURES <small>(Check all that apply)</small>		
<input checked="" type="checkbox"/> Fee Transmittal Form <input type="checkbox"/> Fee Attached <input checked="" type="checkbox"/> Amendment/Reply <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/Declaration(s) <input type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input checked="" type="checkbox"/> Information Disclosure Statement <input type="checkbox"/> Certified Copy of Priority Document(s) <input type="checkbox"/> Response to Missing Parts/Incomplete Application <input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53	<input checked="" type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers <input type="checkbox"/> Petition <input type="checkbox"/> Petition to Convert to a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation <input type="checkbox"/> Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Request for Refund <input type="checkbox"/> CD, Number of CD(s)	<input type="checkbox"/> After Allowance Communication to a Technology Center (TC) <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input type="checkbox"/> Appeal Communication to TC (Appeal Notice, Brief, Reply Brief) <input type="checkbox"/> Proprietary Information <input type="checkbox"/> Status Letter <input checked="" type="checkbox"/> Other Enclosure(s) (please identify below):
<p style="text-align: right; font-size: 24pt; font-weight: bold;">RECEIVED</p> <p style="text-align: center;">MAY 06 2004</p> <p style="text-align: right;">Technology Center 2100</p>		
<p>SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT</p>		

Firm or Individual	Russell N. Swerden	Reg. No. 38,843
Signature	<i>Russell N. Swerden</i>	
Date	April 30, 2004	

CERTIFICATE OF TRANSMISSION/MAILING		
I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, Washington, DC 20231 on this date: <u>April 30, 2004</u>		
Typed or printed	Karen Howe-Behrooz	
Signature	<i>Karen Howe-Behrooz</i>	Date 4-30-2004

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, Washington, DC 20231.

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PTO/SB/17 (10-03)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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FEE TRANSMITTAL
for FY 2004
Effective 10/01/2003. Patent fees are subject to annual revision.

Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$)**0**

Complete if Known

Application Number	09/755,723
Filing Date	01/05/2001
First Named Inventor	GOODMAN, Ron
Examiner Name	RONES, Charles
Art Unit	2175
Attorney Docket No.	6407P212

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MAY 06 2004

METHOD OF PAYMENT (check all that apply)

Check Credit card Money Order Other None

Deposit Account:

Deposit Account Number: _____
Deposit Account Name: _____

The Director is authorized to: (check all that apply)

Charge fee(s) indicated below Credit any overpayments
 Charge any additional fee(s) or any underpayment of fee(s)
 Charge fee(s) indicated below, except for the filing fee to the above-identified deposit account.

FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description	Fee Paid
1001 770	2001 385	Utility filing fee	
1002 340	2002 170	Design filing fee	
1003 530	2003 265	Plant filing fee	
1004 770	2004 385	Reissue filing fee	
1005 160	2005 80	Provisional filing fee	
SUBTOTAL (1)			(\$) 0

2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

Total Claims: -20** = 0 X 18 = 0
Independent Claims: -3** = 0 X 86 = 0
Multiple Dependent:

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description	Fee Paid
1202 18	2202 9	Claims in excess of 20	
1201 86	2201 43	Independent claims in excess of 3	
1203 290	2203 145	Multiple dependent claim, if not paid	
1204 68	2204 43	** Reissue independent claims over original patent	
1205 18	2205 9	** Reissue claims in excess of 20 and over original patent	
SUBTOTAL (2)			(\$) 0

3. ADDITIONAL FEES

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description	Fee Paid
1051 130	2051 65	Surcharge - late filing fee or oath	
1052 60	2052 25	Surcharge - late provisional filing fee or cover sheet	
1053 130	1063 130	Non-English specification	
1812 2,520	1812 2,520	For filing a request for <i>ex parte</i> reexamination	
1804 920*	1804 920*	Requesting publication of SIR prior to Examiner action	
1805 1,840*	1805 1,840*	Requesting publication of SIR after Examiner action	
1251 110	2251 55	Extension for reply within first month	
1252 420	2252 210	Extension for reply within second month	
1253 950	2253 475	Extension for reply within third month	
1254 1,480	2254 740	Extension for reply within fourth month	
1255 2,010	2255 1,005	Extension for reply within fifth month	
1401 330	2401 155	Notice of Appeal	
1402 330	2402 185	Filing a brief in support of an appeal	
1403 290	2403 145	Request for oral hearing	
1451 1,510	1451 1,510	Petition to institute a public use proceeding	
1452 110	2452 55	Petition to revive - unavoidable	
1453 1,330	2453 665	Petition to revive - unintentional	
1501 1,330	2501 665	Utility issue fee (or reissue)	
1502 480	2502 240	Design issue fee	
1503 640	2503 320	Plant issue fee	
1460 130	1460 130	Petitions to the Commissioner	
1807 50	1807 50	Processing fee under 37 CFR 1.17(q)	
1806 180	1806 180	Submission of Information Disclosure Stmt	
8021 40	8021 40	Recording each patent assignment per property (times number of properties)	
1809 770	2809 385	Filing a submission after final rejection (37 CFR 1.129(a))	
1810 770	2810 385	For each additional invention to be examined (37 CFR 1.129(b))	
1901 770	2801 385	Request for Continued Examination (RCE)	
1802 900	1802 900	Request for expedited examination of a design application	
Other fee (specify): _____			
*Reduced by Basic Filing Fee Paid			
SUBTOTAL (3)			(\$) 0

**or number previously paid, if greater. For Reissues, see above

SUBMITTED BY (Complete if applicable)

Name (Print/Type)	RUSSELL N. SWERDON	Registration No. (Attorney/Agent)	36,943	Telephone	(408)428-6600
Signature	<i>Russell N. Swerdon</i>	Date	4-30-2004		

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

This collection of information is required by 37 CFR 1.17 and 1.27. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Exhibit 20

Notice of Allowability	Application No.	Applicant(s)	
	09/755,723	GOODMAN ET AL	
	Examiner	Art Unit	
	Charles L. Rones	2175	

- The MAILING DATE of this communication appears on the cover sheet with the correspondence address -

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS. This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. This communication is responsive to amendment filed May 4, 2004.
2. The allowed claim(s) is/are 24-36.
3. The drawings filed on 05 January 2001 are accepted by the Examiner.
4. Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some* c) None of the:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) Including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) hereto or 2) to Paper No./Mail Date _____.
 - (b) Including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

<ol style="list-style-type: none"> 1. <input type="checkbox"/> Notice of References Cited (PTO-892) 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date <u>19</u> 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material 	<ol style="list-style-type: none"> 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) 6. <input type="checkbox"/> Interview Summary (PTO-413), Paper No./Mail Date _____. 7. <input type="checkbox"/> Examiner's Amendment/Comment 8. <input type="checkbox"/> Examiner's Statement of Reasons for Allowance 9. <input type="checkbox"/> Other _____.
--	---

Charles Rones
 Charles L. Rones
 Primary Examiner
 Art Unit: 2175



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

0371 7590 06/09/2004
BLAKELY SOKOLOFF TAYLOR & ZAFMAN
12400 WILSHIRE BOULEVARD, SEVENTH FLOOR
LOS ANGELES, CA 90025

EXAMINER

RONES, CHARLES

ART UNIT PAPER NUMBER

3175

DATE MAILED: 06/09/2004

Table with 5 columns: APPLICATION NO., FILING DATE, FIRST NAMED INVENTOR, ATTORNEY DOCKET NO., CONFIRMATION NO.
09/755,723 01/05/2001 Ron Goodman 017002022500 3723

TITLE OF INVENTION: AUTOMATIC HIERARCHICAL CATEGORIZATION OF MUSIC BY METADATA

Table with 6 columns: APPLN. TYPE, SMALL ENTITY, ISSUE FEE, PUBLICATION FEE, TOTAL FEE(S) DUE, DATE DUE
nonprovisional NO \$1330 \$300 \$1630 09/09/2004

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE REFLECTS A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE APPLIED IN THIS APPLICATION. THE PTOL-85B (OR AN EQUIVALENT) MUST BE RETURNED WITHIN THIS PERIOD EVEN IF NO FEE IS DUE OR THE APPLICATION WILL BE REGARDED AS ABANDONED.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

- A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.
B. If the status is changed, pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above and notify the United States Patent and Trademark Office of the change in status, or

If the SMALL ENTITY is shown as NO:

- A. Pay TOTAL FEE(S) DUE shown above, or
B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check the box below and enclose the PUBLICATION FEE and 1/2 the ISSUE FEE shown above.
[] Applicant claims SMALL ENTITY status. See 37 CFR 1.27.

II. PART D - FEE(S) TRANSMITTAL should be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). Even if the fee(s) have already been paid, Part B - Fee(s) Transmittal should be completed and returned. If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** Mail Stop **ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
 or **Fax** (703) 746-4000

INSTRUCTIONS: This form should be used for transmitting the **ISSUE FEE** and **PUBLICATION FEE** (if required). Blocks 1 through 4 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEB ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Please Legibly mark-up with any corrections of use Block 1)

08791 7590 06/09/2004

BLAKELY SOKOLOFF TAYLOR & ZAFMAN
12400 WILSHIRE BOULEVARD, SEVENTH FLOOR
LOS ANGELES, CA 90025

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop **ISSUE FEE** address above, or being facsimile transmitted to the USPTO, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09715,723	01/05/2001	Ron Goodman	017002022500	3728

TITLE OF INVENTION: AUTOMATIC HIERARCHICAL CATEGORIZATION OF MUSIC BY METADATA

APPLN TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1330	\$300	\$1630	09/09/2004

EXAMINER	ART UNIT	CLASS-SUBCLASS
ROWES, CHARLES	2175	707-104100

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363). <input type="checkbox"/> Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached. <input type="checkbox"/> "Fee Address" indication (or "Fee Address" indication form PTO/SB/47; Rev. 03-02 or more recent) attached. Use of a Customer Number is required.	2. For printing on the patent front page, list (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.	1 _____
		2 _____
		3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)
 PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. Inclusion of assignee data is only appropriate when an assignment has been previously submitted to the USPTO or is being submitted under separate cover. Completion of this form is NOT a substitute for filing an assignment.
 (A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): individual corporation or other private group entity government

4a. The following fee(s) are enclosed: <input type="checkbox"/> Issue Fee <input type="checkbox"/> Publication Fee <input type="checkbox"/> Advance Order - # of Copies _____	4b. Payment of Fee(s): <input type="checkbox"/> A check in the amount of the fee(s) is enclosed. <input type="checkbox"/> Payment by credit card. Form PTO-2038 is attached. <input type="checkbox"/> The Director is hereby authorized by charge the required fee(s), or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).
--	--

Director for Patents is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid issue fee to the application identified above.

(Authorized Signature)	(Date)
NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant, a registered attorney or agent, or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office. This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.	

TRANSMIT THIS FORM WITH FEE(S)

PTOL-85 (Rev. 11/03) Approved for use through 04/30/2004. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/755,723	01/05/2001	Ron Goodman	017002022500	3728
08791	7550	06/09/2004	EXAMINER	
BLAKELY SOKOLOFF TAYLOR & ZAFMAN 12400 WILSHIRE BOULEVARD, SEVENTH FLOOR LOS ANGELES, CA 90025			RONES, CHARLES	
			ART UNIT	PAPER NUMBER
			2175	

DATE MAILED: 06/09/2004

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

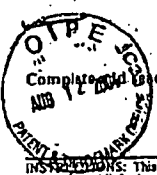
The Patent Term Adjustment to date is 303 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 303 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) system (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (703) 305-1383. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at (703) 305-8283.

816104



PART B - FEE(S) TRANSMITTAL

Mail Stop ISSUE FEE
 Commissioner for Patents
 P.O. Box 1450
 Alexandria, Virginia 22313-1450
 or Fax (703) 746-4000

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 4 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Must Legibly mark-up with any corrections on one block 1)

08791 7190 0609/2004
BLAKELY SOKOLOFF TAYLOR & ZAFMAN
 12400 WILSHIRE BOULEVARD, SEVENTH FLOOR
 LOS ANGELES, CA 90025

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first-class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO, on the date indicated below.

Cynthia K. Dawn (Depositor's name)
 Cynthia K. Dawn (Signature)
 August 12, 2004 (Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09753,723	01/05/2001	Ron Goodman	017002022500	3728

TITLE OF INVENTION: AUTOMATIC HIERARCHICAL CATEGORIZATION OF MUSIC BY METADATA

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1330	\$300	\$1630	09/09/2004

EXAMINER	ART UNIT	CLASS-SUBCLASS
RONES, CHARLES	2175	707-104100

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- Change of correspondence address (or Change of Correspondence Address form PTO/SB/633) attached.
 - "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.
2. For printing on the patent front page, list (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
- Russell N. Swerdon
Creative Technology LTD

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. Inclusion of assignee data is only appropriate when an assignment has been previously submitted to the USPTO or is being submitted under separate cover. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: Creative Technology LTD
 (B) RESIDENCE: (CITY AND STATE OR COUNTRY) Singapore

Please check the appropriate assignee category or categories (will not be printed on the patent): individual corporation or other private group entity government

- 4a. The following fee(s) are enclosed:
- Issue Fee
 - Publication Fee
 - Advance Order - # of Copies _____
- 4b. Payment of Fee(s):
- A check in the amount of the fee(s) is enclosed.
 - Payment by credit card. Form PTO-2038 is attached.
 - The Director is hereby authorized by charge the required fee(s), or credit any overpayment, to Deposit Account Number _____ (enclose as extra copy of this form).

Director for Patents is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid Issue fee to the application identified above.

(Authorized Signature) Russell N. Swerdon (Date) Aug. 12, 2004

Russell N. Swerdon, Reg. No. 36,963
 NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant, a registered attorney or agent, or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, Alexandria, Virginia 22313-1450.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

09/10/2004 09:12:12 00000002 03753723
 01 Fee(s) 1330.00 GP
 02 Fee(s) 300.00 GP

TRANSMIT THIS FORM WITH FEE(S)



I hereby certify that the form Part B - Fee(s) Transmittal PTOL-83 and the check in the amount of the fee is being deposited with the U.S. Postal Service "Express Mail Post Office to Addressee" service under 37 CFR § 1.10 on the date indicated below and is addressed to:

Commissioner for Patents
P.O. Box 1430
Alexandria, VA 22313-1450

By: Cynthia K. Dawn

Typed Name: Cynthia K. Dawn

Express Mail Label No.: EV347886201US

Date of Deposit: August 12, 2004

Exhibit 21



B/93 2175
 #21
 8-16-04
 TC

Approved for use through 11/30/2005. OMB 0831-0033
 U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

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REVOCATION OF POWER OF ATTORNEY WITH NEW POWER OF ATTORNEY AND CHANGE OF CORRESPONDENCE ADDRESS	Application Number	09735723
	Filing Date	1/5/2001
	First Named Inventor	GOODMAN et al.
	Art Unit	2175
	Examiner Name	Rones, Charles
	Attorney Docket Number	6407P212

I hereby revoke all previous powers of attorney given in the above-identified application.

A Power of Attorney is submitted herewith.

OR

I hereby appoint the practitioners associated with the Customer Number:

Please change the correspondence address for the above-identified application to:

The address associated with Customer Number:

OR

<input type="checkbox"/> Firm or Individual Name			
Address			
Address			
City	State	Zip	
Country			
Telephone	Fax		

I am the:

Applicant/Inventor.

Assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)

SIGNATURE of Applicant or Assignee of Record

Name	Chon Hock Leow		
Signature	<i>Chon Hock Leow</i>		
Date	<i>7/6/04</i>	Telephone	(408) 428-6600

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.

Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.38. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 422 and 37 CFR 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1460, Alexandria, VA 22313-1460.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.





PTO/SB/06 (04-03)

Approved for use through 07/01/2008, OMB 0631-0031
U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: CREATIVE TECHNOLOGY LTD.
Application No./Patent No.: 09/755,723 Filed/Issue Date: 1/5/2001
Entitled: AUTOMATIC HIERARCHICAL CATEGORIZATION OF MUSIC BY METADATA
CREATIVE TECHNOLOGY LTD., a CORPORATION
(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

- 1. the assignee of the entire right, title, and interest; or
- 2. an assignee of less than the entire right, title and interest.
The extent (by, percentage) of its ownership interest is _____ %
in the patent application/patent identified above by virtue of either:

A. An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office of Reel/Frame 011768/0174, or for which a copy thereof is attached.

OR:

B. A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as shown below:

- 1. From: _____ To: _____
The document was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.
- 2. From: _____ To: _____
The document was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.
- 3. From: _____ To: _____
The document was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.

Additional documents in the chain of title are listed on a supplemental sheet.

Copies of assignments or other documents in the chain of title are attached.
(NOTE: A separate copy (i.e., the original assignment document or a true copy of the original document) must be submitted to Assignment Division in accordance with 37 CFR Part 3, if the assignment is to be recorded in the records of the USPTO. See MPEP 302.08)

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

7/6/04
Date
(408) 428-6600
Telephone number

CHON HOCK LEOW
Typed or printed name

Signature
CHIEF TECHNOLOGY OFFICER
Title

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Exhibit 22



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1472
Alexandria, Virginia 22313-1430
www.uspto.gov

APPLICATION NUMBER	FILING OR 371 (c) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/755,723	01/05/2001	Ron Goodman	017002022500

08791
BLAKELY SOKOLOFF TAYLOR & ZAFMAN
12400 WILSHIRE BOULEVARD
SEVENTH FLOOR
LOS ANGELES, CA 90025-1030

CONFIRMATION NO. 3728
OC000000013550953

22

Date Mailed: 08/16/2004

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 07/12/2004.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

Timothy Caldwell
For ALLEN M WILLIS
OPPD (

OFFICE COPY

Exhibit 23

07-12-04

2175#
B
93
#23
9/10/04



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby certify that this correspondence is being deposited with the United States Postal Service as Express Mail No. ER886552274US with sufficient postage in an envelope addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

on July 9, 2004
Date of Deposit
Cynthia K. Dawn
Name of Person Mailing Correspondence
Cynthia K. Dawn

Application No.: 09/755,723
Title: AUTOMATIC HIERARCHICAL CATEGORIZATION OF MUSIC BY METADATA
Applicant: Ron Goodman
Filed: January 5, 2001
TC/A.U. 2175
Examiner: Rones, Charles
Docket No.: 6407P212
Customer No.: 40032

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Match and Return

AMENDMENT AND PETITION UNDER 37 C.F.R. § 1.48(c)
TO CORRECT INVENTORSHIP

Dear Sir:

The undersigned hereby respectfully requests and petitions that the above-referenced application be amended under 37 C.F.R. § 1.48(c) to correct inventorship of the application.

The application was filed on January 5, 2001 naming the following persons as inventors of the present patent application:

97/711/2004 (621)WSS1 00660056 09755723
130.00 DP
64-FEB-04

- (1) Ron Goodman, a citizen of the United States, residing at 226 Jeter Street, Santa Cruz, CA 95060; and
- (2) Howard N. Egan, a citizen of the United States, residing at 219 Elinor Street, Capitola, CA 95010.

Please correct and amend the present patent application so that David Bristow, a citizen of the United Kingdom, residing at 5988 NE Tolo Road, Bainbridge Island, WA 98110 is additionally named as a joint inventor of the present patent application.

It is respectfully submitted that the amendment is necessitated by amendment of the claims and that the error in inventorship of the present patent application was made without any deceptive intent by anyone, including the actual inventors.

Enclosed with this Amendment and Petition are the following documents:

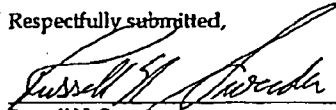
- (1) a verified Statement of Facts by David Bristow stating that the addition in inventorship of the present patent application is necessitated by amendment of the claims and that the inventorship error occurred without any deceptive intent on his part;
- (2) an executed Declaration/Power of Attorney indicating all inventors; and
- (3) an Assent of Assignee for Correction of Inventorship with a copy of the previously recorded Notice of Recordation of Assignment document.

The Assignment by the additional inventor, David Bristow, to be recorded in accordance with 37 C.F.R. § 1.33(1), and a check in the amount of \$40.00 to cover the recordation fee required by 37 C.F.R. § 1.21(h), are being forwarded separately to the Assignment Division.

Enclosed herewith is a check in the amount of \$130.00 in payment of the fee under 37 C.F.R. § 1.17(i) for correction of inventorship.

Respectfully submitted,

Dated: July 9, 2004



Russell N. Swerdon
Reg. No. 36,943

Creative Labs, Inc.
1901 McCarthy Boulevard
Milpitas, CA 95035
(408) 428-6600

09/755,723

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6407P112

Jul 09 04 11:50a

David Bristow

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P. 6

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby certify that this correspondence is being deposited with the United States Postal Service as Express Mail with sufficient postage in an envelope addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Date of Deposit: July 9, 2004

Name of Filing Correspondent: Cynthia K Dawn

Signature: Cynthia K Dawn Date: July 9, 2004

Application No.: 09/755,723

Title: AUTOMATIC HIERARCHICAL CATEGORIZATION OF MUSIC BY METADATA

Applicant: Ron Goodman

Filed: January 5, 2001

TC/A.U. 2175

Examiner: Rones, Charles

Docket No.: 6407P212

Customer No.: 40032

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

STATEMENT OF FACTS BY DAVID BRISTOW
UNDER 37 C.F.R. § 1.48(c)

Dear Sir:

I hereby declare:

I. I am making this Statement of Facts under 37 C.F.R. § 1.48(c) in connection with U.S. Patent Application Serial No.09/755,723 filed January 5, 2001 (hereinafter referred to as "the present patent application").

2. My current residence and country of citizenship is as follows:

David Bristow, a citizen of the United Kingdom, residing at 5988 NE Tolo Road, Bainbridge Island, WA 98110.

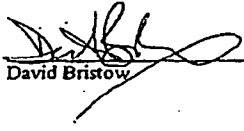
3. The amendment in inventorship is made as necessitated by amendment of the claims. An inventorship error was made by naming only Ron Goodman and Howard N. Egan as joint inventors, rather than naming Ron Goodman, Howard N. Egan and David Bristow as joint inventors.

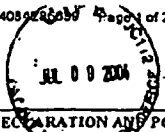
4. The inventorship error was made without any deceptive intent whatsoever on my part.

5. It is now requested that the additional inventor David Bristow be added to the present patent application.

I declare that all statements made herein on my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with knowledge that willful false statements and the like so made are punishable by fine or imprisonment or both under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Dated: July 7th 2004


David Bristow



PATENT APPLICATION

DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION ATTORNEY DOCKET NO. 6407P212

As a below named inventor, I hereby declare that:

My residence/post office address and citizenship are as stated below next to my name; I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: **AUTOMATIC HIERARCHICAL CATEGORIZATION OF MUSIC BY METADATA** the specification of which is attached hereto unless the following box is checked:

(X) was filed on January 5, 2001 as US Application Serial No. or PCT International Application Number 09/755,723 and was amended on 4/30/2004 (if applicable).

I hereby state that I have reviewed and understood the contents of the above-identified specification, including the claims, as amended by any amendment(s) referred to above. I acknowledge the duty to disclose all information which is material to patentability as defined in 37 CFR 1.56.

Foreign Application(s) and/or Claims of Foreign Priority

I hereby claim foreign priority benefits under Title 35, United States Code Section 119 of any foreign application(s) for patent or inventor(s) certificate listed below and have also identified below my foreign application(s) for patent or inventor(s) certificate having a filing date before that of the application on which priority is claimed:

COUNTRY	APPLICATION NUMBER	DATE FILED	PRIORITY CLAIMED UNDER 35 U.S.C. 119
			YES: _____ NO: _____
			YES: _____ NO: _____

Provisional Application

I hereby claim the benefit under Title 35, United States Code Section 119(e) of any United States provisional application(s) listed below:

APPLICATION SERIAL NUMBER	FILING DATE

U.S. Priority Claims

I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code Section 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, Section 1.56(e) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

APPLICATION SERIAL NUMBER	FILING DATE	STATUS (patented/pending/abandoned)

POWER OF ATTORNEY:

As a named inventor, I hereby appoint the practitioners associated with Customer No. 40012 as my patent attorneys, with full power of substitution and revocation, to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

Send Correspondence to: P. Francois de Villiers Customer No. 40032 Creative Labs, Inc. 1901 McCarthy Boulevard Milpitas, CA 95035	Direct Telephone Calls To: Russell N. Swarden (408) 428-6600
--	--

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like to make are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full Name of Inventor: Ron GOODMAN Citizenship: UNITED STATES
 Residence: 326 Jeter Street, Santa Cruz, CA USA 95060
 Post Office Address: Same

Ron Goodman
 Inventor's Signature

July 7 2004
 Date

DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION (continued) **ATTORNEY DOCKET NO. 6487P212**

Full Name of Inventor: Howard N. EGAN Citizenship: UNITED STATES
Residence: 212 Elmer Street, Capitola, CA 95018 USA
Post Office Address: Same

Inventor's Signature _____ Date: July 2004

Full Name of Inventor: David BRISTOW Citizenship: UNITED KINGDOM
Residence: 5288 NE Tele Road, Bellingham Island, WA 98110
Post Office Address: Same

Inventor's Signature _____ Date: July 2004

Full Name of Inventor: _____ Citizenship: _____
Residence: _____
Post Office Address: _____

Inventor's Signature _____ Date: _____

Full Name of Inventor: _____ Citizenship: _____
Residence: _____
Post Office Address: _____

Inventor's Signature _____ Date: _____

Full Name of Inventor: _____ Citizenship: _____
Residence: _____
Post Office Address: _____

Inventor's Signature _____ Date: _____

Full Name of Inventor: _____ Citizenship: _____
Residence: _____
Post Office Address: _____

Inventor's Signature _____ Date: _____

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CREATIVE ATC

PAGE 02



PATENT APPLICATION

DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION ATTORNEY DOCKET NO. 6407P212

As a below-named inventor, I hereby declare that:

My residence/post office address and citizenship are as stated below next to my name; I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

AUTOMATIC HIERARCHICAL CATEGORIZATION OF MUSIC BY META DATA

the specification of which is attached hereto unless the following box is checked:

(X) was filed on January 5, 2001 as US Application Serial No. or PCT International Application Number 09/755,723 and was amended on 4/30/2004 (if applicable).

I hereby state that I have reviewed and understood the contents of the above-identified specification, including the claims, as amended by any amendment(s) referred to above. I acknowledge the duty to disclose all information which is material to patentability as defined in 37 CFR 1.56.

Foreign Application(s) and/or Claims of Foreign Priority

I hereby claim foreign priority benefits under Title 35, United States Code Section 119 of any foreign application(s) for patent or inventor(s) certificate listed below and have also identified below any foreign application for patent or inventor(s) certificate having a filing date before that of the application on which priority is claimed:

Table with 4 columns: COUNTRY, APPLICATION NUMBER, DATE FILED, PRIORITY CLAIMED UNDER 35 U.S.C. 119. Includes YES/NO checkboxes.

Provisional Applications

I hereby claim the benefit under Title 35, United States Code Section 119(e) of any United States provisional application(s) listed below:

Table with 2 columns: APPLICATION SERIAL NUMBER, FILING DATE.

U.S. Priority Claims

I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code Section 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, Section 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

Table with 3 columns: APPLICATION SERIAL NUMBER, FILING DATE, STATUS (patented/pending/abandoned).

POWER OF ATTORNEY:

As a named inventor, I hereby appoint the practitioners associated with Customer No. 40032 as my patent attorneys, with full power of substitution and revocation, to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

Form with fields for Send Correspondence to: P. Francois de Villiers, Creative Labs, Inc., 1901 McCarthy Boulevard, Milpitas, CA 95035. Direct Telephone Calls To: Russell N. Swarden, (408) 418-6600.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Form with fields for Full Name of Inventor: Ron GOODMAN, Residence: 316 Jeter Street, Santa Cruz, CA, USA 95060, Post Office Address: Same, and Citizenship: UNITED STATES.

Inventor's Signature: _____ Date: July 31, 2004

DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION (continued)	ATTORNEY DOCKET NO. 64072112
---	------------------------------

Full Name of Inventor: HAROLD N. EGAN Citizenship: UNITED STATES

Residence: 212 Elmer Street, Capitola, CA 95018 USA

Post Office Address: Same

Inventor's Signature:  Date: 7 July 2004

Full Name of Inventor: David BRISTOW Citizenship: UNITED KINGDOM

Residence: 5928 NE Tolu Road, Bainbridge Island, WA 98110

Post Office Address: Same

Inventor's Signature: _____ Date: 7 July 2004

Full Name of Inventor: _____ Citizenship: _____

Residence: _____

Post Office Address: _____

Inventor's Signature: _____ Date: _____

Full Name of Inventor: _____ Citizenship: _____

Residence: _____

Post Office Address: _____

Inventor's Signature: _____ Date: _____

Full Name of Inventor: _____ Citizenship: _____

Residence: _____

Post Office Address: _____

Inventor's Signature: _____ Date: _____

Full Name of Inventor: _____ Citizenship: _____

Residence: _____

Post Office Address: _____

Inventor's Signature: _____ Date: _____

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dave bristow

208 JD 2496

P. 4
 4/7

PATENT APPLICATION

DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION ATTORNEY DOCKET NO. 6107P212

As a below named inventor, I hereby declare that: My residence/post office address and citizenship are as stated below next to my name; I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: **AUTOMATIC HIERARCHICAL CATEGORIZATION OF MUSIC BY METADATA** the specification of which is attached hereto unless the following box is checked:

(X) was filed on January 3, 2001 as US Application Serial No. or PCT International Application Number 09/735,721 and was amended on 4/30/2004 (if applicable).

I hereby state that I have reviewed and understood the contents of the above-identified specification, including the claims, as amended by any amendment(s) referred to above. I acknowledge the duty to disclose all information which is material to patentability as defined in 37 CFR 1.56.

Foreign Application(s) and/or Claim of Foreign Priority I hereby claim foreign priority benefits under Title 35, United States Code Section 119 of any foreign application(s) for patent or invention certificate listed below and have also identified below any foreign application for patent or invention certificate having a filing date before that of the application on which priority is claimed:

COUNTRY	APPLICATION NUMBER	DATE FILED	PRIORITY CLAIMED UNDER 35 U.S.C. 119	
			YES	NO
			YES	NO
			YES	NO

Provisional Application(s) I hereby claim the benefit under Title 35, United States Code Section 119(e) of any United States provisional application(s) listed below:

APPLICATION SERIAL NUMBER	FILING DATE

U.S. Priority Claim I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s) listed below and, briefly as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code Section 112. I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, Section 1.56(a) which occurred between the filing date of the prior application and the national or PCT (international) filing date of this application:

APPLICATION SERIAL NUMBER	FILING DATE	STATUS (patented/pending/abandoned)

POWER OF ATTORNEY: As a named inventor, I hereby appoint the practitioners associated with Customer No. 40032 as my patent attorneys, with full power of substitution and revocation, to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

Mail Correspondence to: P. Francisco de Villiers Customer No. 40032 Creative Labs, Inc. 1903 McKinley Boulevard Midvale, CA 95035	Direct Telephone Calls To: Renell N. Overman (408) 428-6600
--	---

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full Name of Inventor: Ron GOODRIAN Citizenship: UNITED STATES
 Residence: 216 Arley Street, Santa Cruz, CA 95061
 Post Office Address: None

Inventor's Signature _____ Date July 2004

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ve bristow

21 780 2496

P.5
5/7

**DECLARATION AND POWER OF ATTORNEY
FOR PATENT APPLICATION (continued)**

ATTORNEY DOCKET NO. 6407E212

Full Name of Inventor: Howard N. EGAN Citizenship: UNITED STATES

Residence: 219 E. 1st Street, Canby, OR 97001 USA

Post Office Address: Same

Inventor's Signature _____ Date: July 2004

Full Name of Inventor: David BRISTOW Citizenship: UNITED KINGDOM

Residence: SPYNYT, Tolo Head, Balphridon Island, WA 98110

Post Office Address: Same

Inventor's Signature *David Bristow* Date: July 2004

Full Name of Inventor: _____ Citizenship: _____

Residence: _____

Post Office Address: _____

Inventor's Signature _____ Date: _____

Full Name of Inventor: _____ Citizenship: _____

Residence: _____

Post Office Address: _____

Inventor's Signature _____ Date: _____

Full Name of Inventor: _____ Citizenship: _____

Residence: _____

Post Office Address: _____

Inventor's Signature _____ Date: _____

Full Name of Inventor: _____ Citizenship: _____

Residence: _____

Post Office Address: _____

Inventor's Signature _____ Date: _____



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby certify that this correspondence is being deposited with the United States Postal Service as Express Mail No. ER86632274US with sufficient postage in an envelope addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

on July 9, 2001
Date of Deposit

Cynthia K. Dawn
Name of Person Mailing Correspondence

Cynthia K. Dawn

Application No.: 09/755,723

Title: AUTOMATIC HIERARCHICAL CATEGORIZATION OF MUSIC BY METADATA

Applicant: Ron Goodman

Filed: January 5, 2001
TC/A.U. 2175

Examiner: Rones, Charles

Docket No.: 6407P212
Customer No.: 40032

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

ASSENT OF ASSIGNEE UNDER 37 C.F.R. § 3.73(b)
FOR CORRECTION OF INVENTORSHIP

Dear Sir:

Attached please find a copy of the Recordation of Assignment document that is currently on file with the U.S. Patent and Trademark Office concerning the above noted application. The Assignment document is being submitted to provide evidence of chain of title for this application.

07/14/2001 5M1N851 00000096 09755723
01 FC11460 130.00 DP

RECORDED COPY

Assignee, CREATIVE TECHNOLOGY LTD., a Singapore corporation having a place of business at 31 International Business Park, Creative Resource, Singapore 609921, Republic of Singapore, does hereby assent to the correction of inventorship, the petition for which is filed herewith, which seeks to add David Bristow as an additional inventor in the above-referenced application. The undersigned of Creative Technology Ltd. does hereby declare, under penalty of perjury, that he is authorized by Creative Technology Ltd. to make this Assent of Assignee for Correction of Inventorship.

Respectfully submitted,

Dated: 7/6, 2004



Chon Hock Leow
Chief Technology Officer



UNITED STATES DEPARTMENT OF COMMERCE
 Patent and Trademark Office
 ASSISTANT SECRETARY AND COMMISSIONER
 OF PATENTS AND TRADEMARKS
 Washington, D.C. 20231

JULY 30, 2001

PTAS
 TOWNSEND AND TOWNSEND AND CREW LLP
 CHARLES E. KRUEGER
 TWO EMBARCADERO CENTER, EIGHTH FLOOR
 SAN FRANCISCO, CALIFORNIA 94111



GE Stanton
 017002022500US

UNITED STATES PATENT AND TRADEMARK OFFICE
 NOTICE OF RECORDATION OF ASSIGNMENT DOCUMENT

THE ENCLOSED DOCUMENT HAS BEEN RECORDED BY THE ASSIGNMENT DIVISION OF THE U.S. PATENT AND TRADEMARK OFFICE. A COMPLETE MICROFILM COPY IS AVAILABLE AT THE ASSIGNMENT SEARCH ROOM ON THE REEL AND FRAME NUMBER REFERENCED BELOW.

PLEASE REVIEW ALL INFORMATION CONTAINED ON THIS NOTICE. THE INFORMATION CONTAINED ON THIS RECORDATION NOTICE REFLECTS THE DATA PRESENT IN THE PATENT AND TRADEMARK ASSIGNMENT SYSTEM. IF YOU SHOULD FIND ANY ERRORS OR HAVE QUESTIONS CONCERNING THIS NOTICE, YOU MAY CONTACT THE EMPLOYEE WHOSE NAME APPEARS ON THIS NOTICE AT 703-308-9723. PLEASE SEND REQUEST FOR CORRECTION TO: U.S. PATENT AND TRADEMARK OFFICE, ASSIGNMENT DIVISION, BOX ASSIGNMENTS, CG-4, 1213 JEFFERSON DAVIS HWY, SUITE 320, WASHINGTON, D.C. 20231.

RECORDATION DATE: 04/23/2001

REEL/FRAME: 011788/0174
 NUMBER OF PAGES: 4

BRIEF: ASSIGNMENT OF ASSIGNOR'S INTEREST (SEE DOCUMENT FOR DETAILS).

ASSIGNOR:
 GOODMAN, RON

DOC DATE: 03/14/2001

ASSIGNOR:
 EGAN, HOWARD N.

DOC DATE: 03/22/2001

ASSIGNEE:
 CREATIVE TECHNOLOGY LTD., A CORP.
 OF THE REPUBLIC OF SINGAPORE
 31 INTERNATIONAL BUSINESS PARK
 CREATIVE RESOURCE
 SINGAPORE, SINGAPORE 609921

SERIAL NUMBER: 09755723
 PATENT NUMBER:

FILING DATE: 01/05/2001
 ISSUE DATE:

011788/0174 PAGE 2

ALLYSON PURNELL, EXAMINER
ASSIGNMENT DIVISION
OFFICE OF PUBLIC RECORDS

Attorney Docket No.: 17002-022500US
Client Reference No.: CT-1139

ASSIGNMENT OF PATENT APPLICATION

WHEREAS, RON GOODMAN, of 226 Jeter Street, Santa Cruz, CA 95060; HOWARD N. EGAN, of 219 Elinor Street, Capitola, CA 95010; hereinafter referred to as "Assignors," are the inventors of the invention described and set forth in the below-identified application for United States Letters Patent:

Title of Invention: **AUTOMATIC HIERARCHICAL CATEGORIZATION OF
MUSIC BY METADATA**

Date(s) of Execution:

Filing Date: January 5, 2001

Application No.: 09/755,723; and

WHEREAS, CREATIVE TECHNOLOGY LTD., located at 31 International Business Park, Creative Resource, Singapore, 609921, hereinafter referred to as "ASSIGNEE," is desirous of acquiring ASSIGNORS' interest in the said invention and application and in any U.S. Letters Patent which may be granted on the same;

NOW, THEREFORE, TO ALL WHOM IT MAY CONCERN: Be it known that, for good and valuable consideration, receipt of which is hereby acknowledged by Assignors, Assignors have sold, assigned and transferred, and by these presents do sell, assign and transfer unto the said Assignee, and Assignee's successors and assigns, all their right, title and interest in and to the said invention and application, and in and to any Letters Patent which may hereafter be granted on the same in the United States, the said interest to be held and enjoyed by said Assignee as fully and exclusively as it would have been held and enjoyed by said Assignors had this Assignment and transfer not been made, to the full end and term of any Letters Patent which may be granted thereon, or of any division, renewal, continuation in whole or in part, substitution, conversion, reissue, prolongation or extension thereof.

Assignors further agree that they will, without charge to Assignee, but at Assignee's expense, cooperate with Assignee in the prosecution of said application and/or applications, execute, verify, acknowledge and deliver all such further papers, including applications for Letters Patent and for the reissue thereof, and instruments of assignment and transfer thereof, and will perform such other acts as Assignee lawfully may request, to obtain or maintain Letters Patent for said invention and improvement, and to vest title thereto in Assignee, or Assignee's successors and assigns.

Assignors hereby authorize and request Townsend and Townsend and Crew LLP, Two Embarcadero Center, 8th Floor, San Francisco, CA 94111-3834, to insert herein above the application number and filing date of said application when known.

IN TESTIMONY WHEREOF, Assignors have signed their names on the dates indicated.

Assignment
Attorney Docket No.: 17002-022500US
Page 2

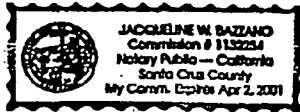
Dated: 3/14/2001


RON GOODMAN

STATE OF CALIFORNIA)
) ss.
COUNTY OF)

On March 14, 2001, before me, Jacqueline W. Bazzano, personally appeared RON GOODMAN, personally known to me (or proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to the within instrument, and acknowledged to me that he/she executed the same in his/her authorized capacity, and that by his/her signature on the instrument the person, or the entity upon behalf of which the person acted, executed the instrument.

WITNESS my hand and official seal.




NOTARY PUBLIC

My Commission Expires: 4/2/2001

Dated: 3-22-2001

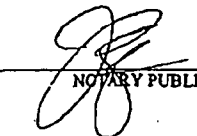

HOWARD N. EGAN

STATE OF CALIFORNIA)
) ss.
COUNTY OF)

On March 22, 2001, before me, Jacqueline W. Bazzano (Notary Public), personally appeared HOWARD N. EGAN, personally known to me (or proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to the within instrument, and acknowledged to me that he/she executed the same in his/her authorized capacity, and that by his/her signature on the instrument the person, or the entity upon behalf of which the person acted, executed the instrument.

WITNESS my hand and official seal.




NOTARY PUBLIC

My Commission Expires: 4/2/2001

2

Exhibit 24

001 #24E
9/10/04
A.W.
(PBF)

C.P.
OK to
Enter
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Drawings
v. ill. be
filed
separately

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT

In re application of: Goodman, et al

Attorney Docket No.:
6407P212

RECEIVED
CENTRAL FAX CENTER

Application No.: 09/755,723

Examiner: Ronea, Charles L.

JUL 27 2004

Filed: January 5, 2001

Group: 2175

Title: AUTOMATIC HIERARCHICAL
CATEGORIZATION OF MUSIC BY
METADATA

OFFICIAL

CERTIFICATE OF FACSIMILE TRANSMISSION
I hereby certify that this correspondence is being facsimile
transmitted to the United States Patent and Trademark Office
(FAX No. (703) 572-9906 on July 27, 2004.

Signed: Cynthia K. Dawn
Cynthia K. Dawn

Amendment After Notice of Allowance, pursuant to 37 CFR 1.312

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

The enclosed remarks and amendments are submitted under the provisions of 37
CFR 1.312. This amendment is filed on or before the date the issue fee is paid.
Applicants respectfully request reconsideration of the captioned application in view of
the following remarks and amendments. A listing of the claims commences on page 2.
Remarks begin on page 6 of this paper. Formal drawings are also attached to replace
several informal drawings in the drawing package previously submitted.

USSN: 09/755,723

Atty Dkt No.: 6407P212

BEST AVAILABLE COPY

Listing of Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

1-23. (cancelled)

¹ 24. (currently amended) A method of selecting at least one track from a plurality of tracks stored in a computer-readable medium of a portable media player configured to present sequentially a first, second, and third display screen on the display of the media player, the plurality of tracks ~~accessed~~ ^{organized} according to a file hierarchy, the file hierarchy having a plurality of categories, subcategories, and items respectively in a first, second, and third level of the hierarchy, the method comprising:

selecting a category in the first display screen of the portable media player,
 displaying the subcategories belonging to the selected category in a listing presented in the second display screen;
 selecting a subcategory in the second display screen;
 displaying the items belonging to the selected subcategory in a listing presented in the third display screen; and
 accessing at least one track based on a selection made in one of the display screens.

² 25. (previously presented) The method of selecting a track as recited in claim ¹ 24 wherein the accessing at least one track comprises selecting a subcategory in the second display screen and playing a plurality of tracks associated with the selected subcategory.

³ 26. (previously presented) The method of selecting a track as recited in claim ¹ 24 wherein the accessing at least one track comprises selecting a subcategory and adding the tracks associated with the selected subcategory to a playlist.

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USSN: 09/755,723

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Atty Dkt No.: 6407P212

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 27. (previously presented) The method of selecting a track as recited in claim 24 wherein the accessing at least one track comprises selecting an item in the third display screen and playing at least one track associated with the selected item.

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 28. (previously presented) The method of selecting a track as recited in claim 24 wherein the accessing at least one track comprises selecting an item in the third display screen and adding at least one track associated with the selected item to a playlist.

6
 29. (previously presented) The method of selecting a track as recited in claim 24 wherein the accessing at least one track comprises one of playing or adding to a playlist at least one track associated with a selected one of the category, subcategory, and item.

7
 30. (previously presented) The method of selecting a track as recited in claim 24 wherein the accessing at least one track is made after the presentation of the third display screen by reverting back to one of the second and first display screens, the second display screen presented sequentially after the third display screen.

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 31. (previously presented) The method of selecting a track as recited in claim 24 further comprising selecting one of the items displayed in the third display screen and presenting a listing of items associated with the selected item in a fourth sequentially presented display screen.

9
 32. (previously presented) The method of selecting a track as recited in claim 24 wherein the category genre is selected in the first display screen from available categories that include at least artist, album, and genre; and the subcategories listed in the second display screen comprise a listing of at least one genre type and one of the at least one genre type is selected.

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 33. (previously presented) The method of selecting a track as recited in claim 32 further comprising displaying in the third display screen at least one album associated with the selected genre type and selecting one of the at least one albums displayed in the

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USSN: 09/755,723

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Atty Dkt No.: 6407P212

third display screen and presenting a listing of tracks associated with the selected album in a fourth sequentially presented display screen.

¹¹ 34. (previously presented) The method of selecting a track as recited in claim 24 wherein the category artist is selected in the first display screen from available categories that include at least artist, album, and genre; the subcategories listed in the second display screen comprise a listing of names of artists and a first artist name is selected; and the items displayed in the third display screen comprises at least one album associated with the first artist name.

¹² 35. (currently amended) The method of selecting a track as recited in claim 24 wherein the track is a music track, ~~accessing at least one track comprises accessing a track title the item accessed in the third display screen is a track title~~, and the track is played in response to the access.

E1

¹³ 36. (previously presented) The method of selecting a track as recited in claim 24 wherein receipt of the selection in the first display screen results in an automatic transition of the first display screen into the second display screen and receipt of the selection in the second display screen results in an automatic transition of the second display screen into the third display screen.

¹⁴ 37. (new) The method of selecting a track as recited in claim 24 wherein the category selected in the first display screen is from a top level of the hierarchy.

¹⁵ 38. (new) The method of selecting a track as recited in claim 24 wherein the category selected in the first display screen is a category from a level at least one level below the top level of the hierarchy.

¹⁶ 39. (new) The method of selecting a track as recited in claim 24 wherein the plurality of categories comprise a list of artist names, the plurality of subcategories comprise a list of album names and the plurality of items comprise a list of track names.

Amendments to the Drawings:

Five sheets of Replacement Drawings for Figures 9-13 are attached. These are formal drawings submitted to replace the informal drawings submitted and entered with the April 30 amendment. Inasmuch as the previously submitted informal drawings include handwritten reference numbers and grayscale sectioning that may be unsuitable for publication, applicants request entry of the formal drawings attached.

ATTACHMENT: 5 sheets of formal drawings

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Atty Dkt No.: 6407P212

REMARKS

The examiner had indicated the allowability of claims 24-36 in a notice of allowance mailed on June 9, 2004. As a result of the amendment filed on or about April 30, only claims 1 and 24-36 had been pending.

Applicants herewith have amended the claims to cancel claim 1. Claim 1 had previously been merely withdrawn, hence the cancellation deals with mere informalities. Independent claim 24 has been amended to identify in the preamble that the plurality of tracks are accessed according to a hierarchy instead of organized according to a file hierarchy. Applicants believe that this amendment should be entered for at least the reason that it helps clarify the invention and that the amended claim with the change in only two words is allowable for the same reasons as the previously presented claim was found to be allowable by the Examiner. Further, the claim is patentable over the art of record for at least the reason that Grew does not teach or suggest displaying categories or subcategories in a display screen.

Dependent claim 35 has been amended to overcome any problems as to explicit antecedent basis for the phrase "the item accessed" and hence largely deals with informalities. Dependent claims 37, 38, and 39 are new claims, all of which are dependent from independent claim 24. A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers (35 USC 112.) These claims add a further limitation to independent claim 24 and thus help clarify applicant's invention. Since the added claims are dependant claims, applicants submit that this reason alone strongly supports their entry. In particular, MPEP section 714.16 notes in pertinent part as follows:

"Where claims added by amendment under 37 CFR 1.312 are all of the form of dependant claims, some of the usual reasons for nonentry are less likely to apply."

The dependent claims depend from an allowed independent claim (claim 24) and are therefore patentable for at least the same reason as the independent claim 24. Support for the amendments may be found in the drawings, FIGS. 1, 3, 7, 10-11, their associated descriptions, and throughout the specification, in particular the abstract and page 8. They

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6

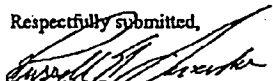
Atty Dkt No.: 6407P212

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add no new matter. The amendments to claim 35 had not been submitted previously because the lack of proper antecedent basis for the terms used had not been noticed previously. Allowed claims 24-36 had first been presented in the amendment recently filed on April 30, 2004 (in response to a restriction requirement) and thus had not been previously involved in any discussions or communications between the examiner and applicants. Applicants submit that the amendments to add dependent claims 37-39 are proper to help clarify and disclose applicant's invention.

Conclusion

Applicants believe that entry of the amendment is proper and respectfully request that the application not be withdrawn from issue. Applicants respectfully request that the primary examiner recommend entry of the amendment as provided by the guidelines set forth in MPEP Section 714.16(e), including the claim amendments discussed above and the entry of replacement formal drawings, FIGS. 9-13, as discussed in the drawings amendment section. Applicants believe that consideration of the matters presented herein will not require any substantial amount of additional work on the part of the Office and are needed for proper disclosure of the invention. If the Examiner believes that a telephone conference would expedite the prosecution of this application, he is invited to contact the Applicants' undersigned attorney at the telephone number set out below.

Respectfully submitted,

Russell N. Szeardon
Registration No. 36,943

Creative Labs, Inc.
1901 McCarthy Boulevard
Milpitas, CA 95035
(408) 428-6600

USSN: 09/755,723

7

Atty Dkt No.: 6407P212

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09/755,723

07/27/04 11:00 FAX 408 428 8899

CL1

008

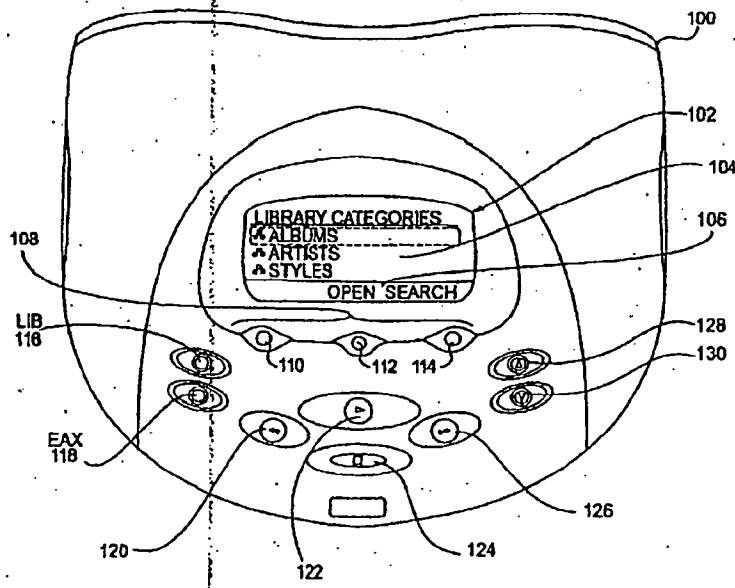


FIG. 9

PAGE 8/12 * RCVD AT 7/27/04 2:07:02 PM (Eastern Daylight Time) * SVR:UCPTD-EXR07-10 * DRIB:0720308 * CRID:105 428 8899 * DURATION [mm-ss]:03-00

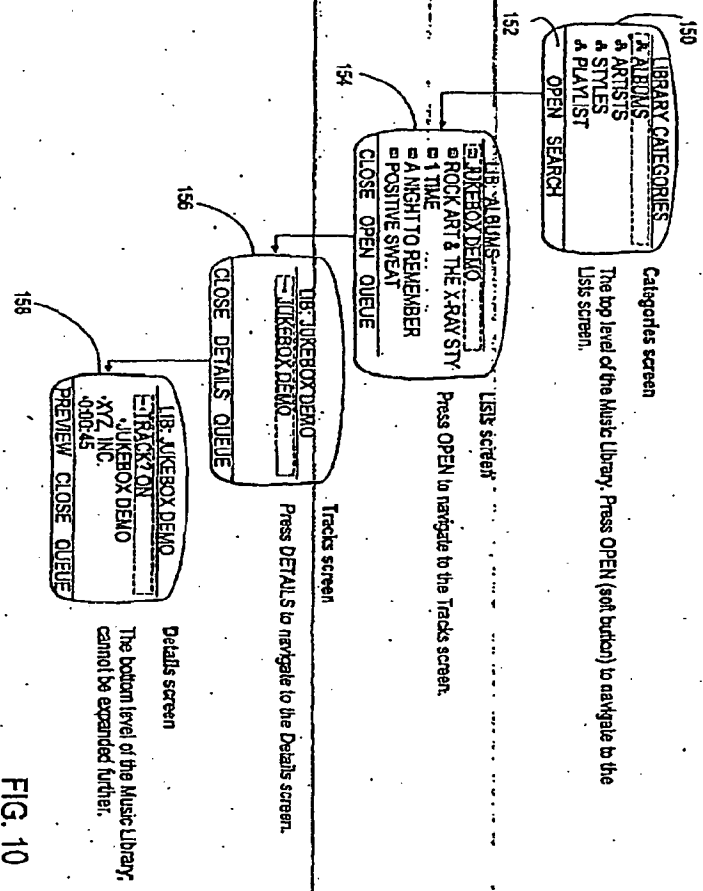


FIG. 10

© 2004

11/27/04 11:56 FAX 408 426 6899

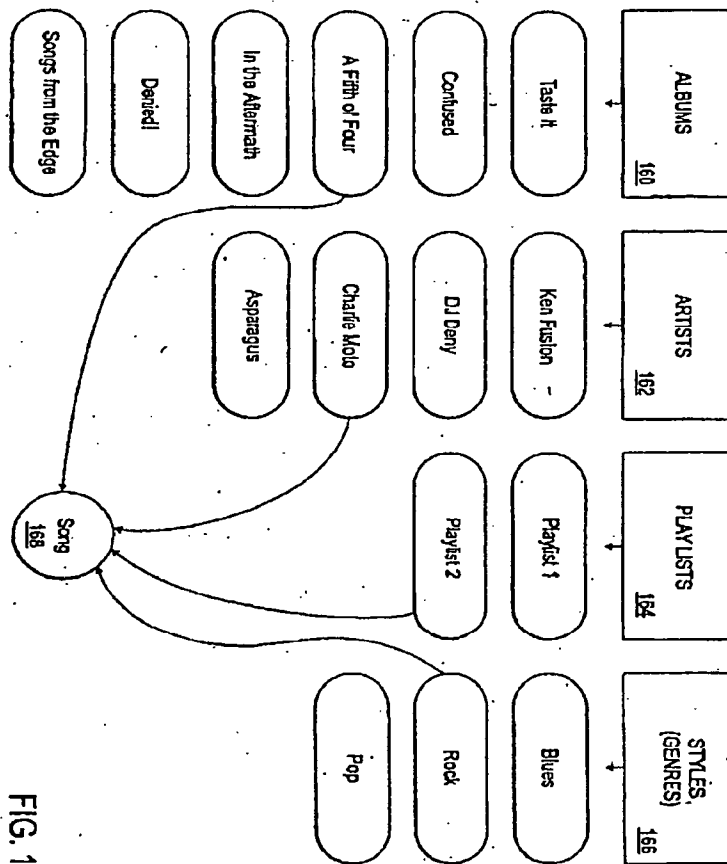


FIG. 11

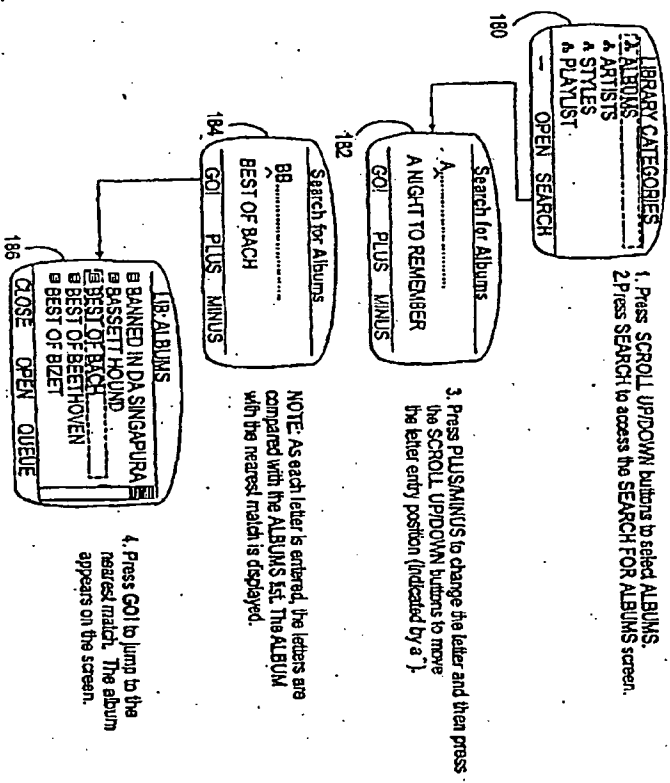
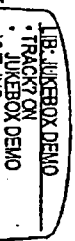
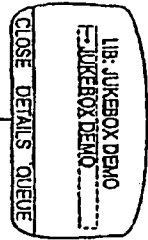


FIG. 12

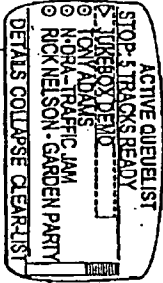
View DETAILS accessed from the TRACKS screen:

1. Press DETAILS. The DETAILS screen displays the Track Order, Album, Artist and duration of the track.

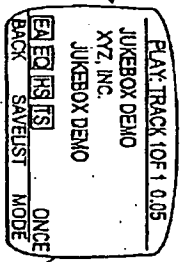


2. Press CLOSE to return to the TRACKS screen.

Viewing DETAILS accessed from the ACTIVE QUEUE LIST screen:



1. Press DETAILS. The DETAILS screen displays the Track Title, Artist, Album together with Audio Playback settings (see note below) and Play Mode (see Setting Play Mode on page 16).



2. Press BACK to return to the ACTIVE QUEUE LIST screen.

FIG. 13

Exhibit 25



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILED DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/755,723	01/05/2001	Ron Goodman	017002022500	3728

40032 7390 02/08/2005
CREATIVE LABS, INC.
LEGAL DEPARTMENT
1901 MCCARTHY BLVD
MILPITAS, CA 95035

EXAMINER

RONES, CHARLES

ART UNIT PAPER NUMBER

2164

DATE MAILED: 02/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Response to Rule 312 Communication	Application No.	Applicant(s)	
	09/755,723	GOODMAN ET AL.	
	Examiner	Art Unit	
	Charles Rones	2164	

- The MAILING DATE of this communication appears on the cover sheet with the correspondence address -

1. The amendment filed on July 27, 2004 under 37 CFR 1.312 has been considered, and has been:

a) entered.

b) entered as directed to matters of form not affecting the scope of the invention.

c) disapproved because the amendment was filed after the payment of the Issue fee.
Any amendment filed after the date the Issue fee is paid must be accompanied by a petition under 37 CFR 1.313(c)(1) and the required fee to withdraw the application from Issue.

d) disapproved. See explanation below.

e) entered in part. See explanation below.



Charles Rones
Primary Examiner
Art Unit 2164

Exhibit 26



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
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Alexandria, Virginia 22313-1475
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/755,723	01/05/2001	Ron Goodman	017002022500	3728

48032 7390 03/03/2005

CREATIVE LABS, INC.
LEGAL DEPARTMENT
1901 MCCARTHY BLVD
MILPITAS, CA 95035

EXAMINER

RONES, CHARLES #26

ART UNIT PAPER NUMBER

2164

DATE MAILED: 03/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<i>Supp.</i> Notice of Allowability	Application No.	Applicant(s)	
	09/755,723	GOODMAN ET AL.	
	Examiner	Art Unit	
	Charles Rones	2164	

- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--
 All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included
 herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. THIS
 NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS. This application is subject to withdrawal from issue at the initiative
 of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. This communication is responsive to drawing replacement sheets filed 11-16-04, 11-19-04 and 7-27-04.
2. The allowed claim(s) is/are 24-39.
3. The drawings filed on 11-16-04, 11-19-04 and 7-27-04 are accepted by the Examiner.
4. Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some* c) None of the:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) Including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) hereto or 2) to Paper No./Mail Date _____.
 - (b) Including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s) 1. <input type="checkbox"/> Notice of References Cited (PTO-892) 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____ 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material	5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) 6. <input type="checkbox"/> Interview Summary (PTO-413), Paper No./Mail Date _____ 7. <input type="checkbox"/> Examiner's Amendment/Comment 8. <input type="checkbox"/> Examiner's Statement of Reasons for Allowance 9. <input type="checkbox"/> Other _____
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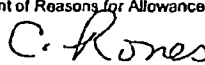

 Charles Rones
 Primary Examiner
 Art Unit: 2164

Exhibit 27



94

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27
4-25-05
TG

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT

In re application of: Goodman, et al

Attorney Docket No.:
6407P212

Application No.: 09/755,723

Examiner: Rones, Charles L.

Filed: January 5, 2001

Group: 2175

Title: **AUTOMATIC HIERARCHICAL
CATEGORIZATION OF MUSIC BY
METADATA**

Declaration from Practitioner re Amendatory Material

Mail Stop Issue Fee
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

I, Russell N. Swerdon, declare as follows:

1. I am the an attorney employed by Creative Labs, Inc. and am one of the attorneys of record for assignee Creative Technology Ltd. with respect to the above entitled patent application. I have reviewed the file in this matter including the application filed on or about Jan. 5, 2001, and the application entitled "System for Selecting and Playing Songs in a Playback Device with a Limited User Interface," also filed on Jan. 5, 2001, and assigned application serial number 09/755,629. Based on my review of the records I can make the following statements either based on personal knowledge or upon information and belief.

2. The currently pending application, application serial number 09/755,723, incorporated by reference the application entitled "System for Selecting and Playing Songs in a Playback Device with a Limited User Interface," also filed on Jan. 5, 2001, and assigned application serial number 09/755629.

USSN: 09/755,723

1

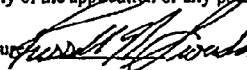
Atty Dkt No.:

3. On or about April 30, 2004 a substitute specification was submitted in an amendment filed with the PTO. The amendment also included new drawings, FIGS. 9-14 which were submitted rather than relying upon their previous incorporation by reference. The amendatory material as provided in the substitute specification, included FIGS. 9-14, constitutes the same material incorporated by reference in the referencing application.

4. I hereby declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date: 11-16-04

Signature



Russell N. Swerdon

Respectfully submitted,




Russell N. Swerdon

Registration No. 36,943

Creative Labs, Inc.
1901 McCarthy Blvd.
Milpitas, CA 95035
(408) 428-6600

Exhibit 28

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): GOODMAN, et al		Art Unit: 2175	Examiner: Charles L. RONES
Application No.: 09/755,723			
Filed: 1/5/2001			
Title: AUTOMATIC HIERARCHICAL CATEGORIZATION OF MUSIC BY METADATA			
Attorney Docket No.: 6407P212			

Approved 3-1-05 CR

28

Mail Stop Issue Fee
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450


FORMAL DRAWING TRANSMITTAL LETTER

Dear Sir:

Enclosed herewith please find five sheets of formal drawings (Figs 9-13) in substitution for the identically numbered formal drawings previously submitted by fax. Applicants were informally notified that several of the formal drawings previously submitted by fax were of poor quality. Please substitute these formal drawings for the corresponding poor quality drawings previously filed.

Entry of these drawings is respectfully requested.

Dated: 11-15-01


Russell N. Swerdon
Reg. No. 36943

1901 McCarthy Boulevard
Milpitas, CA 95035
Tel. (408) 546-6104
Fax (408) 428-6699



09255723 R25

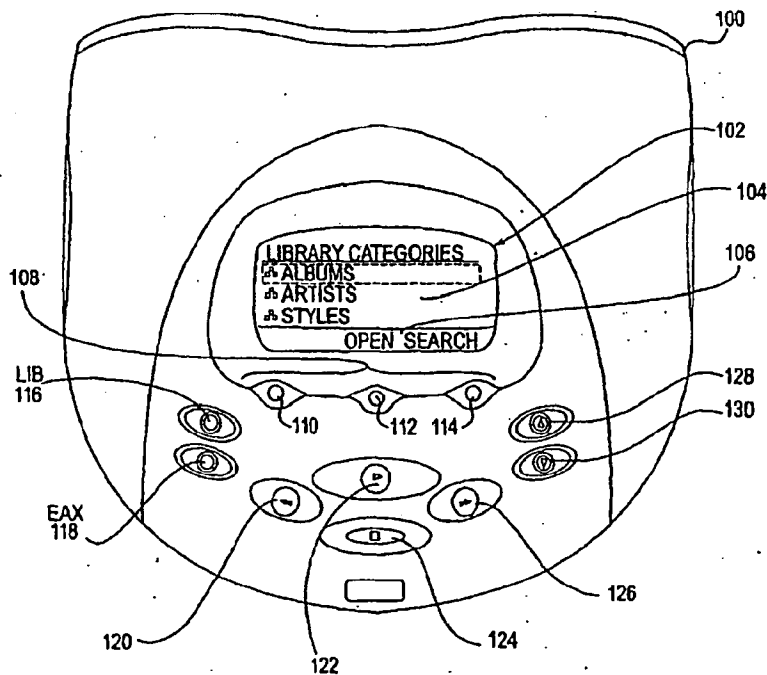


FIG. 9

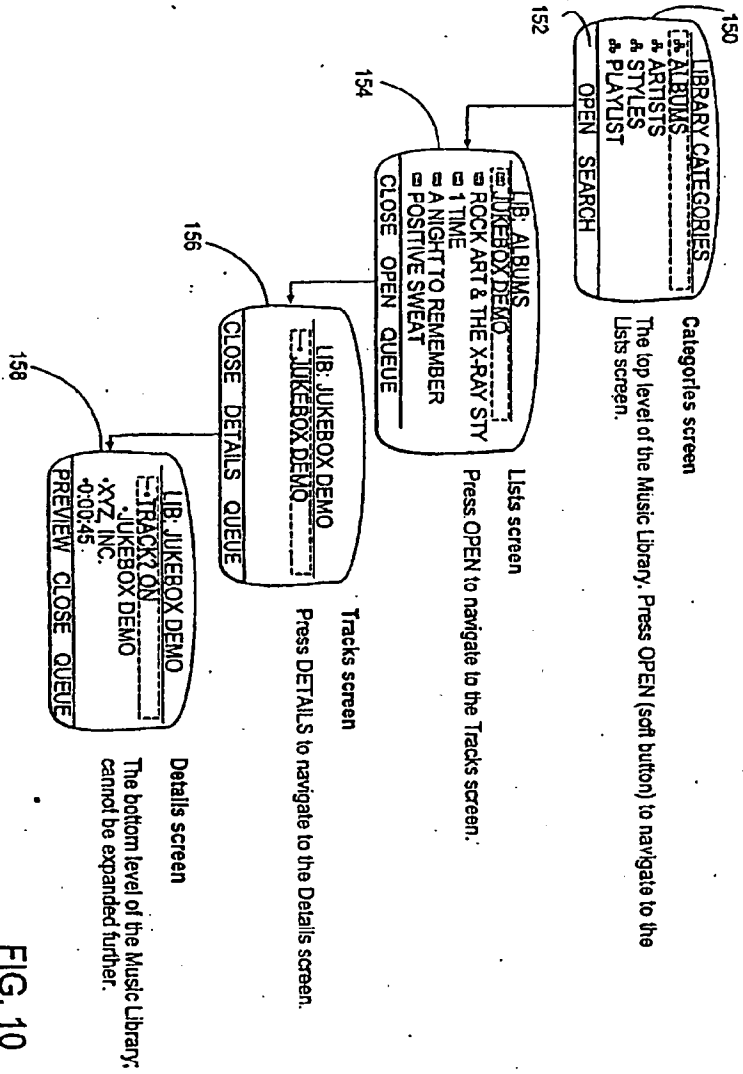


FIG. 10

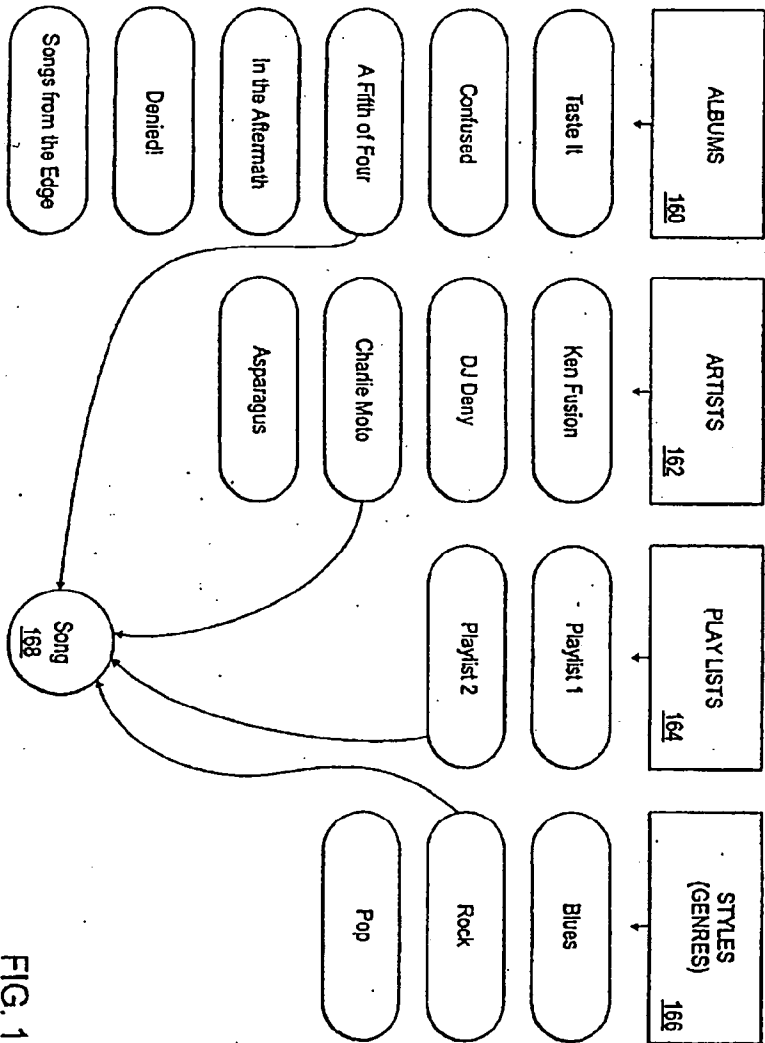


FIG. 11

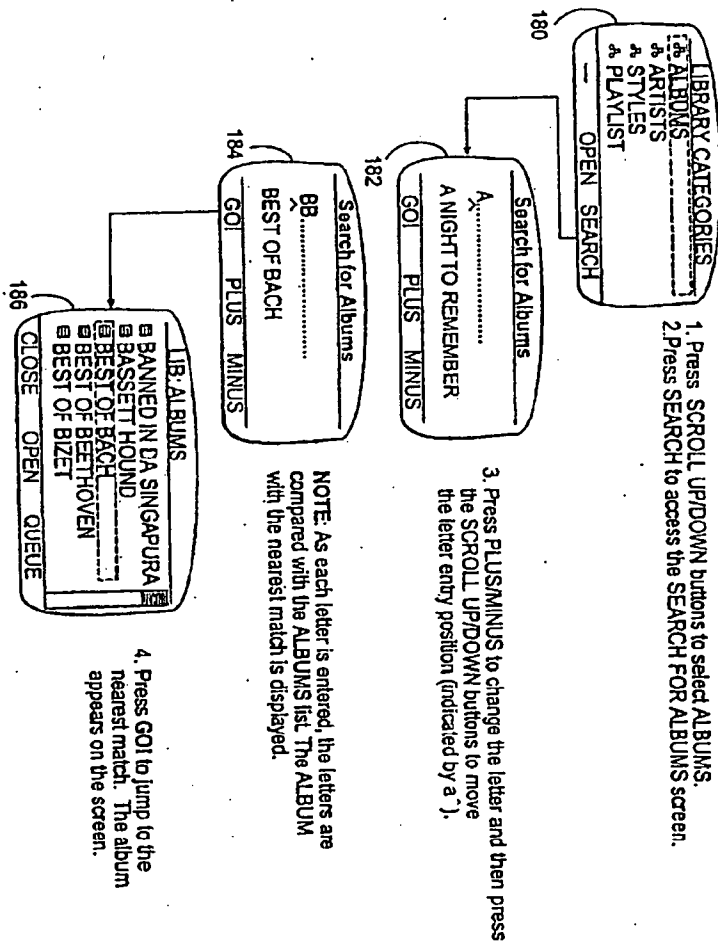


FIG. 12

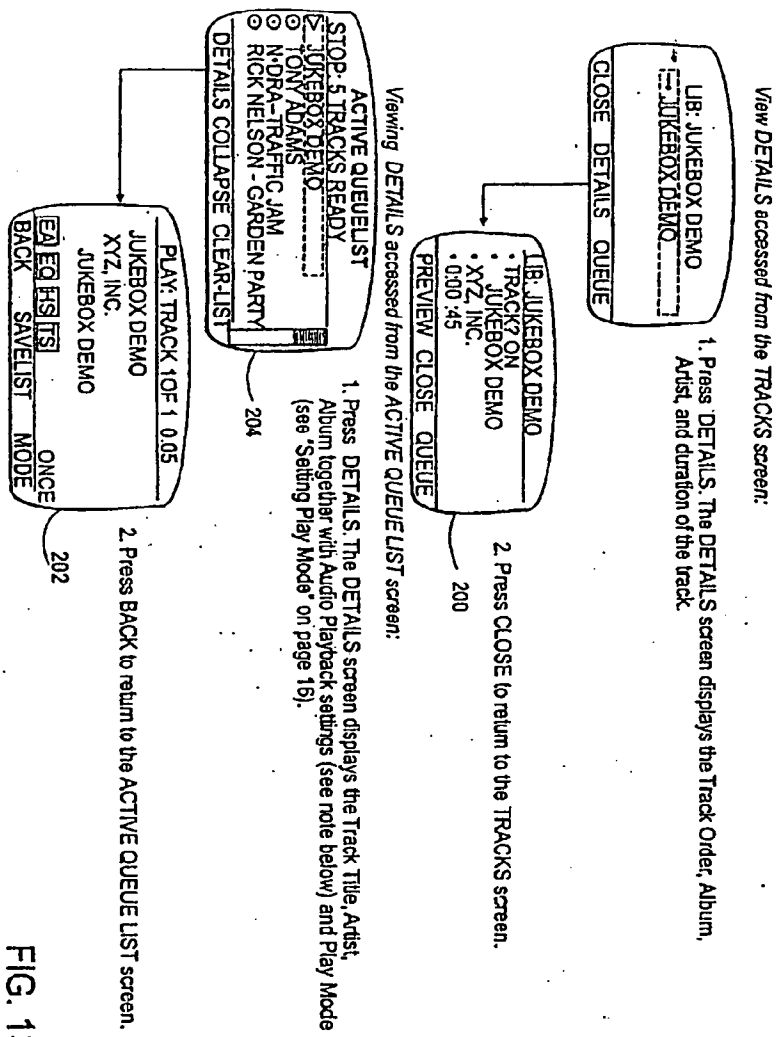


FIG. 13

Exhibit 29



Approved
3-1-05 CR

11-22-04

941 2175
#29

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT

In re application of: Goodman, et al

Attorney Docket No.:

6407P212

Application No.: 09/755,723 ✓

Examiner: Rones, Charles L.

Filed: January 5, 2001

Group: 2175

Title: AUTOMATIC HIERARCHICAL
CATEGORIZATION OF MUSIC BY
METADATA

Mail Stop Issue Fee
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

FORMAL DRAWING TRANSMITTAL LETTER

Sir:

Enclosed herewith please find 1 sheet of formal drawing(s) including FIG. 14. Please substitute this formal drawing for the informal FIG. 14 drawing, originally filed with the amendment (including substitute specification) mailed on or about April 30, 2004.

Please add this sheet to the formal drawing sheets corresponding to FIGS. 1-8 (previously approved) and the recently filed (November 16, 2004) formal drawing sheets pertaining to FIGS. 9-13.

Applicants respectfully request that the Examiner approve entry of this formal drawing. If any others of the formal drawings in the group of Figures 1-14 are not currently approved, then applicants further request that the Examiner approve entry of those drawings.

Respectfully submitted,

Russell M. Koverdon
Registration No. 36,943

Creative Labs, Inc.
1901 McCarthy Boulevard
Milpitas, CA 95035
(408) 428-6600

CERTIFICATE OF EXPRESS MAIL (37 C.F.R. § 1.10)

Express Mail No.: EV 413 048 674 US

Date: 11/19/2004

I hereby certify that this paper (along with any referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as "Express Mail Post Office to Addressee" in an envelope addressed to Mail Stop Issue Fee, Commissioner For Patents, P.O. Box 1450, Alexandria, VA 22313-1450

Date of Deposit: 11/19/04



REPLACEMENT SHEET 09795723

12

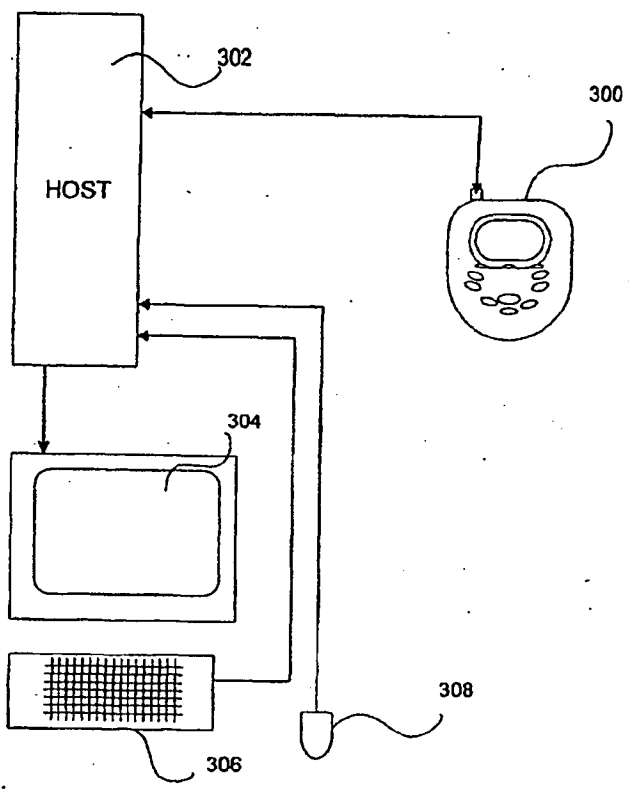


FIG. 14

VALID

Pat. No. 05970370 - 2
Issue Date: 06/21/04

Group ID: D Page 1
User ID: Sxperer KS: 1,278

Warning [Pages Of US References:]

page 4 has no references

Warning [Pages Of Foreign References:]

page 1 has no references

page 2 has no references

page 3 has no references

page 4 has no references

Warning [Pages Of Other References:]

page 1 has no references

page 2 has no references

page 3 has no references

Pat. No. 05970370 - 2
Issue Date: 06/21/04

Group ID: D
User ID: Sxperer

Page 1

CHECK LIST

Rule 47 Continuing Data PCT Disclaimer
No No No No
Microfiche Appendix CPA tag
No No

Foreign Priority Claimed: No
Acknowledged: No

State Code: CA Country Code:

Text Endorsement: 09755723.010501

=====
JACKET

<u>SERIAL NUMBER</u>	<u>FILING DATE</u>	<u>CLASS</u>	<u>SUBCLASS</u>	<u>GAU</u>
09/755,723	01/05/01	707	4	2175

FOREIGN PRIORITY
Country Document Number Date

DISCLAIMER

/ /

TITLE

Automatic hierarchical categorization of music by metadata

MICROFICHE APPENDIX

ASSISTANT EXAMINER:

First: Middle: Last:

PRIMARY EXAMINER:

First: Middle: Last:

Charles Ronen

CLAIMS ALLOWED

Pat. No. 05970370 - 2
Issue Date: 06/21/04

Group ID: D
User ID: Sxperer

Page 2

Total Print

13 1

DRAWINGS

Sheets Figures Print

6 8 Y

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BLUE SLIP INFORMATION

SERIAL NUMBER CLASS SUBCLASS GAU

09/755,723 707 4 2175

INDEP. CLAIMS

1

TOTAL CLAIMS

13

=====

BLUE SLIP (Page 1)

INTERNATIONAL CLASSIFICATION

Class SubClass

G06P 17/30

CROSS-REFERENCES

Class SubClass

707 3;102

385 46

=====

TERM EXTENSION

303

FIELD OF SEARCH

Class SubClass

84 609;601;602;611-614

707 104.1;3;4;102

386 46

=====

OATH

INVENTOR NAME

First: Ron Middle: Last: Goodman Signed: Yes
City: Santa Cruz
State: CA ZIP Code: Country: Foreign ZIP:

INVENTOR NAME

First: Howard Middle: N. Last: Egan Signed: Yes
City: Capitola
State: CA ZIP Code: Country: Foreign ZIP:

=====

PCT INFO

=====

CONTINUING DATA (Page 1)

LINE CODE SERIAL NUMBER FILING DATE STATUS DOCUMENT NO. ISSUE DATE

=====

REFERENCES (Page 1) SERIAL NUMBER: 09/755,723
FORM 892

U.S. REFERENCES

<u>U.S. Pat No.</u>	<u>Date</u>	<u>Patentee</u>	<u>Class</u>	<u>SubClass</u>
5,670,730	09/1997	Grewe et al.	84	609
5,616,876	04/1997	Cluts	84	609
5,918,303	06/1999	Yamaura et al.	84	609
5,969,283	10/1999	Looney et al.	84	609

*6,062,868 05/2000 Toriumi 434 307 A
No issue date available.

*6,248,946 06/2001 Dwek 84 609
No issue date available.

FOREIGN REFERENCES

Foreign Doc No. Date Country Class SubClass

OTHER REFERENCE CITATIONS (incl. Author, Title, Date, Pertinent Pages, etc.)

=====

REFERENCES (Page 2) SERIAL NUMBER: 09/755,723
FORM 892

U.S. REFERENCES

U.S. Pat No. Date Patentee Class SubClass

2003/0016940 01/2003 Robbins 386 46

FOREIGN REFERENCES

Foreign Doc No. Date Country Class SubClass

OTHER REFERENCE CITATIONS (incl. Author, Title, Date, Pertinent Pages, etc.)

=====

REFERENCES (Page 3) SERIAL NUMBER: 09/755,723
FORM 1449

U.S. REFERENCES

U.S. Pat No. Date Patentee Class SubClass

*6,377,530 04/2002 Burrows
No issue date available.

FOREIGN REFERENCES

Foreign Doc No. Date Country Class SubClass

OTHER REFERENCE CITATIONS (incl. Author, Title, Date, Pertinent Pages, etc.)

=====

REFERENCES (Page 4) SERIAL NUMBER: 09/755,723
FORM 1449

U.S. REFERENCES

U.S. Pat No. Date Patentee Class SubClass

L Number	Hits	Search Text	DB	Time stamp
	1495	(title or titles) near2 (musicl or song\$2)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/07 17:11
	167	(title or titles) near2 (musicl or song\$2) near5 (list\$2 or playlist\$2)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/07 17:12
	4	((title or titles) near2 (musicl or song\$2) near5 (list\$2 or playlist\$2)) same (tree\$2 or hierarch\$5)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/07 17:14
	374	playlist\$2	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/07 17:15
	208	playlist\$2 and track\$2	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/07 17:14
	19	playlist\$2 same (tree\$2 or hierarch\$5)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/07 17:25
	291382	musicl or song\$2 or audiol	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/07 17:32
	13375	(musicl or song\$2 or audiol) and (tree\$2 or hierarch\$5)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/07 17:29
	1907	(musicl or song\$2 or audiol) same (tree\$2 or hierarch\$5)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/07 17:51
	38	((musicl or song\$2 or audiol) same (tree\$2 or hierarch\$5)) and metadata	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/07 17:28
	113	(musicl or song\$2 or audiol) and (tree\$2 or hierarch\$5) same metadata	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/07 17:49
	118371	(musicl or song\$2 or audiol) and (catergor\$7 or organiz\$7 or fil\$4)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/07 17:35
	10109	(musicl or song\$2 or audiol) near2 (catergor\$7 or organiz\$7 or fil\$4)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/07 18:06

Search History 1/10/03 11:04:22 AM Page 1
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117	((musicl or song\$2 or audiol) near2 (catergor\$7 or organiz\$7 or fil\$4)) same (tree\$2 or hierarch\$5)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/07 17:44
11110	(musicl or song\$2 or audiol) near2 (track\$2 or number\$2)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/07 17:50
5413	(musicl or song\$2 or audiol) near2 (track\$2)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/07 17:51
56	((musicl or song\$2 or audiol) near2 (track\$2)) same (tree\$2 or hierarch\$5)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/07 18:05
0	catergor\$7 near3 (musicl or songs)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/07 18:05
0	catergor\$7 near2 (musicl or songs)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/07 18:05
0	((musicl or song\$2 or audiol) near2 (catergor\$7 or organiz\$7)) same metadata	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/07 18:08
9	((musicl or song\$2 or audiol) near2 (catergor\$7 or organiz\$7)) and metadata	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/07 18:08
287	(musicl or song\$2 or audiol) near2 (catergor\$7 or organiz\$7)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/01/07 18:07

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Web page on +37 Can you carry your CD collection in your pocket+48 +0
Yes, you can.+38 +0 Compaq web site, 3 pages,
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ISSUES 09/755,723

1. AMENDMENT AND RESPONSE TO RESTRICTION REQUIREMENT

(System Date: May 4, 2004)

****A. Substitute Specification (37 CFR 1.125) [Needs to be entered into the system]**

****B. New informal Drawings [Needs to be entered into the system] FIGS. 9-13 are informal.**

****C. IDS [Need copy of signed off version]**

2. Amendments after allowance:

July 9 amendment to add inventor pursuant to 37 CFR 1.48

3. Amendment after allowance filed July 27, 2004.

Amend claim 24, amend claim 35 to deal with antecedent basis, add 37-39 dependant claims. All told, going from 13 to 16 claims.

USE PTO-~~21~~ form.

PATENT APPLICATION FEE DETERMINATION RECORD
Effective October 1, 2000

Application or Docket Number

09755723

CLAIMS AS FILED - PART I

	(Column 1)	(Column 2)
TOTAL CLAIMS	10	
FOR	NUMBER FILED	NUMBER EXTRA
TOTAL CHARGEABLE CLAIMS	10 minus 20 =	0
INDEPENDENT CLAIMS	5 minus 3 =	2
MULTIPLE DEPENDENT CLAIM PRESENT <input type="checkbox"/>		

* If the difference in column 1 is less than zero, enter "0" in column 2

CLAIMS AS AMENDED - PART II

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
	Total	Minus	**
	Independent	Minus	***
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM <input type="checkbox"/>			

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
	Total	Minus	**
	Independent	Minus	***
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM <input type="checkbox"/>			

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT C	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
	Total	Minus	**
	Independent	Minus	***
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM <input type="checkbox"/>			

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

SMALL ENTITY

TYPE

OTHER THAN SMALL ENTITY

RATE	FEE	OR	RATE	FEE
BASIC FEE	355.00		BASIC FEE	710.00
X\$ 9=			X\$18=	
X40=			X80=	160.00
+135=			+270=	
TOTAL			TOTAL	870.00

SMALL ENTITY

OTHER THAN SMALL ENTITY

RATE	ADDITIONAL FEE	OR	RATE	ADDITIONAL FEE
X\$ 9=			X\$18=	
X40=			X80=	
+135=			+270=	
TOTAL ADDIT. FEE			TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE	OR	RATE	ADDITIONAL FEE
X\$ 9=			X\$18=	
X40=			X80=	
+135=			+270=	
TOTAL ADDIT. FEE			TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE	OR	RATE	ADDITIONAL FEE
X\$ 9=			X\$18=	
X40=			X80=	
+135=			+270=	
TOTAL ADDIT. FEE			TOTAL ADDIT. FEE	

CLAIMS ONLY

SERIAL NO. **09755723** FILING DATE

APPLICANT(S)

CLAIMS

	AS FILED		AFTER 1st AMENDMENT		AFTER 2nd AMENDMENT		*	IND.	DEP.	*	IND.	DEP.	*	IND.	DEP.
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TOTAL CLAIMS															

* MAY BE USED FOR ADDITIONAL CLAIMS OR ADMENDMENTS

Can you carry your CD collection in your pocket? **Yes, you can.**

The **Personal Jukebox**, or PJB, was created as a prototype personal audio appliance by Compaq's Systems Research Center (SRC) and Palo Alto Advanced Development group (PAAD). The PJB project started in May 1998, and the PJB-100 product shipped in November 1999.

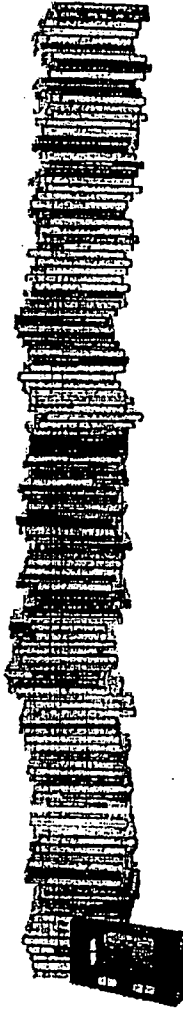
The PJB is a portable music player built around a small disk drive. A 30 GByte PJB will hold 550 hours of CD-quality audio. The battery lasts 10 to 11 hours on a single charge. The player weighs 9.5 ounces and can fit your jacket pocket. The audio quality is generally regarded as excellent, and the user interface is remarkably easy to learn and use. A 20 GByte PJB currently sells for around \$550; the 6 GByte version is under \$500.

Stereo Review's *Sound & Vision* magazine said:

In my 20 years of covering audio and video equipment, I can count on the fingers of one hand those products that gave me a spine-tingling "this changes everything" feeling. Now I can add the PJB-100 to the list.



The PJB is being shipped as a product by our partner, HanGo Electronics (dba Remote Solutions). You can see their product specifications on their web site. You can also read several product reviews.



You can try out our Java emulation of the PJB User Interface. Or, of course, you could just buy a real one: try Hammacher-Schlemmer (U.S. mail and web order catalog), MP3FactoryDirect (U.S. distributor), or Uhu (European distributor).

For a slightly more detailed description of the PJB, see our PowerPoint presentation about it.

For information about the research project that created the PJB, please contact Andrew Birrell, Dave Redell, or Ted Wobber.

Opening up the covers, you'll find that the PJB is a fairly powerful special-purpose computer. It contains a Motorola 56309 digital signal processor (DSP), a 6.5 GByte hard disk, 12 MB of memory, 1 MB of flash memory, a USB port, a high quality digital-to-analog converter, and a small LCD display. We currently use MPEG-2 layer-3 encoding technology (MP3) from Fraunhofer IIS to store compressed-CD-quality digital audio on the hard disk. This results in a 11:1 size reduction over raw digital audio with little noticeable difference in sound quality (even when you play it over your home stereo). Because the PJB uses flash ROM and a general-purpose DSP, it's quite easy to upgrade it to use other compression algorithms, or even to use different algorithms for different tracks.

You download music into a PJB using a PC program called the Jukebox Manager. This program communicates with the PJB using a proprietary RPC protocol over the USB. It reads digital audio from a CD in a local CD-ROM drive, compresses the bit stream, and stores the result on the PJB hard disk.

The Jukebox manager can also copy MP3 files from your PC into your PJB. The Jukebox Manager creates and manages a hierarchical table-of-contents (TOC), stored on the PJB, that makes it easy to find material in the PJB. The manager makes use of the Internet CDDB database to attach names to sets (categories), disks and tracks. Using the Jukebox Manager, it's easy to create personal playlists, to adjust the set/disk/track names to suit your personal tastes, and to move or copy items around within a TOC.

COMPAQ

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MusicMatch Jukebox 4.1, the Ultimate MP3 Utility

★★★★★

By [Patrick Norton](#)

Before RealJukebox jumped into the MP3 scene this summer, MusicMatch's Jukebox was the first such product. The latest version of MusicMatch Jukebox, 4.1 delivers nifty database and playlist tweaks, a graphic equalizer, and settings to help record from analog sources. As far as we're concerned, MusicMatch Jukebox (free to download, \$29.99 for high bit encoding), is the best MP3 tool out there for managing, playing, and creating MP3 audio files.

MusicMatch divvies the Jukebox interface across four windows: one each for the player, library, recorder, and track information such as title or cover information from the CDDB database. The latter info automatically gets downloaded if your system has a connection to the Net. All we did was drop in a CD, check the songs we wanted to encode, and hit the start button. MusicMatch then plays and records the songs in real time. Unfortunately, this product doesn't offer RealJukebox's speedy "read-ahead" encoding.

Both MusicMatch Jukebox and RealJukebox use our favorite encoder: Xing Technologies. In blind testing, we couldn't tell the difference between MP3s encoded (or played back) over either app. Both sounded as good as MP3 gets. Jukebox's AutoDJ, which maps types of music to a specific program time gives it a lead over RealJukebox. We also found its interface more intuitive.

Summary, Pros, Cons

Summary: MusicMatch Jukebox 4.1 delivers the best MP3 utility for encoding, organizing, and playing back, at least for our dollar.

Pros: Solid interface, Xing encoder delivers great audio quality; nifty AutoDJ settings.

Cons: \$29.99 upgrade if you want the best encoding; doesn't offer RealJukebox's speed in encoding.

Company: [MusicMatch Inc.](#)

Phone: 619.385.8360

Price: Free; \$22.99 for high quality encoding

Available: Now

Category: MP3, Audio

Platform: Windows 95, 98, NT 4.0

Specs: NA

Requirements: Pentium/166 or better PC; 16MB RAM (32MB for Windows NT); 30MB hard disk space; sound card; speakers

Originally posted September 17, 1999

<http://www.techtv.com/freshgear/print/0,23102,2324631,00.html>

4/30/2004

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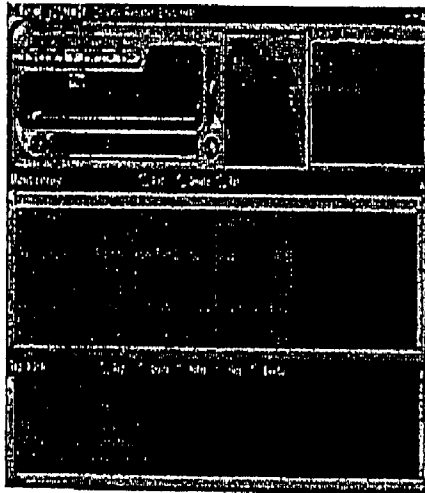
MusicMatch Jukebox 4.0: Screen Shot 2

From [PC Magazine](#)

June 17, 1999



[Find Local Retailers on Microsoft Sidewalk](#)



Via support for ID3v2, Jukebox lets you add graphics or text to your encoded music and view the information

included on MP3 files downloaded from the Internet.

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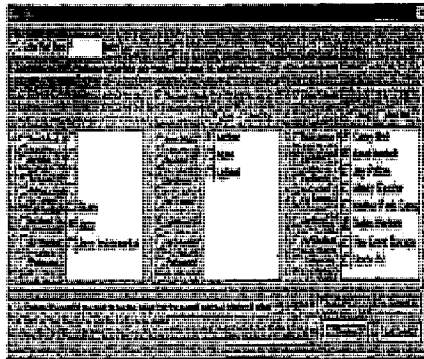
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MusicMatch Jukebox 4.0: Screen Shot 1

From [PC Magazine](#)
June 17, 1999



800.com
Electron Ideas!

Click

Jukebox's AutoDJ function lets you select songs by general categories to fill large blocks of listening time easily.

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MP3 *newswire.net*

1200 Song MP3 Portable is a Milestone Player

By Richard Menta- 01/11/00

Remote Solutions Personal Jukebox is a milestone product. By that we mean any product whose breakthrough innovations are so significant, they influence the future course of its industry. The iMac, which presently has PC manufacturers scrambling to breakout of the beige box routine, is a recent example of a milestone product.



Remote Solutions Personal Jukebox holds 1200 songs in its 4.8G hard drive

Personal Jukebox raises the bar in several areas and there is no doubt the leaders in MP3 portables are re-evaluating their future product releases. The most obvious element is Personal Jukebox's huge storage ability.

Up until now, all MP3 portables came with either 32MB or 64MB of memory, capable of holding anywhere of 9 to 20 song files at the standard 128k compression. This is the most limiting factor of MP3 players (many manufacturers advertise player capacity using songs compressed at a lower quality 56k setting. This stretches the limit of 64MB units to two hours), but promises of 300MB units using expensive flash memory or IBM's pricey, but tiny, micro drive litter manufacturer press releases.

The Personal Jukebox uses a 4.8G laptop hard drive, larger than the IBM's but far cheaper per MB of storage. This translates to a whopping 81 hours of music or 1200 songs and that is measured using the the higher 128k compression.

Think about this for a second. Right now, the largest capacity flash memory on the market is a 224MB CompactFlash card which Delkin started shipping Dec 99. The only player using that particular card to date is the RCA Lyra. The cost of the 224MB card is a very steep \$800. Add to that the \$200 cost of the Lyra costs and your up to \$1,000. The Personal Jukebox offers more that

20 times that capacity and does it for \$799.

And that is another area where the Personal Jukebox will affect the industry - price. Think about S3's (formerly Diamond's) Rio. The next generation of players is to include a unit using IBM's 300+MB micro drive. While this drive obviously has a size and weight advantage over the Jukebox's, how much can they actually sell it for now that its MP3 capacity, in a span of a few months, has gone from huge to modest. The player hasn't even come out yet! Indeed, these new Rio's may possibly be scrapped because market forces might not allow them to sell at prices that would cover the costs of those expensive micro drives.

The good news for consumers is that Remote Solution has provided shoppers with a choice. A choice that puts pressure on the companies supplying the storage cards and micro drives to drop prices, less they watch the MP3 portable industry shift to laptop drives - a seasoned, and far more competitive, arena.

The Hardware

The Personal Jukebox is a large and heavy unit for an MP3 player, closer in size and weight to a portable CD player. That's still a pretty reasonable size, especially since you can tote far more music along. It may not be the first choice of joggers for whom the smaller the better, but everywhere else it was a blessing

Real Jukebox uses a rechargeable Lithium Ion battery which give the unit a very long life considering the power needs of the hard drive, about 10 hours. This battery is another feature that makes this unit a candidate for milestone kudos. The battery charges inside the unit which comes with a power adapter.

The unit, which comes with both a cassette and cigarette lighter adapter, was ideally suited for the car. We didn't even bother to use the lighter adapter, we just attached the cassette adapter, popped it in the cassette bay of our radio, closed the player in the glove compartment, and ran tunes the whole day on just the battery. No CD changer in the trunk, no miles of speaker wire to lay.

We also hooked our player up to the stereo system. At this point we had a dozen CD's worth of music and if the Personal Jukebox seems big when

compared to other MP3 portables, it is sleek and petite when compared to the bulky 100 CD carousels that equals it's music capacity.

Getting started: A

The unit includes Jukebox Manager, an intuitive drag-and-drop interface that easily allowed us to rip and download files to the player. We had no problem loading the software to our PC. A key (and another milestone) feature is the user has the ability to rip and encode MP3 files directly to the players hard drive, bypassing the need to load these files on your computers hard drive first. This is a major convenience in both time and system space.

The player connects to your PC through a USB cable, the only way to go when you have the power to download hundreds of megs of MP3 files in a shot. Downloads were quick and simple.

Controls: A

Big and easy. The unit doesn't have some of the nice features in other units, like the ability to scan within a song, but it did the job well and that is what's most important. The controls were precise and effective.

The Display: A

Excellent. The display on the Personal Jukebox is twice the size of the nearest competitor and they put it to good use. The unit shows no less than six categories of information simultaneously, avoiding the need to navigate through various sub-menus to display the info you need. This includes CD and folder titles (the player can separate music by genre or album title) track name, tone and bass settings, battery consumption, volume, bit rate of the music, a counter, and more.

While the unit does not come with a backlight, the letters were big and clear and were very readable in all but the lowest light conditions.

Sound: A

Again, excellent.

The Personal Jukebox comes with a fine set of Koss headphones. Some may

choose to go with low profile earbuds - the Sennheiser MX-4 earbuds are our recommendation - but there was no need to upgrade for the sound quality, the Koss's did the job well

Conclusion

The reason MP3 player's will eventually send the cassette the way of the 8 track is convenience and the ability to store large amounts of music without taking up physical space. The biggest complaint of 32MB and 64MB portables is that they simply are not there yet, requiring you to constantly run back to your PC to swap music. The Personal Jukebox IS there right now as Jukebox owners can hold most (if not their entire) CD library, leveraging the advantages of the format today.

The industry seemed ready to bring larger capacity units by 64MB increments, thereby using capacity as a continual upgrading point, similar to how PC's use chip speed to get you to upgrade your system every few years. Personal Jukebox jumped over all that malarchy and now stands alone as the pre-eminent machine. The \$799 pricetag should cause ripples in an industry that would have today priced this much capacity in the thousands.

The unit is not a perfect instrument. It's a tad heavy for the exercise minded, you can feel the hard drive mildly vibrate when it changes tunes, it doesn't have some useful scan and backlight features. So what? We'll take four-and-a-half gigs of extra space over a backlight anyday. In other words, the advantages this portable offers far outbalances the couple of minor niceties it may be missing. This unit is more expensive than the \$150-\$200 portables on the market, but it offers far more bang to the buck.

BUT - and this is important - this does NOT mean that every other portable on the market is ready for the dustbin. The reason is the memory expansion slots most have, the saving grace of the industry. Right now a 32MB flash card sells for about \$100, quite a bit of money. Those prices will go down!

As mentioned above, what makes the Personal Jukebox so significant to the industry is that it pressures memory manufacturers to drop those prices quicker. In a couple of years, 32MB cards will sell for around five bucks and 300 MB cards will sell for about \$50. At those prices, these flash cards will essentially become the new cassettes. Heck, we might be able to buy them

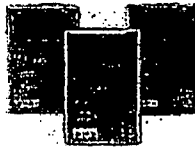
pre-programmed with music from the record store like any other album (the Rio people saw this early and added sleeves to the carrying case of the Rio 500 that holds 8 flash cards).

When that happens, users will get that bang for the buck, even on units that already been on the market for a year. They also get the size and weight advantages not offered by the large Remote Solutions machine.

Bottom line, not everyone has \$800 to spend right now for the Personal Jukebox. For a fraction of that cost, the better of the 64MB players like the Rio 500 and the RaveMP can do just fine till memory card prices drop. Hopefully that will be sooner rather than later.

Final Score: A+ (a Milestone Player)

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Order The New Rio PMP 500 from Amazon for \$289.

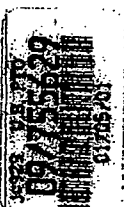
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MP3 MUSIC
MP3 PLAYERS
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WANT TO KNOW WHICH MP3 PLAYER IS BETTER?

5239



Class	Sub	ISSUE CLASSIFIC
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U.S. UTILITY Patent Application

O.I.P.E. PATENT DATE
 SCANNED MS (3) O.A. AA

APPLICATION NO.	CONT/PRIOR	CLASS	SUBCLASS	ART UNIT	EXAMINER
09/755629		084	609	2837	Witkowski

APPLICANTS
 Ron Goodman
 Howard Egan
 David Bristow

TITLE
 System for selecting and playing songs in a playback device with a limited user interface

PTO-2040
12/99

ISSUING CLASSIFICATION							
ORIGINAL		CROSS REFERENCE(S)					
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INTERNATIONAL CLASSIFICATION							

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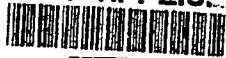
<input type="checkbox"/> TERMINAL DISCLAIMER <input type="checkbox"/> The term of this patent subsequent to _____ (date) has been disclaimed. <input type="checkbox"/> The term of this patent shall not extend beyond the expiration date of U.S. Patent. No. _____ <input type="checkbox"/> The terminal _____ months of this patent have been disclaimed.	DRAWINGS Sheets Drwg. Figs. Drwg. Print Fig.			CLAIMS ALLOWED Total Claims Print Claim for O.G.	
	_____ (Assistant Examiner) _____ (Date)			NOTICE OF ALLOWANCE MAILED	
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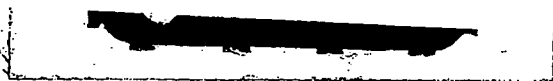


INITIALS

CONTENTS

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	Date Received (Incl. C. of M.) or Date Mailed		Date Received (Incl. C. of M.) or Date Mailed
1. Application	11 papers.	42.	
2. H.R. Rep. Dec/Dec, Fed/Dec	12-16-01	43.	
3. Dec. Fee. Date/Date	04-16-01	44.	
9-19-01 4. Rej 3 mos.	9/24/01	45.	
5. Jmd/BA	12-26-01	46.	
2-7-02 6. Rej 3 mos.	2/19/02	47.	
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8A	609-614 63A-638 477R 478		
43A	307A	9-18-01	SJW
Above to date		2-6-02	SJW

SEARCH NOTES (INCLUDING SEARCH STRATEGY)		
	Date	Exmr.

INTERFERENCE SEARCHED			
Class	Sub.	Date	Exmr.

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CLASSIFICATION NOTES

Examiner/ Classifier	Class	Date	Initials

E. Usillo

2-15-01

POSITION	INITIALS	ID NO.	DATE
FEE DETERMINATION			
O.I.P.E. CLASSIFIER			
FORMALITY REVIEW	<i>AA</i>	<i>901</i>	<i>07/15/01</i>
RESPONSE FORMALITY REVIEW	<i>2/19</i>	<i>883</i>	<i>05/25/01</i>

INDEX OF CLAIMS

- ✓ Rejected
- Allowed
- (Through numeral) ... Canceled
- + Restricted
- N Non-elected
- I Interference
- A Appeal
- O Objected

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SERIAL NUMBER 09/755,629	FILING DATE 01/05/2001 RULE	CLASS .084	GROUP ART UNIT 2837	ATTORNEY-DOCKET NO. 17002020800
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APPLICANTS
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 Howard N. Egan, Capitola, CA;
 David Bristow, Santa Cruz, CA;

** CONTINUING DATA *****

** FOREIGN APPLICATIONS *****

IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** 02/15/2001

Foreign Priority claimed <input type="checkbox"/> yes <input checked="" type="checkbox"/> no	STATE OR COUNTRY CA	SHEETS DRAWING 11	TOTAL CLAIMS 15	INDEPENDENT CLAIMS 7
35 USC 119 (a-d) conditions met <input type="checkbox"/> yes <input checked="" type="checkbox"/> no <input type="checkbox"/> Met after Allowance				
Verified and Acknowledged <i>[Signature]</i> Examiner's Signature	<i>[Initials]</i> Initials			

ADDRESS
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TITLE
System for selecting and playing songs in a playback device with a limited user interface

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Attorney Docket No. 17002-020800US

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Sir:

Transmitted herewith for filing under 37 CFR 1.53(b) is the

- patent application of
- continuation patent application of
- divisional patent application of
- continuation-in-part patent application of

Inventor(s)/Applicant Identifier: Ron Goodman, et al.

For: SYSTEM FOR SELECTING AND PLAYING SONGS IN A PLAYBACK DEVICE WITH A LIMITED USER INTERFACE

Enclosed are:

- 11 page(s) of specification
- 4 page(s) of claims
- 1 page of Abstract
- 11 sheet(s) of formal informal drawing(s).

An assignment of the invention to _____

A signed unsigned Declaration & Power of Attorney

A signed unsigned Declaration.

A Power of Attorney.

A verified statement to establish small entity status under 37 CFR 1.9 and 37 CFR 1.27 is enclosed was filed in the prior application and small entity status is still proper and desired.

A certified copy of a _____ application.

Information Disclosure Statement under 37 CFR 1.97.

A petition to extend time to respond in the parent application.

Notification of change of power of attorney correspondence address filed in prior application.

Postcard.

In view of the Unsigned Declaration as filed with this application and pursuant to 37 CFR §1.53(f), Applicant requests deferral of the filing fee until submission of the Missing Parts of Application.

DO NOT CHARGE THE FILING FEE AT THIS TIME.

Charles J. Kulas
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Attorneys for Applicant

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(415) 576-0200

Facsimile:
(415) 576-0300

SF 1675578 v1

PATENT APPLICATION

**SYSTEM FOR SELECTING AND PLAYING SONGS IN A PLAYBACK
DEVICE WITH A LIMITED USER INTERFACE**

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09755629-010501

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**SYSTEM FOR SELECTING AND PLAYING SONGS IN A PLAYBACK
DEVICE WITH A LIMITED USER INTERFACE**

CROSS REFERENCE TO RELATED APPLICATIONS

5 This application is related to the following co-pending applications: "System
For Managing Power In A Portable Music Player" (Atty. Docket No. 17002-022400) and
"Automatic Hierarchical Categorization Of Music By Metadata" (Atty. Docket No. 17002-
022500) both filed January 5, 2001, the disclosures of which are incorporated herein by
reference.

10

BACKGROUND OF THE INVENTION

Today, portable consumer electronic devices are more powerful than ever.
For example, small, portable music playback devices can store hundreds, even thousands, of
compressed songs and can play-back the songs at high quality. With the capacity for so many
songs, a playback device can store many songs from different albums, artists, styles of music,
etc.

However, a problem exists with such devices because the small size of the
devices means that only a very limited user interface can be provided.

Typically, the user interface includes a small display screen. Such a display
screen might be, e.g., 1" x 2". This small display size is necessary because of the physical
size of the device which is typically carried in the hand. The small size also limits the
number, size, shape, and types of user input controls that can be mounted on the device. For
example, a few pushbuttons are usually provided to perform all of the device's control
functions.

Using such a compact user interface to navigate and select among hundreds of
songs is inefficient and often frustrating. The display screen can only show a few song titles
at one time, and the limited controls make it difficult for a user to arbitrarily select, or move
among, the songs.

Thus, it is desirable to provide a user interface suitable for a small device. The
user interface should allow a user to efficiently navigate among, and select from, many items
stored in the device.

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SUMMARY OF THE INVENTION

The present invention provides an efficient user interface for a small portable music player. The invention is suitable for use with a limited display area and small number of controls to allow a user to efficiently and intuitively navigate among, and select, songs to be played. By using the invention, very large numbers of songs can be easily accessed and played.

One aspect of the invention includes an overlapping hierarchy of categories. Categories include items that can also be included in other categories so that the categories "overlap" with each other. Thus, a song title can be accessed in multiple different ways by starting with different categories. For example, a preferred embodiment of the invention uses the top-level categories "Albums", "Artists", "Genres" (or styles), and "Play Lists". Within the Albums category are names of different albums of songs stored in the device. Within each album are the album tracks, or songs, associated with that album. Similarly, the Artists category includes names of artists which are, in turn, associated with their albums and songs. The Genre category includes types of categories of music such as "Rock", "Hip Hop", "Rap", "Easy Listening", etc. Within these sub-categories are found associated songs. Finally, the "Play Lists" category includes collections of albums and/or songs which are typically defined by the user.

Advantageous use is made of the overlapping hierarchy to allow the user to quickly designate a song for playback. The device uses three "soft" pushbuttons that have assignable functions. The interface maintains consistent button functionality whenever possible and uses uniform command names and operations on different types of items so that the interface is more intuitive. For example, the user can open and queue both albums and songs with predictable results.

The interface also provides for multiple functions for a single control. For example, a "Play" button can act, in a first function, to play a currently-selected song. The Play button can act, in a second function, to cycle through different playback modes. The modes can be, e.g., (1) playback of songs from a hard disk; (2) playback of music from a radio receiver built into the device; and (3) playback of voice messages. The first function for the Play button can be activated by momentarily depressing the Play button for a short period of time. The second function is invoked by depressing the Play button for a longer period of time whereupon the device cycles through the different modes. Other ways of invoking the functions are possible such as where the second function is automatically entered from a powered-down state.

In one embodiment, the invention provides a method for selecting songs to be played in an electronic audio device, wherein the device includes a display and one or more user input controls, wherein songs are organized into categories, albums, wherein songs and albums are associated with artist names. The method includes steps of displaying categories on the display; accepting signals from a user input control to select a category; displaying one or more songs in the selected category on the display; accepting signals from a user input control to select a displayed song; and entering selected songs into a playlist queue, wherein the device plays back songs in the playlist queue.

10

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 illustrates the NOMAD Jukebox and its user interface controls;

Fig. 2 illustrates a sequence of display screens describing how to navigate to lower levels;

Fig. 3 illustrates associations among items;

Fig. 4 shows display screens used to search for a song or other item;

Fig. 5 illustrates details of different items;

Fig. 6 shows menus that are available to the user to set different parameters;

Fig. 7A is a flowchart illustrating menu displays and sequencing for navigating through a playlist;

Fig. 7B is a flowchart illustrating menu displays and sequencing for playing files and managing playlists;

Fig. 7C is a flowchart illustrating menu displays and sequencing for deleting items;

Fig. 8 illustrates a playback device coupled to a host computer system; and

Fig. 9 is a screen display of a bridge interface.

25

DESCRIPTION OF THE SPECIFIC EMBODIMENTS

A preferred embodiment of the present invention is incorporated into a product manufactured and distributed by Creative Technology, Ltd. The product is called the "NOMAD Jukebox."

30

Fig. 1 illustrates the NOMAD Jukebox and its user interface controls.

In Fig. 1, electronic audio device 100 measures about 5.5" wide by 5.5" tall by 1" thick. Display screen 102 is about 2" wide by 1" tall. Display screen 102 includes different regions such as main region 104 and soft button function description region 106.

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Three soft buttons are located at 108; including buttons 110, 112 and 114. The specific command, or function, that any of the soft buttons perform when depressed is indicated by the label in soft button function description region 106. Thus, the function of soft button 112 (as shown in Fig. 1) is "open," the function of soft button 114 is "search" while soft button 110 is currently not assigned a function.

The other eight buttons on device 100 perform essentially the same functions at all times. In other words, they are not subject to function changes according to soft button function description area 106. These buttons include Library button 116, EAX and System button 118, Skip Backward button 120, Play button 122, Stop button 124, Skip Forward button 126, Scroll Up button 128 and Scroll Down button 130. However, as discussed below, these buttons (or any type of controls used with the device) can include alternate functionality that is invoked in different ways.

The device uses visual cues, or indicators, in the display. When an item is highlighted it indicates that the item is the "current" item, or currently-selected item, which is susceptible to be operated on by a subsequent user action – such as playback, or expansion of the item. In Fig. 1, screen 102 shows that the item, "ALBUMS," is highlighted. The highlighted item can be acted upon by using the soft buttons, or another button, as discussed below. The current item can be changed by using Scroll Up button 128 and Scroll Down button 130 to move the highlight up or down, respectively, throughout a list of displayed items.

Icons are used to provide additional visual cues for an item. In Fig. 1, each of the categories has a category icon to the left of it. The category icon, which may not be distinctly visible in the Figure, illustrates a first box connected by lines to additional boxes below the first box. The icon depicts a hierarchy and illustrates the property of categories, i.e., that categories can contain additional categories, songs or other items.

Fig. 2 illustrates a sequence of display screens describing how to navigate to lower levels.

In Fig. 2, library category screen 150 shows the display as it appears when the user depresses library button 116 of Fig. 1. A preferred embodiment of the device uses 4 first-level categories. These are "Albums", "Artists," "Styles" and "Play Lists". Each of these categories can "contain," or be associated with, other categories, songs, or items.

Note that in library category screen 150 ALBUMS is currently highlighted. By depressing soft button 112 of Fig. 1, the "open" command is performed on the highlighted

category, as indicated by the labeling of soft button 112 and soft button function description area 152 of Fig. 2.

Lists screen 154 is displayed as a result of a user opening the Albums category of library category screen 150. Lists screen 154 shows items within the Albums category
5 such as commercial albums of multiple songs from a record label, pre-made lists or collections created by a user, or other predefined lists or collections of songs or recordings.

In Fig. 2, lists screen 154 shows each item as a list of songs. This is shown visually by the icon to the left of each item which depicts a miniature list. Possible soft button commands are "Close", "Open" and "Queue". These commands correspond to soft
10 buttons 110, 112 and 114, respectively. If the user selects the Close command, the display reverts to library category screen 150. If the user selects the Open command, the display shows tracks screen 156. Alternatively, the user can select the Queue command to instruct the device to place all the songs from the selected (i.e., highlighted) list into the play list for eventual playback. Yet another option allows the user to press play button 122 of Fig. 1 to
15 cause any currently-selected songs or a list of songs (e.g., an album) to immediately be played.

Returning to Fig. 2, tracks screen 156 shows that a single song called "JukeBox Demo" is in the list. The list is also called JukeBox Demo as shown in lists screen 154. Tracks screen 156 shows possible soft commands assigned to buttons, namely "Close", "Details" and "Queue." The Close button performs the same function as before -- it returns the user to the previous screen which, in this case, is lists screen 154. The user can also select the Details command to cause details of the song JukeBox Demo to be displayed in details
20 screen 158 as shown in Fig. 2. The user can select the Queue command by soft button 114 to enter the selected song into the play list queue. As before, the user can also depress play button 122 of Fig. 1 to cause immediate playback of the selected song.
25

Details screen 158 shows information about the selected song including the name of the song, album (or list) name containing the song; the track number, if applicable, and track duration. Note that other information can be included. The user can preview the song, close the Details screen to return to the Tracks screen or queue the song on the play list
30 queue.

The device provides the ability to "preview" audio files even while a current song, or playlist, is being played. When a user chooses to preview an audio file, the audio file is played for about 10 seconds while any currently-played file or playlist is suspended.

After previewing is complete, the suspended file or playlist resumes playback. In other embodiment, the preview duration can vary, or be stopped by user selection.

Fig. 3 illustrates associations among items.

In Fig. 3, song 168 is one of many songs stored in the device. Categories such
5 as albums 160, artists 162, play lists 164 and genres 166 each include sub-categories. For
example, albums 160 includes the names of various albums. Songs are associated with
albums, genres and playlists. Such association can be by using pointers, a data structure
including items to be associated, etc. "Association" as used herein, includes a first item
10 associated with a second item; and the second item associated with the first item. In other
words, albums can be associated with one or more songs in the database of the device so that
an automated search to find all songs associated with an album is easier. The direction of
arrow pointers in Fig. 3 is not intended to limit the manner of associations among items in the
present invention.

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Similar to albums, the category of artists 162 includes names of artists, or
15 performers, of songs. Each artist name is associated with one or more songs in the database.
Playlists 164 includes names of playlists. These are collections of songs that can be defined
by the user, the device manufacturer, or others. Each playlist can be associated with one or
more songs. Genres 166 includes various styles of music which are associated with one or
more songs in the database. Note that items can exist without being associated with a song.
20 Also, items can be associated with other items as where an artist name is associated with the
albums containing the songs that the artist has created.

Although not shown in Fig. 3, items can have additional information, such as
properties, details, etc., associated with the item. For example, a song can have information
such as play time, artist name, artist album, copyright owner, etc., associated with the song.

25 Fig. 4 illustrates display screens used to search for a song or other item.

In Fig. 4, screen 180 is the initial library screen, as discussed above. If the
user invokes the Search command (via the appropriate soft button) with Albums selected then
screen 182 is displayed. Note that the search function can be applied to any of the categories.
The user can depress the Plus or Minus soft buttons to cycle through the alphabet and change
30 the character in the current location as indicated by the cursor. The cursor position is
changed by using the scroll up/scroll down buttons 128 and 130, respectively, of Fig. 1. As
each letter is entered the letters are compared and the nearest match of the stored albums'
names is displayed as shown in screen 184. When the desired match is displayed the user
selects the Go! command.

Screen 186 shows the result of selecting the Go! command. A list of albums is displayed with the matched album centered and selected. The user can close, open or queue the album as discussed above.

Fig. 5 illustrates details of different items.

5 In Fig. 5, screen 200 illustrates details displayed as a result of selecting the "Details" command from soft button 1A track is selected. Screen 200 shows that details of the track "Jukebox Demo" shows the name of the album that the track resides on, the creator, or copyright owner, of the track, and the playing time of the track.

10 Screen 202 illustrates details of an item on the active queue list. Items are placed onto the active queue list by selecting the "Queue" command when an album, song, track, or other item is selected, as discussed above. For example, screen 204 shows the active queue list where the track "Jukebox Demo" is selected. By invoking the "Details" command screen 202 is brought up to show details of the Jukebox Demo track.

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460
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470
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As shown in screen 202, the Detail screen shows what track number the selected track is, which album the track is from; the creator, or copyright owner, of the track, and the title of the track. Additionally, the details for an item on the queue list also show playback settings. These are shown by two-letter abbreviations at the bottom of the screen. The settings are as show in Table I, below.

EA	Environmental Preset
EQ	Parametric EQ
HS	Headphone Spatialization
TS	Time Scaling
4S	Four Channel Speaker Sound (only if speakers are connected)

20

TABLE I

These settings have their common meanings, as is known in the art. Note that the setting 4S is not shown in screen 202 as it is not currently active.

Fig. 6 shows menus that are available to the user to set different parameters for some of the settings shown in Table I, and for additional properties of the device.

5 In screen 202, the word "ONCE" to the far right of the screen indicates the current playback setting for the play list, namely, that each track will played once. Other possible settings are SHUFFLE, RANDOM, or REPEAT.

10 Figs. 7A, 7B and 7C are flowcharts to illustrate menu displays and sequences for three different operations of, respectively, (1) navigating through a playlist, (2) playing files and managing playlists and (3) deleting files.

Fig. 8 illustrates the Nomad Jukebox coupled to a host computer system.

15 In Fig. 8, device 300 (e.g., the Nomad Jukebox) is coupled to host system 302. In a preferred embodiment host system 302 is a personal computer, such as an IBM-PC compatible computer. Host system 302 includes a user interface having display 304 and user input devices such as keyboard 306 and mouse 308. In other embodiments the host system need not be a full computer system. Any type of processing system having a user interface is possible. For example, it is possible to couple the device to a laptop computer, game console, web-enabled television, or any consumer electronic device or digital platform, in general. The host user interface need not provide a display and can be much more minimal than the keyboard and mouse shown in Fig. 8. A preferred embodiment of the invention uses a
20 Universal Synchronous Bus (USB) connection but any type of connection such as IEEE 1394 (FireWire), Ethernet, Serial Port, etc. can be used. A wireless (i.e., optical or radio frequency) connection can be used.

25 Once device 300 is coupled to host system 302, a user of host system 302 can launch a bridge interface to allow for the transfer of files between device 300 and host system 302. In a preferred embodiment, once the bridge interface is launched, the controls of device 300 are inoperable. The user interface of host system 302 is used to operate the bridge interface to transfer files.

Fig. 9 is a screen display of the bridge interface.

30 In Fig. 9, the bridge display is shown having two separate areas. A first area at 350 corresponds to information and controls for the host system while a second area 352 corresponds to information and controls relating to the playback device, or Nomad Jukebox. The main windows in each of the areas show files residing on the respective system or device. Window 354 shows files residing on the host system. Window 356 shows files

residing on the playback device. A highlighted file is transferred between the system and device by highlighting the file and depressing one of the two "Transfer" buttons between the windows.

In a preferred embodiment, only files in one window are actively highlighted. In Fig. 9, the file "Intrigue" in window 354 on the host system is actively highlighted. Although the file "Supernatural" in the playback device window 356 is also highlighted, this file is not "active" and the highlight for "Supernatural" is slightly less in intensity, or contrast. This difference may not be visible in the reprinted Figure. A file is made active simply by clicking on the file name. If a file is already highlighted in a window, clicking anywhere in the window makes any highlighted files in the window the active file or files.

When the active file is on the host system, only the lower transfer button is operable to send the file to the playback device. Likewise, when the active file is on the playback device, only the upper button is operable to send the file to the host system. The operable button is indicated by "brightening" the text of the button, as shown in Fig. 9 for the lower transfer button.

Both areas include controls for file manipulation such as changing directories, renaming and deleting files, etc.

Playback controls are shown in area 350. These are used to control playback of sound files on the host system. Standard controls for playing, pausing, stopping, skipping forward or backward, volume control, etc. are shown. In a preferred embodiment, once the bridge interface is launched, the physical controls on the playback device are not operable. Other embodiments can allow both the bridge interface and the playback device physical controls to operate. The bridge interface controls in area 350 of Fig. 9 can be used to control playback of audio files on the playback device. Controls on the playback device can be used to control playback of audio files on the host system.

In addition to the use of soft buttons as described, above, an embodiment of the invention provides for a single control, such as a button, to have multiple functions. For example, the Play button can perform a first function to play a currently-selected song. The Play button can also be used to perform a second function to put the device in an alternative playback mode. For example, an alternative embodiment of the device can include a radio receiver for playing signals from radio stations. A short depressing of the playback button acts to perform the first function and play back a currently-selected song. A long depressing of the playback button acts to perform the second function and to cycle through the different playback modes.

As an example, depressing the Play button for less than one-half second invokes the first function – that of playback of a selection. Depressing the Play button for more than one-half second causes playback of a selection for two second. After two seconds a test is made by the device to determine if the Play button is still being depressed. If not, the selected song continues to play and the device remains in the mode of playing back songs from a hard disk. If the Play button is still being depressed then playing of a currently selected (or last chosen) radio station begins for two seconds. Again, after the two-second interval if the button is no longer pressed the radio mode of the device is maintained and the radio signals are played. If the Play button is still pressed then a third mode of voice-recorded message playback is entered whereupon voice messages recorded by a user are played back.

Note that either function of the Play button can be invoked by other means. For example, the second function (mode changing) can be entered whenever the Play button is depressed when the device is in a powered-down state. Also, other modes can be used such as video playback, audio CD playback, etc. – assuming the device is so equipped.

Although the present invention has been discussed with respect to specific embodiments, these embodiments are merely illustrative, and not restrictive, of the invention. For example, although the bridge interface has been discussed only for purposes of transferring files, the bridge interface can also be used to operate any of the controls of the device to cause the device (e.g., the Nomad JukeBox) to start, pause and stop the playback of songs.

The scope of the invention is to be determined solely by the appended claims.

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WHAT IS CLAIMED IS:

1 1. A method for presenting songs to be played in an electronic audio
2 device, wherein the electronic audio device includes a display and at least one user input
3 control, the method comprising
4 associating a song with two or more categories in the device,
5 displaying the categories;
6 accepting signals from a user input control to select a category;
7 displaying the songs in the selected category;
8 accepting signals from a user input control to select a song; and
9 playing the song.

1 2. The method of claim 1, wherein the categories include the category
2 "album."

1 3. The method of claim 1, wherein the categories include the category
2 "artist."

1 4. The method of claim 1, wherein the categories include the category
2 "style."

1 5. A method for navigating among a plurality of song titles, the method
2 using a device having a display and a user interface, the device including a plurality of songs
3 associated with items and categories, the method comprising
4 displaying first, second and third categories on the display, wherein the first
5 category is of albums of songs, wherein the second category is of artists and wherein the third
6 category is of genres of recordings;
7 accepting signals from the user input control to select a category;
8 displaying items associated with the category;
9 accepting signals from the user interface to select one or more items and, if the
10 selected items have additional associated items then displaying the additional associated
11 items to progress down the hierarchy; and
12 displaying at least one song associated with one or more of the selected items.

1 6. A user interface for a device to play back songs, user interface
2 comprising

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3 a processor;
4 a display coupled to the processor;
5 at least one user input control coupled to the processor;
6 storage coupled to the processor, wherein the storage includes a song
7 associated with two different categories;
8 a category display process for displaying the categories on the display;
9 a category selection mechanism for receiving signals from the user interface to
10 select a category, wherein the category includes the song;
11 a song display mechanism for displaying the song in response to a signal from
12 the category selection mechanism; and
13 a playback mechanism for playing the song.
14 accepting a new song for storage in the device;
15 associating the new song with two or more top-level categories in the
16 hierarchy;
17 allowing the user to store a new song in the device; and
18 accepting signals from the user interface to associate the song in the
19 overlapping hierarchy.

1 7. A method for selecting songs to be played in an electronic audio
2 device, wherein the device includes a display and one or more user input controls, wherein
3 songs are organized into categories, albums, wherein songs and albums are associated with
4 artist names, the method comprising
5 displaying categories on the display;
6 accepting signals from a user input control to select a category;
7 displaying one or more songs in the selected category on the display;
8 accepting signals from a user input control to select a displayed song; and
9 entering selected songs into a playlist queue, wherein the device plays back
10 songs in the playlist queue.

1 8. The method of claim 1, wherein the categories include the category
2 "album."

3 9. The method of claim 1, wherein the categories include the category
4 "artist."

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1 10. The method of claim 1, wherein the categories include the category
2 "style."

1 11. A method for presenting songs for selection on a display, the method
2 comprising
3 organizing the songs into multiple overlapping categories; and
4 displaying the categories and songs on the display.

1 12. A method for selecting songs for playback in an electronic device, the
2 device including a user interface coupled to a processor, the user interface including a display
3 and user input controls, wherein a plurality of songs are stored in the device and are
4 associated with an album name, the method comprising
5 displaying the album name on the display;
6 designating a first single-action user input control for signaling an "opening"
7 command;
8 designating a second single-action user input control for signaling a "queuing"
9 command;
10 if the "queuing" command is received then designating the plurality of songs
11 for playback;
12 if the "opening" command is received then performing the following steps
13 displaying the plurality of songs;
14 accepting signals from a user input control to select a song;
15 if the "queuing" command is received then designating the selected
16 song for playback; and
17 if the "opening" command is received then displaying information
18 about the selected song.

1 13. A method for providing multiple functions for a Play button in an
2 electronic device, wherein the electronic device includes a first playback mode for playing
3 audio files from a local storage and a second playback mode for playing audio information
4 from other than the local storage, the method comprising
5 determining whether the Play button is operated by a user in a first manner;

6 if the Play button is operated in the first manner then performing the step of
7 playing back an audio file from the local storage else performing the step of playing back
8 audio information from other than the local storage.

9

10 14. The method of claim 13, wherein the first manner is depressing the Play
11 button for less than a predetermined time.

12

13 15. The method of claim 13, wherein the first manner is depressing the Play
14 button for greater than a predetermined time.

*add
A1*

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SYSTEM FOR SELECTING AND PLAYING SONGS IN A PLAYBACK DEVICE WITH
A LIMITED USER INTERFACE

ABSTRACT OF THE DISCLOSURE

5 An efficient user interface for a small portable music player. The user
interface uses an overlapping hierarchy of categories. A song title can be accessed in
multiple different ways by starting with different categories. A preferred embodiment of the
invention uses the top-level categories "Albums", "Artists", "Genres" (or styles), and "Play
Lists". Within the Albums category are names of different albums of songs stored in the
10 device. Within each album are the album tracks, or songs, associated with that album.
Similarly, the Artists category includes names of artists which are, in turn, associated with
their albums and songs. The Genre category includes types of categories of music such as
"Rock", "Hip Hop", "Rap", "Easy Listening", etc. Within these sub-categories are found
associated songs. Finally, the "Play Lists" category includes collections of albums and/or
15 songs which are typically defined by the user. The interface also provides for multiple
functions for a single control. For example, a "Play" button can act, in a first function, to
play a currently-selected song. The Play button can act, in a second function, to cycle
through different playback modes. The modes can be, e.g., (1) playback of songs from a hard
disk; (2) playback of music from a radio receiver built into the device; and (3) playback of
20 voice messages.

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25

DECLARATION

As a below named inventor, I declare that:

My residence, post office address and citizenship are as stated below next to my name; I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural inventors are named below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: **SYSTEM FOR SELECTING AND PLAYING SONGS IN A PLAYBACK DEVICE WITH A LIMITED USER INTERFACE** the specification of which X is attached hereto or was filed on as Application No. and was amended on (if applicable).

I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above. I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56. I claim foreign priority benefits under Title 35, United States Code, Section 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s)

Country	Application No.	Date of Filing	Priority Claimed Under 35 USC 119

Hereby claim the benefit under Title 35, United States Code § 119(e) of any United States provisional application(s) listed below:

Application No.	Filing Date

Claim the benefit under Title 35, United States Code, Section 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, Section 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, Section 1.56 which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

Application No.	Date of Filing	Status
Unassigned	01/05/00	Pending
Unassigned	01/05/00	Pending

Full Name of Inventor 1:	Last Name: GOODMAN	First Name: RON	Middle Name or Initial:	
Residence & Citizenship:	City: Santa Cruz	State/Foreign Country: California	Country of Citizenship: United States	
Post Office Address:	Post Office Address: 226 Jeter Street	City: Santa Cruz	State/Country: California	Postal Code: 95060

0975629

Full Name of Inventor 2:	Last Name: EGAN	First Name: HOWARD	Middle Name or Initial: N.	
Residence & Citizenship:	City: Capitola	State/Foreign Country: California	Country of Citizenship: United States	
Post Office Address:	Post Office Address: 219 Elinor Street	City: Capitola	State/Country: California	Postal Code: 95010
Full Name of Inventor 3:	Last Name: BRISTOW	First Name: DAVID	Middle Name or Initial:	
Residence & Citizenship:	City:	State/Foreign Country:	Country of Citizenship: Canada	
Post Office Address:	Post Office Address:	City:	State/Country:	Postal Code:
Full Name of Inventor 4:	Last Name: AYON	First Name: MARIA	Middle Name or Initial:	
Residence & Citizenship:	City:	State/Foreign Country:	Country of Citizenship:	
Post Office Address:	Post Office Address:	City:	State/Country:	Postal Code:

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Signature of Inventor 1 _____ Ron Goodman	Signature of Inventor 2 _____ Howard N. Egan	Signature of Inventor 3 _____ David Bristow
Date	Date	Date
Signature of Inventor 4 _____ Maria Ayon		
Date		

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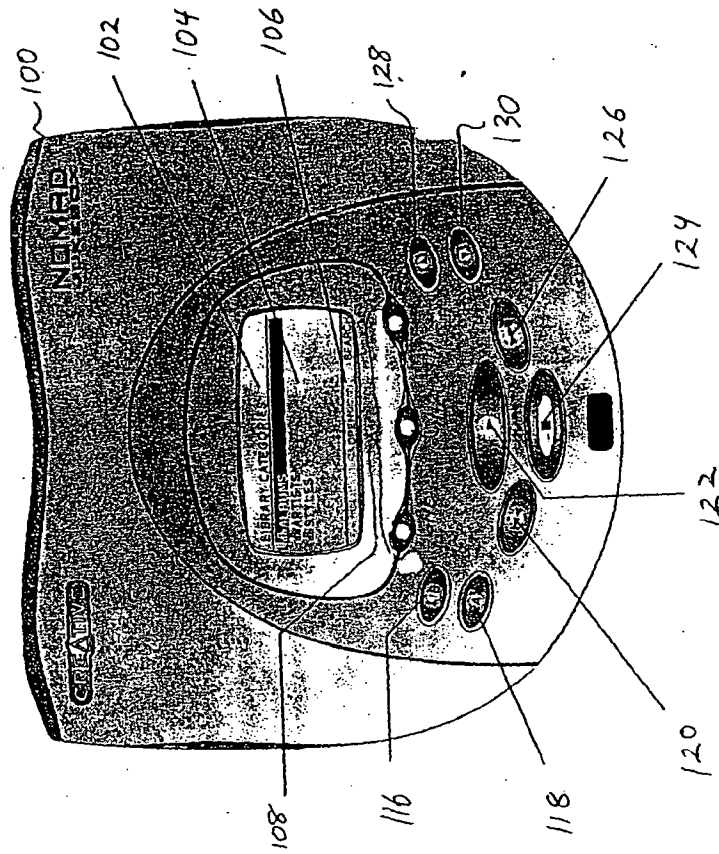


Fig. 1

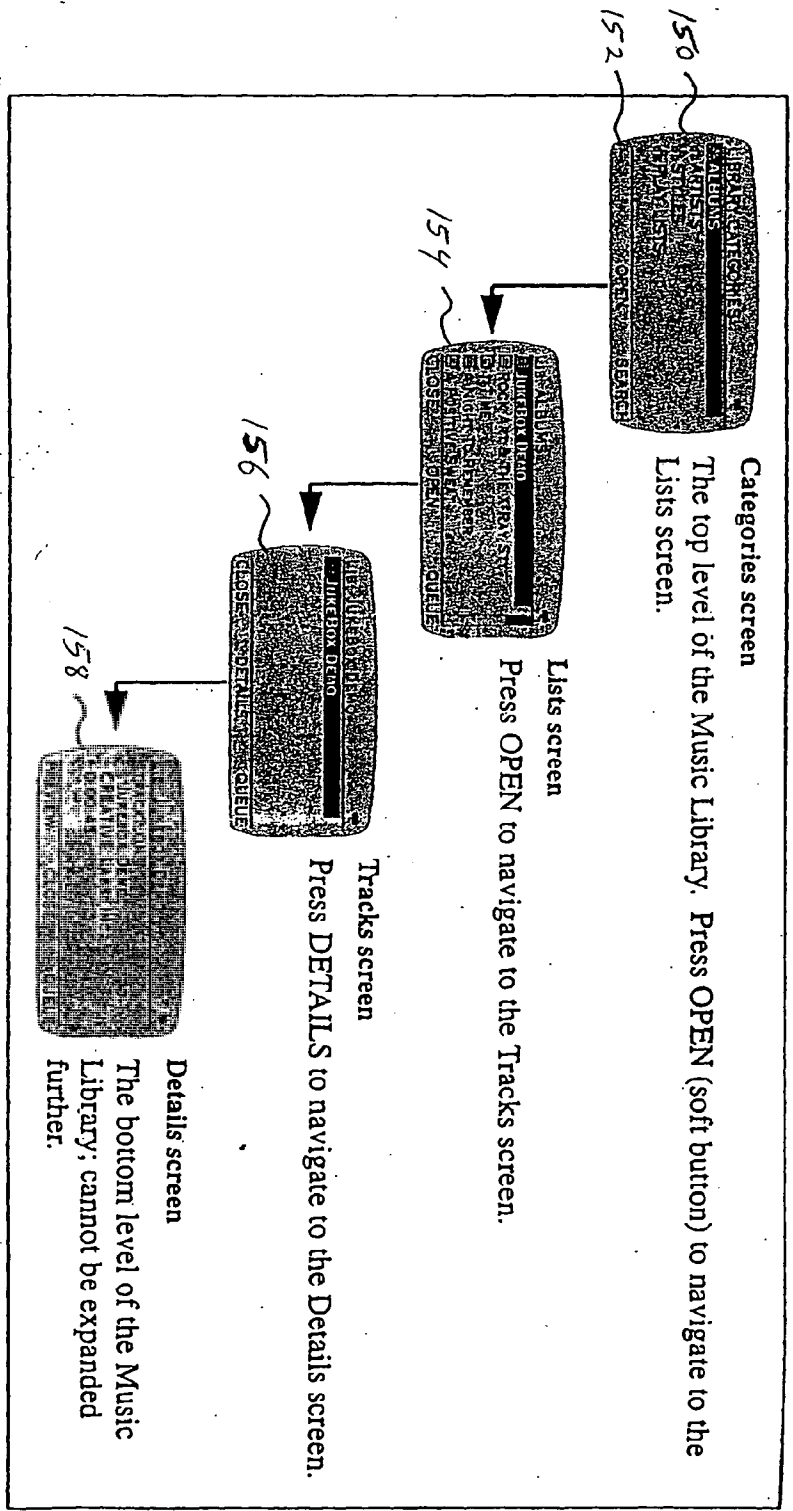


Fig. 2

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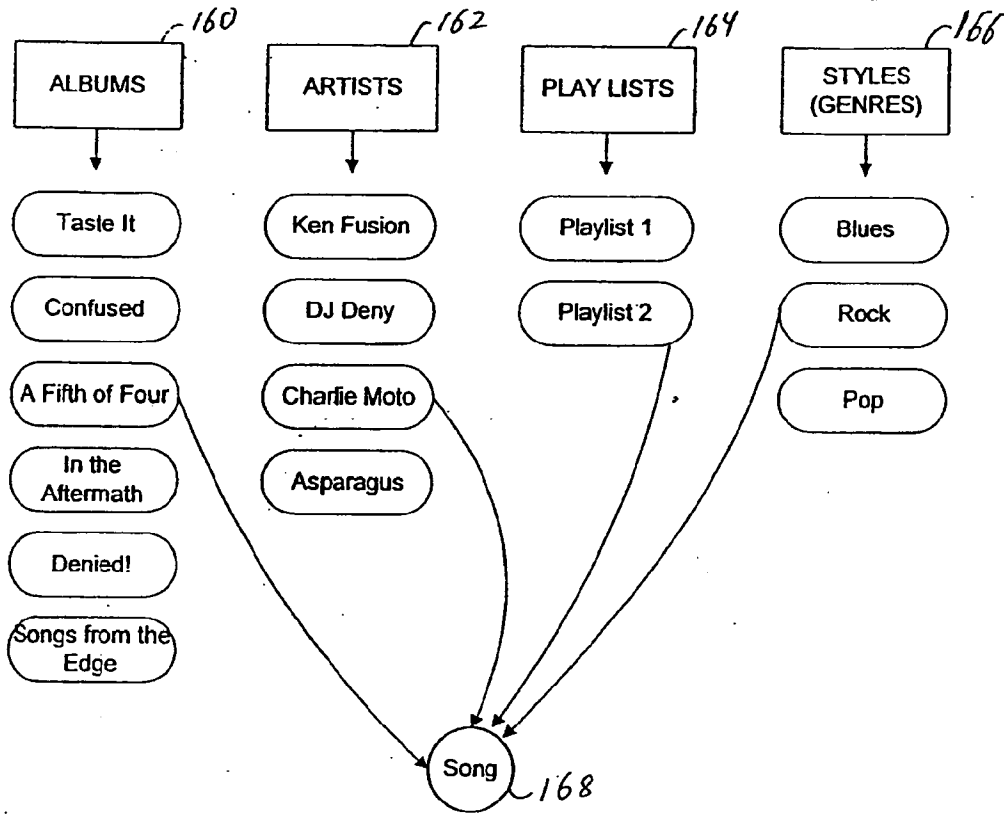
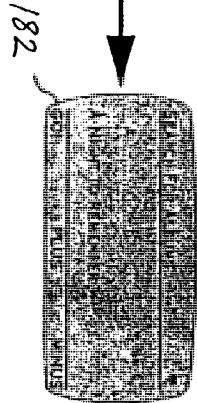
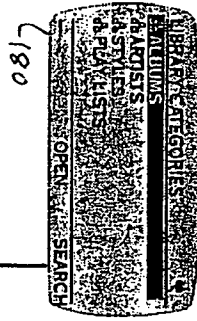
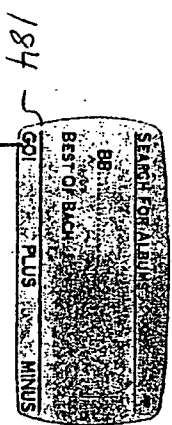


Fig. 3

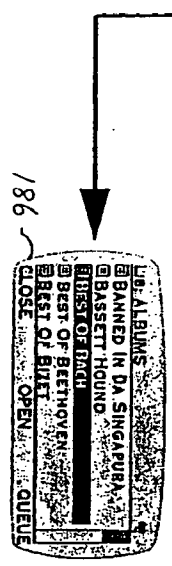
1. Press SCROLL UP/DOWN buttons to select ALBUMS.
2. Press SEARCH to access the SEARCH FOR ALBUMS screen.



3. Press PLUS/MINUS to change the letter and then press the SCROLL UP/DOWN buttons to move the letter entry position (indicated by a ^).



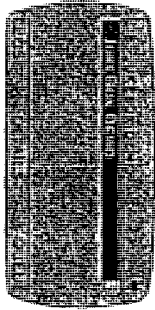
NOTE: As each letter is entered, the letters are compared with the ALBUMS list. The ALBUM with the nearest match is displayed.



4. Press GO! to jump to the nearest match. The album appears on the screen.

Fig. 4

View DETAILS accessed from the TRACKS screen:

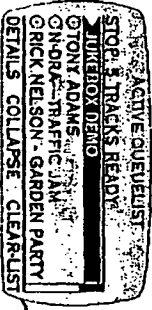


1. Press DETAILS. The DETAILS screen displays the Track Order, Album, Artist, and duration of the track.

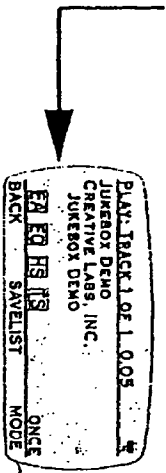


2. Press CLOSE to return to the TRACKS screen.

Viewing DETAILS accessed from the ACTIVE QUEUE LIST screen:



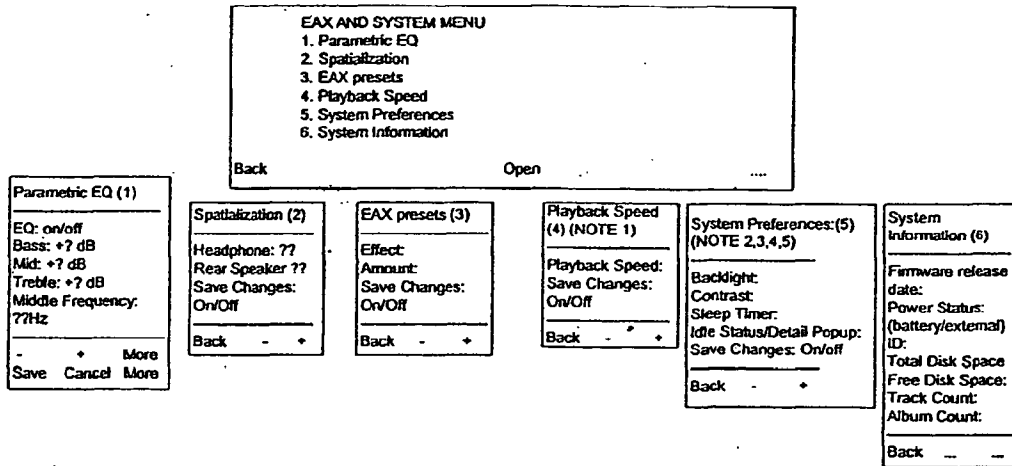
1. Press DETAILS. The DETAILS screen displays the Track Title, Artist, and Album together with Audio Playback settings (see note below) and Play Mode (see "Setting Play Mode" on page 16).



2. Press BACK to return to the ACTIVE QUEUE LIST screen.

Fig. 5

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EAX AND SYSTEM MENU Screen
System Options

LIB BUTTON Function:
LIB button rotates between current EAX submenu and Main Library screen

EAX BUTTON Function:
EAX button rotates between current EAX submenu and main Active Queue screen.

NOTE 1: When the playback speed is not 1x. The following should be displayed on screen.
Playback speed: ??
EAX effects disabled
Bottom line disappear if speed returns to 1x.

NOTE 2: Backlight should have the following options when +/- pressed: Always OFF/10 Seconds/30 Seconds/1 Minute/5 Minutes/Always ON

NOTE 3: Start up volume should retain volume when unit was last turned off as well as having the ability to change volume any time.

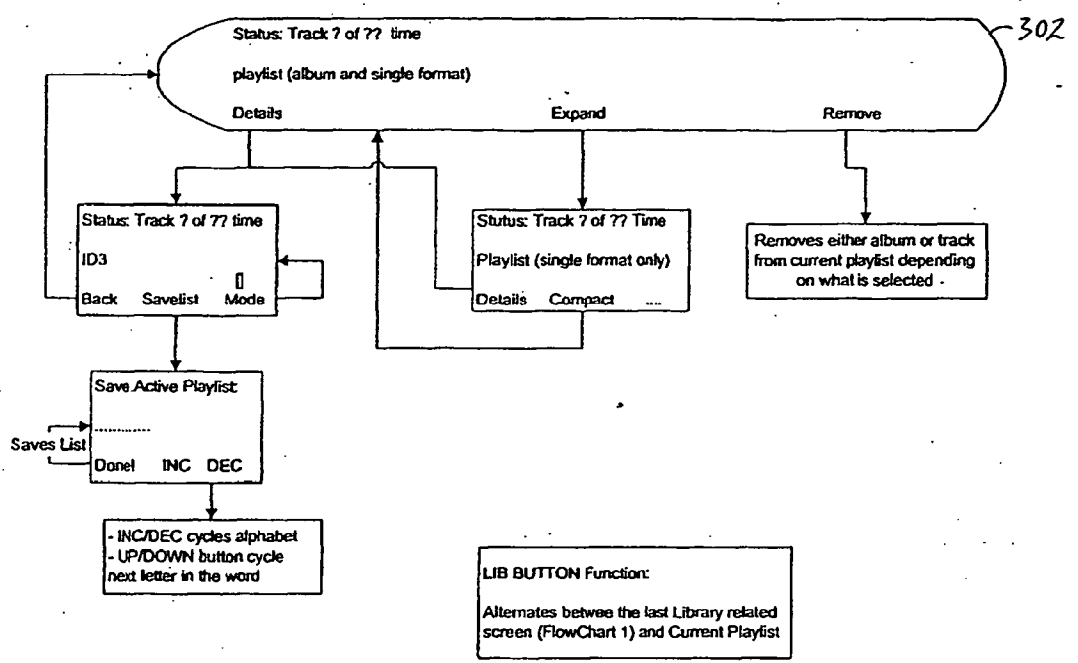
NOTE 4: Sleep Timer options: Off/30 Seconds/1 Minute/3 Minutes/4 Minutes/5 Minutes/10 Minutes/15 Minutes

NOTE 5: Idle Status/Details Popup: Always Off/30 Seconds/1 Minute/3 Minutes/4 Minutes/5 Minutes/10 Minutes/15 Minutes

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Fig. 6

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Navigating through current playlist.

SF 1123480 v1

Fig. 7A

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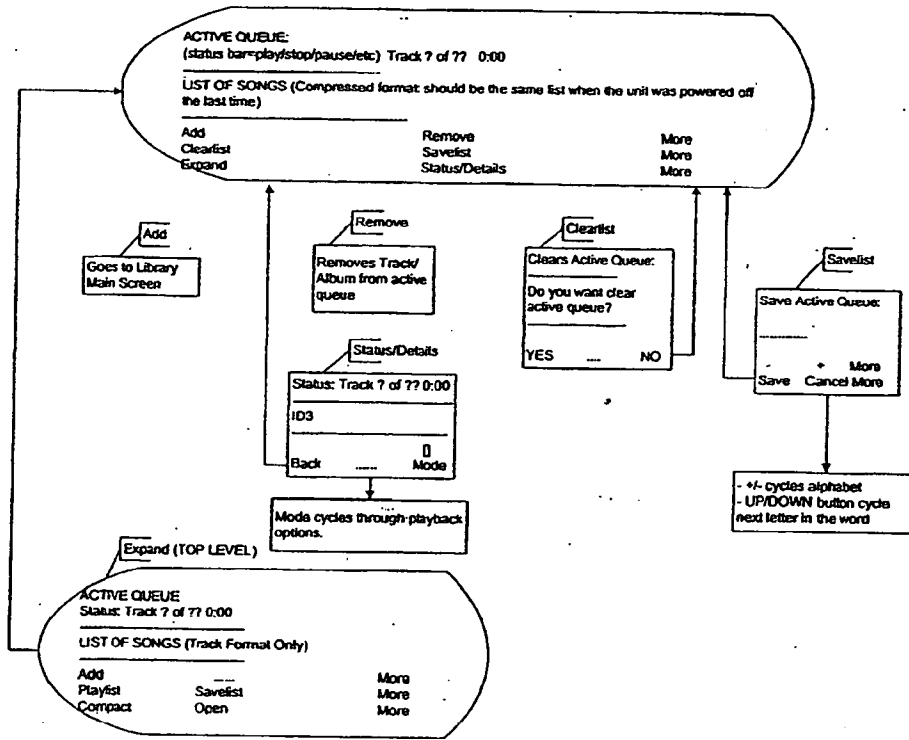


Fig. 7B

ACTIVE QUEUE Screen
Playing files and managing playlists

NOTE: The Status/Details should pop up with select/playing track on playlist when the player is idle for certain period of time. Option in EAX should control idle on/off and time before idle screen pops up.

NOTE: Pause status be a popup box that disappear after a few seconds.

NOTE: All queued commands should display "Queued" text on top right hand corner for a second while staying at current screen.

NOTE: The More button assigns new function to soft keys

NOTE: "Open" at (library; track level) previews the track. If a song is already playing, error message should be (No Preview While Song Playing) instead of current error message (No auditioning while previewing). "Back" key should stop preview as well.

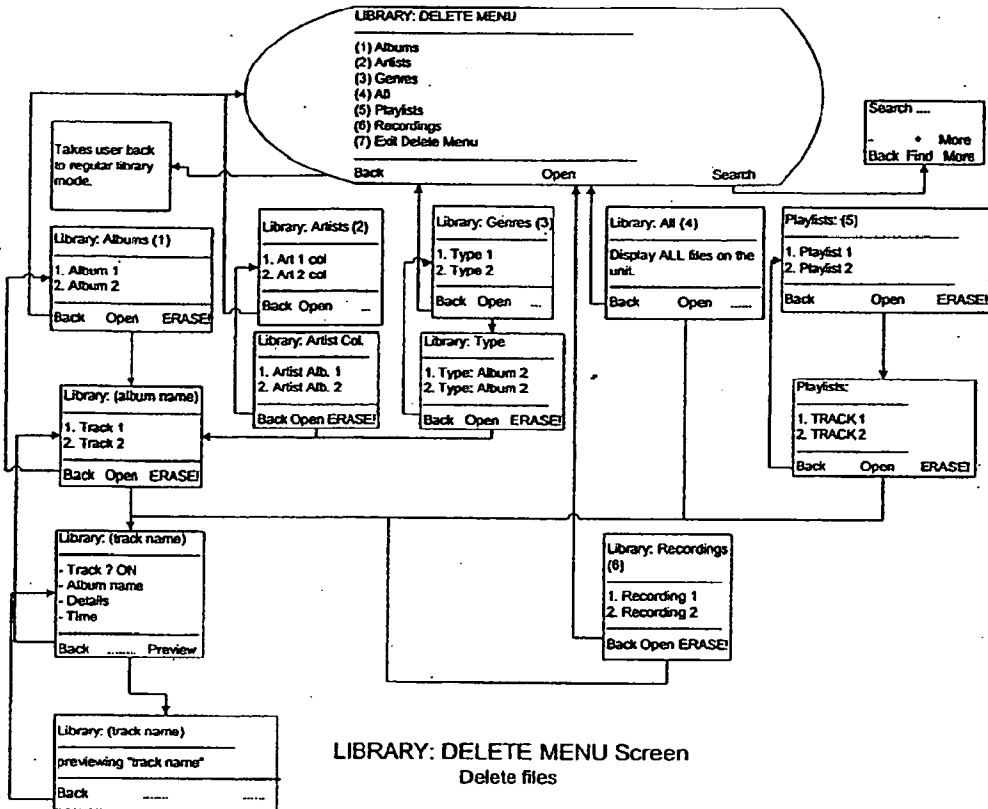
NOTE: "Back" saves previous screen.

LB BUTTON Function:
Alternates between the last Library related screen and last Active Queue related screen

EAX BUTTON Function:
Toggles ON/OFF EAX main screen.

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LIBRARY: DELETE MENU Screen
Delete files

Fig. 7C

NOTE: All song playing should be stopped while in delete mode.

NOTE: While in delete mode, top line of all screen should have the words "DELETE MODE" appended.

NOTE: All ERASE! keypresses would give user a popup warning:

Are you sure? (pop up screen)

YES NO

NOTE: "Open" at (library: track level) previews the track. "Back" key would stop preview.

LIB BUTTON Function:
Returns to Main Library Menu
and exits Delete Menu

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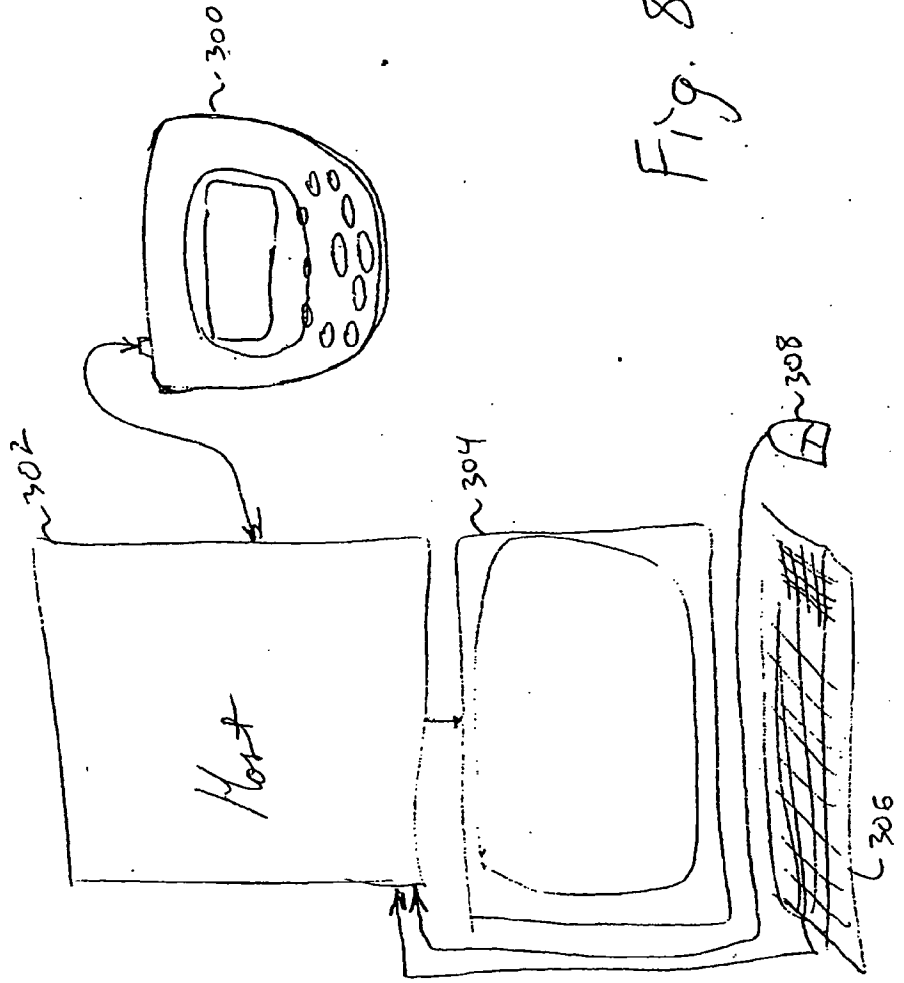


Fig. 8

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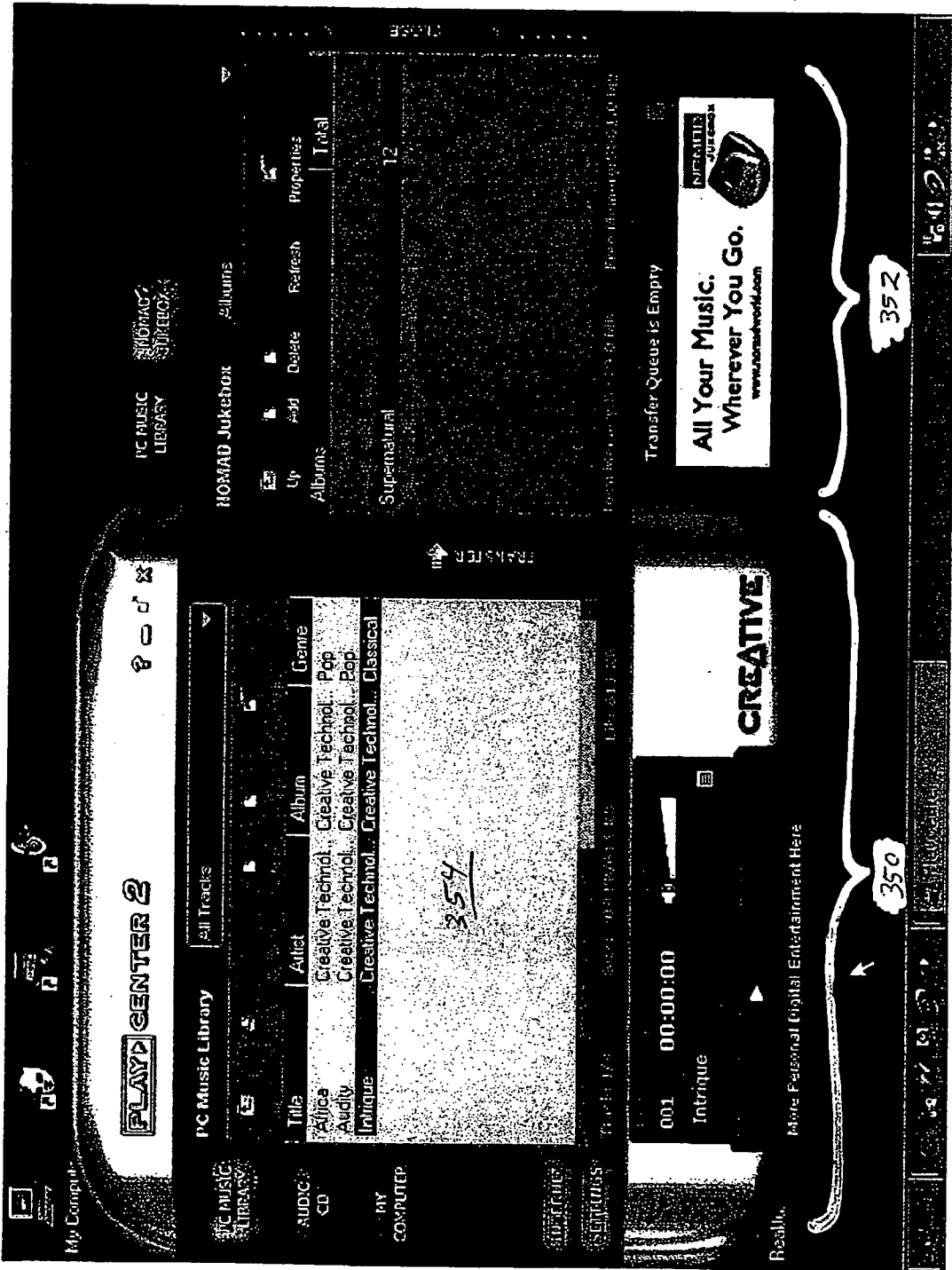


Fig. 9

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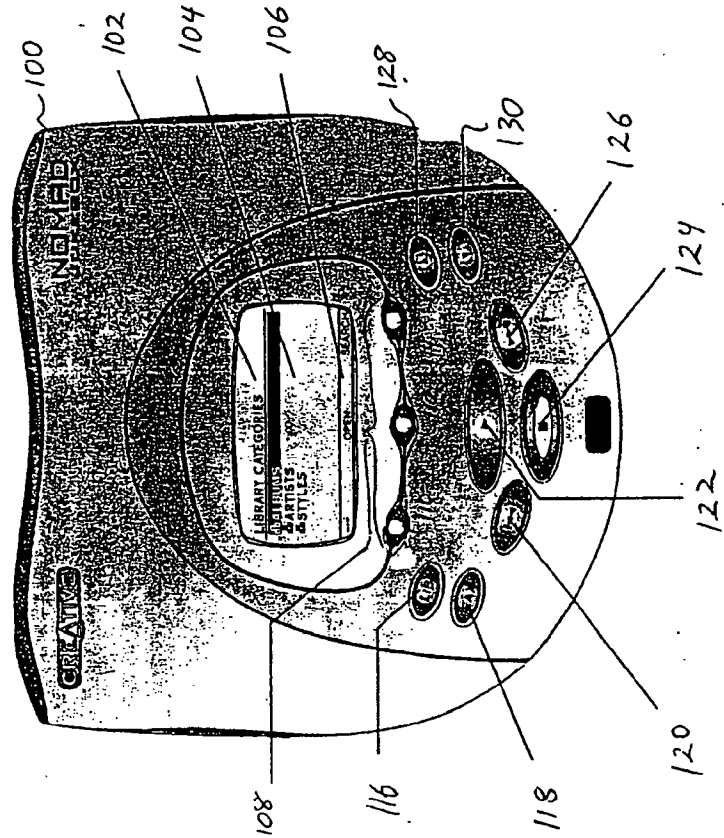


Fig. 1

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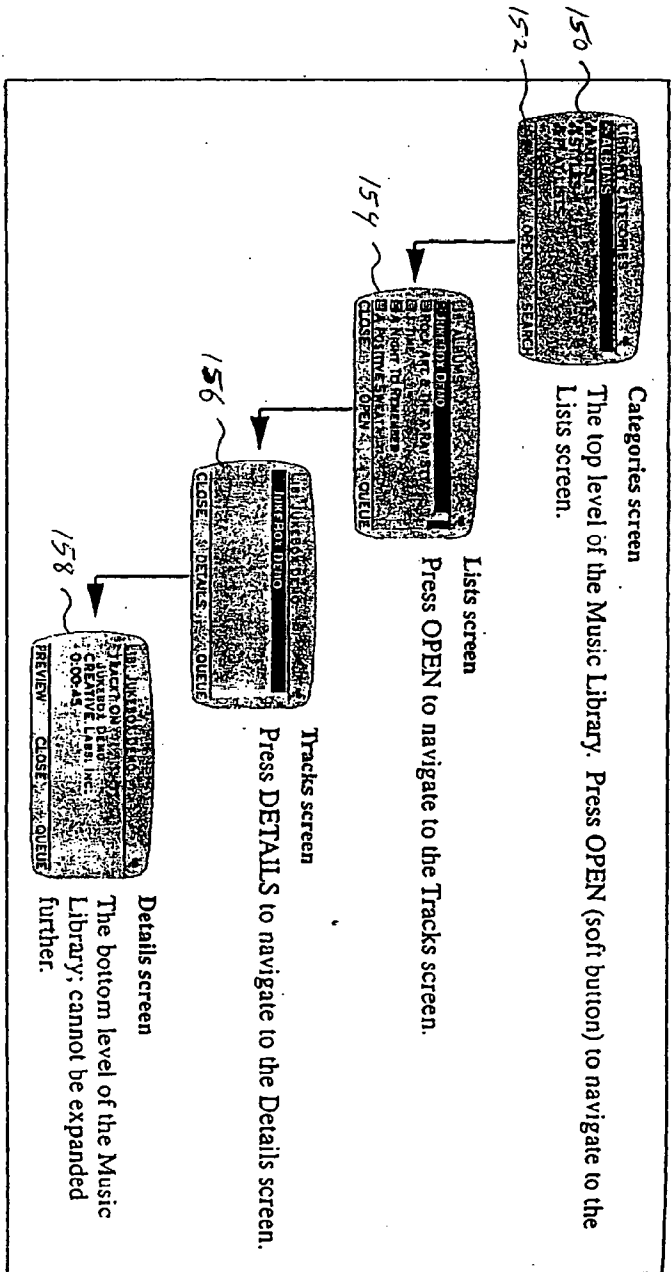
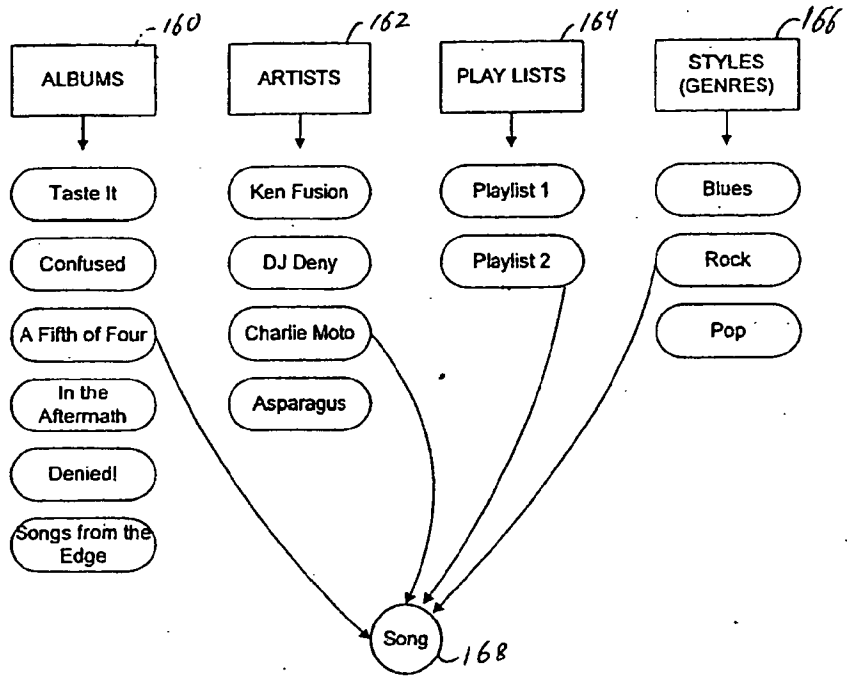


Fig. 2

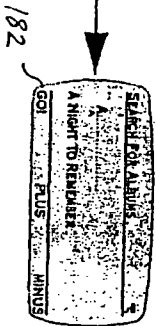
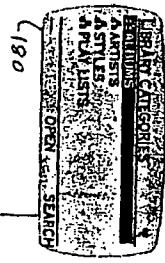


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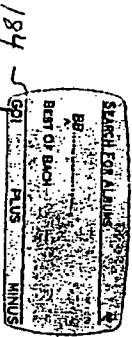
Fig. 3

105010 62955260

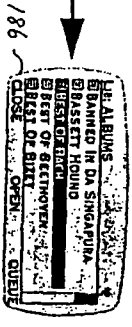
1. Press SCROLL UP/DOWN buttons to select ALBUMS.
2. Press SEARCH to access the SEARCH FOR ALBUMS screen.



3. Press PLUS/MINUS to change the letter and then press the SCROLL UP/DOWN buttons to move the letter entry position (indicated by a ^).



NOTE: As each letter is entered, the letters are compared with the ALBUMS list. The ALBUM with the nearest match is displayed.



4. Press GO! to jump to the nearest match. The album appears on the screen.

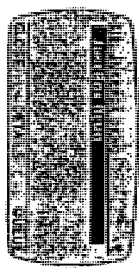
Fig. 4

AS ORIGINALLY FILED

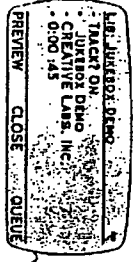
TOSCFD 62955760

View DETAILS accessed from the TRACKS screen:

1. Press DETAILS. The DETAILS screen displays the Track Order, Album, Artist, and duration of the track.

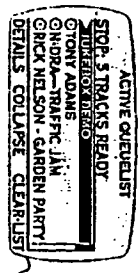


2. Press CLOSE to return to the TRACKS screen.



Viewing DETAILS accessed from the ACTIVE QUEUE LIST screen:

1. Press DETAILS. The DETAILS screen displays the Track Title, Artist, and Album together with Audio Playback settings (see note below) and Play Mode (see "Setting Play Mode" on page 16).



2. Press BACK to return to the ACTIVE QUEUE LIST screen.

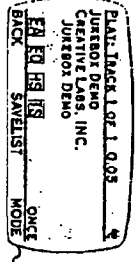
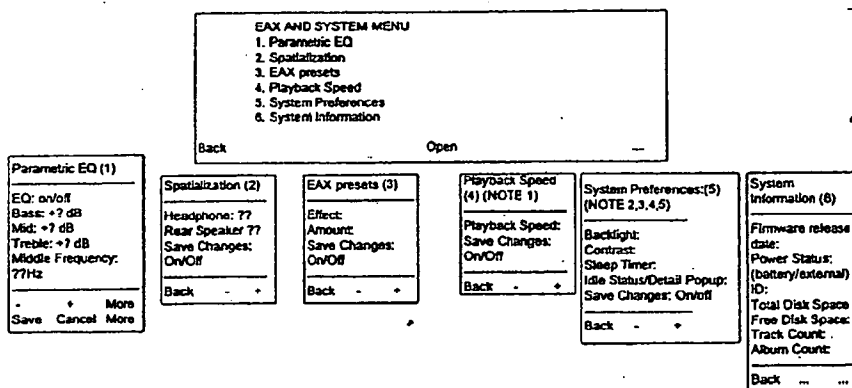


Fig. 5

AS ORIGINALLY FILED



09755629.010501

EAX AND SYSTEM MENU Screen
System Options

NOTE 1: When the playback speed is not 1x. The following should be displayed on screen.
Playback speed: ??
EAX effects disabled
Bottom line dts appear if speed returns to 1x.

NOTE 2: Backlight should have the following options when +/- pressed:
Always OFF/10 Seconds/30 Seconds/1 Minute/5 Minutes/Always ON

NOTE 3: Start up volume should retain volume when unit was last turned off as well as having the ability to change volume any time.

NOTE 4: Sleep Timer options:
Off/30 Seconds/1 Minute/3 Minutes/4 Minutes/5 Minutes/10 Minutes/15 Minutes

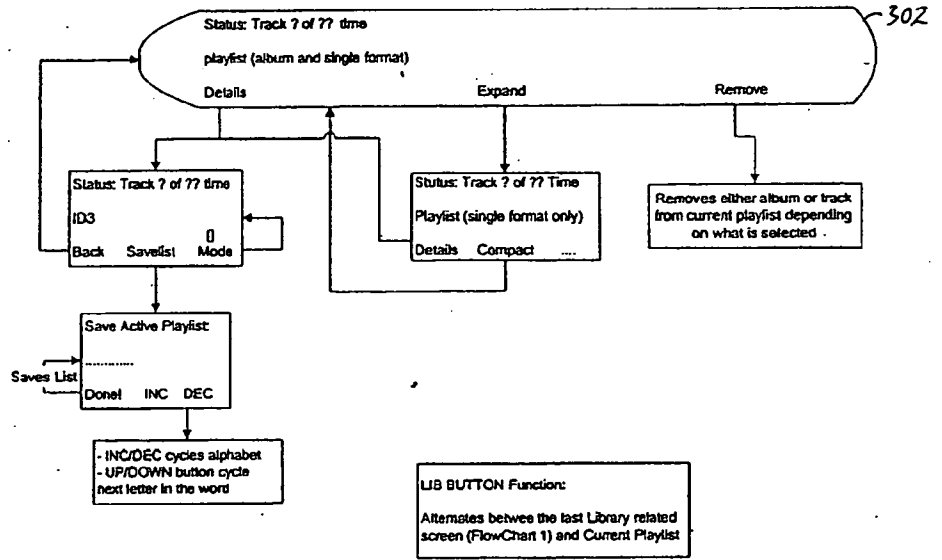
NOTE 5: Idle Status/Details Popup:
Always On/30 Seconds/1 Minute/3 Minutes/4 Minutes/5 Minutes/10 Minutes/15 Minutes

LIB BUTTON Function:
LIB button rotates between current EAX submenu and Main Library screen

EAX BUTTON Function:
EAX button rotates between current EAX submenu and main Active Queue screen.

SF 1123485 v1

Fig. 6



09755629-010501

Navigating through current playlist.

SF 1123480 v1

Fig. 7A

09755629.010501

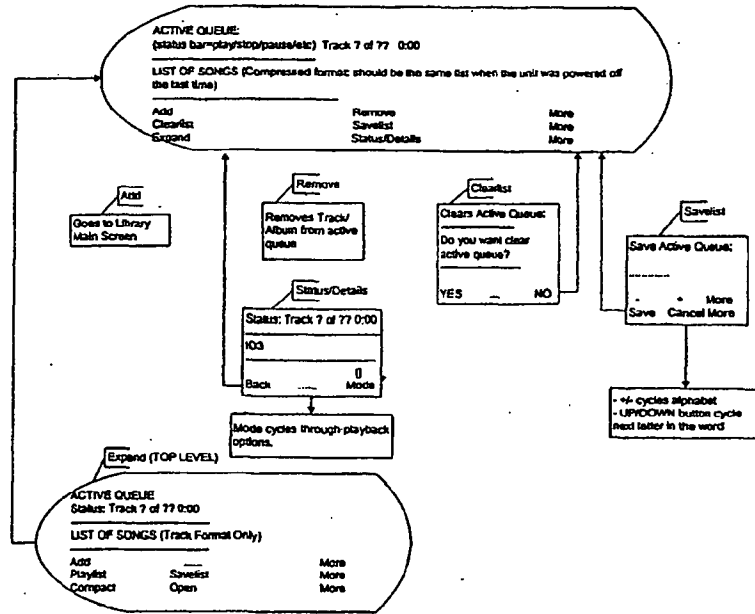


Fig. 7B

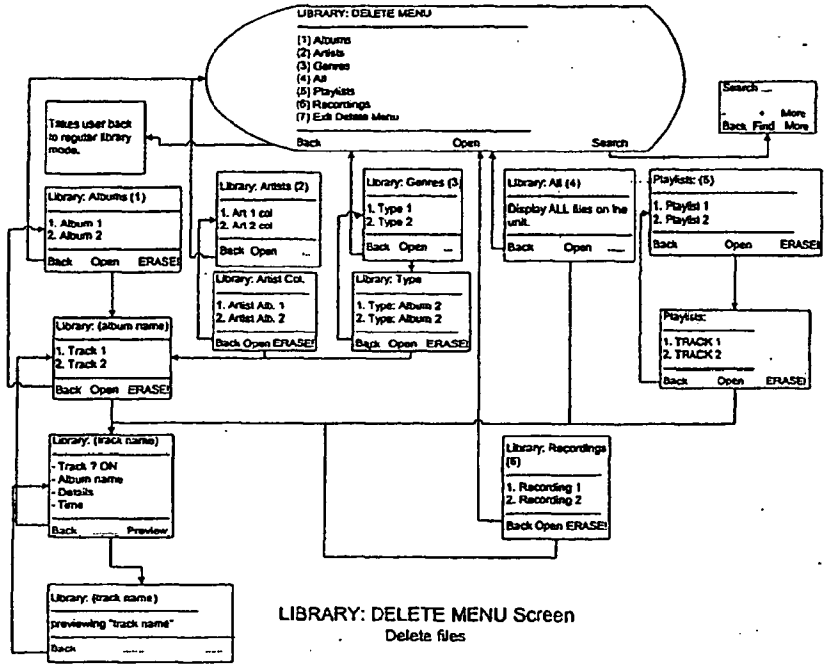
ACTIVE QUEUE Screen
 Playing files and managing playlists

- NOTE: The Status/Details should pop up with select/playing track on playlist when the player is idle for certain period of time. Option in EAX should control idle on/off and time before idle screen pops up.
- NOTE: Pause status be a popup box that disappear after a few seconds.
- NOTE: All queued commands should display "Queued" text on top right hand corner for a second while staying at current screen.
- NOTE: The More button assigns new function to soft keys
- NOTE: "Open" at (library; track level) previews the track. If a song is already playing, error message should be (No Preview While Song Playing) instead of current error message (No additional while previewing). "Back" key should stop preview as well.
- NOTE: "Back" saves previous screen.

- LIB BUTTON Function:**
 Alternates between the last Library related screen and last Active Queue related screen
- EAX BUTTON Function:**
 Toggles ON/OFF EAX main screen.

SF 1123478 v1

09755629.010501



LIBRARY: DELETE MENU Screen
Delete files

Fig. 7C

LIB BUTTON Function:
Returns to Main Library Menu
and exits Delete Menu

NOTE: All song playing should be stopped while in delete mode.
NOTE: While in delete mode, top line of all screen should have the words "DELETE MODE" appended.
NOTE: All ERASE keypresses would give user a popup warning:
Are you sure? (pop up screen)
YES NO
NOTE: "Open" at (Library, track level) previews the track. "Back" key would stop preview.

09755629-010501

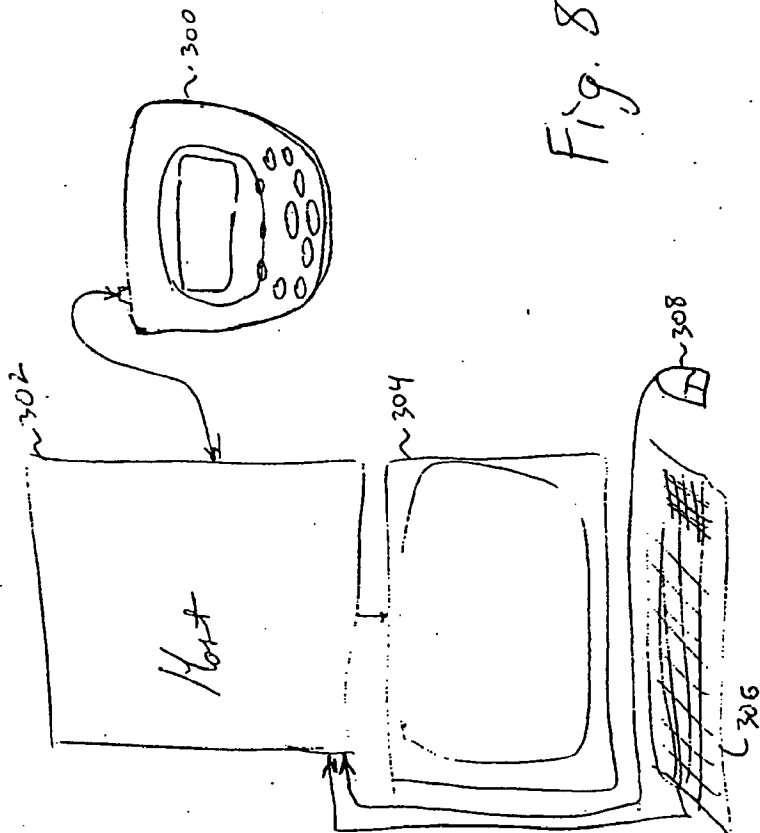


Fig. 8

FO5010:62955Z60

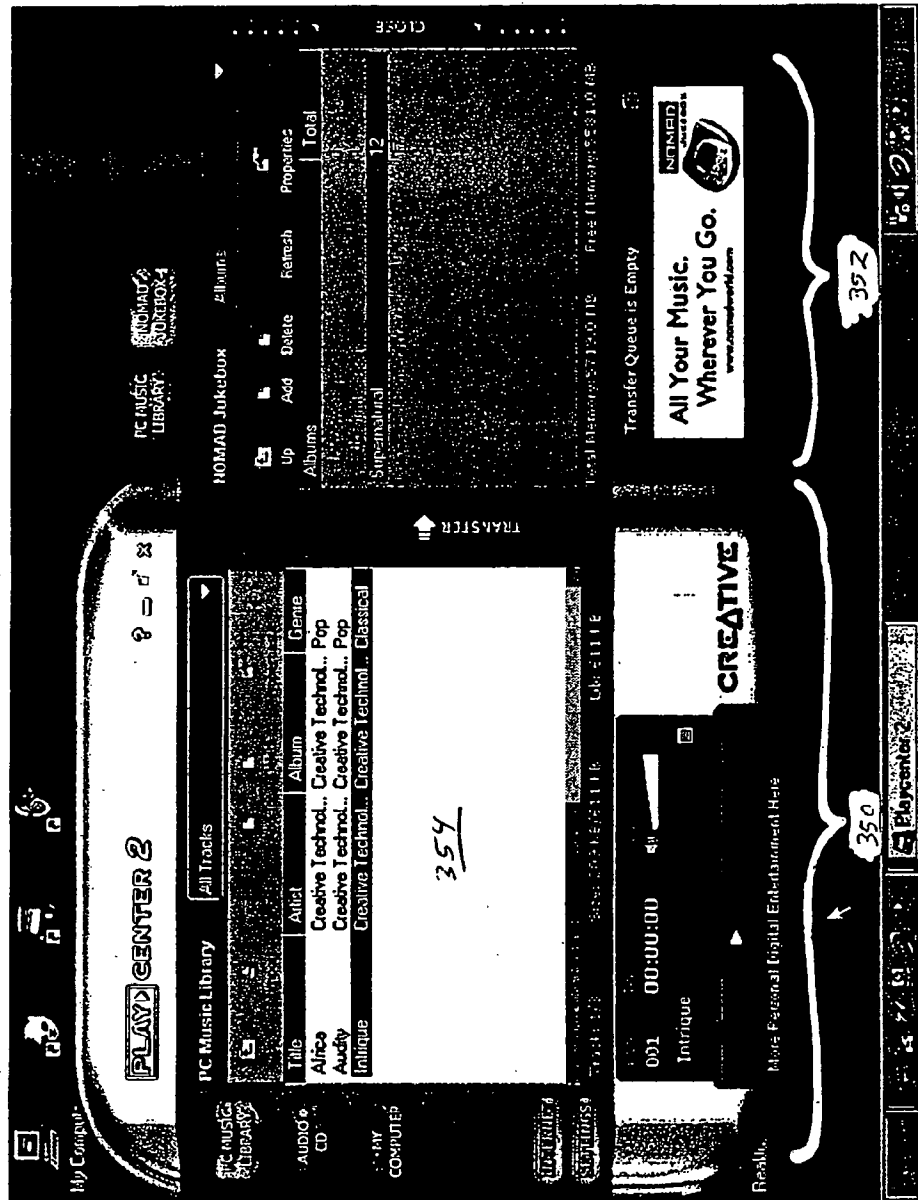


Fig. 9

PATENT APPLICATION FEE DETERMINATION RECORD
Effective October 1, 2000

APPROPRIATE OF Docket Number

CLAIMS AS FILED - PART I

	(Column 1)	(Column 2)
TOTAL CLAIMS	15	
FOR	NUMBER FILED	NUMBER EXTRA
TOTAL CHARGEABLE CLAIMS	15 minus 20 =	0
INDEPENDENT CLAIMS	7 minus 3 =	4
MULTIPLE DEPENDENT CLAIM PRESENT <input type="checkbox"/>		

* If the difference in column 1 is less than zero, enter "0" in column 2

SMALL ENTITY TYPE OR

OTHER THAN SMALL ENTITY

RATE	FEE
BASIC FEE	355.00
X\$ 9=	
X40=	
+135=	
TOTAL	

RATE	FEE
BASIC FEE	710.00
X\$18=	
X80=	
+270=	
TOTAL	

CLAIMS AS AMENDED - PART II

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR
	Total	10 Minus	20 =
	Independent	2 Minus	3 = 1
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM <input type="checkbox"/>			

SMALL ENTITY OR

OTHER THAN SMALL ENTITY

RATE	ADDITIONAL FEE
X\$ 9=	
X40=	
+135=	
TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE
X\$18=	
X80=	
+270=	
TOTAL ADDIT. FEE	

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR
	Total	Minus	=
	Independent	Minus	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM <input type="checkbox"/>			

RATE	ADDITIONAL FEE
X\$ 9=	
X40=	
+135=	
TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE
X\$18=	
X80=	
+270=	
TOTAL ADDIT. FEE	

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT C	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR
	Total	Minus	=
	Independent	Minus	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM <input type="checkbox"/>			

RATE	ADDITIONAL FEE
X\$ 9=	
X40=	
+135=	
TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE
X\$18=	
X80=	
+270=	
TOTAL ADDIT. FEE	

- * If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
 - ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."
 - *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."
- The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.



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WASHINGTON, D.C. 20231
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APPLICATION NUMBER	FILING/RECEIPT DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NUMBER
09/755,629	01/05/2001	Ron Goodman	17002-020800US

CONFIRMATION NO. 3004

20350
TOWNSEND AND TOWNSEND AND CREW
TWO EMBARCADERO CENTER
EIGHTH FLOOR
SAN FRANCISCO, CA 94111-3834

FORMALITIES LETTER



OC00000005771943

Date Mailed: 02/16/2001

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given TWO MONTHS from the date of this Notice within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The statutory basic filing fee is missing.
Applicant must submit \$ 710 to complete the basic filing fee and/or file a small entity statement claiming such status (37 CFR 1.27).
- Total additional claim fee(s) for this application is \$320.
 - \$320 for 4 independent claims over 3 .
- The oath or declaration is unsigned.
- To avoid abandonment, a late filing fee or oath or declaration surcharge as set forth in 37 CFR 1.16(e) of \$130 for a non-small entity, must be submitted with the missing items identified in this letter.

- The balance due by applicant is \$ 1160.

*A copy of this notice **MUST** be returned with the reply.*

Customer Service Center
Initial Patent Examination Division (703) 308-1202

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PTO/SB/01 (10-00)

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DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63) <input type="checkbox"/> Declaration Submitted With Initial Filing <input checked="" type="checkbox"/> Declaration Submitted after Initial Filing (surcharge (37 CFR 1.16 (e)) required)	Attorney Docket Number	017002020800
	First Named Inventor	Ron Goodman
	COMPLETE IF KNOWN	
	Application Number	09/755,629
	Filing Date	January 5, 2001
	Group Art Unit	2837
Examiner Name	Unassigned	

As a below named inventor, I hereby declare that:

My residence, post office address, and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

SYSTEM FOR SELECTING AND PLAYING SONGS IN A PLAYBACK DEVICE WITH A LIMITED USER INTERFACE

the specification of which *(Title of the Invention)*

is attached hereto
 OR
 was filed on (MM/DD/YYYY) 01/05/01 as United States Application Number or PCT International Application Number 09/755,629 and was amended on (MM/DD/YYYY) (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims as amended specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or of any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY) Country	Priority Not Claimed	Certified Copy Attached?	
				YES	NO
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

I hereby claim the benefit under 35 U.S.C. 119(e) of any United States provisional application(s) listed below.

Application Number(s)	Filing Date (MM/DD/YYYY)

Additional provisional application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

[Page 1 of 2]

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PTO/SB/01 (10-00)
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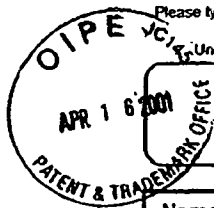
DECLARATION — Utility or Design Patent Application

Direct all correspondence to:		<input checked="" type="checkbox"/> Customer Number or Bar Code Label	20350	OR	<input type="checkbox"/> Correspondence address below
Name					
Address					
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City			State	ZIP	
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<small>I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.</small>					
NAME OF SOLE OR FIRST INVENTOR:			<input type="checkbox"/> A petition has been filed for this unsigned inventor		
Given Name Ron			Family Name Goodman or Surname		
Inventor's Signature				Date 3/26/01	
Residence: City Santa Cruz		State CA	Country USA	Citizenship USA	
Mailing Address 226 Jeter Street					
Mailing Address					
City Santa Cruz		State CA	ZIP 95060	Country USA	
NAME OF SECOND INVENTOR:			<input type="checkbox"/> A petition has been filed for this unsigned inventor		
Given Name Howard N.			Family Name Egan or Surname		
Inventor's Signature				Date 4-4-01	
Residence: City Capitola		State CA	Country USA	Citizenship USA	
Mailing Address 219 Elinor Street					
Mailing Address					
City Capitola		State CA	ZIP 95010	Country USA	
<input checked="" type="checkbox"/> Additional inventors are being named on the 1 supplemental Additional Inventor(s) sheet(s) PTO/SB/02A attached hereto.					

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DECLARATION

ADDITIONAL INVENTOR(S)
 Supplemental Sheet
 Page 1 of 1

Name of Additional Joint Inventor, if any:		<input type="checkbox"/> A petition has been filed for this unsigned inventor	
Given Name (first and middle [if any])		Family Name or Surname	
David		Bristow	
Inventor's Signature		Date 4/4/01	
Residence: City Santa Cruz	State CA	Country USA	Citizenship Canada UK
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Mailing Address			
City Santa Cruz	State CA	ZIP 95060	Country USA
Name of Additional Joint Inventor, if any:		<input type="checkbox"/> A petition has been filed for this unsigned inventor	
Given Name (first and middle [if any])		Family Name or Surname	
Inventor's Signature		Date	
Residence: City	State	Country	Citizenship
Mailing Address			
Mailing Address			
City	State	ZIP	Country
Name of Additional Joint Inventor, if any:		<input type="checkbox"/> A petition has been filed for this unsigned inventor	
Given Name (first and middle [if any])		Family Name or Surname	
Inventor's Signature		Date	
Residence: City	State	Country	Citizenship
Mailing Address			
Mailing Address			
City	State	ZIP	Country

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 SF 1199791 v1

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State or Province:: CA
Postal or Zip Code:: 95010
Citizenship Country:: USA

Inventor Three Given Name:: David
Family Name:: Bristow
Name Suffix::
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City:: Santa Cruz
State or Province:: CA
Postal or Zip Code:: 95060
Citizenship Country:: Canada

Correspondence Information

Correspondence Customer Number:: 20350

Application Information

Title Line One:: SYSTEM FOR SELECTING AND PLAYING
Title Line Two:: SONGS IN A PLAYBACK DEVICE WITH A
Title Line Three:: LIMITED USER INTERFACE
Total Drawing Sheets:: 11
Formal Drawings?:: No
Application Type:: Utility
Docket Number:: 17002020800
Secrecy Order in Patent Appl.?:: No

Representative Information

Representative Customer Number:: 20350

Continuity Information

This application is a:
> Application One::
Filing Date::
Patent Number::

which is a:
>>Application Two::
Filing Date::
Patent Number::

and which is a:
>>Application Three::
Filing Date::
Patent Number::

This application is a:
>Application Four::
Filing Date::
Patent Number::

which is a:
>>Application Two::
Filing Date::
Patent Number::

and which is a:
>>Application Three::
Filing Date::
Patent Number::

Prior Foreign Applications

Foreign Application One::
Filing Date::
Country::
Priority Claimed::

Foreign Application Two::
Filing Date::
Country::
Priority Claimed::

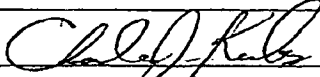
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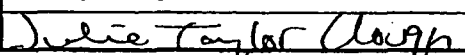
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TRANSMITTAL FORM <i>(to be used for all correspondence after initial filing)</i>	Application Number	09/755,629	
	Filing Date	January 5, 2001	
	First Named Inventor	Ron Goodman	
	Group Art Unit	2837	
	Examiner Name		
Number of Pages in Submission	8	Attorney Docket Number	017002020800

ENCLOSURES (check all that apply)		
<input checked="" type="checkbox"/> Fee Transmittal Form <input type="checkbox"/> Fee Attached <input type="checkbox"/> Amendment / Response <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input type="checkbox"/> Information Disclosure Statement <input type="checkbox"/> Certified Copy of Priority Document(s) <input checked="" type="checkbox"/> Response to Missing Parts/ Incomplete Application <input checked="" type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53	<input type="checkbox"/> Assignment Papers (for an Application) <input type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers <input type="checkbox"/> Petition Routing Slip (PTO/SB/69) and Accompanying Petition <input type="checkbox"/> Petition to Convert to a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Request for Refund <input type="checkbox"/> CD, Number of CD(s) _____	<input type="checkbox"/> After Allowance Communication to Group <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input type="checkbox"/> Appeal Communication to Group (Appeal Notice, Brief, Reply Brief) <input type="checkbox"/> Proprietary Information <input type="checkbox"/> Status Letter <div style="border: 1px solid black; padding: 2px; text-align: center;"> Executed Declaration Application Data Sheet Postcard </div>
Remarks	The Commissioner is authorized to charge any additional fees to Deposit Account 20-1430.	

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT	
Firm and Individual name	Townsend and Townsend and Crew LLP Charles J. Kulas, Reg. No. 35,809
Signature	
Date	4-12-01

CERTIFICATE OF MAILING			
I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231 on this date: 4-12-01			
Typed or printed name	Julie Taylor Clough		
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FEE TRANSMITTAL for FY 2001

Patent fees are subject to annual revision.

Complete if Known

Application Number	09/755,629
Filing Date	January 5, 2001
First Named Inventor	Ron Goodman
Examiner Name	
Group Art Unit	2837
Attorney Docket No.	017002020800

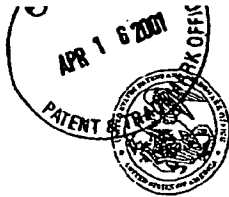
REGISTRATION FOR PAYMENT (\$) 1,160.00

METHOD OF PAYMENT (check one)		FEE CALCULATION (continued)																																																																																																																																																																														
1. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge indicated fees and credit any over payments to: Deposit Account Number: 20-1430 Deposit Account Name: Townsend and Townsend and Crew LLP <input checked="" type="checkbox"/> Charge Any Additional Fee Required Under 37 CFR 1.16 and 1.17 <input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27		3. ADDITIONAL FEES <table border="1"> <thead> <tr> <th>Fee Code</th> <th>Large Entity Fee (\$)</th> <th>Small Entity Fee (\$)</th> <th>Fee Description</th> <th>Fee Paid</th> </tr> </thead> <tbody> <tr><td>105</td><td>130</td><td>205</td><td>65</td><td>Surcharge - late filing fee or oath</td><td>130.00</td></tr> <tr><td>127</td><td>50</td><td>227</td><td>25</td><td>Surcharge - late provisional filing fee or cover sheet</td><td></td></tr> <tr><td>139</td><td>130</td><td>139</td><td>130</td><td>Non-English specification</td><td></td></tr> <tr><td>147</td><td>2,520</td><td>147</td><td>2,520</td><td>For filing a request for reexamination</td><td></td></tr> <tr><td>112</td><td>920*</td><td>112</td><td>920*</td><td>Requesting publication of SIR prior to Examiner action</td><td></td></tr> <tr><td>113</td><td>1,840*</td><td>113</td><td>1,840*</td><td>Requesting publication of SIR after Examiner action</td><td></td></tr> <tr><td>115</td><td>110</td><td>215</td><td>55</td><td>Extension for reply within first month</td><td></td></tr> <tr><td>116</td><td>390</td><td>216</td><td>195</td><td>Extension for reply within second month</td><td></td></tr> <tr><td>117</td><td>890</td><td>217</td><td>445</td><td>Extension for reply within third month</td><td></td></tr> <tr><td>118</td><td>1,390</td><td>218</td><td>695</td><td>Extension for reply within fourth month</td><td></td></tr> <tr><td>128</td><td>1,890</td><td>228</td><td>945</td><td>Extension for reply within fifth month</td><td></td></tr> <tr><td>119</td><td>310</td><td>219</td><td>155</td><td>Notice of Appeal</td><td></td></tr> <tr><td>120</td><td>310</td><td>220</td><td>155</td><td>Filing a brief in support of an appeal</td><td></td></tr> <tr><td>121</td><td>270</td><td>221</td><td>135</td><td>Request for oral hearing</td><td></td></tr> <tr><td>138</td><td>1,510</td><td>138</td><td>1,510</td><td>Petition to institute a public use proceeding</td><td></td></tr> <tr><td>140</td><td>110</td><td>240</td><td>55</td><td>Petition to revive - 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*or number previously paid, if greater. For Reissues, see above		The Commissioner is authorized to charge any additional fees to the above noted Deposit Account.																																																																																																																																																																														

SUBMITTED BY		Complete (if applicable)			
Name (Print/Type)	Charles J. Kulas	Registration No. Attorney/Agent	35,809	Telephone	(415) 576-0200
Signature	<i>Charles J. Kulas</i>	Date	4-12-01		

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2035.

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UNITED STATES PATENT AND TRADEMARK OFFICE

COMMISSIONER FOR PATENTS
UNITED STATES PATENT AND TRADEMARK OFFICE
WASHINGTON, D.C. 20231
www.uspto.gov

APPLICATION NUMBER	FILING/RECEIPT DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NUMBER
09/755,629	01/05/2001	Ron Goodman	17002-020800US

20350
TOWNSEND AND TOWNSEND AND CREW
TWO EMBARCADERO CENTER
EIGHTH FLOOR
SAN FRANCISCO, CA 94111-3834

CONFIRMATION NO. 3004
FORMALITIES LETTER

OC00000005771943

Date Mailed: 02/16/2001

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given TWO MONTHS from the date of this Notice within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The statutory basic filing fee is missing.
Applicant must submit \$ 710 to complete the basic filing fee and/or file a small entity statement claiming such status (37 CFR 1.27).
- Total additional claim fee(s) for this application is \$320.
 - \$320 for 4 independent claims over 3 .
- The oath or declaration is unsigned.
- To avoid abandonment, a late filing fee or oath or declaration surcharge as set forth in 37 CFR 1.16(e) of \$130 for a non-small entity, must be submitted with the missing items identified in this letter.
- The balance due by applicant is \$ 1160.

*A copy of this notice **MUST** be returned with the reply.*

TOWNSEND & CREW
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Initial Patent Examination Division (703) 308-1202

PART 2 - COPY TO BE RETURNED WITH RESPONSE

05000020 201430 09755629

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150.00 CH
300.00 CH



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PTO/SB/21 (08-00)

Approved for use through 10/31/2002. OMB 0651-0031

U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

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TRANSMITTAL FORM <small>(to be used for all correspondence after initial filing)</small>	Application Number	09/755,629	
	Filing Date	January 5, 2001	
	First Named Inventor	Ron Goodman	
	Group Art Unit	2837	
	Examiner Name		
Total Number of Pages in This Submission	3	Attorney Docket Number	017002020800

ENCLOSURES (check all that apply)		
<input type="checkbox"/> Fee Transmittal Form <input type="checkbox"/> Fee Attached <input type="checkbox"/> Amendment / Response <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input type="checkbox"/> Information Disclosure Statement <input type="checkbox"/> Certified Copy of Priority Document(s) <input type="checkbox"/> Response to Missing Parts/ Incomplete Application <input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53	<input type="checkbox"/> Assignment Papers (for an Application) <input type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers <input type="checkbox"/> Petition Routing Slip (PTO/SB/69) and Accompanying Petition <input type="checkbox"/> Petition to Convert to a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Request for Refund <input type="checkbox"/> CD, Number of CD(s)	<input type="checkbox"/> After Allowance Communication to Group <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input type="checkbox"/> Appeal Communication to Group (Appeal Notice, Brief, Reply Brief) <input type="checkbox"/> Proprietary Information <input type="checkbox"/> Status Letter <div style="border: 1px solid black; padding: 2px; margin-top: 5px;"> Power of Attorney Statement Under 37 CFR §3.73(b) Postcard </div>
Remarks		The Commissioner is authorized to charge any additional fees to Deposit Account 20-1430. <div style="text-align: right; font-weight: bold; font-size: 1.2em;"> RECEIVED MAY - 1 2001 TC 2800 MAIL ROOM </div>

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT	
Firm and Individual name	Townsend and Townsend and Crew LLP Kevin T. LeMond, Reg. No. 35,933
Signature	<i>Kevin T. LeMond</i>
Date	4/24/01

CERTIFICATE OF MAILING			
I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231 on this date: 4/24/01			
Typed or printed name	Julie Taylor Clough		
Signature	<i>Julie Taylor Clough</i>	Date	4/24/01

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SF 1216632 v1



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POWER OF ATTORNEY OR AUTHORIZATION OF AGENT	Application Number	09/755,629
	Filing Date	01/05/01
	First Named Inventor	Goodman, Ron
	Group Art Unit	2837
	Examiner Name	Unassigned
	Attorney Docket Number	17002020800

I hereby appoint:

Practitioners at Customer Number 20350 → Place Customer
Number Bar Code
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Practitioner(s) named below:

Name	Registration Number

as my/our attorney(s) or agent(s) to prosecute the application identified above, and to transact all business in the Patent and Trademark Office connected therewith.

Please change the correspondence address for the above-identified application to:

The above-mentioned Customer Number.
 OR

<input type="checkbox"/> Firm or Individual Name	Charles J. Kulas		
Address			
Address			
City	State	ZIP	
Country			
Telephone	415-576-0200	Fax	415-576-0300

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I am the:

- Applicant/Inventor.
- Assignee of record of the entire interest. See 37 CFR 3.71.
 Certificate under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).

SIGNATURE of Applicant or Assignee of Record

Name	Ng Keh Long
Signature	<i>Ng Keh Long</i>
Date	April 10, 2001

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

*Total of 1 forms are submitted.

SF 1200150 v1

APR 27 2001



STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Ron Goodman, et al.

Application No./Patent No.: 09/755,629 Filed/Issue Date: January 5, 2001

Entitled: SYSTEM FOR SELECTING AND PLAYING SONGS IN A PLAYBACK DEVICE WITH A LIMITED USER INTERFACE

Creative Technology Ltd., a Corporation
(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

- 1. the assignee of the entire right, title, and interest; or
- 2. an assignee of an undivided part interest

In the patent application/patent identified above by virtue of either:

A. An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.

OR

B. A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as shown below:

1. From: _____ To: _____
The document was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.

2. From: _____ To: _____
The document was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.

3. From: _____ To: _____
The document was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.

Additional documents in the chain of title are listed on a supplemental sheet.

Copies of assignments or other documents in the chain of title are attached.

[NOTE: A separate copy (i.e., the original assignment document or a true copy of the original document) must be submitted to Assignment Division in accordance with 37 CFR Part 3, if the assignment is to be recorded in the records of the USPTO. See MPEP 302.8]

The undersigned (whose title is supplied below) is empowered to sign this statement on behalf of the assignee.

April 10, 2001
Date

Signature

Ng Keh Long
Typed or printed name

Chief Financial Officer
Title

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UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office

Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/755,629	01/05/01	GOODMAN	R 17002020800
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020350 MM91/0924
TOWNSEND AND TOWNSEND AND CREW
TWO EMBARCADERO CENTER
EIGHTH FLOOR
SAN FRANCISCO CA 94111-3834

EXAMINER

WITKOWSKI, S

ART UNIT	PAPER NUMBER
----------	--------------

2837

DATE MAILED:

09/24/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks



UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office

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Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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EXAMINER

WITKOWSKI, S

ART UNIT	PAPER NUMBER
2837	

2837

DATE MAILED: 09/24/01

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Commissioner of Patents and Trademarks

Office Action Summary

Application No. 09/755629	Applicant(s) Goodman et al.
Examiner Witkowski	Group Art Unit 2837

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

- Responsive to communication(s) filed on _____
- This action is FINAL.
- Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- Claim(s) 1-15 is/are pending in the application.
- Of the above claim(s) _____ is/are withdrawn from consideration.
- Claim(s) _____ is/are allowed.
- Claim(s) 1-15 is/are rejected.
- Claim(s) _____ is/are objected to.
- Claim(s) _____ are subject to restriction or election requirement.

Application Papers

- See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- The proposed drawing correction, filed on _____ is approved disapproved.
- The drawing(s) filed on _____ is/are objected to by the Examiner.
- The specification is objected to by the Examiner.
- The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

- Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
 - All Some* None of the CERTIFIED copies of the priority documents have been received.
 - received in Application No. (Series Code/Serial Number) _____
 - received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

Attachment(s)

- Information Disclosure Statement(s), PTO-1449, Paper No(s). _____
- Notice of Reference(s) Cited, PTO-892
- Notice of Draftsperson's Patent Drawing Review, PTO-948
- Interview Summary, PTO-413
- Notice of Informal Patent Application, PTO-152
- Other _____

Office Action Summary

Art Unit: 2837

1. The abstract should be limited to 150 words.
2. In the first paragraph of the specification, the serial numbers, filing dates and patent numbers (if available) for the two applications should be provided.
3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

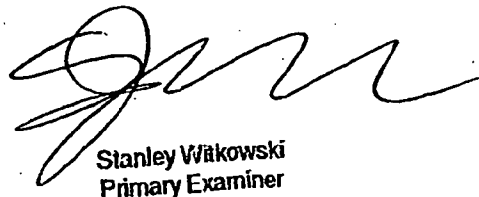
4. Claims 1-15 are rejected under 35 U.S.C. 102(b) as being fully met by either of Cluts, Looney et alii or Yamaura et al.

Each patent discloses the grouping of songs into categories such as album, artist, style, and title. The categories overlap and are displayed.

5. Any inquiry concerning this communication should be directed to Stanley J. Witkowski at telephone number (703) 308-3101.

Witkowski/nt

9/19/01



Stanley Witkowski
Primary Examiner

Notice of References Cited

Application No. 09/755629 Goodman et al
 Examiner Witkowski Group Art Unit 2837 Page 1 of 1

U.S. PATENT DOCUMENTS

* A	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS
A	5,616,876	4-1997	Cluts	84	609
B	5,918,303	6-1999	Yamaura et al.	84	609
C	5,969,283	10-1999	Looney et al.	84	609
D					
E					
F					
G					
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I					
J					
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FOREIGN PATENT DOCUMENTS

* N	DOCUMENT NO.	DATE	COUNTRY	NAME	CLASS	SUBCLASS
N						
O						
P						
Q						
R						
S						
T						

NON-PATENT DOCUMENTS

* U	DOCUMENT (Including Author, Title, Source, and Pertinent Pages)	DATE
U		
V		
W		
X		

* A copy of this reference is not being furnished with this Office action.
 (See Manual of Patent Examining Procedure, Section 707.05(a).)

United States Patent [19]
Clats

[11] Patent Number: **5,616,876**
 [45] Date of Patent: **Apr. 1, 1997**

- [54] **SYSTEM AND METHODS FOR SELECTING MUSIC ON THE BASIS OF SUBJECTIVE CONTENT**
- [75] Inventor: Jonathan C. Clats, Redmond, Wash.
- [73] Assignee: Microsoft Corporation, Redmond, Wash.
- [21] Appl. No.: 424,781
- [22] Filed: Apr. 19, 1995
- [51] Int. Cl.^o G09B 15/06; G09B 15/04; G10H 7/00
- [52] U.S. Cl. 84/609; 84/477 R; 434/307 A
- [58] Field of Search 84/609-614, 601, 84/602, 634-638, 477 R, 478; 358/335; 273/433; 379/93, 96, 97, 100; 434/307 A

[56] **References Cited**

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5,250,745	10/1993	Tamura	84/609 X
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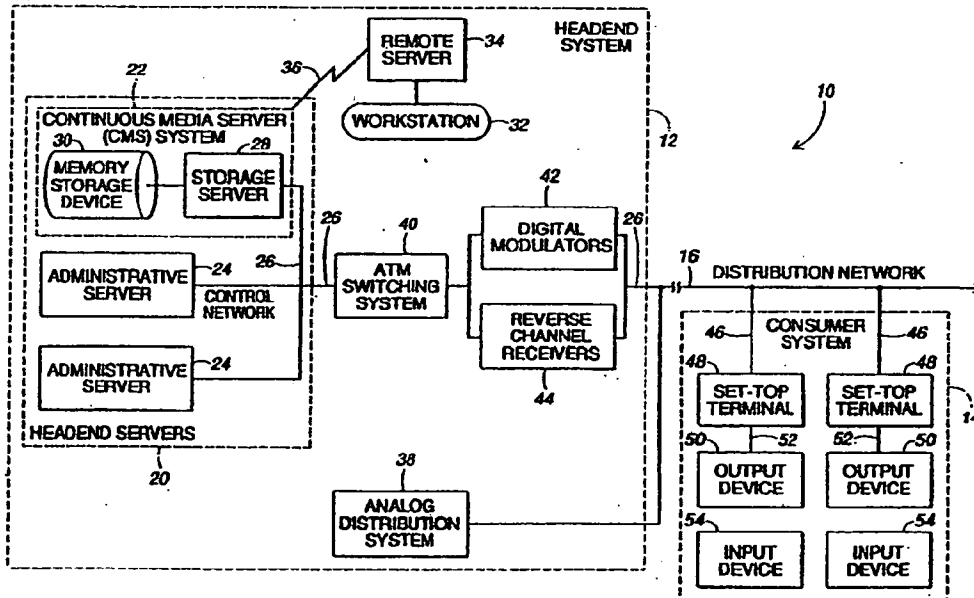
The Big Picture, "Introducing Digital Music Express", Georgia Cable TV & Communications, Apr. 1995.
More Like This, "Get More of What You're Looking For", Lexis-Nexis, 1995.

Primary Examiner—Stanley J. Witkowski
Attorney, Agent, or Firm—Jones & Askew

[57] **ABSTRACT**

An interactive network provides music to subscribers. A "more like" function allows a subscriber to use a seed song to identify other songs that are similar to the seed song, and to add the new songs to the current playlist. The similarity between songs is based on the subjective content of the songs, as reflected in style tables prepared by editors. The subscriber may control the closeness of the match by adjusting a style slider provided by the user interface. A style equalizer employs eight faders that indicate the predominant styles of the songs in the playlist. A subscriber may use the style equalizer to see what types of songs are included in the playlist, and to adjust the mix of songs that are played from the playlist.

45 Claims, 8 Drawing Sheets



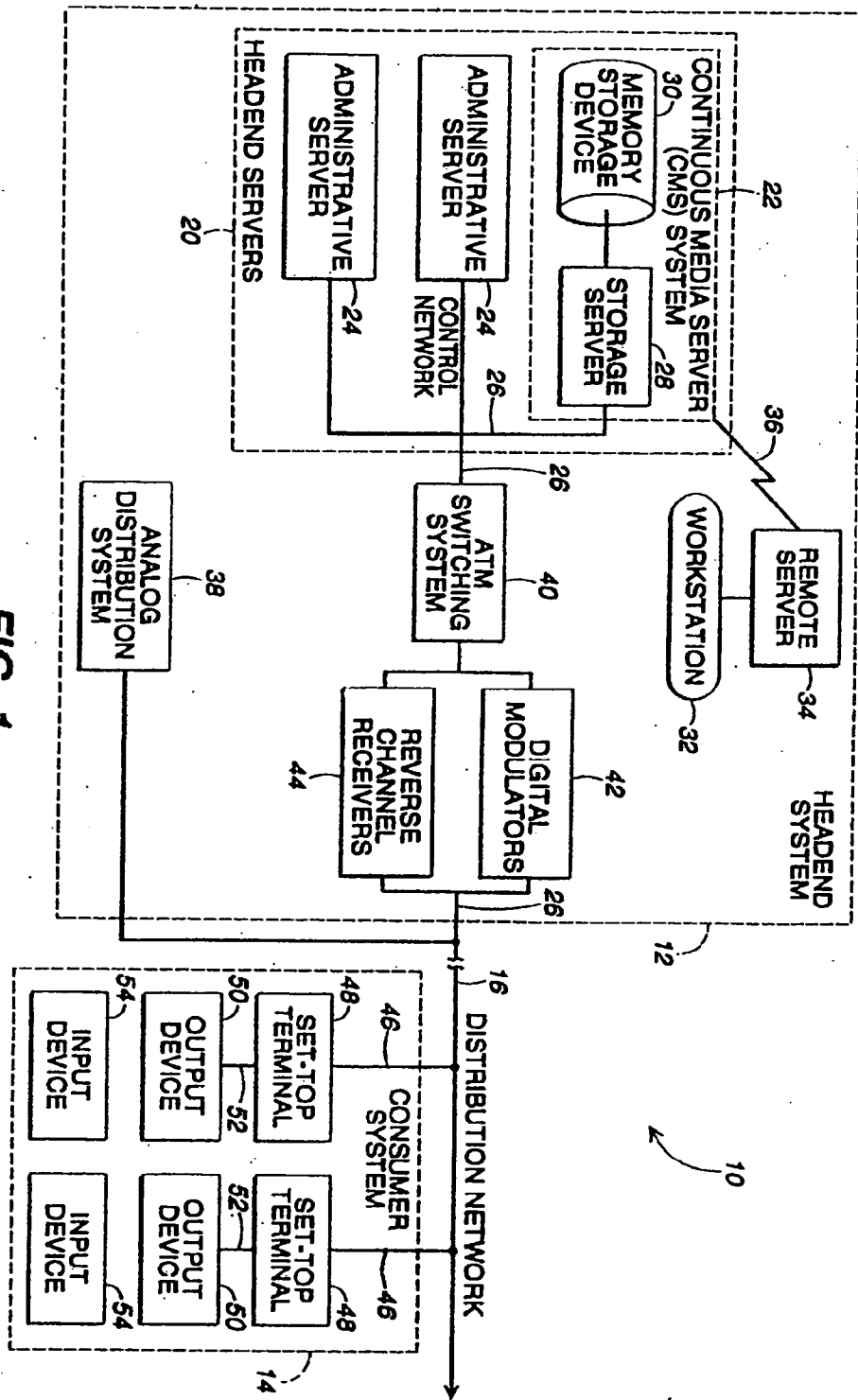


FIG. 1

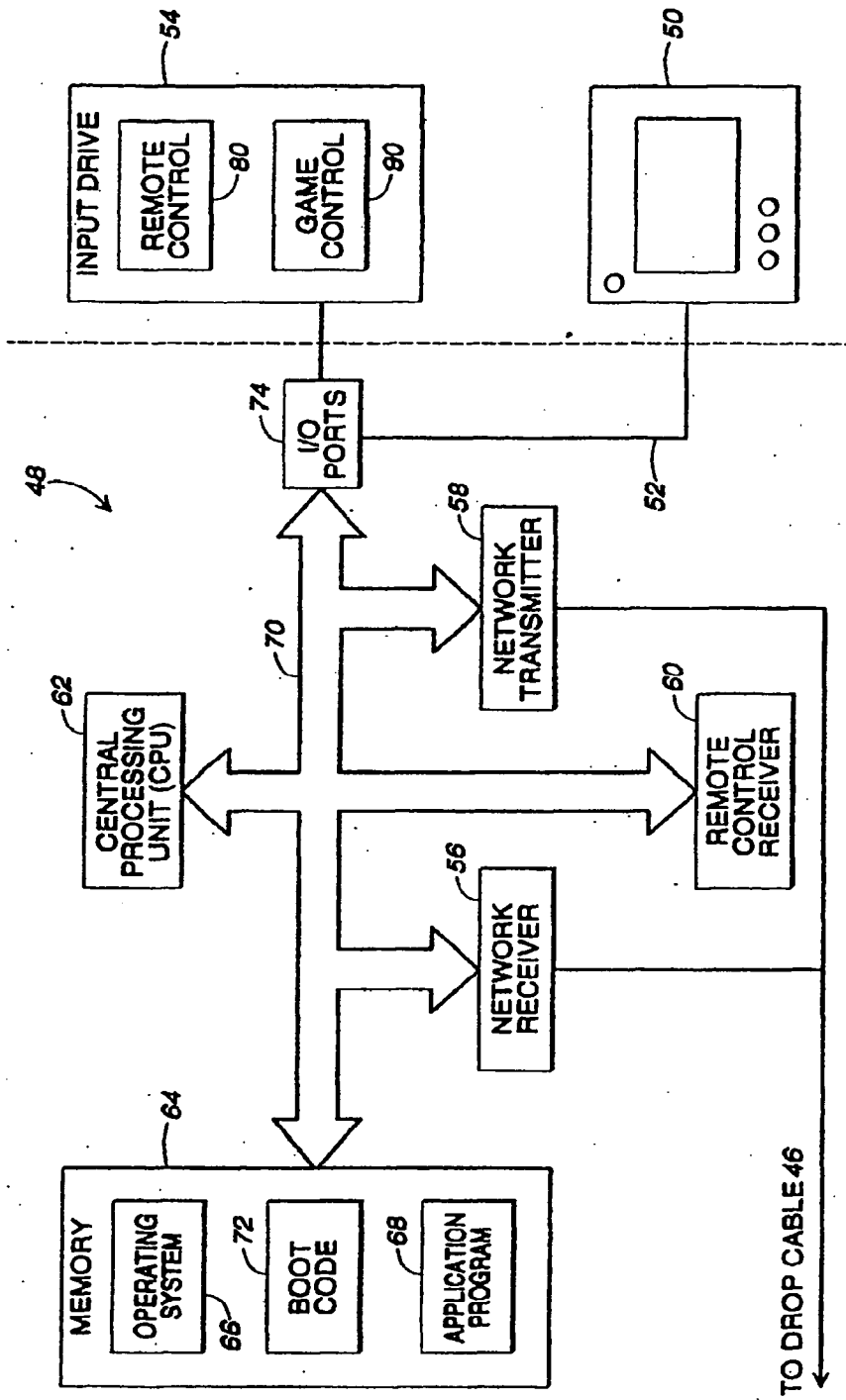


FIG. 2

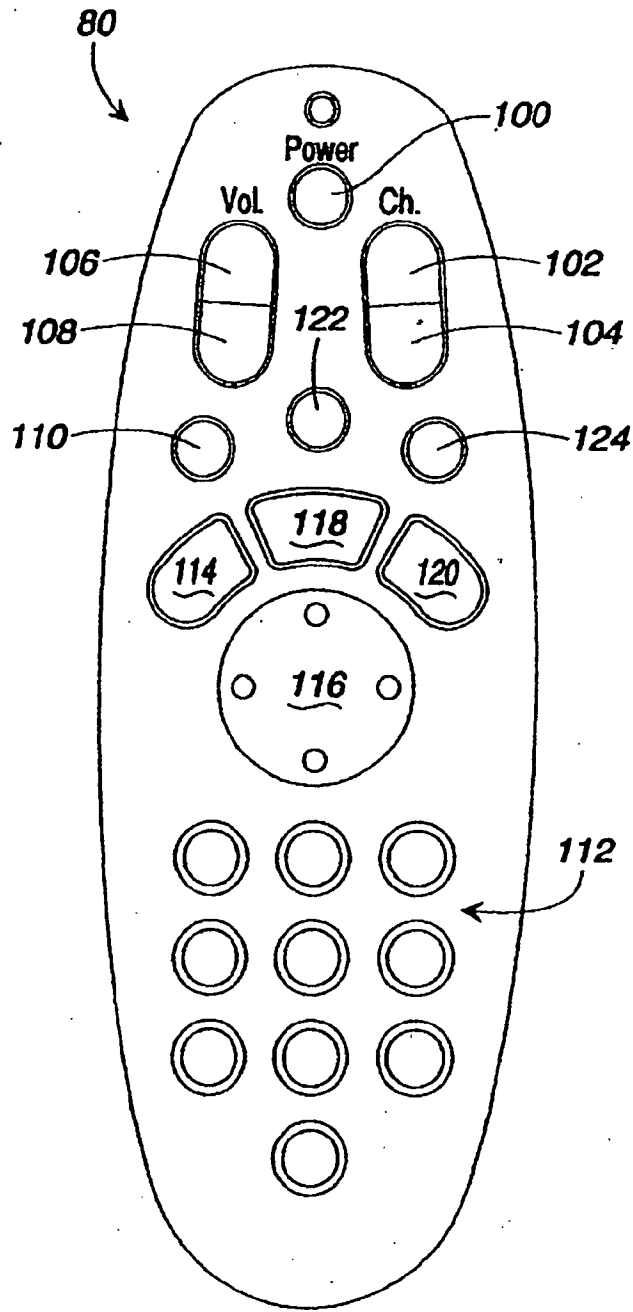


FIG. 3

FIG. 4

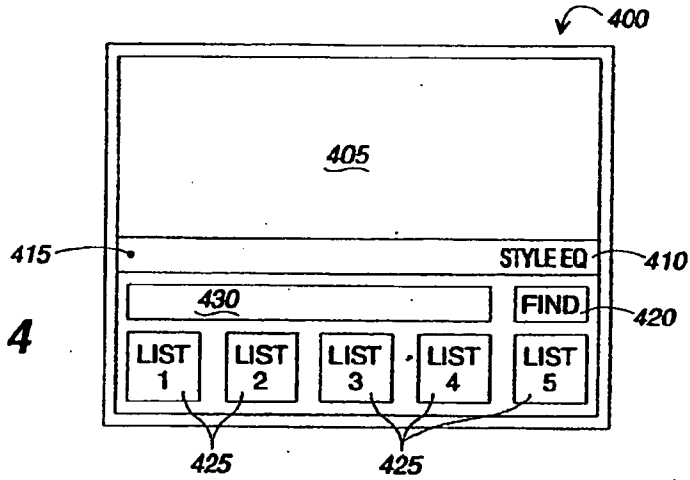


FIG. 5

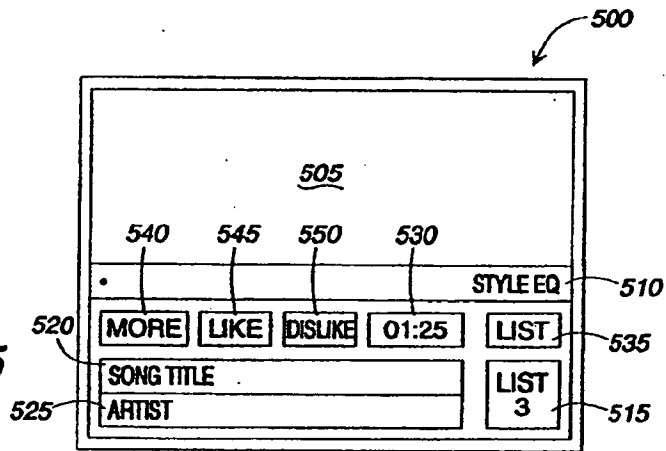
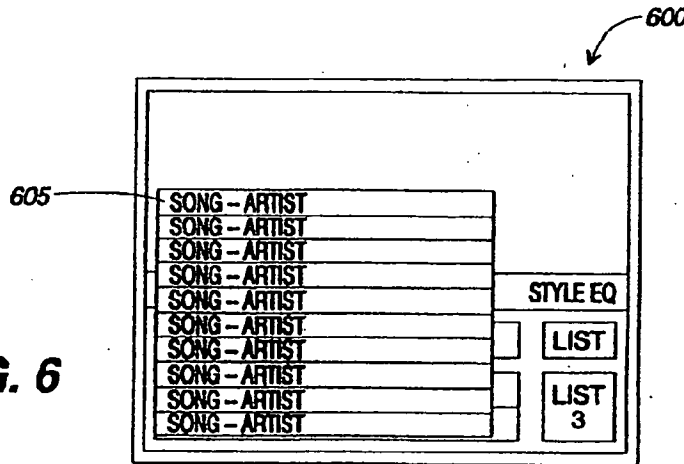
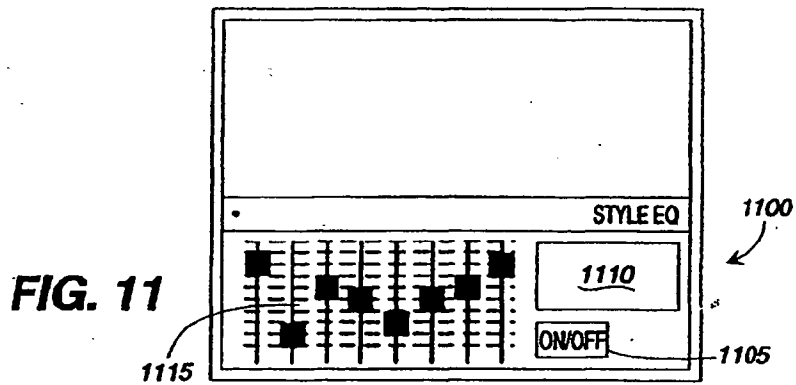
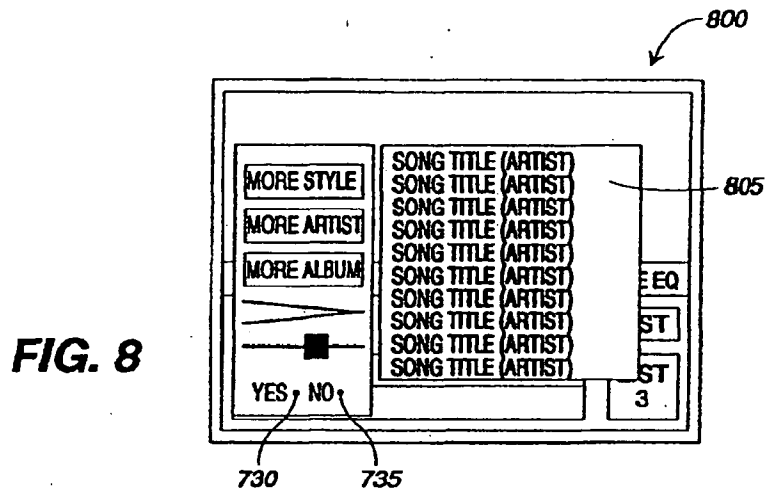
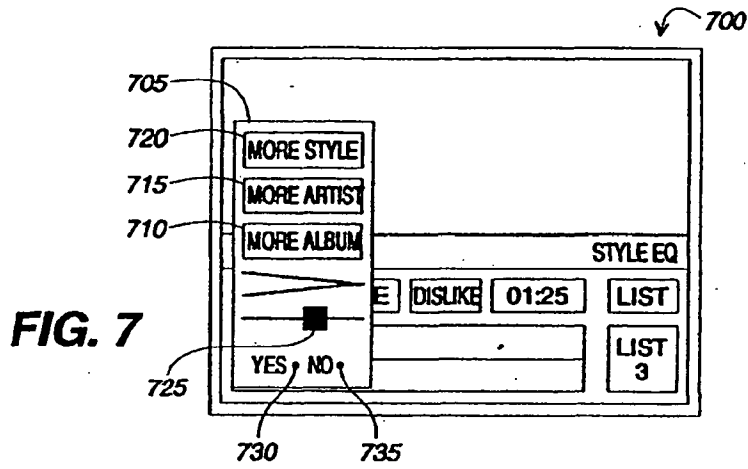


FIG. 6





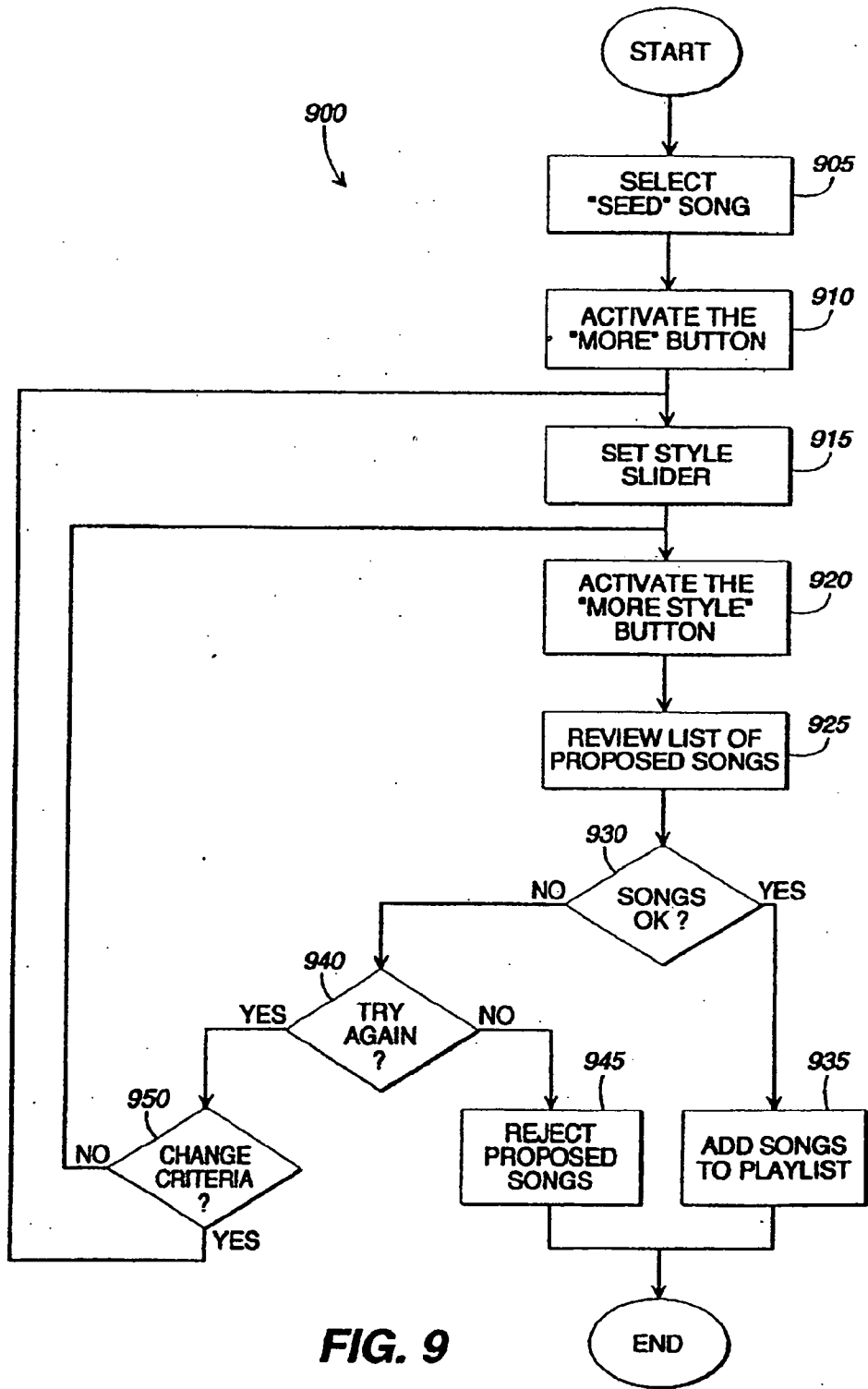


FIG. 9

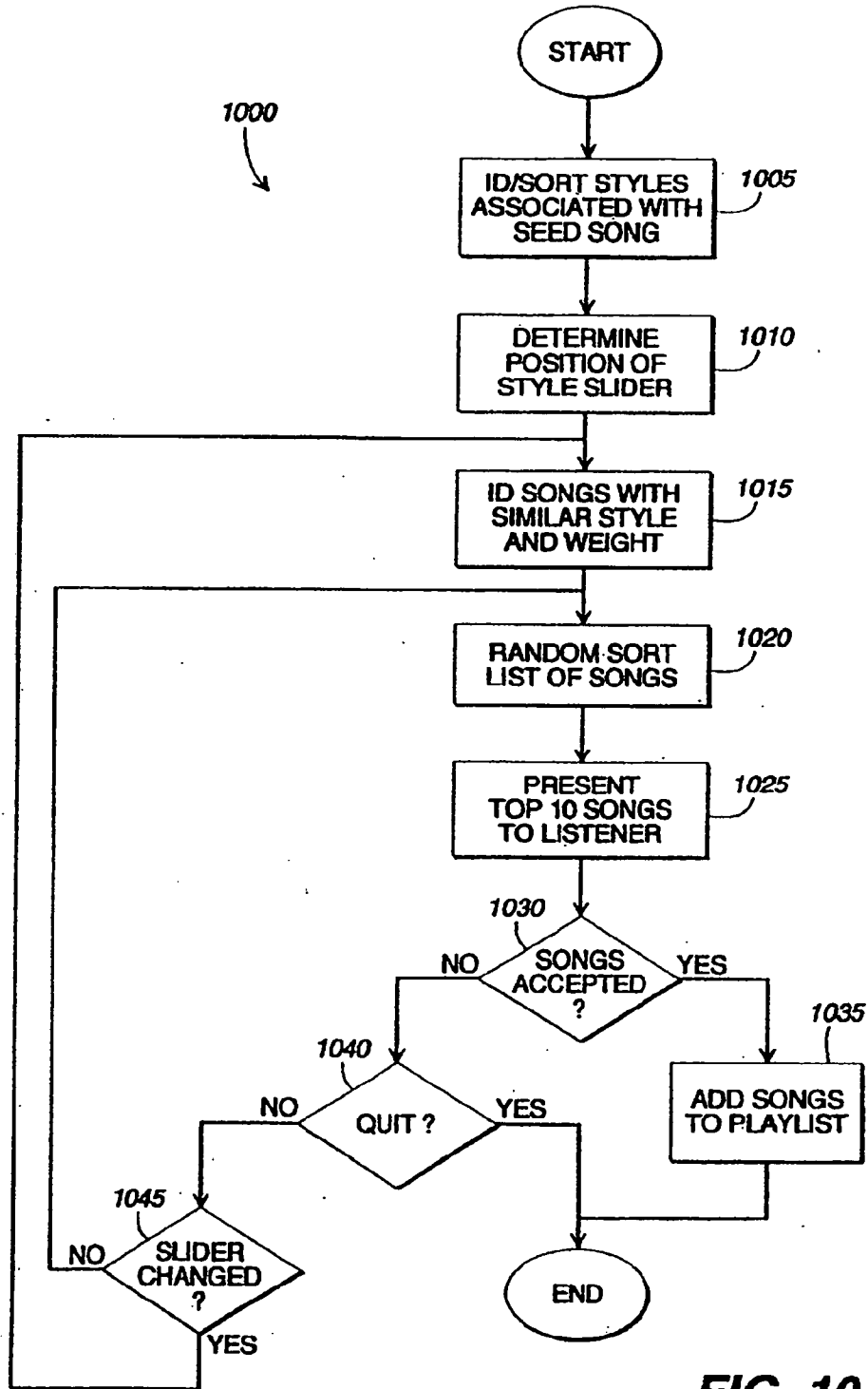


FIG. 10

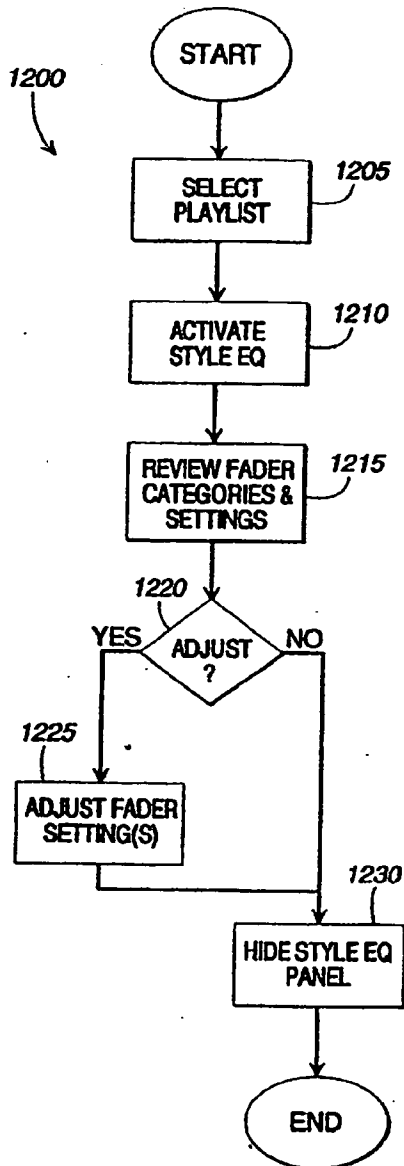


FIG. 12

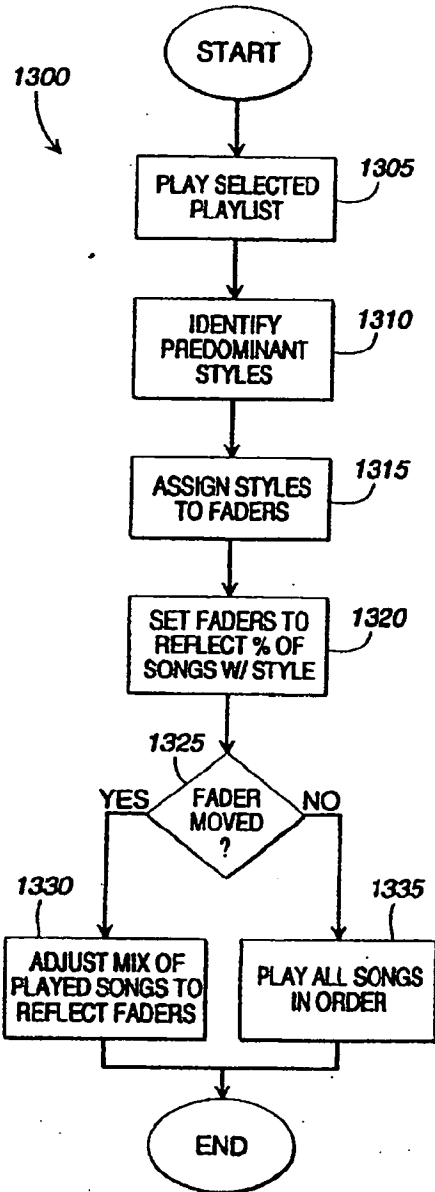


FIG. 13

SYSTEM AND METHODS FOR SELECTING MUSIC ON THE BASIS OF SUBJECTIVE CONTENT

TECHNICAL FIELD

The present invention relates to systems and methods for selecting and playing audio selections, and more particularly relates to methods for selecting and playing audio selections on the basis of their subjective content.

BACKGROUND OF THE INVENTION

The expansion and improvement of cable television systems (sometimes referred to as community antenna television or CATV systems) have made it possible for cable companies to provide a variety of programming services to subscribers. These services typically include a multitude of television channels that are viewed on the subscriber's television. Some cable companies also provide music channels that are connected to a subscriber's stereo system through a subscriber terminal.

Although CATV systems were originally designed to distribute television signals in the "downstream" direction only (i.e., from a central "headend" location to multiple subscriber locations, which is also known as the "forward" path), the advent of pay-per-view services and of other interactive television applications has fueled the development of bidirectional or "two-way" cable systems. These two-way cable systems also provide for the transmission of signals from the subscriber locations back to the headend via an "upstream" direction or a "reverse" path.

By upgrading conventional CATV systems to increase their bandwidth, cable service providers can use the additional channels gained by this wider bandwidth network to provide many new subscriber services. The ever-expanding deployment of fiber optic technology supports the implementation of an "interactive network" that allows a subscriber to obtain desirable services or programming at a time and date specified by the subscriber. Indeed, it is feasible that this interactive network will have sufficient bandwidth to supply hundreds of channels of programming information, thereby leading to an explosion of program options available to subscribers. Potential subscriber services supported by this interactive network include Movies on Demand (MOD) or Video on Demand (VOD), interactive music channels, interactive computing, shopping, entertainment, and other related services.

An interactive network makes it possible for subscribers to have immediate access to vast selections of music. For example, record companies may provide catalogs of their music for subscribers to listen to via an interactive network. Similarly, various publishers may compile playlists of various styles of music (e.g., Jazz, Classical, Top 40, etc.) that will be available to subscribers via an interactive network.

When music catalogs are available via an interactive network, a subscriber must have a way to select the music he or she would like to listen to. The computers that form a part of an interactive network facilitate selection by song title, artist, or album name. As in a record store, music may also be classified and searched by style (e.g., Jazz, Classical, Top 40, etc.). Thus, in an interactive network, it will be very simple for a subscriber to select a specific song.

However, unless a subscriber is familiar with a particular artist or song title, there is no simple way to identify other music that the subscriber may enjoy. Because of the sub-

jective nature of such a decision, there is no simple way for a subscriber to identify additional music that is similar to a song he or she likes. This is a significant disadvantage in an environment where a large assortment of music is readily available.

When a listener browses published playlists, the playlists are typically described by a short title, such as Jazz, Classical, Top 40, Progressive Rock, etc. When a subscriber listens to such a playlist, there is no simple way for the subscriber to get a clearer idea of the specific types of music that are included in the playlist. Similarly, there is no simple way for a subscriber to alter the mix of the songs that are played back from the playlist.

In summary, there is no simple, effective way for a subscriber to identify and select music he or she is likely to enjoy on the basis of the music's subjective content and its similarity to a song the subscriber is familiar with. Furthermore, there is no way for a user to quickly assess the mix of music included in a playlist and to alter the mix of music played from the playlist.

Therefore, there is a need in the art for a system that allows a subscriber to pick a song he or she likes and to then identify additional songs that include similar subjective content. Likewise, there is a need in the art for a system that allows a user to perceive the content of a playlist and alter the mix of songs played from the playlist.

SUMMARY OF THE INVENTION

The present invention satisfies the above described needs by providing systems and methods for selecting and playing music based on its subjective content.

Generally described, the present invention provides a method for selecting programming information items in an interactive media distribution system that includes a server, a distribution network, an output device and an input device. The method includes storing on the server a plurality of programming information items and editorial data associated with the programming information items. An initial programming information item is played in response to a first input signal. In response to a second input signal, a list of proposed new programming information items is created on the basis of the editorial data associated with the initial programming information item and the plurality of programming information items. The list of proposed new programming information items is presented on the output device. The proposed new programming information items are then added to a playlist in response to a third input signal.

The present invention also provides a method for classifying and selecting programming information items having subjective content. A plurality of programming information items and editorial data associated with the programming information items are stored. The editorial data includes a plurality of categories and weightings associating each programming information item with the categories. An initial programming information item is selected in response to a first input signal. The setting of a matching closeness indicator is determined in response to a second input signal. The method determines matching categories for the initial programming entry. The matching categories include the categories whose weightings correspond to the position of the matching closeness indicator. The method determines matching programming information items based on the initial programming information item. The matching items include the matching categories with weightings corresponding to the setting of the matching closeness indicator. The matching items are presented to the user.

The present invention also provides a system for classifying and selecting programming information having subjective content. The system includes a data storage device containing a plurality of programming information items and editorial data associated with the programming information items, an output device for providing information to a user, an input device for receiving input from the user, and a computer associated with the data storage device. The computer is configured to play an initial programming information item in response to a first input signal. The computer creates a list of proposed new programming information items on the basis of the editorial data associated with the programming information items in response to a second input signal. The list of proposed new programming information items is presented on the output device. Finally, the proposed new programming information items are added to a playlist in response to a third input signal.

In another aspect, the present invention provides a method for indicating the mix of programming information included in a playlist and adjusting the mix of programming information played from the playlist. The method includes loading a playlist including a plurality of programming information items and loading editorial data associated with the programming information items. A predetermined number of indicators are displayed on the output device. Each of the indicators is associated with a category from the editorial data. The indicators are positioned to indicate the portion of the plurality of programming information items corresponding to each of the categories. At least one of the indicators is adjusted in response to an input signal from an input device. In response to the adjustment of one or more indicators, the method selects programming information items from the playlist such that the portions of the selected programming information items associated with each of the categories corresponds to the adjusted positions of the indicators.

It is therefore an object of the present invention to provide a system for classifying and selecting information having subjective content.

It is another object of the present invention to provide a method for the context based selection of subjective material.

It is another object of the present invention to provide a method for adding items having subjective content to a group of items having similar subjective content.

It is another object of the present invention to predict, based on a listener's current choice of music, the choices from an audio content database that are most like the current choice.

It is another object of the present invention to identify other music that is similar to the music a listener is listening to.

It is another object of the present invention to identify more music that is like a current musical selection.

It is another object of the present invention to identify other movies that are similar to a movie a viewer is watching.

It is another object of the present invention to display the types of music are in a playlist.

It is another object of the present invention to allow a user to alter the mix of music that is selected and played from a playlist.

It is another object of the present invention to select various types of programming on the basis of its subjective content.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 illustrates an interactive network system.

FIG. 2 illustrates a set top terminal, which forms a part of the interactive network system of FIG. 1.

FIG. 3 illustrates the preferred remote control unit for use with the set top terminal of FIG. 2.

FIG. 4 illustrates the features of the initial screen display in the preferred audio on demand system.

FIG. 5 illustrates the features of the playlist screen display in the preferred audio on demand system.

FIG. 6 illustrates a list of songs provided in response to the find button on the playlist screen display of FIG. 5.

FIG. 7 illustrates the "more like" panel provided in response to the "more" button on the playlist screen display of FIG. 5.

FIG. 8 illustrates a list of songs provided by the "more like" function.

FIG. 9 is a flow diagram illustrating the steps taken by a subscriber when using the "more like" function.

FIG. 10 is a flow diagram illustrating the "more like" function as implemented in a program module running on the preferred interactive network.

FIG. 11 illustrates the features of the "style equalizer" screen display.

FIG. 12 is a flow diagram illustrating the steps taken by a subscriber when using the "style equalizer" function.

FIG. 13 is a flow diagram illustrating the "style equalizer" function as implemented in a program module running on the preferred interactive network.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The preferred embodiment of the present invention is directed to systems and methods for selecting music on the basis of its subjective content, and is implemented in an interactive network system that can deliver a variety of services, including entertainment, information, and transaction services, to consumers via an interactive broadband network. The preferred system, which is referred to as the audio on demand system, allows a subscriber to listen to songs provided by the system. The subscriber may select songs on the basis of title, artist and album. The subscriber may also select playlists, which are predetermined collections of songs. The audio on demand system provides a "more like" function that identifies more music that is like the subscriber's current selection. In addition, the system includes a "style equalizer" that allows a subscriber to see the predominant styles of music included in a playlist, and to adjust the mix of music played from the playlist.

Although the preferred embodiment will be generally described in the context of an interactive television system for delivering broadcast television programs, music, and related information, those skilled in the art will recognize that the present invention also can be used to support the delivery of other forms of programming information, including radio, broadcast print, audio, games, computer software, including program modules such as application programs and operating systems, and other combinations of audio, video and/or computer software. Accordingly, it will be understood that the terms "programming information" and "programming information items" generally include information transmitted electronically to entertain, instruct, edu-

cate, or inform the recipient, as well as program modules for supporting these services.

Turning first to the nomenclature of the specification, the detailed description which follows is represented largely in terms of processes and symbolic representations of operations by conventional computer components, including a central processing unit (CPU), memory storage devices for the CPU, and connected pixel-oriented display devices. These operations include the manipulation of data bits by the CPU and the maintenance of these bits within data structures resident in one or more of the memory storage devices. Such data structures impose a physical organization upon the collection of data bits stored within computer memory and represent specific electrical or magnetic elements. These symbolic representations are the means used by those skilled in the art of computer programming and computer construction to most effectively convey teachings and discoveries to others skilled in the art.

For the purposes of this discussion, a process is generally conceived to be a sequence of computer-executed steps leading to a desired result. These steps generally require physical manipulations of physical quantities. Usually, though not necessarily, these quantities take the form of electrical, magnetic, or optical signals capable of being stored, transferred, combined, compared, or otherwise manipulated. It is conventional for those skilled in the art to refer to these signals as bits, values, elements, symbols, characters, terms, numbers, records, files or the like. It should be kept in mind, however, that these and similar terms should be associated with appropriate physical quantities for computer operations, and that these terms are merely conventional labels applied to physical quantities that exist within and during operation of the computer.

It should also be understood that manipulations within the computer are often referred to in terms such as adding, comparing, moving, etc. which are often associated with manual operations performed by a human operator. It must be understood that no involvement of a human operator is necessary or even desirable in the present invention. The operations described herein are machine operations performed in conjunction with a human operator or user that interacts with the computer. The machines used for performing the operation of the present invention include general purpose digital computers or other similar computing devices.

In addition, it should be understood that the programs, processes, methods, etc. described herein are not related or limited to any particular computer or apparatus. Rather, various types of general purpose machines may be used with programs constructed in accordance with the teachings described herein. Similarly, it may prove advantageous to construct specialized apparatus to perform the method steps described herein by way of dedicated computer systems with hard-wired logic or programs stored in nonvolatile memory, such as read only memory.

Referring now to the drawings, in which like numerals represent like elements throughout the several figures, the present invention and the preferred operating environments will be described.

THE OPERATING ENVIRONMENT

A typical CATV system for the delivery of television programming to subscribers comprises three main elements: a headend, a distribution system, and subscriber drops.

The "headend" is a signal reception and processing center that collects, organizes and distributes signals. The headend

receives satellite-delivered video and audio programming, over-the-air broadcast television station signals, and network feeds delivered by terrestrial microwave and other communication systems. In addition, headends may inject local broadcast programming into the package of signals sent to subscribers, such as commercials and live programs created in a television studio.

The "distribution system" carries the signals from the headend to a number of distribution points in a community and, in turn, distributes these signals to individual neighborhoods for delivery to subscribers. A modern distribution system typically comprises a combination of coaxial cable and optical fibers with trunk amplifiers periodically spaced to compensate for attenuation of the signals along the line.

"Subscriber drops" are taps in the distribution system that feed individual lines into subscribers' television sets or subscriber set-top terminals, often referred to as "subscriber premises equipment" or "customer premises equipment" ("CPE").

Referring to FIG. 1, an interactive network system 10 includes a headend system 12 for delivering programming information to and receiving instructions from a consumer system 14 via a "two-way" distribution network 16. The headend system 12 is the control center for collecting, organizing, and distributing the signals for all interactive network operations and the source for all programming information. The distribution network 16 transports signals carrying programming information and instructions between the headend system 12 and the consumer system 14. The distribution network 16 can include a world-wide public asynchronous transfer mode (ATM) compatible network with links to the Internet, third party service providers, and other wired and wireless communications networks. The consumer system 14 includes the equipment required for a consumer to receive programming information directly at his or her office or residence and to transmit requests and instructions to the headend system 12.

The headend system 12 can include a set of headend servers 20, including a continuous media server (CMS) system 22 and one or more administrative servers 24, to support various network functions, and a control network 26 linking these headend servers. The headend servers 20 can execute program modules, including service and application program software, to support the transmission of programming information and the reception of requests for such programming information.

It will be appreciated that the headend servers 20 are not necessarily located in one physical location, but can be linked by wired and/or wireless communications paths supplied by the control network. The control network 26 can be a local area network, a wide area network, or a combination of both types of networks. For the preferred embodiment, the control network 26 is implemented as an ATM-based network for routing digital data between the headend servers 20 and the distribution network 16.

The CMS system 22 is a server-based file storage and delivery system that can manage on-demand access to stored digitized data, such as audio and video. On-demand access of digitized data is a particularly desirable characteristic of the CMS system 22 because it allows the interactive network to support the on-demand delivery of various types of programming, such as music, movies, etc. The preferred CMS system 22 can supply digital data streams at a constant rate to numerous consumers of the consumer system 14.

The CMS system 22 includes one or more storage servers 28, which operate to retrieve and to transmit the digitized

data as required by clients of the CMS system, i.e., the equipment of the consumer system 14. The digitized data, which typically comprises programming information, is maintained on one or more memory storage devices 30 connected to the storage servers 28. Each memory storage device 30 can be implemented as a SCSI hard disk drive, an optical storage system, or any other similar mass storage media. By spreading the data management operations across a group of storage servers and memory storage devices, user load can be balanced with the limited disk, network, and input/output (I/O) resources of the headend system. This also supports fault tolerance by replicating digitized data within the CMS system 22 to survive the failure of a storage server or a memory storage device.

To support the tasks of updating or revising programming information stored on a memory storage device 30 of the CMS system 22, a computer workstation 32 and a remote server 34 can be connected to the control network 26 via a communications link 36. This communications link allows a program distributor or supplier, which typically operates at a location remote from the CMS system 22, to transmit programming information for storage by one or more of the memory storage devices 30 and eventual distribution to consumers via the headend system 12. The communications link 36 can be implemented by either a wireless or wired communications system. For example, the communications link 36 can be constructed as a microwave link or as a conventional telephone link.

The administrative servers 24 of the headend system 12 can support a variety of services and applications associated with the interactive network system 10, including network security, monitoring, object storage, financial transactions, data management, and other administrative functions. The administrative servers 24 also handle the interactive service requests or instructions transmitted via the consumer system 14 by consumers. For an application involving a large base of consumers, an administrative server 24 is preferably dedicated to a particular service or function. For example, one or more servers can handle all consumer authorization requirements, whereas other servers can handle network management services, and so forth. These administrative servers preferably support the Simple Network Management Protocol (SNMP) to enable end-to-end network administration and monitoring.

The headend system 12 also can support the distribution of programming information and other services via an analog distribution system 38 that is coupled to the distribution network 16. This distribution of analog formatted signals can be handled by a separate headend system associated with a community antenna television (CATV) system. The headend of the CATV system typically supports satellite-delivered video and audio programs, over-the-air broadcast television station signals, and broadcast network signal feeds delivered by microwave and other communications systems.

The distribution network 16 is a two-way communications network that connects the headend system 12 to various community distribution points of the consumer system 14 and, in turn, to individual neighborhood nodes for delivery to consumers of services supplied by the interactive network system 10. The distribution network 16 comprises one or more downstream channels supporting transmissions from the headend system to the consumer system and one or more upstream channels for carrying transmissions from the consumer system to the headend system. This bidirectional communications network supports delivery of programming information via the headend system 12 to each consumer

and the delivery of requests for programming information by a consumer to the headend system 12. The distribution network 16 can be implemented by a microwave distribution system, a telephone system, coaxial cables, optical fibers, or any combination of these delivery systems. However, the preferred distribution network is implemented by a combination of hybrid optical fiber/coaxial cable (HFC) and optical fiber-to-the-curb (FTTC).

Those persons skilled in the art will appreciate that the programming information delivered over the distribution network 16 typically includes both video and audio signals. Programming information can be delivered in digital format, analog format, or a combination of both analog and digital formats. For the preferred embodiment, music-related programming is delivered as a stream of digital audio and video signals in a compressed digital data stream, which may include conventional MPEG-1 and MPEG-2 compressed video streams. Likewise, requests or instructions issued by consumers via the consumer system 14 are preferably formatted as digital signals.

The CMS system 22 and the administrative servers 24 are connected to the distribution network 16 via an ATM switching system 40. The ATM switching system 40 supports network switching requirements for delivery by the headend system 12 of digital data streams carrying multimedia content and the handling of interactive service requests from consumers.

Because the interactive network 10 is a two-way communications system, the ATM switching system 40 preferably connects to the distribution network 16 via modulation/demodulation devices. The downstream channels of the distribution network 16 can be connected to the ATM switching system 40 via digital modulators 42, whereas the reverse channels of the distribution network 16 are connected to reverse channel receivers 44.

Each consumer within a neighborhood node of the consumer system 14 is connected to the distribution network 16 via a subscriber drop cable 46, which is typically part of a local cable network administered by a multiple service operator (MSO). The drop cable 46 is typically a coaxial cable or optical fiber connected to a set-top terminal 48 or set-top box located at the consumer's location. This combination of the drop cable 46 and the set-top terminal 48 operates as a "tap" into the distribution network 16, and allows the consumer to (1) receive program modules and programming information distributed by the headend system 12 and to (2) transmit requests or instructions to the headend system 12. For example, the set-top terminal 48 can accept and convert signals carrying programming information to a format compatible for presentation by an output device 50, such as a television or a computer system. This output device 50, which can be connected to the set-top terminal via a conductive path 52 such as coaxial cable, preferably includes a receiver and a display or monitor for receiving and displaying programs and program-related information. Those skilled in the art will understand that the output device 50 can be implemented as a combination of separate components, such as a receiver and a monitor, or as a single component, such as a conventional television or a general purpose computer system.

Selected operating functions of the set-top terminal 48 can be controlled by an input device 54 capable of supplying input data to the set-top terminal 48. The input device 54 can be used to transmit command signals to the set-top terminal 48 and to input character-based data, such as text, for processing by the set-top terminal 48. For example, the input

device 54 can be used to control the position of a display object presented by the output device or to enter text for conducting a service-related transaction supported by the interactive network 10. The input device 54 can be implemented as one or more devices for inputting data, including a hand held control, a keyboard, a mouse device, a game control, a joystick, a pen or stylus, a trackball, or a track pad.

For the preferred embodiment, the input device 54 is implemented as a hand held remote control unit capable of transmitting infrared signals carrying commands for controlling the operation of the set-top terminal 48. The remote control unit can include a directional keypad having distinct keys for allowing the user to control direction (up, down, left, right) and relative changes in volume or channel (increase or decrease), as well as absolute changes to channel value via a numeric key pad. The remote control unit and its functions are more fully described in conjunction with FIG. 3.

FIG. 2 illustrates the basic components of the set-top terminal 48. The primary components of the set-top terminal 48 include a network receiver 56, a network transmitter 58, a remote control receiver 60, a central processing unit (CPU) 62, and memory 64. These components are connected by a system bus 70, which can carry control, address, and data signals. The network receiver 56 conducts tuning operations for receiving a selected channel of the interactive network 10 and decoding operations for decoding compressed digitized data supplied via the interactive network 10. For example, the set-top terminal 48 can include MPEG decoding capability for converting the compressed digitized data into standard National Television Standard Committee (NTSC) video signals for reception by a conventional television. The network transmitter 58 transmits requests for programming information and related instructions for processing by the headend system 12. The network receiver 56 and the network transmitter 58 can be connected to the distribution network 16 via the drop cable 46. The remote control receiver 60, which is preferably implemented as an infrared receiving device, can decode signals carrying the commands issued by the input device 54, such as a remote control unit 80.

The CPU 62, which is connected to the network receiver and transmitter 56 and 58, as well as to the remote control receiver 60, controls the operations of the set-top terminal 48 and supports the rendering of graphical images that form a part of the user interface. The CPU 62 is typically implemented by at least one microprocessor, such as the model 80486 or the "PENTIUM" microprocessor, manufactured by Intel Corporation, Santa Clara, Calif. The CPU 62 communicates, by means of control, address, and data signals, with the remaining components of the set-top terminal 48 through the system bus 70. The CPU 62 operates in conjunction with the operating system 66 to retrieve, process, store, and display data. It will be appreciated that the processing functions of the CPU 62 may be divided among two or more microprocessors to support the presentation of a graphics-intensive user interface. For example, a microprocessor may be dedicated to control operations associated with the bi-directional communications with the headend system 12, whereas another microprocessor may be dedicated to the generation of graphics.

The memory 64, which is connected to the CPU 62, is useful for storing one or more program modules and data associated with set-top terminal operations. Program modules stored in the memory 64 can include operating system 66 and one or more application programs 68. The memory 64 can be implemented as a combination of dynamic

memory, such as random access memory (RAM), and static memory, such as read only memory (ROM).

The operating system 66 comprises a set of computer programs that control the internal functions of the set-top terminal and support the execution of other program modules, including application programs 68. The preferred operating system 66 supports a graphics-based presentation of program-related information, including control items that visually represent control functions of the operating system and other program modules. A control item or control object is any visual image that can be manipulated by the user to perform an operation. The operating system 66 can receive and interpret input data supplied by the input device 54, as received by the remote control receiver 60. As described in more detail below, a user can "select" and "activate" (or launch) control items by the use of the input device 54 in a manner similar to the computer arts.

For the preferred set-top terminal 48, the memory includes a ROM containing at least a portion of program module representing "boot code" 72 for initializing the operations of the set-top terminal 48. Upon power-up of the set-top terminal 48, the boot code 72 initiates a request for the headend system 12 to download certain program modules, including the operating system 66 and one or more application programs 68. The program modules can be stored within the memory 64 of the set-top terminal 48. This downloading process allows the headend system 12 to easily update the program modules used in set-top terminals 48 throughout the interactive network 10. For example, the application programs 68 may be maintained within the set-top terminal 48 only during actual use of the features of these programs; otherwise, these application programs are maintained at the headend system 12. Thus, it will be appreciated that the preferred set-top terminal 48 relies heavily upon data storage mechanisms located at the headend system 12 rather than within the set-top terminal 48 itself.

The set-top terminal 48 can be connected to a peripheral device via input/output (I/O) ports 74. The I/O ports 74 support the connection of the system bus 70 to a connected peripheral device. For example, the output device 50 can be connected to the I/O ports 74 via a conductor 52. Likewise, an input device 54, such as a game control 90, can be connected to the I/O ports 74. In contrast to the remote control unit 80, which communicates with the remote control receiver 60 via a wireless communications link, other types of input devices 54 are typically connected to the I/O ports 74 via a cable. Nevertheless, those skilled in the art will appreciate that input devices 54 can communicate with the set-top terminal 48 by use of either wireless or wired communications links.

Generally, when a user first powers-up a set-top terminal 48, the set-top terminal 48 contacts the headend system 12 and requests the downloading of certain program modules, including the operating system 66. In response to loading these program modules, the set-top terminal 48 enters a stand-by mode to limit power consumption and awaits a command signal initiated by a user pressing a key or button on an input device 54, such as a remote control unit 80. In this stand-by mode, the set-top terminal can communicate with the headend system and can respond to administrative requests transmitted by the headend system 12. In the event that a user tunes to an interactive channel (such as the audio on demand service), the set-top terminal 48 changes modes and enters the active mode. In the active mode, the set-top terminal 48 communicates with the headend system 12 to process the instructions transmitted by the remote control

unit. For example, the set-top terminal 48 responds to a command requesting programming information by forwarding this instruction to the headend system 12 via the drop cable 46 and the distribution network 16. The headend system 12 responds by retrieving selected programming information from the CMS system 22 and transmitting the selected programming information via the return path provided by the distribution network 16 and the drop cable 46. The set-top terminal then supplies this programming information in the proper format for presentation by the display 50.

FIG. 3 illustrates the preferred remote control unit 80, which is used to transmit commands to the set-top terminal 48. The remote control unit 80 includes a variety of keys that are common to remote control units for use with conventional television sets. These include power on/off 100, channel up 102, channel down 104, volume up 106, volume down 108, mute 110, and a 10 digit numeric keypad 112.

The preferred remote control unit also includes keys that are specifically related to preferred interactive system. A menu button 114 is used to open and close on-screen menus. A directional control 116 is a rocker switch that is used to select specific control items by moving a cursor up, down, left or right. An action button 118 is used to activate a selected control item. A help key 120 is used to initiate on-screen help. An "A" button 122 and "B" button 124 are used to select specific options that are provided in some contexts.

The Preferred Systems and Methods for Selecting Music Based on Subject Content

Turning now to FIGS. 4-13, the preferred systems and methods for selecting music based on subjective content will be described. The primary features of the present invention are a "more like" music search function and a "style equalizer" (style EQ). In addition, the preferred audio on demand system also provides a variety of ancillary features. These features allow a subscriber to find a specific song by artist and title or select a playlist, which is a collection of songs. Once a playlist is selected, the user may review the contents of the playlist and select another song in the playlist. While a song is playing, the listener may add the song to a playlist called "my favorites", or mark the song so that it is never played again. Each of these features is discussed in conjunction with its corresponding user interface and control objects.

FIGS. 4-6 illustrate general aspects of the user interface employed in the preferred embodiment of the present invention, which is referred to as the audio on demand system. FIGS. 7-10 include screen displays and flow charts associated with the "more like" function, which provides the subscriber with more songs that are like the current song. FIGS. 11-13 includes a screen display and flow charts associated with the style EQ function, which displays the styles associated with the current playlist and allows the subscriber to adjust the mix of songs played from the playlist.

The General User Interface

Before describing the preferred "more like" and "style EQ" functions in detail, it will be helpful to understand the basic features of the preferred audio on demand system and the user interface. This information is provided in conjunction with FIGS. 4-6, which illustrate screen displays that appear on the subscriber's display or monitor. Each of the screen displays that form a part of the user interface provide

information and control objects, which typically appear as buttons. The subscriber may select and activate the control objects using the directional control and action button on the remote control unit (FIG. 3). An object is selected by moving the "focus" to the object. The focus is analogous to a cursor on a general purpose computer, and may be represented by a highlighted or colored frame or border that appears around a control object.

The audio on demand system relies on an audio content database, which includes all of the programming information items (e.g., songs) available on the system. The songs in the audio content database are obtained from various sources and are loaded on the continuous media servers that form a part of the headend system. In most cases, the operator of the system will arrange for record companies to provide their music catalogs. Those skilled in the art will appreciate that while the audio on demand system is capable of combining music catalogs from various sources into an integrated music resource, some music companies may prefer that their music not be mixed with music from other publishers. In this case, the system may make different music catalogs available on different channels on the interactive network.

FIGS. 4-6 illustrate the basic features of the audio on demand user interface. FIG. 4 illustrates the initial audio on demand screen display 400, which appears when the subscriber selects the audio on demand system. The initial screen display 400 is divided into three (3) different regions or panels. The top region is a graphic display field 405, which may be used to display graphic images associated with the audio on demand system. For example, the service provider may choose to display a service mark, trademark or other logo when an audio on demand channel is selected by the subscriber.

Immediately below the graphic display field 405 is the style EQ panel 410. The style EQ panel 410 is used to select the style equalizer, which is described below. The style EQ panel 410 also includes a style EQ status indicator 415, which indicates whether the style EQ feature is currently activated.

The bottom region of the screen display 400 is used to select individual songs or playlists. A find button 420 is provided in order to allow a subscriber to select a specific song. When the find button is activated, the screen displays bins that appear to be similar to those found in music stores. In these bins, artists are listed in alphabetical order. When the subscriber selects a particular artist, the names of the artist's albums appear in chronological order, and are followed by an alphabetical listing of the artist's songs. The subscriber may use this feature to select a particular song or album. If the user selects a song, that song is loaded into a new playlist. If the user selects an album, all of the songs from that album are loaded into a new playlist.

The screen display 400 also includes a plurality of playlist buttons 425, which allow the subscriber to select a playlist. As described briefly above, a playlist is a collection of songs. Playlists may be generated in a variety of different ways. For example, various types of playlists may be provided by the service provider or other publishers. In addition, a subscriber may build a playlist one song at a time using the find button 420. A subscriber may also communicate with the preferred interactive network via a personal computer. When connected in this manner, the subscriber may use the personal computer to create and name playlists, perform abstract music searches or queries, etc. Those skilled in the art will appreciate that the interface provided by a personal computer is much more efficient for these tasks than a cumbersome

some on-screen interface that relies on input from a remote control unit. Those skilled in the art will also appreciate that playlists need not be limited to songs. Playlists can include collections of news stories, movies, and other types of programming information. The five playlist buttons 425 are similar to the preset buttons on car radio and indicate the subscriber's five favorite playlists.

The bottom portion of the screen display 400 includes an alphanumeric display 430, which is used to provide some feedback when the subscriber selects one of the other control objects on the screen. For example, when the subscriber uses the remote control unit to move the focus to one of the playlist buttons, the alphanumeric display 430 indicates the name of the associated playlist. Likewise, when the find button has the focus, the alphanumeric display 430 displays an informative message such as "select a song".

FIGS. 5 and 6 illustrate the format of the screen displays 500 that are associated with individual playlists. The playlist screen display 500 appears after the subscriber has created a new playlist by using the find button 420 or selected an existing playlist using one of the playlist buttons 425 on the initial screen display 400 (FIG. 4). Like the initial screen display 400, the playlist screen display 500 includes a graphic display field 505 and a style BQ panel 510. The graphic display panel 505 may be used to display general information associated with the playlist or information associated with the currently playing album or song.

The bottom portion of the playlist screen display 500 includes a playlist identification box 515. If the playlist was selected by choosing one of the playlist buttons 425 on the initial screen display, the playlist identification box 515 will include the same name, logo or icon that appeared on the playlist button. In the preferred audio on demand system, if the playlist was selected by using the find button 420 on the initial screen display, the playlist identification box 515 will display an icon that resembles a compact disc. The compact disc icon is used to indicate a user preference playlist.

As mentioned above, a playlist is a collection of songs. When a playlist is selected, the audio on demand system begins to play the first song in the playlist. The name of the current song is displayed in a song title box 520. The artist's name is displayed in an artist box 525. A counter 530 displays the elapsed time of the current song.

The playlist screen display 500 also provides a list button 535, which may be used to display a list of the songs that are included in the current playlist and to jump to another song in the playlist. FIG. 6 shows a screen display 600 with a pop-up list 605, which is displayed when the subscriber activates the list button 535 on the playlist screen display 500. Each entry in the list includes the title of the song and the artist. In the preferred audio on demand system, the list displays ten (10) of the songs in the current playlist. The subscriber may use the directional control on the remote control unit to scroll through all of the songs in the playlist. The subscriber may also select any of the songs in the playlist by using the directional control to highlight the desired song and pressing the action button (on the remote control unit, FIG. 3). After the subscriber selects a song from the list 605, the system returns to the playlist screen display 500. At that point, the newly selected song begins to play, and the song's title and artist are displayed in the song title box 520 and artist box 525, respectively.

The playlist screen display of FIG. 5 also includes a "more" button 540, a "like" button 545, and a "dislike" button 550. The "more" button 540 is used to activate the "more like" music search function, which is described below. The subscriber may add the currently playing song to

a playlist called "my favorites" by activating the "like" button 545 while a song is playing. If the user does not like the current song, the subscriber may activate the "dislike" button 550 while the song is playing. Once the subscriber indicates the song is disliked, the audio on demand system will never play that song again for the subscriber. This is true without regard to where the song is found. In the preferred audio on demand system, the only way for a subscriber to again listen to a song has been labeled as disliked is to select that specific song using the find button on the initial screen display (FIG. 4).

The "More Like" Function

Generally described, the "more like" function of the present invention provides systems and methods for using a seed song (e.g., the current song) to add new songs to a playlist. This is accomplished on the basis of subjective style classifications and style weightings that are associated with the songs in the audio content database.

The "more like" function allows for the context based selection of subjective material. More particularly, the "more like" function allows a subscriber to locate additional songs on the basis of subjective decisions that have been made regarding the styles of the songs. In order to work properly, the subscriber must be able to predict the output of the "more like" function to some extent. In other words, the "more like" functions must find songs that most subscribers would agree are "similar" to the seed song.

Those skilled in the art will appreciate that it is subjective content that complicates the classification of information. Systems that classify only objective content are easily implemented. For example, songs are easily classified and identified by their title and artist. However, systems that accurately and predictably classify and search subjective content are more complex. In this sense, the present invention is applicable to any systems that classify and select programming information having subjective content. However, in the preferred system, the invention is described in the context of musical selections.

In the present invention, the subjective content associated with each song is embodied in style tables, which are tools for classifying each song's subjective content. Each song can be associated with any number of different styles. The editor that creates the style table must determine how important each style is to the description of each song. This is reflected by weighting each style as it pertains to each song. Thus, the process of creating a style table for an artist involves two steps: (1) creating the list of possible style categories; and (2) assigning weightings to each style category. Both of these steps are performed by the editor that creates the style table.

The "more like" function relies on two elements: a database and a method for searching and combining the songs in the audio content database. As mentioned above, the database takes the form of style tables that classify the style of each song. Although human beings work well as editors to provide the required editorial content, there are limits as to the number of categories that can be considered. For example, the operator of the audio on demand system may deem it acceptable to spend the time to classify the artists of the songs that are provided on the system. However, the system operator may not consider it feasible to classify each and every song on the system.

In the present system, these considerations are accommodated by allowing music to be classified by various levels (e.g., artist, album, song). The editor is responsible for choosing the particular level or levels that will be used in the system. This decision depends on the amount of editorial

time the editor is willing to spend and the specificity required for the desired outcome of the "more like" function. Although they require more editorial work, higher level style tables (e.g., album or song) allow the style tables to more accurately reflect the styles associated with each song or album. This is especially useful in the case of artists whose styles have varied over their career or from album to album.

In the preferred audio on demand system, the style tables are constructed at the artist level, which is the lowest level, or broadest area of categorization. This reduces the amount of editorial work required, while providing style information that can be broadly applied to all of the songs available on the system.

In the preferred system, each song has a song identification (ID) number that uniquely identifies that song. Similarly, each artist is identified by a unique artist ID number. The digital audio data is stored on a continuous media server by song ID number. The associated administrative information is stored on an administrative server. The administrative information includes the style tables, information for each song (title, artist, album, etc.), and all of the other databases, graphics, text, etc. that are required by the audio on demand system. A playlist is created by creating a database that includes the song ID numbers of the songs that are included in the playlist.

In the preferred embodiment of the present invention, the style tables operate in the following manner. The audio on demand system operator creates an artist level default style table for all of the artists whose songs appear on the system. As mentioned above, the editor must determine which style categories to use and the weightings assigned to each artist. Therefore, the default style tables may include any number of style categories associated with any number of artists.

An example of a style table for the Beatles is shown below:

Artist: The Beatles	
Style Category	Weight
1960s	1
1970s	1
British Invasion	7
Rock	5
Pop	5
Innovators	6

Although the audio on demand system provides default style tables for all of the artists whose songs appear on the system, playlist publishers may wish to provide their own style tables that categorize artists in a different manner. For example, the default style tables may include a single category for rap music. However, rap music aficionados may prefer to further classify rap music into more precise sub-categories, such as New York City rap, Los Angeles Rap, Male Rap, Female Rap, etc.

The present invention allows playlist-specific style tables to be loaded into the system with each playlist. Therefore, playlist publishers may elect to use the default style tables, or may provide their own. Each playlist-specific style table may reclassify all of the artists whose music appears on the system, or only artists of particular interest. Thus, in the previous rap music example, a publisher of a rap music playlist may provide a style table that reclassifies those artists whose music appears in the rap playlist. In other words, a playlist publisher can recategorize the artists that are important to that publisher, and for which they want to make finer distinctions.

The method of searching for and matching the entries in the audio content database employs a qualitative scale of closeness, which is controlled by a matching closeness indicator. In the preferred system, the matching closeness indicator is a style slider, which is presented as part of the user interface. The qualitative scale of closeness determines the degree of similarity between the subjective content of the seed song and the songs that will be chosen by the "more like" function. Thus, the style slider allows the subscriber to determine the closeness of the match.

The advantage of the qualitative scale of closeness is that it purposely allows the subscriber to choose a very broad setting. Those skilled in the art will appreciate that many subscribers will want to expand their playlists to include new songs that are only somewhat similar to earlier entries. This provides a mechanism by which a subscriber may move his or her playlist in new directions instead of repeatedly narrowing the playlist. Likewise, this method of finding similar music is vastly superior to searching by artist name or song title.

The outcome of the "more like" function depends on the relationship between the number of styles in the style tables, the weighting scale, and the position of the style slider when the "more like" function is activated.

FIGS. 7 and 8 illustrate the screen displays associated with the "more like" music search function. FIG. 7 illustrates the more like screen display 700. A more like panel 705 appears when the subscriber activates the more button 540 on the playlist screen display 500 (FIG. 5). The more like panel 705 includes several control objects. A more album button 710 instructs the audio on demand system to list the other songs from the album that includes the current song. A more artist button 715 instructs the system to list more songs by the artist that performed the current song. A yes button 730 and a no button 735 allow the subscriber to accept or reject the list of songs that are presented as the output of the "more album" and "more artist" functions. If the subscriber selects the yes button, the listed songs are added to the current playlist.

A more style button 720 allows the subscriber to locate more music that is like the current song. The more style button 720 operates in conjunction with a style slider 725, which the subscriber sets to indicate the degree of closeness or similarity that is required in order for a song to match the current song. If the subscriber moves the style slider 725 all the way to the right, the "more like" function will produce songs with styles that are very similar to the current song. As the style slider 725 is moved to the left, the "more like" function will present the subscriber with a broader group of songs that are in some way similar to the current song. A yes button 730 and a no button 735 allow the subscriber to accept or reject the list of similar songs that are presented as the output of the "more like" function.

FIG. 8 is a screen display 800 that includes a list 805 of songs that are generated in response to the more style button. In the preferred system, ten similar songs are presented to the subscriber. If the subscriber likes the songs in the list, he or she can add the songs to current playlist by activating the yes button 730. If the subscriber wants to see other songs based on the same matching criteria, he or she may activate the more style button while leaving the style slider in the same position. If the subscriber wants to see songs that are more or less similar than those in the current list, the subscriber may adjust the style slider and activate the more style button. Finally, if the subscriber decides not to add any songs to the current playlist, the subscriber may activate the no button 735. Once the subscriber activates the yes or no

button, the list 805 and more like panel disappear, and the system displays the playlist screen display 500 (FIG. 5). The details of the "more like" engine are provided below.

FIG. 9 is a flow diagram that summarizes the steps carried out by a subscriber who is using the more button 540 to find more music. The method 900 begins at step 905 when the user selects a song to hear. This is accomplished by using the find button to select a specific song, or by selecting a playlist. Those skilled in the art will appreciate that the "more like" function uses the current song as a "seed song" and selects other songs that match the style criteria associated with the seed song.

At step 910 the subscriber activates the more button 540 on the playlist screen display 500 (FIG. 5). This causes the more like panel to appear. At step 915 the subscriber sets the style slider in order to determine the closeness of the match. When the style slider is moved to the right, the "more like" function finds songs whose style more strongly resembles the seed song. As the style slider is moved to the left, the "more like" function relaxes the degree of similarity that is required. The function of the style slider is described more completely below.

At step 920 the user activates the more style button 720 on the more like panel 705 (FIG. 7). When the subscriber activates the more style button, the audio on demand system carries out the process of identifying songs that have a style similar to the seed song. This process is described in detail below in connection with FIG. 10. When the process is complete, the system displays a list of ten (10) songs for review by the subscriber. This list is reviewed by the subscriber at step 925.

At step 930 the subscriber determines whether the songs included in the list should be added to the current playlist. If so, the subscriber activates the yes button on the more like panel, and the system adds the songs to the playlist (step 935). If the subscriber decides not to add the songs to the playlist, the subscriber must decide whether to quit the more like function (step 940). If so, the subscriber activates the no button and the more like panel is dismissed (step 945).

At step 940 the subscriber may decide to try the more like function again and see a different list of songs. If this is the case, the subscriber determines whether to leave the style slider in the same place (step 950). If so, the subscriber returns to step 920 and activates the more style button. This causes the system to display ten other songs from the group of songs that was generated earlier. If the subscriber decides to expand or narrow the matching criteria, the subscriber returns to step 915 and adjusts the style slider prior to activating the more style button.

FIG. 10 is a flow diagram illustrating the "more like" function of the present invention as implemented in a program module running on a headend server, which forms a part of the interactive network. The method 1000 begins at step 1005 after the user has selected a seed song and activated the more style button. At step 1005 the system uses the style tables to identify the style categories and weightings that are associated with the seed song. In the preferred embodiment, which implements only artist level style tables, this step involves identifying the style table that corresponds to the artist that performed the seed song. The style table data is then sorted by weighting in decreasing order.

At step 1010 the system determines the setting of the style slider. The style slider operates to indicate a percentage, which is applied to the sorted style table in the manner described below. The percentage associated with a particular style slider position depends on the granularity of the style slider. If the style slider has 11 positions, the positions would

represent increments of 10% each (ranging from 0% to 100%). Thus, the rightmost position would indicate a 100% match was desired. If the style slider is in the center position, that would indicate a 50% was desired.

At step 1015 the system uses the seed song's style table and the position of the style slider to identify more songs that are like the seed song. In the preferred system, this step involves identifying other artists who have the same styles as the seed song artist at weights that are at least as high as the position of the style slider.

The following example will illustrate the operation of this step, and the relationship between the styles in the style table, the weighting scale, and the position of the style slider. Assume the style table weighting scale ranges from 1-10 and the style slider has 11 positions (at >0%, 10%, 20%, . . . 80%, 90%, 100%). If the style slider is set at 100%, the system will determine which of the style categories associated with the seed song artist have weightings of 10 (which is 100% of the 1-10 scale). After these style categories are identified, the system will search for artists who have at least one of the same style categories at a weighting of 10. Those skilled in the art will appreciate that this process will yield artists whose style is very similar to the seed song artist.

If the style slider is set at 50%, the system will determine which of the style categories associated with the seed song artist have weightings of at least 5 (which is 50% of the 1-10 scale). After these style categories are identified, the system will search for artists who have at least one of the same style categories with a weighting of at least 5.

If the seed song is a Beatles song and the system uses the sample style table provided above, a style slider position of 50% would match artists who have the styles British Invasion, Innovators, Rock or Pop with a weighting of at least 5. Those skilled in the art will understand that the "more like" function is constrained by the style categories that are associated with the seed song artist. However, the matching weightings for those style categories are determined by the position of the style slider.

At this point, it should be appreciated that the style slider positions, which are determined by the system provider, work with any style table, regardless of the weighting scale used. For example, if a style table uses a weighting scale of 1-100, a style slider position of 60% will search for artists having the requisite styles with a weighting of at least 60. This allows playlist publishers and others to create compatible style tables using any size weighting scale.

After the matching artists are identified, the system compiles a list of the songs performed by those artists. In order to limit the number of songs that may be included in the group, the system can be designed to select only a predetermined number of songs by each artist.

At step 1020 the system performs a random sort of the songs that were identified in step 1015. At step 1025 the system picks the first ten songs from the sorted group of songs and displays a list of those 10 songs to the subscriber. This is illustrated in FIG. 8. In the preferred system, the style categories and weightings that are used in the search are not displayed to the subscriber.

At step 1030 the system determines whether the subscriber has accepted the songs by activating the yes button on the more like panel. If so, the method proceeds to step 1035, the 10 songs in the list are added to the current playlist, and the method 1000 ends. Instead of adding all 10 songs to the playlist, an alternative user interface may be provided in order to allow the subscriber to specify which of the 10 listed songs should be added to the playlist.

If the subscriber does not activate the yes button, the method proceeds to step 1040 and determines if the sub-

scriber has activated the no button on the more like panel. If so, the method 1000 ends.

At step 1040 the system may determine that the subscriber has again activated the more style button. If this occurs, the system proceeds to step 1045 and determines the position of the style slider. If the position of the style slider is the same as before, the system returns to step 1020 and resorts to the same group of songs. If the subscriber moved the style slider before reactivating the more style button, the system returns to step 1015 and identifies other songs that match the new criteria.

Although the preferred system only implements artist level style tables, the system could also implement album level style tables and song level style tables. Those skilled in the art will appreciate that using "low level" style tables (i.e., artist level) reduces the amount of editorial work required to classify the music available in the system. While requiring more editorial work, higher level style tables (e.g., album or song) allow the style tables to more accurately reflect the styles associated with songs or albums. This is advantageous because it can be used to take into account artists whose styles have varied over their career or from album to album.

If more than one level of style tables is provided, the system may be designed to implement an "aggregation function" in the process of step 1015. Aggregation allows the system to combine one or more levels using any type of mathematical operator. For example, "adding" style levels leads to a tighter match between songs. "Multiplying" style levels results in a broader spread of songs that will match the seed song.

Although the "more like" function has been described as searching the entire audio content database, it is possible to limit the search material that is searched by the system. For example, instead of searching all published songs, the "more like" process may be used to search only new releases. This would allow a subscriber to use the "more like" function to add new music to a playlist. Those skilled in the art will understand that the source material in the audio content database may be selected or restricted in any number of ways, and that the data used to make such distinctions is maintained on the interactive network's administrative servers.

From the foregoing description of the "more like" function, those skilled in the art will appreciate that the present invention includes two means for providing context during the search. First, the style slider allows the subscriber to control the closeness of the matches provided by the "more like" function. Second, the present invention employs editorial data produced by the system operator and playlist publishers to classify the songs in the audio content database. Because new style tables may be loaded in with a playlist, the outcome of the "more like" function will vary depending on the nature of the style table and the editorial decisions made by the playlist publisher.

Finally, those skilled in the art will appreciate that the present invention provides distinct advantages over various other computer based processes that could be used to identify similar songs. For example, it is possible to implement a "more like" engine based on the computer analysis of rhythm, tempo, etc. However, such an approach would require relatively powerful computer processors, and would require that all of the songs in the audio content database be pre-analyzed. Furthermore, such a system may not be predictable, because most listeners would not equate jazz at 120 beats per minute with classical at 120 beats per minute.

The Style EQ Function

As described briefly above, the style EQ function addresses two distinct needs that arise in the interactive

network environment. These problems arise because a subscriber typically selects a playlist on the basis of a very short title, and because playlists may include a relatively large number of songs. First, the style EQ allows the subscriber to get a clearer look at what types of music are included in the playlist. The system accomplishes this by displaying an indicator for each of the predominant styles in the playlist and setting the position of the indicators to reflect the relative portion of the playlist that includes that style. This allows the subscriber to see how much music of each style is present in the playlist. Second, the style EQ feature allows the subscriber to alter the mix of the songs that are played from the playlist by adjusting one or more of the indicators. Thus, if the subscriber does not care for one of the styles in the playlist, the subscriber can decrease the amount of that style that is played. Similarly, the subscriber can boost the styles of music that he or she enjoys, which acts as a filter and does not alter the actual content of the playlist. This allows a subscriber to listen to a playlist in a variety of different ways.

FIG. 11 illustrates the screen display associated with the style EQ function provided by the preferred audio on demand system. The style EQ screen display 1100 is displayed when the subscriber selects the style EQ function from the style EQ panel on the initial screen display 400 (FIG. 4) or the playlist screen display 500 (FIG. 5). The style EQ screen display 1100 covers the bottom portion of the display. The style EQ screen display includes an on/off button 1105, an alphanumeric display 1110, and a plurality of faders 1115. The style EQ is tuned on and off by activating the on/off button 1105. The alphanumeric display 1110 provides information to the subscriber.

The preferred style EQ includes eight (8) indicators, or faders 1115. Those skilled in the art will appreciate that the style EQ faders resemble a conventional graphic equalizer. However, instead of each fader being assigned to a frequency band, each fader is assigned to a particular style of music included in the playlist. This allows the faders to be used to give a subscriber a clearer picture of the types of music included in a playlist. For example, a playlist that includes rock music may simply be called "Rock". The style EQ faders may indicate that the playlist includes music that may be more specifically described as 1970s rock, 1980s rock, 1990s rock, soft rock, acid rock, heavy metal, etc.

When a playlist is loaded and the style EQ function is first turned on, the faders 1115 are positioned by the system to indicate the portion of the playlist that fits into the associated style category. The subscriber may get an idea of what is included in the playlist by using the remote control unit's directional control to highlight each of the faders. The display 1110 displays the name of the style associated with the highlighted fader.

The style EQ function also allows the subscriber to adjust the mix of songs that is played from the playlist. For example, if the subscriber dislikes acid rock and heavy metal, the subscriber can "attenuate" those styles by using the remote control unit to move those faders to their lowest position. Likewise, the subscriber can "boost" the amount of soft rock songs that are played by moving the fader upward. Those skilled in the art will appreciate that the style EQ function does not alter the content of the playlist. Instead, it merely adjusts the mix of songs that are played from the playlist. The details regarding the operation of the style EQ function and the assignment of style names to the faders are discussed below.

FIG. 12 is a flow diagram that summarizes the steps carried out by a subscriber who is using the style EQ

function. The method 1200 begins at step 1205 when the user selects a playlist. This is accomplished by using the playlist buttons on the initial screen display. After a playlist is selected the subscriber activates the style EQ screen display 900 (FIG. 9) by activating the style EQ button on the playlist screen display (step 1210). This causes the system to display the style EQ panel with the faders set to indicate the mix of songs included in the playlist.

At step 1215 the subscriber reviews the style labels associated with each fader and the proportion of songs that are described by that style. At step 1220 the subscriber determines whether to adjust the sliders in order to alter the mix of music that is played from the playlist. If so, the subscriber uses the direction control on the remote control unit to adjust one or more faders up or down (step 1225). The subscriber then proceeds to step 1230 and dismisses the style EQ panel. If at step 1220, the subscriber decides not to adjust the faders, the subscriber proceeds to step 1230 and dismisses the style EQ panel.

FIG. 13 is a flow diagram illustrating the style EQ function of the present invention as implemented in a program module running on a headend server, which forms a part of the interactive network. The method 1300 begins at step 1305 by playing a playlist that has been selected by the subscriber.

At step 1310 the system identifies the predominant styles of music that are included in the playlist. Those skilled in the art will appreciate that this step may be accomplished in a variety of ways. In the preferred system, the style information used by the style EQ function is provided by the publisher of the playlist, and is loaded into the system when the playlist is selected. In this case, the playlist style data defines the style categories that will be associated with each of the faders and provides the initial settings for the faders.

In an alternative embodiment, the system may assign style categories to faders by reading the style tables (provided in conjunction with the "more like" function) and assigning the predominant style categories to the faders. The style tables would provide the information necessary to determine how many songs are associated with each style, and the relative portions of the playlist that are described by each of these styles.

Once the predominant styles have been identified, the system proceeds to step 1315 and assigns the styles to the faders. As described above, the style EQ function in the preferred system includes 8 faders. Those skilled in the art will appreciate that there are no inherent limitations on the number of faders (and associated styles) that can be used in conjunction with the style EQ function.

Those skilled in the art will appreciate that either method allows the fader labels to be determined by the music in each playlist. This avoids the problems that would arise if the system defined only a fixed number of style labels that could be assigned regardless of the types of music in a playlist. The present invention allows broad labels to be used for playlist containing a broad mix of styles and specific labels to be used for narrower playlists. For example, if a playlist included all of the music in the world, the fader labels would be broad categories, such as classical, jazz, country, rock, etc. Similarly, if a playlist includes only jazz music, the style EQ function will assign meaningful jazz related subcategories to the faders.

Defining the labels on the basis of the content of each playlist also ensures that each fader label represents music that is in fact included in the playlist. This avoids the problems of having a fader label without having any music to go with it. For example, it would be misleading is there

is a standard label for jazz music, but a playlist does not include jazz music. This would lead to the subscriber thinking he can increase the amount of jazz music played from the playlist, when in fact the playlist includes no jazz music.

At step 1320 the system adjusts the position of the faders to reflect the relative portion of songs that are described by the style associated with each fader. This allows the subscriber to see about what portion of the playlist is represented by each style of music.

At step 1325 the system determines whether the subscriber has moved any of the fader from their original positions. If not, the method proceeds to step 1330 and plays all of the songs in the playlist in order.

If at step 1325 one or more of the faders have been moved, the system goes to step 1335 and adjusts the mix of the music that is played from the playlist. Those skilled in the art will appreciate that the style EQ feature does not alter the playlist by adding or removing songs. Instead it simply adjusts the mix of songs that are played from the playlist.

In the preferred system, the percentage of the songs that have each style is determined by the following equation:

$$\% \text{ of style} = (\text{value of style}) / (\text{total values for all styles})$$

In this equation, the value of each style is determined by the position of the fader and the number of positions on each fader. For example, on the style EQ panel of FIG. 10, each fader has 10 positions. If we refer to each of the faders as styles 1-8 (from left to right), the total values for all styles is 51 (which is the sum of $9 + 3 + 7 + 6 + 4 + 6 + 7 + 9$) out of a possible 80. In this example, the percentage of music with style 1 is $\frac{9}{51} = 18\%$. Similarly, the percentage of music with style 2 is $\frac{3}{51} = 6\%$.

Those skilled in the art will appreciate that an advantage of the style EQ feature is that moving a fader up or down leads to results that the user can understand. Furthermore, although the style EQ function has been described in the context of music playlist, those skilled in the art will appreciate that this aspect of the invention may be applied to many collections of material with subjective content. For example, the style EQ could be applied to a playlist that includes news stories, with faders labels such as national news, international news, business, sports, etc. This would allow subscribers to adjust the faders so that they hear more of the stories they are interested in, and less of the stories they are not interested in.

From the foregoing description, it will be appreciated that the present invention provides efficient systems and method for selecting and playing music based on its subjective content.

The foregoing methods of the present invention may conveniently be implemented in a program module that is based upon the flow charts in FIGS. 10 and 13. No particular programming language has been indicated for carrying out the various procedures described above because it is considered that the operations, steps and procedures described above and illustrated in the accompanying drawings are sufficiently disclosed to permit one of ordinary skill in the art to practice the instant invention. Moreover, there are many computers and operating systems which may be used in practicing the instant invention and therefore no detailed computer program could be provided which would be applicable to these many different systems. Each user of a particular computer will be aware of the language and tools which are most useful for that user's needs and purposes.

The present invention has been described in relation to particular embodiments which are intended in all respects to

be illustrative rather than restrictive. For example, although the present invention has been described in the context of an interactive network system, those skilled in the art will understand that the principles of the present invention may be applied to, and embodied in, any type of interactive computing device, including general purpose computers, personal computer, notebook computers, etc.

Furthermore, the program modules described in conjunction with the preferred embodiment run on the headend server, which forms a part of the interactive system. Those skilled in the art will appreciate that the system may be configured so that various program modules run on the set top terminal. For example, data associated with the current playlist and its style EQ settings could be downloaded to the set top terminal in order to increase the processing speed.

Alternative embodiments will become apparent to those skilled in the art to which the present invention pertains without departing from its spirit and scope. Accordingly, the scope of the present invention is defined by the appended claims rather than the foregoing description.

What is claimed is:

1. In an interactive media distribution system including a media server, a distribution network, an output device and an input device, a method for selecting programming information items from said media server comprising the steps of:

storing on said server a plurality of programming information items and editorial data associated with said programming information items;

playing, in response to a first input signal from said input device, an initial programming information item from said plurality of programming information items;

creating, in response to a second input signal from said input device, a list of proposed new programming information items on the basis of said editorial data associated with said initial programming information item and said plurality of programming information items;

presenting on said output device said list of said proposed new programming information items; and

adding, in response to a third input signal from said input device, said proposed new programming information items to a playlist.

2. In an interactive media distribution system including a media server, a distribution network, an output device and an input device, a method for selecting programming information items as recited in claim 1, wherein said editorial data comprises subjective content and weighting information associated with each of said programming information items, and wherein creating a list of proposed new programming information items comprises the steps of:

retrieving said editorial data associated with said initial programming information item;

identifying other programming information items having similar editorial data; and

selecting a predetermined number of said other programming information items having similar editorial data.

3. In an interactive media distribution system including a media server, a distribution network, an output device and an input device, a method for selecting programming information items as recited in claim 1, wherein said editorial data comprises subjective content and weighting information associated with the author of each of said programming information items, and wherein creating a list of proposed new programming information items comprises the steps of:

identifying the author of said initial programming information item;

retrieving the editorial data associated with said author; identifying other authors having similar editorial data; and selecting a predetermined number of programming information items by authors having similar editorial data.

4. In an interactive media distribution system including a media server, a distribution network, an output device and an input device, a method for selecting programming information items as recited in claim 1, wherein creating a list of proposed new programming information items comprises the steps of:

determining the setting of a matching closeness indicator; and

selecting new programming information items by comparing said editorial data associated with said initial programming information item with said editorial data associated with said plurality of programming information items, said comparison being based on the setting of said matching closeness indicator.

5. In an interactive media distribution system including a media server, a distribution network, an output device and an input device, a method for selecting programming information items as recited in claim 1, wherein said interactive media distribution system comprises an interactive television system.

6. In an interactive media distribution system including a media server, a distribution network, an output device and an input device, a method for selecting programming information items as recited in claim 1, wherein said server is a continuous media server.

7. In an interactive media distribution system including a media server, a distribution network, an output device and an input device, a method for selecting programming information items as recited in claim 1, wherein said output device is a television monitor and said input device is a remote control unit.

8. In an interactive media distribution system including a media server, a distribution network, an output device and an input device, a method for selecting programming information items as recited in claim 1, wherein said programming information items comprise musical selections.

9. In an interactive media distribution system including a media server, a distribution network, an output device and an input device, a method for selecting programming information items as recited in claim 1, wherein said programming information items comprise movies.

10. In an interactive media distribution system including a media server, a distribution network, an output device and an input device, a method for selecting programming information items as recited in claim 1, wherein said programming information items comprise news stories.

11. In an interactive music distribution system including a server, a distribution network, an output device and an input device, a method for selecting musical selections from said server comprising the steps of:

storing on said server a plurality of musical selections and editorial data associated with said musical selections;

playing, in response to a first input signal from said input device, an initial musical selection from said plurality of musical selections;

creating, in response to a second input signal from said input device, a list of proposed new musical selections on the basis of said editorial data associated with said initial musical selection and said plurality of musical selections;

presenting on said output device said list of said proposed new musical selections; and

adding, in response to a third input signal from said input device, said proposed new musical selections to a playlist.

12. In an interactive music distribution system including a server, a distribution network, an output device and an input device, a method for selecting musical selections as recited in claim 11, wherein said editorial data comprises subjective style and weighting information associated with each of said musical selections, and wherein creating a list of proposed new musical selections comprises the steps of: 5
retrieving said editorial data associated with said initial musical selection;
identifying other musical selections having similar editorial data; and
selecting a predetermined number of said other musical selections having similar editorial data.

13. In an interactive music distribution system including a server, a distribution network, an output device and an input device, a method for selecting musical selections as recited in claim 11, wherein said editorial data comprises subjective style and weighting information associated with an album on which each of said musical selections was released, and wherein creating a list of proposed new musical selections comprises the steps of: 10
identifying the album on which said initial musical selection was released;
retrieving said editorial data associated with said album;
identifying other albums having similar editorial data; and
selecting a predetermined number of musical selections from said other albums having similar editorial data.

14. In an interactive music distribution system including a server, a distribution network, an output device and an input device, a method for selecting musical selections as recited in claim 11, wherein said editorial data comprises subjective style and weighting information associated with the artist who performed each of said musical selections, and wherein creating a list of proposed new musical selections comprises the steps of: 15
identifying the artist who performed said initial musical selections;
retrieving the editorial data associated with said artist;
identifying other artists having similar editorial data; and
selecting a predetermined number of musical selections performed by artists having similar editorial data.

15. In an interactive music distribution system including a server, a distribution network, an output device and an input device, a method for selecting musical selections as recited in claim 11, wherein creating a list of proposed new musical selections comprises the steps of: 20
determining the setting of a matching closeness indicator; and
selecting new musical selections by comparing said editorial data associated with said initial musical selection with said editorial data associated with said plurality of musical selections, said comparison being based on the setting of said matching closeness indicator.

16. In an interactive music distribution system including a server, a distribution network, an output device and an input device, a method for selecting musical selections as recited in claim 11, wherein said interactive music distribution system comprises an interactive television system. 25

17. In an interactive music distribution system including a server, a distribution network, an output device and an input device, a method for selecting musical selections as recited in claim 11, wherein said server is a continuous media server. 30

18. In an interactive music distribution system including a server, a distribution network, an output device and an input device, a method for selecting musical selections as recited in claim 11, wherein said output device is a television monitor and said input device is a remote control unit. 35

19. A method for classifying and selecting programming information items having subjective content, comprising the steps of: 40
storing a plurality of programming information items;
storing editorial data associated with said programming information items, said editorial data including a plurality of categories and weightings associating each programming information item with said categories;
identifying, in response to a first input signal from an input device, an initial programming information item from said plurality of programming information items;
determining, in response to a second input signal from said input device, the setting of a matching closeness indicator; 45
determining matching categories for said initial programming entry, said matching categories including the categories whose weightings correspond to the position of the matching closeness indicator;
identifying matching programming information items, said matching programming information items including said matching categories with weightings corresponding to the setting of said matching closeness indicator; and
presenting said matching programming information items of a user.

20. A method for classifying and selecting programming information items having subjective content as recited in claim 19, wherein said matching closeness indicator is set in response to a third input signal from said input device. 50

21. A method for classifying and selecting programming information items having subjective content as recited in claim 19, wherein said programming information items comprise songs. 55

22. A method for classifying and selecting programming information items having subjective content as recited in claim 19, wherein said programming information items comprise news stories. 60

23. A method for classifying and selecting programming information items having subjective content as recited in claim 19, wherein said programming information items comprise movies. 65

24. A system for classifying and selecting programming information having subjective content, comprising: 70
a data storage device containing a plurality of programming information items and editorial data associated with said programming information items;
an output device for providing information to a user;
an input device for receiving input from said user; and
a computer associated with said data storage device, said computer being configured to: 75
play, in response to a first input signal from said input device, an initial programming information item from said plurality of programming information items;
create, in response to a second input signal from said input device, a list of proposed new programming information items on the basis of said editorial data associated with said programming information items;
present on said output device said list of proposed new programming information items, and 80

18. In an interactive music distribution system including a server, a distribution network, an output device and an input device, a method for selecting musical selections as recited in claim 11, wherein said output device is a television monitor and said input device is a remote control unit.

19. A method for classifying and selecting programming information items having subjective content, comprising the steps of:

storing a plurality of programming information items;
storing editorial data associated with said programming information items, said editorial data including a plurality of categories and weightings associating each programming information item with said categories;
identifying, in response to a first input signal from an input device, an initial programming information item from said plurality of programming information items;
determining, in response to a second input signal from said input device, the setting of a matching closeness indicator;

determining matching categories for said initial programming entry, said matching categories including the categories whose weightings correspond to the position of the matching closeness indicator;

identifying matching programming information items, said matching programming information items including said matching categories with weightings corresponding to the setting of said matching closeness indicator; and

presenting said matching programming information items of a user.

20. A method for classifying and selecting programming information items having subjective content as recited in claim 19, wherein said matching closeness indicator is set in response to a third input signal from said input device.

21. A method for classifying and selecting programming information items having subjective content as recited in claim 19, wherein said programming information items comprise songs.

22. A method for classifying and selecting programming information items having subjective content as recited in claim 19, wherein said programming information items comprise news stories.

23. A method for classifying and selecting programming information items having subjective content as recited in claim 19, wherein said programming information items comprise movies.

24. A system for classifying and selecting programming information having subjective content, comprising:

a data storage device containing a plurality of programming information items and editorial data associated with said programming information items;

an output device for providing information to a user;

an input device for receiving input from said user; and

a computer associated with said data storage device, said computer being configured to:

play, in response to a first input signal from said input device, an initial programming information item from said plurality of programming information items;

create, in response to a second input signal from said input device, a list of proposed new programming information items on the basis of said editorial data associated with said programming information items;

present on said output device said list of proposed new programming information items, and

add, in response to a third input signal from said input device, said proposed new programming information items to a playlist.

25. A system for classifying and selecting programming information as recited in claim 24, wherein said editorial data includes a plurality of style categories and weightings associated with each of said style categories.

26. A system for classifying and selecting programming information as recited in claim 25, wherein said proposed new programming information items and said initial programming selection include at least one identical style category.

27. A system for classifying and selecting programming information as recited in claim 24, wherein said programming information items comprise songs.

28. A system for classifying and selecting programming information as recited in claim 24, wherein said programming information items comprise new stories.

29. A system for classifying and selecting programming information as recited in claim 24, wherein said programming information items comprise movies.

30. In an interactive system including a server, an output device, and an input device, a method for indicating the mix of programming information included in a playlist and adjusting the mix of programming information played from said playlist, comprising the steps of:

loading a playlist including a plurality of programming information items;

loading editorial data associated with said plurality of programming information items;

displaying on said output device a predetermined number of indicators;

associating with each of said indicators a category from said editorial data, said indicators being positioned to indicate the portion of said plurality of programming information items corresponding to each of said categories;

adjusting, in response to an input signal from said input device, the position of at least one of said indicators;

selecting programming information items from said playlist such that the portions of said selected programming information items associated with each of said categories corresponds to the adjusted positions of said indicators; and

playing said selected programming information items on said output device.

31. In an interactive system including a server, an output device, and an input device, a method for indicating the mix of programming information included in a playlist and adjusting the mix of programming information played from said playlist as recited in claim 30, wherein associating a category with each of said indicators comprises the steps of:

determining the predominant categories of said categories; and

assigning said predominant categories to said indicators.

32. In an interactive system including a server, an output device, and an input device, a method for indicating the mix of programming information included in a playlist and adjusting the mix of programming information played from said playlist as recited in claim 31, wherein determining the predominant categories comprises the steps of:

identifying the categories included in said editorial data; and

determining the number of programming information items associated with each of said categories.

33. In an interactive system including a server, an output device, and an input device, a method for indicating the mix of programming information included in a playlist and adjusting the mix of programming information played from said playlist as recited in claim 30, wherein selecting songs comprises the steps of:

determining a total number of positions associated with said indicators;

determining a number of positions associated with one of said indicators; and

dividing said number of positions by said total number of positions.

34. In an interactive system including a server, an output device, and an input device, a method for indicating the mix of programming information included in a playlist and adjusting the mix of programming information played from said playlist as recited in claim 30, wherein said programming information items comprise songs.

35. In an interactive system including a server, an output device, and an input device, a method for indicating the mix of programming information included in a playlist and adjusting the mix of programming information played from said playlist as recited in claim 30, wherein said programming information items comprise news stories.

36. In an interactive system including a server, an output device, and an input device, a method for indicating the mix of programming information included in a playlist and adjusting the mix of programming information played from said playlist as recited in claim 30, wherein said programming information items comprise movies.

37. In an interactive system including a server, an output device, and an input device, a method for indicating the mix of programming information included in a playlist and adjusting the mix of programming information played from said playlist as recited in claim 30, wherein said server comprises a desktop computer and said output device comprises a display.

38. In an interactive system including a server, an output device, and an input device, a method for indicating the mix of programming information included in a playlist and adjusting the mix of programming information played from said playlist as recited in claim 30, wherein said input device is a remote control unit.

39. In an interactive system including a server, an output device, and an input device, a method for indicating the mix of programming information included in a playlist and adjusting the mix of programming information played from said playlist as recited in claim 30, wherein said video output device is a television monitor.

40. In an interactive music system including a server, a video output device, an audio output device and an input device, a method for indicating the mix of songs included in a playlist and adjusting the mix of songs played from said playlist, comprising the steps of:

loading a playlist including a plurality of songs;

loading editorial data associated with said plurality of songs;

displaying on said video output device a predetermined number of indicators;

associating with each of said indicators a category from said editorial data;

setting the position of said indicators to indicate the portion of said plurality of songs corresponding to each of said categories;

adjusting, in response to an input signal from said input device, the position of at least one of said indicators;

selecting songs from said playlist such that the portions of said selected songs associated with each of said categories corresponds to the adjusted positions of said indicators; and

playing said selected songs on said audio output device.

41. In an interactive music system including a server, a video output device, an audio output device and an input device, a method for indicating the mix of songs included in a playlist and adjusting the mix of songs played from said playlist as recited in claim 40, wherein associating a category with each of said indicators comprises the steps of:

determining the predominant categories of said categories; and

assigning said predominant categories to said indicators.

42. In an interactive music system including a server, a video output device, an audio output device and an input device, a method for indicating the mix of songs included in a playlist and adjusting the mix of songs played from said playlist as recited in claim 41, wherein determining the predominant categories comprises the steps of:

identifying the categories included in said editorial data; and

determining the number of songs associated with each of said categories.

43. In an interactive music system including a server, a video output device, an audio output device and an input

device, a method for indicating the mix of songs included in a playlist and adjusting the mix of songs played from said playlist as recited in claim 40, wherein selecting songs comprises the steps of:

determining a total number of positions associated with said indicators;

determining a number of positions associated with one of said indicators; and

dividing said number of positions by said total number of positions.

44. In an interactive music system including a server, a video output device, an audio output device and an input device, a method for indicating the mix of songs included in a playlist and adjusting the mix of songs played from said playlist as recited in claim 40, wherein said input device is a remote control unit.

45. In an interactive music system including a server, a video output device, an audio output device and an input device, a method for indicating the mix of songs included in a playlist and adjusting the mix of songs played from said playlist as recited in claim 40, wherein said video output device is a television monitor.

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United States Patent [19]

Yamaura et al.

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[54] **PERFORMANCE SETTING DATA
SELECTING APPARATUS**

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[57] **ABSTRACT**

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[51] **Int. Cl.⁶** G10H 1/06; G10H 1/26;
G10H 1/36

A performance setting data selecting apparatus including: a data storing unit for storing a plurality set of performance setting data; a table for storing a correspondence between each tune name of the plurality of tunes and each set of the performance setting data stored in the data storing unit suitable for playing a tune having the associated tune name; a designating unit for designating a tune name; and a unit for reading the performance setting data corresponding to the tune name designated by the designating unit from the data storing unit by referring to the table and setting the read performance setting data.

[52] **U.S. Cl.** 84/609; 84/610; 84/612;
84/622; 84/477 R; 434/307 A

[58] **Field of Search** 84/609-614, 622-625,
84/634-638, 477 R, 478, DIG. 12, 601,
602; 434/307 A

[56] **References Cited**

U.S. PATENT DOCUMENTS

5,574,239 11/1996 Kang et al. 84/610

23 Claims, 13 Drawing Sheets

TUNE NUMBER (ABC ORDER)	TUNE NAME	ARTIST NUMBER	COM-POSER NUMBER	GENRE NUMBER	STYLE NUMBER	TOPE COLOR NUMBER	TEMPO VALUE	HARMONY NUMBER
1	AAAA	35	5	22	10	1	150	2
2	AAAB	1	25	3	26	58	80	0
3	BBBB	18	32	11	10	36	110	4
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
400	ZZZZ	67	3	19	62	1	75	5

35

36

37

38

FIG. 1

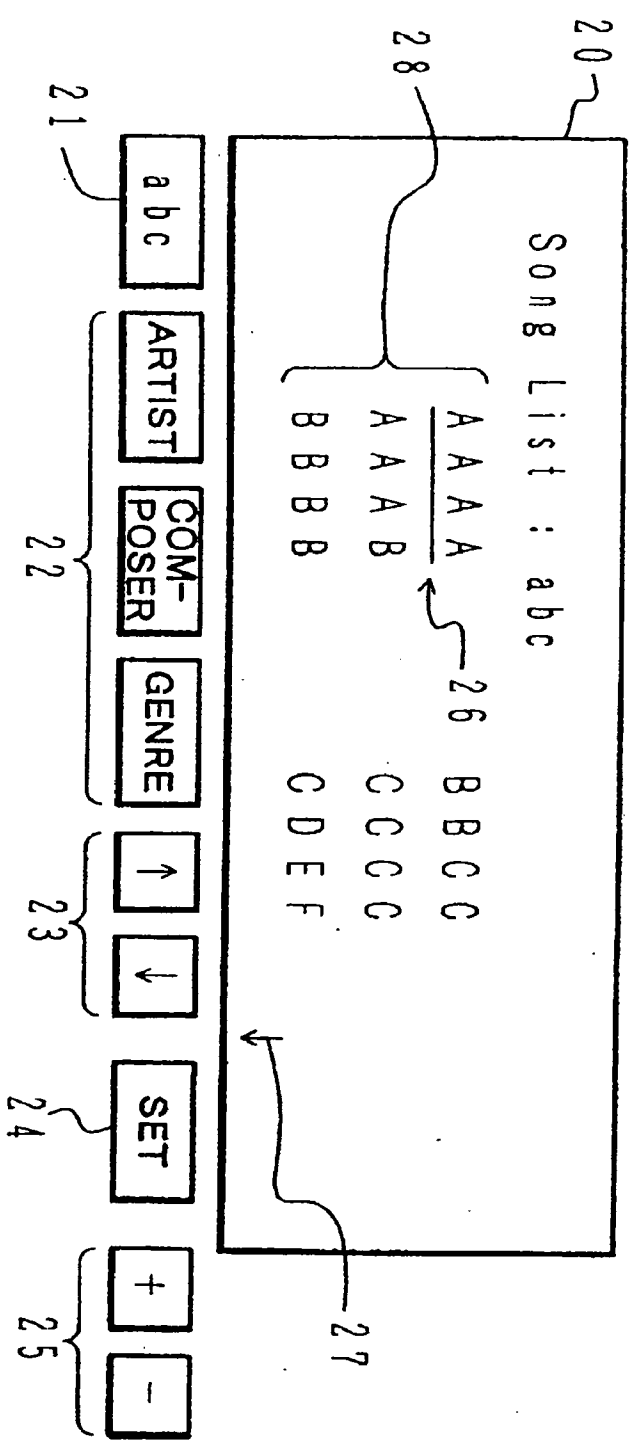


FIG.2

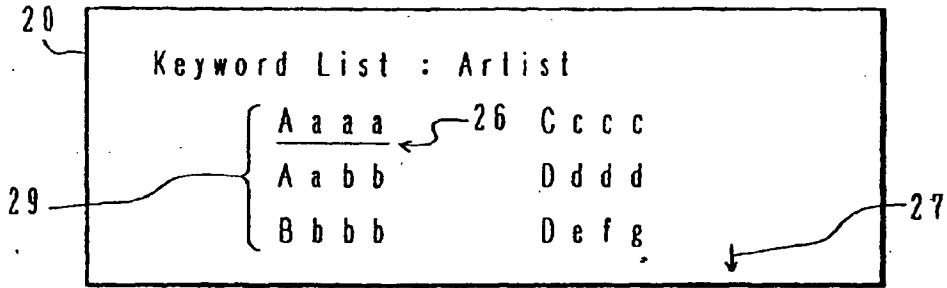


FIG.3

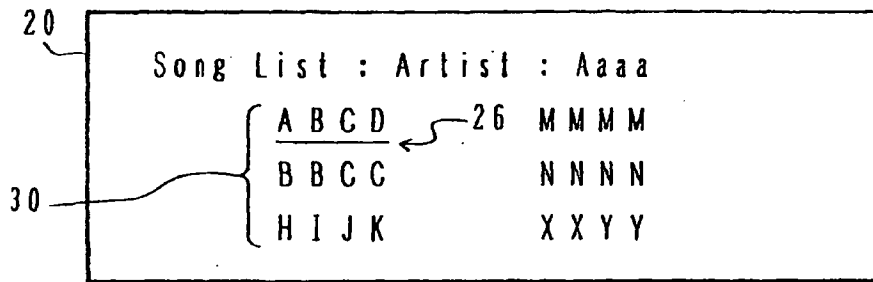


FIG.4

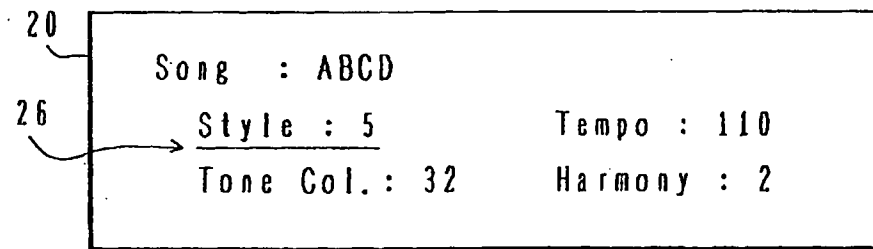


FIG. 5

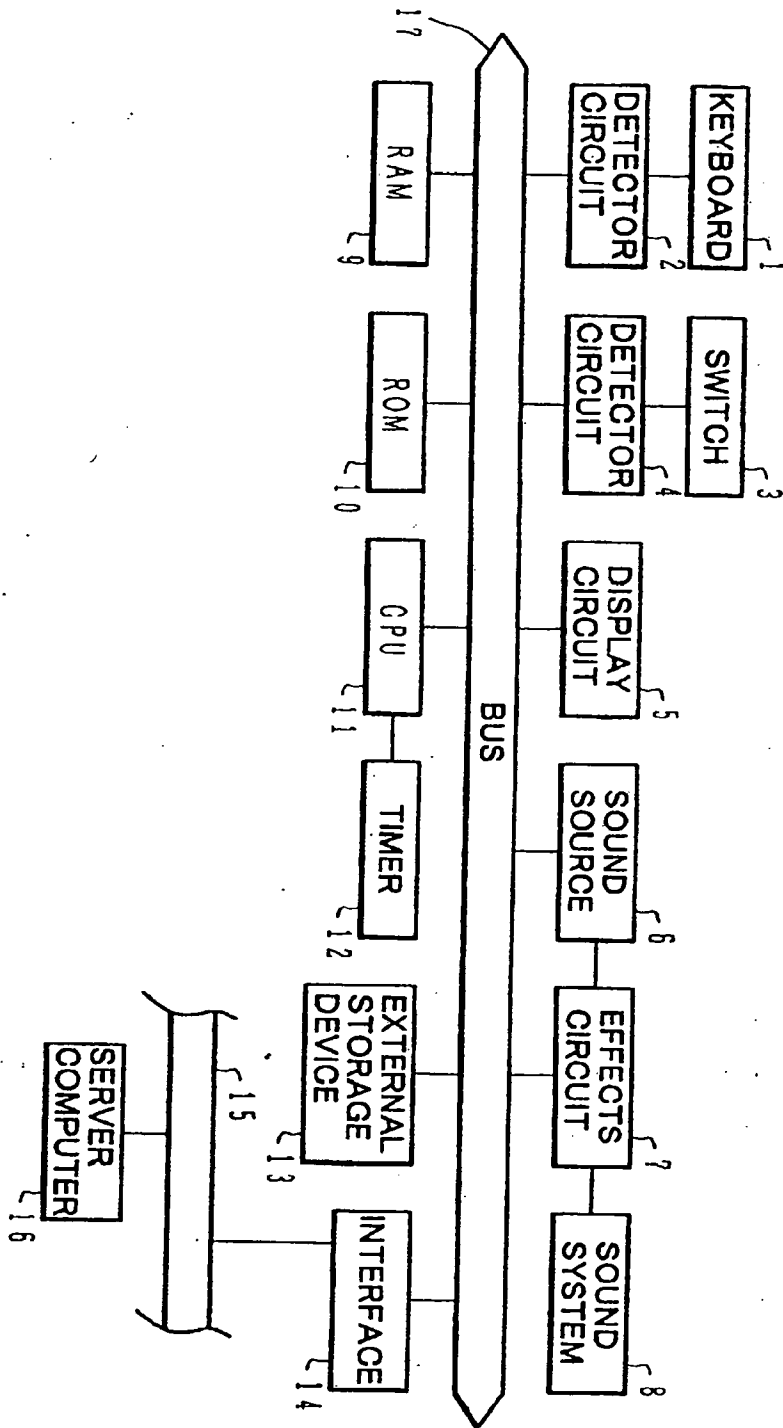


FIG. 6

TUNE NUMBER (ABC ORDER)	TUNE NAME	ARTIST NUMBER	COM-POSER NUMBER	GENRE NUMBER	STYLE NUMBER	STONE COLOR NUMBER	TEMPO VALUE	HARMONY NUMBER
1	AAAA	35	5	22	10	1	150	2
2	AAAB	1	25	3	26	58	80	0
3	BBBB	18	32	11	10	36	110	4
!	!	!	!	!	!	!	!	!
400	ZZZZ	67	3	19	62	1	75	5

35

36

37

38

FIG.7A

ARTIST NUMBER	ARTIST NAME
1	Aaaa
2	Aabb
3	Bbbb
!	!
80	Zzzz

FIG.7B

COMPOSER NUMBER	COMPOSER NAME
1	aaaa
2	aabb
3	bbaa
!	!
62	zzzz

FIG.7C

GENRE NUMBER	GENRE NAME
1	Rock
2	POPs
3	Dance
!	!
40	Enka

FIG.8A

STYLE NUMBER	STYLE DATA
1	--
2	--
3	--
⋮	⋮
100	--

STYLE NAME
INITIAL TEMPO
TIME
NUMBER OF BARS
RHYTHM PATTERN
BASE PATTERN
CODE PATTERN

FIG.8B

TONE COLOR NUMBER	TONE COLOR DATA
1	--
2	--
3	--
⋮	⋮
100	--

TONE COLOR NAME
TONE COLOR PARAMETER

FIG.8C

HARMONY NUMBER	HARMONY DATA
0	NONE
1	--
2	--
3	--
4	--

HARMONY NAME
HARMONY PARAMETER

FIG. 9

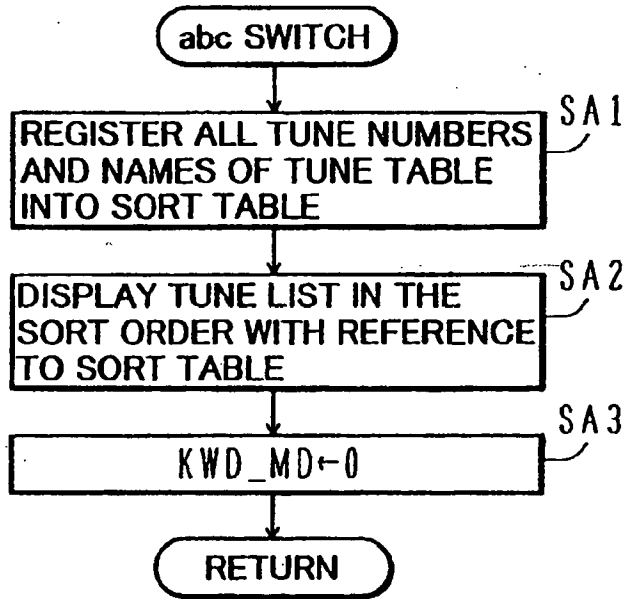


FIG. 10

P →

SORT ORDER	TUNE NUMBER	TUNE NAME
1	4	...
2	16	...
3	38	...
⋮	⋮	⋮
N	M	...

FIG. 11

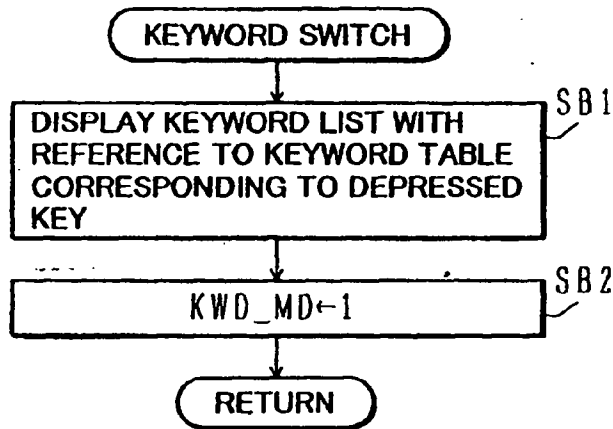


FIG. 12

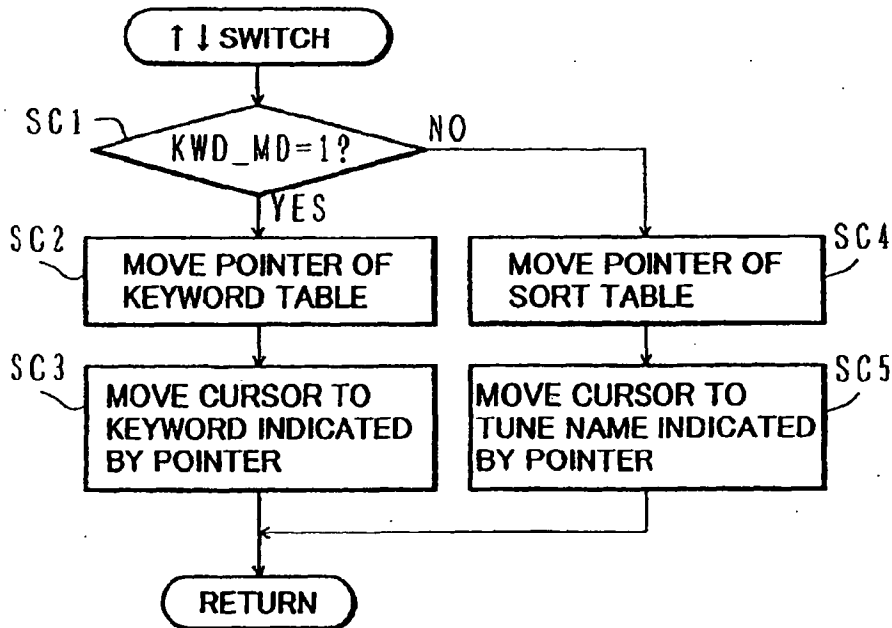


FIG. 13

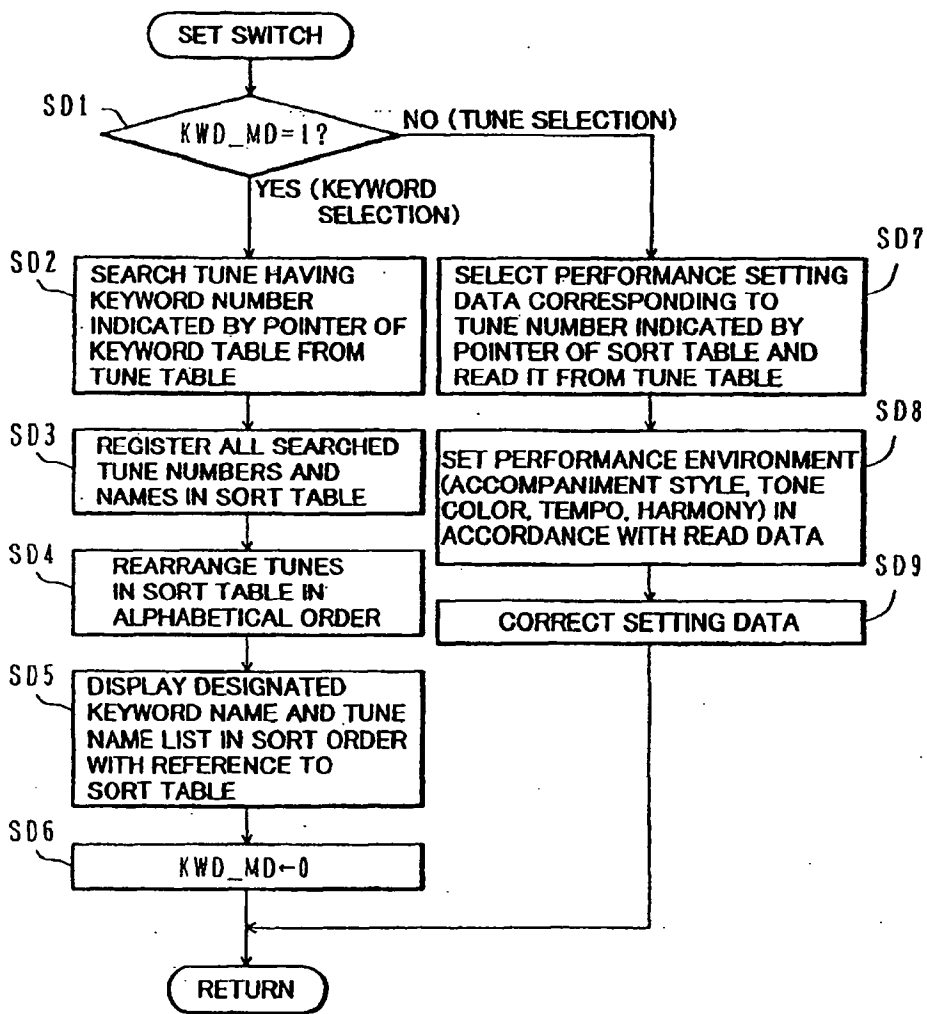


FIG. 14

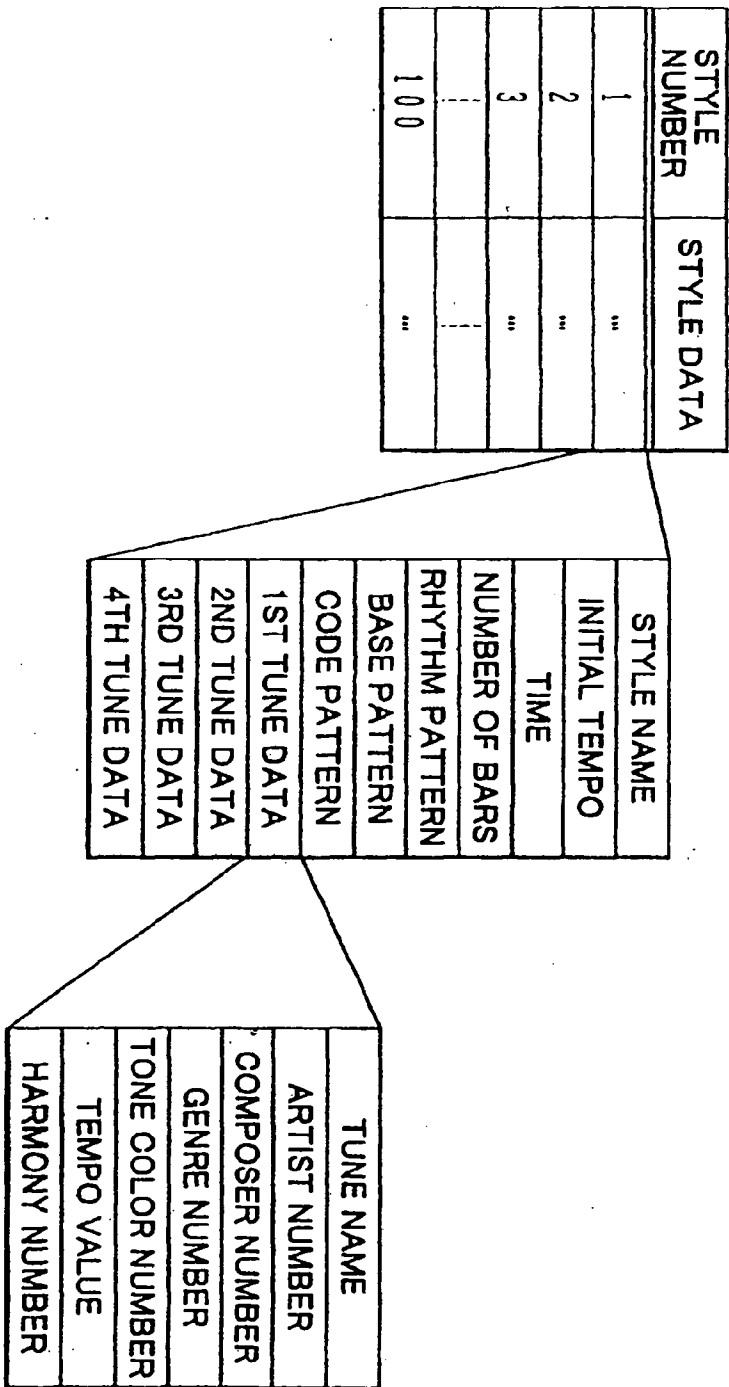


FIG. 15

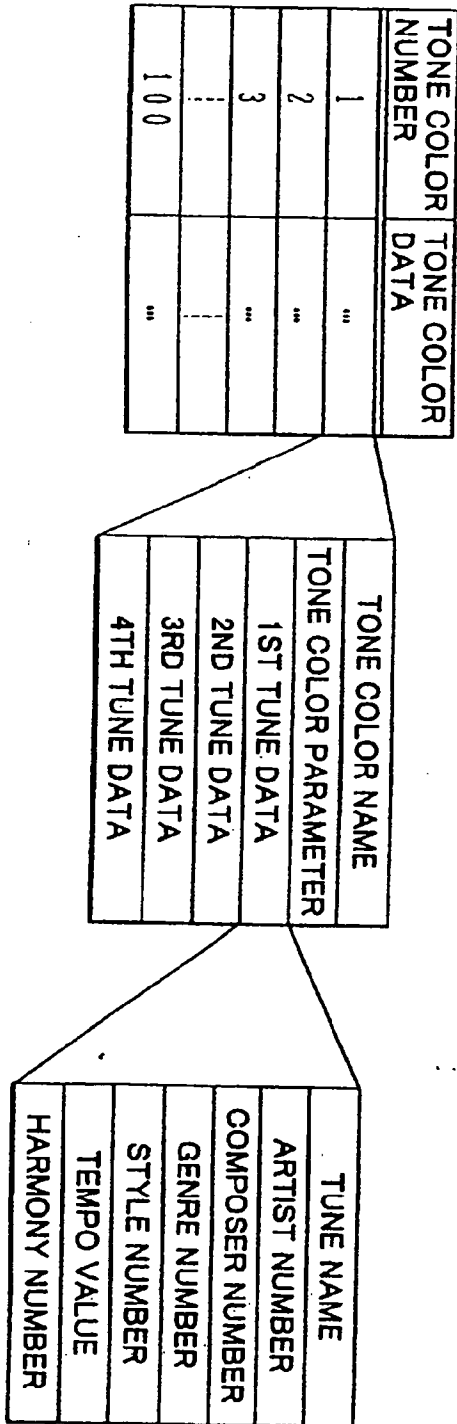


FIG.16

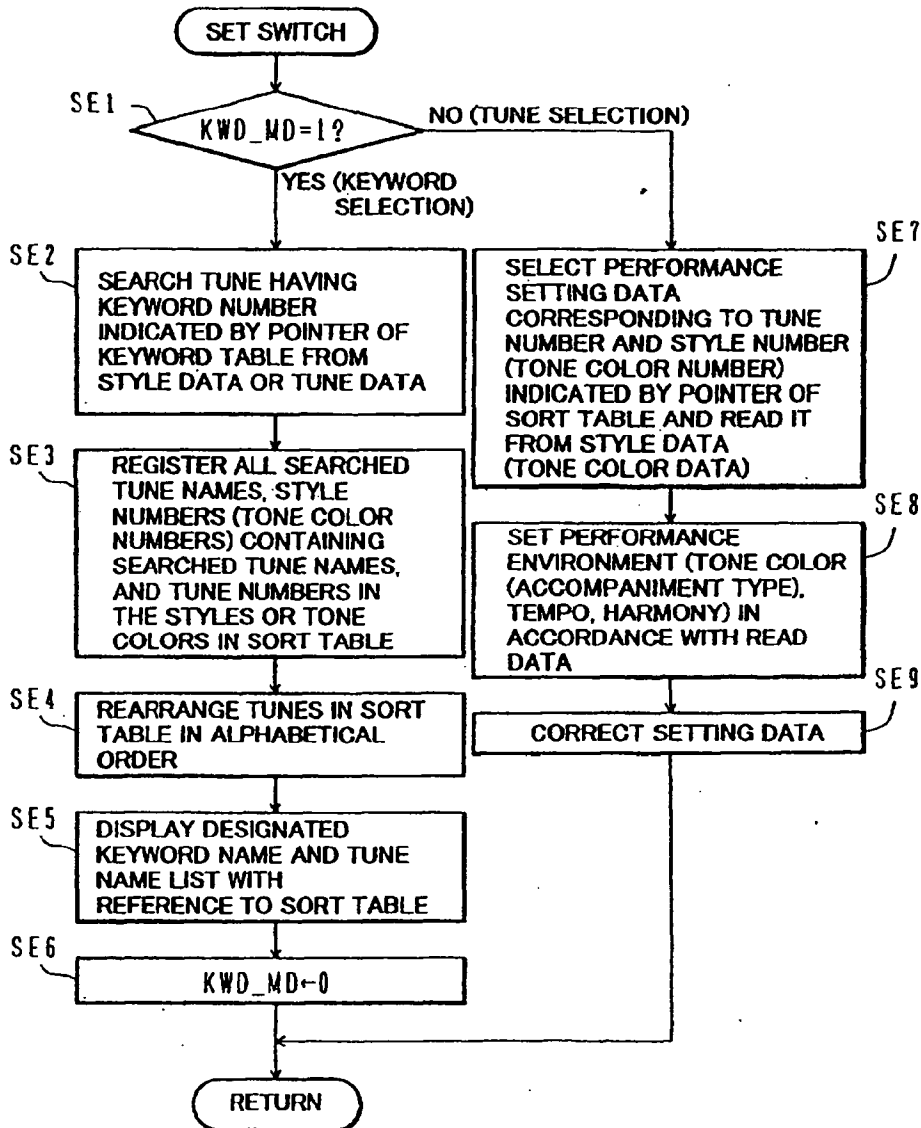


FIG.17

SORT ORDER	STYLE NUMBER	TUNE NUMBER IN STYLE	TUNE NAME
1	23	1
2	5	3
3	12	4
⋮	⋮	⋮	⋮
N	68	2

PERFORMANCE SETTING DATA SELECTING APPARATUS

This application is based on Japanese patent application No. 8-314037 filed on Nov. 25, 1996, the entire contents of which are incorporated herein by reference.

BACKGROUND OF THE INVENTION

a) Field of the Invention

The present invention relates to performance setting data selecting techniques, and more particularly to performance setting data selecting techniques which facilitate to select performance setting data necessary for the execution of tone color data or the like.

b) Description of the Related Art

A performance setting data selecting apparatus is used with, for example, an automatic accompaniment apparatus. A user can select performance setting data necessary for automatic accompaniment by using the performance setting data selecting apparatus. The performance setting data is, for example, a combination of accompaniment style, tone color, tempo, harmony and the like.

One of the methods of selecting performance setting data is a method called one touch setting (OTS). How one touch setting is used will be described.

(1) An accompaniment style is first selected. For example, [Pop Ballad Style] is selected.

(2) A switch [OTS] is depressed to select performance setting data. Upon depression of this switch, a list of four tune images matching the selected accompaniment style is displayed on a display device.

[Pop Ballad Style]

1. Richard's Solo
2. Classic Guitar
3. Orchestral Ballad
4. Piano Ballad

(3) One of the four numbers displayed on the display device is selected with a switch.

(4) The performance setting data matching the tune of the selected number is automatically set. The automatically set performance setting data is the data other than the already set accompaniment style data, and may be melody tone color data, tempo data, harmony data and the like.

When a user plays a tune, it is possible to play only a melody line, while leaving accompaniment matching the melody line to an automatic accompaniment apparatus. In this case, the tune to be played by the user is already determined. Although it is difficult for an ordinary user to manually select each set of performance setting data matching the tune to be played, one touch setting can automatically set the performance setting data.

Even if a tune to be played is already determined, it is difficult to determine which accompaniment style and tune image are to be selected in order to set performance setting data matching the tune.

Further, with one touch setting, an accompaniment style is first selected and then a tune image is selected. Even if a suitable tune image can be known, it may happen that it is not certain which accompaniment style is to be selected in order to select the tune image.

Still further, since only an abstract title of a tune image to be selected is displayed after the accompaniment style is selected, it is difficult to image the final accompaniment.

Under the presence of such problems, even if an accompaniment style and tune image a user thinks proper are

selected, the actual automatic accompaniment may not match the played tune.

Even if it is found that the actual automatic accompaniment does not match a tune, it is difficult for the user to find more suitable settings.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a performance setting data selecting apparatus, a performance setting data selecting method, and a medium storing programs for executing the method, capable of facilitating to select performance setting data matching a tune to be played.

According to one aspect of the present invention, there is provided a performance setting data selecting apparatus comprising: means for storing a correspondence between each of a plurality of tune names and performance setting data suitable for playing each tune; means for designating the tune name of each tune; and means for setting the performance setting data corresponding to the tune name of each tune designated by said designating means by reading the performance setting data from said storing means.

According to another aspect of the present invention, there is provided a performance setting data selecting apparatus comprising: data storing means for storing a plurality set of performance setting data; a table for storing a correspondence between each tune name of the plurality of tunes and each set of the performance setting data stored in said data storing means suitable for playing a tune having the associated tune name; means for designating a tune name; and means for reading the performance setting data corresponding to the tune name designated by said designating means from said data storing means by referring to said table and setting the read performance setting data.

By designating a tune name, a user can automatically set the performance setting data suitable for the performance of the tune having the designated tune name. Since a tune is easy to be imaged from the tune name, the performance setting data a user wishes to play can be set by designating the tune name.

According to another aspect of the present invention, there is provided a performance setting data selecting apparatus comprising: storing means for storing a plurality set of performance setting data and storing a correspondence between each tune name and each set of the performance setting data suitable for playing a tune having the associated tune name; means for designating the tune name of each tune; and means for setting the performance setting data corresponding to the tune name of each tune designated by said designating means by reading the performance setting data from said storing means.

The storing means stores the performance setting data, and also stores a correspondence between each tune name and each set of the performance setting data suitable for playing a tune having the associated tune name. It is therefore possible to easily add new performance setting data. By designating a tune name, a user can automatically set the performance setting data suitable for the performance of the tune having the designated tune name.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGS. 1 to 4 show a display screen which is used for selecting performance setting data by using a performance setting data selecting apparatus according to an embodiment of the invention.

FIG. 5 is a block diagram showing the structure of the performance setting data selecting apparatus of the embodiment.

FIG. 6 is a diagram showing the structure of a tune table.

FIGS. 7A to 7C are diagrams showing the structure of a keyword table, FIG. 7A shows the structure of an artist table, FIG. 7B shows the structure of a composer table, and FIG. 7C shows the structure of a genre table.

FIGS. 8A to 8C are diagrams showing the structure of performance setting data, FIG. 8A shows the structure of style data, FIG. 8B shows the structure of tone color data, and FIG. 8C shows the structure of harmony data.

FIG. 9 is a flow chart illustrating an operation to be executed by CPU when an abc switch is operated.

FIG. 10 is a diagram showing the structure of a sort table.

FIG. 11 is a flow chart illustrating an operation to be executed by CPU when a keyword switch is operated.

FIG. 12 is a flow chart illustrating an operation to be executed by CPU when a cursor switch is operated.

FIG. 13 is a flow chart illustrating an operation to be executed by CPU when a set switch is operated.

FIG. 14 is a diagram showing of the structure of other sets of style data.

FIG. 15 is a diagram showing of the structure of other sets of tone color data.

FIG. 16 is a flow chart illustrating another operation to be executed by CPU when a set switch is operated.

FIG. 17 shows the structure of another sort table.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIGS. 1 to 4 are diagrams illustrating a method of selecting performance setting data by using a performance setting data selecting apparatus according to an embodiment of the invention. The performance setting data setting apparatus of this embodiment can automatically select performance setting data matching a tune selected by a user. This selecting method is called hereinafter song image setting (abbreviated as SIS).

FIG. 1 shows a display screen 20 of the performance setting data selecting apparatus and operation switches 21, 22, 23, 24 and 25.

An abc switch 21 is used for displaying a tune list on the display screen. For example, when this switch 21 is depressed, the names 28 of six tunes are displayed on the display screen 20 in an alphabetical order (in the order of a, b, c, . . .) or in a Japanese syllabary order (in the order of a, i, u, e, o . . . (phonetic translation of Japanese phonemes)). For example, tune names 28 are displayed in the order of AAAA, AAAB, BBBB, BBCC, CCCC and CDEF.

An arrow 27 indicates that the next page continues. Only six tune names, for example, can be displayed on the display screen 20. If there are seven or more tune names, the arrow 27 is displayed to notify a user of the presence of other tune names still not displayed on this display screen. The tune names 28 are displayed on the display screen 20, for example, in two columns. AAAA, AAAB and BBBB are displayed on the left column, and BBCC, CCCC and CDEF are displayed on the right column.

A cursor 26 displayed on the display screen 20 can be moved by a user operating a cursor motion switch 23. As the cursor is moved down at the lowest position of the left column, the cursor moves to the highest position of the right column. Conversely, as the cursor is moved up at the highest position of the right column, the cursor moves to the lowest position of the left column. The succeeding tune names can be displayed on the display screen 20 by moving the cursor to the lowest position of the right column.

Next, a method of selecting a tune will be described. A user moves the cursor 26 to the position of a tune name 28 which the user wants to select, by operating the cursor motion switch 23. In the example shown in FIG. 1, the cursor 26 is at the position of the tune name AAAA. As the user depresses a set switch 24 in this state, performance setting data matching the tune name AAAA is automatically set. The details of the performance setting data will be later described.

In addition to the abc switch 21, cursor motion switch 23 and set switch 24, the apparatus is provided with a keyword switch 22 and a numerical value change switch 25. The keyword switch 22 includes an artist switch, a composer switch and a genre switch. By operating the keyword switch 22, a user can select one of the artist, composer and genre as a keyword.

In the following description, it is assumed that an artist is selected as the keyword. Similar operations are executed also when a composer or genre is selected as the keyword.

FIG. 2 shows a display screen in the case where an artist is selected as the keyword. In order to indicate that the artist was selected as the keyword, "Keyword List: Artist" is displayed on the upper area of the display screen 20. Although the operation switches same as those shown in FIG. 1 are actually displayed on the lower area of the display screen 20, they are omitted in FIGS. 2, 3 and 4.

By operating the keyword switch 22, an artist is selected as the keyword. A list of artists are displayed on the display screen 20 in the alphabetical order or in the Japanese syllabary order. For example, six artist names 29 are displayed on the display screen 20. The artist names 29 are displayed in the order of, for example, Aaaa, Aabb, Bbbb, Cccc, Dddd, and Ddef. An artist is, for example, a player. An arrow 27 indicates that there are other artists still not displayed.

Next, a method of selecting an artist will be described. A user moves the cursor 26 to the position of an artist name 28 which the user wants to select, by operating the cursor motion switch 23. In the example shown in FIG. 2, the cursor 26 is at the position of the artist name Aaaa. As the user depresses the set switch 24 in this state, a list of names of tunes to be played by the artist is displayed on the display screen 20.

FIG. 3 shows a display screen 20 in the case where the artist name Aaaa is selected and the set switch 24 is depressed. In order to indicate that the artist name Aaaa was selected, "Artist: Aaaa" is displayed on the upper area of the display screen 20.

A list of names of tunes to be played by the selected artist Aaaa is displayed on the display screen 20 in the alphabetical order or in the Japanese syllabary order. For example, six tune names 30 are displayed on the display screen 20. The tune names 30 are displayed in the order of, for example, ABCD, BBCC, HIJK, MMMM, NNNN, and XXYY.

As shown in FIG. 1, when the abc switch 21 is operated, a list of all tunes is displayed. Since the number of tunes is very large, the keyword is used for reducing the number of tunes. For example, if an artist name Aaaa is selected as the keyword, a list of tunes belonging only to the artist Aaaa is displayed as shown in FIG. 3. By using the keyword, a user can find a desired tune name quickly and easily.

Next, with reference to FIG. 3, a method of selecting a tune will be described. A user moves the cursor 26 to the position of a tune name which the user wants to select, by operating the cursor motion switch 23. In the example shown in FIG. 3, the cursor 26 is at the position of the tune

name ABCD. As the user depresses the set switch 24 in this state, performance setting data matching the tune name ABCD is displayed.

FIG. 4 shows a display screen 20 in the case where the tune name ABCD is selected as illustrated in FIG. 3. In order to indicate that the tune name ABCD was selected, "Song: ABCD" is displayed on the upper area of the display screen 20.

The contents of the performance setting data matching the selected tune name are displayed on the display screen. For example, the settings that an accompaniment style is the fifth style (Style: 5), a melody tone color is the thirty second melody tone color (Tone Col: 32), a tempo is 110 (Tempo: 110), and a harmony is the second harmony (Harmony: 2) are displayed on the display screen 20.

A user can determine whether or not the contents of the displayed performance setting data are satisfactory. If satisfactory, the set switch 24 is depressed to set the performance setting data.

If any portion of the contents of the performance setting data is to be corrected, a user moves the cursor 26 to the position of the performance setting data to be corrected, by operating the cursor motion switch 23. Thereafter, the numeral value change switch 25 shown in FIG. 1 is operated to correct the numerical value of the performance setting data. Thereafter, the set switch 24 is depressed to set the corrected performance setting data. In the above manner, even if the user dislikes a portion of the contents of the performance setting data, the contents can be corrected to those the user likes.

FIG. 5 is a block diagram showing the structure of an electronic musical instrument having the performance setting data selecting apparatus of this embodiment.

A key depression detector circuit 2 detects a key operation (key depression, key release and the like) of a keyboard 1, and generates a note-on signal, a note-off signal, a key code and the like. A switch detector circuit 4 detects a switch operation of a switch 3 and generates a switch signal. The switch 3 includes the abc switch 21, keyword switch 22, cursor motion switch 23, set switch and numerical value change switch 25 shown in FIG. 1.

A bus 17 is connected to the key depression detector circuit 2 and switch detector circuit 4 as well as a display circuit 5, a sound source (tone generator) circuit 6, an effects circuit 7, a RAM 9, a ROM 10, a CPU 11, an external storage device 13, and a communication interface 14.

RAM 9 has a working area for CPU 11, including flags, buffers and the like. ROM 10 stores various parameters and computer programs. CPU 11 executes calculations and controls in accordance with computer programs stored in ROM 10.

A timer 12 is connected to CPU 11. CPU 11 is supplied with time information from the timer 12. The communication interface 14 includes a musical instrument digital interface (MIDI) and other communication network interfaces to be described later.

The external storage device 13 includes an interface via which it is connected to the bus 17. The external storage device 13 may be a floppy disk drive (FDD), a hard disk drive (HDD), a magneto-optic drive (M), a compact disk—read only memory (CD-ROM) drive or the like.

In the external storage device 13 or ROM 10, a tune table (FIG. 6), keyword tables (FIGS. 7A to 7C), performance setting data (FIGS. 8A to 8C) are stored which tables are used for setting the performance setting data. The details thereof will be later given.

The performance setting data includes performance data such as accompaniment style data (accompaniment pattern data). If the performance data is stored in the external storage device 13, the performance data is loaded from the external storage device 13 into RAM 9 to reproduce the performance data. Other performance setting data is also loaded from the external storage device 13 into RAM 9.

CPU 11 reads the performance data stored in RAM 9 or ROM 10 and supplies musical tone parameters and effects parameters to the sound source circuit 6 and effects circuit 7. CPU 11 generates the musical tone parameters and effects parameters in accordance with a note-on signal and the like generated by the key depression detector circuit 2 and a switch signal generated by the switch detector circuit, and supplies the generated parameters to the sound source circuit 6 and effects circuit 7.

The sound source circuit 6 generates musical tone signals in accordance with supplied musical tone parameters. The effects circuit 7 assigns effects such as delay and reverb to a musical tone signal generated by the sound source circuit 6, in accordance with the supplied effects parameters. The sound system 8 includes a D/A converter and a speaker, converts the supplied digital musical tone signal into an analog musical tone signal and reproduces it.

The sound source circuit 6 may use any method including a waveform memory method, a frequency modulation method, a physical model method, a higher harmonics synthesis method, a formant synthesis method, and an analog synthesizer method with a voltage controlled oscillator (VCO), a voltage controlled filter (VCF) and a voltage controlled amplifier (VCA).

The sound source circuit 6 may be configured not only by using dedicated hardware but also by using a digital signal processor (DSP) and microprograms or by using a CPU and software programs.

A single sound source circuit may be used time divisionally to form a plurality of sound generating channels, or a single sound source circuit may be used independently for each of a plurality of sound generating channels.

Without storing computer programs and various data in ROM 10, they may be stored in a hard disk loaded in HDD which is one type of the external storage device 13. By reading computer programs or the like from a hard disk and loading them in RAM 9, CPU 11 can execute operations similar to the case where computer programs or the like are stored in ROM 10. With this arrangement, addition, version-up and the like of computer programs or the like become easy.

Computer programs and various data can be stored in CD-ROM (external storage device 13). Computer programs or the like can be copied from CD-ROM to a hard disk. It becomes easy therefore to perform installation and version-up of computer programs or the like.

The communication interface 14 is connected to a communication network 15 such as a local area network (LAN), Internet and a telephone network, and via this communication network 15 to a server computer 16. If computer programs or the like are not stored in HDD, they can be down-loaded from the server computer 16. The electronic musical instrument as a server computer transmits a command for requesting a down-load of computer programs or the like to the server computer 16 via the communication interface 14 and communication network 15. Upon reception of this command, the server computer 16 distributes the requested computer programs or the like to the electronic musical instrument via the communication network 15. The

electronic musical instrument receives the computer programs or the like via the communication interface 14 and stores them in HDD to thereby complete a down-load.

FIG. 6 shows the structure of a tune table stored in RAM or the like. The tune table stores a tune number 35, a tune name 36, a keyword 37, and a set of performance setting data 38, all being associated with each other. For example, the tune names 36 of 400 tunes are stored and each tune name 36 is assigned a specific tune number 35. It is preferable that the tune names 36 are disposed in the alphabetical order or in the Japanese syllabary order, and in the ascending order of the tune numbers 35.

The keyword 37 is constituted of an artist number, a composer number and a genre number. For example, the tune number No. 1 has a tune name AAAA, an artist number No. 35, a composer number No. 5, and a genre number No. 22. Each number is an identification number of the keyword. It is possible to search a tune name having a specific keyword by using the keyword 37.

The performance setting data 38 is constituted of a style number, a tone color number, a tempo value and a harmony number. For example, if the tune number No. 1 (tune name AAAA) is selected, the style number is set to 10, the tone color number is set to 1, the tempo value is set to 150 and the harmony number is set to 2.

FIGS. 7A to 7C show the structure of the keyword table stored in RAM or the like.

FIG. 7A shows the structure of the artist table. The artist table stores an artist number and an artist name, both being associated with each other. The artist number corresponds to the artist number of the keyword 37 shown in FIG. 6. For example, eighty artist names are stored in the artist table, each artist name being assigned a specific artist number. It is preferable that the artist names are disposed in the alphabetical order or in the Japanese syllabary order, and in the ascending order of the artist numbers.

FIG. 7B shows the structure of the composer table. The composer table stores a composer number and a composer name, both being associated with each other. The composer number corresponds to the composer number of the keyword 37 shown in FIG. 6. For example, sixty two composer names are stored in the composer table. It is preferable that the composer names are disposed in the alphabetical order or in the Japanese syllabary order, and in the ascending order of the composer numbers.

FIG. 7C shows the structure of the genre table. The genre table stores a genre number and a genre name, both being associated with each other. The genre number corresponds to the genre number of the keyword 37 shown in FIG. 6. For example, the genre name includes rock, pop, dance, and Japanese country song (Enka). It is preferable that the genre numbers are disposed in the order of higher user frequency or in a group containing similar genres.

FIGS. 8A to 8C show the structure of the performance setting data stored in RAM or the like.

FIG. 8A shows the structure of style data. Each set of style data is associated with a specific style number. The style number corresponds to the style number of the performance setting data 38 shown in FIG. 6. For example, the style data includes a style name, an initial tempo, a time, the number of bars, a rhythm pattern, a base pattern, and a code (chord) pattern.

The initial tempo is different from the tempo value shown in FIG. 6. The tempo value shown in FIG. 6 is a value set when a tune name is selected in the manner described earlier.

The initial tempo shown in FIG. 8A is a tempo set not when a tune name is selected but when a style is singularly selected. Therefore, when a tune name is selected, the initial tempo is neglected and the tempo value shown in FIG. 6 is adopted.

The rhythm pattern, base pattern and code pattern each contain a plurality of pattern sections such as intro, main, fill-in and ending.

FIG. 8B shows the structure of tone color data. Each set of tone color data is associated with a specific tone color number. The tone color number corresponds to the tone color number of the performance setting data 38 shown in FIG. 6. For example, the tone color data includes a tone color name and a tone color parameter.

FIG. 8C shows the structure of harmony data. Each set of harmony data is associated with a specific harmony number. The harmony number corresponds to the harmony number of the performance setting data 38 shown in FIG. 6. The harmony number No. 0 does not have harmony data and harmony is not added. For example, it is better not to add harmony when a piano solo performance is played.

The harmony number No. 1 and following numbers have harmony data and add harmony. The harmony data includes a harmony name and a harmony parameter. Harmony parameters include information on how many musical tones having what degree are added to each melody tone to be played by a player, and information on the volume and reproducing timings of the musical tones.

FIG. 9 is a flow chart illustrating an operation to be executed by CPU when the abc switch is operated.

At Step SA1, all tune numbers and names in the tune table (FIG. 6) are registered in a sort table. FIG. 10 shows the structure of the sort table. The sort table stores a sort order, a tune number and a tune name, all being associated with each other. The sort table shown in FIG. 10 shows an example wherein after a keyword search is performed, tune numbers and names are registered, and the contents thereof are not necessarily coincident with the contents of the sort table (correspondence between sort order and tune number) at this Step. For example, if four hundred tunes are registered in the tune table shown in FIG. 6, all four hundred tune numbers and names are registered in the sort table.

If the tune names are disposed in the tune table shown in FIG. 6 in the alphabetical order or in the Japanese syllabary order, then the sort order and tune number having the same serial number are registered in the sort table when the abc switch is operated. However, if the tune names are not disposed in the tune table shown in FIG. 6 in the alphabetical order or in the Japanese syllabary order, the tune names are sorted in the alphabetical order or in the Japanese syllabary order and thereafter they are registered in the sort table. Therefore, even if the tune names are not disposed in the tune table shown in FIG. 6 in the alphabetical order or in the Japanese syllabary order, the tune names are disposed in the alphabetical order or in the Japanese syllabary order.

At Step SA2, a list of tune names is displayed on the display device by referring to the sort table, the tune names being disposed in the sort order. The tune names are disposed on the display device in the alphabetical order or in the Japanese syllabary order (FIG. 1).

At Step SA3, a keyword mode flag KWD_MD is set to 0 to terminate the process for the abc switch. When the keyword mode flag KWD_MD takes 0, the mode is a tune selection mode, and when it takes 1, the mode is a key word selection mode.

FIG. 11 is a flow chart illustrating an operation to be executed by CPU when the keyword switch is operated.

At Step SB1, with reference to a keyword table (FIGS. 7A to 7C) corresponding to the operated switch, a keyword list is displayed on the display device (FIG. 2). If the keyword is an artist or a composer, the keywords are displayed in the alphabetical order or in the Japanese syllabary order, whereas if the keyword is a genre, they are displayed in the order of higher use frequency or in a group containing similar genres.

At Step SB2, the keyword mode flag KWD_MD is set to 1 to terminate the process for the keyword switch. When the flag KWD_MD is set to 1, the keyword selection mode is set.

FIG. 12 is a flow chart illustrating the operation to be executed by CPU when the cursor motion switch is operated.

At Step SC1, it is checked whether the flag KWD_MD is 1. If the flag KWD_MD is 0, it means the tune selection mode so that the flow advances to Step SC4 along a NO arrow.

At Step SC4, an address pointer of the sort table (FIG. 10) is moved. At the initial stage, the address pointer P is at the head of the table as shown in FIG. 10. For example, if a cursor up-direction switch is operated, the address pointer is decremented, whereas if a cursor down-direction switch is operated, the address pointer is incremented.

At Step SC5, the cursor is moved on the display screen to the tune name indicated by the address pointer of the sort table and displayed at this position. If necessary, the display screen is scrolled or the arrow 27 indicating a presence of other tunes is displayed. Thereafter, the process for the cursor motion switch is terminated.

If it is judged at Step SC1 that the flag KWD_MD is 1, it means that the mode is the keyword selection mode, and the flow advances to Step SC2 along a YES arrow. Namely, if the cursor motion switch is moved after the keyword switch is operated, the flow advances to Step SC2.

At Step SC2, an address pointer of the keyword table (FIGS. 7A to 7C) is moved. For example, if the cursor up-direction switch is operated, the address pointer is decremented, whereas if the cursor down-direction switch is operated, the address pointer is incremented.

At Step SC3, the cursor is moved on the display screen to the keyword indicated by the address pointer of the keyword table. If necessary, the display screen is scrolled or the arrow 27 indicating a presence of other keywords is displayed. Thereafter, the process for the cursor motion switch is terminated.

FIG. 13 is a flow chart illustrating the operation to be executed by CPU when the set switch is operated.

At Step SD1, it is checked whether the flag KWD_MD is 1. If the flag KWD_MD is 1, it means the keyword selection mode so that the flow advances to Step SD2 along a YES arrow. For example, if the cursor is positioned at a desired artist name or the like in the list displayed on the display screen and the set switch is operated, the flow advances to Step SD2.

At Step SD2, a tune having the keyword number indicated by the address pointer of the keyword table (FIGS. 7A to 7C) is searched from the tune table (FIG. 6). For example, if the artist number No. 1 is selected, a tune number and a tune name having the artist number No. 1 are searched.

At Step SD3, all searched tune numbers and tune names are registered in the sort table (FIG. 10). Since only the tune number and names having the same keyword are registered, the tune numbers are registered generally in a discontinuous order as shown in FIG. 10.

At Step SD4, the tune names in the sort table are rearranged in the alphabetical order or in the Japanese syllabary order. If the tune numbers are being disposed in the alphabetical order of tune names or in the Japanese syllabary order of tune names, the tune names may be sorted in the tune number order and registered in the sort table.

At Step SD5, the designated keyword name is displayed on the display screen. For example, "Artist: Aaaa" is displayed on the upper area of the display screen, as shown in FIG. 3. With reference to the sort table, a list 30 (FIG. 3) of tune names is displayed in the sort order (i.e., in the alphabetical order or in the Japanese syllabary order).

At Step SD6, the flag KWD_MD is set to 0 in order to change the keyword selection mode to the tune selection mode. Thereafter, the process for the set switch is terminated.

If it is judged at Step SD1 that the flag KWD_MD is 0, it means that the mode is the tune selection mode so that the flow advances to Step SD7 along a NO arrow. For example, if the cursor is moved to the position of a desired tune name among the tune names displayed on the display screen and the set switch is operated, the flow advances to Step SD7.

At Step SD7, the performance setting data 38 corresponding to the tune number indicated by the address pointer of the sort table is selected and read from the tune table (FIG. 6).

At Step SD8, the performance environment (such as accompaniment style, tone color, tempo and harmony) is set in accordance with the read performance setting data.

At Step SD9, if a user performs a correction of the performance setting data, the performance environment is set in accordance with the corrected performance setting data. If a user is not satisfied with the performance setting data read from the tune table, the user can correct the performance setting data by using the numerical value change switch (FIG. 4). Thereafter, the corrected performance setting data is set as described above to terminate the process for the set switch.

FIG. 14 shows the structure of other sets of style data different from the style data shown in FIG. 8A.

The style data is associated with a style number. The style data includes a style name, an initial tempo, a time, the number of bars of a repetition pattern of accompaniment, a rhythm pattern, a base pattern, a code pattern, and tune data. For example, if there are four tunes corresponding to the style number No. 1, the style data contains first tune data, second tune data, third tune data and fourth tune data.

The tune data includes a tune name, an artist number, a composer number, a genre number, a tone color number, a tempo value, and a harmony number. A keyword search becomes possible by using the artist number, composer number and genre number. Setting the performance setting data such as a tone color number also becomes possible. Since the style data contains tune data, the tune table shown in FIG. 6 becomes unnecessary.

With the configuration that style data contains tune data, it becomes easy to supplement style data. If the style data shown in FIG. 8A is used in place of the style data shown in FIG. 14, it is not easy to supplement new style data. In this case, it is necessary not only to add new style data to the style data shown in FIG. 8A but also to correspondingly register the new style number in the tune table shown in FIG. 6. The operation, therefore, becomes complicated. In contrast, if the style data shown in FIG. 14 is used, it is sufficient if only new style data is added, and the other

portions are not necessary to be changed. The operation of adding new data is therefore easy. Style data to be later added may be supplied to users in the form of floppy disk or the like.

FIG. 15 shows the structure of other sets of tone color data different from the tone color data shown in FIG. 8B.

The tone color data is associated with a tone color number. The tone color data includes a tone color name, a tone color parameter, and tune data. For example, if there are four tunes corresponding to the tone color number No. 1, the tone color data contains first tune data, second tune data, third tune data and fourth tune data.

The tune data includes a tune name, an artist number, a composer number, a genre number, a style number, a tempo value, and a harmony number. A keyword search becomes possible by using the artist number and the like, and the tune table shown in FIG. 6 becomes unnecessary. With the configuration that tone color data contains tune data, it becomes easy to supplement tone color data.

FIG. 16 is a flow chart illustrating the operation to be executed by CPU when the style data shown in FIG. 14 or the tone color data shown in FIG. 15 is used and the set switch is operated. This flow chart is used as a substitution for the flow chart shown in FIG. 13.

At Step SE1, it is checked whether the flag KWD_MD is 1. If the flag KWD_MD is 1, it means the keyword selection mode so that the flow advances to Step SE2 along a YES arrow.

At Step SE2, a tune having the keyword number indicated by the address pointer of the keyword table (FIGS. 7A to 7C) is searched from the style data (FIG. 14) or tone color data (FIG. 15).

At Step SE3, all searched tune names, style (tone color) numbers containing the searched tune names, and tune numbers in the styles (tone colors) are registered in the sort table (FIG. 17). As shown in FIG. 17, the sort table stores the style numbers, tune numbers in the styles, and tune names, all being associated with each other.

At Step SE4, the tune names in the sort table are rearranged in the alphabetical order or in the Japanese syllabary order.

At Step SE5, the designated keyword name is displayed on the display screen. With reference to the sort table, a list 30 (FIG. 3) of tune names is displayed in the sort order (i.e., in the alphabetical order or in the Japanese syllabary order).

At Step SE6, the flag KWD_MD is set to 0 in order to change the keyword selection mode to the tune selection mode. Thereafter, the process for the set switch is terminated.

If it is judged at Step SE1 that the flag KWD_MD is 0, it means that the mode is the tune selection mode so that the flow advances to Step SE7 along a NO arrow.

At Step SE7, the performance setting data (excepting style number and tone color number) corresponding to the style number (tone color number) and tune number indicated by the address pointer of the sort table is selected and read from the style data (FIG. 14) or tone color data (FIG. 15).

At Step SE8, the performance environment (such as tone color (or accompaniment style), tempo and harmony) is set in accordance with the read performance setting data. In this case, the performance environment for the style number and tone color number is also set.

At Step SE9, if a user performs a correction of the performance setting data, the performance environment is set in accordance with the corrected performance setting data. Thereafter, the process for the set switch is terminated.

With the performance setting data selecting apparatus of this embodiment, the performance setting data matching a tune to be played can be easily set by selecting a tune name itself, and so-called song image setting is possible. A tune name can be selected easily and quickly by searching the tune name by using an artist, a composer, a genre or the like as a keyword.

If a tune to be played by a user is already determined, the performance setting data matching the tune can be automatically set upon selection of the tune name.

If a user can have particular images of a tune basing upon its tune name, the user can select the tune name easily without being embarrassed. Performance imaged by a user becomes likely to match the actually played performance.

The performance setting data may include: in addition to an accompaniment style and a tone color, chord progression data; intro pattern data; coding pattern data; effects data such as reverb; left hand chord designating mode (single finger, finger chord, full keyboard, and so on) data; volume data of a melody part, an accompaniment part or the like; and other data. The keyword may include other keywords in addition to an artist name, a composer and a genre.

The performance setting data selecting apparatus is not limited only to the form of an electronic musical instrument, but may be realized by a combination of a personal computer and application software. The application software stored in a recording medium such as a magnetic disk may be supplied to the personal computer or it may be supplied via a network to the personal computer.

The performance setting data selecting apparatus may be realized as an integrated part of an electronic musical instrument with built-in sound source and automatic performance units, or may be realized as a discrete part of such an electronic musical instrument interconnected by communication means such as MIDI and networks. The invention is not limited only to keyboard musical instruments, but may be applied to other instruments such as stringed musical instruments, wind musical instruments, and percussion musical instruments.

The present invention has been described in connection with the preferred embodiments. The invention is not limited only to the above embodiments. It is apparent that various modifications, improvements, combinations, and the like can be made by those skilled in the art.

What is claimed is:

1. A performance setting data selecting apparatus comprising:

means for storing a correspondence between each of a plurality of tune names and performance setting data suitable for playing each tune;

means for designating the tune name of each tune; and

means for setting the performance setting data corresponding to the tune name of each tune designated by said designating means by reading the performance setting data from said storing means.

2. A performance setting data selecting apparatus according to claim 1, wherein

said storing means comprises:

data storing means for storing a plurality set of performance setting data; and

a table for storing a correspondence between each tune name of the plurality of tunes and each set of the performance setting data stored in said data storing means suitable for playing a tune having the associated tune name, and

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said designating means reads the performance setting data corresponding to the tune name designated by said designating means from said data storing means by referring to said table and setting the read performance setting data.

3. A performance setting data selecting apparatus according to claim 1, wherein

said storing means stores a plurality set of performance setting data and stores a correspondence, for each set of the performance setting data, between a tune name or names and each set of the performance setting data suitable for playing a tune having the associated tune name or names.

4. A performance setting data selecting apparatus according to claim 1, wherein the performance setting data includes at least one of an accompaniment style, a tone color, a tempo and a harmony.

5. A performance setting data selecting apparatus according to claim 1, wherein said setting means changes the performance setting data read from said storing means in accordance with a user instruction and sets the changed performance setting data.

6. A performance setting data selecting apparatus according to claim 1, further comprising means for displaying the tune names stored in said storing means on a display device.

7. A performance setting data selecting apparatus according to claim 6, wherein said displaying means sorts the tune names and displays the sorted tune names, in accordance with a predetermined rule.

8. A performance setting data selecting apparatus according to claim 6, wherein said displaying means displays only the tune names searched by keyword searching.

9. A performance setting data selecting apparatus according to claim 7, wherein said displaying means sorts the tune names in an alphabetical order and displays the sorted tune names.

10. A performance setting data selecting apparatus according to claim 8, wherein said displaying means performs a search by using at least one of an artist, a composer, and a genre as a keyword.

11. A performance setting data selecting apparatus according to claim 3, wherein said storing means stores the plurality set of performance setting data and the tune names, the performance setting data sets and the tune names being associated with each other.

12. A performance setting data selecting apparatus according to claim 6, wherein said displaying means displays the performance setting data read by said setting means from said storing means on the display device.

13. A performance setting data selecting apparatus according to claim 12, wherein said setting means changes the performance setting data displayed by said displaying means in accordance with a user instruction and sets the changed performance setting data.

14. A performance setting data selecting apparatus comprising:

memory which stores a plurality of performance setting data suitable for playing a plurality of tunes and respective correspondences between the plurality of performance setting data and the plurality of tunes;

designating device which designates one of the plurality of tunes;

controlling device which sets one of the plurality of performance setting data corresponding to the designating

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nated tune by reading out the one from the memory based on the correspondences,

wherein an automatic accompaniment of the designated tune is executed under the set performance setting data.

15. A performance setting data selecting method comprising the steps of:

(a) preparing means for storing a correspondence between each of a plurality of tune names and performance setting data suitable for playing each tune;

(b) designating the tune name of each tune; and

(c) setting the performance setting data corresponding to the tune name of each designated tune by reading the performance setting data from said storing means.

16. A medium storing a program to be executed by a computer, the program comprising the processes of:

(a) preparing means for storing a correspondence between each of a plurality of tune names and performance setting data suitable for playing each tune;

(b) designating the tune name of each tune; and

(c) setting the performance setting data corresponding to the tune name of each designated tune by reading the performance setting data from said storing means.

17. A medium according to claim 16, wherein

said storing means comprises:

data storing means for storing a plurality set of performance setting data; and

a table for storing a correspondence between each tune name of the plurality of tunes and each set of the performance setting data stored in said data storing means suitable for playing a tune having the associated tune name, and

said process (c) reads the performance setting data corresponding to the designated tune name from said data storing means by referring to said table and setting the read performance setting data.

18. A medium according to claim 16, wherein

said process (a) prepares the storing means for storing a plurality set of performance setting data and storing a correspondence, for each set of the performance setting data, between a tune name or names and each set of the performance setting data suitable for playing a tune having the associated tune name or names.

19. A medium according to claim 16, wherein the performance setting data includes at least one of an accompaniment style, a tone color, a tempo and a harmony.

20. A medium according to claim 16, wherein said process (c) changes the performance setting data read from said storing means in accordance with a user instruction and sets the changed performance setting data.

21. A medium according to claim 16, further comprising the process (d) of displaying the tune names stored in said storing means on a display device, before said process (b).

22. A medium according to claim 18, wherein said process (a) prepares the storing means for storing a correspondence between each set of the performance setting data and a plurality of tune names, after said process (b).

23. A medium according to claim 21, wherein said process (d) displays only the tune names searched by keyword searching.

* * * * *

United States Patent [19]

[11] Patent Number: **5,969,283**

Looney et al.

[45] Date of Patent: **Oct. 19, 1999**

- [54] **MUSIC ORGANIZER AND ENTERTAINMENT CENTER**
- [75] Inventors: **Brian M. Looney, Lexington, Mass.; Dale R. McMullin, Parker, Colo.; Joseph Pasciuto, Bellingham; Edward T. Doyle, Westford, both of Mass.**
- [73] Assignee: **Looney Productions, LLC, Lexington, Mass.**

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Primary Examiner—Stanley J. Witkowski
 Attorney, Agent, or Firm—Cesari and McKenna LLP

- [21] Appl. No.: **09/098,843**
- [22] Filed: **Jun. 17, 1998**
- [51] Int. Cl.⁶ **G09B 5/00; G09B 15/04; H04L 9/00; G10H 1/46**
- [52] U.S. Cl. **84/609; 84/639; 84/478; 84/633; 380/19; 380/25; 380/49; 380/53; 434/307 A**
- [58] Field of Search **84/601, 602, 609-614, 84/633-640, 477 R, 478, DIG. 6; 434/307 R, 307 A; 380/19-21, 23-25, 30, 49, 50, 53**

[57] **ABSTRACT**

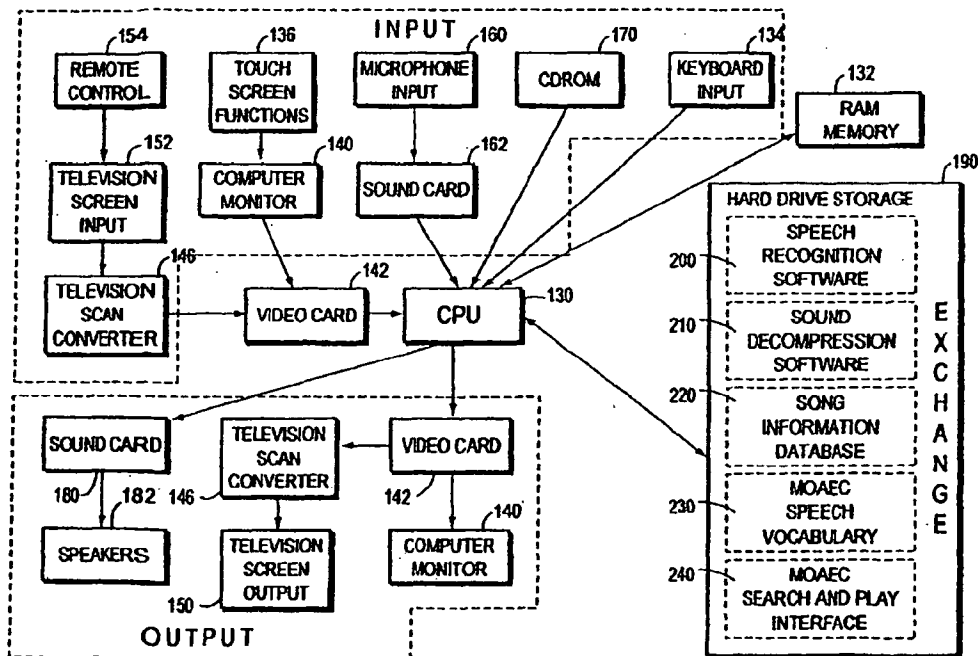
A music organizer and entertainment center provides a center having a microprocessor, sound card functions and high-volume data storage and retrieval units for playing back music according to a variety of predetermined categories. Music can be played back in random form or can be played back according to a particular pre-selected order. The categories are provided by service provider who delivers selected titles and/or songs to the end user. The songs are typically loaded using a custom CD-ROM provided from the service provider. The music is provided in data-compressed form and is decompressed and processed through a sound card during playback. The categories can include a variety of parameters such as title, artists, date, speed, dance characteristics, subjective energy level and music style, such as easy-listening, upbeat, etc.

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18 Claims, 27 Drawing Sheets



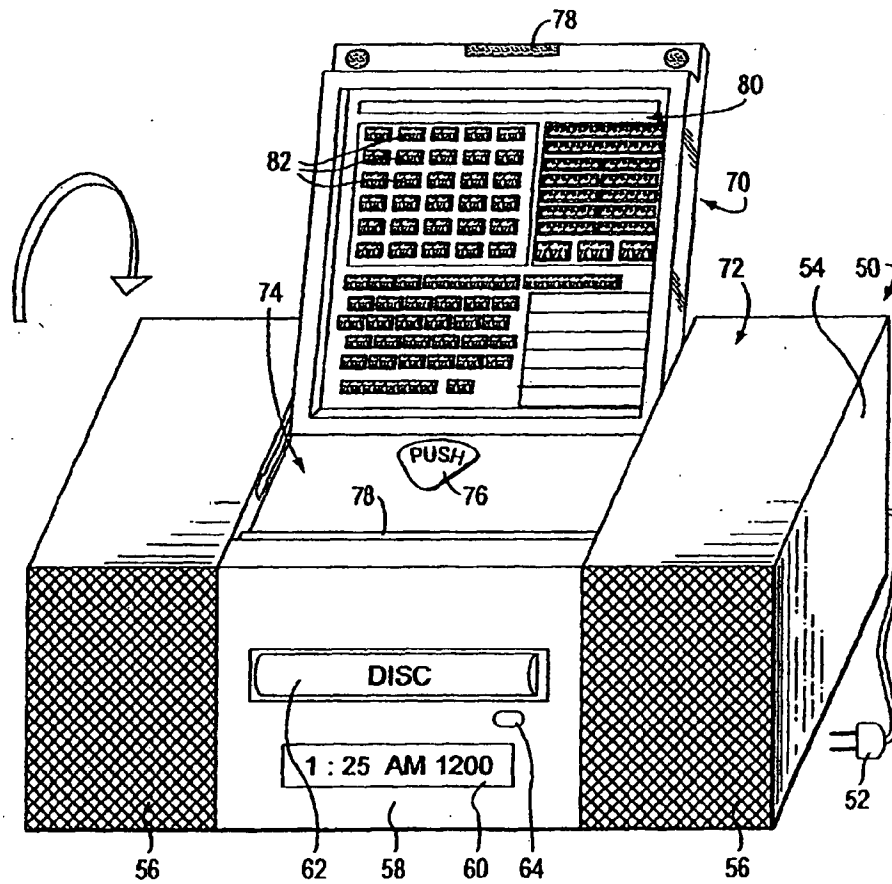


FIG. 1

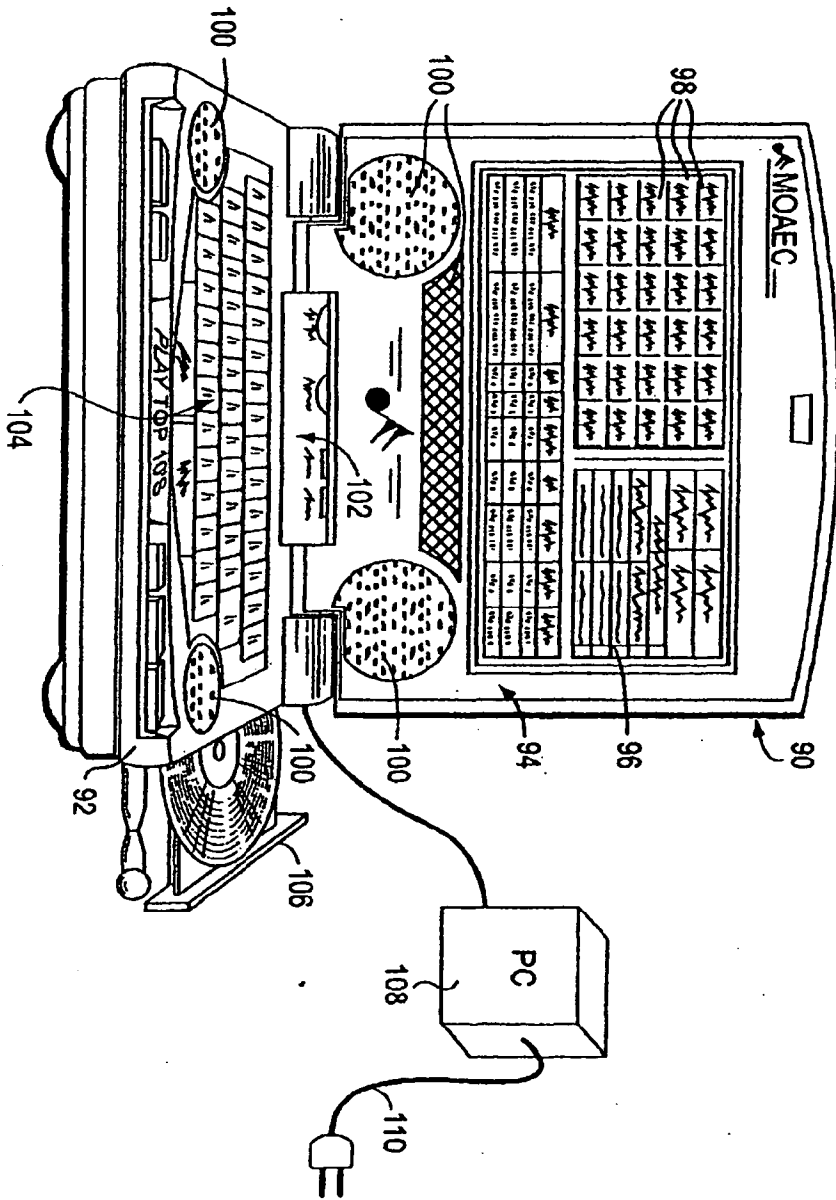


FIG. 2

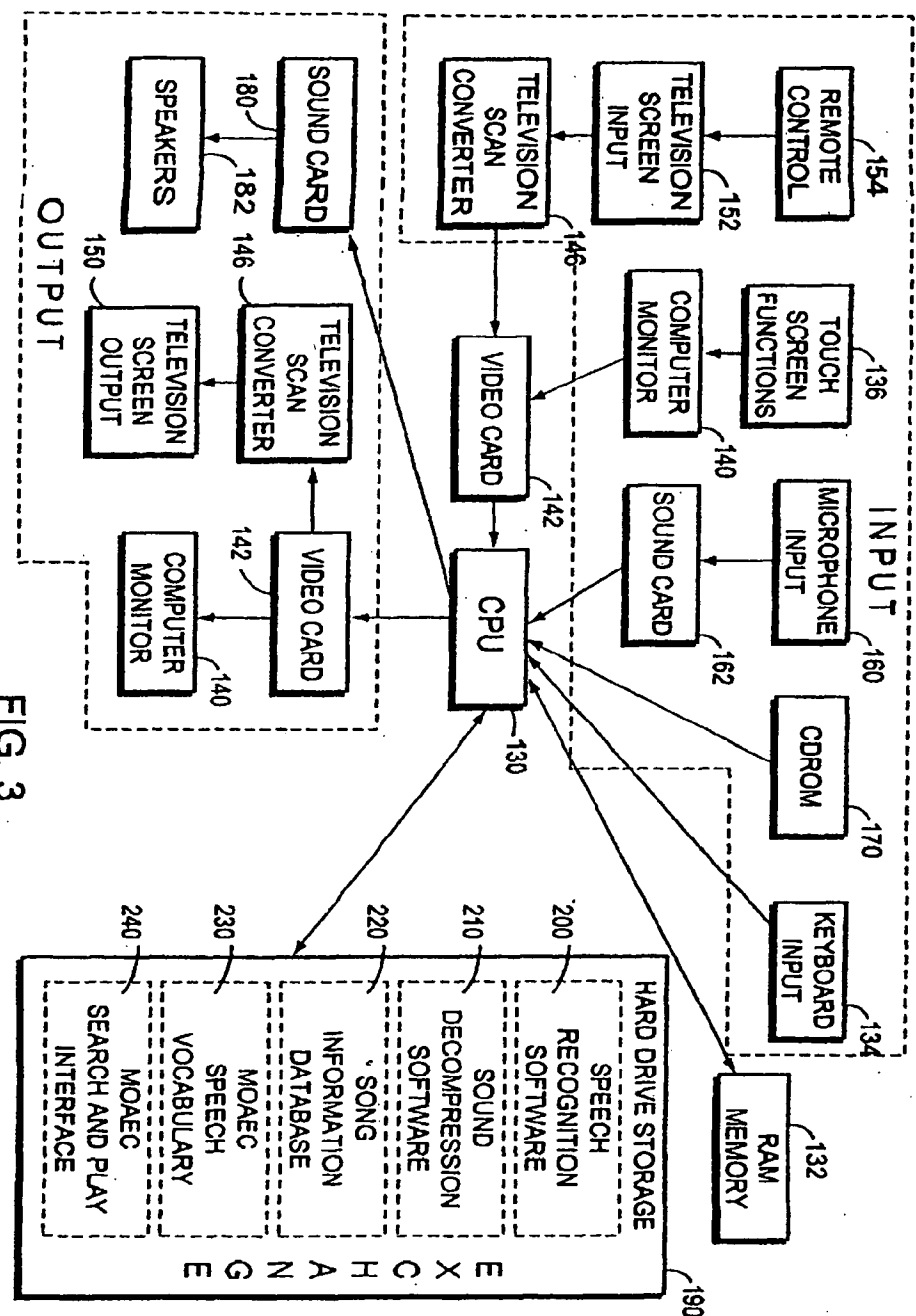


FIG. 3

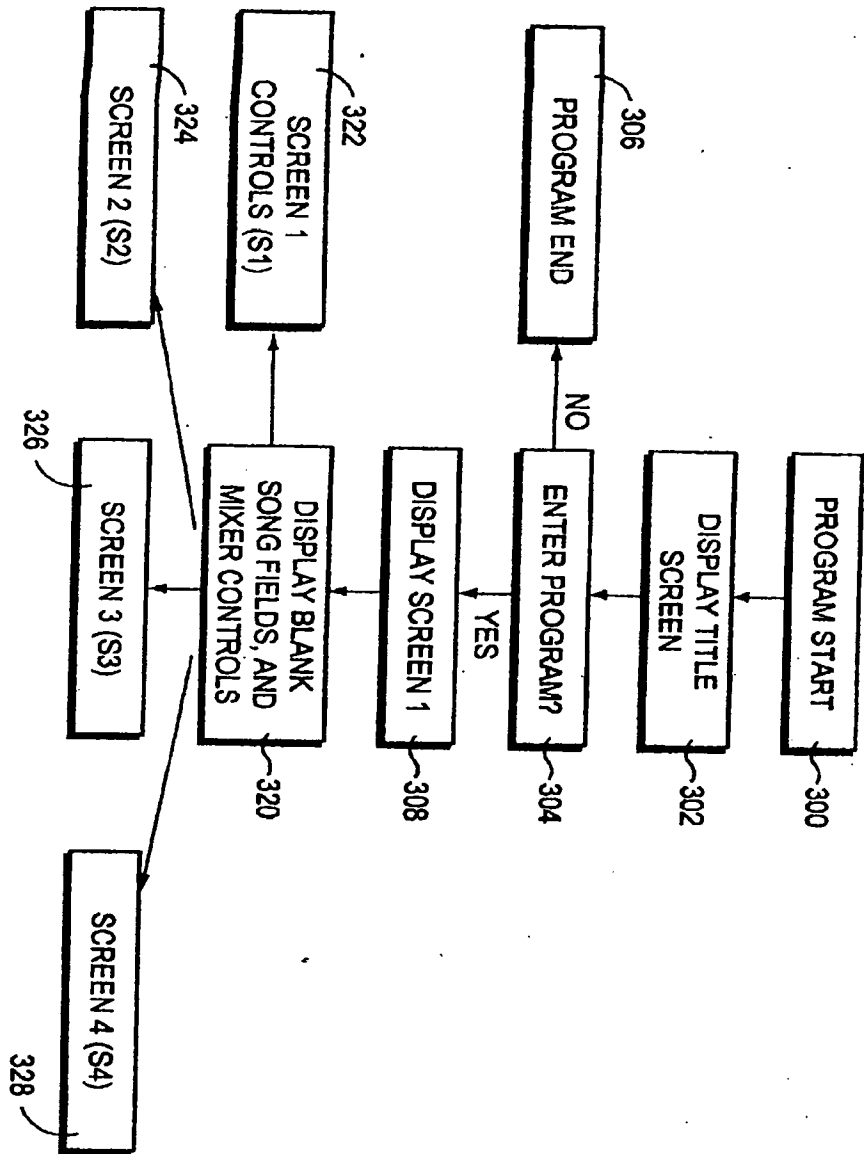
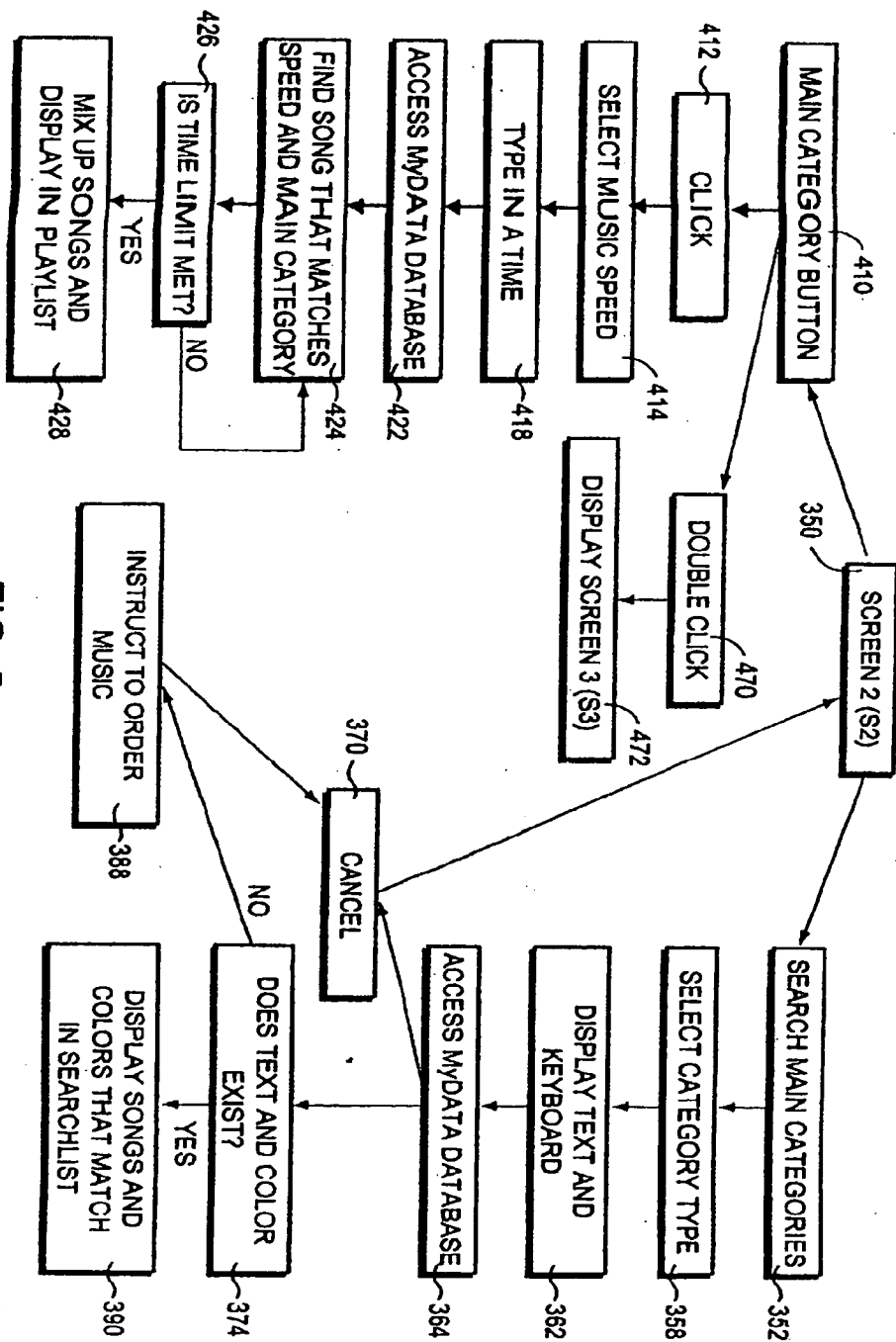


FIG. 4

FIG. 5



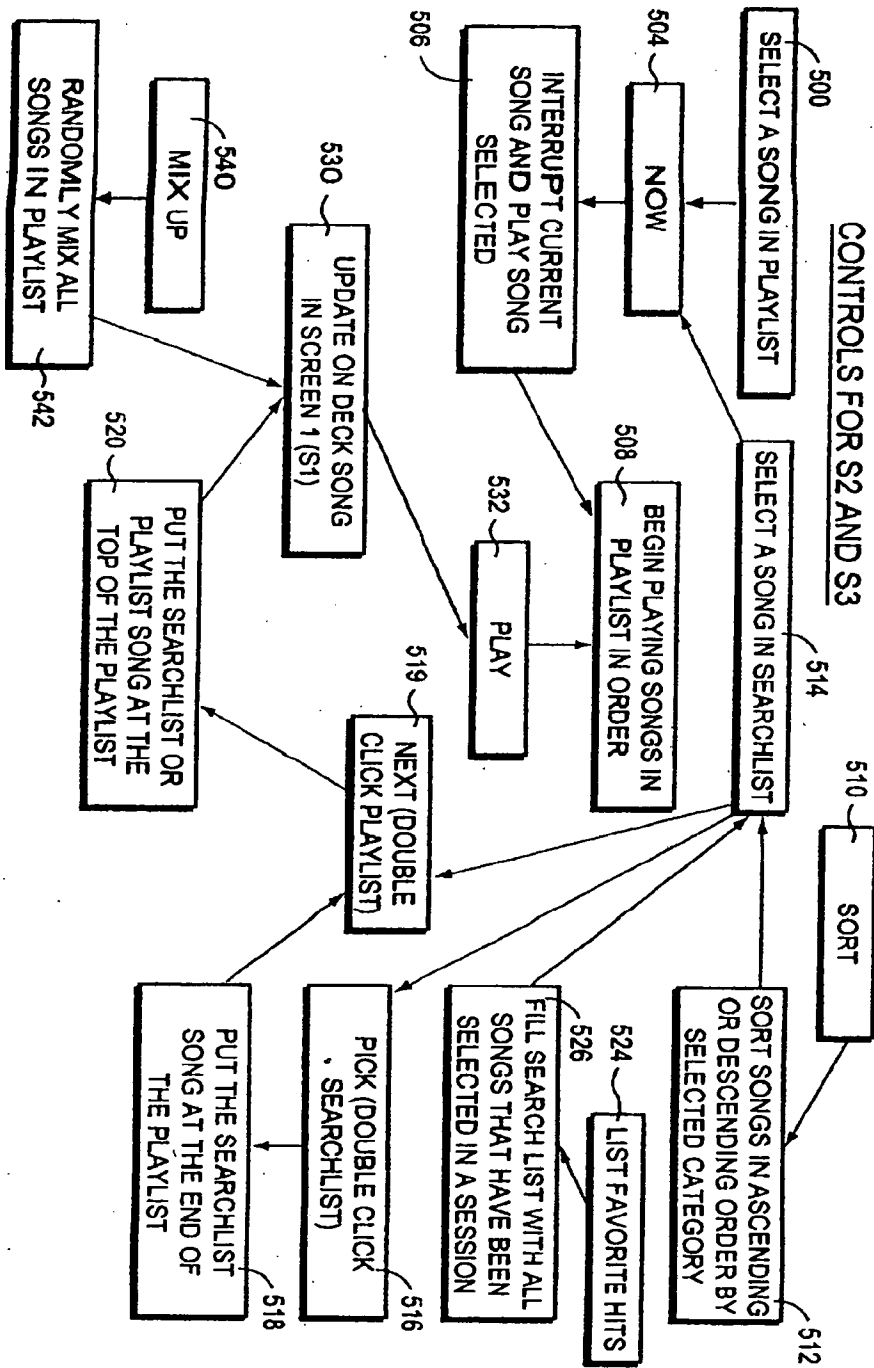


FIG. 6

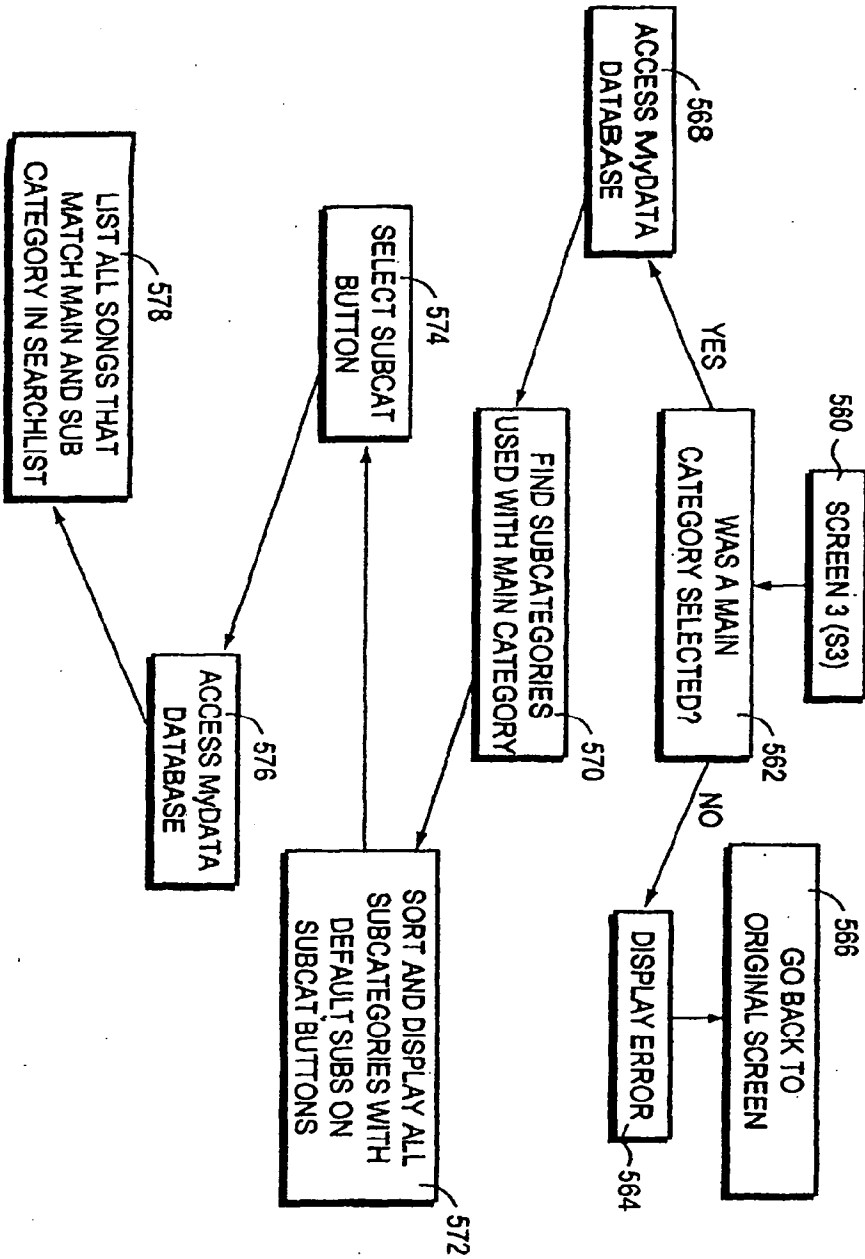


FIG. 7

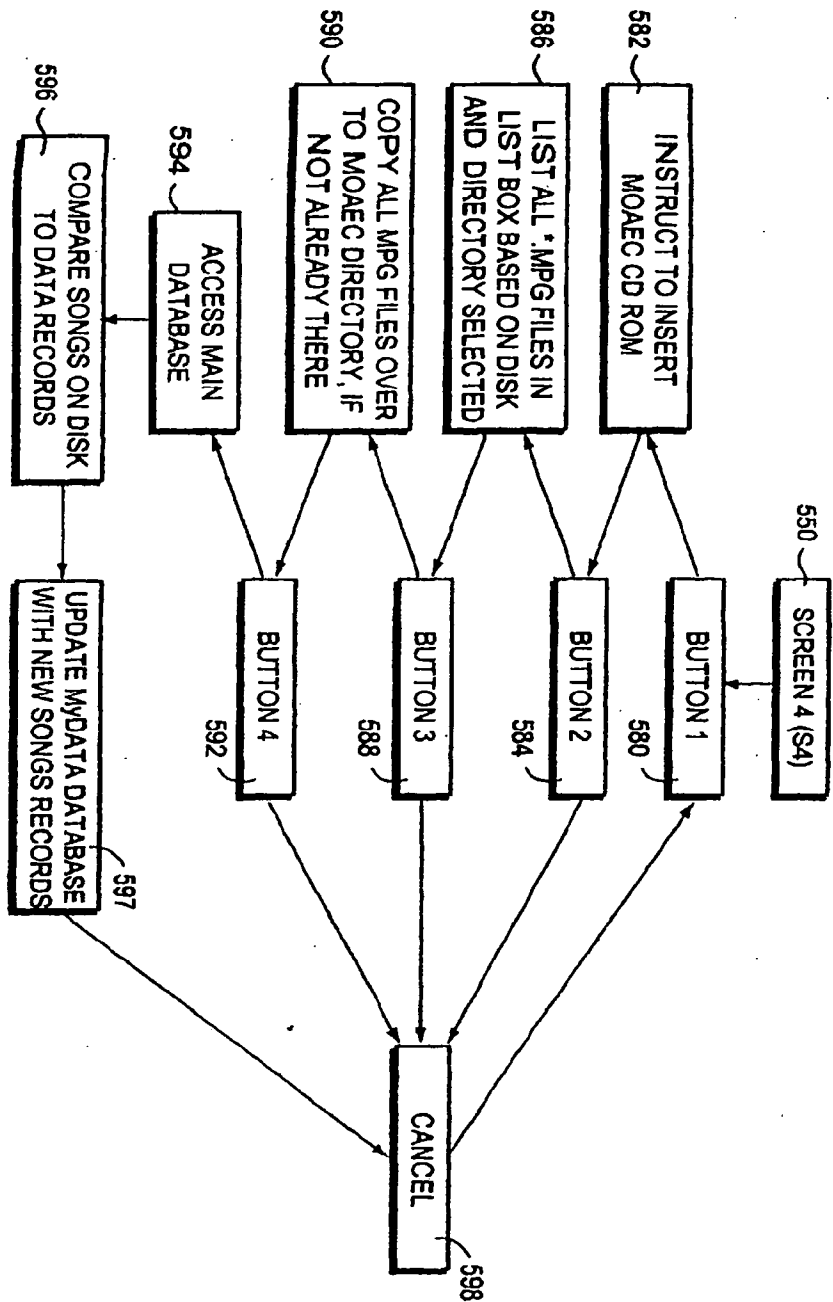


FIG. 8

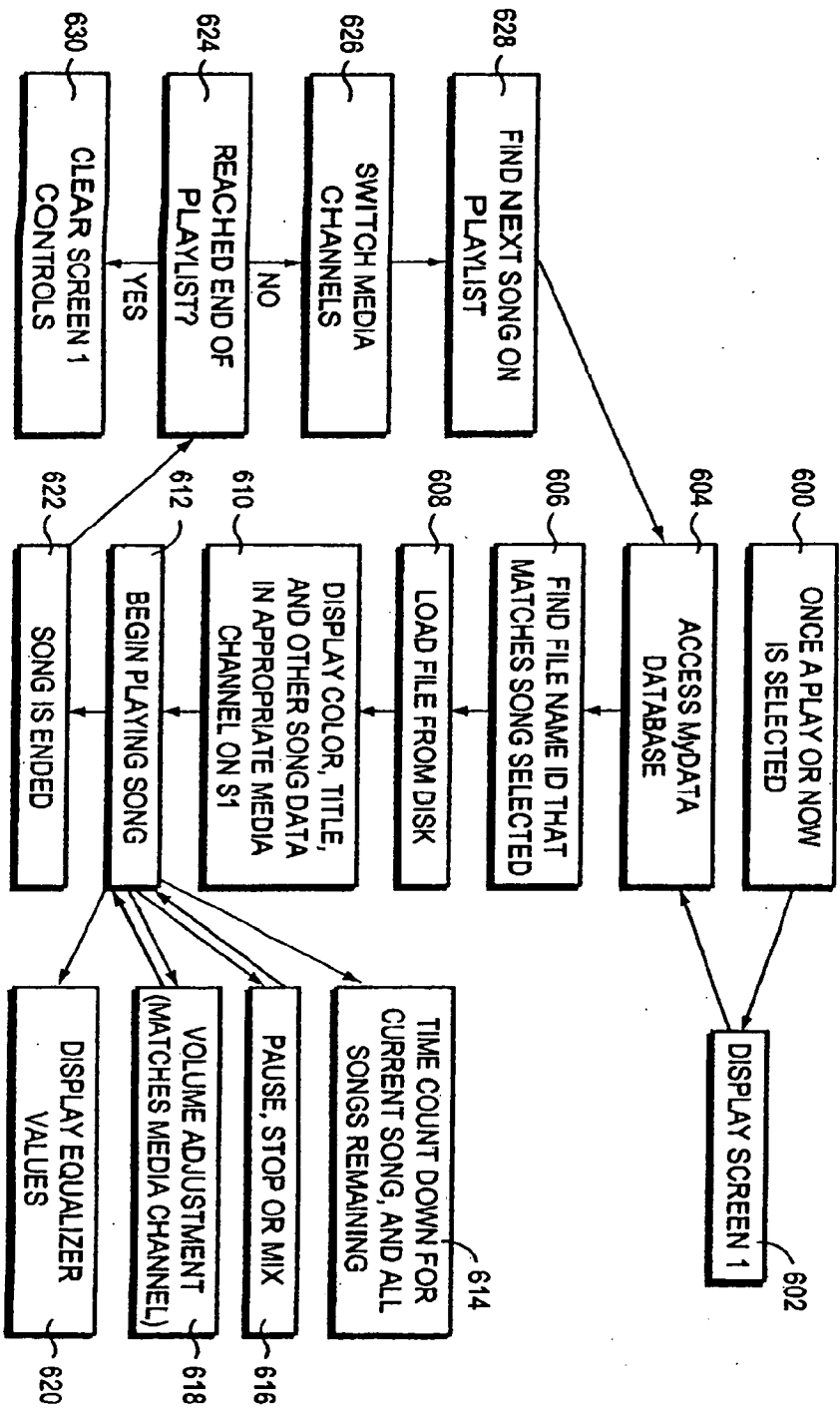


FIG. 9

SAVING AND LOADING
PLAYLIST

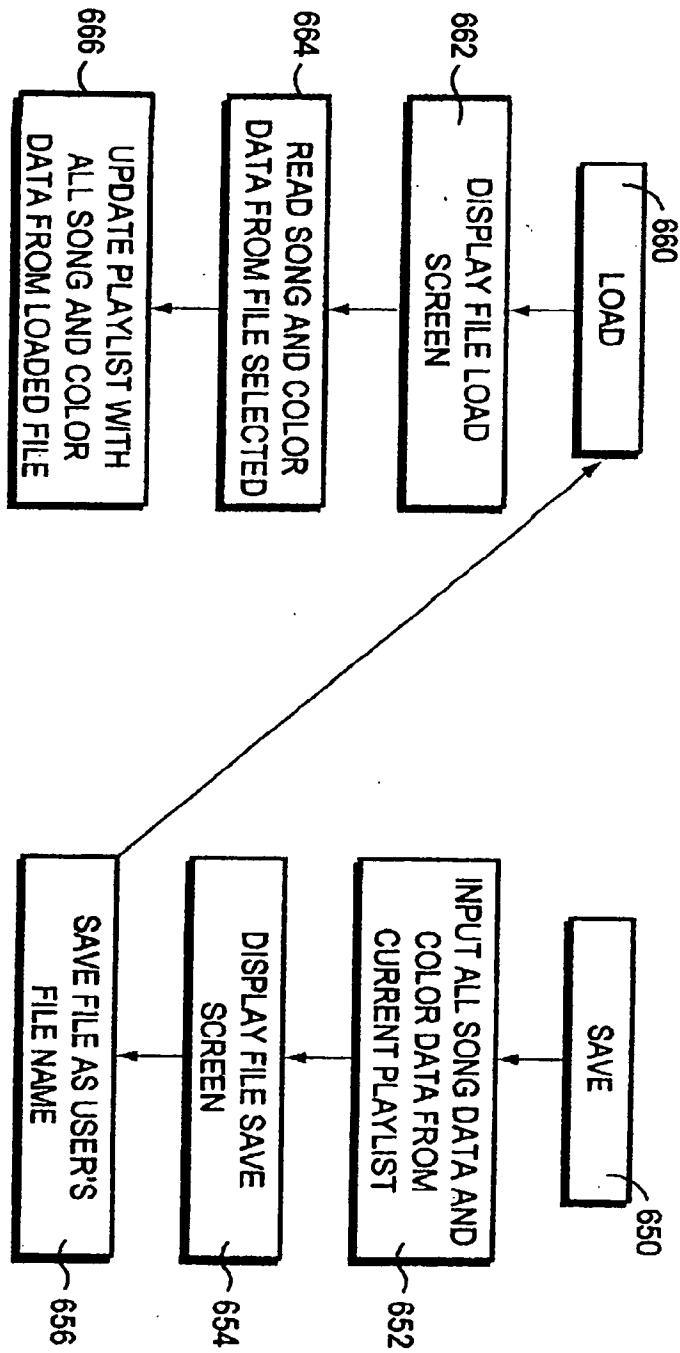


FIG. 10

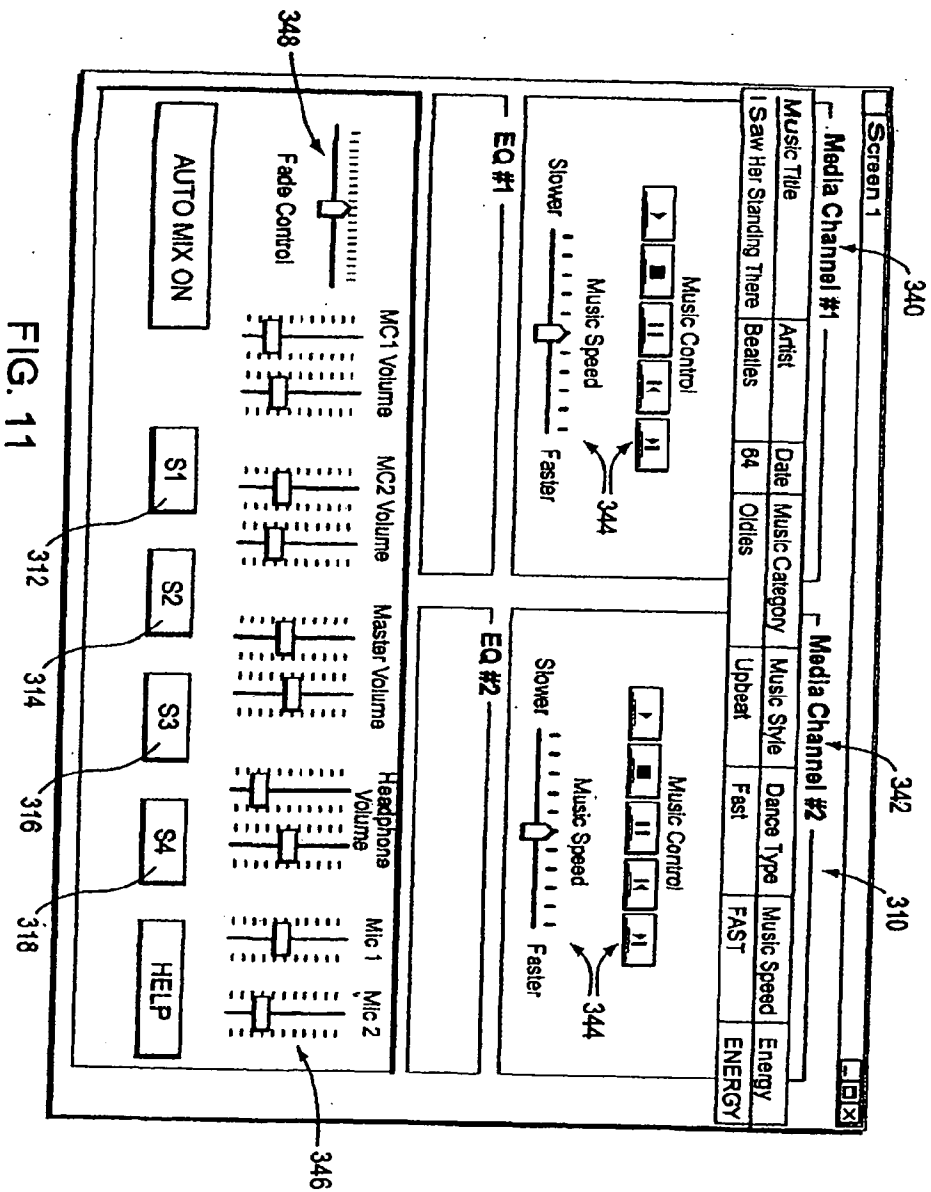


FIG. 11

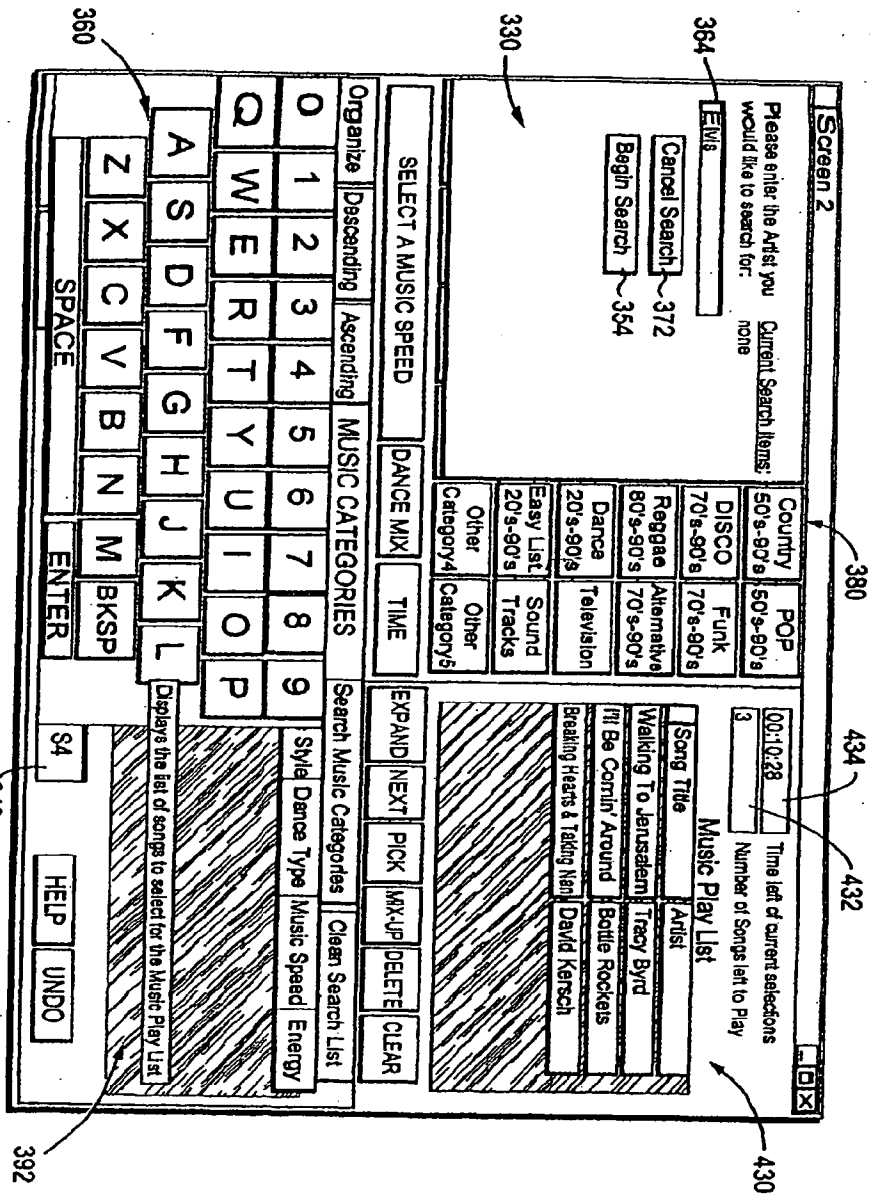


FIG. 12

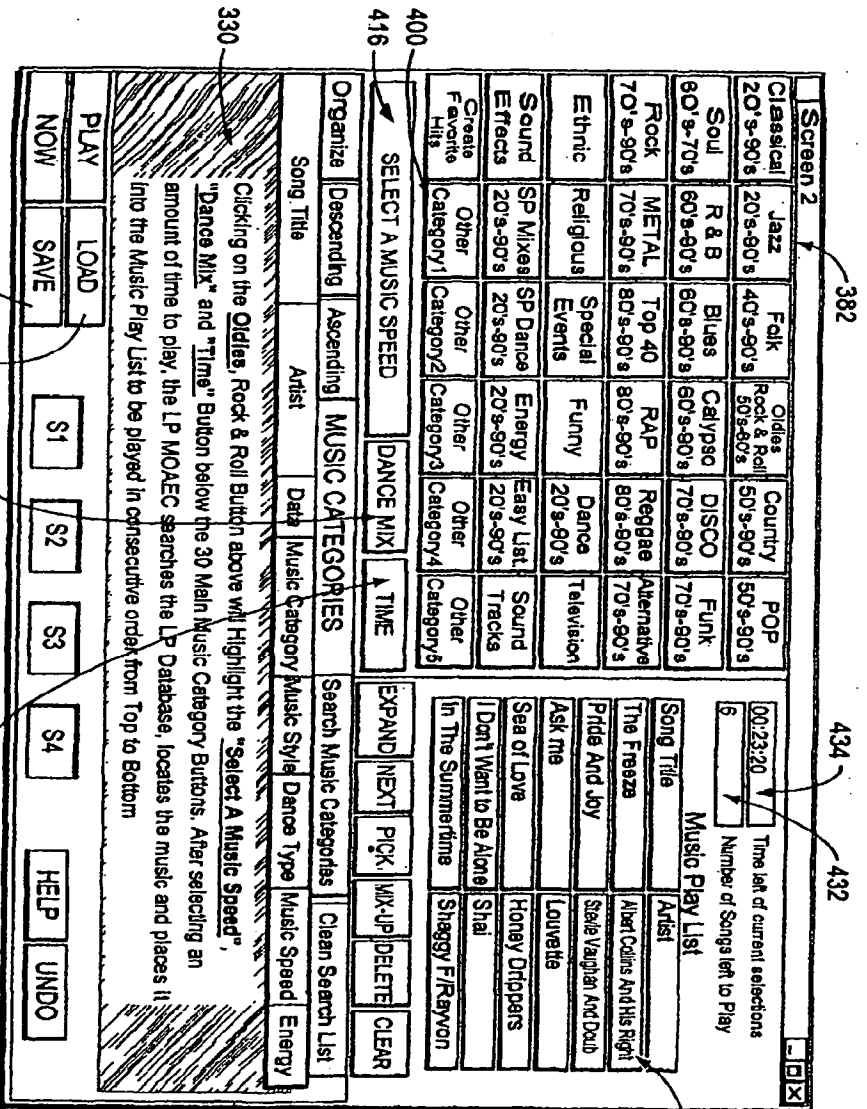


FIG. 13

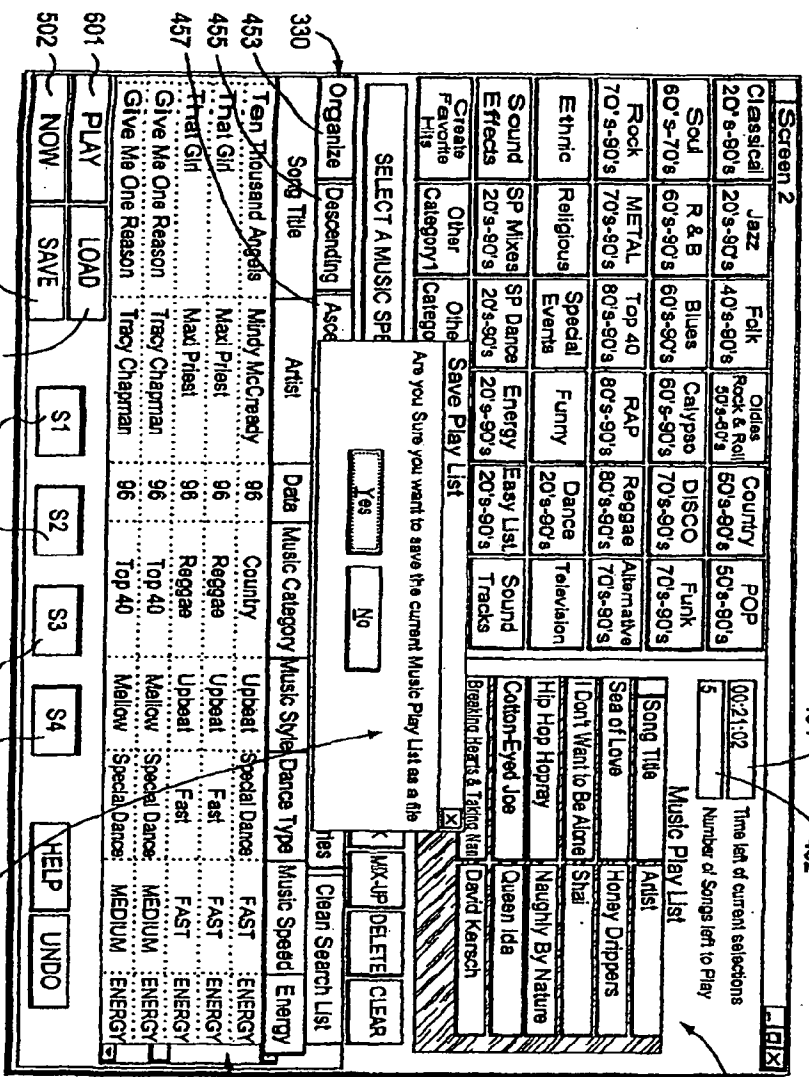


FIG. 14

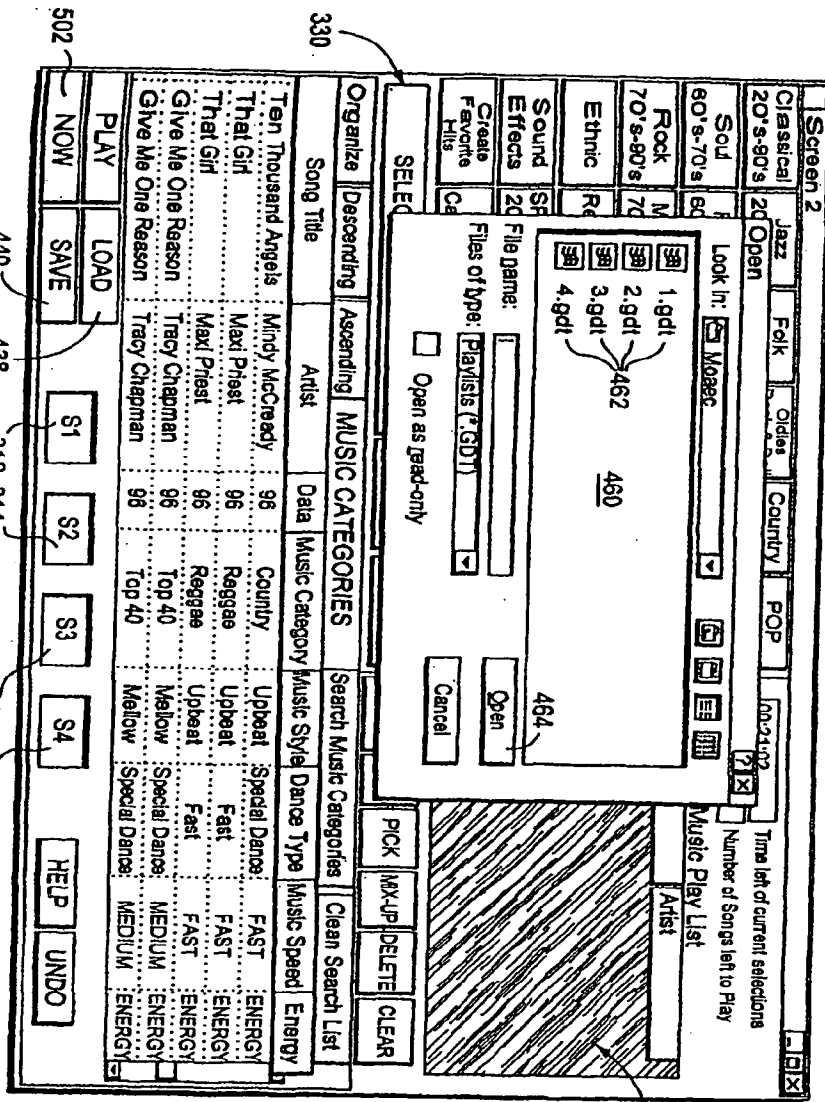


FIG. 15

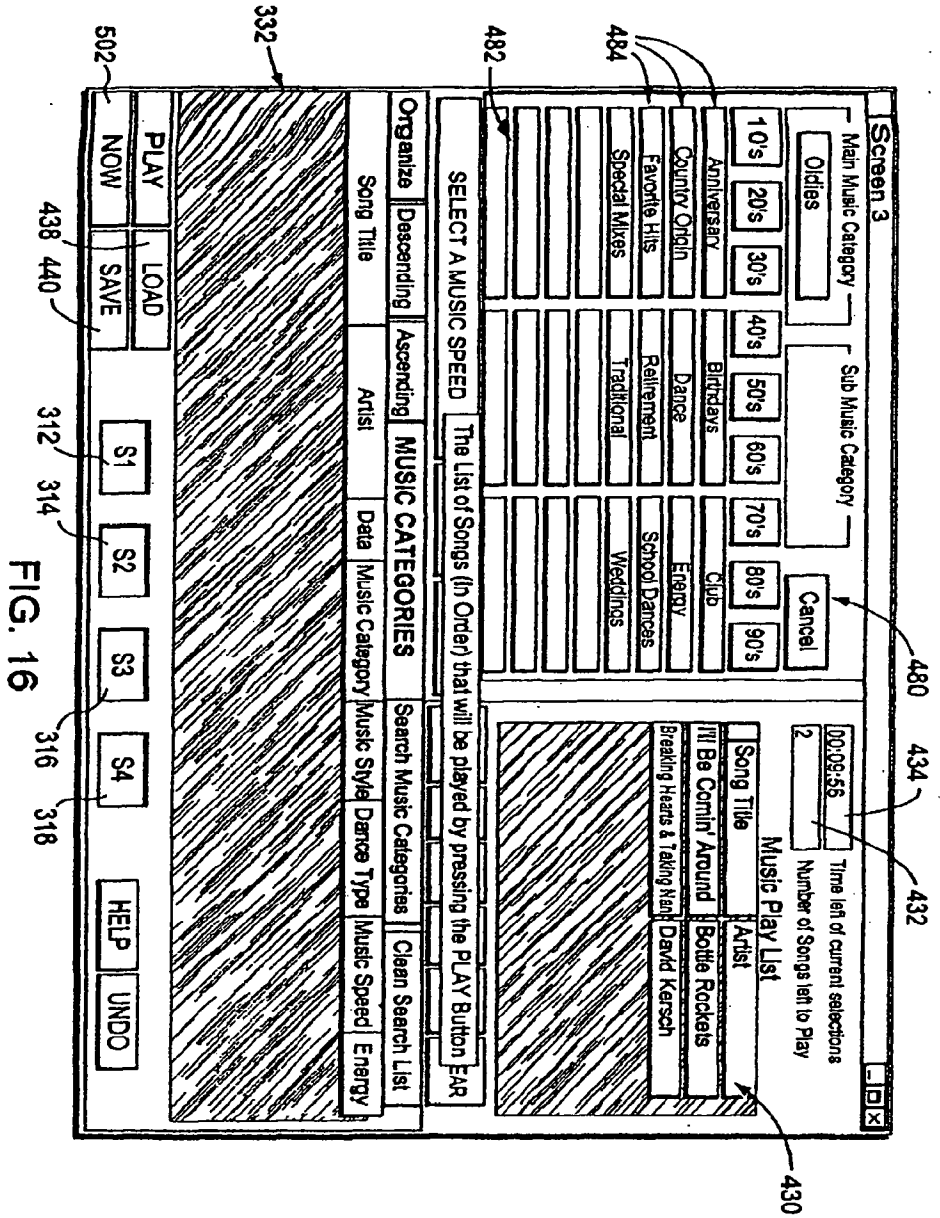


FIG. 16

Record ID	LP	Complete Music Guide	Table	552	554	556	558	560	562	564	566	568	570	572
Test ID	Disk Num	Song Num	Title	Artist	MSV	DR	SP	Time	ENT	TA	CA	MA	TA	CA
OK	2:RH34	3416	1979	Smashing Pumpkins	UP		M	260						
OK	3:RU14	10	1979	Smashing Pumpkins	UP		M	310						
OK	5:1327	11	A Little Bit Me, A Little You	Red Hot Chili Peppers	UP		M	211		FAST D				
OK	6:1317	11	Aeroplane	Red Hot Chili Peppers	UP		M	251		FAST D				
OK	11:RH36	3607	Big Me	Foo Fighters	UP		M	133		MELLO				
OK	12:1319	13	Big Me	Foo Fighters	UP		M	133		MELLO				
OK	13:1319	10	Big Bang Baby	Stone Temple Pilots	UP		F	203						
OK	15:1320	15	Bluster	Stone Temple Pilots	UP		M	194						
OK	16:1314	16	Brother	Stone Temple Pilots	UP		M	237						
OK	17:RH38	06	But Anyway (Studio E Blues Traveler)	Blues Traveler	MEL		M	179						
OK	19:RH36	3618	Chamagne Super No. 1	Oasis	MEL		M	304						
OK	20:1317	13	Chamagne Super No. 1	Oasis	MEL		M	301						
OK	22:1322	04	Charm (Radio Remik)	Philosophie Kings	UP		M	247						
OK	23:RH35	3508	Closer to Free	Boyz n the Banda	UP		M	191		FAST D				
OK	24:1322	13	Common People (7 & 7)	Common People	UP		M	249		FAST D				
OK	25:RH37	3702	Counting Blue Cars	Dishwalla	UP		M	263						
OK	26:1319	15	Counting Blue Cars (E. Dishwalla)	Dishwalla	UP		M	263						
OK	28:1325	17	Dangerous Type	Latties To Cleo	UP		M	194						
OK	31:1360	14	Dirt Speak	No Doubt	UP		M	252						
OK	34:RH35	3502	Everything Falls Apart	Dog's Eye View	UP		F	227						
F/OK	35:1318	17	Food	Jays Or Clay	UP		F	196						
F/OK	38:RH36	3614	Flood	Jays Or Clay	UP		F	197						
OK	37:RH35	3513	Follow You Down	Shin Blossoms	UP		F	226						
OK	38:1313	11	Follow You Down	Shin Blossoms	UP		F	226						
OK	40:1334	11	Free To Decide	Cranberries	MEL		M	285						
OK	41:RH36	03	Free To Decide	Cranberries	MEL		M	285						
F/OK	43:1323	18	Girl Don't Tell Me	Fuzzy	UP		F	408						
F/OK	44:1324	03	God Only Knows	INVONS	UP		M	211						

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FIG. 17

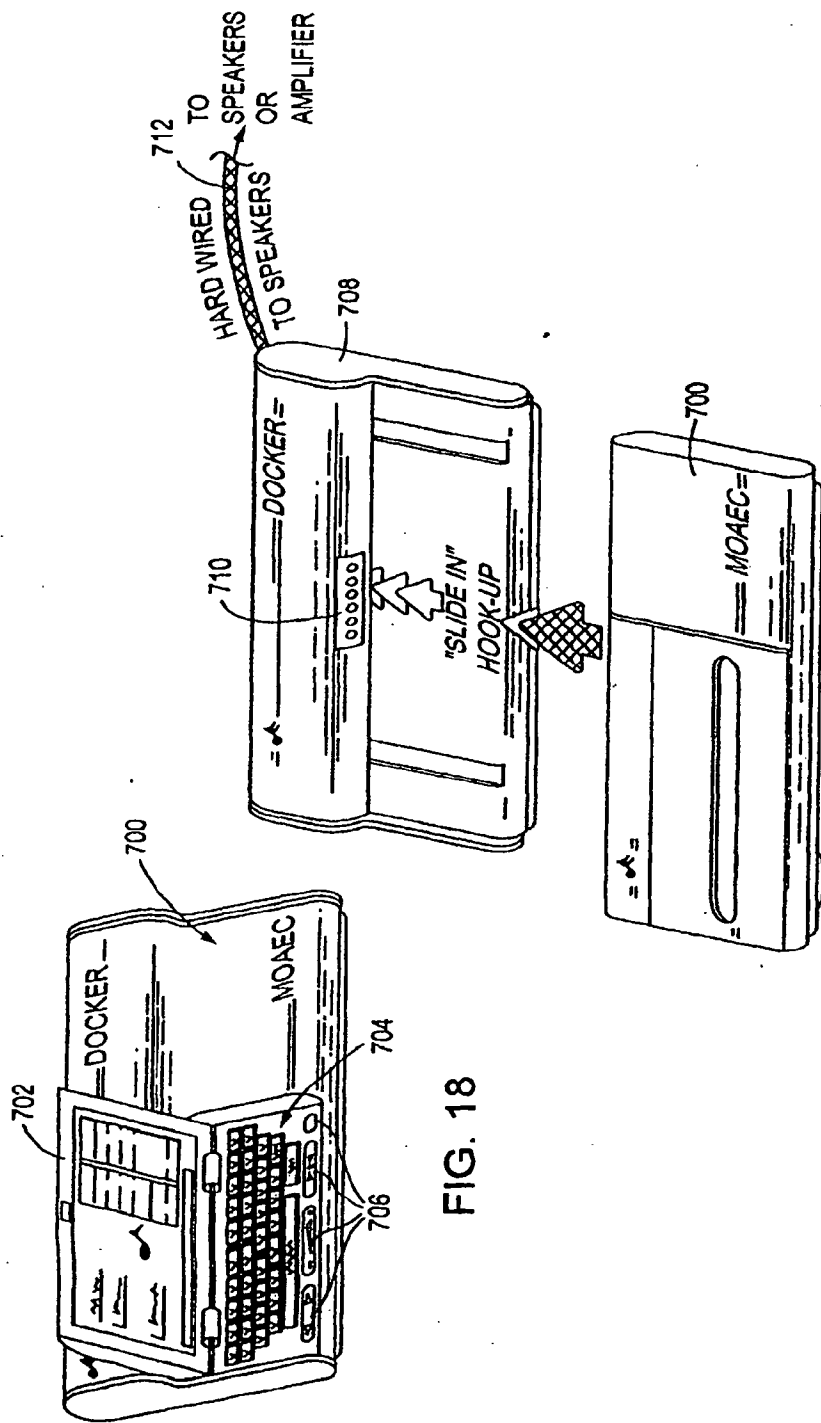


FIG. 18

FIG. 19

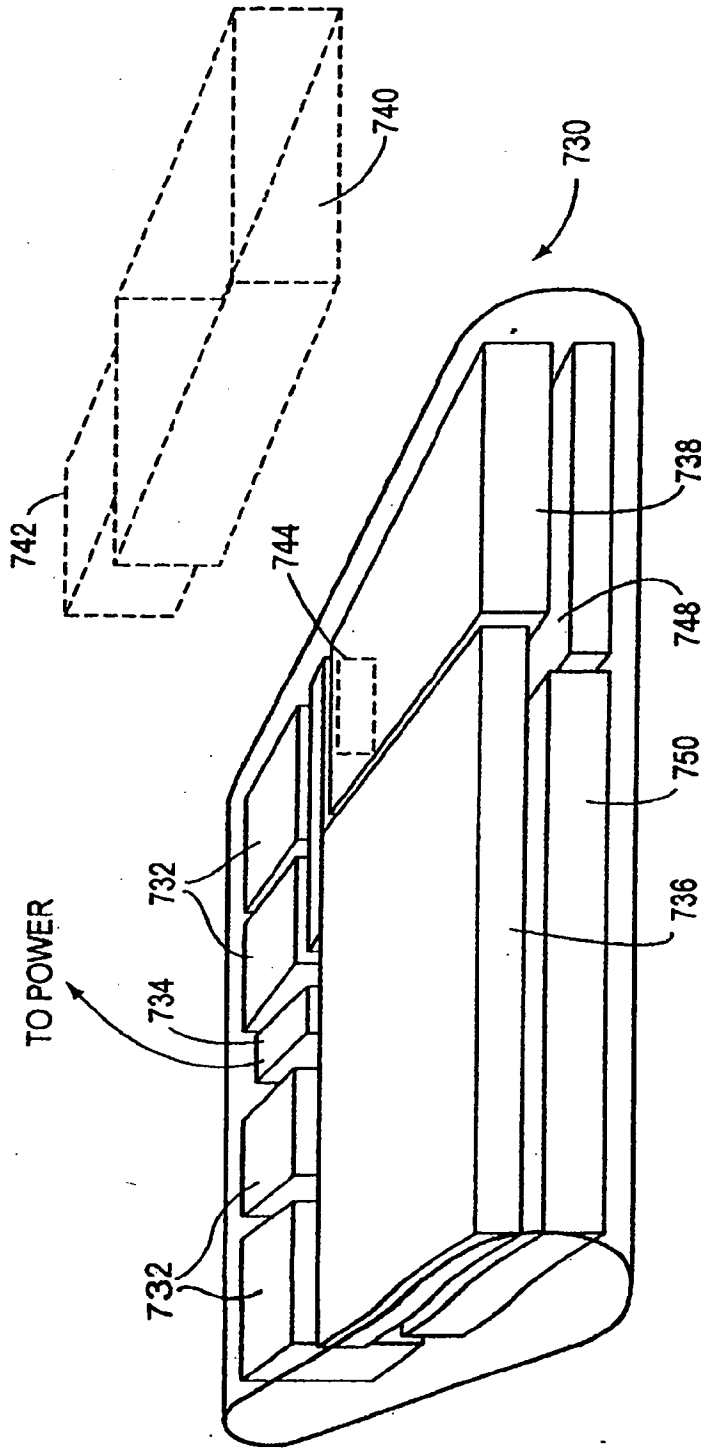


FIG. 20

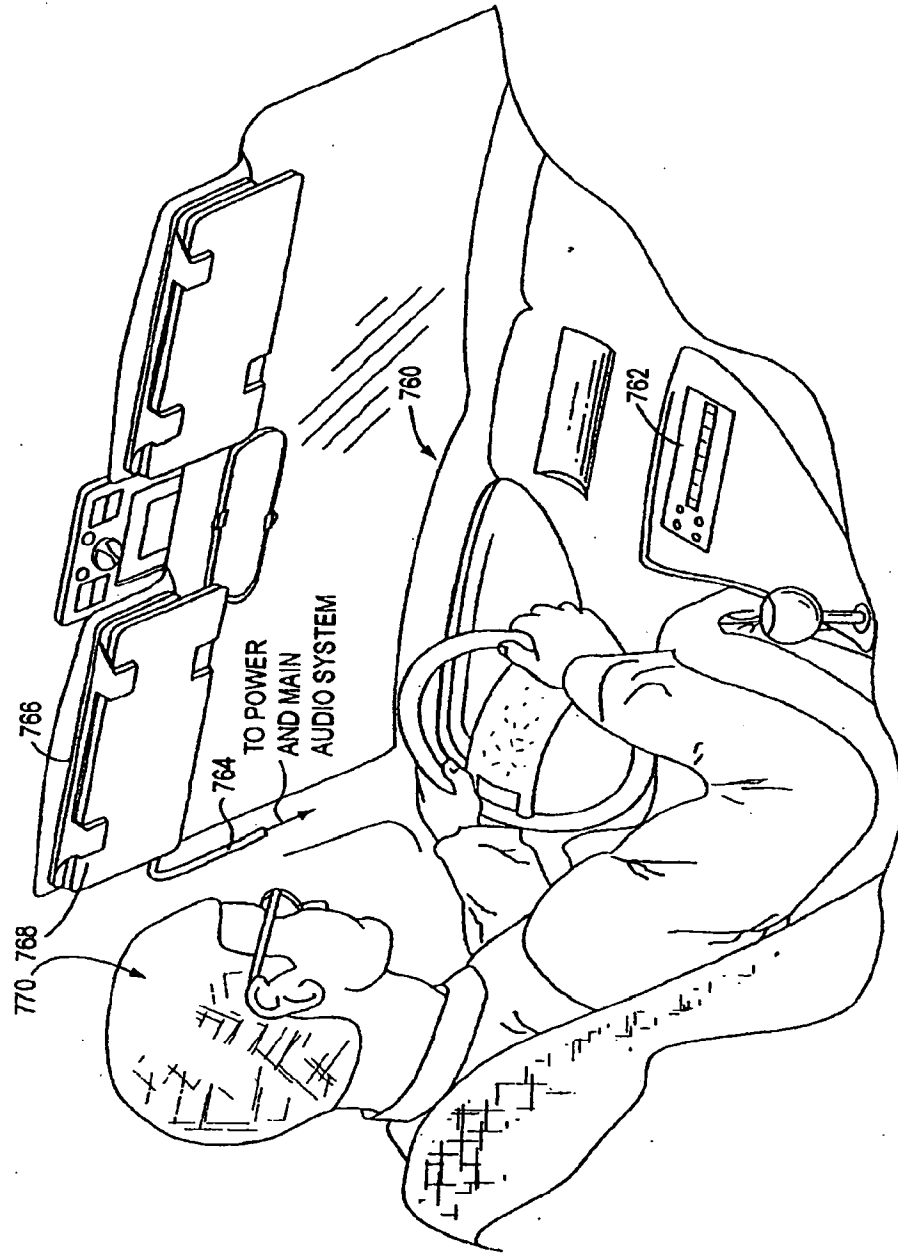


FIG. 21

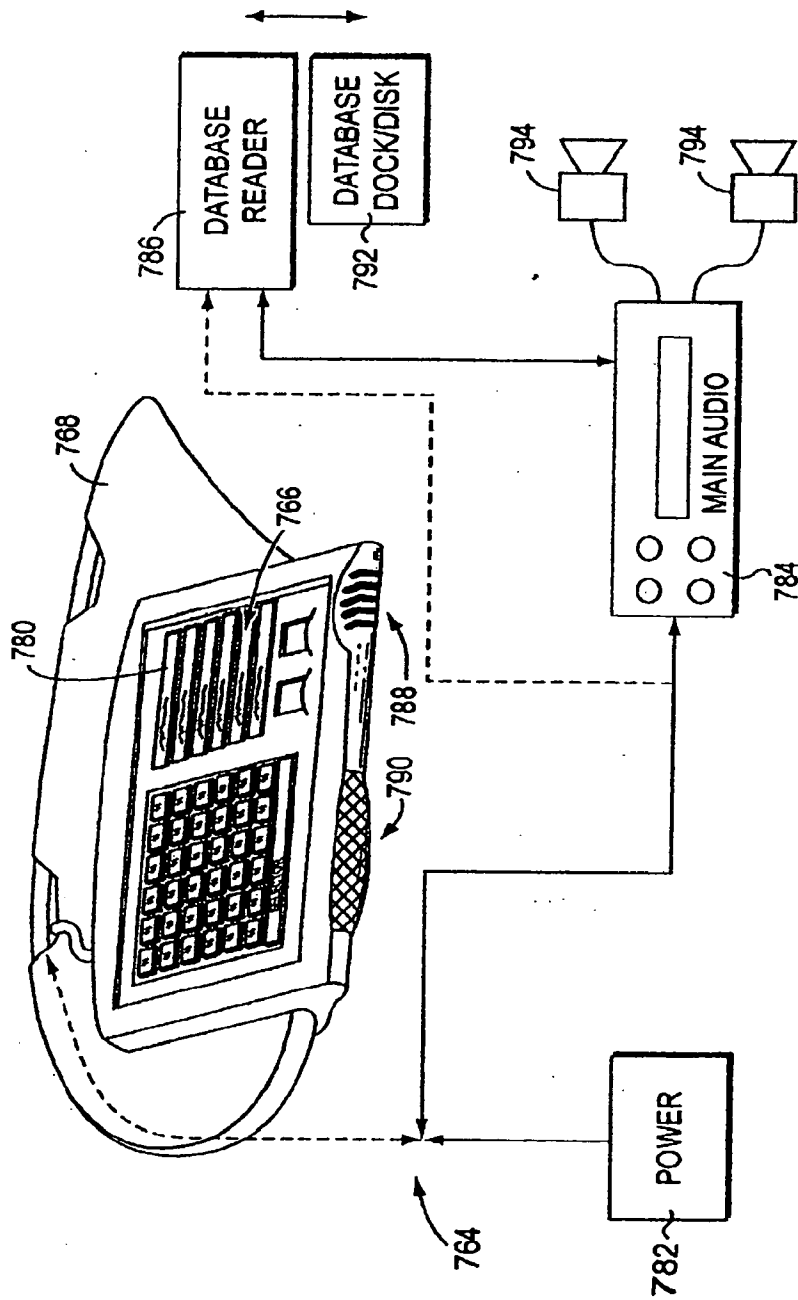


FIG. 22

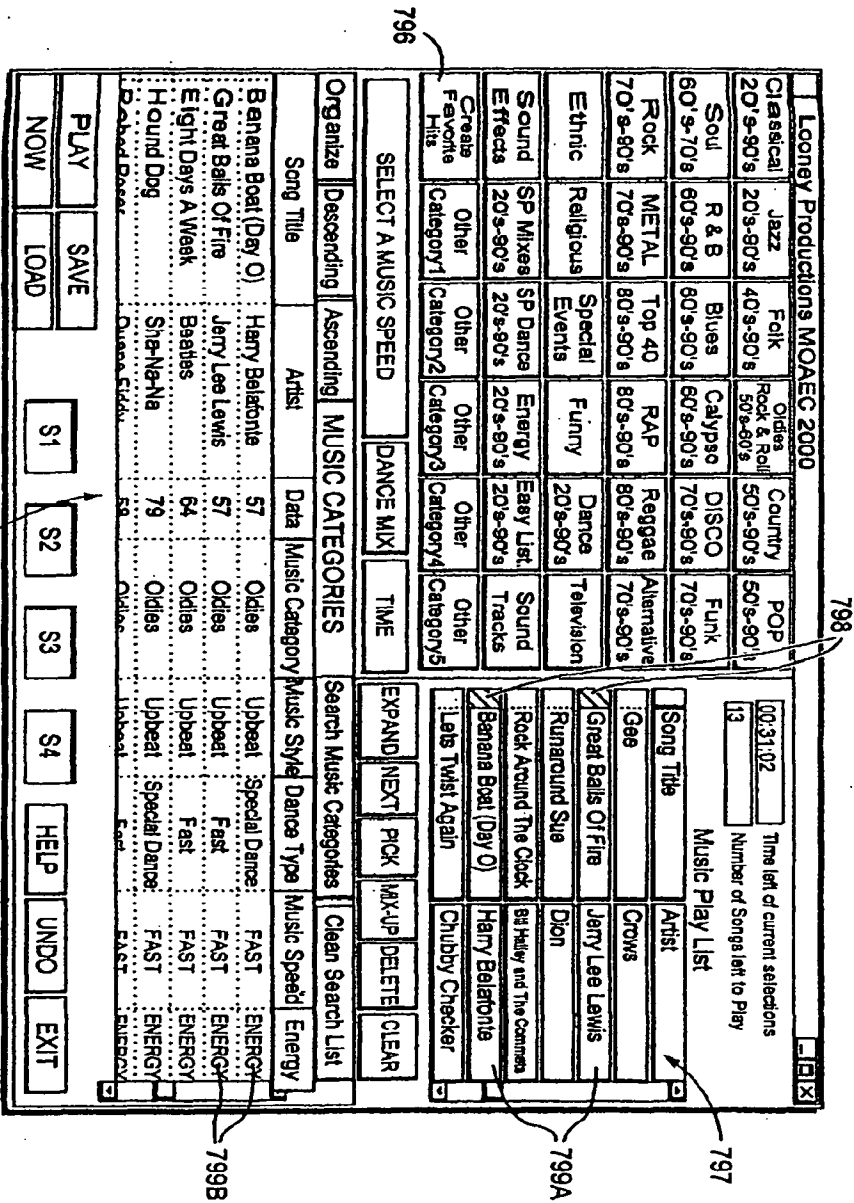


FIG. 23

The Complete MOAEC Music Library

Looney Productions MOAEC 2000

816	801	802	804	806	808	810	812	814	818
Own	Song Title	Artist	Date	Music Category	Music Style	Dance Type	Music Speed	Energy	Rating
Yes	Head Overfeet	Archie Morssett	95	Alternative	Uppbeat	Special Dance	Medium	Energy	
Yes	He Is	Ashley Cleveland		Country	Mellow	Special Dance	Medium	Energy	
Yes	Spartan	Babylon Zoo		Rock	Uppbeat	Special Dance	Fast	Energy	
Yes	Spartan Soul Versus	Big Soul Revival		Rock	Uppbeat	Special Dance	Fast	Energy	R
Yes	Here With Me	Blind Melon		Alternative	Uppbeat	Special Dance	Medium	Energy	
Yes	Three Is The Magic Number	Blink 182	96	Alternative	Uppbeat	Special Dance	Medium	Energy	
Yes	But Anyway (Sung For Gull)	Blink 182	96	Alternative	Mellow	Special Dance	Medium	Energy	
Yes	Hurt By Love	Blink 182	97	Alternative	Uppbeat	Special Dance	Medium	Energy	
Yes	Chaper To Free	Bodense	96	Alternative	Uppbeat	Special Dance	Fast	Energy	
Yes	U Be Coolin Around	Boyz n the City		Country	Uppbeat	Special Dance	Fast	Energy	
Yes	That's The Point	Charlie Peacock		Country	Mellow	Special Dance	Medium	Energy	
Yes	The World I Know	Collective Soul	95	Alternative	Mellow	Special Dance	Medium	Energy	
Yes	Free To Decide	Crabberies	96	Alternative	Mellow	Special Dance	Medium	Energy	
Yes	Free To Decide	Crabberies	96	Alternative	Mellow	Special Dance	Medium	Energy	
Yes	Salvation	Crabberies	96	Alternative	Mellow	Special Dance	Medium	Energy	
Yes	Yellowed	Crabberies	96	Alternative	Uppbeat	Special Dance	Fast	Energy	PG
Yes	Between You And Me	DC Talk		Alternative	Uppbeat	Special Dance	Medium	Energy	
Yes	Counting Blue Cars (Edi)	Dio	96	Alternative	Uppbeat	Special Dance	Medium	Energy	
Yes	Counting Blue Cars (Edi)	Dio	96	Alternative	Uppbeat	Special Dance	Medium	Energy	
Yes	Everything Falls Apart	Dio's Five Year	96	Alternative	Uppbeat	Special Dance	Fast	Energy	
Yes	The Winding Song	Double Plus Good	95	Rap	Uppbeat	Special Dance	Fast	Energy	
Yes	Santa Monica	Everclear	95	Alternative	Uppbeat	Special Dance	Medium	Energy	R
Yes	Big Me	Foo Fighters	95	Alternative	Uppbeat	Special Dance	Medium	Energy	
Yes	Girl Don't Tell Me	Foxy	98	Alternative	Uppbeat	Special Dance	Fast	Energy	
Yes	Stupid Girl	Foxy	98	Alternative	Uppbeat	Special Dance	Fast	Energy	PG

800 EXIT 820 RESET RATING S1 S2 S3 S4 CLEAR LIST STOP

FIG. 24

Looney Productions MOAEC 2000

The Complete MOAEC Music Library

Own	Song Title	Artist	Data	Music Category	Music Style	Dance Type	Music Speed	Energy	Rating
Yes	Heard Overst	Al			Uppbeat	Special Dance	Medium	Energy	
Yes	He Is	B4			Melody	Special Dance	Medium	Energy	
Yes	Speccmen	B4			Uppbeat	Special Dance	FMS	Energy	
Yes	Somethin Bout Jesse	B4			Uppbeat	Special Dance	FMS	Energy	
Yes	Here With Me	B4			Uppbeat	Special Dance	FMS	Energy	R
Yes	Three Is The Magic Number	B4			Uppbeat	Special Dance	Medium	Energy	
Yes	But Anyways (Studio Edit) G.M.	B4			Melody	Special Dance	Medium	Energy	
Yes	Hurt By Love	B4			Uppbeat	Special Dance	Medium	Energy	
Yes	Close To Free	B4			Uppbeat	Special Dance	Medium	Energy	
Yes	Ill Be Comin Around	B4			Uppbeat	Special Dance	Medium	Energy	
Yes	That's The Point	B4			Melody	Special Dance	Medium	Energy	
Yes	The World I Know	C4			Melody	Special Dance	Medium	Energy	
Yes	Free To Decide	C4			Melody	Special Dance	Medium	Energy	
Yes	Savation	C4			Melody	Special Dance	Medium	Energy	
Yes	Wellheard	C4			Uppbeat	Special Dance	Fast	Energy	R9
Yes	Between You And Me	DC Talk			Uppbeat	Special Dance	Fast	Energy	
Yes	Counting Blue Cars (Edit)	Dishwalla			Uppbeat	Special Dance	Medium	Energy	
Yes	Counting Blue Cars (Full)	Dishwalla			Uppbeat	Special Dance	Medium	Energy	
Yes	Evening Falls Apart	Dog's Eye View			Uppbeat	Special Dance	Fast	Energy	
Yes	The Winding Song	Double Plus Good			Uppbeat	Special Dance	Fast	Energy	
Yes	Santa Monica	Everclear			Uppbeat	Special Dance	Medium	Energy	R
Yes	Big Me	Foo Fighters			Uppbeat	Special Dance	Medium	Energy	
Yes	Gill Don't Tell Me	Foo Fighters			Uppbeat	Special Dance	Medium	Energy	R
Yes	Supaid Girl	Fuzzy			Uppbeat	Special Dance	Fast	Energy	R
Yes	Supaid Girl	Gardner			Uppbeat	Special Dance	Medium	Energy	R9

Choose from following options to control the music your MOAEC will search, display, and play.

Blocking Options

Do Not Block Any Music

Block "PG" and "R" Rated Music

Block "R" rated Music Only

Cancel OK Password

EXIT RESET RATING S1 S2 S3 S4 CLEARLIST STOP

820 822 824

FIG. 25

Looney Productions MOAEC 2000

The Complete MOAEC Music Library

Own	Song Title	Artist	Data	Music Category	Music Style	Dance Type	Music Speed	Energy	Rating
Yes	Head Overfeet	Artist: Moresette	95	Alternative	Uppbeat	Special Dance	Medium	Energy	
Yes	He Is	Artist: Cherished		Country	Medium	Special Dance	Medium	Energy	
Yes	Something Bout Jesus	Bl MOAEC			Uppbeat	Special Dance	Fast	Energy	R
Yes	Here With Me	Bl			Uppbeat	Special Dance	Fast	Energy	R
Yes	Three Is The Magic Number	Bl			Uppbeat	Special Dance	Medium	Energy	
Yes	But Anyway (Studio Edit)	Bl			Uppbeat	Special Dance	Medium	Energy	
Yes	Hurt By Love	Bl			Uppbeat	Special Dance	Medium	Energy	
Yes	Close To Free	Bl			Uppbeat	Special Dance	Medium	Energy	
Yes	W 2e Comin Around	Bl			Uppbeat	Special Dance	Medium	Energy	
Yes	That's The Point	Bl			Uppbeat	Special Dance	Medium	Energy	
Yes	The World I Know	Bl			Uppbeat	Special Dance	Medium	Energy	
Yes	Free To Decide	Bl			Uppbeat	Special Dance	Medium	Energy	
Yes	Savvy	Bl			Uppbeat	Special Dance	Medium	Energy	
Yes	Jellyhead	Bl			Uppbeat	Special Dance	Fast	Energy	PG
Yes	Between You And Me	Bl			Uppbeat	Special Dance	Fast	Energy	PG
Yes	Counting Blue Cars (Edit)	Bl			Uppbeat	Special Dance	Medium	Energy	
Yes	Everything Falls Apart	Bl			Uppbeat	Special Dance	Medium	Energy	
Yes	The Winding Song	Bl			Uppbeat	Special Dance	Fast	Energy	
Yes	Save Monica	Bl			Uppbeat	Special Dance	Medium	Energy	R
Yes	Big Me	Bl			Uppbeat	Special Dance	Medium	Energy	
Yes	Big Me	Bl			Uppbeat	Special Dance	Medium	Energy	
Yes	Girl Don't Tell Me	Bl			Uppbeat	Special Dance	Fast	Energy	R
Yes	Stupid Girl	Bl			Uppbeat	Special Dance	Medium	Energy	PG

Please enter your password

EXIT RESET RATING S1 S2 S3 S4 CLEARLIST STOP

800 820 825

FIG. 26

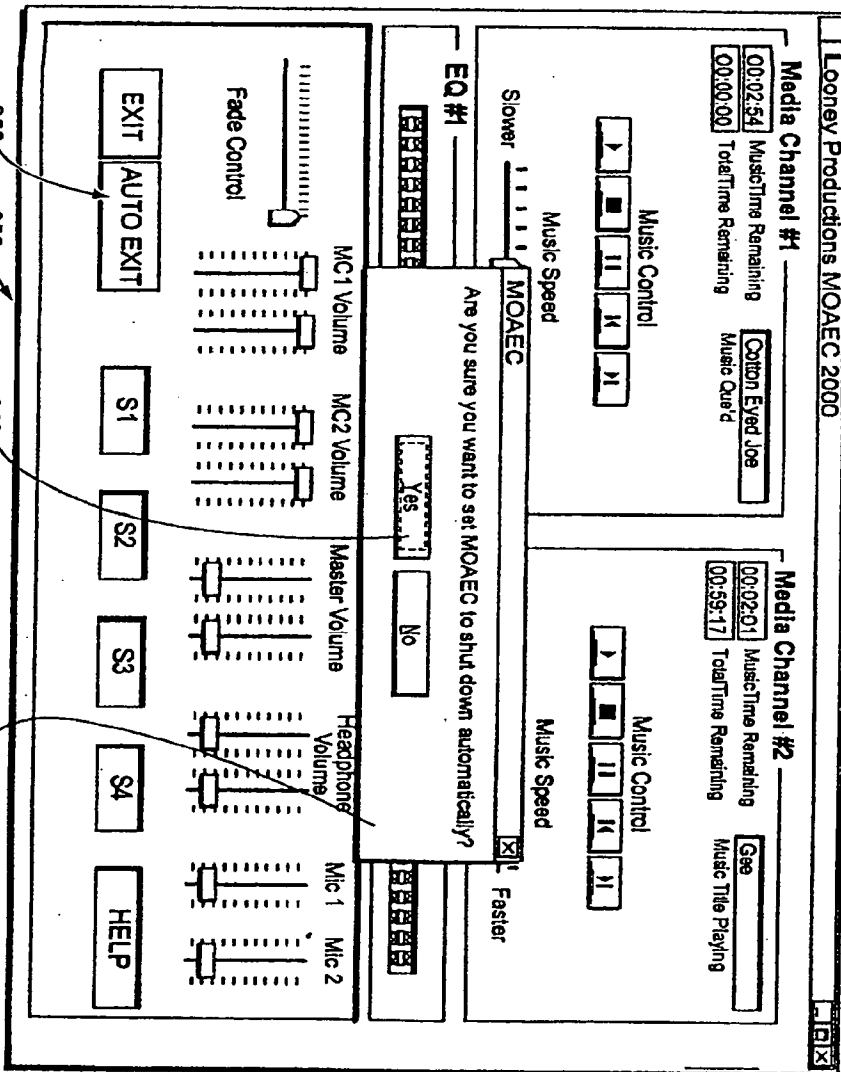


FIG. 27

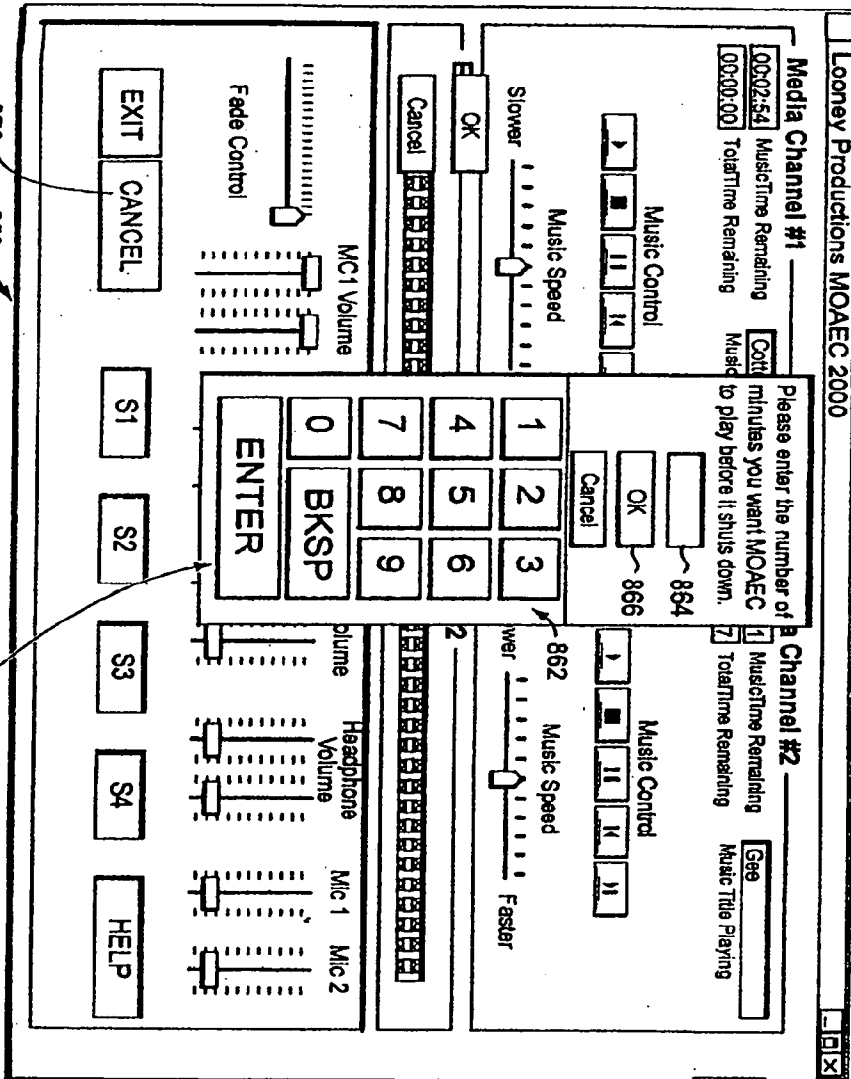


FIG. 28

MUSIC ORGANIZER AND ENTERTAINMENT CENTER

This application includes a Microfiche Appendix pursuant to 37 CFR 1.96(c) that contains a computer program listing of program commands in the commercially available Visual Basic language for implementing various functions of one embodiment of the center of the present invention described herein. The total number of microfiche and the total number of frames in the Microfiche Appendix are 2 and 103, respectively. A portion of the disclosure of this patent document or patent disclosure contains material, which is subject to copyright protection. The copyright owner has no objection to the facsimile reproduction by anyone of the patent document or the patent disclosure, as it appears in the Patent and Trademark Office patent file or records, but otherwise reserves all copyright rights whatsoever.

FIELD OF THE INVENTION

This invention relates to music recording and playback systems, and more particularly to a system that enables storage and playback of a wide range of individual music selections/songs according to a pre-programmed list of categories.

BACKGROUND OF THE INVENTION

The storage of music on digital media has presented a number of opportunities to miniaturize storage devices for music, thus enabling larger amounts of music to be stored in one place, and to radically alter the presentation of this music. In addition to the actual music sound data, new data related to certain characteristics of the music can now be overlaid in the storage media. This enables a listener to organize and playback music in a highly customized manner. It is no longer strictly necessary to store music in one format (e.g., a single disc or record) and playback individual selections from this disc or record according to a strict organization scheme. Likewise, advances in data compression and storage technology have enabled much larger quantities of digital data to be stored on magnetic disc and optical media than previously. The "Red Book" format common to music compact discs is somewhat inefficient due to its slow sample rate, and a much larger amount of data can be compressed on a standard data optical disc (CD-ROM), and decompressed and replayed using any number of readily available playback software routines.

In addition, most computers and data processing devices are now equipped with multimedia programs and advanced high-fidelity sound.

It is, therefore, an object of this invention to provide a music organizer and entertainment center that takes advantage of the latest advances in music data compression, storage and data processing capabilities. It is a further object of this invention to provide a user with the ability to fully customize playback of music according to a variety of parameters including categories of music. The graphical presentation of playback and storage controls should be easy to use and learn, and should take advantage of color and other visual aids.

SUMMARY OF THE INVENTION

This invention overcomes the disadvantages of the prior art by providing a music organizer and entertainment center that enables customized playback of music having a variety of predetermined categories that are provided, typically,

ahead of time by a service provider. Music is played back in any desired order based upon those categories from an onboard database that can include a large number of songs or titles.

The music organizer and entertainment center provides a center having a microprocessor, sound card functions and high-volume data storage and retrieval units for playing back music according to a variety of predetermined categories. Music can be played back in random form or can be played back according to a particular pre-selected order. The categories are provided by service provider who delivers selected titles and/or songs to the end user. The songs are typically loaded using a custom CD-ROM provided from the service provider. The music is provided in data-compressed form and is decompressed and processed through a sound card during playback. The categories can include a variety of parameters such as title, artists, date, speed, dance characteristics, energy level and music style.

The user selects between a variety of graphical user interface screens that are arranged on a display. The display can comprise a touch screen, or can include a variety of cursor-moving functions for operating different display "buttons" defined on the screen. Alternatively voice recognition software can be used to provide a voice operation capability to the user. Likewise, voice synthesis can be used to inform the user of various system operations.

The interface can be organized according to various music categories that each appear as buttons. Within each button can be contained sub-categories for further organization. All categories are cross indexed with categories that are predefined within various fields of the database, that stores the data for each song in an appropriate file having the various category flags appended thereto. Conventional database software such as Microsoft Access® can be used in forming the database for compressed music data and categories. The music is preferably compressed using MPEG3 and a standard sound card, typically having high-fidelity characteristics is used to playback the decompressed music. The music is stored in a hard drive or other high-volume storage medium on the system in compressed form. Compression of the music, as well as loading of appropriate category flags is accomplished at the service provider's facility based upon the user's orders. Orders can be taken and filled electronically, via the Internet. Alternatively, oral orders can be made, that are filled by preparing a CD-ROM containing the selected songs in compressed form. A master list can be contained on the database of the users' system. This master list can be used to select the various songs from the service provider; the CD-ROM can include updates to the master list that are loaded along with the songs.

The CD-ROM and/or individual songs can include a special code or identification that is keyed to the user's system's code. In this manner only the user's system can load the songs on its hard drive. A docking mechanism can be provided to all or part of the system to allow songs to be moved to different playback devices. In this manner the user can have a library of songs to playback in a variety of portable and fixed base units including vehicles.

One of the categories provided to selections can be ratings. Ratings are typically provided ahead of time by the service provider and are appended to the overall database of categories. The user has, in the center, a facility for blocking out any songs from being listed or searched that exceed a predetermined rating category. A password is used to control the block-out function. This password is initially entered by the user or is provided ahead of time by the service provider. It must be entered in order to control the block-out function.

The center can also be provided with an auto exit function. When an initial screen is called, the user can indicate how many minutes he or she wishes the center to playback songs. When that number of minutes has elapsed, the center automatically shuts off.

It is contemplated that with appropriate data storage techniques and playback facilities, the center can organize video and image data as well as music data. Particular video data compression and playback hardware and software are typically required for such playback.

BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing and other objects and advantages of the invention will become more clear with reference to the following detailed description, as illustrated by the drawings in which:

FIG. 1 is a perspective view of an exemplary music organizer and entertainment center according to an embodiment of this invention;

FIG. 2 is a perspective view of an exemplary music organizer and entertainment center designed for portability according to an alternate embodiment of this invention;

FIG. 3 is a schematic block diagram of the hardware architecture of an exemplary music organizer and entertainment center;

FIG. 4 is a schematic flow diagram illustrating a basic control data path for the music organizer and entertainment center of this invention;

FIG. 5 is a schematic flow diagram illustrating the use of a graphical user interface screen selected according to the flow diagram of FIG. 4;

FIG. 6 is a schematic flow diagram showing the selection of a graphical user interface screen selected according to the flow diagram of FIG. 4;

FIG. 7 is a schematic flow diagram showing the selection of a graphical user interface screen selected according to the flow diagram of FIG. 4;

FIG. 8 is a schematic flow diagram of a graphical user interface screen selected according to the flow diagram of FIG. 4;

FIG. 9 is a schematic flow diagram of the playback process using the graphical user interface screens selected according to the flow diagram in FIG. 4;

FIG. 10 is a schematic flow diagram showing the saving and loading of play lists using the music organizer and entertainment center according to this invention;

FIG. 11 is a plan view of a first graphical user interface screen;

FIG. 12 is a plan view of a second graphical user interface screen;

FIG. 13 is a more-detailed plan view of the second graphical user interface screen of FIG. 12;

FIG. 14 is a more-detailed plan view showing the saving of music play list selections using the graphical user interface screen of FIG. 12;

FIG. 15 is a more-detailed plan showing the loading of a music play list using the graphical user interface screen of FIG. 12;

FIG. 16 is a plan view of a third graphical user interface screen;

FIG. 17 is a plan view of a fourth graphical user interface screen;

FIGS. 18 and 19 are perspective views of an exemplary music organizer and entertainment center according to an

alternate embodiment of this invention utilizing a base unit and docking principle;

FIG. 20 is yet another alternate embodiment of a music organizer and entertainment center utilizing a docking principle for a main hard drive;

FIGS. 21 and 22 are perspective views of yet another exemplary music organizer and entertainment center for use in mobile environments including, for example, the docking element shown in FIG. 20;

FIG. 23 is a plan view of the graphical user interface screen of FIG. 12 detailing a favorite hits function;

FIG. 24 is a plan view of the fourth graphical user interface screen showing a display of the service provider's available library;

FIG. 25 is a plan view of the graphical user interface screen of FIG. 24 showing the use of a rating category;

FIG. 26 is a plan view of the graphical user interface screen of FIG. 24 showing a password entry window for retrieving rated music;

FIG. 27 is a plan view of a modified first graphical user interface screen according to another embodiment of the invention, including an auto-exit function; and

FIG. 28 is a plan view of the graphical user interface screen of FIG. 27 showing a shut-down time control window.

DETAILED DESCRIPTION OF ILLUSTRATIVE EMBODIMENTS

A generalized embodiment of a music organizer and entertainment center 50 is detailed in FIG. 1. For the purposes of this description the term "center" will be used to describe any of the music organizer and entertainment center systems described herein.

The center 50 is a stand-alone unit powered by household current using a conventional power cord 52. The chassis 54 of the center includes at least two integral speakers 56 to provide stereo sound. A variety of horn-folding and acoustic enhancement techniques can be used to increase the performance of the speakers. Alternatively, separable speakers can be used, placed at remote locations in a room. The front panel 58 of the center can include a variety of knobs, switches and displays. In this embodiment, a basic LCD display 60 is shown and a retractable tray mechanism for receiving an optical data or music compact disc is also provided 62. This tray 62 is conventional according to this embodiment, extending outwardly and retracting inwardly based upon a switch 64. The transport mechanism and reading mechanism can be conventional. The center includes a flip-up type display 70 according to this embodiment. The display is located on the top 72 of the center and is retractable into a recess 74. A large button 76 is provided to support the display 70 in an upright position. This button can be spring-loaded. When it is pushed downwardly, it allows the display to be adjusted into different position. A latch mechanism 78 can be provided to the display 70 and to the recess 74. The latch mechanism allows the display to be locked into a close position, or, alternatively, released for deployment as shown. The display, itself, includes a screen 80 having any acceptable size, format and display technology. For example, a color active-matrix screen, such as that found in a laptop computer can be used. The pixel dimensions are generally comparable to those of a laptop computer display. The display itself includes a graphically user interface with a series of displayed graphical user interface "buttons" 82 that can be actuated using a touch-screen layer

applied to the display 80. The touch-screen hardware and controller software are conventional and commercially available. Alternatively, a mouse or other cursor-moving mechanism, such as a track ball, can be provided to the chassis 54.

With reference to FIG. 2, an alternate embodiment of a center 90 is detailed. This center comprises a laptop arrangement having a base 92 and a foldable display section 94. This center can comprise, in essence, a modified laptop computer with all the basic components of a modern multimedia computer system. Certain personal computer components not specifically required for the purposes of this embodiment can be omitted. For example, a display 96 having buttons 98 as described above can be provided. A plurality of speakers 100 can also be provided representing base, midrange, tweeters, etc. Volume and screen display controls 102 can also be provided as well as a basic alphanumeric keyboard 104 of conventional design. A retracting compact disc tray and reader 106 can also be provided. An onboard battery (not shown) provides power while an AC/DC converter 108 recharges the unit based upon household current provided by a power cord 110. Note that automotive DC current can also be used.

The generalized architecture of a center is further detailed in FIG. 3, complete with optional components. The "heart" of the center is its central processing unit or CPU 130. The CPU, in a preferred embodiment comprises a Pentium® II microprocessor having an operating speed of 266 MHz or greater available from Intel. The architecture of this microprocessor is well-known. It is adapted to accept inputs from a variety of hardware components. These hardware components are, themselves, commercially available and can be interfaced with the CPU 130 by those of ordinary skill. In summary, the components involved in a complete center will now be described.

A random access memory (RAM) 132 is provided to support the CPU 130. This RAM typically provides twenty megabytes of storage or greater. A keyboard and/or cursor-moving mouse interface is also provided. The keyboard 134 can be omitted in certain embodiments where a touch-screen is used for all onboard functions. For example, the touch-screen, shown as a touch-screen interface 136, and used in conjunction with the monitor screen 140, can include a touch-keyboard thereon for entering alphanumeric characters. Where a monitor 140 is used, a video driver card 142 of conventional design is provided. A conventional television can also be utilized. Where a television screen is used for displaying data, a scan converter 146 can be provided. The scan converter 146 can be used for output 150 to the television screen and/or input 152 from, for example, a television remote control 154. In this manner both input and output via a television and/or computer monitor can be accomplished. A microphone 160 and appropriate voice recognition card 162 can also be provided in conjunction with the CPU. Additionally, a CD-ROM, with appropriate driver card 170 can also be provided. For output, a sound card, available from a variety of commercial sources such as the Soundblaster® driver 180 can be employed and appropriate amplifiers and speakers 182 can be provided. The amplifiers and speakers are conventional and receive inputs from the sound card in the form, typically, of analog audio signals.

Input/output exchange of data is provided through a hard drive storage 190, also of conventional design. As will be described further below, the hard drive storage interacts with the CPU 130 using onboard software. This software includes a speech recognition software block 200 a sound decompression software block 210, a sound information database 220 the center's proprietary speech vocabulary 230 and the center's search and play interface 240.

A significant feature of the center, to be described in greater detail below, is the organization of individual songs or selections according to specific categories, that are determined ahead of time, on a partially subjective basis, by the service provider. These categories are carried in a database, along with the raw digital music data, and allow the user to playback each of the individual selections based upon specific categories in a random or ordered manner. The use of categories for storage and playback empowers the user in an entirely new way. Songs can be chosen based upon a specific desire or mood that relates to categories such as music age, energy, speed, style, dance, or rating. Experienced listeners can enjoy new convenience in music playback. Newer listeners typically find their use of the center to be highly educational, as they quickly learn to associate certain types of categories with specific selections, artists and songs, and can enjoy the benefit of a full display of the song data via the center's screen.

With reference to the above-described architecture, the procedure by which individual songs become categorized and eventually made available for a user to playback according to particular categories will be described in summary:

1. Musical source material is first purchased or otherwise acquired by the service provider that services the music organizer and entertainment center of this invention. This music is typically obtained in standard Red Book compact disc format on individual music albums and singles.
2. A standard compact disc player, DAT or other audio playback medium is used by the service provider in conjunction with a main computer having a large database. A hard drive rated at five gigabytes or larger is used in conjunction with the database.
3. Music is played by the playback device into a data compression card commercially available from, for example, Dialog Four™. This data compression card compresses the music into the commercially available MPEG3 format. A CPU, similar to that shown in FIG. 3 stores the music in the hard drive of the service provider in compressed form. Individual songs are each given their own file identifier for later processing.
4. Compressed music is subsequently catalogued using a conventional database program such as Microsoft Access® 2.0 in this embodiment. The following categories, among others can be used in conjunction with the database program to catalog each individual musical selection-song title, artist, date, main music category, sub-main music category, special music category, sub-music category, music style, dance type, music speed and a subjective music "energy level" determined by the service provider. These categories are used subsequently by the center's operating system as described below. All categories are stored in the service provider's hard drive for subsequent retrieval.
5. A master list of available music, in the form of individual selections or songs, is compiled by the service provider. Individual customers or subscribers are solicited to select songs or groups of songs or selections from a service

provider. According to a preferred embodiment, the selected songs are copied from the service provider hard drive to a writable data compact disc in MPEG3 compressed format. The center operating system software and Access® 2.0 database program available from Microsoft, Inc. of Redmond, Wash. can also be loaded onto this compact disc when the playback device does not already contain these software packages.

The package of data compressed songs and other software if applicable, is tagged with a distinct serial number or other identifier and/or format that matches a pre-loaded serial number or format in the subscriber's particular center. This serial number or format has been pre-loaded in the center from software made available by the service provider. For example, a commercially private or public key encryption algorithm can be provided to the subscriber. The data in the compact disc includes an appropriate encryption key that matches one already present in the center. Compressed data can be decrypted and "unlock" based upon a match between the key provided by the service provider and the key provided by the center. In any case, a technique for locking information so that only a desired center can read the information and, hence, play the songs, is provided. This prevents copyright infringement and unauthorized playback of songs by other units that have not paid appropriate license fees for receiving the music.

6. As noted above, a formatted, data-compressed disc is provided to the subscriber via a physical transfer of the disc. In other words, the disc is mailed or otherwise delivered to the subscriber. It should be noted that, while an optical disc is the preferred form of data transfer according to an embodiment of this invention, another form of storage media such as tape, circuit chips, removable hard drive, or any other acceptable high-volume data storage can be used to transfer song data. Likewise, the formatted compressed data can be transferred via a radio or telephone network link, assuming that appropriately wide bandwidths is available to enable the transfer to occur in a sufficiently short period of time. All these techniques of transferring formatted, compressed, customized song data are expressly contemplated according to this invention. It is desired primarily that the data include various categories as described above with reference to step 4.

When the subscriber receives the customized song data on the disc or other medium, the customer installs the disc in his or her center by following conventional installation and instructions provided with the disc. As noted, the center either includes well known CD-ROM installer routines, such as those found in popular Windows® operating system available from Microsoft or, alternatively, specialized installation software is included with the disc transferred from the service provider. All data on the disc is typically transferred into the high-volume hard drive or other storage media provided with the center. The song data, therefore, resides in the center formatted in the Access® 2.0 database as described above. The categories appended to each song as part of the database program also reside in the center's hard drive at this time.

7. The center's software loads data related to individual song selections and categories into appropriate database locations.

8. The center polls data in the downloaded disc to determine whether the appropriate identification code and/or serial number, matching that of the center is present. If not, then the downloading process is terminated, and the user is advised to contact the service provider.

9. If downloading of song data is completed successfully, then the data becomes resident on the center's disc drive or other high-volume random access memory storage unit. New songs are appended to a list that contains any previous songs. This information is displayed in a manner to be described further below.

10. The CD-ROM is subsequently removed from the center and stored for backup purposes. At this time, the user can select various songs downloaded in the previous steps using various graphical user interface and/or voice commands to be described further below.

11. Upon playback, song data is decompressed from its stored format using MPEG3 data compression. The decompressed song data is then played in a standard "wave" format using, for example, Winplay 3® available from Microsoft, or another data-to-sound software procedure. It is contemplated that the software procedure be compatible with an appropriate sound card, as described above. Speakers and an amplifier are used to deliver music to the user, as also described above.

Reference will now be made to the flow diagrams illustrated in FIGS. 4-10, and corresponding graphical user interface display screen illustrations will also be referenced. These display screens are shown in FIGS. 11-17.

Referring first to FIG. 4, the user initializes the program in a program start step 300. A title screen, not shown, is displayed 302. Any acceptable title screen can be used. The title screen prompts the user to enter the program in step 304. If the user does not desire to enter the program, it ends in step 306. If the user enters the program, then Screen1 is entered in step 308. Screen1 is shown in the display 310 in FIG. 11. Note that the various screens, entitled Screen1, Screen2, Screen3 and Screen4 are denoted respectively by buttons S1 (312), S2 (314), S3 (316) and S4 (318). These buttons appear on the bottom of all display screens used herein so that a user can quickly select between different control screens. The blank control fields are displayed in step 320. Based upon these fields, a user selects between Screen1 controls in step 322, Screen2 controls in step 324, Screen3 controls in step 326 and Screen4 controls in step 328.

Note that the Screen2 display 330 is shown in FIGS. 12, 13, 14 and 15. Likewise, Screen3 displays 332 are shown in FIG. 16 and Screen4 displays 336 are shown in FIG. 17. These screen displays will be described further below.

With reference to Screen1, as shown in FIG. 11, various media channels for playing back music can be established. In this example, Channel1 340 and Channel2 342 are provided. Each channel includes an individual set of speed and playback buttons 344 having conventional control symbols allowing, for example, play, stop, pause, forward and reverse. Additional controls 346 can also be provided for the channels and can be used, for example, for specialized functions such as mixing of songs and overriding of songs using, for example, external microphone inputs. Note that, in particular, a fade control 348 is provided.

FIG. 5 details user operations utilizing Screen2 after branching from step 350. Screen2 is shown generally in FIG. 12, as noted above. By branching to the searching step 352, a user can search the main categories of music recognized by the system. The begin search button 354 (FIG. 12) controls the searching of main categories. As noted, a variety of categories such as artists, as shown in FIG. 12, can be searched. The selection of an appropriate category is noted in block 358. Various text can be entered using a keyboard 360 (FIG. 12) according to the block 362. The particular

element being searched as shown in the window 364 causes the system program to access a main song database entitled MyData in block 364. The request can be canceled in block 370, which causes a branching back to the initial screen block 350. The button 372 enables cancellation.

If no cancellation occurs, then block 374 determines whether the requested category and text within the category exists. In addition, categories and information can be characterized according to a variety of colors, as displayed in the partial window of categories 380 and the more complete window, as shown in FIG. 13 as window 382. If the particular category and/or text does not exist, then block 388 notes its absence and suggests ordering the desired music. This block then branches to the cancellation block 370. Conversely, if the particular categories and/or text exists, then the appropriately organized songs are displayed according to block 390 in the window 392.

Screen2 acts generally, as a main control screen for searching and playing any selections within the center. The illustrated window 382 in FIG. 13 shows some of the possible categories that can be organized by the service provider and cross-referenced within the database with respect to each individual selection. "Other category" buttons 400 are provided for future expansion. If one of the main category buttons in the window 382 is selected, as shown in block 410, then the routine determines whether a single or double "click" of the user interface has occurred. If a single click occurs as shown in block 412, then the system prompts the user to select a music "speed" in block 414 according to screen button 416. The user is then prompted to input an appropriate time duration within which music will be played in block 418 based upon button 420. Given these parameters, the system accesses the database in step 422 to determine music matching, the selected criteria for time and category. Songs are entered in a play list according to the categories based upon blocks 424, 426 and 428. In particular, according to block 428, the songs can be randomized after the time and category criteria have been met to provide a "disc-jockey" type playback which is somewhat arbitrary. The play list for the given time is detailed in window 430. The number of songs in the play list currently remaining as shown in window 432 and the time remaining is shown in window 434. Time values are based upon pre-entered time values provided by the service provider in the original database. Like other criteria, time of a song can be determined as an individual criteria. Conversely, the time of song can be measured based upon the size of the data file and upon other criteria well known to those of ordinary skill.

At any time, a portion of the current search list 451 is displayed, showing the various depicted categories such as title, artist, publication date, music category music style, dance type, music speed and energy in row-and-column form. The search list represents the selections located by pressing one or more category buttons. Songs from the search list can be appended to the end of the play list 430 by, for example clicking on their entry in the search list 451.

Once a selected play list is created, the user has the option to load and/or save the play list using respective buttons 438 and 440. If the save button 440 is pressed, then a confirmation window 450 is displayed as shown in FIG. 14. This particular play list is assigned a name and can be replayed at any give time by calling up the particular play list from a menu.

A set of buttons of particular interest are used to organize the search list 451 so that the song titles therein are displayed in a desired manner. The organize button 453 allows displays to be refined. In particular, by pressing either ascending or descending buttons 455 and 457, respectively, the search results can be displayed in corresponding order.

Another button of interest as detailed in FIG. 13 is the "dance mix" button 452. This button is a default selection button that selects and searches for dance music having a particular speed. In a preferred embodiment, this function specifically selects, at random, from the MyData database three dance category songs with a fast speed category followed by two dance category songs having a slow speed category. These songs, the order three fast and then two slow are placed in the music play list for playback at the earliest available time.

FIG. 15 shows a file listing window 460 having a four separate play list files 462 that can be selected. The selected play list file 462 can be transferred to the main music play list window 430 by pressing the open button 464 within the window 460.

Before discussing the system procedure further, it is noted that pressing the category button as detailed in step 410 (FIG. 5) twice (e.g., "double click") as shown in block 470, causes the particular category button to display Screen3 480 (FIG. 16). The display of Screen3 is detailed in block 472. Screen3 provides a window 482 with subcategories that fall under a particular music category. The sub-categories are listed as individual buttons 484. These categories can comprise a variety of parameters such as time frame, special occasions, type of music, etc. In addition, the basic categories such as speed or "energy" can be included as sub-categories under a particular category.

Further reference is made to FIG. 6. The controls for screens 2 and 3 will be described first, in further detail. When a particular song in a play list is selected by, for example, highlighting a song with the cursor as detailed in block 500, the song can be played immediately by pushing the Now button 502 as detailed generally in block 504. Any current song being played is interrupted in block 506 and the selected song is played instead. Subsequently, the play list begins playing songs in the prior order in block 508. Conversely, if the sort command is given in block 510, then songs are sorted in ascending or descending order according to a selected category in block 512. A song in the search list is selected in block 514. The song selected can be played according to the Now block 504. Alternatively, the pick block 516 can be used to put the searched song at the end of a given play list as shown in block 518. If the play list song is "clicked" twice as shown in block 519 then the search list song selected is placed to the top of the play list in block 520. In addition, a listing of favorite hits/selections can be requested by the user in block 524. This causes the search list to be filled that have been pre-selected in block 526 and a song from the search list is selected in block 514. Block 514 then branches to the now block 504 and continues as described.

Referring again to block 520, if a song is placed at the top of the play list the song is updated in Screen1 in block 530. The song is then played based upon the play block 532. If the mix up command is entered by the user in block 540, then songs in the play list are randomly mixed in block 542 and Screen1 is updated in block 530. As described above, the play command 532 causes songs to be played in the play list order selected in block 508.

The selection of Screen3, shown in block 560, then the system determines whether a main category was selected in block 562. If not, then an error message is displayed in block 564 and the original screen is re-displayed in block 566. If a main category is selected in block 562, then the system accesses the MyData database of songs and categories in block 568. Any appropriate sub-categories are listed based upon that particular main category in block 570. Sub-categories are sorted and displayed on appropriate default sub-category buttons 572 shown in the window 482 in FIG. 16. The user can select appropriate sub-category buttons by "clicking" on them as shown in block 574. The MyData database is accessed in block 576 based upon the selected sub-categories and all songs that match the main and sub-category selections are listed in block 578. This listing is shown in the search window 332. Note that the search window 332 displays various category information such as title, artist, date, music category, music style, dance type, music speed and energy. Of course, this can also be included as desired by the service provider who originally formats such categories. In addition, custom category information can be included based upon the user's desires.

FIG. 8 relates to the selection of Screen4 as shown in block 550. Screen4 is also illustrated generally as the display 336 in FIG. 17. The display is organized to display all songs within the user's library and the broader service provider's library. The display 336 includes columns showing data test status 552, song identification number 554, disc number (e.g., the disc on the service provider on which the song resides 556) the catalog song number 558, the title 590, the artist 592, the music style 594, the dance type, if any, 596, the speed 598, the time in seconds 570, the energy level, if any, 572 and any other appropriate category.

The entire library of the service provider can be provided in this format to the users, so that the user can select the songs that it wishes to order at later times. A series of buttons can be provided within Screen4. The first button, Button1, shown in block 580 instructs the user to insert an appropriate CD-ROM containing music and category data in block 582. The user is then prompted to use Button2, shown in block 584. This button lists all compressed data files based on the particular disc and directory selected in block 586. The user is then prompted by Button3 in block 588. Activating this button causes the copying of all compressed files from the disc over to the directory if these files are not already present in block 560. The user is then prompted by Button4 in block 562. Activating this button accesses the main database in block 564. Songs on the CD-ROM are compared to the data records within the center in block 566. The MyData database is updated with new songs in block 567. At any time, the canceled button can be pressed as shown in block 598, which returns to the Button1 prompt of block 580.

Reference is now made to FIG. 9. If a Play (see button 601, FIG. 14) or Now button on the screen is selected in block 600, Screen1 is displayed showing the various playback controls in block 602. The MyData database is accessed in block 604. The file MID that matches the selected song is searched for by the system in block 606. The file is loaded from the disc in block 608. Again, this file is retrieved from the disc in MPEG3 data compressed format. A particular color for the song, which may correspond to a given set of categories, as well as a title and other data are provided to one of the media channels in Screen1 in block 610. The song begins playing in block 612 as soon as the data is ready. A time countdown for the song is initiated

using known techniques in block 614. If a pause, stop or mixed command is received in block 616 then these steps, is described above, are carried out. In particular, a pause or stop ends playing of the song either temporarily (e.g., until pause is pressed again) or permanently, in case of a stop command.

Volume adjustment and other equalizer values can be provided according to block 618 and 620. These act upon the playback of a song using known techniques. When the particular song has ended in blocks 622 the system checks whether it has reached the end of the current play list in block 624 if not, media channels are switched in block 626 and the next song on the play list is located in block 628. This song information is transferred back to block 604 and the name of that new song is located in block 606. The process continues as described above.

If the end of the play list is reached in block 624, then Screen1 controls are cleared in block 630. The system awaits further instructions at this time.

FIG. 10 describes the saving and loading of play list in more detail. If a save command is initiated by the user in block 650, then all song data and associated colored data for the display from the current play list is collected 652. The file save window is placed on the screen in block 654. The user can select an appropriate file name for saving the particular play list file in block 656. Again, the display for this procedure is detailed in FIG. 14.

If a load command is entered by a user as shown in block 660, then the file load window is displayed in block 662. The display for this window is shown in FIG. 15.

Song and color data are read from the selected file in block 664 and the current play list is updated and/or replaced with all song in color data from the loaded file in block 666.

It is specifically noted that category information is provided by the service provider appended to each song in the database. The accessing of songs having such data appended thereto occurs according to applicant's unique graphical user interface based upon provider categories. The association of various database identifiers to each song is implemented using conventional database programs such as the above-described Microsoft Access® 2.0. The association of category objects to song data should be conventional to those of ordinary skill. The storage of MPEG3 data compressed song files is accomplished in the same manner as other data stored as files in a database. The Microfiche Appendix included in the subject application pursuant to 37 CFR 1.96(c) contains a listing of program commands in the commercially available Visual Basic language for implementing various functions of the center according to this embodiment.

Using the hardware and software elements described above, FIGS. 18 and 19 detail a docking mechanism in which music is stored on a hard drive or other electronic medium in a main data handling unit 700 with a flip-up display 702 and associated keyboard 704 that can include playback controls 706 (e.g., play, stop, pause, forward and reverse). The unit 700 can be "docked" to a base unit 708 that includes a connector 710 for interfacing with an associated connector in the unit 700. A cable 712 can interconnect the base unit 708 with appropriate speakers or amplifiers. The unit 700, hence, can include the music data for the system and can be moved from location to location so that there is no need to purchase additional playback units to play music provided from the service provider with the particular code.

FIG. 20 illustrates an alternate embodiment for docking unit in which a base unit 730 includes speakers 732, a power coupling 734, a flip-up display 736 and a removable memory storage device, such as a compact hard drive 738. The hard drive is shown removed in phantom 740. A connector 742 can interface with an associated connector (shown in phantom) 744 on the base unit. The hard drive, itself, it moved from base unit to base unit so that, again, there is need to purchase music only once, and that music is identified to a particular hard drive. The base unit can also include a CD-ROM shelf 748 for reading music during the original loading process. In certain remote units, the CD-ROM may be omitted, since all music is contained on the hard drive and loading of music is accomplished with the base unit 730. A mother board 750 controls the operations of the unit.

FIGS. 21 and 22 illustrate a mobile playback system according to this invention. The above described docking units in FIGS. 19 and 20 can be utilized in conjunction with this unit. In other words, an entire hard drive or unit can be interfaced with an onboard automotive base unit to enable music in the hard drive or docking unit to be played within a car or other vehicle. In this embodiment, the automotive interior 760 is provided with a main audio system 762. Various cords 764 interconnect the main system to a contact display unit 766 that, in this embodiment, is located on the sun visor 768 where the driver 770 can easily access it. It is contemplated that the display unit can be located at any acceptable location. Alternatively, the unit can be entirely operated by voice commands, with no display unit, and instead, a voice response system implementing conventional voice-generating software. With further reference to FIG. 22, the sun visor 768 is lowered to reveal the display 766 having a screen 780. The wires 764 interconnect the display with a power source 782, that can be part of the main audio systems 784 or can be separate. The wires also connect the display 780 with the main audio system 784, or alternatively, can be routed directly to the vehicle's onboard database reader 786. The database reader is any microprocessor-based system as described above. It can be exclusively a disc drive or other high-volume data reader or can include many of the processing functions performed by the center. Alternatively the processor functions can be performed within the display 766. The display 766 includes a microphone 788 for voice activation. As described above, conventional voice-recognition software can be used in conjunction with the center. A hand grip 790 is provided for moving the display to an acceptable position. The database reader interfaces with an onboard docking unit or disc 792, as described above. This can be removed when not in use for placement in another database reader, such as the base unit 730 shown in FIG. 20. Music is routed from the database reader 786 or the display 766 depending upon where the microprocessor are located, back to the main audio unit 784 where amplification occurs. The music is played back on appropriate speakers 794.

Reference is now made to additional features that can be implemented according to certain embodiments of the invention. FIG. 23 details a favorite hits function that can be applied to Screen2. The display 795 includes a favorite hits creation button 796. Favorite hits, when identified

by a user on the current play list 797 can be flagged by "clicking" on the individual titles. A colored flag 798 appears next to flagged songs. Unflagging can involve a second click on a flagged song or a separate delete button on the screen. The flagged songs 799A appear as top selections 799B on the current search music categories list 803. By clicking on the create favorite hits button 796, these favorites can be saved, so that they always appear at the top of the search categories list 803. In this manner, they can be retrieved to place on the play list within seconds. Again, any song on the search categories list 803 can be transferred to the play list for playback in a desired order (typically first-in-first-out) by simply clicking or double clicking on the specific search list song entry.

FIGS. 24, 25 and 26 detail an alternate view of Screen4, as discussed above. The display 800 includes an overall listing of the selections available from the service provider. A list of over one hundred thousand titles can be included in the MyData database, as selections are delivered from the service provider. The category fields described above are provided for each title 801—namely, artist 802, date of publication 804, specific music category 806 (e.g. "rock," "jazz," "alternative," etc.), music style 808, dance type 810, music speed 812 and energy 814. In addition, an ownership column 816 is provided that indicates whether the music data accompanying the title is present in the users own database. If so, the entry states "yes," otherwise a "no" indication is provided to the column 816 next to the particular title. In addition a rating column 818 is now is provided with an appropriate entry field in the database. In this example songs that the service provider may not think are suitable for certain listeners due to content are appended with a rating, as appropriate. In this example, all songs not rates are acceptable to all. A specific rating letter such as "G" can also be placed next to such songs in the column 818. Higher rated songs can include the rating letter PG, or stronger rating letter R, on their particular title row. The depicted ratings are exemplary only. The actual song titles shown should not be taken to have these actual ratings. The music selection list of Screen2 would also display ratings when they are used. Note that a variety of levels of rating and rating criteria can be used. In general such ratings are defined and appended to individual songs by the service provider.

FIG. 25 illustrates the activation of Screen4's rating button 820. This button calls a window 822 that prompts the blocking of R and/or PG-rated songs. In this manner, higher rated song titles cannot be viewed or played. This function is enable and disabled using a password that is entered after striking the password button 824 in the window 822. This button calls a password-entry window 826, detailed in FIG. 26. Once an initial password is entered, it must be reentered to change the rating blocking function or to change the password itself.

FIGS. 27 and 28, finally, illustrate an auto-exit option appended to the display 850 of Screen1 in this embodiment. An auto-exit button 852 can be clicked to call an automatic shut-down window 854. By clicking a "yes" button 856 in this window, the center calls another window (FIG. 28) with an auto-shutdown keyboard 860. The window 860 includes a numeric keyboard 862 for entering shutdown time in minutes. A time box 864 indicates the selected time. Press-

ing the "OK" button 866 causes the shutdown time to be acted upon. Playback will occur until the time has been elapsed. At any time, the cancel button 870 can be activated to cause the shutdown routine to cease and/or the window 860 to be removed from Screen1.

The architecture and database storage techniques, as well as the various graphical user interface functions described above can be readily adapted to handle images and full motion video as well. The primary addition to the above-described embodiments would be a screen capable of playing back video of appropriate size interconnected to the center's processor by an appropriate video driver card that is typically commercially available. In addition, appropriate data compression/decompression routines applicable to full motion video and/or images is desirable. In substance, the data for video packages is stored with various categories similar to or the same as those applicable to music described above. The graphical user interface is organized identically, as is control and manipulation of playback. In the case of music videos, most or all of the same categories as music can be used, with the addition, perhaps of certain video-specific categories.

A sufficiently large hard-drive can be used to store a large database of movies and/or other video data. Where storage is problematic, one example contemplates that the center's processor can interface with a commercially available, multi-disc CD-ROM or DVD (Digital Versatile/Video Disc) drive. The drive is interfaced to the processor using commercially available interface hardware. The raw video data can be retrieved as needed from the play-ready optical discs according to a request by the user entered via the MyData database which carries the underlying video category data associated with each video title in its list. Any titles not currently held in the optical unit, can trigger a load-optical-

disc message, prompting the user to load-in the optical disc containing the desired data. Of course, this is only one example of a system that handles video data using the underlying interface and organizational structure of the present invention.

Note that the graphical user interface herein has been described in terms of its primary functions. Any buttons on the display screens detailed herein not expressly described can be assumed to perform functions that are straightforward, and particularly noted on the buttons themselves, such as "OK" and "Cancel." All functions not specifically described should be clear to those of ordinary skill.

The foregoing has been a detailed description of a preferred embodiment of the invention. Various modifications and additions can be made without departing from the spirit and scope of this invention. For example, a variety of colors can be used for different keys and buttons, categories can be identified based on certain colors. Voice recognition and voice-playback functions can be provided to any of the embodiments described herein. Various interface devices can be used, such as touch screens, light pens and alike. In addition, the database, data compression and playback systems and software described herein can be substituted for any other acceptable system or software. The particular layout the graphical displays and content of various buttons in the display can also be varied. Again, it is expressly contemplated that particular category buttons on Screen2 are displayed in different colors, and that specific colors can be used to highlight certain windows or underlying selections in a display, as well as the status of various functions. Accordingly, this description is meant to be taken only by way of example and not to otherwise limit the scope of the invention.

APPENDIX

```

MOAEC CODE
Updated 6/2/98
Author: Dale McMullin
Media: Microsoft Visual Basic V.5.0
Total Lines: 5,245

"Recorder.frm"
Sub UpdateList()
Dim i As Integer, final As Integer
Dim color As Long
Dim songdata(9) As Variant
On Error GoTo Stoploop
MusicListing.Rows = 1
Screen2.Data1.DatabaseName = App.Path & "music.mdb"
Screen2.Data2.DatabaseName = App.Path & "music.mdb"
Screen2.Data3.DatabaseName = App.Path & "vrrydata.mdb"
Screen2.Data3.RecordSource = "LP Complete Music Guide"
Screen2.Data1.Refresh
Screen2.Data2.Refresh
Screen2.Data1.Recordset.MoveLast
Screen2.Data1.Recordset.MoveFirst
final = Screen2.Data1.Recordset.RecordCount
Do While Not Screen2.Data1.Recordset.EOF And StoplistingList = False
loopTop:
DoEvents
If PauseList = True Then NewPauseStartTime = Timer() - TimeSoFar
MousePointer = 11
Screen2.Data2.RecordSource = "LP Complete Music Guide"
Screen2.Data1.Recordset.MoveNext
i = Screen2.Data1.Recordset.AbsolutePosition
If i < 0 Or StoplistingList = True Then Exit Do
songdata(1) = Screen2.Data1.Recordset.Fields("Title")
Screen2.Data3.Refresh
Screen2.Data3.Recordset.FindFirst "Title = " & songdata(1) & ""
If Screen2.Data3.Recordset.NoMatch Then
songdata(9) = ""
If DisplayLibrary = False Then GoTo LoopTop
Else
songdata(9) = "yes"
End If
songdata(2) = Screen2.Data1.Recordset.Fields("artist")
songdata(3) = Screen2.Data1.Recordset.Fields("date")
songdata(4) = Screen2.Data1.Recordset.Fields("main1")
songdata(5) = Screen2.Data1.Recordset.Fields("Mstyle")
songdata(6) = Screen2.Data1.Recordset.Fields("Dtype")
songdata(7) = Screen2.Data1.Recordset.Fields("Speed")
songdata(8) = Screen2.Data1.Recordset.Fields("Energy")
Screen2.Data2.RecordSource = "Music Colors"
Screen2.Data2.Refresh
Screen2.Data2.Recordset.FindFirst "Main1 = " & songdata(4) & ""
color = Val(Screen2.Data2.Recordset.Fields("colorID"))
For X = 4 To 8
DoEvents
Screen2.Data2.RecordSource = X

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Screen2.Data2.Refresh
Screen2.Data2.Recordset.FindFirst "tag = "" & songdata(1) & ""
songdata(X) = Screen2.Data2.Recordset.Fields("Label")
Next X
If DisplayLibrary = True Or (DisplayLibrary = False And songdata(9) = "yes") Then
    MusicListing.AddItem songdata(9) & Chr(9) & songdata(1) & Chr(9) & songdata(2) & Chr(9) & songdata(3) & Chr(9) &
songdata(4) & Chr(9) & songdata(5) & Chr(9) & songdata(6) & Chr(9) & songdata(7) & Chr(9) & songdata(8)

    MusicListing.Row = MusicListing.Rows - 1

    For j = 0 To 9
        MusicListing.Col = j
        MusicListing.CellBackColor = color
    Next j
    MusicListing.Col = 0
End If

If StoplistingList = True Then GoTo Stoploop
DoEvents
Loop
Stoploop:
If Screen1.wp.LinkMode <> LINK_NONE And PauseList = True Then
    Screen1.wp.LinkExecute "pause"
    PauseList = False
End If
MousePointer = 0
Screen2.Data1.DatabaseName = App.Path & "\mydata.mdb"
Screen2.Data2.DatabaseName = App.Path & "\mydata.mdb"
Screen2.Data3.DatabaseName = App.Path & "\mydata.mdb"
Screen2.Data1.RecordSource = "LP Complete Music Guide"
Screen2.Data2.RecordSource = "LP Complete Music Guide"
Screen2.Data3.RecordSource = "Music Colors"
Exit Sub
End Sub

Private Sub ClearList_Click()
    MusicListing.Rows = 1
    StoplistingList = True
    If RatingBox.Visible = True Then RatingBox.Visible = False
End Sub

Private Sub ExitSystem_Click()
    response = MsgBox("Are you sure you want to exit the system?", 4)
    If response = vbNo Then
        Exit Sub
    Else
        ExitButton.Pushed = True
    End If
End Sub

Private Sub Form_Activate()

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```

If MusicListing.Rows > 2 Or Screen.ActiveForm.Name <> "Recorder" Then Exit Sub
If FirstLibrary = True Then
    answer = MsgBox("Are you sure you want to create the Library?" & Chr(13) & "Any music playing will be automatically
paused.", 4)
    If answer = vbNo Then Exit Sub
    If SongPlaying = True And Screen1.sp.LinkMode <> LINK_NONE Then
        Screen1.sp.LinkExecute "pause"
        PauseList = True
    End If

    Load choices
    choices.Show 1

End If
If CancellLibrary = True Then
    CancellLibrary = False
    Screen2.Show
    Screen2.SetFocus
    Exit Sub
Else
    FirstLibrary = False
End If
UpdateList
End Sub

Private Sub Form_Load()
    Recorder.WindowState = 2
    FirstLibrary = True
    StopListingList = False
    RatingBlock = "none"
    RatingOption(0).Value = True
    password = "MOAEC"
End Sub

Private Sub Form_QueryUnload(Cancel As Integer, UnloadMode As Integer)
    Dim Msg: Declare variable.

    If ExitButtonPushed = False Then
        Msg = "Do you really want to exit the application?"
    Else
        ExitButtonPushed = True
    End If
End Sub

Private Sub Form_Resize()
    On Error Resume Next
    If WindowState = 2 Then
        For X = 1 To 3

```

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```

    ScreenShow(X).Left = ScreenShow(X - 1).Left + 1200
Next X
For X = 0 To 3
    ScreenShow(X).Top = Screen.Height - 1155
Next X
MusicListing.Height = Screen.Height - 2300
Else

For X = 1 To 3
    ScreenShow(X).Left = ScreenShow(X - 1).Left + 1200
Next X
For X = 0 To 3
    ScreenShow(X).Top = Recorder.Height - 1155
Next X
MusicListing.Height = Recorder.Height - 2300
End If
Title.Left = (Recorder.Width / 2) - 3500
ExitSystem.Top = ScreenShow(0).Top
SearchAgain.Top = ScreenShow(0).Top
Rating.Top = ScreenShow(0).Top
SearchAgain.Height = ExitSystem.Height
MusicListing.Left = (Recorder.Width / 2) - (MusicListing.Width / 2)
StopListUpdate.Top = ScreenShow(0).Top
StopListUpdate.Left = Recorder.Width - 1560
ClearList.Top = ScreenShow(0).Top
ClearList.Left = StopListUpdate.Left - 1815
End Sub
Private Sub Form_Unload(Cancel As Integer)
End All
End Sub
Private Sub MusicListing_Click()
If RatingBox.Visible = True Then RatingBox.Visible = False
MusicListing.SelectionMode = flexSelectionFree
MusicListing.Sort = 1
End Sub

Private Sub MusicListing_DbClick()
If RatingBox.Visible = True Then RatingBox.Visible = False
MusicListing.SelectionMode = flexSelectionFree
MusicListing.Sort = 1

End Sub

Private Sub Rating_Click()
Dim answer As String
answer = InputBox("Please enter your password.")
If answer <> password Then
MsgBox "The password was incorrect."
Exit Sub
Else
RatingBox.Visible = True

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```

End If
End Sub

Private Sub RatingCancel_Click()
RatingBox.Visible = False
If RatingBlock = "none" Then
RatingOption(0).Value = True
ElseIf RatingBlock = "PG" Then
RatingOption(1).Value = True
ElseIf RatingBlock = "R" Then
RatingOption(2).Value = True
End If
End Sub

Private Sub RatingOK_Click()
Dim message As String
RatingBlock = RatingTemp
If RatingBlock = "none" Then
message = "No music"
ElseIf RatingBlock = "PG" Then
message = "PG and R rated music"
ElseIf RatingBlock = "R" Then
message = "R rated music"
End If
RatingBox.Visible = False
MsgBox(message & " will be blocked from search, display, and play.")
End Sub

Private Sub RatingOption_Click(Index As Integer)
If RatingOption(0).Value = True Then
RatingTemp = "none"
ElseIf RatingOption(1).Value = True Then
RatingTemp = "PG"
ElseIf RatingOption(2).Value = True Then
RatingTemp = "R"
Else
RatingTemp = "none"
End If
End Sub

Private Sub RatingPassword_Click()
NewPassword1 = InputBox("Please type your new password.")
If NewPassword1 = "" Then Exit Sub
NewPassword2 = InputBox("Please confirm your new password.")
If NewPassword2 = "" Then Exit Sub
If NewPassword2 = NewPassword1 Then
password = NewPassword1
MsgBox "Password changed successfully."
Else
MsgBox "Error entering new password."
End If
End Sub

```

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```

Private Sub ScreenShow_Click(Index As Integer)

Dim i As Integer
On Error Resume Next
If RatingBox.Visible = True Then RatingBox.Visible = False
If (SelCat1 = "" And Index = 2) Then
MsgBox ("Please select a main category from screen 2 before viewing this screen !!!")
Exit Sub
End If

For i = 0 To 3
Screen2.ScreenShow(i).BackColor = &H8000000F
ScreenShow(i).BackColor = &H8000000F
ScreenShow(i).ForeColor = &H80000012
Next i

Select Case Index
Case 0
Screen2.DD.Group = "Screen1"
Screen2.Hide
Screen2.cat1screen.Visible = True
Screen2.cat2screen.Visible = False
Screen2.FavHitsScrn.Visible = False
For i = 0 To 4
Screen1.ScreenShow(i).BackColor = &H8000000F
Screen1.ScreenShow(Index).ForeColor = &H80000012
Next i
Screen1.ScreenShow(Index).BackColor = &HC0&
Screen1.ScreenShow(Index).ForeColor = &H8000000E
Screen1.Show
If Screen1.WindowState <> 2 Then Screen1.WindowState = 2
Exit Sub
Case 1
Screen2.DD.Group = "Screen2"
Screen2.cat1screen.Visible = True
Screen2.cat2screen.Visible = False
Screen2.FavHitsScrn.Visible = False
For i = 0 To 4
Screen2.ScreenShow(i).BackColor = &H8000000F
Screen2.ScreenShow(Index).ForeColor = &H80000012
Next i
Screen2.ScreenShow(Index).BackColor = &HC0&
Screen2.ScreenShow(Index).ForeColor = &H8000000E
Screen2.Show
If Screen2.WindowState <> 2 Then Screen2.WindowState = 2
Exit Sub
Case 2
Screen2.DD.Group = "Screen2"
SelCat1 = MemCat
Screen2.cat1screen.Visible = False
Screen2.cat2screen.Visible = True
Screen2.FavHitsScrn.Visible = False
For i = 0 To 4
Screen2.ScreenShow(i).BackColor = &H8000000F

```

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```

Screen2.ScreenShow(Index).ForeColor = &H80000012
Next i
Screen2.ScreenShow(Index).BackColor = &HC0&
Screen2.ScreenShow(Index).ForeColor = &H8000000E
Screen2.Show
If Screen2.WindowState <> 2 Then Screen2.WindowState = 2
Exit Sub
Case 3
Screen2.DD.Group = "Screen4"
Recorder.ScreenShow(Index).BackColor = &HC0&
Recorder.ScreenShow(Index).ForeColor = &H8000000E
Screen1.Hide
Screen2.Hide
Recorder.Show
If Recorder.WindowState <> 2 Then Recorder.WindowState = 2

Recorder.Refresh
Screen2.cat1screen.Visible = True
Screen2.cat2screen.Visible = False
Screen2.FavHitsScreen.Visible = False

End Select
End Sub

Private Sub SearchAgain_Click()
response = MsgBox("Are you sure you want to Reset the Library Display?" & Chr(15) & "Any music playing will be automatically
Paused.", 4)
If response = vbNo Then
Exit Sub
Else
If RatingBox.Visible = True Then RatingBox.Visible = False
If SongPlaying = True And Screen1.wp.LinkMode <> LINK_NONE Then
Screen1.wp.LinkExecute "pause"
PauseList = True
End If
Load choices
choices.Show 1
If CancelLibrary = True Then
CancelLibrary = False
Screen2.Show
Screen2.SetFocus
Exit Sub

End If
StoplistingList = False
UpdateList
End If
End Sub

Private Sub StopListUpdate_Click()
StoplistingList = True
If RatingBox.Visible = True Then RatingBox.Visible = False

```

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```

If Screen1.wp.LinkMode <> LINK_NONE And PauseList = True Then
  Screen1.wp.LinkExecute "pause"
  PauseList = False
End If

```

```
End Sub
```

```

"Loader.frm"
Private Sub Form_Activate()
  Dim ftime, wtime As Integer

  Loader.Refresh
  MousePointer = 11
  ftime = Timer()
  wtime = 0
  App.HelpFile = App.Path & "\noohelp.hlp"
  Load titlefrm
  titlefrm.Animation1.AutoPlay = True
  titlefrm.Animation2.AutoPlay = True
  titlefrm.Animation1.Open App.Path & "\cd1a.avi"
  titlefrm.Animation2.Open App.Path & "\cd1b.avi"
  titlefrm.Animation1.Play
  titlefrm.Animation2.Play
  titlefrm.MMControl1.FileName = App.Path & "\Intro.wav"
  Call titlefrm.Main

  touchscreen = True

  Do While wtime < 10
    wtime = Timer() - ftime
    DoEvents
  Loop
  titlefrm.Show
  Loader.Hide
  MousePointer = 0
  Unload Loader
End Sub

```

```

"choices.frm"
Private Sub Form_Load()
  DisplayLibrary = False

```

```
End Sub
```

```
Private Sub OKButton_Click(Index As Integer)
```

```

  If Index = 1 Then
    CancelLibrary = True
  End If
  Unload choices

```

```
End Sub
```

```
Private Sub Option1_Click()
  DisplayLibrary = False

```

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```

Recorder.Title.Caption = " Current Music You Own"
End Sub

Private Sub Option2_Click()
DisplayLibrary = True
Recorder.Title.Caption = "The Complete MOAEC Music Library"
End Sub

"Screen1.frm"
Private Declare Function mciSendCommandA Lib "WinMM" _
(ByVal wDeviceID As Long, ByVal message As Long, _
ByVal dwParam1 As Long, ByVal dwParam2 As Any) As Long

Private Declare Function mciSendStringA Lib "WinMM" _
(ByVal mciCommand As String, ByVal returnStr As String, _
ByVal returnLength As Integer, ByVal callback As Integer) As Long

Private Declare Function GetProfileString Lib "kernel32" _
Alias "GetProfileStringA" (ByVal lpAppName As String, _
ByVal lpKeyName As String, ByVal lpDefault As String, _
ByVal lpReturnedString As String, ByVal nSize As Long) As Long

Const MCI_OPEN = &H803
Const MCI_CLOSE = &H804
Const MCI_PLAY = &H806
Const MCI_OPEN_TYPE = &H200&
Const MCI_OPEN_ELEMENT = &H200&
Const MCI_WAIT = &H2&

Private Type MCI_WAVE_OPEN_PARMS
dwCallback As Long
wDeviceID As Long
lpstrDeviceType As String
lpstrElementName As String
lpstrAlias As String
dwBufferSeconds As Long
End Type

Private Type MCI_PLAY_PARMS
dwCallback As Long
dwFrom As Long
dwTo As Long
End Type

Private Function StartApp(appname As String) As Long
On Error Resume Next

StartApp = (Shell(appname))
DoEvents

```

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```

If StartApp = 0 Then
  MsgBox "Couldn't start " & appname
  StartApp = 0
End
End If
End Function
Private Function CreateLink() As Integer

```

```

On Error Resume Next

```

```

' set DDE parameter
wp.LinkMode = NONE
wp.LinkItem = ""

```

```

wp.LinkTopic = "WinPlay3 audio"
wp.LinkMode = LINK_MANUAL
tmp = Err

```

```

If (tmp = 0) Then
  WinPlayConnected = 1
Else
  WinPlayConnected = 0
End If

```

```

CreateLink = tmp

```

```

End Function

```

```

Sub AdjustVolume(SliderNum As Integer)

```

```

Dim newvolume As Long
Dim first As Integer
Dim other As Integer
Dim leftVol As Long
Dim rightVol As Long
Dim fadevalue As Variant

```

```

If ((SliderNum = 0 Or SliderNum = 1) And channel = 1) Or ((SliderNum = 2 Or SliderNum = 3) And channel = 2) Then

```

```

If (channel = 1 And mixerbar.Value < 0) Or (channel = 2 And mixerbar.Value > 0) Then

```

```

  fadevalue = Abs(mixerbar.Value) / 100

```

```

  If fadevalue < 0.5 Then fadevalue = 0

```

```

End If

```

```

If SliderNum = 0 Or SliderNum = 1 Then

```

```

  first = 1

```

```

  other = 0

```

```

ElseIf SliderNum = 2 Or SliderNum = 3 Then

```

```

  first = 3

```

```

  other = 2

```

```

End If

```

```

If SliderNum = first Or SliderNum = other Then

```

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```

Text2.Text = oldvolume
leftVol = CLng(Val("&H" & Hex(volumesdr(Other).Value)) - 1)
RightVol = CLng(Val("&H" & Hex(fadevalue * (65535 - volumesdr(first).Value)) & Hex(fadevalue * (65535 -
volumesdr(Other).Value))))
newvolume = RightVol
Call waveOutSetVolume(VolumeID, newvolume)
End If
End If
End Sub

```

```

Sub Playwave(WaveFile As Variant, songlength As Double)
Dim Ltime As Long
Dim Y As Long
Dim X As Long
Dim errorCode As Integer
Dim returnStr As Integer
Dim errorStr As String * 255
Dim MaxMsecs As Double
Dim volumeCode As Long
Dim pitch As Long
Dim mixinc As Integer
Dim count As Double
Dim PiggYBack As Double
Dim checker As Integer

On Error GoTo errorHandler

play(channel).Enabled = True
pause(channel).Enabled = True
Screen1.stop(channel).Enabled = True
Screen1.stop(OtherChannel).Enabled = False
wp.LinkExecute "set PlayList " & WaveFile
Ltime = Timer()
X = 0
Do While X < 5
    X = Timer() - Ltime
Loop
wp.LinkExecute "play"
StopList = False
If channel = 1 Then other = 0
If channel = 2 Then other = 3

PlayLab(channel).Visible = True
QueLab(channel).Visible = False
If channel = 1 Then mixerbar.Value = -100
If channel = 2 Then mixerbar.Value = 100
NewPauseStartTime = Timer()
X = 0
Do While X < TimeSerial(0, 0, songlength)
    DoEvents
    If Timer() > AutoExitTime - 30 And Timer() < AutoExitTime - 27 And AutoExitEvent = True Then
        MsgBox ("MOAEC WILL SHUT DOWN IN 30 SECONDS !!!" & Chr(13) & " Press CANCEL to prevent auto exit.")
    End If

```

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 703-805-7627

```

If Timer() > AutoExitTime And AutoExitEvent = True Then
  SendKeys "{enter}"
  EndIfAll
  Call ExitWindows(&H0, &H0)
End If
If PauseList = True Then
  NewPauseStartTime = Timer() - TimeSoFar
End If
If PauseList = False Then
  nexttrack(1).Enabled = True
  prevtrack(1).Enabled = True
  nexttrack(2).Enabled = True
  prevtrack(2).Enabled = True
  TimeSoFar = Timer() - NewPauseStartTime
  Let X = TimeSerial(0, 0, (TimeSoFar))
  TimeElapsed(channel).Text = Format(TimeSerial(0, 0, SongsTime + songlength) - X, "hh:mm:ss")
  Text1(channel).Text = Format(TimeSerial(0, 0, songlength) - X, "hh:mm:ss")
  Screen2.timebox.Text = Format(TimeSerial(0, 0, SongsTime + songlength) - X, "hh:mm:ss")
End If

If StopList = True Then
  X = TimeSerial(0, 0, 0)
  NewPauseStartTime = Timer()
  If PrevTrackVar = True Then
    PrevTrackVar = False
    StopList = False
    wp.LinkExecute "play"
  End If
  End If
  If NextTrackVar = True Then
    X = TimeSerial(0, 0, songlength)
    NextTrackVar = False
  End If
End If

Loop

PlayLab(channel).Visible = False
QuitLab(channel).Visible = True

ExitSub
errorhandler:
  MsgBox ("Sorry...There was a problem playing this music selection.")
End Sub

Private Sub eject_Click()
  Dim files As String
  Dim o As Integer

  If wp.LinkMode <> LINK_NONE Then
    On Error Resume Next
    fileopendlg.Action = 1
  End If

```

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 Sunpot Software and Graphics
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End Sub

```
Private Sub Command1_Click()
  If wp.LinkMode <> LINK_NONE Then
    wp.LinkExecute "dialog options output"
  End If
End Sub
```

Private Sub AutoExit_Click()

```
  On Error GoTo endsub
  If AutoExit.Caption = "CANCEL" Then
    response = MsgBox("Are you sure you want to cancel auto shutdown?", 4)
    If response = vbNo Then
      Exit Sub
    Else
      AutoExitEvent = False
      AutoExit.Caption = "AUTO EXIT"
    End If
  Else
    If SongPlaying = False Then Exit Sub
    response = MsgBox("Are you sure you want to set MOAEC to shut down automatically?", 4)
    If response = vbNo Then
      Exit Sub
    Else
      AutoExit.Caption = "CANCEL"
      TimeFrame.Visible = True
      keyboard.Visible = True
      TimeInput.SetFocus
    End If
  End If
endsub:
End Sub
```

```
Private Sub backup_Click()
  If TimeInput.Visible = True Then
    TimeInput.SetFocus
    SendKeys "{end}"
    SendKeys "{backspace}"
    SendKeys "{tab}"
  End If
End Sub
```

```
Private Sub CurrentSongExpanded_Click(Index As Integer)
  CurrentSongExpanded(Index).Visible = False
End Sub
```

```
Private Sub cursong_click(Index As Integer)
```

MOAEC MASTER CODE (page 13)
Sampson Software and Graphics
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```

    CurrentSongExpanded(Index).Visible = True
End Sub

Private Sub ENTERKEY_Click()
    If TimeInput.Visible = True Then

        TimeOK.SetFocus
        SendKeys "{enter}"
    End If
End Sub

Private Sub ExitSystem_Click()
    response = MsgBox("Are you sure you want to exit the system?", 4)
    If response = vbNo Then
        Exit Sub
    Else
        ExitButtonPushed = True
        EndItAll
    End If
End Sub

Private Sub Form_GotFocus()
    On Error Resume Next
    Screen2.DD.Group = "Screen1"
End Sub

Public Sub Form_Load()
    Dim oldvolume As Long
    Dim oldrate As Long
    Dim newvolume As Long
    Dim VolumePoint As Long
    Dim volumeID As Long
    Dim volumecode As Long

    Dim tmp As String * 256
    Dim WinPlay3Name As String
    Dim n As Integer
    StoplistingList = True
    Screen1.WindowState = 2
    automix = True
    NextTrackVar = False
    AutoExitEvent = False
    volinc(0) = Master(0).Value
    volinc(1) = Master(1).Value
    'Open DDE connection with WinPlay3
    If CreateLink() <> NONE Then

        'get path to winplay3 from win.ini
        n = GetProfileString("WinPlay3", "ProgramFile", "WinPlay3.Exe", tmp, 256)
        WinPlay3Name = Left$(tmp, n)
        If StartApp(WinPlay3Name & " /DDE") Then
            Select Case CreateLink()
            Case 0
                'dde server started

```

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 Sonspot Software and Graphics
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```

Case NO_APP_RESPONDED
MsgBox "Sorry, still can't connect."
End Select
End If

End If

Call waveOutGetID(VolumeHandle, VolumeID)
Call waveOutGetVolume(VolumeID, oldvolume)

PlaySpeed(0).Value = oldvolume
PlaySpeed(1).Value = oldvolume

Master(0).Value = 49000
Master(1).Value = 49000
volumesld(8).Value = 49000
volumesld(9).Value = 49000
For i = 4 To 5
    volumesld(i).Value = 49000
Next i
For i = 0 To 3
    volumesldr(i).Value = 49000
Next i
mixerbar.Value = 100
Call waveOutSetVolume(VolumeID, CLng(Val("&H" & Hex(16000) & Hex(16000))))
PlaySpeed(0).Value = 5
PlaySpeed(1).Value = 5
End Sub

Private Sub Form_Resize()
On Error Resume Next
If WindowState = 2 Then
    For X = 1 To 4
        ScreenShow(X).Left = ScreenShow(X - 1).Left + 1200
    Next X
    For X = 0 To 3
        ScreenShow(X).Top = Screen.Height - 1155
    Next X
    ExitSystem.Top = Screen.Height - 1155
    Label10.Top = Screen.Height - 1155
Else
    For X = 1 To 4
        ScreenShow(X).Left = ScreenShow(X - 1).Left + 1200
    Next X
    For X = 0 To 4
        ScreenShow(X).Top = Screen.Height - 1155
    Next X
    ExitSystem.Top = Screen.Height - 1155
    Label10.Top = Screen.Height - 1155

```

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```

End If
Label10.Left = Screen1.Width - 1455
ExitSystem.Left = 120
Channel1(1).Left = (Screen1.Width / 2) + 8
Channel1(3).Left = (Screen1.Width / 2) + 8
Picture1.Width = Screen1.Width - 460
Picture1.Top = Screen1.Height - 3255
For X = 0 To 3
    Channel1(X).Width = (Screen1.Width / 2) - 353
Next X
For X = 0 To 1
    PlaySpeed(X).Left = (Channel1(0).Width / 2) - 1200
Next X
Label3(0).Left = PlaySpeed(0).Left + 720
Label3(1).Left = PlaySpeed(0).Left - 600
Label3(3).Left = PlaySpeed(0).Left + 720
Label3(4).Left = PlaySpeed(0).Left - 600
Label3(2).Left = PlaySpeed(0).Left + 2520
Label3(5).Left = PlaySpeed(0).Left + 2520
Label4(0).Left = PlaySpeed(0).Left + 720
Label4(1).Left = PlaySpeed(0).Left - 720

For X = 1 To 2
    play(X).Left = ((Channel1(0).Width / 2) - 1425)
    Screen1.stop(X).Left = ((Channel1(0).Width / 2) - 1425) - 570
    pause(X).Left = ((Channel1(0).Width / 2) - 1425) - 1140
    prevtrack(X).Left = ((Channel1(0).Width / 2) - 1425) - 1710
    nexttrack(X).Left = ((Channel1(0).Width / 2) - 1425) + 2280
    cursong(X).Left = Channel1(1).Width - 2175
    Quelab(X).Left = cursong(1).Left
    PlayLab(X).Left = cursong(1).Left
Next X
For X = 2 To 3
    Channel1(X).Height = Screen1.Height - Channel1(0).Height - Picture1.Height - 1600
Next X
volumesldr(0).Left = 0.209 * Picture1.Width
volumesldr(1).Left = 0.267 * Picture1.Width
volumesldr(2).Left = 0.36 * Picture1.Width
volumesldr(3).Left = 0.418 * Picture1.Width
volumesldr(4).Left = 0.6734 * Picture1.Width
volumesldr(5).Left = 0.7315 * Picture1.Width
volumesldr(8).Left = 0.8128 * Picture1.Width
volumesldr(9).Left = 0.894 * Picture1.Width
Master(0).Left = 0.5225 * Picture1.Width
Master(1).Left = 0.5806 * Picture1.Width
Label1(1).Left = volumesldr(0).Left + 120
Label1(2).Left = volumesldr(2).Left + 120
Label1(4).Left = volumesldr(4).Left + 120
Label1(5).Left = volumesldr(8).Left - 120
Label1(6).Left = volumesldr(9).Left - 120
Label1(3).Left = Master(0).Left - 120

```

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 Sontop Software and Graphics
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```

AutoExit.Top = ExitSystem.Top
For X = 1 To 2
    CurrentSongExpanded(X).Left = (Screen1.Width / 2) - 5408
Next X
EQ1(0).Top = (Channel1(2).Height / 2) - 100
EQ1(1).Top = (Channel1(2).Height / 2) - 100
EQ1(0).Left = (Channel1(2).Width / 2) - 2280
EQ1(1).Left = (Channel1(2).Width / 2) - 2280
End Sub

```

```

Private Sub Form_Unload(Cancel As Integer)
    If wp.LinkMode <> LINK_NONE Then
        wp.LinkExecute "stop"
        wp.LinkExecute "exit"
    End If
    WinPlay3Connected = 0
    wp.LinkMode = LINK_NONE

```

```
EndItAll
```

```
End Sub
```

```
Private Sub Label10_Click()
    SendKeys "{F1}"
End Sub

```

```
Private Sub Letters_Click(Index As Integer)
    'Type the letter pressed in the text field
    If TimeInput.Visible = True Then
        TimeInput.SetFocus
        SendKeys LCase(Lenets(Index).Caption)
        SendKeys "{tab}"
    End If

```

```
End Sub
```

```
Private Sub Master_Click(Index As Integer)
```

```

    volinc(0) = Master(0).Value
    volinc(1) = Master(1).Value

```

```
End Sub
```

```
Private Sub Master_Scroll(Index As Integer)
```

```

    Dim volinc2(2) As Long
    volinc2(Index) = Master(Index).Value - volinc(Index)

```

```
Select Case Index
```

```
Case 0
```

```

    volumesldr(0).Value = OrigVol(0) - volinc2(0)
    volumesldr(2).Value = OrigVol(2) + volinc2(0)
    volumesldr(4).Value = OrigVol(4) + volinc2(0)

```

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```

Case 1
  volrmesldr(1).Value = OrigVol(1) + volinc2(1)
  volrmesldr(3).Value = OrigVol(3) + volinc2(1)
  volrmesldr(5).Value = OrigVol(5) + volinc2(1)

End Select
volinc(Index) = Master(Index).Value

End Sub

Private Sub mixerbar_Change()
  If (mixerbar.Value <= 0 And channel = 1) Then
    AdjustVolume (1)
  ElseIf (mixerbar.Value >= 0 And channel = 2) Then
    AdjustVolume (2)
  End If
End Sub

Private Sub mixerbar_Scroll()
  If (mixerbar.Value <= 0 And channel = 1) Then
    AdjustVolume (1)
  ElseIf (mixerbar.Value >= 0 And channel = 2) Then
    AdjustVolume (2)
  End If
End Sub

Private Sub MixFade_Click()
  If MixFade.Caption = "AUTO MIX OFF" Then
    MixFade.Caption = "AUTO MIX ON"
    automix = True
  Else
    MixFade.Caption = "AUTO MIX OFF"
    automix = False
  End If
End Sub

Private Sub nexttrack_Click(Index As Integer)
  If Index = channel Then
    If wp.LinkMode <> LINK_NONE Then
      response = MsgBox("Are you sure you want to skip to the next song?", 4)
      If response = vbNo Then
        Exit Sub
      Else
        NextTrackVar = True
      End If
    End If
  End If
End Sub

```



```

Private Sub pause_Click(Index As Integer)
If channel = Index Then
If StopList = False Then
MsgBox ("Your library is still updating!" & Chr(13) & "Please switch to Screen 4 to resume play.")
Exit Sub
End If
If wp.LinkMode <> LINK_NONE Then
wp.LinkExecute "pause"
If PauseList = True Then
PauseList = False
Else
PauseList = True
End If
End If
End If
End Sub

Private Sub play_Click(Index As Integer)

If wp.LinkMode <> LINK_NONE Then
If Index = OtherChannel And StopList = True Then
NextTrackVar = True
Self Index = channel Then
PauseList = False
wp.LinkExecute "play"
StopList = False
End If
End If
End Sub

Private Sub PlaySpeed_Scroll(Index As Integer)
Dim oldrate As Long
Dim volumecode As Long
Dim newrate As Long
End Sub

Private Sub RestartMus_Click()
Dim SoundCom As Long

SoundCom = waveOutRestart(VolumeID)
Text2.Text = SoundCom

End Sub

Private Sub prevtrack_Click(Index As Integer)
If channel = Index Then
If wp.LinkMode <> LINK_NONE Then
wp.LinkExecute "stop"
StopList = True
PauseList = False
PreTrackVar = True

```

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```

End If
End If
End Sub

Private Sub ScreenShow_Click(Index As Integer)
Dim I As Integer
On Error Resume Next
If (SelCat1 = "" And Index = 2) Then
MsgBox ("Please select a main category from screen 2 before viewing this screen!!!")
Exit Sub
End If
Screen2.Category(1).Visible = False
cnt1count = 0
'disable speed buttons since switching to screen 3
For i = 0 To Screen2.SongSpeed.count - 1
Screen2.SongSpeed(i).Enabled = False
Screen2.SongSpeed(i).BackColor = &H8000000F
Next i
Screen2.Mix.Enabled = False
Screen2.PlayTime.Enabled = False
Screen2.Mix.BackColor = &H8000000F
Screen2.PlayTime.BackColor = &H8000000F
For i = 0 To 4
Screen2.ScreenShow(i).BackColor = &H8000000F
ScreenShow(i).BackColor = &H8000000F
ScreenShow(i).ForeColor = &H80000012
Next i

Select Case Index
Case 0
Screen2.DD.Group = "Screen1"
Screen2.Hide
Screen2.cnt2screen.Visible = False
Screen2.FavHisScrn.Visible = False
Exit Sub
Case 1
Screen2.DD.Group = "Screen2"
Screen2.cnt2screen.Visible = False
Screen2.FavHisScrn.Visible = False
For i = 0 To 4
Screen2.ScreenShow(i).BackColor = &H8000000F
Screen2.ScreenShow(Index).ForeColor = &H80000012
Next i
Screen2.ScreenShow(Index).BackColor = &HC00
Screen2.ScreenShow(Index).ForeColor = &H8000000E
Screen2.Show
If Screen2.WindowState <> 2 Then Screen2.WindowState = 2
Exit Sub
Case 2
If IsDDWinRunning() Then Screen2.DD.Group = "Screen2"

```

MOAEC MASTER CODE (page 20)
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```

SelCat1 = MemCat
Screen2.catScreen.Visible = True
Screen2.FavHitsScrn.Visible = False
For i = 0 To 4
    Screen2.ScreenShow(i).BackColor = &H8000000F
    Screen2.ScreenShow(Index).ForeColor = &H00000012
Next i
Screen2.ScreenShow(Index).BackColor = &HC0&
Screen2.ScreenShow(Index).ForeColor = &H8000000E
Screen2.Show
    If Screen2.WindowState <> 2 Then Screen2.WindowState = 2

Exit Sub
Case 3
Screen2.DD.Group = "Screen4"
Recorder.ScreenShow(Index).BackColor = &HC0&
Recorder.ScreenShow(Index).ForeColor = &H8000000E
Screen1.Hide
Screen2.Hide
Recorder.Show
    If Recorder.WindowState <> 2 Then Recorder.WindowState = 2

Recorder.Refresh
Screen2.catScreen.Visible = False
Screen2.FavHitsScrn.Visible = False
End Select
make the button pressed the right color
End Sub

Private Sub stop_Click(Index As Integer)
    If channel = Index Then
        If wp.LinkMode <> LINK_NONE Then
            wp.LinkExecute "stop"
            StopList = True
            play(OtherChannel).Enabled = True
        End If
    End If
End Sub

Private Sub undo_Click()

End Sub

Private Sub TimeCancel_Click()
    TimeFrame.Visible = False
    keyboard.Visible = False
End Sub

Private Sub TimeOK_Click()
    Dim Timer1 As Long

```

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```

Dim timer2 As Long
On Error GoTo endsub
If Val(TimeInput.Text) < 0 Then
    AutoExitStart = Timer()
    AutoExitTime = AutoExitStart + (Val(TimeInput.Text) * 60)
    AutoExitEvent = True
End If
TimeFrame.Visible = False
keyboard.Visible = False

```

```

endsub:
End Sub

```

```

Private Sub volumesldr_Change(Index As Integer)
AdjustVolume (Index)
OrigVol(Index) = volumesldr(Index).Value

```

```

End Sub

```

```

Private Sub volumesldr_Scroll(Index As Integer)

```

```

    On Error Resume Next
    AdjustVolume (Index)

```

```

End Sub

```

```

Private Sub wp_LinkClose()

```

```

    If WiaPlayConnected < 0 Then

```

```

    End If

```

```

    wp.LinkMode = LINK_NONE

```

```

End Sub

```

```

Private Sub wp_LinkError(LinkErr As Integer)

```

```

    MsgBox ("Link error")

```

```

End Sub

```

```


```

```


```

```

Screen2.frm

```

```

Sub DD_SpeechRecognized(Word As String, WordValue As String)

```

```

    Dim CurControl As Control

```

```

    Dim VoiceFlag As Boolean

```

```

    Dim SavedName As String

```

```

    On Error GoTo errorHandler

```

```

    If Word = "[classical]" Then Category1(0).SetFocus

```

```

    If Word = "[jazz]" Then Category1(1).SetFocus

```

```

    If Word = "[folk]" Then Category1(2).SetFocus

```

```

    If Word = "[oldies]" Then Category1(3).SetFocus

```

```

    If Word = "[country]" Then Category1(4).SetFocus

```

```

    If Word = "[pop]" Then Category1(5).SetFocus

```

```

    If Word = "[soul]" Then Category1(6).SetFocus

```

```

    If Word = "[R and B]" Then Category1(7).SetFocus

```

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```

If Word = "[blues]" Then Category1(8).SetFocus
If Word = "[calypso]" Then Category1(9).SetFocus
If Word = "[disco]" Then Category1(10).SetFocus
If Word = "[funk]" Then Category1(11).SetFocus
If Word = "[rock]" Then Category1(12).SetFocus
If Word = "[metal]" Then Category1(15).SetFocus
If Word = "[top 40]" Then Category1(14).SetFocus
If Word = "[rap]" Then Category1(15).SetFocus
If Word = "[reggae]" Then Category1(16).SetFocus
If Word = "[alternative]" Then Category1(17).SetFocus
If Word = "[ethic]" Then Category1(18).SetFocus
If Word = "[religion]" Then Category1(19).SetFocus
If Word = "[special events]" Then Category1(20).SetFocus
If Word = "[funny]" Then Category1(21).SetFocus
If Word = "[easy listening]" Then Category1(22).SetFocus
If Word = "[favorite hits]" Then Category1(23).SetFocus
If Word = "[special dance]" Then Category1(24).SetFocus
If Word = "[special mixes]" Then Category1(25).SetFocus
If Word = "[dance]" Then Category1(26).SetFocus
If Word = "[energy]" Then Category1(27).SetFocus
If Word = "[sound effects]" Then Category1(28).SetFocus
If Word = "[sound tracks]" Then Category1(29).SetFocus
If Word = "[television]" Then Category1(30).SetFocus

If Word = "[Dance Mix]" Then Mix.SetFocus
If Word = "[Clear]" Then ChrSrh.SetFocus
If Word = "[Undo]" Then undo.SetFocus

If Word = "[Search List]" Then searchlist.SetFocus
If Word = "[Play List]" Then Playlist(0).SetFocus
If Word = "[Search]" Then search.SetFocus
If Word = "[Expand]" And ExpandList.Caption = "EXPAND" Then
    ExpandList.SetFocus
ElseIf Word = "[Shrink]" And ExpandList.Caption = "SHRINK" Then
    ExpandList.SetFocus
End If

If Word = "[Load]" Then LoadPlay.SetFocus
If Word = "[Save]" Then SavePlay.SetFocus
If Word = "[Next]" Then AddList(0).SetFocus
If Word = "[Pick]" Then AddList(1).SetFocus
If Word = "[Delete]" Then delete.SetFocus

If Word = "[Title]" Then SearchCat(1).SetFocus
If Word = "[Artist]" Then SearchCat(2).SetFocus
If Word = "[Date]" Then SearchCat(3).SetFocus
If Word = "[Song Category]" Then SearchCat(4).SetFocus
If Word = "[Dance Type]" Then SearchCat(6).SetFocus
If Word = "[Music Style]" Then SearchCat(5).SetFocus
If Word = "[Speed]" And SearchCat(1).Enabled = True Then SearchCat(7).SetFocus
If Word = "[Energy]" Then SearchCat(8).SetFocus

If Word = "[Speed]" And AllSpeeds.Enabled = True Then AllSpeeds.SetFocus
If Word = "[Fast]" And SongSpeed(0).Enabled = True Then SongSpeed(0).SetFocus

```

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```

If Word = "[Fast]" Then SongSpeed(0).SetFocus
If Word = "[Medium]" And SongSpeed(1).Enabled = True Then SongSpeed(1).SetFocus
If Word = "[Slow]" And SongSpeed(2).Enabled = True Then SongSpeed(2).SetFocus
If Word = "[Time]" And PlayTime.Enabled = True Then PlayTime.SetFocus
If Word = "[30]" Then
    TimeInput.SetFocus
    TimeInput.Text = 30
End If
If Word = "[OK]" And timebox.Visible = True Then TimeOK.SetFocus
If Word = "[Begin Search]" And SearchScreen.Visible = True Then BeginSearch.SetFocus
If Word = "[Cancel]" And timebox.Visible = True Then TimeCancel.SetFocus
If Word = "[Cancel]" And SearchScreen.Visible = True Then Cancel.SetFocus
If Word = "[Cancel]" And on2screen.Visible = True Then CancelSubScreen.SetFocus
If word = "[minutes]" Then Text2.SetFocus
If Word = "[Play]" Then PlayButton.SetFocus
If Word = "[Now]" Then Now.SetFocus

If word = "[screen 1]" Then ScreenShow(0).SetFocus
If word = "[screen 2]" Then ScreenShow(1).SetFocus
If word = "[screen 3]" Then ScreenShow(2).SetFocus
If word = "[screen 4]" Then ScreenShow(3).SetFocus
SendKeys ""

Errorhandler:
Exit Sub
End Sub
Sub GrayOut()
    'disable and gray out speed, mix, and time buttons
    Mix.Enabled = False
    AllSpeeds.Visible = True
    AllSpeeds.Enabled = False
    PlayTime.Enabled = False
    Mix.BackColor = &H8000000F
    AllSpeeds.BackColor = &H8000000F
    PlayTime.BackColor = &H8000000F
    For i = 0 To SongSpeed.count - 1
        SongSpeed(i).Enabled = False
        SongSpeed(i).BackColor = &H8000000F
    Next i
End Sub
Sub LoadNewSong(Songfile As String)
    Dim memHandle As Long
    Dim memPointer As Long
    Dim filename As String
    Dim retValue As Long
    Dim nBytes As Long
    Dim fileSize As Long

    Dim origStr As String
    Dim strSize As Long
    Dim textStr As String

On Error GoTo noFilename

```

```

fileName = Songfile
FilePointer = CreateFile(fileName, GENERIC_READ Or GENERIC_WRITE, 0&, 0&, OPEN_EXISTING,
FILE_ATTRIBUTE_NORMAL, 0&)
fileSize = GetFileSize(FilePointer, 0)
memHandle = GlobalAlloc(GMEM_MOVEABLE Or GMEM_ZEROINIT, fileSize)
memPointer = GlobalLock(memHandle)
retValue = ReadFile(FilePointer, ByVal memPointer, fileSize, nBytes, 0&)

Call Screen1.Playwave(fileName, songlength)
CloseHandle (FilePointer)
GlobalUnlock (memHandle)
GlobalFree (memHandle)
Exit Sub

noFilename:

End Sub
Sub StartPlay(row As Integer, list As Integer)
Dim song, songlength? As String
Dim i, j As Integer
Dim CurControl As MSFlexGrid
Dim OtherChannel As Integer
On Error GoTo errorHandler
If list = 1 Then
Set CurControl = searchlist
ElseIf list = 2 Then
Set CurControl = Playlist(0)
End If
StopList = False
If (CurControl.Name = Playlist(0).Name And Playlist(0).Rows > 1) Or CurControl.Name = searchlist.Name Then
SongPlaying = True
answer = MsgBox("Are you sure you want to interrupt the current song?", 4, "Interrupt Song Playing")
If answer = vbNo Then
Exit Sub
Else
If channel = 1 Then
channel = 2
OtherChannel = 1
ElseIf channel = 2 Then
channel = 1
OtherChannel = 2
End If
End If

End If
End If

Mic.Enabled = False
Switch to s1
Screen1.Show

```

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```

Screen1.Refresh
Screen2.Hide

If Playlist(0).Rows > 1 Then
  Playlist(0).Col = 1
  Playlist(1).Col = 1
  Playlist(0).ColSel = 2
  Playlist(1).ColSel = 8
End If
'build the songlist array from the play list
'find the song from the play list
'disable mix button
If CurControl.Name = searchlist.Name Then
If searchlist.RowSel > 0 Then
  searchlist.BackColorSel = searchlist.CellBackColor
  searchlist.ForeColorSel = searchlist.CellForeColor
  For i = 0 To 3
    selsong(i) = searchlist.TextMatrix(searchlist.row, i)
  Next i
  Playlist(0).AddItem selsong(0) & Chr(9) & selsong(1) & Chr(9) & selsong(2)
  Playlist(1).AddItem selsong(0) & Chr(9) & selsong(1) & Chr(9) & selsong(2)
'Add a song to the total to be played
NumSongs.Text = PlaySongs
'Add the song time to the play time box
End If
End If
'Begin playing song list
Do Until Playlist(0).Rows < 2
  undo.Enabled = False
  For j = 0 To 4
    ScreenShow(j).BackColor = &H8000000F
    ScreenShow(j).ForeColor = &H80000012
    Screen1.ScreenShow(j).BackColor = &H8000000F
    Screen1.ScreenShow(j).ForeColor = &H80000012
  Next j
  Screen1.ScreenShow(0).BackColor = &HCDA
  Screen1.ScreenShow(0).ForeColor = &H3000000E

Screen1.Refresh

If Playlist(0).Rows > 1 Then
  CurControl.row = row
  If channel = 1 Then OtherChannel = 2
  If channel = 2 Then OtherChannel = 1
  Screen1.PlayLab(OtherChannel).Visible = False
  Screen1.QuoteLab(OtherChannel).Visible = True
  'find the first song to be played

```

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```

If the song was already on deck then play it
Data1.Refresh
Data1.Recordset.MoveLast
Data1.Recordset.MoveFirst
Data1.Recordset.FindFirst "Title = " & CurControl.TextMatrix(row, 1) & " and Artist = " & CurControl.TextMatrix(row, 2) &

If IsNull(Data1.Recordset.Fields("ID")) Then
    MsgBox ("There was a problem finding your song file on disk.")
Else
    songlist = "c:\Progra-1\moec\895.mpg"
    'songlist = "C:\Progra-1\moec\" & Data1.Recordset.Fields("ID") & ".mpg"
    'songlist = "c:\windows\media\ada.wav"
    songlist = "e:\\" & Data1.Recordset.Fields("ID") & ".mpg"

End If

songlength = Val(CurControl.TextMatrix(row, 0)) - 2
Screen1.cursong(channel).Text = CurControl.TextMatrix(row, 1)
CurControl.Col = 1
Screen1.cursong(channel).BackColor = CurControl.CellBackColor
Screen1.Text1(channel).Text = Format(TimeSerial(0, 0, songlength), "hh:mm:ss")
If CurControl.Name = Playlist(0).Name Then
    For X = 0 To 8
        Screen1.CurrentSongExpanded(channel).TextMatrix(1, X) = Playlist(1).TextMatrix(row, X)
        Screen1.CurrentSongExpanded(channel).CellBackColor = Playlist(1).CellBackColor
        Screen1.CurrentSongExpanded(channel).BackColorSel = Playlist(1).CellBackColor
        Screen1.CurrentSongExpanded(channel).ForeColorSel = Playlist(1).CellForeColor
    Next X
Else
    For X = 0 To 8
        Screen1.CurrentSongExpanded(channel).TextMatrix(1, X) = CurControl.TextMatrix(row, X)
        Screen1.CurrentSongExpanded(channel).CellBackColor = CurControl.CellBackColor
        Screen1.CurrentSongExpanded(channel).BackColorSel = CurControl.CellBackColor
        Screen1.CurrentSongExpanded(channel).ForeColorSel = CurControl.CellForeColor
    Next X
End If
Data1.Recordset.Close
If (CurControl.Name = Playlist(0).Name And Playlist(0).Rows > 2) Or CurControl.Name = searchlist.Name Then
    If (CurControl.Name = Playlist(0).Name And row <= 1) Or CurControl.Name = searchlist.Name Then
        Playlist(0).row = 1
        Playlist(1).row = 1
    Else
        Playlist(0).row = 2
        Playlist(1).row = 2
    End If
    songlength2 = Val(Playlist(0).TextMatrix(Playlist(0).row, 0))
    Screen1.cursong(OtherChannel).Text = Playlist(0).TextMatrix(Playlist(0).row, 1)
    Playlist(0).Col = 1
    Screen1.cursong(OtherChannel).BackColor = Playlist(0).CellBackColor
    Screen1.Text1(OtherChannel).Text = Format(TimeSerial(0, 0, songlength2), "hh:mm:ss")
    Screen1.TimeElapsed(OtherChannel).Text = Format(TimeSerial(0, 0, 0), "hh:mm:ss")

```

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```

For X = 0 To 8
  Screen1.CurrentSongExpanded(OtherChannel).TextMatrix(1, X) = Playlist(1).TextMatrix(Playlist(0).row, X)
  Screen1.CurrentSongExpanded(OtherChannel).CellBackColor = Playlist(1).CellBackColor
  Screen1.CurrentSongExpanded(OtherChannel).BackColorSel = Playlist(1).CellBackColor
  Screen1.CurrentSongExpanded(OtherChannel).ForeColorSel = Playlist(1).CellForeColor
Next X

Else
  songlist2 = ""
  Screen1.CursorSong(OtherChannel).Text = ""
  Screen1.CursorSong(OtherChannel).BackColor = &H80000009
  Screen1.Text1(OtherChannel).Text = Format(TimeSerial(0, 0, 0), "hh:mm:ss")
  Screen1.TimeElapsed(OtherChannel).Text = Format(TimeSerial(0, 0, 0), "hh:mm:ss")
End If

If CurControl.Name = searchlist.Name Then SongsTime = SongsTime + CLng(Val(CurControl.TextMatrix(row, 0)))
SongsTime = SongsTime - CLng(Val(CurControl.TextMatrix(row, 0)))
timebox.Text = Format(TimeSerial(0, 0, CLng(SongsTime)), "hh:mm:ss")

If Playlist(0).Rows > 2 Then
  If CurControl.Name = Playlist(0).Name And row < 1 Then
    Playlist(0).row = row
    Playlist(1).row = row
  ElseIf CurControl.Name = searchlist.Name Then
    Playlist(0).row = Playlist(0).Rows - 1
    Playlist(1).row = Playlist(0).Rows - 1
  Else
    Playlist(0).row = 1
    Playlist(1).row = 1
  End If
  Playlist(1).RemoveItem (Playlist(0).row)
  Playlist(0).RemoveItem (Playlist(0).row)
Else
  Playlist(0).Clear
  Playlist(1).Clear
  Playlist(0).Rows = 1
  Playlist(1).Rows = 1
  Playlist(0).Col = 1
  Playlist(1).Col = 1
  Playlist(0).ColSel = 2
  Playlist(1).ColSel = 8
  Playlist(0).CellBackColor = Playlist(0).BackColorFixed
  Call FormatHeaders
End If
If CurControl.Name = searchlist.Name Then PlaySongs = PlaySongs + 1
PlaySongs = PlaySongs - 1
NumSongs.Text = PlaySongs
Playlist(0).Col = 1
Playlist(1).Col = 1
Playlist(0).ColSel = 2
Playlist(1).ColSel = 8

```

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```

Playlist(0).BackColorSel = Playlist(0).CellBackColor
Playlist(0).ForeColorSel = Playlist(0).CellForeColor
Playlist(1).BackColorSel = Playlist(0).CellBackColor
Playlist(1).ForeColorSel = Playlist(0).CellForeColor
SongPlaying = True
Call Screen1.Playwave(songlist, songlength)
If CurControl.Name = searchlist.Name Then Set CurControl = Playlist(0)
row = 1

If channel = 1 Then
    channel = 2
    OtherChannel = 1
Else
    channel = 1
    OtherChannel = 2
End If
SongPlaying = False

End If
Loop
Else
    StopList = True
End If
Clearall:
SongsTime = 0
Playlist(0).Col = 1
Playlist(1).Col = 1
Playlist(0).ColSel = 2
Playlist(1).ColSel = 8
timebox.Text = Format(TimeSerial(0, 0, CLng(SongsTime)), "hh:mm:ss")
Playlist(0).Clear
Playlist(0).Rows = 1
Call FormatHeaders
Playlist(0).BackColorSel = Playlist(0).BackColorFixed
Playlist(0).ForeColorSel = Playlist(0).ForeColorFixed
Playlist(1).Clear
Playlist(1).Rows = 1
Playlist(1).BackColorSel = Playlist(1).BackColorFixed
Playlist(1).ForeColorSel = Playlist(1).ForeColorFixed
searchlist.BackColorSel = &H80000008
searchlist.ForeColorSel = &H8000000E
PlaySongs = 0
NumSongs.Text = "0"
Screen1.cursong(channel).Text = ""
Screen1.cursong(channel).BackColor = &H80000009

Screen1.Text1(channel).Text = Format(TimeSerial(0, 0, 0), "hh:mm:ss")
Screen1.TimeElapsed(channel).Text = Format(TimeSerial(0, 0, 0), "hh:mm:ss")
Screen1.cursong(OtherChannel).Text = ""
Screen1.cursong(OtherChannel).BackColor = &H80000009

Screen1.Text1(OtherChannel).Text = Format(TimeSerial(0, 0, 0), "hh:mm:ss")
Screen1.TimeElapsed(OtherChannel).Text = Format(TimeSerial(0, 0, 0), "hh:mm:ss")

```

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```

Now.Enabled = False
PlayButton.Enabled = False
Now.BackColor = &H8000000F
PlayButton.BackColor = &H8000000F

```

```
Exit Sub
```

```
errorhandler:
```

```

MsgBox "There was a problem finding your selected song file."
SongPlaying = False

```

```
End Sub
```

```
Sub RestoreSearchList()
```

```
CurRow2 = 1
```

```
CurRow1 = 1
```

```
CurCol = 0
```

```
undo.Enabled = False
```

```
'clear the playlists
```

```
SearchSongs = 0
```

SEARCHLIST

```
searchlist.AllowBigSelection = True
```

```
searchlist.Rows = numRows
```

```
If numRows = 0 Then
```

```
ClearSearchList
```

```
ChrSch.Enabled = False
```

```
Else
```

```
ChrSch.Enabled = True
```

```
searchlist.row = 1
```

```
searchlist.Col = 0
```

```
searchlist.RowSel = numRows - 1
```

```
searchlist.ColSel = 8
```

```
searchlist.Clip = allCells1
```

```
For i = 1 To numRows - 1
```

```
searchlist.row = i
```

```
For k = 0 To 8
```

```
searchlist.Col = k
```

```
searchlist.CellBackColor = FileColors(i)
```

```
Next k
```

```
SearchSongs = SearchSongs + 1
```

```
Next i
```

```
searchlist.AllowBigSelection = False
```

```
searchlist.row = 1
```

```
searchlist.Col = 0
```

```
delete.Enabled = True
```

```
End If
```

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```

Exit Sub

End Sub
Sub RestorePlayList()
If numRows = 0 Then
ClearPlayList
Else
CurRow2 = 1
CurRow1 = 1
CurCol = 0
undo.Enabled = False
'clear the playlists
PlaySongs = 0
SongsTime = 0
NumSongs.Text = 0
timebox.Text = Format(TimeSerial(0, 0, CLng(SongsTime)), "hh:mm:ss")
SinglePlayTime.Text = "00:00:00"
Playlist(0).AllowBigSelection = True
Playlist(1).AllowBigSelection = True
Playlist(0).Rows = numRows
Playlist(0).row = 1
Playlist(0).Col = 0
Playlist(0).RowSel = numRows - 1
Playlist(0).ColSel = 2
Playlist(1).Rows = numRows
Playlist(1).row = 1
Playlist(1).Col = 0
Playlist(1).RowSel = numRows - 1
Playlist(1).ColSel = 8
Playlist(0).Clip = allCells1
Playlist(1).Clip = allCells2
For i = 1 To numRows - 1
Playlist(0).row = i
For j = 0 To 2
Playlist(0).Col = j
Playlist(0).CellBackColor = FileColors(i)
Next j
Playlist(1).row = i
For k = 0 To 8
Playlist(1).Col = k
Playlist(1).CellBackColor = FileColors(i)
Next k
SongsTime = SongsTime + CLng(Val(Playlist(0).TextMatrix(i, 0)))
timebox.Text = Format(TimeSerial(0, 0, SongsTime), "hh:mm:ss")
PlaySongs = PlaySongs + 1
NumSongs.Text = PlaySongs
Next i
Playlist(0).AllowBigSelection = False
Playlist(1).AllowBigSelection = False
Playlist(0).row = 1
Playlist(1).row = 1
Playlist(0).Col = 0
Playlist(1).Col = 0
ExpandList.Enabled = True

```

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```

delete.Enabled = True
Command1.Enabled = True
Now.Enabled = True
Now.BackColor = &HFF&
PlayButton.Enabled = True
PlayButton.BackColor = &HFF8080
RndMix.Enabled = True
SavePlay.Enabled = True
Call CheckOnDeck
End If
Exit Sub

End Sub
Sub SaveSearchList()

    CurRow1 = searchlist.row
    CurCol = 0
    undo.Enabled = True
    On Error GoTo errorhandler

    searchlist.AllowBigSelection = True
    searchlist.row = 1
    searchlist.Col = 0
    searchlist.RowSel = searchlist.Rows - 1
    searchlist.ColSel = 8
    allCells1 = searchlist.Clip

    numRows = searchlist.Rows
    ReDim FileColors(searchlist.Rows - 1)
    For i = 1 To searchlist.Rows - 1
        searchlist.row = i
        FileColors(i) = searchlist.CellBackColor
        *Write @FileNum. FileColors(i)
    Next i
    searchlist.AllowBigSelection = False
    searchlist.row = CurRow1
    searchlist.Col = 0

    Exit Sub

errorhandler:
Exit Sub
End Sub
Sub SavePlayList()

    CurRow2 = Playlist(1).row
    CurRow1 = Playlist(0).row
    CurCol = 0
    undo.Enabled = True
    On Error GoTo errorhandler

    Playlist(0).AllowBigSelection = True
    Playlist(0).row = 1

```

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```

Playlist(0).Col = 0
Playlist(0).RowSel = Playlist(0).Rows - 1
Playlist(0).ColSel = 2
allCells1 = Playlist(0).Clip
Playlist(1).AllowBigSelection = True
Playlist(1).Row = 1
Playlist(1).Col = 0
Playlist(1).RowSel = Playlist(1).Rows - 1
Playlist(1).ColSel = 8
allCells2 = Playlist(1).Clip
numRows = Playlist(0).Rows
ReDim FileColors(Playlist(0).Rows + 1)
For i = 1 To Playlist(0).Rows - 1
    Playlist(0).row = i
    FileColors(i) = Playlist(0).CellBackColor
    Write #FileNum, FileColors(i)
Next i
Playlist(1).AllowBigSelection = False
Playlist(0).AllowBigSelection = False
Playlist(0).row = CurRow1
Playlist(1).row = CurRow2
Playlist(0).Col = 1
Playlist(1).Col = 1
Exit Sub
End Sub

Sub ListFavHits()
    If PlayedSongs(1, 1) <> "" Then
        Organize.Enabled = True
        For z = 1 To zed
            searchlist.AddItem PlayedSongs(1, z, 0) & Chr(9) & PlayedSongs(1, z, 1) & Chr(9) & PlayedSongs(1, z, 2) & Chr(9) &
            PlayedSongs(1, z, 3) & Chr(9) & PlayedSongs(1, z, 4) & Chr(9) & PlayedSongs(1, z, 5) & Chr(9) & PlayedSongs(1, z, 6) & Chr(9) &
            PlayedSongs(1, z, 7) & Chr(9) & PlayedSongs(1, z, 8)
            SearchSongs = SearchSongs + 1
            searchlist.row = SearchSongs
            For X = 0 To 8
                searchlist.Col = X
                searchlist.CellBackColor = PlayedSongs(1, z, 9)
            Next X
            ChrSrch.Enabled = True
            searchlist.BackColorSel = searchlist.CellBackColor
        Next z
    Else
        MsgBox ("Sorry...You have no song selections defined as favorite hits.")
    End If
End Sub

Sub ClearPlayList()
    Dim i As Integer
    reset the song variables

```

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```

SongsTime = 0
PlaySongs = 0
'clear the fields associated with song count and time
timebox.Text = Format(TimeSerial(0, 0, CLng(SongsTime)), "hh:mm:ss")
SinglePlayTime.Text = "00:00:00"
NumSongs.Text = "0"
'purge the contents of the playlist
For i = 0 To 1
    Playlist(i).Clear
    Playlist(i).Rows = 1
    Playlist(i).BackColorSel = Playlist(0).BackColorFixed
    Playlist(i).ForeColorSel = Playlist(0).ForeColorFixed
Next i
'reset column widths and make the smallest list visible
Call FormatHeaders
Playlist(0).Visible = True
Playlist(1).Visible = False
'reset the buttons
SavePlay.Enabled = False
RndMix.Enabled = False
Mix.Enabled = False
Now.Enabled = False
Now.BackColor = &H800000F
PlayButton.BackColor = &H800000F
PlayButton.Enabled = False
AddList(0).Enabled = False
Command1.Enabled = False
ExpandList.Enabled = False
'reset button colors and return selection to searchlist
Now.BackColor = &H800000F
Mix.BackColor = &H800000F
searchlist.BackColorSel = &H8000008
searchlist.ForeColorSel = &H800000E
End Sub
Sub ClearSearchList()
Dim i As Integer
'reset caption of main search button and text fields
search.Caption = "Search Music Categories"

For i = 0 To 9
    csearch(i).Caption = ""
Next i
'remove all rows of the list
searchlist.Clear
searchlist.Rows = 1
Call FormatHeaders
'reset the searchlist colors
searchlist.BackColorSel = searchlist.BackColorFixed
searchlist.ForeColorSel = searchlist.ForeColorFixed
searchlist.BackColor = &H800000E
'reset the main search flag and flag label
csearch(0).Caption = "none"
searchflag = 0
'reset searchlist variables and reset buttons

```

MOAEC MASTER CODE (page 34)
 Sonosoft Software and Graphics
 303-893-7637


```

SearchSongs = 0
AddList(0).Enabled = False
AddList(1).Enabled = False
ChSrch.Enabled = False
Organize.Enabled = False
Now.Enabled = False
Now.BackColor = &H8000000F
End Sub
Sub DeletePlay(RowNum As Integer)
If Playlist(0).Rows <= 2 Then
    Playlist(1).row = 1
    For i = 0 To 8
        UndoText(i) = Playlist(1).TextMatrix(i, i)
    Next i
    ClearPlayList
Else
    PlaySongs = PlaySongs - 1
    SongsTime = SongsTime - CLng(Val(Playlist(0).TextMatrix(RowNum, 0)))
    timebox.Text = Format(TimeSerial(0, 0, SongsTime), "hh:mm:ss")
    NumSongs.Text = PlaySongs
    Playlist(0).RemoveItem RowNum
    Playlist(1).RemoveItem RowNum
End If
End Sub
Sub ExpandListButs()
On Error Resume Next
Dim X As Integer
Dim ButWidth(9) As Integer
Dim ButLeft(8) As Integer
ButWidth(1) = 2450
ButWidth(2) = 1960
ButWidth(3) = 690
ButWidth(4) = 1630
ButWidth(5) = 1000
ButWidth(6) = 1450
ButWidth(7) = 1150
ButWidth(8) = 1080
ButLeft(2) = 4410
ButLeft(3) = 5100
ButLeft(4) = 6730
ButLeft(5) = 7730
ButLeft(6) = 9180
ButLeft(7) = 10330
ButLeft(8) = 11410
For X = 1 To 8
    SearchCat(X).Width = ButWidth(X) + (HeadExpand * 44.5)
Next X
For X = 2 To 8
    SearchCat(X).Left = SearchCat(X - 1).Left + SearchCat(X - 1).Width - 15

```

MOAEC MASTER CODE (page 35)

Sunspot Software and Graphics
303-805-7637

```

Next X
End Sub
Sub FormatHeaders()
  'Expands the headers of the spreadsheets to match screen width
  On Error Resume Next
  Playlist(0).FormatString = "<Song Title           " & Space(5 * HeadExpand) & "<Artist           " &
Space(5 * HeadExpand)
  Playlist(1).FormatString = "<Song Title           " & Space(HeadExpand) & "<Artist           " &
Space(HeadExpand) & "<Date           " & Space(HeadExpand) & "<Music Category           " & Space(HeadExpand) & "<Music Style           " &
Space(HeadExpand) & "<Dance Type           " & Space(HeadExpand) & "<Music Speed           " & Space(HeadExpand) & "<Energy           " &
Space(HeadExpand)
  searchlist.FormatString = "<Song Title           " & Space(HeadExpand) & "<Artist           " &
Space(HeadExpand) & "<Date           " & Space(HeadExpand) & "<Music Category           " & Space(HeadExpand) & "<Music Style           " &
Space(HeadExpand) & "<Dance Type           " & Space(HeadExpand) & "<Music Speed           " & Space(HeadExpand) & "<Energy           " &
Space(HeadExpand)
End Sub
Sub CheckSub(checker As String)
  If checker = "Sub1" Then
    SubCol = "Sub2"
    SubCount = 0
  ElseIf checker = "Sub2" Then
    SubCol = "Sub3"
  ElseIf checker = "Sub3" Then
    SubCol = "Sub4"
  ElseIf checker = "Sub4" Then
    SubCol = "Sub5"
  ElseIf checker = "Sub5" Then
    SubCol = "Sub6"
  ElseIf checker = "Sub6" Then
    SubCol = "Sub7"
  ElseIf checker = "Sub7" Then
    SubCol = "Sub8"
  ElseIf checker = "Sub8" Then
    SubCol = "Sub9"
  ElseIf checker = "Sub9" Then
    SubCol = "Sub10"
  ElseIf checker = "Sub10" Then
    SubCol = "Sub11"
  ElseIf checker = "Sub11" Then
    SubCol = "Sub1"
  End If
  SubCount = SubCount + 1
End Sub
Option Compare Text
Sub CheckMain(checker2 As String)
  If checker2 = "Main" Then
    Cn1 = "Main1"
  ElseIf checker2 = "Main1" Then
    Cn1 = "Main2"
    MainCount = 0
  ElseIf checker2 = "Main2" Then
    Cn1 = "Main3"
  End If

```

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 Synopt Software and Graphics
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```

ElseIf checker2 = "Main3" Then
    Cat1 = "Main4"
ElseIf checker2 = "Main4" Then
    Cat1 = "Main5"
ElseIf checker2 = "Main5" Then
    Cat1 = "Main6"
ElseIf checker2 = "Main6" Then
    Cat1 = "Main7"
ElseIf checker2 = "Main7" Then
    Cat1 = "Main8"
ElseIf checker2 = "Main8" Then
    Cat1 = "Main1"

End If
MainCount = MainCount + 1
End Sub
Sub CheckOnDeck()
Dim songlist2 As String
Dim songlength2 As Integer
On Error GoTo errorhandler
If Playlist(0).Rows > 1 Then
    songlength2 = Val(Playlist(0).TextMatrix(1, 0))

    Playlist(0).row = 1
    Playlist(1).row = 1
    Playlist(0).BackColorSel = Playlist(0).CellBackColor
    Playlist(0).ForeColorSel = Playlist(0).CellForeColor
    Playlist(1).BackColorSel = Playlist(1).CellBackColor
    Playlist(1).ForeColorSel = Playlist(1).CellForeColor

    Screen1.cursong(OtherChannel).Text = Playlist(0).TextMatrix(1, 1)
    Screen1.cursong(OtherChannel).BackColor = Playlist(0).CellBackColor
    Screen1.Text1(OtherChannel).Text = Format(TimeSerial(0, 0, songlength2), "hh:mm:ss")
    Screen1.TimeElapsed(OtherChannel).Text = Format(TimeSerial(0, 0, 0), "hh:mm:ss")
    For X = 0 To 8
        Screen1.CurrentSongExpanded(OtherChannel).TextMatrix(1, X) = Playlist(1).TextMatrix(1, X)
        Screen1.CurrentSongExpanded(OtherChannel).CellBackColor = Playlist(1).CellBackColor
        Screen1.CurrentSongExpanded(OtherChannel).BackColorSel = Playlist(1).CellBackColor
        Screen1.CurrentSongExpanded(OtherChannel).ForeColorSel = Playlist(1).CellForeColor
    Next X
    Data1.Recordset.Close
Else
    Screen1.cursong(OtherChannel).Text = ""
    Screen1.cursong(OtherChannel).BackColor = &H80000009
    Screen1.Text1(OtherChannel).Text = Format(TimeSerial(0, 0, 0), "hh:mm:ss")
    Screen1.TimeElapsed(OtherChannel).Text = Format(TimeSerial(0, 0, 0), "hh:mm:ss")
End If
Screen1.PlayLab(OtherChannel).Visible = False
Screen1.Quelab(OtherChannel).Visible = True
Exit Sub
errorhandler:

```

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 Sunspot Software and Graphics
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```

Exit Sub

End Sub

Private Sub AllSpeeds_Click()
    AllSpeeds.Visible = False
    AllSpeeds.Enabled = False
End Sub

Private Sub CancelSubScreen_Click()
    CancelSearch = True
End Sub

Private Sub ENTERKEY_Click()
    If searchfield.Visible = True Then
        BeginSearch.SetFocus
        SendKeys "[end]"
        SendKeys "[enter]"
    Else
        TimeOK.SetFocus
        SendKeys "[enter]"
    End If
End Sub

Private Sub ExitSystem_Click()
    response = MsgBox("Are you sure you want to exit the system?", 4)
    If response = vbNo Then
        Exit Sub
    Else
        ExitButtonPushed = True
        EndItAll
    End If
End Sub

Private Sub Form_GotFocus()
    On Error Resume Next
    Screen2.DD.Group = "Screen2"
End Sub

Private Sub Form_QueryUnload(Cancel As Integer, UnloadMode As Integer)
    Dim Msg ' Declare variable.
    If ExitButtonPushed = False Then

        Msg = "Do you really want to exit the application?"

    Else
        EndItAll
        ExitButtonPushed = True
    End If

End Sub

Private Sub Form_Resize()

```

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 Script Software and Graphics
 303-805-7637

```

If WindowState = 2 Then
  Screen1.WindowState = 2
  Recorder.WindowState = 2
  HeadExpand = 0
  Call FormatHeaders
  Call ExpandListButs
  HeadExpand = (Screen2.Width - 11565) / 443
  Call FormatHeaders
  Call ExpandListButs
  If ExpandList.Caption = "EXPAND" Then
    Picture1.Left = 6720
    Picture1.Width = Screen.Width - 6830
    SinglePlayTime.Left = Screen.Width + 100
    Label5.Left = Screen.Width - 100
    Label1.Left = 1440
  Else
    Picture1.Left = 0
    Picture1.Width = Screen2.Width - 195
    Playlist(1).Left = 0
    SinglePlayTime.Left = 4800
    Label5.Left = 6240
    Label1.Left = 0.41 * Picture1.Width
  End If
  Picture1.Top = 0

  Picture4.Height = Screen.Height - 6290
  Picture4.Width = Screen2.Width - 195
  searchlist.Width = Picture4.Width - 100
  searchlist.Height = Picture4.Height - 600
  For X = 0 To 4
    ScreenShow(X).Top = Screen.Height - 1155
  Next X
  undo.Top = Screen.Height - 1155
  Help.Top = Screen.Height - 1155
  SavePlay.Top = Screen.Height - 1490
  PlayButton.Top = Screen.Height - 1490
  LoadPlay.Top = Screen.Height - 995
  Now.Top = Screen.Height - 995

  ScreenShow(0).Left = 0.211 * Screen.Width
  For X = 1 To 4
    ScreenShow(X).Left = ScreenShow(X - 1).Left + 1200
  Next X
  undo.Left = Screen.Width - 2025
  Help.Left = Screen.Width - 2985
  Label2.Left = 0.4 * Screen.Width
  search.Left = Screen.Width - 4575
  ClrSrch.Left = Screen.Width - 2175
  Playlist(0).Width = Picture1.Width - 240
  Playlist(1).Width = Screen.Width

Else
  HeadExpand = 0
  maxed = True

```

MOAEC MASTER CODE (page 39)
 Sampot Software and Graphics
 303-803-7637

```

Call FormatHeaders
Call ExpandListBus
HeadExpand = (Screen2.Width - 11565) / 340
Call ExpandListBus
Call FormatHeaders
If ExpandList.Caption = "EXPAND" Then
    Picture1.Left = 6720
    Picture1.Width = 4815
    Playlist(1).Left = 120
    Playlist(0).Left = 120
    Label1.Left = 1440
Else
    Picture1.Left = 0
    Picture1.Width = 11535
    Playlist(1).Left = 0
    Playlist(0).Left = 0
    Label1.Left = 4200
End If
SinglePlayTime.Left = 4800
Label5.Left = 6240
Picture1.Top = 0
Picture1.Height = 2775
Picture1.Width = 11535
searchlist.Width = 11435
searchlist.Top = 480
searchlist.Height = 2175
For X = 0 To 4
    ScreenShow(X).Top = 7800
Next X
undo.Top = 7800
Help.Top = 7800
LoadPlay.Top = 7560
Now.Top = 8040
SavePlay.Top = 8040
PlayButton.Top = 7560
Label2.Left = 4080
ScreenShow(0).Left = 5600
For X = 1 To 4
    ScreenShow(X).Left = ScreenShow(X - 1).Left + 1200
Next X
undo.Left = 9540
Help.Left = 8580
search.Left = 6840
ClrSrch.Left = 9240
Playlist(0).Width = Picture1.Width - 240
Playlist(1).Width = 11535
End If
ExitSystem.Left = undo.Left + 975
ExitSystem.Top = undo.Top
End Sub
Private Sub AddList_Click(Index As Integer)
Dim i As Integer
Dim j As Integer
Dim oldcolor, oldcolor2, oldcolor3 As Long

```

MOAEC MASTER CODE (page 40)
 Sampol Software and Graphics
 303-803-7637

```

Dim oldtime As Integer
On Error GoTo errorhandler
delete.Enabled = True
ExpandList.Enabled = True
SavePlay.Enabled = True
Command1.Enabled = True
RndMix.Enabled = True
If IsNull(channel) Then
    channel = 1
    OtherChannel = 2
End If
MousePointer = 11
'select the text from the search list
Now.BackColor = &HFF&
Now.Enabled = True
PlayButton.Enabled = True
PlayButton.BackColor = &HFF8080
undo.Enabled = True
UndoEvent = 0
If Playlist(0).Rows = 1 Then
    numRows = 0
Else
    SavePlayList
End If
If searchlist.Rows >= 1 Then
    'if the PICK button is pushed
    If Index = 1 Then
        If SelList = 1 Then
            PlaySongs = PlaySongs + 1
            zed = zed + 1
            For j = 0 To 8
                selsong(j) = searchlist.TextMatrix(searchlist.row, j)
                PlayedSongs(1, zed, j) = searchlist.TextMatrix(searchlist.row, j)
            Next j
            PlayedSongs(1, zed, 9) = searchlist.CellBackColor
            Playlist(0).AddItem selsong(0) & Chr(9) & selsong(1) & Chr(9) & selsong(2)
            Playlist(1).AddItem selsong(0) & Chr(9) & selsong(1) & Chr(9) & selsong(2) & Chr(9) & selsong(3) & Chr(9) &
            selsong(4) & Chr(9) & selsong(5) & Chr(9) & selsong(6) & Chr(9) & selsong(7) & Chr(9) & selsong(8)
            'add a song to the total to be played

            NumSongs.Text = PlaySongs
            Playlist(0).row = Playlist(0).Rows - 1
            Playlist(1).row = Playlist(1).Rows - 1
            'add the song time to the play time box
            SongsTime = SongsTime + CLng(Val(searchlist.TextMatrix(searchlist.row, 0)))
            timebox.Text = Format(TimeSerial(0, 0, SongsTime), "hh:mm:ss")
            For z = 0 To 2
                Playlist(0).Col = z
                Playlist(0).CellBackColor = searchlist.CellBackColor
                Playlist(0).BackColorSel = searchlist.CellBackColor
                Playlist(0).ForeColorSel = searchlist.CellForeColor
            Next z

```

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 Sureport Software and Graphics
 303-805-7637

MOAEC MASTER CODE (page 44)

```

For i = X - 1 To 1 Step -1
  Playlist(0).row = i
  Playlist(1).row = i
  oldcolor = Playlist(0).CellBackColor
  For j = 0 To 2
    Playlist(0).TextMatrix(i + 1, j) = Playlist(0).TextMatrix(i, j)
    Playlist(0).row = i + 1
    Playlist(0).Col = j
    'change color
    Playlist(0).CellBackColor = oldcolor
  Next j
  For j = 0 To 8
    Playlist(1).TextMatrix(i + 1, j) = Playlist(1).TextMatrix(i, j)
    Playlist(1).row = i + 1
    Playlist(1).Col = j
    'change color
    Playlist(1).CellBackColor = oldcolor
  Next j
Next i
For j = 0 To 2
  Playlist(0).TextMatrix(1, j) = selsong(j)
  Playlist(0).row = 1
  Playlist(0).Col = j
  Playlist(0).CellBackColor = oldcolor2
  Playlist(0).BackColorSel = oldcolor2
  Playlist(0).ForeColorSel = oldcolor3
Next j
For j = 0 To 8
  Playlist(1).TextMatrix(1, j) = selsong(j)
  Playlist(1).row = 1
  Playlist(1).Col = j
  Playlist(1).CellBackColor = oldcolor2
  Playlist(1).BackColorSel = oldcolor2
  Playlist(1).ForeColorSel = oldcolor3
Next j
End If
End If
searchlist.RemoveItem searchlist.Row Position
End If
End If
MousePointer = 0
UndoRow = Playlist(0).row
Call CheckOnDeck
Exit Sub

errorhandler:
  MsgBox ("Sorry, there was a problem with the song data...unable to add to playlist")
  MousePointer = 0
End Sub

Private Sub backup_Click()
  If searchfield.Visible = True Then
    searchfield.SetFocus
    SendKeys "{end}"
  End If

```

MOAEC MASTER CODE (page 44)
 Samsco Software and Graphics
 MO-805-7637

```

SendKeys "{backspace}"
SendKeys "{tab}"
Else
TimeInput.SetFocus
SendKeys "{end}"
SendKeys "{backspace}"
SendKeys "{tab}"
End If
End Sub

Private Sub BeginSearch_Click()
'loop to search the Access database
Dim position, final As Long
Dim flag As Boolean
Dim selection As String
Dim Meant1 As String
Dim string2 As String * 255
Dim SelTag As String
Dim tempfield(9) As String
Dim finalfield(10) As String
SaveSearchList
On Error GoTo errorHandler:
keyboard.Visible = False
delete.Enabled = False
AddList(1).Enabled = False
AddList(0).Enabled = False
CancelSearch = False
If searchflag >= 10 Then
MsgBox "Sorry, you have already narrowed your search to ten categories !!!"
MousePointer = 0

searchfield.Text = ""
search.Enabled = True
For i = 1 To 8
SearchCat(i).Enabled = False
Next i
AddList(0).Enabled = True
AddList(1).Enabled = True
ClrSelch.Enabled = True
Organize.Enabled = True
Exit Sub
End If
UndoEvent = 1
SaveSearchList
undo.Enabled = True
flag = True
SearchCats(0, searchflag) = column
SearchCats(1, searchflag) = searchfield.Text
rsearch(searchflag).Caption = searchfield.Text
MousePointer = 11
'search data base for first search
If searchflag = 0 Then
selection = "" & Trim(searchfield.Text) & ""
If column >= 4 Then

```

MOAEC MASTER CODE (page 45)
Semipet Software and Graphics
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```

Data2.RecordSource = Trim(Str(column))
Data2.Refresh
Data3.Refresh
Data2.Recordset.MoveLast
Data3.Recordset.MoveLast
Data2.Recordset.MoveFirst
Data3.Recordset.MoveFirst
Data2.Recordset.FindFirst "Label LIKE " & selection
If Data2.Recordset.NoMatch Then
    MsgBox ("Sorry...Could not find that entry.")
    flag = False
Else
    SelTag = Data2.Recordset.Fields("Tag")
    selection = "" & SelTag & ""
End If
End If

```

MainLoop:

```

DoEvents
Data1.RecordSource = "LP Complete Music Guide"
Data1.Refresh
Data2.Refresh
Data3.Refresh
Data1.Recordset.MoveLast
Data3.Recordset.MoveLast
Data1.Recordset.MoveFirst
Data3.Recordset.MoveFirst

Data1.Recordset.FindLast Cat1 & " LIKE " & selection
If Data1.Recordset.NoMatch Then flag = False
final = Data1.Recordset.AbsolutePosition
Data1.Recordset.MoveFirst
If flag = True Then
    SearchSongs = searchlist Rows - 1
    Do Until position = final
        DoEvents
        Data1.Recordset.FindNext Cat1 & " LIKE " & selection
        If Data1.Recordset.NoMatch Then

            position = Data1.Recordset.AbsolutePosition

    Else
        position = Data1.Recordset.AbsolutePosition
        assign song color to tracking array
        Data3.Recordset.MoveFirst
        If IsNull(Data1.Recordset.Fields("Main1")) Then
            Mcat1 = "none found"
            MncatColor(SearchSongs) = &H80000005
        Else
            Mcat1 = Data1.Recordset.Fields("Main1")
            Data3.Recordset.FindFirst "Main1 = " & Mcat1 & ""
            MncatColor(SearchSongs) = Val(Data3.Recordset.Fields("colorID"))
        End If
    End If

```

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301-805-7637

```

'find the abbreviations for each category
finalfield(9) = Val(Data3.Recordset.Fields("colorID"))
If IsNull(Data1.Recordset.Fields("time")) Then
    finalfield(0) = 300
Else
    finalfield(0) = Data1.Recordset.Fields("time")
End If
If IsNull(Data1.Recordset.Fields("Title")) Then
    finalfield(1) = "NL"
Else
    finalfield(1) = Data1.Recordset.Fields("Title")
End If
If IsNull(Data1.Recordset.Fields("Artist")) Then
    finalfield(2) = "NL"
Else
    finalfield(2) = Data1.Recordset.Fields("Artist")
End If
If IsNull(Data1.Recordset.Fields("Date")) Then
    finalfield(3) = "NL"
Else
    finalfield(3) = Data1.Recordset.Fields("Date")
End If
If IsNull(Data1.Recordset.Fields("Main1")) Then
    tempfield(4) = "NL"
Else
    tempfield(4) = Data1.Recordset.Fields("Main1")
End If
If IsNull(Data1.Recordset.Fields("Mstyle")) Then
    tempfield(5) = "NL"
Else
    tempfield(5) = Data1.Recordset.Fields("Mstyle")
End If
If IsNull(Data1.Recordset.Fields("Dtype")) Then
    tempfield(6) = "NL"
Else
    tempfield(6) = Data1.Recordset.Fields("Dtype")
End If
If IsNull(Data1.Recordset.Fields("Speed")) Then
    tempfield(7) = "NL"
Else
    tempfield(7) = Data1.Recordset.Fields("Speed")
End If
If IsNull(Data1.Recordset.Fields("Energy")) Then
    tempfield(8) = ""
Else
    tempfield(8) = Data1.Recordset.Fields("Energy")
End If
For X = 4 To 8
    Data2.RecordSource = X
    Data2.Refresh
    Data2.Recordset.MoveLast
    Data2.Recordset.MoveFirst
    Data2.Recordset.FindFirst "Tag = " & tempfield(X) & ""
    finalfield(X) = Data2.Recordset.Fields("Label")

```

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Sunspot Software and Graphics
303-805-7637

DATA130 - C:\MSDEV\

```

Next X
searchlist.AddItem finalfield(0) & Chr(9) & finalfield(1) & Chr(9) & finalfield(2) & Chr(9) & finalfield(3) & Chr(9) &
finalfield(4) & Chr(9) & finalfield(5) & Chr(9) & finalfield(6) & Chr(9) & finalfield(7) & Chr(9) & finalfield(8)
If IsNull(finalfield(0)) Then
    searchlist.TextMatrix(searchlist.row, 0) = 300
End If

searchlist.row = SearchSongs + 1
For z = 0 To 8
    searchlist.Col = z
    searchlist.CellBackColor = MnCatColor(SearchSongs)
Next z
searchlist.BackColorSel = MnCatColor(SearchSongs)
searchlist.ForeColorSel = searchlist.ForeColor
SearchSongs = SearchSongs + 1
search.Caption = "Narrow Search Results"
searchflag = 1

End If
' move to the next data row in data base
If CancelSearch = True Then
    Data1.Recordset.Close
    Data2.Recordset.Close
    Data3.Recordset.Close
    MousePointer = 0
    SearchScreen.Visible = False
    searchfield.Text = ""
    search.Enabled = True
    For i = 1 To 8
        SearchCat(i).Enabled = False
    Next i
    AddList(0).Enabled = True
    AddList(1).Enabled = True
    ChrSrch.Enabled = True
    Organize.Enabled = True
    Exit Sub
End If
Loop
If colnum = 4 Then
    Call CheckMain(Cat1)
    If MainCount < 8 Then GoTo MainLoop
End If
MainCount = 0

End If
If SearchSongs > 0 Then flag = True
stoppoint:
If flag = False Then
    MsgBox "Your entry was either misspelled or is not found in your current Music Library, Please go to Screen 4 and review and
select music from the LP MOAEC Music Library."
    MousePointer = 0
    Data1.Recordset.Close
    Data2.Recordset.Close

```

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```

Data3.Recordset.Close
keyboard.Visible = True
searchfield.Text = ""
searchfield.SetFocus
Exit Sub
End If
Data1.Recordset.Close
Data2.Recordset.Close
Data3.Recordset.Close

```

```

Elseif searchflag < 10 And searchflag <> 0 Then
'if searchlist is already full, narrow the field

```

```

For j = 1 To searchflag
i = 1
Do While i <= searchlist.Rows - 1
If searchlist.Rows <= 2 Then Exit Do
If SearchCats(0, j) <> 9 Then
result = InStr(1, searchlist.TextMatrix(i, SearchCats(0, j)), SearchCats(1, j), 1)
If result = 0 Then
searchlist.row = i
searchlist.RemoveItem searchlist.row
SearchSongs = SearchSongs - 1

Else
i = i - 1
End If
Elseif SearchCats(0, j) = 9 Then
result = InStr(1, searchlist.TextMatrix(i, SearchCats(0, j)), SearchCats(1, j), 1)
If result = 0 Then
searchlist.row = i
searchlist.RemoveItem searchlist.row
SearchSongs = SearchSongs - 1

Else
i = i - 1
End If
End If

```

```

Loop
Next j
searchflag = searchflag + 1

```

```

End If

```

```

'once the search is complete, hide the screen

```

```

MousePointer = 0
SearchScreen.Visible = False
searchfield.Text = ""
search.Enabled = True
For i = 1 To 8
SearchCat(i).Enabled = False

```

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 303-805-7837

```

Next i
AddList(0).Enabled = True
AddList(1).Enabled = True
ChSrch.Enabled = True
Organize.Enabled = True
Exit Sub

```

errorhandler:

```

MsgBox "Sorry, There was an error accessing music database." & Chr(13) & "Please make sure the database is properly installed
or" & Chr(13) & "contact Looney Productions."
MousePointer = 0

```

```

SearchScreen.Visible = False
searchfield.Text = ""
search.Enabled = True
For i = 1 To 8
    SearchCat(i).Enabled = False
Next i
AddList(0).Enabled = True
AddList(1).Enabled = True
ChSrch.Enabled = True
Organize.Enabled = True
Exit Sub
End Sub

```

```

Private Sub Cancel_Click()
    keyboard.Visible = False
    SearchScreen.Visible = False
    searchfield.Text = ""
    search.Enabled = True
    For i = 1 To 8
        SearchCat(i).Enabled = False
    Next i
    CancelSearch = True
End Sub

```

```

Private Sub Category1_Click(Index As Integer)
    Dim i As Integer
    Dim j As Integer
    Dim flag As Boolean
    Dim TempCat, TempCat2 As String
    Dim c As Integer

```

```

Mix.BackColor = &H8000000F
PlayTime.BackColor = &H8000000F
Mix.BackColor = &H8000000F
For i = 0 To 3
    SongSpeed(i).BackColor = &H8000000F
    AllSpeeds.BackColor = &H8000000F

```

```

Next i

```

```

For j = 0 To 2

```

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```

        csearch(i).Caption = ""
    Next i
    csearch(0).Caption = "none"
    searchflag = 0
    SelList = 0
    SelCat1 = Category1(Index).Tag
    If Index = 24 Then
        Cat1 = "Dtype"
    ElseIf Index = 25 Then
        Cat1 = "Main1"
    Else
        Cat1 = "Main1"
    End If
    SubCol = "Sub1"
    If clicked twice, goto category 2 screen and clear time options
    If Index = 23 Then
        Call ListFavHits
        Exit Sub
    End If
    If (cat1count = 1) And (Index = cliktrak) Then
        Call titlefrm.Main
        CatColor = Category1(Index).BackColor

        Category(0).BackColor = CatColor
        Category(1).BackColor = CatColor
        Category(0).Caption = Category1(Index).Tag
        FavHitsLab1.Caption = Category1(Index).Tag
        FavHitsLab1.BackColor = CatColor
        FavHitsLab2.BackColor = CatColor
        Category(1).Visible = False
        cat1count = 0
        For X = 0 To 23
            Category2(X).Caption = ""
            Category2(X).BackColor = &H8000000F
            i = i - 1
        Next X
        'disable speed buttons since switching to screen 3
        For i = 0 To SongSpeed.count - 1
            AllSpeeds.Enabled = False
            SongSpeed(i).Enabled = False
            SongSpeed(i).BackColor = &H8000000F
            AllSpeeds.BackColor = &H8000000F
        Next i
        For i = 0 To 5
            FavHits(i).BackColor = CatColor
        Next i
        Mix.Enabled = False
        PlayTime.Enabled = False
        Mix.BackColor = &H8000000F
        PlayTime.BackColor = &H8000000F
        'change screen lights to screen 3 red
        For i = 0 To 4
            Screen2.ScreenShow(i).BackColor = &H8000000F

```

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```

Screen2.ScreenShow(i).ForeColor = &H8000012
Next i
If Index < 23 Then
Screen2.ScreenShow(2).BackColor = &HC0&
Screen2.ScreenShow(2).ForeColor = &H800000E
cat1screen.Visible = False
FavHtsSern.Visible = False
cat2screen.Visible = True
End If
For i = 0 To 8
searchdate(i).BackColor = CatColor
Next i
'Make sure the static categories match the button
If Index = 20 Then
subcatcount = 9
subcatnotal = 9
FinalCats(7) = StaticCats(9)
FinalCats(8) = StaticCats(10)
FinalCats(9) = StaticCats(11)
ElseIf Index = 18 Then
subcatcount = 8
subcatnotal = 8
FinalCats(7) = StaticCats(8)
FinalCats(8) = StaticCats(11)
ElseIf Index = 1 Then
subcatcount = 7
subcatnotal = 7
FinalCats(7) = StaticCats(7)
Else
subcatcount = 6
subcatnotal = 6
End If
'make the temporary subcats array with tags
For X = 1 To subcatnotal
DoEvents
If CancelSearch = True Then GoTo stopme
Data2.RecordSource = "Subs"
Data2.Refresh
Data3.Refresh
Data2.Recordset.MoveLast
Data3.Recordset.MoveLast
Data2.Recordset.MoveFirst
Data3.Recordset.MoveFirst
Data2.Recordset.FindFirst "Label = " & FinalCats(X) & ""
If Data2.Recordset.NoMatch Then
flag = True
Else
SubCats(X) = Data2.Recordset.Fields("Tag")
End If
Next X

```

UNRECORDED COPY

FIND THE SONG CATEGORY TAG THAT MATCHES THE BUTTON

For X = 1 To subcatotal

DoEvents

If CancelSearch = True Then GoTo stopme

If SelCat1 = "Energy" Then

SelCat1 = "EN"

Else

Data2.RecordSource = 4

Data2.Refresh

Data3.Refresh

Data2.Recordset.MoveLast

Data3.Recordset.MoveLast

Data2.Recordset.MoveFirst

Data3.Recordset.MoveFirst

Data2.Recordset.FindFirst "Label = " & SelCat1 & "

If Data2.Recordset.NoMatch Then

flag = True

Else

SelTag = Data2.Recordset.Fields("Tag")

SelCat1 = SelTag

MemCat = SelTag

End If

End If

Next X

'fill secondary category buttons with text from data

MainSubLoop:

DoEvents

If CancelSearch = True Then GoTo stopme

Data1.Refresh

Data1.Recordset.MoveLast

Data1.Recordset.MoveFirst

MousePointer = 11

LoopReset:

j = 0

For j = 1 To Data1.Recordset.RecordCount

'if cat1 matches the first button, type cat2 in the screen3 buttons

'what is if cat2 is not blank

If UCase(Data1.Recordset.Fields("Main1")) = UCase(Trim(SelCat1)) And (Data1.Recordset.Fields(SubCol) <> "") Then

If IsNull(Data1.Recordset.Fields(SubCol)) Then

j = j + 1

GoTo LoopReset

End If

'and if it isn't already on a button

flag = False

'find new subcategories not default from database

subcatcount = subcatotal

For i = 1 To subcatcount

If Data1.Recordset.Fields(SubCol) = SubCat(i) Then

flag = True

End If

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```

Next I
If flag = False Then
  SubCats(subcount + 1) = Data1.Recordset.Fields(SubCol)
  subcantotal = subcantotal + 1
End If
End If
Data1.Recordset.MoveNext
Next j

Call CheckSub(SubCol)
If SubCount < 11 Then GoTo MainSubLoop
SubCount = 0
For X = 1 To subcantotal
  Data2.RecordSource = "Subs"
  Data2.Refresh
  Data3.Refresh
  Data2.Recordset.MoveLast
  Data3.Recordset.MoveLast
  Data2.Recordset.MoveFirst
  Data3.Recordset.MoveFirst
  Data2.Recordset.FindFirst "Tag = " & SubCats(X) & ""
Next X
'sort subcats array
For i = subcantotal To 1 Step -1
  DoEvents
  If CancelSearch = True Then GoTo stopme
  TempCat = FinalCats(i - 1)
  TempCat2 = SubCats(i - 1)
  c = StrComp(TempCat, FinalCats(i))
  If c = 1 Then
    FinalCats(i - 1) = FinalCats(i)
    SubCats(i - 1) = SubCats(i)
    FinalCats(i) = TempCat
    SubCats(i) = TempCat2
  i = subcantotal - 1
  End If
Next i

'fill buttons with the finalcats array
For X = 0 To subcantotal - 1
  Category2(X).Caption = FinalCats(X - 1)
  Category2(X).BackColor = Category1(Index).BackColor
  i = i - 1
Next X

'make the last of the buttons (if any) blank
Do While i <= 23
  Category2(i).Caption = ""
  Category2(i).BackColor = &H8000000F
  i = i - 1

```

REPRODUCED FROM ORIGINAL

```

Loop
stopme:

Data2.Recordset.Close
Data3.Recordset.Close
cat1screen.Visible = False
cat2screen.Visible = True
MousePointer = 0
'reset color of speed buttons
CancelSearch = False
Exit Sub
End If

'otherwise assign button caption to primary category variable
clicktrak = Index
'enable speed selection buttons
CatColor = Category1(Index).BackColor
PlayTime.BackColor = CatColor
PlayTime.Enabled = True
Mix.Enabled = True
Mix.BackColor = CatColor
For i = 0 To SongSpeed.count - 1
    AllSpeeds.Enabled = True
    SongSpeed(i).Enabled = True
    SongSpeed(i).BackColor = CatColor
    AllSpeeds.BackColor = CatColor
Next i
cat1count = 1
End Sub

Private Sub Category2_Click(Index As Integer)
Dim flag As Boolean
Dim i As Integer
Dim tempfield(9) As String
Dim finalfield(10) As String

If Category2(Index).Caption = ButMem Then
    MsgBox ("You just picked that button...Please pick another.")
    Exit Sub
End If
ButMem = Category2(Index).Caption

Cat1 = "Main1"
flag = False
Category(1).Caption = Category2(Index).Caption
Category(1).Visible = True

If Category2(Index).Caption = "Favorite Hits" Then
    ListFavHits
    Exit Sub
End If
If Category2(Index).Caption = "ENERGY" Then SubCol = "Energy"
'fill search screen with selections from the categories
MousePointer = 11

```

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```

If SelCat1 = "SPMIX" Or SelCat1 = "Special Mixes" Then
  Cat1 = "Main3"
  SelCat1 = "SPMIX"

ElseIf SelCat1 = "EN" Or SelCat1 = "Energy" Then
  Cat1 = "Main2"
  SelCat1 = "EN"

ElseIf SelCat1 = "EL" Or SelCat1 = "Easy Listening" Then
  Cat1 = "Mstyle"
  SelCat1 = "EL"

ElseIf SelCat1 = "Special Dance" Or SelCat1 = "SPD" Then
  Cat1 = "Dtype"
  SelCat1 = "SPD"
End If

MainLoop:
DoEvents
Data1.Refresh
Data3.Refresh
Data1.Recordset.MoveLast
Data3.Recordset.MoveLast
Data1.Recordset.MoveFirst
Data3.Recordset.MoveFirst

For i = 1 To Data1.Recordset.RecordCount

  'if the data base field matches search criteria, write it to the searchlist
  If UCase(Data1.Recordset.Fields(Cat1)) = SelCat1 And UCase(Data1.Recordset.Fields(SubCol)) = UCase(Trim(SubCat1(Index
- 1))) Then
    Data3.Recordset.MoveFirst
    If IsNull(Data1.Recordset.Fields("Main1")) Then
      Mcat1 = "none listed"
      MInCatColor(SearchSongs) = &H8000005
    Else
      Mcat1 = Data1.Recordset.Fields("Main1")
      Data3.Recordset.FindFirst "Main1 = " & Mcat1 & ""
      MInCatColor(SearchSongs) = Val(Data3.Recordset.Fields("colorID"))
      finalfield(9) = Val(Data3.Recordset.Fields("colorID"))
      If IsNull(Data1.Recordset.Fields("time")) Then
        finalfield(0) = 300
      Else
        finalfield(0) = Data1.Recordset.Fields("time")
      End If
      If IsNull(Data1.Recordset.Fields("Title")) Then
        finalfield(1) = "NL"
      Else
        finalfield(1) = Data1.Recordset.Fields("Title")
      End If
      If IsNull(Data1.Recordset.Fields("Artist")) Then
        finalfield(2) = "NL"
      Else
        finalfield(2) = Data1.Recordset.Fields("Artist")
      End If
      If IsNull(Data1.Recordset.Fields("Date")) Then
        finalfield(3) = "NL"

```

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```

Else
    finalfield(5) = Data1.Recordset.Fields("Date")
End If
If IsNull(Data1.Recordset.Fields("Main1")) Then
    tempfield(4) = "NL"
Else
    tempfield(4) = Data1.Recordset.Fields("Main1")
End If
If IsNull(Data1.Recordset.Fields("Mstyle")) Then
    tempfield(5) = "NL"
Else
    tempfield(5) = Data1.Recordset.Fields("Mstyle")
End If
If IsNull(Data1.Recordset.Fields("Dtype")) Then
    tempfield(6) = "NL"
Else
    tempfield(6) = Data1.Recordset.Fields("Dtype")
End If
If IsNull(Data1.Recordset.Fields("Speed")) Then
    tempfield(7) = "NL"
Else
    tempfield(7) = Data1.Recordset.Fields("Speed")
End If
If IsNull(Data1.Recordset.Fields("Energy")) Then
    tempfield(8) = ""
Else
    tempfield(8) = Data1.Recordset.Fields("Energy")
End If
For X = 4 To 8
    Data2.RecordSource = X
    Data2.Refresh
    Data2.Recordset.MoveLast
    Data2.Recordset.MoveFirst
    Data2.Recordset.FindFirst "Tag = " & tempfield(X) & ""
    finalfield(X) = Data2.Recordset.Fields("Label")
    Data2.Recordset.Close
Next X
searchlist.AddItem finalfield(0) & Chr(9) & finalfield(1) & Chr(9) & finalfield(2) & Chr(9) & finalfield(3) & Chr(9) &
finalfield(4) & Chr(9) & finalfield(5) & Chr(9) & finalfield(6) & Chr(9) & finalfield(7) & Chr(9) & finalfield(8)
Stime(searchlist.row) = Data1.Recordset.Fields("time")
flag = True
SearchSongs = SearchSongs + 1
search.Caption = "Narrow Search Results"
searchflag = 1
End If

searchlist.row = SearchSongs
For z = 0 To 8
    searchlist.Col = z
    searchlist.CellBackColor = finalfield(9)
Next z
searchlist.BackColorSet = finalfield(9)
searchlist.ForeColorSet = searchlist.ForeColor

```

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```

End If

'move to the next data row in data base
Data1.Recordset.MoveNext
Next i
If Category2(Index).Caption <> "ENERGY" Then
    Call CheckSub(SubCol)
    If SubCount < 11 Then GoTo MainLoop
End If
SubCount = 0
SubCol = "Sub1"
Data1.Recordset.Close
Data3.Recordset.Close
MousePointer = 0
AddList(0).Enabled = True
AddList(1).Enabled = True
ChSrch.Enabled = True
Organize.Enabled = True
If flag = False Then
    MsgBox "No matches were found for your search. Please try again."
Exit Sub
End If

End Sub

Private Sub ChSrch_Click()
'clear all items off the search list
UndoEvent = 1
SaveSearchList
Call ClearSearchList

End Sub

Public Sub Command1_Click()
Dim answer As Variant
answer = MsgBox("Are you sure you want to delete the current play list?", 4, "Clear Play List")
If answer = vbNo Then
Exit Sub
Else
UndoEvent = 0
SavePlayList
ClearPlayList
RndMix.Enabled = False
If maxed = True Then
Picture1.Left = 6720
Picture1.Width = Screen2.Width - 6850
SinglePlayTime.Left = Screen.Width - 100
Label5.Left = Screen.Width - 100
Label11.Left = 1440
Else
Picture1.Width = 4695
Picture1.Left = 6720

```

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```

SinglePlayTime.Left = 4680
Label5.Left = 6240
Label1.Left = 1440

```

```

End If
ExpandList.Left = 120
ExpandList.Caption = "EXPAND"
AddList(0).Left = 1020
AddList(1).Left = 1730
RndMix.Left = 2430
delete.Left = 3070
Command1.Left = 3840

```

```

Playlist(0).Width = Picture1.Width - 240
Playlist(0).Left = 120
Playlist(1).Visible = False

```

```

End If
cat1screen.Visible = True
Call CheckOnDeck

```

```

End Sub

```

```

Private Sub DataCreate_Click()
' user creates his own song lists and databases
'show a new form
End Sub

```

```

Private Sub datalock_Click()
Dim password As String

password = InputBox("Please enter the database access password:")
Datalocked = False
End Sub

```

```

Private Sub delete_Click()
Dim answer As String
On Error GoTo errorhandler
If SongSelected = False Then
MsgBox ("No song has been selected for deletion!!!")
Exit Sub
End If
answer = MsgBox("Are you sure you want to delete the selected song?", 4, "Remove Song")
If answer = vbYes Then

```

```

If SelList = 2 Then
UndoEvent = 0
SavePlayList
For i = 0 To 8
UndoText(i) = Playlist(1).TextMatrix(i, i)
Next i
If ExpandList.Caption = "EXPAND" Then
Playlist(1).row = Playlist(0).row
UndoRow = Playlist(0).row
For i = 0 To 8

```

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```

        UndoText(i) = Playlist(1).TextMatrix(Playlist(0).row, i)
    Next i
    Call DeletePlay(Playlist(0).row)
Else
    Playlist(0).row = Playlist(1).row
    UndoRow = Playlist(1).row
    For i = 0 To 8
        UndoText(i) = Playlist(1).TextMatrix(Playlist(0).row, i)
    Next i
    Call DeletePlay(Playlist(1).row)
End If

SongSelected = False
ElseIf SellList = 1 Then
    UndoEvent = 1
    SaveSearchList
    If searchlist.Rows <= 2 Then
        search.Caption = "Search Music Categories"
        For i = 0 To 2
            csearch(i).Caption = ""
        Next i
        searchlist.Rows = 1
        Call FormatHeaders
        searchlist.BackColorSel = searchlist.BackColorFixed
        searchlist.ForeColorSel = searchlist.ForeColorFixed
        csearch(0).Caption = "none"

        SearchSongs = 0
        searchflag = 0
        searchlist.Clear
        searchlist.BackColor = &H800000E
        searchlist.Rows = 1
        AddList(0).Enabled = False
        AddList(1).Enabled = False
        ChSrch.Enabled = False
        Organize.Enabled = False
    Else
        UndoEvent = 1
        X = searchlist.row
        For i = x To searchlist.Rows - 1
            Stime(i) = Stime(i - 1)
        Next i
        For i = 0 To 8
            UndoText(i) = searchlist.TextMatrix(X, i)
        Next i
        searchlist.RemoveItem searchlist.row
        SearchSongs = SearchSongs - 1
    End If
End If
Call CheckOnDeck
undo.Enabled = True
SongSelected = False
Exit Sub
ElseIf answer = vbNo Then

```

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```

Exit Sub
End If

errorhandler:
Now.BackColor = &H8000000F
Now.Enabled = False
PlayButton.Enabled = False
PlayButton.BackColor = &H8000000F
MsgBox "You have no songs to delete!"
delete.Enabled = False
End Sub

```

```

Private Sub ExpandList_Click()
'expand the playlist to display all information

```

```

If ExpandList.Caption = "EXPAND" Then
cancelScreen.Visible = False
Playlist(1).Visible = True
ExpandList.Caption = "SHRINK"
If maxed = True Then
Picture1.Left = 0
Picture1.Width = Screen2.Width - 195
SinglePlayTime.Left = 4680
Label5.Left = 6240
Playlist(0).Left = 0
Playlist(1).Left = 0
Label1.Left = 0.41 * Picture1.Width
Else
Picture1.Width = 11550
Picture1.Left = 0
SinglePlayTime.Left = 4680
Label5.Left = 6240
Playlist(0).Left = 0
Playlist(1).Left = 0
Label1.Left = 4200
End If

```

```

ExpandList.Left = 120 - 6720
AddList(0).Left = 1020 - 6720
AddList(1).Left = 1750 - 6720
RndMix.Left = 2430 - 6720
delete.Left = 3070 - 6720
Command1.Left = 3840 - 6720
Playlist(1).RowSel = Playlist(0).RowSel

```

```

Else
If maxed = True Then
Picture1.Left = 6720
Picture1.Width = Screen.Width - 6850
SinglePlayTime.Left = Screen.Width - 100
Label5.Left = Screen.Width - 100

```

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```

Else
  Picture1.Width = 4815
  Picture1.Left = 6720
  SinglePlayTime.Left = 4800
  Labels.Left = 6500

End If
Playlist(0).Left = 120
Playlist(1).Left = 120
ctrlscreen.Visible = True
Playlist(1).Visible = False
ExpandList.Caption = "EXPAND"
ExpandList.Left = 120
AddList(0).Left = 1020
AddList(1).Left = 1730
RedMix.Left = 2430
delete.Left = 3070
Command1.Left = 3840
Playlist(0).RowSel = Playlist(1).RowSel
Label1.Left = 1440
End If

AddList(0).Enabled = False
AddList(1).Enabled = False
End Sub

Private Sub FavHits_Click(Index As Integer)
  ButMem = FavHits(Index).Caption
  FavHitsFrm2.Visible = True
  FavHitsLab2.Visible = True
  FavHitsLab2.BackColor = FavHitsLab1.BackColor
  FavHitsLab2.Caption = FavHits(Index).Caption
  If PlayedSongs(1, 1, 1) <> "" Then
    Organize.Enabled = True
    For z = 1 To zed
      searchlist.AddItem PlayedSongs(1, z, 0) & Chr(9) & PlayedSongs(1, z, 1) & Chr(9) & PlayedSongs(1, z, 2) & Chr(9) &
        PlayedSongs(1, z, 3) & Chr(9) & PlayedSongs(1, z, 4) & Chr(9) & PlayedSongs(1, z, 5) & Chr(9) & PlayedSongs(1, z, 6) & Chr(9) &
        PlayedSongs(1, z, 7) & Chr(9) & PlayedSongs(1, z, 8)
      SearchSongs = SearchSongs + 1
      searchlist.row = SearchSongs
      For X = 0 To 8
        searchlist.Col = X
        searchlist.CellBackColor = PlayedSongs(1, z, 9)
      Next X

      CtrlSrch.Enabled = True
    Next z
  Else
    MsgBox ("Sorry... You have no song selections defined as favorite hits.")
  End If
End Sub

```

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```

Private Sub Form_Load()
Dim i As Integer
Dim running As Boolean
Screen2.WindowState = 2
maxed = True
Data1.DatabaseName = App.Path & "mydata.mdb"
Data2.DatabaseName = App.Path & "mydata.mdb"
Data3.DatabaseName = App.Path & "mydata.mdb"
For i = 0 To 9
  csearch(i).Caption = ""
Next i
zed = 0
Speed = ""
channel = 1
SearchSongs = 0
PlaySongs = 0
Speed = "Any"
DataLocked = True
SongSelected = False
ScreenShow(1).BackColor = &HC0&
'assign buttons to color array for reference
For i = 0 To 33
  MoacColor(i) = Category1(i).BackColor
Next i
If VoiceActivation = True Then
If Not IsDDWinRunning(i) Then
  running = StartDDWin(i)
  If Not running Then
    MsgBox "Could not start dragon dictate", vbExclamation
  End
  End If
End If
DD.Attach = True
If FindVocabulary("Moac") And Not FindGroup("Moac", "ver1.0") Then
  On Error GoTo VocabAdd
  DeleteVocabulary ("Moac")
End If
VocabAdd:
  If Not FindVocabulary("Moac") Then
    AddVocabulary "Moac"
    Call AddGroup("Moac", "ver1.0")
    Call AddGroup("Moac", "Screen1")
    Call AddGroup("Moac", "Screen2")
    Call AddGroup("Moac", "Screen3")
    Call AddGroup("Moac", "Screen4")
    Call AddWord("Moac", "Screen2", "[classical]", "")
    Call AddWord("Moac", "Screen2", "[jazz]", "")
    Call AddWord("Moac", "Screen2", "[folk]", "")
    Call AddWord("Moac", "Screen2", "[oldies]", "")
    Call AddWord("Moac", "Screen2", "[country]", "")
    Call AddWord("Moac", "Screen2", "[pop]", "")
    Call AddWord("Moac", "Screen2", "[soul]", "")
    Call AddWord("Moac", "Screen2", "[R and B]", "")
  End If
End Sub

```

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```

Call AddWord("Moacc", "Screen2", "[blue]", "")
Call AddWord("Moacc", "Screen2", "[calypso]", "")
Call AddWord("Moacc", "Screen2", "[disco]", "")
Call AddWord("Moacc", "Screen2", "[funk]", "")
Call AddWord("Moacc", "Screen2", "[rock]", "")
Call AddWord("Moacc", "Screen2", "[metal]", "")
Call AddWord("Moacc", "Screen2", "[top 40]", "")
Call AddWord("Moacc", "Screen2", "[rap]", "")
Call AddWord("Moacc", "Screen2", "[reggae]", "")
Call AddWord("Moacc", "Screen2", "[alternative]", "")
Call AddWord("Moacc", "Screen2", "[ethnic]", "")
Call AddWord("Moacc", "Screen2", "[regional]", "")
Call AddWord("Moacc", "Screen2", "[special events]", "")
Call AddWord("Moacc", "Screen2", "[funny]", "")
Call AddWord("Moacc", "Screen2", "[easy listening]", "")
Call AddWord("Moacc", "Screen2", "[favorite hits]", "")
Call AddWord("Moacc", "Screen2", "[special dance]", "")
Call AddWord("Moacc", "Screen2", "[special mixes]", "")
Call AddWord("Moacc", "Screen2", "[dance]", "")
Call AddWord("Moacc", "Screen2", "[energy]", "")
Call AddWord("Moacc", "Screen2", "[sound effects]", "")
Call AddWord("Moacc", "Screen2", "[sound tracks]", "")
Call AddWord("Moacc", "Screen2", "[television]", "")

Call AddWord("Moacc", "Screen2", "[Dance Mix]", "")
Call AddWord("Moacc", "Screen2", "[Clear]", "")
Call AddWord("Moacc", "Screen2", "[Linde]", "")

Call AddWord("Moacc", "Screen2", "[Search List]", "")
Call AddWord("Moacc", "Screen2", "[Play List]", "")
Call AddWord("Moacc", "Screen2", "[Search]", "")
Call AddWord("Moacc", "Screen2", "[Expand]", "")

Call AddWord("Moacc", "Screen2", "[Shrink]", "")

Call AddWord("Moacc", "Screen2", "[Load]", "")
Call AddWord("Moacc", "Screen2", "[Save]", "")
Call AddWord("Moacc", "Screen2", "[Next]", "")
Call AddWord("Moacc", "Screen2", "[Pick]", "")
Call AddWord("Moacc", "Screen2", "[Delete]", "")

Call AddWord("Moacc", "Screen2", "[Title]", "")
Call AddWord("Moacc", "Screen2", "[Artist]", "")
Call AddWord("Moacc", "Screen2", "[Date]", "")
Call AddWord("Moacc", "Screen2", "[Song Category]", "")
Call AddWord("Moacc", "Screen2", "[Dance Type]", "")
Call AddWord("Moacc", "Screen2", "[Music Style]", "")
Call AddWord("Moacc", "Screen2", "[Speed]", "")
Call AddWord("Moacc", "Screen2", "[Energy]", "")

Call AddWord("Moacc", "Screen2", "[Speed]", "")
Call AddWord("Moacc", "Screen2", "[Fast]", "")
Call AddWord("Moacc", "Screen2", "[Medium]", "")
Call AddWord("Moacc", "Screen2", "[Slow]", "")

```

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```

Call AddWord("Moac", "Screen2", "[Time]", "")
Call AddWord("Moac", "Screen2", "[OK]", "")
Call AddWord("Moac", "Screen2", "[Begin Search]", "")
Call AddWord("Moac", "Screen2", "[Cancel]", "")
Call AddWord("Moac", "Screen2", "[Cancel]", "")
Call AddWord("Moac", "Screen2", "[Cancel]", "")
Call AddWord("Moac", "Screen2", "[minutes]", "")
Call AddWord("Moac", "Screen2", "[Play]", "")
Call AddWord("Moac", "Screen2", "[Now]", "")

Call AddWord("Moac", "Screen2", "[screen 1]", "")
Call AddWord("Moac", "Screen2", "[screen 2]", "")
Call AddWord("Moac", "Screen2", "[screen 3]", "")
Call AddWord("Moac", "Screen2", "[screen 4]", "")
End If
DD.Vocabulary = "Moac"
DD.Group = "Screen2"
End If
End Sub

Private Sub Form_Unload(Cancel As Integer)
    End!All
End
End Sub

Private Sub Help_Click()
    SendKeys "{F1}"
End Sub

Private Sub Letters_Click(Index As Integer)
    'type the letter pressed in the text field
    If searchfield.Visible = True Then
        searchfield.SetFocus
        SendKeys LCase(Letters(Index).Caption)
        SendKeys "{tab}"
    Else
        TimeInput.SetFocus
        SendKeys LCase(Letters(Index).Caption)
        SendKeys "{tab}"
    End If
End Sub

Private Sub LoadPlay_Click()
    Dim allCells1, allCells2 As String
    Dim FileNum As Integer
    Dim CurRow1, CurRow2, CurCol As Integer
    Dim FileColors() As Variant
    On Error GoTo errorhandler
    GrayOut

```

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```

If Playlist(0).Rows > 1 Then
  CurRow2 = Playlist(1).row
  CurRow1 = Playlist(0).row
  CurCol = 0
End If
response = MsgBox("Are you sure you want to replace the current Music Playlist?", 4, "Load Play List")
If response = vbNo Then
  Exit Sub
ElseIf response = vbYes Then
  'clear the playlists
  CommonDialog1.DefaultExt = "GDT"
  CommonDialog1.ShowOpen
  FileNum = FreeFile
  Open CommonDialog1.FileName For Input As #FileNum
  Input #FileNum, numRows
  ReDim FileColors(numRows - 1)
  Input #FileNum, allCells1
  Input #FileNum, allCells2
  ClearPlayList
  PlaySongs = 0
  SongsTime = 0
  NumSongs.Text = 0
  timebox.Text = Format(TimeSerial(0, 0, CLng(SongsTime)), "hh:mm:ss")
  SinglePlayTime.Text = "00:00:00"
  Playlist(0).AllowBigSelection = True
  Playlist(1).AllowBigSelection = True
  Playlist(0).Rows = numRows
  Playlist(0).row = 1
  Playlist(0).Col = 0
  Playlist(0).RowSel = numRows - 1
  Playlist(0).ColSel = 2
  Playlist(1).Rows = numRows
  Playlist(1).row = 1
  Playlist(1).Col = 0
  Playlist(1).RowSel = numRows - 1
  Playlist(1).ColSel = 8
  Playlist(0).Clip = allCells1
  Playlist(1).Clip = allCells2
  For i = 1 To numRows - 1
    Input #FileNum, FileColors(i)
    Playlist(0).row = i
    For j = 0 To 2
      Playlist(0).Col = j
      Playlist(0).CellBackColor = FileColors(i)
    Next j
    Playlist(1).row = i
    For k = 0 To 8
      Playlist(1).Col = k
      Playlist(1).CellBackColor = FileColors(i)
    Next k
    SongsTime = SongsTime + CLng(Val(Playlist(0).TextMatrix(i, 0)))
  Next i
  timebox.Text = Format(TimeSerial(0, 0, SongsTime), "hh:mm:ss")
  PlaySongs = PlaySongs + 1
  NumSongs.Text = PlaySongs

```

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```

Next i

Close #FileNum
Playlist(0).AllowBigSelection = False
Playlist(1).AllowBigSelection = False
Playlist(0).row = CurRow1
Playlist(1).row = CurRow2
Playlist(0).Col = 0
Playlist(1).Col = 0
ExpandList.Enabled = True
delete.Enabled = True
Command1.Enabled = True
RndMix.Enabled = True
Now.Enabled = True
Now.BackColor = &HFF&
PlayButton.Enabled = True
PlayButton.BackColor = &HFF8080
SavePlay.Enabled = True
If SongPlaying = True Then
    Call CheckOnDeck
End If
CommonDialog1.FileName = ""
Exit Sub
End If

errorhandler:
If Err.Number = cd1Cancel Then
    CommonDialog1.FileName = ""
Exit Sub
End If
MsgBox "Unknown error while loading file " & CommonDialog1.FileName

End Sub

Private Sub Mix_Click()
Dim RanPlace, RanPlace2 As Integer
Dim TempTime, TempTime2 As Integer
Dim MixCount As Integer
Dim TestSpeed As String
Dim LoopStop As Boolean
Dim slowcount, midcount, fastcount As Boolean
Dim FirstMedCount, medcount As Integer
'mix up the selected song list by categories
Mix.Enabled = False
If Playlist(0).Rows > 1 Then
    Playlist(0).Col = 0
    Playlist(1).Col = 0
    Playlist(0).ColSel = 2
    Playlist(1).ColSel = 8
End If
If SelList = 2 And Playlist(0).Rows > 1 Then

    MixCount = 0

```

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```

medcount = 0
'disable once clicked
Mix.Enabled = False
Mix.BackColor = &H8000000F
AddList(0).Enabled = False
AddList(1).Enabled = False
FastSpeed = "FAST"
MidSpeed = "MEDIUM"
SlowSpeed = "SLOW"
fastcount = False
midcount = False
slowcount = False
For i = 1 To Playlist(0).Rows - 1
  TestSpeed = Playlist(1).TextMatrix(i, 7)
  If TestSpeed = "FAST" Then
    fastcount = True
  ElseIf TestSpeed = "MEDIUM" Then
    midcount = True
  ElseIf TestSpeed = "SLOW" Then
    slowcount = True
  End If
Next i
If slowcount = False Then
  If midcount = False Then
    MidSpeed = "FAST"
    SlowSpeed = "FAST"
  ElseIf fastcount = False Then
    FastSpeed = "MEDIUM"
    MidSpeed = "MEDIUM"
    SlowSpeed = "MEDIUM"
  Else
    FastSpeed = "FAST"
    MidSpeed = "FAST"
    SlowSpeed = "MEDIUM"
  End If
ElseIf midcount = False Then
  If fastcount = False Then
    FastSpeed = "SLOW"
    MidSpeed = "SLOW"
  End If
ElseIf fastcount = False Then
  If slowcount = False Then
    FastSpeed = "MEDIUM"
    SlowSpeed = "MEDIUM"
  End If
End If

For i = 1 To Playlist(0).Rows - 1
  TestSpeed = Playlist(1).TextMatrix(i, 7)
  If TestSpeed = MidSpeed Then
    medcount = medcount + 1
  End If
Next i

```

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```

Do Until LoopStop = True
i = 1
MixCount = 0
LoopStop = True

For i = 1 To Playlist(0).Rows - 1
If MixCount > 4 Then MixCount = 0
Playlist(i).row = i
TestSpeed = Playlist(i).TextMatrix(L 7)
If TestSpeed = FastSpeed And MixCount < 3 Then
MixCount = MixCount + 1
ElseIf TestSpeed = SlowSpeed And MixCount >= 3 Then
MixCount = MixCount - 1
Else
Playlist(0).RowPosition(i) = Playlist(0).Rows - 1
Playlist(1).RowPosition(i) = Playlist(1).Rows - 1
medcount = medcount + 1
LoopStop = False
End If
If i >= Playlist(1).Rows - medcount Then
LoopStop = True
End If

Next i
Loop
For j = 0 To 1
Playlist(j).row = 1
Playlist(j).BackColorSel = Playlist(j).CellBackColor
Playlist(j).ForeColorSel = Playlist(j).CellForeColor
Next j
delete.Enabled = False
Else
Speed = "MIXED"
Mix.Enabled = False
Mix.BackColor = &H8000000F
For i = 0 To 3
SongSpeed(i).BackColor = &H8000000F
SongSpeed(i).Enabled = False
AllSpeeds.BackColor = &H8000000F
AllSpeeds.Enabled = False
Next i
End If
If SongPlaying = True Then
Call CheckOnDeck
End If
End Sub

Private Sub Now_Click()

Dim CurControl As Integer

```

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```

If SelList = 1 Then CurControl = searchlist.row
If SelList = 2 Then CurControl = Playlist(0).row

```

```

Call StartPlay(CurControl, SelList)

```

```

End Sub

```

```

Private Sub Organize_Click()
    'enable the sorting buttons
    sortstat = True
    search.Enabled = False
    For i = 1 To 8
        SearchCat(i).Enabled = True
    Next i
End Sub

```

```

Private Sub OrgLst_Click(Index As Integer)
    'sort the searchlist by category
    OrgLst(0).Enabled = False
    OrgLst(1).Enabled = False
    Organize.Enabled = True
    search.Enabled = True
    sortstat = False
    searchlist.Sort = Index - 1
    For i = 1 To 8
        SearchCat(i).Enabled = False
    Next i
End Sub

```

```

Private Sub PlayButton_Click()

```

```

    Call StartPlay(1, 2)

```

```

End Sub

```

```

Private Sub Playlist_Click(Index As Integer)

```

```

    If Playlist(Index).Rows > 1 Then

```

```

        SelList = 2

```

```

        SongSelected = True

```

```

        If Playlist(0).Rows = 1 Then Exit Sub

```

```

        SinglePlayTime.Text = Format(TimeSerial(0, 0, Val(Playlist(Index).TextMatrix(Playlist(Index).row, 0))), "hh:mm:ss")

```

```

        AddList(1).Enabled = False

```

```

        AddList(0).Enabled = True

```

```

    End If

```

```

    If Index = 0 Then

```

```

        Playlist(1).row = Playlist(0).row

```

```

        Playlist(1).Col = Playlist(0).Col

```

```

    End If

```

```

    If Playlist(1).Col = 0 And Playlist(1).CellBackColor <> &H000000 Then 'if the song is flagged add it to the top of the favbits list

```

```

        Playlist(0).SelectionMode = flexSelectionFree

```

```

        Playlist(1).SelectionMode = flexSelectionFree

```

```

        Playlist(0).CellBackColor = &H80000008

```

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```

For i = 1 To zed
  If PlayedSongs(1, i, 1) = Playlist(Index).TextMatrix(Playlist(Index).row, 1) Then
    FavHitsFinder = i
  End If
Next i
For i = (FavHitsFinder - 1) To 1 Step -1
  For j = 0 To 9
    PlayedSongs(1, i - 1, j) = PlayedSongs(1, i, j)
  Next j
Next i
Playlist(0).Col = 1
Playlist(0).BackColorSel = Playlist(0).CellBackColor
Playlist(0).ForeColorSel = Playlist(0).CellForeColor
Playlist(1).Col = 1
Playlist(1).BackColorSel = Playlist(1).CellBackColor
Playlist(1).ForeColorSel = Playlist(1).CellForeColor
For i = 0 To 8
  selSong(i) = Playlist(1).TextMatrix(Playlist(1).row, i)
  PlayedSongs(1, 1, i) = Playlist(1).TextMatrix(Playlist(1).row, i)
Next i
Playlist(1).Col = 1
Playlist(0).Col = 1
PlayedSongs(1, 1, 9) = Playlist(1).CellBackColor
Else
  Playlist(Index).SetFocus
  delete.Enabled = True
  Playlist(0).Col = 1
  Playlist(0).ColSel = 2
  Playlist(1).Col = 1
  Playlist(1).ColSel = 8
  For i = 0 To 1
    Playlist(i).BackColorSel = &H80000008
    Playlist(i).ForeColorSel = &H8000000E
  Next i
  If Index = 1 Then
    Playlist(0).row = Playlist(1).row
    Playlist(0).RowSel = Playlist(1).RowSel
    Playlist(0).Col = 1
    Playlist(0).ColSel = 2
  Else
    Playlist(1).row = Playlist(0).row
    Playlist(1).RowSel = Playlist(0).RowSel
    Playlist(1).Col = 1
    Playlist(1).ColSel = 8
  End If
  Now.Enabled = True
  Now.BackColor = &HFF&
  If searchlist.Rows = 1 Then
    Exit Sub
  End If
  searchlist.BackColorSel = searchlist.CellBackColor
  searchlist.ForeColorSel = searchlist.CellForeColor
End If
End If

```

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```

End If
End Sub

Private Sub Playlist_DbClick(Index As Integer)
Dim X As Integer
If Index = 0 Then
    Playlist(1).row = Playlist(0).row
    Playlist(1).Col = Playlist(0).Col

End If
If Playlist(1).Rows > 1 And Playlist(1).Col < 0 Then
If Index = 1 Then
    Playlist(0).row = Playlist(1).row

End If

If Playlist(0).row = 1 Then
    MsgBox "the Song you want to move is already next!"

Else

    X = Playlist(0).row
    For Y = 0 To 8
        sel song(Y) = Playlist(1).TextMatrix(X, Y)
    Next Y
    oldcolor2 = Playlist(0).CellBackColor
    oldcolor3 = Playlist(0).CellForeColor
    undo.Enabled = True
    UndoEvent = 0
    SavePlaylist
    For i = X - 1 To 1 Step -1
        Playlist(0).row = i
        Playlist(1).row = i
        oldcolor = Playlist(0).CellBackColor
        For j = 0 To 2
            Playlist(0).TextMatrix(i - 1, j) = Playlist(0).TextMatrix(i, j)
            Playlist(0).row = i - 1
            Playlist(0).Col = j
            'change color
            Playlist(0).CellBackColor = oldcolor
        Next j
        For j = 0 To 8
            Playlist(1).TextMatrix(i - 1, j) = Playlist(1).TextMatrix(i, j)
            Playlist(1).row = i - 1
            Playlist(1).Col = j
            'change color
            Playlist(1).CellBackColor = oldcolor
        Next j
    Next i
    For j = 0 To 2
        Playlist(0).TextMatrix(1, j) = sel song(j)
        Playlist(0).row = 1
        Playlist(0).Col = j
        Playlist(0).CellBackColor = oldcolor2
    
```

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```

Playlist(0).BackColorSel = oldcolor2
Playlist(0).ForeColorSel = oldcolor3
Next j
For j = 0 To 8
  Playlist(1).TextMatrix(1, j) = selsong(j)
  Playlist(1).row = 1
  Playlist(1).Col = j
  Playlist(1).CellBackColor = oldcolor2
  Playlist(1).BackColorSel = oldcolor2
  Playlist(1).ForeColorSel = oldcolor3
Next j
End If
Playlist(0).SelectionMode = flexSelectionFree
Playlist(1).SelectionMode = flexSelectionFree
Call CheckOnDeck
End If
End Sub

Private Sub Playlist_Scroll(Index As Integer)
  'make the playlists scroll equally
  Select Case Index
  Case 0
    Playlist(1).TopRow = Playlist(0).TopRow
  Case 1
    Playlist(0).TopRow = Playlist(1).TopRow
  End Select
End Sub

Private Sub PlayTime_Click()
  Dim boxcaption As String
  On Error GoTo errorhandler
  'show the keyboard
  TimeFrame.Visible = True
  keyboard.Visible = True
  AllSpeeds.Visible = True
  GrayOut
  'pop up the time selection query box
  CurScreen = "Time"
  If Speed <> "Any" Then
    boxcaption = "Please enter the number of minutes you would like " & Speed & " " & SelCat1 & " " & "music to play:"
  Else
    boxcaption = "Please enter the number of minutes you would like " & SelCat1 & " music to play:"
  End If
  TimeLabel.Caption = boxcaption
  TimeInput.SetFocus
Exit Sub
'write the variables to the play boxes with colors
'disable button once clicked

errorhandler:
  MsgBox "You did not enter a valid time."
  Exit Sub
End Sub

```

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```

Private Sub RndMix_Click()
    Dim color As Long
    If Playlist(0).Rows > 1 Then
        Randomize
        Playlist(0).SelectionMode = NextSelectionFree
        For i = 1 To Playlist(0).Rows - 1
            k = Rnd()
            Y = Int(Playlist(0).Rows * k)
            If Y <= 0 Then
                Playlist(0).RowPosition(i) = Y
                Playlist(1).RowPosition(i) = Y
            End If
        Next i
        Playlist(0).row = 1
        Playlist(1).row = 1
        Playlist(0).Col = 1
        Playlist(1).Col = 1
        Playlist(0).BackColorSel = Playlist(0).CellBackColor
        Playlist(1).BackColorSel = Playlist(0).CellBackColor
        CheckOnDeck:
    End If
End Sub

Private Sub SavePlay_Click()
    Dim allCells1, allCells2, colors As String
    Dim FileNum, numRows As Integer
    Dim CurRow1, CurRow2, CurCol As Integer
    Dim FileColors() As Variant

    CurRow2 = Playlist(1).row
    CurRow1 = Playlist(0).row
    CurCol = 0
    On Error GoTo errorHandler
    response = MsgBox("Are you Sure you want to save the current Music Play List as a file", 4, "Save Play List")
    If response = vbNo Then
        Exit Sub
    ElseIf response = vbYes Then
        GrayOut
        CommonDialog1.DefaultExt = "GDT"

        CommonDialog1.ShowSave
        Playlist(0).AllowBigSelection = True
        Playlist(0).row = 1
        Playlist(0).Col = 0
        Playlist(0).RowSel = Playlist(0).Rows - 1
        Playlist(0).ColSel = 2
        allCells1 = Playlist(0).Clip
        Playlist(1).AllowBigSelection = True
        Playlist(1).row = 1
        Playlist(1).Col = 0
        Playlist(1).RowSel = Playlist(1).Rows - 1
        Playlist(1).ColSel = 8
    End If
end Sub

```

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```

allCells2 = Playlist(1).Clip
numRows = Playlist(0).Rows
ReDim FileColors(Playlist(0).Rows + 1)
FileNum = FreeFile
Open CommonDialog1.FileName For Output As #FileNum
Write #FileNum, numRows
Write #FileNum, allCells1
Write #FileNum, allCells2
For i = 1 To Playlist(0).Rows - 1
    Playlist(0).row = i
    FileColors(i) = Playlist(0).CellBackColor
    Write #FileNum, FileColors(i)
Next i

Close #FileNum
Playlist(1).AllowBigSelection = False
Playlist(0).AllowBigSelection = False
Playlist(0).row = CurRow1
Playlist(1).row = CurRow2
Playlist(0).Col = 0
Playlist(1).Col = 0
Exit Sub
End If

errorhandler:
If Err.Number = cd1.Cancel Then Exit Sub
MsgBox "Unknown error while saving file " & CommonDialog1.FileName

End Sub

Private Sub ScreenShow_Click(Index As Integer)
Dim i As Integer
On Error Resume Next
If (SelCat1 = "" And Index = 2) Then
MsgBox ("Please select a main category from screen 2 before viewing this screen !!!")
Exit Sub
End If
Category(1).Visible = False
cat1count = 0
'disable speed buttons since swiching to screen 3
For i = 0 To SongSpeed.count - 1
    AllSpeeds.Enabled = False
    SongSpeed(i).Enabled = False
    SongSpeed(i).BackColor = &H8000000F
    AllSpeeds.BackColor = &H8000000F
Next i
Mix.Enabled = False
PlayTime.Enabled = False
Mix.BackColor = &H8000000F
PlayTime.BackColor = &H8000000F
For i = 0 To 4
Screen1.ScreenShow(i).BackColor = &H8000000F
ScreenShow(i).BackColor = &H8000000F
ScreenShow(i).ForeColor = &H80000012

```

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```

Next i
If Index <> 0 And Index <> 3 Then
  ScreenShow(Index).BackColor = &HCO&
  ScreenShow(Index).ForeColor = &H800000E
End If
Select Case Index
Case 0

  On Error Resume Next
  Screen2.DD.Group = "Screen1"
  Screen1.Show
  If Screen1.WindowState <> 2 Then Screen1.WindowState = 2

  Screen2.Hide
  cat1screen.Visible = True
  cat2screen.Visible = False
  For i = 0 To 4
    Screen1.ScreenShow(i).BackColor = &H800000F
    Screen1.ScreenShow(i).ForeColor = &H8000012
  Next i
  Screen1.ScreenShow(Index).BackColor = &HCO&
  Screen1.ScreenShow(Index).ForeColor = &H800000E
Exit Sub
Case 1
  Screen2.DD.Group = "Screen2"
  Screen1.Hide
  Screen2.Show
  If Screen2.WindowState <> 2 Then Screen2.WindowState = 2

  cat1screen.Visible = True
  cat2screen.Visible = False
  FavHissSem.Visible = False
Case 2
  Screen2.DD.Group = "Screen2"
  SelCat1 = MemCat
  Screen1.Hide
  Screen2.Show
  If Screen2.WindowState <> 2 Then Screen2.WindowState = 2
  cat1screen.Visible = False
  cat2screen.Visible = True
  FavHissSem.Visible = False
Case 3
  Screen2.DD.Group = "Screen4"
  Recorder.ScreenShow(Index).BackColor = &HCO&
  Recorder.ScreenShow(Index).ForeColor = &H800000E
  Screen1.Hide
  Screen2.Hide
  Recorder.Show
  If Recorder.WindowState <> 2 Then Recorder.WindowState = 2

  Recorder.Refresh
  cat1screen.Visible = True
  cat2screen.Visible = False
  FavHissSem.Visible = False

```

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End Select

'make the button pressed the right color

End Sub

Private Sub search_Click()

search.Enabled = False

GrayOut

For i = 1 To 8

SearchCat(i).Enabled = True

Next i

End Sub

Private Sub SearchCat_Click(Index As Integer)

Dim QuestCat As String

If sortstat = False Then

'assign the search button caption to the primary search variable

colnum = Index

keyboard.Visible = True

Cat1 = SearchCat(Index).Tag

QuestCat = SearchCat(Index).Caption

CurScreen = "SearchCat"

'Load search screen to begin search

SearchScreen.Visible = True

SearchQuery.Caption = "Please enter the " & QuestCat & " you would like to search for:"

searchfld.SetFocus

Else

searchlist.Col = Index

For i = 1 To 8

SearchCat(i).Enabled = False

Next i

OrgList(0).Enabled = True

OrgList(1).Enabled = True

Organize.Enabled = False

End If

End Sub

Private Sub searchdate_Click(Index As Integer)

Dim finalfield(10) As String

Dim tempfield(9) As String

If searchdate(Index).Caption = ButMem Then

MsgBox ("You just picked that button...Please pick another.")

Exit Sub

End If

ButMem = searchdate(Index).Caption

Cap1 = "Main1"

AddList(0).Enabled = True

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DATA SOURCE: UNCLASSIFIED

```

AddList(1).Enabled = True
ChrSrch.Enabled = True
Organize.Enabled = True
Category(1).Caption = searchdate(Index).Caption
Category(1).Visible = True
'fill search screen with selections from the categories
MousePointer = 11
SearchSongs = searchlist.Rows - 1
Data1.Refresh
Data3.Refresh
Data1.Recordset.MoveLast
Data1.Recordset.MoveFirst
Data3.Recordset.MoveLast
Data3.Recordset.MoveFirst
If SelCat1 = "SPMIX" Or SelCat1 = "Special Mixes" Then
    Cat1 = "Main3"
    SelCat1 = "SPMIX"

Elseif SelCat1 = "EN" Or SelCat1 = "Energy" Then
    Cat1 = "Main2"
    SelCat1 = "EN"
Elseif SelCat1 = "EL" Or SelCat1 = "Easy Listening" Then
    Cat1 = "Main1"
    SelCat1 = "EL"
Elseif SelCat1 = "Special Dance" Or SelCat1 = "SPD" Then
    Cat1 = "Drype"
    SelCat1 = "SPD"
End If
For i = 1 To Data1.Recordset.RecordCount
    DoEvents
    'if the data base field matches search criteria, write it to the searchlist
    If (UCase(Data1.Recordset.Fields(Cat1)) = UCase(Trim(SelCat1))) And Data1.Recordset.Fields("date") >=
searchdate(Index).Tag And Data1.Recordset.Fields("date") <= (searchdate(Index).Tag + 9) Then
        Data3.Recordset.MoveFirst
        If IsNull(Data1.Recordset.Fields("Main1")) Then
            Mcat1 = "none listed"
            MrcatColor(SearchSongs) = &H80000005
        Else
            Mcat1 = Data1.Recordset.Fields("Main1")
            Data3.Recordset.FindFirst "Main1 = '" & Mcat1 & "'
            MrcatColor(SearchSongs) = Val(Data3.Recordset.Fields("colorID"))
            finalfield(9) = Val(Data3.Recordset.Fields("colorID"))
        End If
        If IsNull(Data1.Recordset.Fields("time")) Then
            finalfield(0) = 300
        Else
            finalfield(0) = Data1.Recordset.Fields("time")
        End If
        If IsNull(Data1.Recordset.Fields("Title")) Then
            finalfield(1) = "NL"
        Else
            finalfield(1) = Data1.Recordset.Fields("Title")
        End If
        If IsNull(Data1.Recordset.Fields("Artist")) Then

```

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```

    finalfield(2) = "NL"
Else
    finalfield(2) = Data1.Recordset.Fields("Artist")
End If
If IsNull(Data1.Recordset.Fields("Date")) Then
    finalfield(3) = "NL"
Else
    finalfield(3) = Data1.Recordset.Fields("Date")
End If
If IsNull(Data1.Recordset.Fields("Main1")) Then
    tempfield(4) = "NL"
Else
    tempfield(4) = Data1.Recordset.Fields("Main1")
End If
If IsNull(Data1.Recordset.Fields("Mstyle")) Then
    tempfield(5) = "NL"
Else
    tempfield(5) = Data1.Recordset.Fields("Mstyle")
End If
If IsNull(Data1.Recordset.Fields("Dtype")) Then
    tempfield(6) = "NL"
Else
    tempfield(6) = Data1.Recordset.Fields("Dtype")
End If
If IsNull(Data1.Recordset.Fields("Speed")) Then
    tempfield(7) = "NL"
Else
    tempfield(7) = Data1.Recordset.Fields("Speed")
End If
If IsNull(Data1.Recordset.Fields("Energy")) Then
    tempfield(8) = ""
Else
    tempfield(8) = Data1.Recordset.Fields("Energy")
End If
For X = 4 To 8
    Data2.RecordSource = X
    Data2.Refresh
    Data2.Recordset.MoveLast
    Data2.Recordset.MoveFirst
    Data2.Recordset.FindFirst "Tag = " & tempfield(X) & ""
    finalfield(X) = Data2.Recordset.Fields("Label")
    Data2.Recordset.Close
Next X
searchlist.AddItem finalfield(0) & Chr(9) & finalfield(1) & Chr(9) & finalfield(2) & Chr(9) & finalfield(3) & Chr(9) &
finalfield(4) & Chr(9) & finalfield(5) & Chr(9) & finalfield(6) & Chr(9) & finalfield(7) & Chr(9) & finalfield(8)
SearchSongs = SearchSongs + 1
Data3.Recordset.MoveFirst

searchlist.row = SearchSongs
For z = 0 To 8
    searchlist.Col = z
    searchlist.CellBackColor = finalfield(9)
Next z
searchlist.BackColorSel = finalfield(9)

```

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```

searchlst.ForeColorSel = searchlst.ForeColor
search.Caption = "Narrow Search Results"
searchflag = 1
End If
flag = True
'move to the next data row in data base
Data1.Recordset.MoveNext
Next i
Data1.Recordset.Close
Data2.Recordset.Close

```

```

MousePointer = 0

```

```

End Sub

```

```

Private Sub searchfield_Change()
SendKeys "{tab}"
End Sub

```

```

Private Sub searchlist_Click()
If searchlst.RowSel > 0 Then
Now.BackColor = &HFF&
Now.Enabled = True
SelList = 1
SongSelected = True
If searchlst.Rows = 1 Then Exit Sub
FavHitsLab1.BackColor = searchlst.CellBackColor
FavHitsLab2.BackColor = searchlst.CellBackColor
For i = 0 To 5
FavHits(i).BackColor = searchlst.CellBackColor
Next i
If searchlst.Col = 0 And searchlst.CellBackColor <> &HC0& Then 'if the song is flagged add it to the top of the favhits list
searchlst.SelectionMode = flexSelectionFree
searchlst.CellBackColor = &H8000008
For i = 1 To zed
If PlayedSongs(1, i, 1) = searchlst.TextMatrix(searchlst.row, i) Then
FavHitsFinder = i
End If
Next i
If FavHitsFinder = zed Then FavHitsFinder = FavHitsFinder + 1
For i = (FavHitsFinder - 1) To 1 Step -1
For j = 0 To 9
PlayedSongs(1, i + 1, j) = PlayedSongs(1, i, j)
Next j
Next i
searchlst.Col = 1
searchlst.BackColorSel = searchlst.CellBackColor
searchlst.ForeColorSel = searchlst.CellForeColor
For i = 0 To 8
selSong(i) = searchlst.TextMatrix(searchlst.row, i)
PlayedSongs(1, 1, i) = searchlst.TextMatrix(searchlst.row, i)
Next i
searchlst.Col = 1

```

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```

    PlayedSongs(1, 1, 9) = searchlist.CellBackColor
Else
    searchlist.SetFocus
    AddList(0).Enabled = True
    AddList(1).Enabled = True
    delete.Enabled = True
    searchlist.Col = 1
    searchlist.ColSel = 8
    searchlist.BackColorSel = &H8000008
    searchlist.ForeColorSel = &H800000E

    If Playlist(0).Rows > 1 Then
        Playlist(0).BackColorSel = Playlist(0).CellBackColor
        Playlist(0).ForeColorSel = Playlist(0).CellForeColor
        Playlist(1).BackColorSel = Playlist(1).CellBackColor
        Playlist(1).ForeColorSel = Playlist(1).CellForeColor
    End If
End If
End If
End Sub

Private Sub searchlist_DbClick()
    Dim flag As Boolean
    flag = False
    undo.Enabled = True
    UndoEvent = 0
    If Playlist(0).Rows = 1 Then
        numRows = 0
    Else
        SavePlayList
    End If

    If searchlist.Rows > 1 And searchlist.Col <> 0 Then
        FavHitsLab1.BackColor = searchlist.CellBackColor
        For i = 0 To 5
            FavHits(i).BackColor = searchlist.CellBackColor
        Next i
        PlaySongs = PlaySongs + 1

        For i = 1 To zed
            If searchlist.TextMatrix(searchlist.row, i) = PlayedSongs(1, i, 1) Then
                flag = True
            End If
        Next i
        If flag = False Then
            zed = zed + 1
            For i = 0 To 8
                PlayedSongs(1, zed, i) = searchlist.TextMatrix(searchlist.row, i)
            Next i
            PlayedSongs(1, zed, 9) = searchlist.CellBackColor
        End If
        For i = 0 To 8

```

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```

seisong(i) = searchlist.TextMatrix(searchlist.row, i)
Next i
Playlist(0).Additem seisong(0) & Chr(9) & seisong(1) & Chr(9) & seisong(2)
Playlist(1).Additem seisong(0) & Chr(9) & seisong(1) & Chr(9) & seisong(2) & Chr(9) & seisong(3) & Chr(9) & seisong(4) &
Chr(9) & seisong(5) & Chr(9) & seisong(6) & Chr(9) & seisong(7) & Chr(9) & seisong(8)
'add a song to the total to be played

NumSongs.Text = PlaySongs
Playlist(1).row = Playlist(1).Rows - 1
Playlist(0).row = Playlist(0).Rows - 1
'add the song time to the play time box
SongsTime = SongsTime + CLng(Val(searchlist.TextMatrix(searchlist.row, 0)))
timebox.Text = Format(TimeSerial(0, 0, SongsTime), "hh:mm:ss")
For z = 0 To 2
  Playlist(0).Col = z
  Playlist(0).CellBackColor = searchlist.CellBackColor
  Playlist(0).BackColorSel = searchlist.CellBackColor
  Playlist(0).ForeColorSel = searchlist.CellForeColor
Next z
For z = 0 To 8
  Playlist(1).Col = z
  Playlist(1).CellBackColor = searchlist.CellBackColor
  Playlist(1).BackColorSel = searchlist.CellBackColor
  Playlist(1).ForeColorSel = searchlist.CellForeColor
Next z
If Playlist(0).row = 1 Then CheckOnDeck
delete.Enabled = True
RndMix.Enabled = True
ExpandList.Enabled = True
SavePlay.Enabled = True
Command1.Enabled = True
If IsNull(channel) Then
  channel = 1
  OtherChannel = 2
End If
Now.BackColor = &HFF&
Now.Enabled = True
PlayButton.Enabled = True
PlayButton.BackColor = &HFF8080
End If

End Sub

Private Sub searchlist_MouseMove(Button As Integer, Shift As Integer, X As Single, Y As Single)
Dim ScrollWidth As Integer
Dim ButtonWidth As Integer
ButtonWidth = 1080
ScrollWidth = 400
If (X > searchlist.Width - ScrollWidth) And (searchlist.Height / searchlist.RowHeightMin < searchlist.Rows) Then
  SearchCas(8).Width = ButtonWidth - ScrollWidth - 200 + (HeadExpand * 44)
Else
  SearchCas(8).Width = ButtonWidth + (HeadExpand * 44)
End If
End Sub

```

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```

Dim MixCount As Integer
Dim tempfld(9) As String
Dim position As Integer
Dim rndcount As Integer
On Error GoTo errorHandler
MousePointer = 11
searchflag = 0
cat1count = 0
FastSpeed = "FAST"
SlowSpeed = "SLOW"
MidSpeed = "MEDIUM"
CancelSearch = False
For i = 0 To 3
    SongSpeed(i).Enabled = False
    SongSpeed(i).BackColor = &H8000000F
    AllSpeeds.BackColor = &H8000000F
    AllSpeeds.Enabled = False
Next i
MixCount = 0
flag = True
i = 0
keyboard.Visible = False
If TimeInput.Text <> "" Then
    TotalTime = CLng(Val(TimeInput.Text) * 60)
    PlayTime.Enabled = False
    PlayTime.BackColor = &H8000000F
    Mix.BackColor = &H8000000F
    'search the database for songs until the time is up
    Data1.Refresh
    Data3.Refresh
    'FIND THE SONG CATEGORY TAG THAT MATCHES THE BUTTON
    If Cat1 = "Dtype" Then
        Data2.RecordSource = 6
    Else
        Data2.RecordSource = 4
    End If
    Data2.Refresh
    Data3.Refresh
    Data2.Recordset.MoveLast
    Data3.Recordset.MoveLast
    Data2.Recordset.MoveFirst
    Data3.Recordset.MoveFirst
    Data2.Recordset.FindFirst "Label = " & SelCat1 & ""
    SelTag = Data2.Recordset.Fields("Tag")
    SelCat1 = SelTag
    If SelCat1 = "SPMDX" Then
        Cat1 = "Main3"
        MainCount = 4
    ElseIf SelCat1 = "EN" Then
        Cat1 = "Main2"
        MainCount = 3
    ElseIf SelCat1 = "EL" Then

```

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```

Cat1 = "Mstyle"
End If

If Speed <> "MIXED" And Speed <> "Any" Then
  Data2.RecordSource = 7
  Data2.Refresh
  Data2.Recordset.MoveFirst
  Data3.Recordset.MoveFirst
  Data2.Recordset.FindFirst "Label LIKE "" & Speed & ""
  SelTag = Data2.Recordset.Fields("Tag")
  Speed = SelTag
End If
Data1.Refresh
Data1.Recordset.MoveLast
Data1.Recordset.MoveFirst
Data1.Recordset.FindFirst Cat1 & " like "" & SelCat1 & "" and Speed = "S"
If Data1.Recordset.NoMatch Then
  Data1.Refresh
  Data1.Recordset.MoveLast
  Data1.Recordset.MoveFirst
  Data1.Recordset.FindFirst Cat1 & " like "" & SelCat1 & "" and Speed = "M"
If Data1.Recordset.NoMatch Then
  SlowSpeed = "FAST"
  MidSpeed = "FAST"
Else
  SlowSpeed = "MEDIUM"
  MidSpeed = "FAST"
End If
End If
undo.Enabled = True
UndoEvent = 0
If Playlist0.Rows = 1 Then
  numRows = 0
Else
  SavePlayList
End If
MainLoop:
DoEvents
position = 0
Data1.Recordset.MoveLast
Data3.Recordset.MoveLast
Data1.Recordset.MoveFirst
Data3.Recordset.MoveFirst
If Speed <> "Any" And Speed <> "MIXED" Then
  Data1.Recordset.FindLast Cat1 & " like "" & SelCat1 & "" and Speed = "" & Speed & ""
Else
  Data1.Recordset.FindLast Cat1 & " LIKE "" & SelCat1 & ""
End If
If Data1.Recordset.NoMatch Then flag = False
final = Data1.Recordset.AbsolutePosition
Data1.Recordset.MoveFirst
If flag = True Then
  Do Until position = final

```

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```

DoEvents
If Speed <> "Any" And Speed <> "MIXED" Then
  Data1.Recordset.FindNext Cat1 & " LIKE " & SelCat1 & " and Speed = " & Speed & "
Else
  Data1.Recordset.FindNext Cat1 & " LIKE " & SelCat1 & "
End If
If IsNull(Data1.Recordset.Fields("time")) Then
  timearray(i, 0) = 300
Else
  timearray(i, 0) = Data1.Recordset.Fields("time")
End If
If IsNull(Data1.Recordset.Fields("Title")) Then
  timearray(i, 1) = "NL"
Else
  timearray(i, 1) = Data1.Recordset.Fields("Title")
End If
If IsNull(Data1.Recordset.Fields("Artist")) Then
  timearray(i, 2) = "NL"
Else
  timearray(i, 2) = Data1.Recordset.Fields("Artist")
End If
If IsNull(Data1.Recordset.Fields("Date")) Then
  timearray(i, 3) = "NL"
Else
  timearray(i, 3) = Data1.Recordset.Fields("Date")
End If
If IsNull(Data1.Recordset.Fields("Main1")) Then
  tempfield(4) = "NL"
Else
  tempfield(4) = Data1.Recordset.Fields("Main1")
End If
If IsNull(Data1.Recordset.Fields("Mstyle")) Then
  tempfield(5) = "NL"
Else
  tempfield(5) = Data1.Recordset.Fields("Mstyle")
End If
If IsNull(Data1.Recordset.Fields("Dtype")) Then
  tempfield(6) = "NL"
Else
  tempfield(6) = Data1.Recordset.Fields("Dtype")
End If
If IsNull(Data1.Recordset.Fields("Speed")) Then
  tempfield(7) = "NL"
Else
  tempfield(7) = Data1.Recordset.Fields("Speed")
End If
If IsNull(Data1.Recordset.Fields("Energy")) Then
  tempfield(8) = ""
Else
  tempfield(8) = Data1.Recordset.Fields("Energy")
End If
For X = 4 To 8
  Data2.RecordSource = X

```

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```

Data2.Refresh
Data2.Recordset.MoveLast
Data2.Recordset.MoveFirst
Data2.Recordset.FindFirst "Tag = "" & tempfield(X) & ""
timearray(i, X) = Data2.Recordset.Fields("Label")

Next X 'ReDim timearray(i, 10)
position = Data1.Recordset.AbsolutePosition
'assign song color to tracking array
Data3.Recordset.MoveFirst
Main1 = Data1.Recordset.Fields("Main1")
Data3.Recordset.FindFirst "Main1 = "" & Main1 & ""
timearray(i, 9) = Val(Data3.Recordset.Fields("colorID"))
i = i + 1
If CancelSearch = True Then
MousePointer = 0
Data1.Recordset.Close
Data2.Recordset.Close
Data3.Recordset.Close
SavePlay.Enabled = False
TimeFrame.Visible = False
Speed = "Any"
TimeInput.Text = ""
Exit Sub
End If
Loop
End If
If SetCat1 = "SPMIX" Then
Call CheckMain(Cat1)
If MainCount < 8 Then GoTo MainLoop
End If
MainCount = 0

Data1.Recordset.Close
Data2.Recordset.Close
Data3.Recordset.Close

If IsEmpty(timearray(0, 1)) Then
' - - - - - Then
MsgBox "You do not have enough Music downloaded in the LP MOAEC Database to fill your request. Please Go To Screen
4 and Select the Button, Music Available to Download and place your orders with Looney Productions at T# 781-863-2203."
Speed = "Any"
MousePointer = 0
TimeFrame.Visible = False
TimeInput.Text = ""
Exit Sub
ElseIf Speed = "MIXED" And i < 4 Then
MsgBox "Sorry, there are not enough speed variations to mix that style. Please try again."
MousePointer = 0
TimeFrame.Visible = False
Speed = "Any"
TimeInput.Text = ""
Exit Sub

```

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```

Else
Now.Enabled = True
Now.BackColor = &HFF&
PlayButton.Enabled = True
PlayButton.BackColor = &HFF8080

SavePlay.Enabled = True
Command1.Enabled = True
Now.BackColor = &HFF&
TimeFrame.Visible = False
RndMix.Enabled = True
rndcount = 0
loopcount = 0
Randomize
Do While TimeCount < TotalTime
DoEvents
'select random song selections from the song array and add them to the play list

```

LoopReset:

```

k = Rnd(i)
Y = Int(i * k)
AlreadyChosen = False
If timearray(Y, 0) <> "" Then

If IsNull(timearray(Y, 1)) Then GoTo LoopReset
If Speed = "MIXED" Then
If MixCount > 4 Then MixCount = 0
If loopcount > 500 Then GoTo DEFAULT
If (timearray(Y, 7) = FastSpeed And MixCount < 3) Or (timearray(Y, 7) = SlowSpeed And MixCount >= 3) Then

If rndcount > 0 Then
For j = 0 To rndcount
If RndSongsCount(j) = timearray(Y, 1) Then
AlreadyChosen = True
End If
Next j
End If
If AlreadyChosen = False Then
PlayList(0).AddItem timearray(Y, 0) & Chr(9) & timearray(Y, 1) & Chr(9) & timearray(Y, 2)
PlayList(1).AddItem timearray(Y, 0) & Chr(9) & timearray(Y, 1) & Chr(9) & timearray(Y, 2) & Chr(9) &
timearray(Y, 3) & Chr(9) & timearray(Y, 4) & Chr(9) & timearray(Y, 5) & Chr(9) & timearray(Y, 6) & Chr(9) & timearray(Y, 7) &
Chr(9) & timearray(Y, 8)
RndSongsCount(rndcount) = timearray(Y, 1)
loopcount = 0
PlaySongs = PlaySongs + 1
rndcount = rndcount + 1
MixCount = MixCount - 1
Else
loopcount = loopcount + 1
GoTo LoopReset

```

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```

End If
Else
loopcount = loopcount + 1
GoTo LoopReset
End If

Else
DEFAULT: If rndcount > 0 Then
For j = 0 To rndcount
If RndSongsCount(j) = timearray(Y, 1) Then
AlreadyChosen = True
End If
Next j
End If
If AlreadyChosen = False Then
Playlist(0).AddItem timearray(Y, 0) & Chr(9) & timearray(Y, 1) & Chr(9) & timearray(Y, 2)
Playlist(1).AddItem timearray(Y, 0) & Chr(9) & timearray(Y, 1) & Chr(9) & timearray(Y, 2) & Chr(9) & timearray(Y,
3) & Chr(9) & timearray(Y, 4) & Chr(9) & timearray(Y, 5) & Chr(9) & timearray(Y, 6) & Chr(9) & timearray(Y, 7) & Chr(9) &
timearray(Y, 8)
RndSongsCount(rndcount) = timearray(Y, 1)
PlaySongs = PlaySongs + 1
rndcount = rndcount - 1
End If
End If

If Playlist(0).Rows > 1 And AlreadyChosen = False Then
loopcount = 0
NumSongs.Text = PlaySongs
Playlist(0).row = Playlist(0).Rows - 1
Playlist(1).row = Playlist(1).Rows - 1
For z = 0 To 2
Playlist(0).Col = z
Playlist(0).CellBackColor = timearray(Y, 9)
Playlist(0).BackColorSel = timearray(Y, 9)
Playlist(0).ForeColorSel = Playlist(0).CellForeColor
Next z
For z = 0 To 8
Playlist(1).Col = z
Playlist(1).CellBackColor = timearray(Y, 9)
Playlist(1).BackColorSel = timearray(Y, 9)
Playlist(1).ForeColorSel = Playlist(1).CellForeColor
Next z
TempTime = CLng(timearray(Y, 0))
SongsTime = SongsTime + TempTime
timebox.Text = Format(TimeSerial(0, 0, SongsTime), "hh:mm:ss")
TimeCount = TimeCount + TempTime
zed = zed + 1
For j = 0 To 8
'selSong(j) = Playlist(1).TextMatrix(Playlist(1).Row, j)
PlayedSongs(z, zed, j) = Playlist(1).TextMatrix(Playlist(1).row, j)

```

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```

Next j
PlayedSong(1, zed, 9) = Playlist(1).CellBackColor
Else
loopcount = loopcount + 1
If loopcount > 100 Then
MsgBox ("Sorry, there were not enough different music titles to fill your time request. Please try another category as
well.")
Exit Do
End If
End If

End If
Loop
End If

Speed = "Any"
TimeInput.Text = ""
AddList(0).Enabled = True
ExpandList.Enabled = True
delete.Enabled = True
MousePointer = 0

End If

Call CheckOnDeck

Exit Sub

errorhandler:
Speed = "Any"
TimeInput.Text = ""
AddList(0).Enabled = True
ExpandList.Enabled = True
delete.Enabled = True
MousePointer = 0

Exit Sub
End Sub

Private Sub undo_Click()
On Error GoTo errorhandler

Select Case UndoEvent
Case 0
Call RestorePlayList

Case 1
Call RestoreSearchList

End Select

```

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```

undo.Enabled = False
Exit Sub

errorhandler:
MsgBox ("Sorry...Nothing to undo.")
undo.Enabled = False
End Sub

```

```

"titlefrm.frm"
Sub Main()
'allocate initial subcategories
FinalCats(1) = "Dance"
FinalCats(2) = "ENERGY"
FinalCats(3) = "Favorite Hits"
FinalCats(4) = "Traditional"
FinalCats(5) = "Special Mixes"
FinalCats(6) = "Club"
StaticCats(7) = "Big Band"
StaticCats(8) = "Spanish"
StaticCats(9) = "Halloween"
StaticCats(10) = "School Dances"
StaticCats(11) = "Italian"
subcatcount = 6
subcattotal = 6
CatColor = &H8000000E
CancelSearch = False
channel = 1
cued(1) = False
cued(2) = False
ExitButtonPushed = False
Speed = "Any"

```

```
End Sub
```

```

Private Sub Animation2_Click()
'enters the system if clicked
titlefrm.Hide
Unload titlefrm
Unload Loader
Animation1.Close
Animation2.Close
Screen1.Show
End Sub

```

```

Private Sub EnterSystem_Click(Index As Integer)
'button click to enter the system
If Index = 0 Then
VoiceActivation = True
ElseIf Index = 1 Then
VoiceActivation = False
End If

```

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```

titlefrm.Hide
Unload titlefrm
Unload Loader
Animation1.Close
Animation2.Close
Load Screen1
Load Screen2
Screen1.Show
End Sub

Private Sub ExitSystem_Click()
Dim response As String
'exit option
response = MsgBox("Are you sure you want to exit?", 4, "Exit System")
If response = vbNo Then
Exit Sub
Else
Animation1.Close
Animation2.Close
End If
End If
End Sub

Private Sub Form_Activate()
Dim WaitTime, ftime As Integer
titlefrm.Refresh
Call waveOutSetVolume(0, &HFFFFFFF)
MMControl1.Command = "stop"
MMControl1.Command = "reset"
MMControl1.Command = "play"
WaitTime = Timer()
ftime = Timer() - WaitTime

Do While ftime <= 2
DoEvents
ftime = Timer() - WaitTime
Loop
Animation2.Visible = True
Animation1.Visible = False

'play the theme music
Do While ftime <= 5
'wait 9 seconds and then display title
ftime = Timer() - WaitTime
DoEvents

If ftime >= 3 Then
Title(0).Visible = True

```

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```

        Title1(1).Visible = True
    End If
    Loop
    *play the welcome sound file
    EnterSystem(0).Visible = True
    EnterSystem(1).Visible = True
    ExitSystem.Visible = True

End Sub

Private Sub Form_Load()
    MMControl1.Command = "open"
    titlefrm.WindowState = 2
End Sub

Private Sub Form_Resize()
    Dim ScreenHeight As Integer
    Dim ScreenWidth As Integer

    ScreenHeight = (titlefrm.Height / 2)
    ScreenWidth = (titlefrm.Width / 2)
    Title1(0).Width = titlefrm.Width - 105
    Title1(1).Width = titlefrm.Width - 105
    Animation1.Top = ScreenHeight - 1087
    Animation1.Left = ScreenWidth - 1087
    Animation2.Top = ScreenHeight - 1087
    Animation2.Left = ScreenWidth - 1087
    EnterSystem(1).Top = titlefrm.Height - 2880
    EnterSystem(0).Top = EnterSystem(1).Top + 600
    ExitSystem.Top = EnterSystem(1).Top + 1200
    EnterSystem(1).Left = ScreenWidth - 1207
    EnterSystem(0).Left = EnterSystem(1).Left
    ExitSystem.Left = EnterSystem(1).Left
End Sub

Private Sub Form_Unload(Cancel As Integer)
    Animation1.Close
    Animation2.Close
    MMControl1.Command = "stop"
    MMControl1.Command = "close"

End Sub

"Module 1"
Option Explicit
Global Const NONE = 0

*Clipboard formats
Global Const CF_LINK = &HBF00
Global Const CF_TEXT = 1
Global Const CF_BITMAP = 2

```

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```

Global Const CF_METAFILE = 3
Global Const CF_DIB = 8

Global Const MODAL = 1

' ErrNum (LinkError)
Global Const WRONG_FORMAT = 1
Global Const DDE_SOURCE_CLOSED = 6
Global Const TOO_MANY_LINKS = 7
Global Const DATA_TRANSFER_FAILED = 8

```

```

' MousePointer
Global Const DEFAULT = 0
Global Const HOURGLASS = 11

```

```

' LinkMode (forms and controls)
Global Const LINK_NONE = 0
Global Const LINK_SOURCE = 1
Global Const LINK_AUTOMATIC = 1
Global Const LINK_MANUAL = 2

```

```

' Run time errors
Global Const NO_APP_RESPONDED = 282
Global Const DDE_REFUSED = 285

```

```

' Button parameter masks
Global Const LEFT_BUTTON = 1
Global Const RIGHT_BUTTON = 2

```

```

Global Const MB_YESNO = 4
Global Const MB_ICONQUESTION = 32
Global Const IDYES = 6

```

```

Global Const REP_LIGHT = "1 - Light"
Global Const REP_NORMAL = "2 - Normal"
Global Const REP_INTENSE = "3 - Intense"

```

```

'Module2

```

```

Global Const SEL_DEFAULT = "0 - Default"
Global Const SEL_MINIMAL = "1 - Minimal"
Global Const SEL_AUTOMATIC = "2 - Automatic"
Global Const SEL_ALLWORDS = "3 - All Words"

```

```

'Musicdat

```

```

'constants
Public Const WAVECAPS_LRVOLUME = &H8 ' separate left-right volume control
Public Const WAVECAPS_PITCH = &H1 ' supports pitch control
Public Const WAVECAPS_PLAYBACKRATE = &H2 ' supports playback rate control
Public Const WAVECAPS_VOLUME = &H4 ' supports volume control
Public Const WAVE_FORMAT_1S16 = &H8 ' 11.025 kHz, Stereo, 16-bit
Public Const WAVE_GOING = &H3

```

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```

Public Const GMEM_MOVEABLE = &H2
Public Const GMEM_ZEROINIT = &H40
Public Const GENERIC_READ = &H80000000
Public Const GENERIC_WRITE = &H40000000
Public Const OPEN_EXISTING = 3
Public Const FILE_ATTRIBUTE_NORMAL = &H80
Public Const CREATE_NEW = 1
Public Const CREAT_ALWAYS = 2

```

'global variables

```

Public Cat1 As String
Public MemCat As String
Public SubCol As String
Public muted As Boolean
Public SelCat1 As String
Public Cat2 As String
Public ScreenIndex As Integer
Public letter As String
Public Speed As String
Public cat1count As Integer
Public CurScreen As String
Public SongsTime As Long, time As Long
Public selSong(8) As String
Public DataLocked As Boolean
Public touchscreen As Boolean
Public chktrak As Integer
Public songlist As Variant, songlist2 As Variant
Public songlength As Double
Public sortstat As Boolean
Public SelList As Integer
Public CatColor As Variant
Public MinDate(36) As Integer
Public MaxDate(36) As Integer
Public SearchCats(2, 10) As Variant
Public searchflag As Integer
Public column As Integer
Public SearchSongs As Integer, PlaySongs As Integer
Public MnCatColor(3000) As Variant
Public subcatcount As Integer, subcattotal As Integer
Public Strme(3000) As String, Print(3000), RndSongsCount(3000) As String
Public SubCats(100) As String, FinalCats(100) As String
Public StaticCats(12) As String
Public PlayTime As Integer
Public SongPlaying As Boolean
Public CancelSearch As Boolean
Public channel As Integer
Public HeadExpand As Integer
Public OtherChannel As Integer
Public and As String * 255
Public StopList As Boolean, PauseList As Boolean
Public cued(3) As Boolean
Public MainCount As Integer, SubCount As Integer
Public UndoEvent As Integer
Public UndoText(10) As String

```

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```

Public UndoRow As Integer
Public ButMem As String
Public PlayedSongs(6, 3000, 10) As Variant
Public PlaylistsPlayed As Integer
Public PlayedTemp(6) As Integer
Public SlowSpeed As String
Public MidSpeed As String
Public FastSpeed As String
Public zed As Integer
Public FavHitsFinder As Integer
Public InitialFolder As String
Public totalFiles As Integer
Public NewSlidePos As Long
Public OldSlidePos As Long
Public volInc(2) As Long
Public RateInc As Long
Public DevID As Long
Public VolumeID As Long
Public VolumeHandle As Long
Public PitchHandle As Long
Public CancelCopy As Boolean
Public allCells1 As String, allCells2 As String, colors As String
Public FileNum As Integer, numRows As Integer
Public CurRow1 As Integer, CurRow2 As Integer, CurCol As Integer
Public FileColors() As Variant
Public AlreadyChosen As Boolean
Public autoMix As Boolean
Public FadePercent As Single
Public OldVolValue(2) As Long
Public WinPlayConnected As Integer
Public DisplayLibrary As Boolean
Public FirstLibrary As Boolean
Public NextTrackVar As Boolean
Public PrevTrackVar As Boolean
Public AutoExitTime As Long
Public AutoExitStart As Long
Public AutoExitEvent As Boolean
Public ExitButtonPushed
Public CancelLibrary As Boolean
Public VoiceActivation As Boolean
Public SongSelected As Boolean
Public FilePointer As Long
Public OrigVol(9) As Long
Public SteplistingList As Boolean
Public RatingTemp As String
Public RatingBlock As String
Public password As String
Public NewPassword1 As String
Public NewPassword2 As String
Public TimeSoFar As Long
Public NewPauseStartTime As Long

Declare Function waveOutClose Lib "winmm.dll" (ByVal hWaveOut As Long) As Long

```

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```

Declare Function waveOutGetVolume Lib "winmm.dll" (ByVal uDeviceID As Long, lpdwVolume As Long) As Long
Declare Function waveOutSetVolume Lib "winmm.dll" (ByVal uDeviceID As Long, ByVal dwVolume As Long) As Long
Declare Function waveOutGetID Lib "winmm.dll" (ByVal hWaveOut As Long, lpDeviceID As Long) As Long
Declare Function waveOutPause Lib "winmm.dll" (ByVal hWaveOut As Long) As Long
Declare Function waveOutRestart Lib "winmm.dll" (ByVal hWaveOut As Long) As Long

Declare Function waveOutGetPlaybackRate Lib "winmm.dll" (ByVal hWaveOut As Long, lpdwRate As Long) As Long
Declare Function waveOutSetPlaybackRate Lib "winmm.dll" (ByVal hWaveOut As Long, ByVal dwRate As Long) As Long

Declare Function waveOutGetPitch Lib "winmm.dll" (ByVal hWaveOut As Long, lpdwPitch As Long) As Long
Declare Function GlobalAlloc Lib "kernel32" (ByVal wFlags As Long, ByVal dwBytes As Long) As Long

Declare Function GlobalLock Lib "kernel32" (ByVal hMem As Long) As Long
Declare Function GlobalFree Lib "kernel32" (ByVal hMem As Long) As Long
Declare Function GlobalUnlock Lib "kernel32" (ByVal hMem As Long) As Long

Declare Function CreateFile Lib "kernel32" Alias "CreateFileA" (ByVal lpFileName As String, ByVal dwDesiredAccess As Long,
ByVal dwShareMode As Long, lpSecurityAttributes As Any, ByVal dwCreationDisposition As Long, ByVal dwFlagsAndAttributes
As Long, ByVal hTemplateFile As Long) As Long

Declare Function ReadFile Lib "kernel32" (ByVal hFile As Long, lpBuffer As Any, ByVal nNumberOfBytesToRead As Long,
lpNumberOfBytesRead As Long, lpOverlapped As Any) As Long

Declare Function WriteFile Lib "kernel32" (ByVal hFile As Long, lpBuffer As Any, ByVal nNumberOfBytesToWrite As Long,
lpNumberOfBytesWritten As Long, lpOverlapped As Any) As Long

Declare Function GetFileSize Lib "kernel32" (ByVal hFile As Long, lpFileSizeHigh As Long) As Long

Declare Function CloseHandle Lib "kernel32" (ByVal hObject As Long) As Long

Declare Function ExitWindows Lib "user32" (ByVal dwReserved As Long, ByVal uReturnCode As Long) As Long
Declare Function waveOutSetPitch Lib "winmm.dll" (ByVal hWaveOut As Long, ByVal dwPitch As Long) As Long

```

```

Public Sub EndAll()
Unload Screen1
Unload Screen2

```

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'Unload titlefrm
'Unload Updater
'Unload DriveScan
'Unload Main
'Unload Recorder
End
End Sub

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What is claimed is:

1. A music organizer and entertainment center comprising:

a storage device for storing encrypted, compressed data and an associated unique encryption key, the data defining a plurality of individual music selections and associated category flags, the encryption key being associated with an authorized user of the data;

a processor that retrieves selections and the associated category flags from the storage device based upon user selection of predetermined of the categories;

a decompression device that translates the encrypted, compressed data stored in the storage device into playable digital music data if a decryption key associated with the authorized user and corresponding to the encryption key has been provided to the decompression device; and

a sound card that converts the playable digital music data into audible music signals.

2. The center as set forth in claim 1 further comprising a data reading device that transfers data to the data storage device, the data reading device receiving data from a service provider that appends predetermined associated category flags to each of the plurality of individual music selections as originally prepared by the service provider.

3. The center as set forth in claim 2 wherein the data reading device comprises an optical disc reader that reads an optical disc of individual music selections prepared by the service provider.

4. The center as set forth in claim 3 wherein the storage device includes a file having all individual music selections available from the service provider, constructed and arranged so that a user can identify each of the individual music selections whereby the individual music selections can be requested from the service provider.

5. The center as set forth in claim 4 wherein one of the category flags comprises an ownership category flag that indicates which music selections from the list of all music selections are currently resident in the storage device.

6. The center as set forth in claim 1 further comprising a graphical user interface display having a plurality of selectable screens, at least one of the selectable screens including a plurality of category buttons constructed and arranged so that when a predetermined of the category buttons is activated, music selections having category flags matching the predetermined category of a respective of the buttons are selected and listed on the display.

7. The center as set forth in claim 6 wherein at least one of the displays includes a play list of music selections chosen from the search list, the center being constructed and arranged to translate compressed data of each of the music

selections on the play list, in a predetermined order, and to convert the playable digital music data into audible music signals.

8. The center as set forth in claim 7 further comprising a memory function constructed and arranged to memorize predetermined lists of music selections for subsequent playback based upon predetermined list identifier commands.

9. The center as set forth in claim 8 wherein at least one of the category flags comprises a rating flag and further comprising means for selectively blocking playback of songs associated with predetermined rating flags, the means for blocking including a password entry function to control the means for blocking.

10. The center as set forth in claim 1 further comprising a display screen having a plurality of graphical user interface displays, at least one of the displays including a plurality of buttons that, when activated, display a list of music selections on a search list having the associated category flags.

11. The center as set forth in claim 10 wherein each of the category buttons is constructed and arranged to display a plurality of sub-category buttons with other associated category flags whereby activation of the sub-category buttons further defines a selection of individual music selections so that the further defined music selections have each of the selected associated category flags.

12. The center as set forth in claim 1 further comprising a graphical user interface having a plurality of display screens, at least one of the screens showing thereon a plurality of buttons associated with individual of the associated category flags, a playback list showing music selections schedule for playback by the center and a search list showing current music selections retrieved based upon predetermined of the category buttons.

13. The center as set forth in claim 12 wherein the graphical user interface comprises a further screen having a plurality of music playback control buttons for controlling sound levels of the audible music signals.

14. The center as set forth in claim 13 wherein the graphical user interface includes a display screen having a listing of all available music selections currently stored in the storage device.

15. The center as set forth in claim 1 wherein the decryption key is stored in the center.

16. The center as set forth in claim 1 wherein the keys comprise a public/private key pair.

17. The center as set forth in claim 1 wherein the center comprises two separately housed units for being docked with each other.

18. The center of claim 1 wherein the center includes a voice-activation mechanism.

* * * * *

Atty Docket No. 017002-020800US

PTO FAX NO.: (703) 872-9318

ATTENTION: Examiner Stanley Witkowski
TELEPHONE NO.: (703) 872-9317

Group Art Unit 2837

OFFICIAL COMMUNICATION
FOR THE PERSONAL ATTENTION OF
EXAMINER STANLEY WITKOWSKI

CERTIFICATION OF FACSIMILE TRANSMISSION

I hereby certify that the following document(s) in re Application of Ron Goodman, et al., Application No. 09/755,629, filed January 5, 2001 for SYSTEM FOR SELECTING AND PLAYING SONGS IN A PLAYBACK DEVICE WITH A LIMITED USER INTERFACE is being facsimile transmitted to the Patent and Trademark Office on the date shown below.

Document(s) Attached

- 1. Amendment

Number of pages being transmitted, including this page: 11

Dated: December 26, 2001


Charles J. Kulas, Reg. No. 35,809

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Attorney Docket No.: 017002-020800US

PATENT

On December 26, 2001

TOWNSEND and TOWNSEND and CREW LLP

By: Lucy Baker

#5/A
1/3/02

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Ron Goodman, et al.

Application No.: 09/755,629

Filed: January 5, 2001

For: SYSTEM FOR SELECTING AND PLAYING SONGS IN A PLAYBACK DEVICE WITH A LIMITED USER INTERFACE

Examiner: S. Witkowski

Art Unit: 2837

AMENDMENT

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Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

In response to the Office Action mailed September 24, 2001 (December 24 and 25, 2001 were government holidays), please amend the above-identified application as follows:

IN THE CLAIMS:

Please cancel claims 1-12.

Please add new claims 16-23 as follows:

A1

- 1 16. (New) The method of claim 13 wherein the audio information from
- 2 other than the local storage comprises a radio broadcast.
- 1 17. (New) The method of claim 13, further comprising:

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2 selecting an audio file from the local storage in response to signals
3 received from a user input control of the electronic device, wherein the selected audio file
4 is played back from the local storage when the Play button is operated in the first manner.

1 18. (New) The method of claim 17, wherein selecting an audio file
2 from the local storage comprises:
3 displaying on a display of the electronic device a plurality of categories
4 including a first category of album names, a second category of artist names, and a third
5 category of style names;
6 accepting signals from the user input control to select one of the displayed
7 categories;
8 displaying a list of audio files in the local storage associated with the
9 selected category; and
10 accepting signals from the user input control to select one of the displayed
11 audio files.

1 19. (New) The method of claim 17, wherein the user input control
2 comprises a plurality of buttons, wherein at least two of the plurality of buttons are
3 configurable, and wherein selecting an audio file from the local storage comprises:
4 associating a plurality of audio files in the local storage with an album
5 name;
6 displaying the album name on a display of the electronic device;
7 designating a first configurable button for signaling an "open" command;
8 designating a second configurable button for signaling a "queue"
9 command;
10 after the "queue" command is received, selecting the plurality of audio
11 files to be played back sequentially; and
12 after the "open" command is received:
13 displaying the plurality of audio files;

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14 accepting signals from a third button to identify one of the plurality
15 of audio files;
16 after the "queue" command is subsequently received, selecting the
17 identified audio file for playback; and
18 after the "open" command is subsequently received, displaying
19 information about the identified audio file.

1 20. (New) The method of claim 17, wherein selecting an audio file
2 from the local storage comprises:
3 accessing a database in the local storage comprising album names, artist
4 names, style names, and audio files, wherein an audio file is associated with at least two
5 of an artist name, an album name, and a style name, at least one album name is associated
6 with an artist name, and at least one album name is associated with a style name;
7 displaying first, second, and third categories on a display of the electronic
8 device, wherein the first category is of albums, the second category is of artists, and the
9 third category is of styles;
10 accepting signals from the user input control to select one of the first,
11 second, and third categories;
12 in response to the first category being selected, displaying a list
13 comprising album names in the database;
14 in response to the second category being selected:
15 displaying a list comprising artist names in the database;
16 accepting signals from the user input control to select one of the
17 displayed artist names; and
18 displaying a list comprising at least one of an album name
19 associated with the selected artist name and an audio file associated with the selected
20 artist name;
21 in response to the third category being selected:
22 displaying a list comprising style names in the database;

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23 accepting signals from the user input control to select one of the
24 displayed style names; and

25 displaying a list comprising at least one of an album name
26 associated with the selected style name and an audio file associated with the selected
27 style name;

28 accepting signals from the user interface to select one of the displayed
29 audio files and the displayed album names; and
30 in response to one of the displayed album names being selected:

31 displaying a list comprising at least one audio file associated with
32 the selected album name; and

33 accepting signals from the user interface to select one of the
34 displayed audio files,

35 wherein, after one of the displayed audio files is selected, the selected
36 audio file is played back from the local storage when the Play button is operated in the
37 first manner.

1 21. (New) A method for playing a song in an electronic audio device
2 having a user interface including a display, a user input control, and a multi-function Play
3 button, the method comprising:

4 accessing a database in a local storage comprising album names, artist
5 names, style names, and songs, wherein each song is associated with at least two of an
6 artist name, an album name, and a style name, at least one album name is associated with
7 an artist name, and at least one album name is associated with a style name;

8 displaying first, second, and third categories on the display, wherein the
9 first category is of albums, the second category is of artists, and the third category is of
10 styles;

11 accepting signals from the user input control to select one of the first,
12 second, and third categories;

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13 in response to the first category being selected, displaying a list
14 comprising at least one album name;
15 in response to the second category being selected:
16 displaying a list comprising at least one artist name;
17 accepting signals from the user input control to select one of the
18 displayed artist names; and
19 displaying a list comprising at least one of an album name
20 associated with the selected artist name and a song associated with the selected artist
21 name;
22 in response to the third category being selected:
23 displaying a list comprising at least one style name;
24 accepting signals from the user input control to select one of the
25 displayed style names; and
26 displaying a list comprising at least one of an album name
27 associated with the selected style name and a song associated with the selected style
28 name;
29 accepting signals from the user interface to select one of the displayed
30 songs and the displayed album names;
31 in response to one of the displayed album names being selected:
32 displaying a list comprising at least one song associated with the
33 selected album name; and
34 accepting signals from the user input control to select one of the
35 displayed songs;
36 after one of the displayed songs is selected, playing back the selected song
37 from the local storage when the multi-function Play button is operated in a first manner;
38 and
39 in response to the multi-function Play button being operated in a second
40 manner, playing back audio information from a source other than the local storage while
41 suspending playback of the selected song.

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- A1
- 1 22. (New) The method of claim 21, further comprising:
2 after one of the displayed songs is selected, queuing the selected song in
3 response to a queue signal received from the user input control before playing back the
4 selected song from the local storage.
-

REMARKS

Claims 13-23 are pending.

Claims 1-15 were rejected under 35 U.S.C. §102(b) as allegedly being anticipated by any one of Cluts, U.S. Patent No. 5,616,876, Looney et al., U.S. Patent No. 5,969,283, or Yamaura et al., U.S. Patent No. 5,918,303.

Claims 1-12 have been canceled by this amendment, and claims 16-23 have been added.

Reconsideration of the rejection of claims 13-15 in view of the following remarks is respectfully requested.

Rejection of Claims 13-15

Claims 13-15 were rejected under 35 U.S.C. §102(b) as allegedly being anticipated by any of Cluts, U.S. Patent No. 5,616,876, Looney et al., U.S. Patent No. 5,969,283, or Yamaura et al., U.S. Patent No. 5,918,303. Applicants respectfully traverse.

Applicants respectfully submit that none of the cited references teaches a "method for providing multiple functions for a Play button in an electronic device" as recited in independent claim 13. According to claim 13, the electronic device has "a first playback mode for playing audio files from a local storage and a second playback mode for playing audio information from other than the local storage." The method of claim 13 comprises "determining whether the Play button is operated by a user in a first manner," and "if the Play button is operated in the first manner then performing the step of playing back an audio file from the local storage else performing the step of playing back audio

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information from other than the local storage." None of the cited references teaches that an electronic device may have first and second playback modes as recited in claim 13, or that a playback mode can be selected by operating a Play button in a first manner or another manner.

Cluts discloses an "audio on demand" system that "allows a subscriber to listen to songs provided by the system" and to select songs and playlists (Cluts, col. 4, lines 45-49). The system includes a set-top terminal at the user's location, via which data is transmitted to and received from a headend system at another location (see Fig. 1; col. 5, line 66-col. 6, line 19). The set-top terminal "communicates with the headend system 12 to process the instructions transmitted by the remote control unit" (col. 10, line 65-col. 11, line 1). As examples, Cluts discloses that the set-top terminal forwards instructions (e.g., a request for programming information) to the headend system, receives data (e.g., programming information) in response, and displays the received data in the proper format (col. 11, lines 1-10). Cluts does not teach that the set-top terminal may include local storage of audio files (see Fig. 2, showing only memory storage of operating system 68, boot code 72, and application program 68). Consequently, a person of ordinary skill in the art would infer that all audio data that is played back comes from the headend, which is a remote source. Therefore, at least the "first playback mode for playing audio files from a local storage" recited in claim 13 is not taught or suggested by Cluts.

Looney discloses a music organizer and entertainment center that plays back music "from an onboard database that can include a large number of songs or titles" (Looney, col. 2, lines 1-4). A user of the entertainment center may load songs into the database by transferring the songs from a compact disc or other computer-readable media (col. 7, lines 27-44). Playback of songs from the onboard (MyData) database is disclosed (see, e.g., Fig. 9), but playback of audio information from other sources is not. Therefore, at least the "second playback mode for playing audio information from other than the local storage" recited in claim 13 is not taught or suggested by Looney.

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Yamaura discloses an apparatus for selecting performance setting data. A tune table is provided, in which tune names are listed (Yamaura, col. 7, lines 4-6). Associated with each tune name is a keyword providing artist, composer, and genre information for the tune (col. 7, lines 13-15) and performance setting data "constituted of a style number, a tone color number, a tempo value, and a harmony number" (col. 7, lines 21-23). Yamaura teaches that performance setting data may be selected by selecting a tune name and setting the performance environment using the performance setting data corresponding to the selected tune name (col. 5, lines 4-19). The performance setting data apparatus is usefully employed in an electronic musical instrument (col. 5, lines 31-33) in which individual tones are generated by a user depressing keys (col. 6, lines 11-14). The performance setting data are used to establish properties of the generated tones (see col. 6, lines 17-25). Yamaura does not disclose that actual tunes are stored; only the name, the keyword, and general characteristics of the tune — style, tone color, tempo, and harmony — are stored. Consequently, a person of ordinary skill in the art would not infer that tunes are played back from local storage. Therefore, at least the "first playback mode for playing audio files from a local storage" recited in claim 13 is not taught or suggested by Yamaura.

Moreover, because none of the cited references teaches both of the first and second playback modes as recited in claim 13, it follows that none teaches or suggests the recited step of "if the Play button is operated in the first manner then performing the step of playing back an audio file from the local storage else performing the step of playing back audio information from other than the local storage."

For at least the foregoing reasons, Applicants respectfully submit that the cited references do not anticipate claim 13. Further, because claims 14 and 15 depend from claim 13, Applicants respectfully submit that the cited references do not anticipate these claims. Withdrawal of the rejection of claims 13-15 under 35 U.S.C. §102(b) is therefore respectfully requested.

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New Claims

Claims 16-23 have been added to more adequately claim various features of the invention. Applicants respectfully submit that support for these claims may be found throughout the specification, for instance, in Figures 1-3 and accompanying disclosure at p. 3, line 32-p. 6, line 24, and at p. 9, line 26-p. 10, line 15.

Further, Applicants respectfully submit that claims 16-23 are patentable over the cited references. Claims 16-21 depend from claim 13 and are therefore patentable for at least the reasons stated above. Independent claim 22 recites a "method for playing a song in an electronic audio device having a user interface including a display, a user input control, and a multi-function Play button." The method includes steps of "when one of the displayed songs is selected, playing back the selected song from the local storage when the multi-function Play button is operated in a first manner; and when the multi-function Play button is operated in a second manner, playing back audio information from a source other than the local storage while suspending playback of the selected song." As explained above, the cited references do not teach or suggest a multi-function Play button that provides both playback of audio data from the local storage and playback of audio information from a source other than the local storage. Therefore, claim 22 is patentable over the cited references. For at least the same reasons, claim 23, which depends from claim 22, is also patentable over the cited references.

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CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 415-576-0200.

Respectfully submitted,



Charles J. Kulas
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/755,629	01/05/2001	Ron Goodman	17002020800	3004

20350 7590 02/19/2002

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EXAMINER

WITKOWSKI, STANLEY J

ART UNIT PAPER NUMBER

2837

DATE MAILED: 02/19/2002

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Office Action Summary

Application No. 09/755629	Applicant(s) Goodman et al.
Examiner Witkowski	Group Art Unit 2837

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A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- Responsive to communication(s) filed on 12-26-01
- This action is FINAL
- Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 1-1; 453 O.G. 213.

Disposition of Claims

- Claim(s) 13-22 is/are pending in the application.
- Of the above claim(s) _____ is/are withdrawn from consideration.
- Claim(s) 21 & 22 is/are allowed.
- Claim(s) 13-18 is/are rejected.
- Claim(s) 19 & 20 is/are objected to.
- Claim(s) _____ are subject to restriction or election requirement

Application Papers

- The proposed drawing correction, filed on _____ is approved disapproved.
- The drawing(s) filed on _____ is/are objected to by the Examiner
- The specification is objected to by the Examiner.
- The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

- Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).
- All Some* None of the:
 - Certified copies of the priority documents have been received.
 - Certified copies of the priority documents have been received in Application No. _____
 - Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))
- *Certified copies not received: _____

Attachment(s)

- Information Disclosure Statement(s), PTO-1449, Paper No(s). _____
- Notice of Reference(s) Cited, PTO-892
- Notice of Draftsperson's Patent Drawing Review, PTO-948
- Interview Summary, PTO-413
- Notice of Informal Patent Application, PTO-152
- Other _____

Office Action Summary

Art Unit: 2837

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 13-17 are rejected under 35 U.S.C. 102(b) as being fully met by Toriumi.

This patent discloses the playback of audio from a local storage 13 or in a second mode of operation from a remote area. For example, see column 8, last two paragraphs. Controller 41 acts as a switch from local playback to remote playback and vice versa.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Art Unit: 2837

5. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Toriumi as applied to claims 13 and 17 above, and further in view of Looney et al.

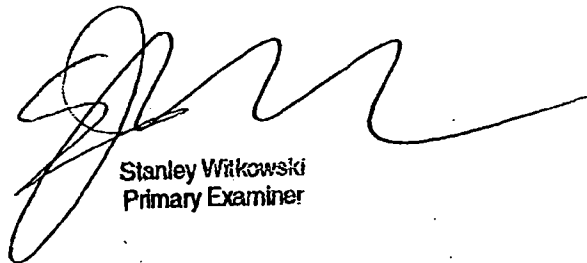
Toriumi does not disclose the breakdown of audio filed into plural categories including album names, artist names and style names. However, Looney discloses that the use of such categories or breakdowns is well-known in the electronic music and entertainment art for purposes of breaking down stored music so that it is more easily and readily identifiable and accessible by the listener. Hence, it would have been obvious to one of ordinary skill in the art to use such an arrangement in Toriumi for aiding the listener in the selection of particular pieces of music therein.

6. Claims 19 and 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. Any inquiry concerning this communication should be directed to Stanley J. Witkowski at telephone number (703) 308-3101.

Witkowski/ds

02/07/02



Stanley Witkowski
Primary Examiner

Notice of References Cited

09/755629 Goodman et al.
 Examiner Witkowski Group Art Unit 2837 Page 1 of 1

U.S. PATENT DOCUMENTS

* A	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS
A	6,062,868	5-2000	Toriumi	84	609X
B					
C					
D					
E					
F					
G					
H					
I					
J					
K					
L					
M					

FOREIGN PATENT DOCUMENTS

* N	DOCUMENT NO.	DATE	COUNTRY	NAME	CLASS	SUBCLASS
N						
O						
P						
Q						
R						
S						
T						

NON-PATENT DOCUMENTS

* U	DOCUMENT (Including Author, Title, Source, and Pertinent Pages)	DATE
U		
V		
W		
X		

*A copy of this reference is not being furnished with this Office action.
 (See Manual of Patent Examining Procedure, Section 707.05(a).)

United States Patent [19]
Toriumi

[11] **Patent Number:** **6,062,868**
[45] **Date of Patent:** **May 16, 2000**

[54] **SING-ALONG DATA TRANSMITTING METHOD AND A SING-ALONG DATA TRANSMITTING/RECEIVING SYSTEM**

[75] **Inventor:** Hiroshi Toriumi, Tokyo, Japan
[73] **Assignee:** Pioneer Electronic Corporation, Tokyo, Japan

[21] **Appl. No.:** 08/732,716

[22] **Filed:** Oct. 18, 1996

[30] **Foreign Application Priority Data**

Oct. 31, 1995 [JP] Japan 7-284011

[51] **Int. Cl.⁷** G09B 15/06; G10H 7/00

[52] **U.S. Cl.** 434/307 A; 434/307 R; 348/13; 84/609; 84/477 R; 340/825.07; 370/437

[58] **Field of Search** 434/307 R-309, 434/318, 118, 365; 84/477 R, 609-613, 634-637, 644, 650-652, 662; 369/1, 2, 4, 48, 178, 192; 360/32, 72.2; 348/473, 595, 563, 564, 484, 478, 7, 12-14, 732, 488, 571; 386/96; 379/93; 370/95.1, 95.2, 85.8, 432, 535, 536, 437; 340/825.03, 825.08, 825.21, 825.07, 705/39; 485/4.2, 5.1, 6.3; 704/769; 455/66, 5.1, 4.2, 6.3, 3.1; 375/358

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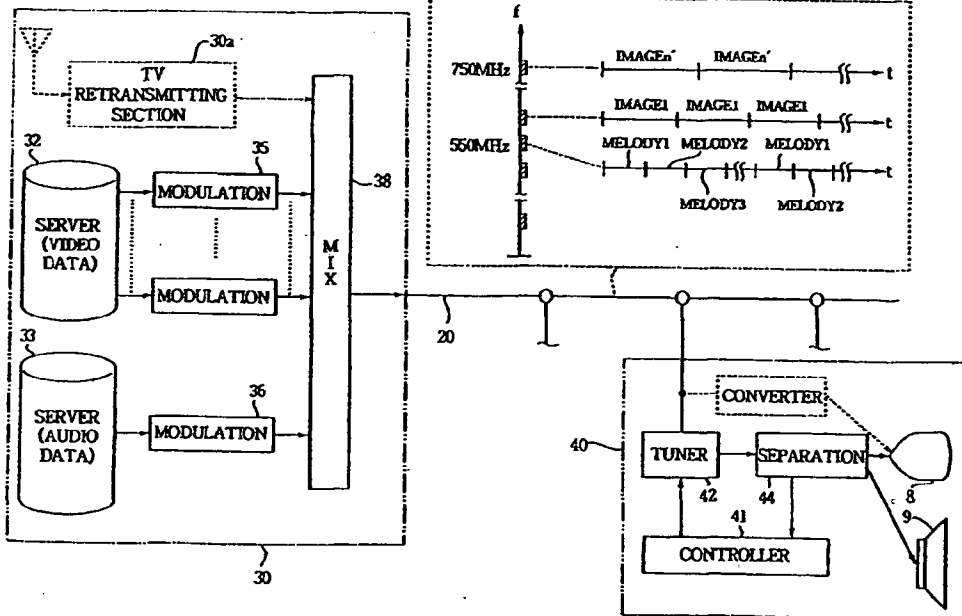
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Primary Examiner—Joe H. Cheng
Attorney, Agent, or Firm—Arent Fox Kinter Plotkin & Kahn PLLC

[57] **ABSTRACT**

A sing-along data transmitting method includes the steps of providing a sing-along data center for supplying background video data and music data, and providing a plurality of sing-along data receiving terminals for receiving the background video data and music data fed from the sing-along data center. The next step is transmitting a plurality of background video data by way of a plurality of different channels, and transmitting music data of a plurality of melodies by way of at least one channel. The method further includes the step of transmitting a channel data indicating a channel through which said background video data corresponding to a selected music is being transmitted, with the channel data being transmitted together with music data. There is also provided a sing-along data transmitting/receiving system for carrying out the above sing-along data transmitting method.

5 Claims, 8 Drawing Sheets



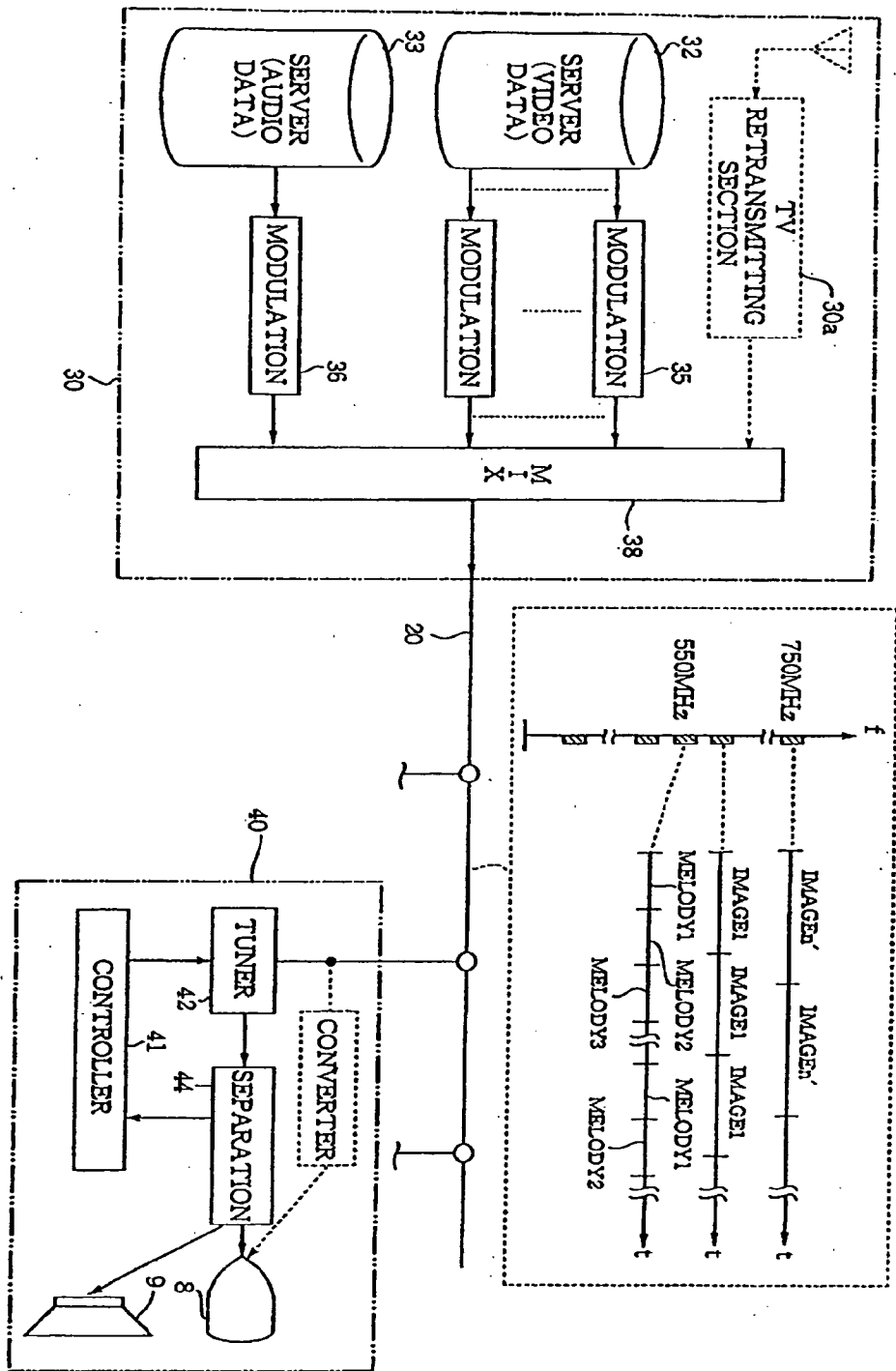
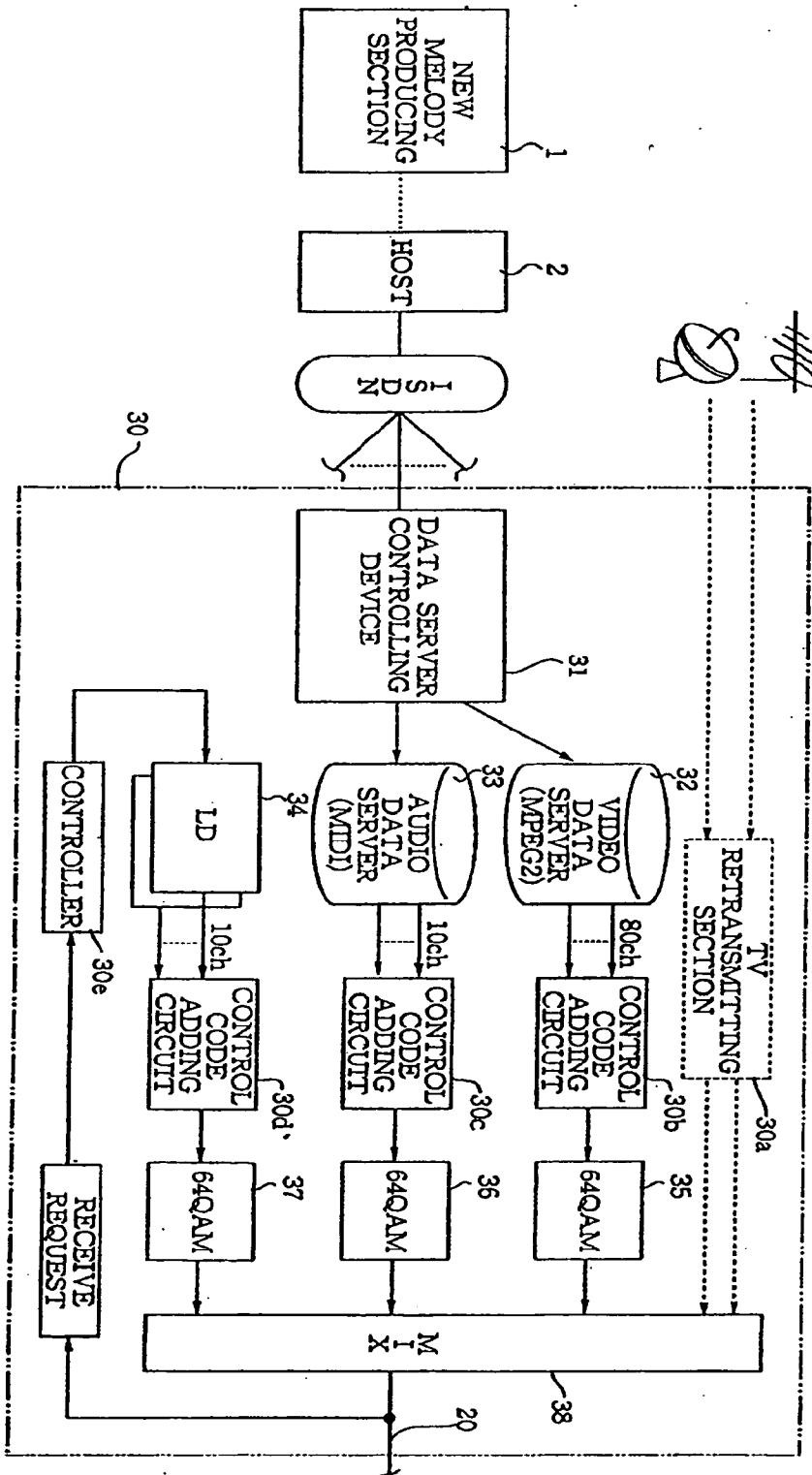


FIG. 1

FIG. 2



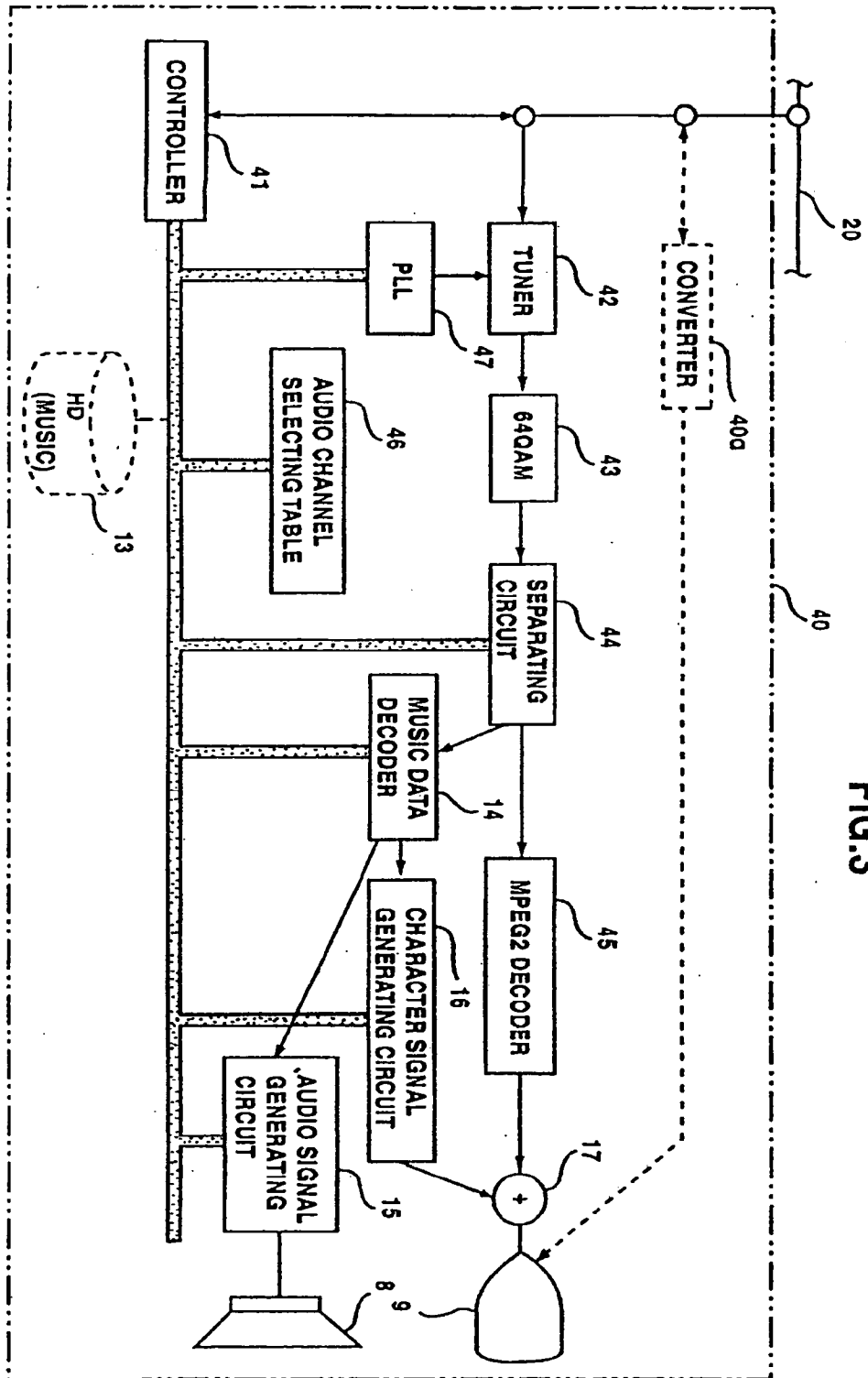


FIG. 3

FIG.4

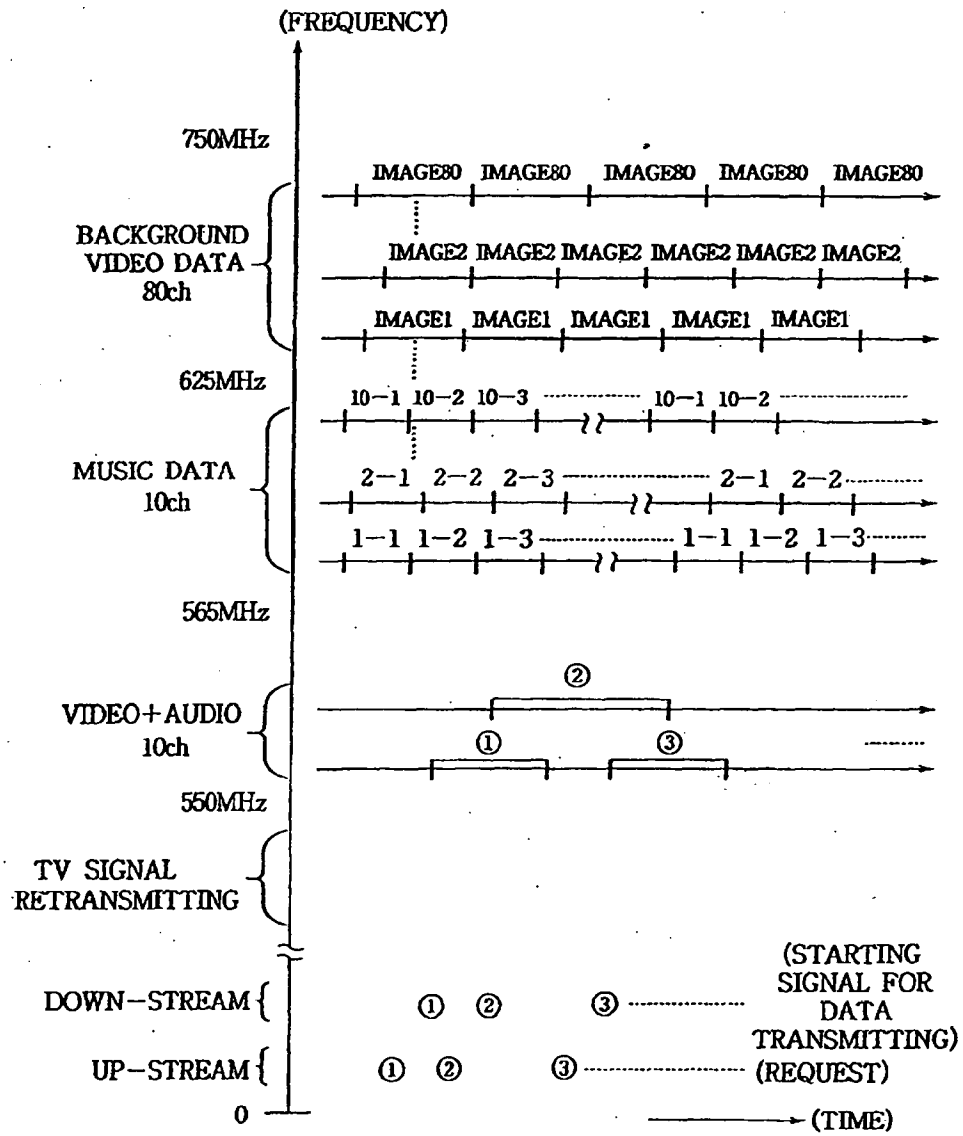
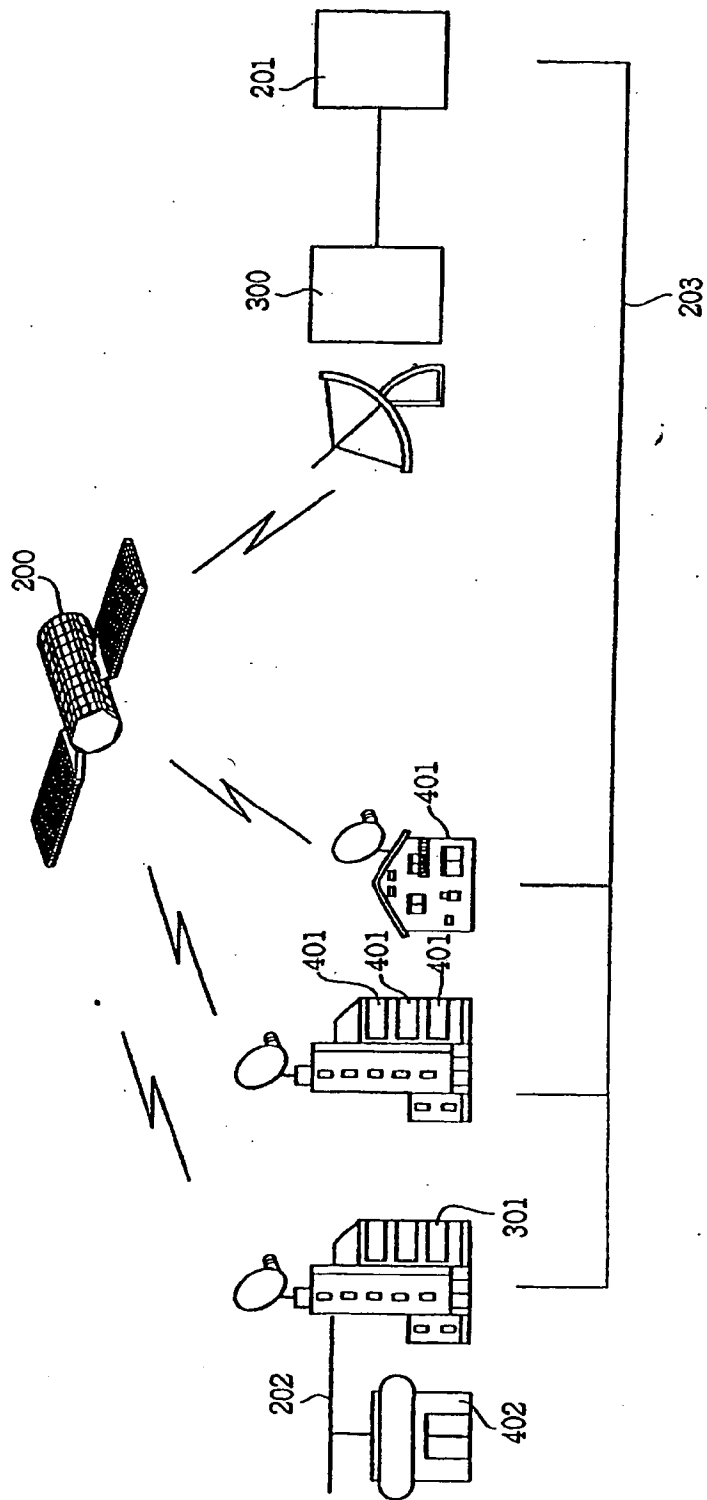


FIG.5



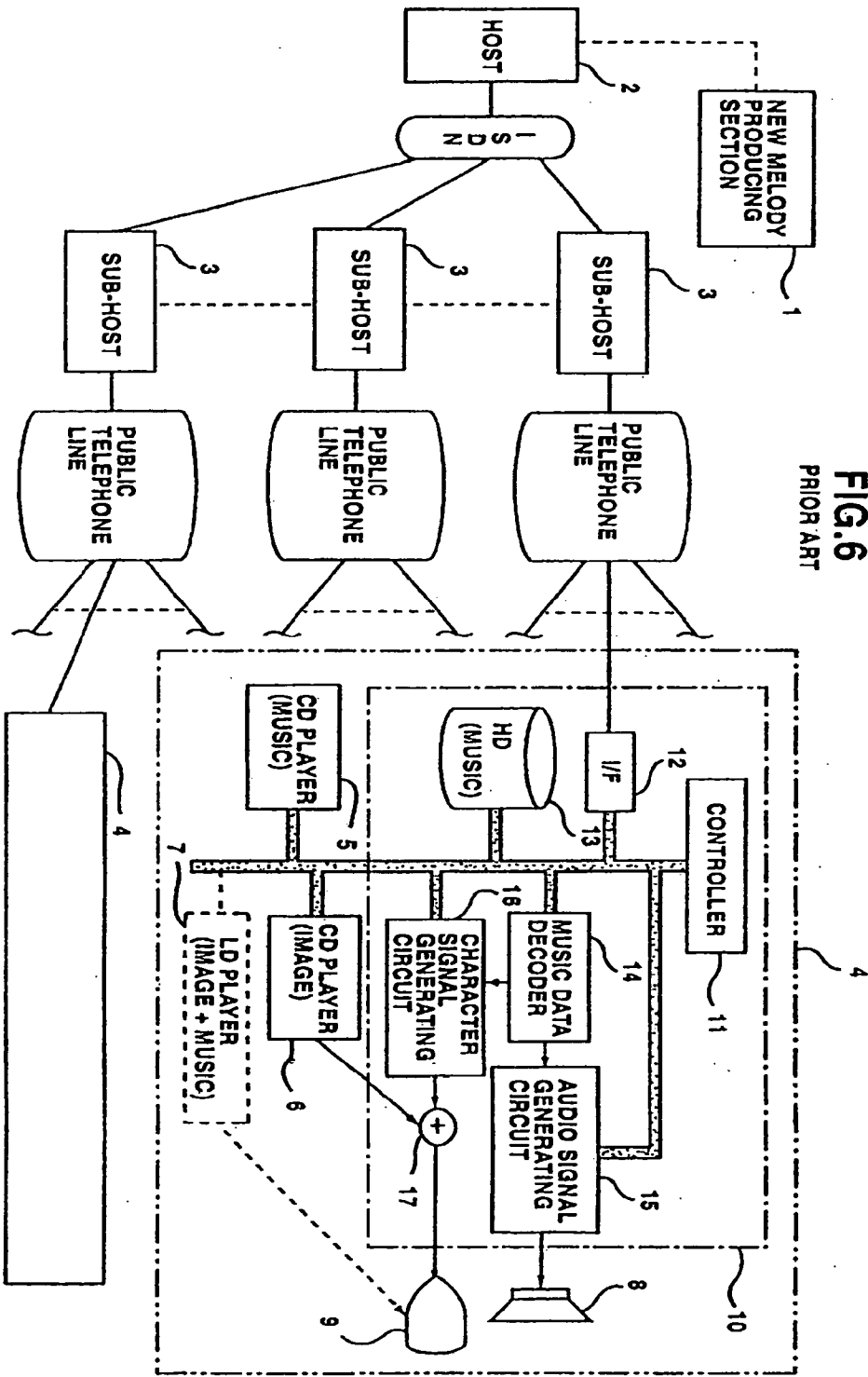


FIG. 6
PRIOR ART

FIG. 7

PRIOR ART

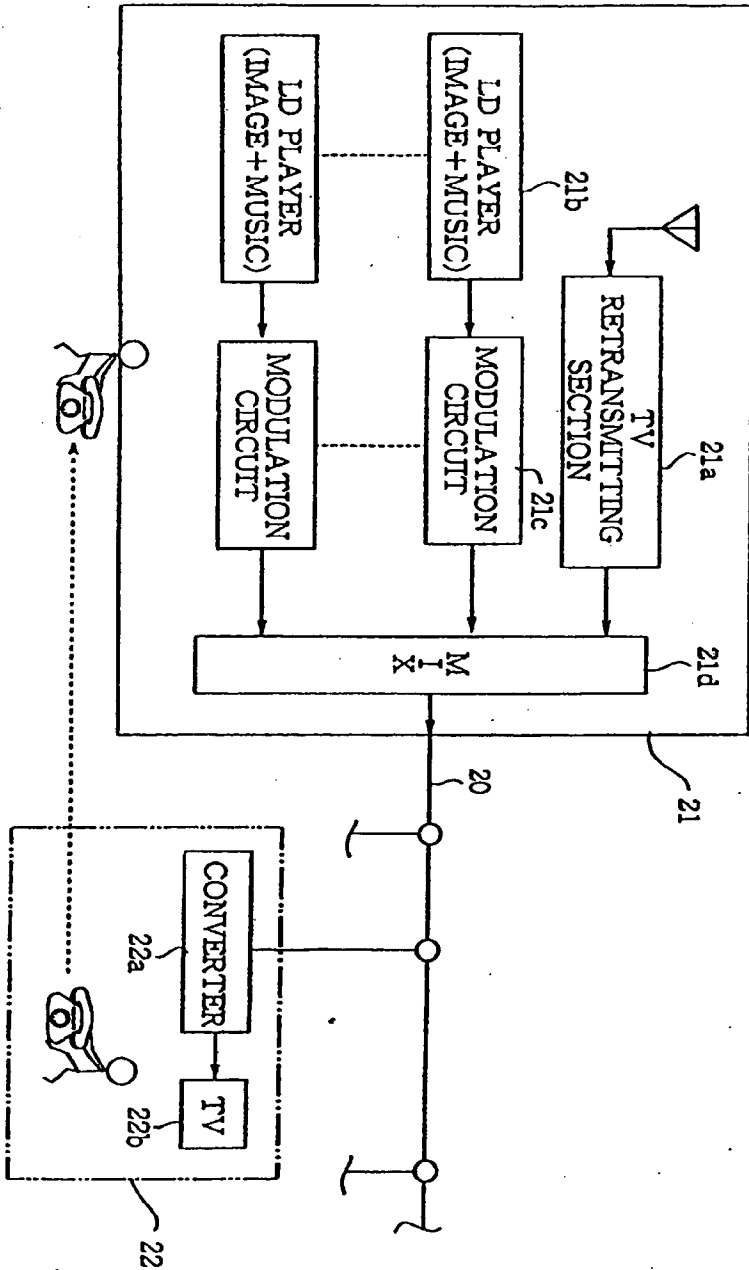
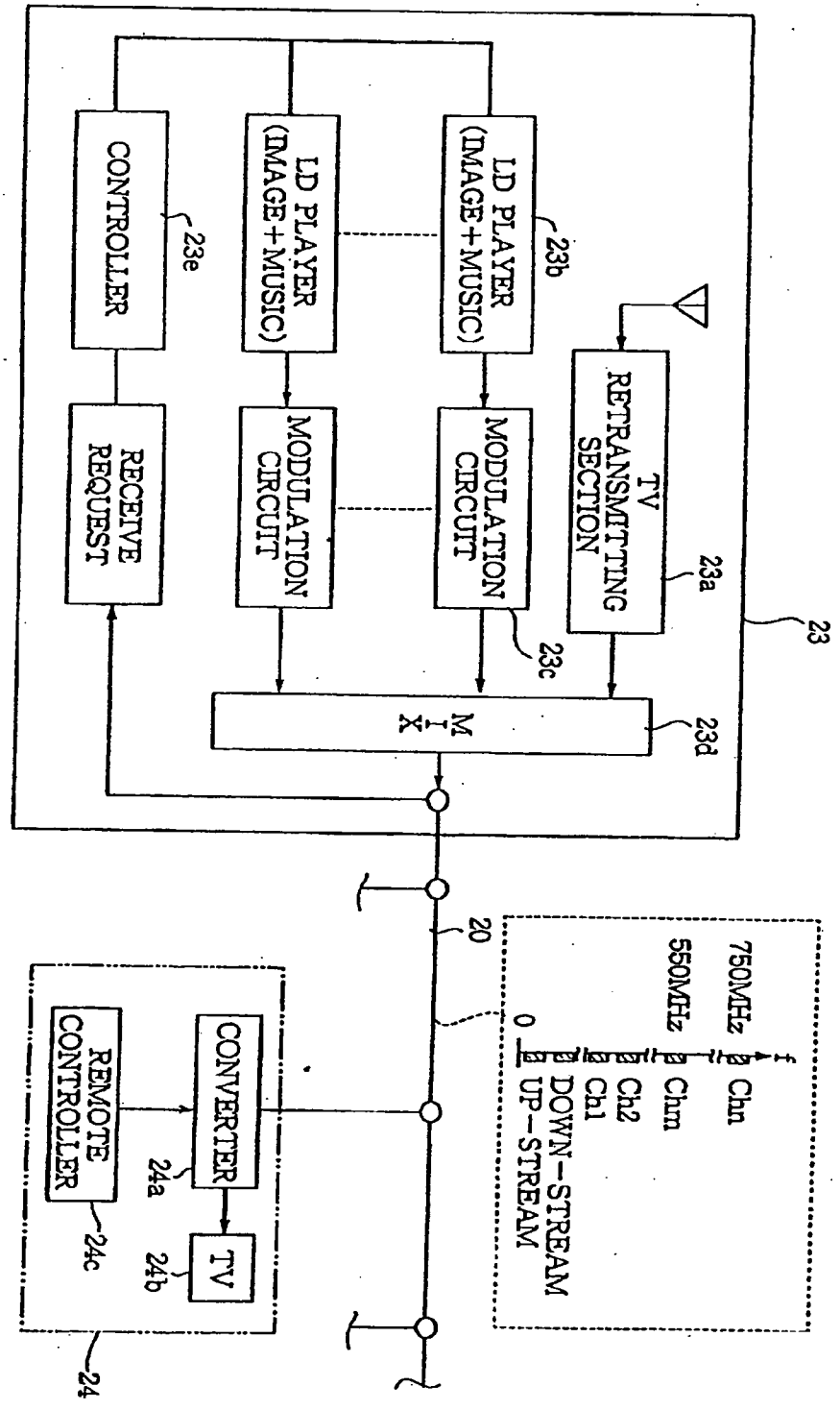


FIG. 8

PRIOR ART



SING-ALONG DATA TRANSMITTING METHOD AND A SING-ALONG DATA TRANSMITTING/RECEIVING SYSTEM

BACKGROUND OF THE INVENTION

The present invention relates to a sing-along (so-called Karaoke) data transmitting method and a sing-along data transmitting/receiving system.

FIG. 6 shows a conventional sing-along data transmitting/receiving system, where a plurality of sing-along data receiving terminals 4 are provided so that they can communicate with a host 2 and/or a plurality of sub-hosts 3 by way of ISDN (integrated service digital network) and/or public telephone lines.

As shown in FIG. 6, each sing-along data receiving terminal 4 has a main section 10 including a communication interface (hereinafter referred to as I/F) 12, a controller 11 capable of operating for the main section 10 to receive sing-along music data through the I/F 12 and to store the data in a hard disc 13. The terminal 4 further has a speaker 8, a monitor 9, an audio player 5, either a background image video player 6 or a laser disc player 7, all of which are connected with the main section 10 on the outside thereof.

Referring to FIG. 6, the main section 10 further contains a music data decoder 14 and an audio signal generating circuit 15 which are provided to produce audio signal in accordance with the music data read from either the audio player 5 or the hard disc 13. The audio signal fed from the audio signal generating circuit 15 is applied to the speaker 8. Moreover, the main section 10 contains a character signal generating circuit 16 and a synthesizing circuit 17. In this way, character signals are generated and mixed with the background image data produced from the background image video player 6. Finally, the synthesized signals are applied to the monitor 9.

In the conventional sing-along data transmitting system shown in FIG. 6, a new melody producing section 1 is provided to compose new melodies. The newly composed melody data are fed to the host 2, and further fed through ISDN to the sub-hosts 3 and stored there. When there is a request for obtaining new melodies, the new melody data may be supplied from the sub-hosts 3 through public telephone lines to the I/F 12, and stored in the hard disc 13 by the control of the controller 11. In this way, newly composed melodies can be supplied to respective terminals 4.

When there is a request for a desired melody, such a request may be input to the sing-along data receiving terminal 4. If the melody data are stored in a disc of the audio player 5, the desired melody data may be read out therefrom. On the other hand, if the desired melody data are stored in the hard disc 13, it can be read out from the hard disc 13. In both cases, read-out melodies are reproduced through the speaker 8. Meanwhile, background image data corresponding to the selected melody may be read out from a disc of the background image video player 6, and the background image is then displayed on the monitor 9.

FIG. 7 shows another conventional sing-along data transmitting/receiving system using a CATV system. As illustrated in FIG. 7, the sing-along data transmitting/receiving system includes a CATV center 21 and a CATV terminal 22, which are connected with each other through a CATV cable 20.

The CATV center 21 contains a re-transmitting section 21a for re-transmitting television broadcast signals, laser disc players 21b for reproducing background images and

corresponding melodies, modulation circuits 21c for modulating reproduced video and audio signal in a predetermined frequency band, a mixer 21d for mixing various signals and for transmitting the mixed signals through the CATV cable 20.

The CATV terminal 22 includes a converter 22a and a TV receiver 22b. Besides, it is also possible to include an audio stereo equipment to improve acoustic sound effect.

In the system shown in FIG. 7, if a sing-along shop (CATV terminal 22) has a request for a desired sing-along song, such a request may be transmitted by telephone to an operator of the CATV center 21. Then, the converter 22a of the CATV terminal 22 is operated to select a sing-along channel. After waiting for a while, the desired sing-along melody and image are reproduced in the CATV center 21 and are transmitted to the CATV terminal 22 through a selected sing-along channel by way of the CATV cable 20.

In order to eliminate the inconvenience of requesting a desired sing-along song by telephone, there has been suggested a further sing-along transmitting/receiving system using a two-way CATV system, as shown in FIG. 8. The system has a CATV terminal 24 including a converter 24a, a TV receiver 24b and a remote controller 24c. The converter 24a is used to transmit a signal requesting a desired sing-along song to the CATV center 23 by way of an up-stream channel of the CATV cable 20. Then, a controller 23e operates to control a laser disc player 23b so as to reproduce the desired melody and image. The reproduced data representing the desired song are transmitted to the terminal 24 through the CATV cable 20.

However, the above conventional sing-along systems have the following disadvantages.

In the system shown in FIG. 6, each sing-along data receiving terminal 4 is required to include an audio data player 5 and a video data player 6. In detail, it is necessary to employ an audio player having a disc changer capable of receiving many audio discs containing the data of at least 10000 melodies. Further, it is also necessary to employ a video player having a disc changer capable of receiving many video discs containing the data of at least 80 patterns of background images. As a result, a sing-along shop has a high burden in equipment investment and daily management.

In the systems using CATV as shown in FIGS. 7 and 8, since there are only limited number of channels for data transmitting, it is merely allowed to have at most 10 terminals (22 or 24) for independently performing sing-along service at the same time. In particular, in the evening of a weekend when there are many customers for sing-along playing, it is often required to stop television retransmitting service in order to ensure sufficient sing-along services.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide an improved sing-along data transmitting method and an improved sing-along data transmitting/receiving system, so as to solve the above-mentioned problems peculiar to the above-mentioned prior arts.

According to one aspect of the present invention, there is provided a sing-along data transmitting method which comprises: providing a sing-along data center for supplying background video data and music data; providing a plurality of sing-along data receiving terminals for receiving the background video data and music data fed from the sing-along data center; transmitting a plurality of background video data by way of a plurality of different channels; and

transmitting music data of a plurality of melodies by way of at least one channel.

The method further includes transmitting a channel data indicating a channel through which said background video data corresponding to a selected music is being transmitted, said channel data being transmitted together with the selected music data. Here, said music data contain music melody data and lyrics data, and are repeatedly transmitted. Further, such music data are compressed so as to be transmitted in a sufficiently shortened time period less than real time.

According to another aspect of the present invention, there is also provided a sing-along data transmitting/receiving system for carrying out the above sing-along data transmitting method.

The sing-along data transmitting/receiving system comprises: a sing-along data center for supplying background video data and music data; a plurality of sing-along data receiving terminals for receiving the background video data and music data fed from the sing-along data center; a data communication way for transmitting the background video data and music data from the sing-along data center to the plurality of sing-along data receiving terminals.

The sing-along data center comprises: a video data supplying means for repeatedly reproducing a plurality of background video data; a video data transmitting means for transmitting the reproduced background video data by way of respective video data transmitting channels; a music data supplying means for repeatedly reproducing music data of a plurality of melodies; a music data transmitting means for transmitting the reproduced music data by way of a predetermined music data transmitting channel.

Each of the sing-along data receiving terminals comprises: an input means for designating a sing-along melody; a music data receiving means for receiving the music data from the above predetermined music data transmitting channel; and a video data receiving means for receiving the video data from one of the above video data transmitting channels.

The sing-along data transmitting/receiving system according to the present invention, further comprises a channel data producing means for producing a channel data indicating a channel through which a background video data corresponding to a music is being transmitted. In particular, the music data transmitting means is provided to transmit reproduced music data together with the produced respective channel data, and the music data receiving means is provided to extract music data of a sing-along melody designated by said input means and to extract channel data corresponding to the designated sing-along melody. Further, the video data receiving means receives the video data from one of the video data transmitting channels, in accordance with the extracted channel data.

According to a further aspect of the present invention, there is provided a sing-along data receiving system, adapted to receive background video data transmitted through a plurality of video data transmitting channels, to receive music data of a plurality of melodies by way of at least one music data transmitting channel, to receive a channel data indicating a channel through which said background video data corresponding to a selected music is being transmitted.

Said sing-along data receiving terminal comprises: an input means for designating a sing-along melody; a music data receiving means for selecting a music data transmitting channel to receive music data of a sing-along melody designated by the input means and channel data corresponding to the sing-along melody, so as to output the sing-along

melody; and a video data receiving means for selecting one of the video data transmitting channels in accordance with channel data received by the above music data receiving means, so as to receive the background video data, thereby outputting the background image.

The above objects and features of the present invention will become more understood from the following description with reference to the accompanying drawings.

BRIEF DESCRIPTION OF DRAWINGS

FIG. 1 is a block diagram showing a preferred embodiment of a sing-along data transmitting/receiving system according to the present invention.

FIG. 2 is a block diagram indicating a sing-along data center involved in the system of FIG. 1.

FIG. 3 is a block diagram indicating a sing-along data receiving terminal involved in the system of FIG. 1.

FIG. 4 is a graphical diagram indicating an assignment of frequency bands for transmitting various signals.

FIG. 5 is an explanatory view illustrating another embodiment of a sing-along data transmitting/receiving system according to the present invention.

FIG. 6 is a block diagram showing a conventional sing-along data transmitting/receiving system.

FIG. 7 is a block diagram showing another conventional sing-along data transmitting/receiving system using a CATV system.

FIG. 8 is a block diagram showing a further conventional sing-along data transmitting/receiving system using a two-way CATV system.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIG. 1, a sing-along data transmitting/receiving system of the present invention includes a sing-along data center 30 (hereinafter, simply referred to as center) for supplying and transmitting sing-along data, a plurality of sing-along data receiving terminals 40 (hereinafter, simply referred to as terminals), a CATV cable 20 for communication between the center 30 and the terminals 40.

The center 30 includes a TV retransmitting section 30a for receiving and transmitting TV signal and performing two-way data communication, all using a frequency band below 550 MHz. The terminal 40 is connected to the CATV cable 20 in a manner similar to a conventional CATV terminal. Sing-along data (image and melody) are transmitted from the center 30 through the CATV cable 20 to the terminals 40 using a frequency band of 750 MHz-550 MHz.

Referring to FIG. 2, the center 30 has a data server controlling device 31 including a micro-computer and an I/F (interface) connecting with ISDN (integrated service digital network) circuit, and a video data server 32 which is under control of the controlling device 31 for storing and transmitting background image video data. There are 80 patterns of background images which are classified in accordance with their specific properties and stored in a form of digital data. Since the background video data are compressed in accordance with a MPEG (moving picture coding experts group)-2 method, the memory capacity of the video data server 32 and the transmitting capacity of the CATV cable 20 are allowed to be comparatively small.

The video data server 32 includes a storage memory such as hard disc, a read-out circuit and a controller for control-

ling the hard disc and the read-out circuit. Such a video data server 32 may be used to continuously read out the 80 patterns of background video data and to feed the same to a control code adding circuit 30b. The control code adding circuit 30b is provided to add a control code in the background video data so as to identify the data.

Then, an AM modulation circuit 35 is provided after the control code adding circuit 30b for modulating 80 patterns (80 channels) of background video data in accordance with a 64QAM (quadrature amplitude modulation) method. In this way, it becomes possible to transmit video data having a data amount corresponding to four channels, using only one channel having a frequency band of 6 MHz, which in prior art can only be used to transmit analogue data of one channel. Thus, the background video data of 80 channels, which have been frequency-multiplexed and converted into signals in a frequency band of 625 MHz-750 MHz, are transmitted through a mixer 38 to the CATV cable 20.

Referring again to FIG. 2, the center 30 is further provided with an audio data server 33 which is also controlled by the data server controlling device 31 so as to store and transmit digital audio data. Such digital audio data include 10000-20000 melodies, of which musical instrument melody data have been compressed in accordance with MIDI (musical instrument digital interface) standard and back-chorus melody data have been compressed in accordance with MPEG method. Therefore, the memory capacity of the audio data server 33 and the transmitting capacity of the CATV cable 20 are allowed to be comparatively small.

In this embodiment according to the present invention, when a music data is being stored in the audio data server 33, the data server controlling device 31 produces a channel data containing a channel number representing a channel through which a desired background video data is being transmitted. For instance, after a melody is selected, and a background image corresponding to the melody is transmitted through channel 3, the data server controlling device 31 will produce a channel data containing a channel number (channel 3). Such a channel data will be added at the beginning of the melody data.

Similarly, the audio data server 33 includes a storage memory such as a hard disc, a read-out circuit and a controller for controlling the hard disc and the read-out circuit. The music audio data containing 10000-20000 melodies are divided in the audio data server 33 into ten groups and will be read out continuously from the hard disc so as to be fed to a control code adding circuit 30c. Similarly, the control code adding circuit 30c is provided to add a control code in the music data so as to identify the data.

Then, a similar AM modulation circuit 36 is provided after the control code adding circuit 30c for modulating 10 groups (10 channels) of melody audio data in accordance with a 64QAM (quadrature amplitude modulation) method. In this way, the melody audio data of 10 channels, which have been frequency-multiplexed and converted into signals in a frequency band of 565 MHz-625 MHz, are transmitted through a mixer 38 to the CATV cable 20.

Referring further to FIG. 2, the center 30 has a controller 30e, a laser disc player 34, a further control code adding circuit 30d and a further AM modulation circuit 37. The controller 30e is provided to receive a request from a terminal 40 for a melody not stored in the audio data server 33. The laser disc player 34 is provided to reproduce a requested melody and corresponding image recorded on a laser disc (in the player 34) in accordance with a command from the controller 30e. The control code adding circuit 30d

and the AM modulation circuit 37 are respectively similar to the control code adding circuit 30c and the AM modulation circuit 36.

The data server controlling device 31 of the center 30, is provided not only to perform the operations described above, but also to receive data of new melodies composed in a new melody producing section 1. The data of new melodies are transmitted from a host 2 through the ISDN (integrated service digital network). In fact, the data server controlling device 31 is so provided that as soon as data of a new melody is received, a channel data will be added in the received melody data which will then be stored in one group of melody data having least data amount as compared with other nine groups of melody data in the audio data server 33.

Referring to FIG. 3, the terminal 40 includes a converter 40a connected with the CATV cable 20 for receiving TV signals retransmitted from the center 30 and for two-way communication using a frequency band below 550 MHz. Similar to a conventional sing-along data transmitting/receiving system, the terminal 40 also has a speaker 8, a monitor 9, a hard disc 13, an music data decoder 14, an audio signal generating circuit 15, a character signal generating circuit 16 and a synthesizing circuit 17. Further, the terminal 40 includes a controller 41, a tuner 42, 64QAM demodulation circuit 43, a separating circuit 44, a MPEG2 decoder 45, an audio channel selecting table 46, and a PLL (phase locked loop) circuit 47.

Since it is possible to dispense with an audio player 5, a background image data player 6 and a laser disc player 7, the terminal 40 may be made more compact in size and lower in cost.

The controller 41 mainly contains a micro-computer to control the PLL circuit 47 and the music data decoder 14 in accordance with a predetermined program. The controller further includes a circuit for receiving data from the center 30 and another circuit for sending a data (such as a request signal) to the center 30.

Moreover, the controller 41 is provided with a commander and a data receiving circuit for specific use with the commander. Accordingly, a customer may perform remote operation using the commander to input a number of his desired melody, so that the number data of desired melody may be stored in an inner memory provided in the controller 41. In this way, it is possible to send a customer's request from the terminal 40 to the center 30, so as to select and reserve a desired melody by operating the controller 41 in the terminal 40.

The tuner 42 is connected with the CATV cable 20, and is adapted to selectively perform tuning within a range of 550 MHz-750 MHz in accordance with an oscillating signal from the PLL circuit 47.

The 64QAM demodulation circuit 43 is a signal processing circuit for processing received signals selected by the tuner 42 in accordance with the QAM method, so as to restore sing-along data transmitted from a predetermined channel.

The separating circuit 44 mainly contains a DSP (digital signal processor), and is capable of identifying whether a sing-along data being transferred herein is a background video data or a music data, with reference to a control code added therein. If a sing-along data is a background video data, the data will be fed to MPEG2 decoder 45. On the other hand, if a sing-along data is music (song) data, the data will be processed so as to separate channel data therefrom. The separated data and remaining data will be in a condition under control by the controller 41.

The audio channel selecting table 46 is a table provided on a memory such as a ROM (read-only memory), in which all the melody numbers including uppermost and lowermost numbers have been recorded. With reference to these numbers, it is possible to know a channel number indicating a channel for transmitting the desired melody.

Further, the controller 41, by referring to the audio channel selecting table 46, will obtain a channel number for a desired melody, so as to control the PLL circuit 47 in order that the tuner 42 will tune to a corresponding frequency band to select an appropriate channel.

In addition, the controller 41 is provided also to monitor the music (song) data passing through the separating circuit 44. When it is determined that a melody number contained in the music data is the same as a melody number of a requested melody, the separating circuit 44 will be controlled so that the music data will be fed to the music data decoder 14 which has a maintainable buffer for maintaining at least one piece of melody. Meanwhile, the controller 41 operates to control the PLL circuit 47 in order that the tuner 42 will tune to a frequency band corresponding to a channel (indicated by a channel data) for a desired background image, in accordance with the channel data separated from the music data in the separating circuit 44.

Furthermore, the controller 41 is provided such that, after music data have been fed from the separating circuit 44 to the music data decoder 14 (mainly containing the DSP), the audio signal generating circuit 15 (mainly containing MIDI audio source and DSP), the character signal generating circuit 16 (mainly containing character generator). Accordingly, character information of the music data is fed from the music data decoder 14 to the character signal generating circuit 16 so as to produce character signal. Meanwhile, musical instrument performance data and chorus data are decoded in accordance with a corresponding standard, thereby producing an analogue audio signal from these decoded data by means of the audio signal generating circuit 15. In this manner, the character signal is added to the background video data in the synthesizing circuit 17, whilst the audio signal is fed to the speaker 8.

The MPEG2 decoder 45, consisting of a DSP and a frame memory etc., receives video data from the separating circuit 44 so as to perform expanding process on the video data in accordance with MPEG-2 method. The background video signals restored through the expanding process are converted into analogue video signals, and finally fed to the monitor 9 through the synthesizing circuit 17.

Referring again to FIG. 3, the hard disc 13 is also adapted to receive newly added and/or renewed data, in particular to store or maintain audio data of 1000 melodies requested by customers. When a melody stored in the hard disc 13 is requested by a customer, the controller 41, by using the music data of the hard disc 13, can immediately effect a desired tuning to a background video data transmitting channel. In this way, the terminal 40 can perform a quick sing-along service by providing a melody newly requested by a customer.

The operation of the above sing-along data transmitting/receiving system, which is the first embodiment of the present invention, will be described in detail below with reference to FIGS. 1-3, and further with reference to FIG. 4 showing various channels carried by the CATV cable 20 and an example of data flow therethrough.

Referring to FIGS. 1 and 4, at first, the background video data of 80 channels are transmitted with the use of a

frequency band of 625 MHz-750 MHz (FIG. 4), by way of the data server controlling device 31, the video data server 32, the control code adding circuit 30b, the 64QAM modulation circuit 35 and the mixer 38. Thus, there have been established a plurality of channels for transmitting background video data. Therefore, a plurality of background video data, corresponding to a plurality of sing-along melodies, may be simultaneously, repeatedly and continuously transmitted through respective channels. For instance, one background image (image 1) is being transmitted by way of background image data transmitting channel 1, at the same time, another background image (image 2) is being transmitted by way of background image data transmitting channel 2.

Further referring to FIGS. 1 and 4, the melody data of 10 channels including 10000-20000 melodies divided into 10 groups each containing 1000-2000 of melodies, are transmitted with the use of a frequency band of 565 MHz-625 MHz (FIG. 4), by way of the data server controlling device 31, audio data server 32, the control code adding circuit 30c, the 64QAM modulation circuit 37 and the mixer 38. Thus, there have been established a plurality of channels for transmitting music audio data. Therefore, a plurality of audio melody data, corresponding to a plurality of sing-along melodies, may be simultaneously, repeatedly and continuously transmitted through respective audio data transmitting channels. Meanwhile, channel data are continuously transmitted together with respective audio melody data in united form therewith. For instance, melodies 1-1, 1-2, 1-3, . . . of the first group (containing 1000-2000 melodies) are being successively and continuously transmitted by way of audio data transmitting channel 1. At the same time, melodies 2-1, 2-2, 2-3, . . . of the second group (containing 1000-2000 melodies) are being successively and continuously transmitted by way of audio data transmitting channel 2.

In the center 30, all the channels for transmitting sing-along data are set above a frequency of 550 MHz, a plurality of background video data are transmitted through different channels, whilst a plurality of audio melody data together with channel data are transmitted through at least one channel. Thus, the sing-along service can be smoothly provided without causing any troubles (interference) to usual CATV service.

Referring again to FIG. 4, a frequency band of 550 MHz-565 MHz is reserved in order that the reproduced data from the laser disc player 34 (FIG. 2) may be transmitted, using such a frequency band which can form another 10 channels.

In the terminal 40, when a customer designates his desired melodies (for example, melody 1-1 and melody 1-2), it is checked whether his desired melodies have been stored in the hard disc 13. If a desired melody data is existing in the hard disc 13, the melody data will be fed to the music data decoder 14 so that a desired sing-along performance can be started immediately.

If a desired melody is not existing in the hard disc 13, the controller 41 makes an access to the audio channel selecting table 46, so that the channel number (for example, channel 1) of an audio data channel for transmitting a selected melody data may be known in accordance with a melody number (for example, melody 1-1). Then, with the PLL circuit 47 being controlled by the controller 41, the music data being transmitted through channel 1 can be received and monitored by means of the tuner 42, 64QAM modulation circuit 43 and the separating circuit 44. In this way, the

music data of melody 1-1 and channel data can be obtained within 10-20 seconds.

In fact, the music data are fed to the music data decoder 14, whilst the channel data are fed to the controller 41. Thus, the controller 41 operates to control the PLL circuit 47 in accordance with the channel data. Therefore, the desired background video data being transmitted through the background video data transmitting channel are fed to the MPEG2 decoder 45. For example, if the channel data indicates that channel 80 is a channel transmitting the desired background video data, the background video data of channel 80 will be applied to the MPEG2 decoder 45.

Thus, while background image (for example, image 80) is combined with the character data in the synthesizing circuit 17 and then displayed on the monitor 9, the sound of melody 1-1 is produced through the audio signal generating circuit 15 and the speaker 8.

Up to this, a sing-along service producing melody 1-1 can be provided to a customer in the terminal 40.

During the sing-along playing of melody 1-1, the controller 41 will continue to control the PLL circuit 47 and the separating circuit 44, so that the music data of another melody (for example, melody 2-2) and the channel data thereof may be obtained in the same manner with relation to melody 1-1. The music data of melody 2-2 and the channel data thereof are temporarily stopped and stored in the separating circuit 44. Then, as fast as the playing of melody 1-1 is over, the music data of melody 2-2 and channel data thereof are fed to music data decoder 14, so as to select a channel transmitting the background image data corresponding to melody 2-2. In this manner, it is possible to provide a customer with his desired melody (melody 2-2) and the corresponding background image in a shortest time period.

On the other hand, if 80 patterns of background image are found to be insufficient, a request may be fed from the terminal 40 through the up-stream channel to the center 30. Then, the laser disc player 34 reproduces a background video data and music data to be transmitted through a frequency band of 550 MHz-565 MHz (FIG. 4). Therefore, the requested and reproduced data may be transmitted from the center 30 to the terminal 40. However, at the beginning of the data transmitting, starting signals containing channel number information are at first transmitted out through the downstream channel.

FIG. 5 shows a second embodiment of the present invention.

In the second embodiment shown in FIG. 5, a sing-along data center 300 has a transmitting section compatible with satellite communication. The center 300 transmits sing-along data to many sing-along data receiving terminals 401 by means of a communication satellite 200. Further, the sing-along data may be transmitted to terminals 402 located far away, first through the satellite 200 and then through a CATV relay station 301 and a CATV cable 202. In the drawing, a communication line 203 is provided to send customer's request to the center 300 via a host 201.

As can be understood from the above description, according to the present invention, since the background video data transmitting channels and the music data transmitting channels will not be unfavourably affected by the number of sing-along data receiving terminals, it is allowed to establish as many sing-along terminals as needed.

Further, since a sing-along data receiving terminal is allowed to dispense with any audio disc player and video disc player, the terminal can be made more compact than a conventional sing-along terminal. Therefore, such a sing-

along data receiving terminal can be formed by its simple combination into an existing or new CATV system, with only a low cost as compared with a conventional sing-along terminal.

Moreover, with the use of the method and system according to the present invention, it is not necessary to maintain and manage many audio and video data in a sing-along terminal (which is unavoidable in a conventional system), thus simplifying the operation and management of the terminal.

In addition, with the use of the method and system according to the present invention, it is easy to add new melodies to those existing in a audio data server, thereby obtaining a greatly increased amount of music data as compared with a conventional sing-along system.

While the presently preferred embodiments of the this invention have been shown and described above, it is to be understood that these disclosures are for the purpose of illustration and that various changes and modifications may be made without departing from the scope of the invention as set forth in the appended claims.

What is claimed is:

1. A sing-along data transmitting method, comprising: providing a sing-along data center for supplying background video data and music data;

providing a plurality of sing-along data receiving terminals for receiving the background video data and music data fed from the sing-along data center;

continuously transmitting a plurality of background video data by way of a plurality of different channels without receiving a request from a specific data receiving terminal of said plurality of data receiving terminals;

transmitting music data of a plurality of melodies by way of at least one channel; and

transmitting a channel data indicating a channel through which said background video data corresponding to a selected music is being transmitted, said channel data being transmitted together with music data;

wherein the music data contains music melody data and lyrics data, and wherein the music data is repeatedly transmitted.

2. The sing-along data transmitting method according to claim 1, wherein said music data are compressed so as to be transmitted in a sufficiently shortened time period less than real time.

3. A sing-along data transmitting/receiving system, comprising:

a sing-along data center for supplying background video data and music data;

a plurality of sing-along data receiving terminals for receiving the background video data and music data fed from the sing-along data center;

a data communication way for continuously transmitting the background video data and music data from the sing-along data center to the plurality of sing-along data receiving terminals;

wherein the sing-along data center comprises:

a video data supplying means for repeatedly reproducing a plurality of background video data;

a video data transmitting means for continuously transmitting the reproduced background video data by way of respective video data transmitting channels without a specific request from one data terminal of the plurality of data terminals;

a music data supplying means for repeatedly reproducing music data of a plurality of melodies;

a music data transmitting means for transmitting the reproduced music data by way of a predetermined music data transmitting channel;

wherein each of the sing-along data receiving terminals comprises:

an input means for designating a sing-along melody;

a music data receiving means for receiving the music data from the above predetermined music data transmitting channel; and

wherein the system further comprises a channel data producing means for producing channel data indicating a channel through which background video data corresponding to a music is being transmitted,

wherein each of the sing-along data receiving terminals further comprises a video data receiving means for receiving the video data from one of the above video data transmitting channels in accordance with the channel data transmitted together with the music data,

wherein music data contains music melody data and lyrics data, and wherein the music data is repeatedly transmitted.

4. A sing-along data transmitting/receiving system according to claim 3,

wherein the music data transmitting means is provided to transmit reproduced music data together with the produced respective channel data, and the music data receiving means is provided to extract music data of a sing-along melody designated by said input means and to extract channel data corresponding to the designated sing-along melody; and

wherein the video data receiving means receives the video data from one of the video data transmitting channels, in accordance with the extracted channel data.

5. A sing-along data receiving system, adapted to receive background video data continuously transmitted through a plurality of video data transmitting channels without receiving a request from a specific data receiving terminal, to receive music data of a plurality of melodies by way of at least one music data transmitting channel, to receive a channel data indicating a channel through which said background video data corresponding to a selected music is being transmitted, said sing-along data receiving terminal comprises:

an input means for designating a sing-along melody;

a music data receiving means for selecting a music data transmitting channel to receive music data of a sing-along melody designated by the input means and channel data corresponding to the sing-along melody, so as to output the sing-along melody; and

a video data receiving means for selecting one of the video data transmitting channels in accordance with channel data received by the above music data receiving means, so as to receive the background video data, thereby outputting the background image,

wherein said channel data is transmitted together with said music data;

wherein said music data contains music melody data and lyrics data, and wherein the music data is repeatedly transmitted.

* * * * *



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/755,629	01/05/2001	Ron Goodman	17002020800	3004

20350 7590 09/19/2002
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EXAMINER

WITKOWSKI, STANLEY J

ART UNIT PAPER NUMBER

2837

DATE MAILED: 09/19/2002

Please find below and/or attached an Office communication concerning this application or proceeding.



UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
 Address: COMMISSIONER OF PATENTS AND TRADEMARKS
 Washington, D.C. 20231

09/755629

APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.
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EXAMINER

ART UNIT	PAPER NUMBER
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7

DATE MAILED:

NOTICE OF ABANDONMENT

This application is abandoned in view of:

- Applicant's failure to timely file a proper response to the Office letter mailed on 2-19-02.
 - A response (with a Certificate of Mailing or Transmission of _____) was received on _____, which is after the expiration of the period for response (including a total extension of time of _____ month(s)) which expired on _____.
 - A proposed response was received on _____, but it does not constitute a proper response to the final rejection.

(A proper response to a final rejection consists only of: a timely filed amendment which places the application in condition for allowance; a Notice of Appeal; or the filing of a continuing application under 37 CFR 1.62 (FWC).
- No response has been received.
- Applicant's failure to timely pay the required issue fee within the statutory period of three months from the mailing date of the Notice of Allowance.
 - The issue fee (with a Certificate of Mailing or Transmission of _____) was received on _____.
 - The submitted issue fee of \$_____ is insufficient. The issue fee required by 37 CFR 1.18 is \$_____.
 - The issue fee has not been received.
- Applicant's failure to timely file new formal drawings as required in the Notice of Allowability.
 - Proposed new formal drawings (with a Certificate of Mailing or Transmission of _____) were received on _____.
 - The proposed new formal drawings filed _____ are not acceptable.
 - No proposed new formal drawings have been received.
- The express abandonment under 37 CFR 1.62(g) in favor of the FWC application filed on _____.
- The letter of express abandonment which is signed by the attorney or agent of record, the assignee of the entire interest, or all of the applicants.
- The letter of express abandonment which is signed by an attorney or agent (acting in a representative capacity under 37 CFR 1.34(a) upon the filing of a continuing application.
- The decision by the Board of Patent Appeals and Interferences rendered on _____ and because the period for seeking court review of the decision has expired and there are no allowed claims.
- The reason(s) below:

Stanley Wilkowski
 Primary Examiner

If * the amendment is filed in the Office prior to the mailing * of the notice of allowance, but is received by the examiner after the mailing of the notice of allowance, it **>may also not be approved for entry. If the amendment is a supplemental reply filed when action is not suspended, such an amendment will not be approved for entry because supplemental replies are not entered as matter of right. See 37 CFR 1.111(a)(2) and MPEP § 714.03(a). If the amendment is a preliminary amendment, such an amendment may be disapproved under 37 CFR 1.115(b). See MPEP § 714.01(e). If the amendment is approved for entry, the examiner may enter the amendment and provide a supplemental notice of allowance, or withdraw the application from issue and provide an Office action.<

**>The< application will not be withdrawn from issue for the entry of an amendment that would reopen the prosecution if the Office action next preceding the notice of allowance closed the application to further amendment, i.e., by indicating the patentability of all of the claims, or by allowing some and finally rejecting the remainder.

After an applicant has been notified that the claims are all allowable, further prosecution of the merits of the application is a matter of grace and not of right. *Ex parte Quayle*, 25 USPQ 74, 1935 C.D. 11, 453 O.G. 213 (Comm'r Pat. 1935).

714.16 Amendment After Notice of Allowance, 37 CFR 1.312 [R-3]

37 CFR 1.312. Amendments after allowance.

No amendment may be made as a matter of right in an application after the mailing of the notice of allowance. Any amendment filed pursuant to this section must be filed before or with the payment of the issue fee, and may be entered on the recommendation of the primary examiner, approved by the Director, without withdrawing the application from issue.

The amendment of an application by applicant after allowance falls within the guidelines of 37 CFR 1.312. Further, the amendment of an application broadly encompasses any change in the file record of the application. Accordingly, the following are examples of "amendments" by applicant after allowance which must comply with 37 CFR 1.312:

- (A) an amendment to the specification,
- (B) a change in the drawings,
- (C) an amendment to the claims,
- (D) a change in the inventorship,

(E) the submission of prior art,

>

(F) a petition to correct the spelling of an inventor's name,

(G) a petition to change the order of the names of the inventors,< etc.

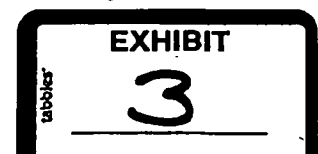
Finally, it is pointed out that an amendment under 37 CFR 1.312 must be filed on or before the date the issue fee is paid, except where the amendment is required by the Office of Patent Publication, see MPEP § 714.16(d), subsection III. An amendment under 37 CFR 1.312 must comply with the provisions of 37 CFR 1.121. >If the amendment is non-compliant under 37 CFR 1.121 and the entry of the amendment would have been otherwise recommended, the examiner may enter the amendment and correct the non-compliance (e.g., an incorrect status identifier) using an examiner's amendment. See MPEP § 714.<

The Director has delegated the approval of recommendations under 37 CFR 1.312 to the supervisory patent examiners.

With the exception of a supplemental oath or declaration submitted in a reissue, a supplemental oath or declaration is not treated as an amendment under 37 CFR 1.312. See MPEP § 603.01. A supplemental reissue oath or declaration is treated as an amendment under 37 CFR 1.312 because the correction of the patent which it provides is an amendment of the patent, even though no amendment is physically entered into the specification or claim(s). Thus, for a reissue oath or declaration submitted after allowance to be entered, the reissue applicant must comply with 37 CFR 1.312 in the manner set forth in this section.

After the Notice of Allowance has been mailed, the application is technically no longer under the jurisdiction of the primary examiner. He or she can, however, make examiner's amendments (see MPEP § 1302.04) and has authority to enter amendments submitted after Notice of Allowance of an application which embody merely the correction of formal matters in the specification or drawing, or formal matters in a claim without changing the scope thereof, or the cancellation of claims from the application, without forwarding to the supervisory patent examiner for approval.

Amendments other than those which merely embody the correction of formal matters without changing the scope of the claims require approval by the supervisory patent examiner. The Technology



Center (TC) Director establishes TC policy with respect to the treatment of amendments directed to trivial informalities which seldom affect significantly the vital formal requirements of any patent, namely, (A) that its disclosure be adequately clear, and (B) that any invention present be defined with sufficient clarity to form an adequate basis for an enforceable contract.

Consideration of an amendment under 37 CFR 1.312 cannot be demanded as a matter of right. Prosecution of an application should be conducted before, and thus be complete *including editorial revision of the specification and claims* at the time of the Notice of Allowance. However, where amendments of the type noted are shown (A) to be needed for proper disclosure or protection of the invention, and (B) to require no substantial amount of additional work on the part of the Office, they may be considered and, if proper, entry may be recommended by the primary examiner.

The requirements of 37 CFR 1.111(c) (MPEP § 714.02) with respect to pointing out the patentable novelty of any claim sought to be added or amended, apply in the case of an amendment under 37 CFR 1.312, as in ordinary amendments. See MPEP § 713.04 and § 713.10 regarding interviews. As to amendments affecting the disclosure, the scope of any claim, or that add a claim, the remarks accompanying the amendment must fully and clearly state the reasons on which reliance is placed to show:

- (A) why the amendment is needed;
- (B) why the proposed amended or new claims require no additional search or examination;
- (C) why the claims are patentable; and
- (D) why they were not presented earlier.

I. NOT TO BE USED FOR CONTINUED PROSECUTION

37 CFR 1.312 was never intended to provide a way for the continued prosecution of an application after it has been passed for issue. When the recommendation is against entry, a detailed statement of reasons is not necessary in support of such recommendation. The simple statement that the proposed claim is not obviously allowable and briefly the reason why is usually adequate. Where appropriate, any one of the following reasons is considered sufficient:

- (A) an additional search is required;
- (B) more than a cursory review of the record is necessary; or
- (C) the amendment would involve materially added work on the part of the Office, e.g., checking excessive editorial changes in the specification or claims.

Where claims added by amendment under 37 CFR 1.312 are all of the form of dependent claims, some of the usual reasons for nonentry are less likely to apply although questions of new matter, sufficiency of disclosure, or undue multiplicity of claims could arise.

See MPEP § 607 and § 714.16(c) for additional fee requirements.

II. AMENDMENTS FILED AFTER PAYMENT OF ISSUE FEE

No amendments should be filed after the date the issue fee has been paid.

¶ 13.10 Amendment Filed After the Payment of Issue Fee, Not Entered

Applicant's amendment filed on [1] will not be entered because the amendment was filed after the issue fee was paid. 37 CFR 1.312 no longer permits filing an amendment after the date the issue fee has been paid.

Examiner Note:

1. Use this paragraph with form PTOL-90 or PTO-90C.
2. In bracket 1, insert the date of the amendment.

714.16(a) Amendments Under 37 CFR 1.312, Copied Patent Claims [R-3]

See MPEP *Chapter 2300< for the procedure to be followed when an amendment is received after notice of allowance which includes one or more claims copied or substantially copied from a patent.

The entry of the copied patent claims is not a matter of right. See MPEP § 714.19.

See MPEP § 607 and § 714.16(c) for additional fee requirements.

714.16(b) Amendments Under 37 CFR 1.312 Filed With a Motion Under 37 CFR *41.208< [R-3]

Where an amendment filed with a motion under 37 CFR *41.208(c)(2)< applies to an application in

issue, the amendment is not entered unless and until the motion has been granted.

714.16(c) Amendments Under 37 CFR 1.312, Additional Claims

If the amendment under 37 CFR 1.312 adds claims (total and independent) in excess of the number previously paid for, additional fees are required. The amendment is *not* considered by the examiner unless accompanied by the full fee required. See MPEP § 607 and 35 U.S.C. 41.

714.16(d) Amendments Under 37 CFR 1.312, Handling [R-3]

I. AMENDMENTS AFFECTING THE DISCLOSURE OF THE SPECIFICATION, ADDING CLAIMS, OR CHANGING THE SCOPE OF ANY CLAIM

Amendments under 37 CFR 1.312 are sent by the Office of Initial Patent Examination (OIPE) to the Publishing Division which, in turn, forwards, for non-Image File Wrapper applications (non-IFW), the proposed amendment, file, and drawing (if any) to the Technology Center (TC) which allowed the application. For IFW applications, amendments under 37 CFR 1.312 must be sent to the Office of Initial Patent Examination (OIPE) Central Scanning. OIPE Central Scanning will scan the amendments. Upon upload of the images, OIPE Central Scanning will message the Office of Patent Publication (PUBS). PUBS will review the messages and forward the messages to the Technology Center (TC), which allowed the application. Once the TC completes the action, the TC will message PUBS that issue processing can resume. If an amendment under 37 CFR 1.312 has been filed directly with the TC, the paper will be forwarded to the OIPE Central Scanning.

Hand delivered amendments under 37 CFR 1.312 are no longer accepted in the TC. Hand delivered amendments (unless specifically required by PUBS, see subsection III. below) may only be delivered to the Customer Window located at:

U.S. Patent and Trademark Office
 **>Customer Service Window
 Randolph Building
 401 Dulany Street
 Alexandria, VA 22314<

In the event that the class and subclass in which the application is classified has been transferred to another TC after the application was allowed, the proposed amendment, file and drawing (if any) are transmitted directly to said other TC and the Publishing Division notified. If the examiner who allowed the application is still employed in the U.S. Patent and Trademark Office but not in said other TC, he or she may be consulted about the propriety of the proposed amendment and given credit for any time spent in giving it consideration.

The amendment is PROMPTLY considered by the examiner who indicates whether or not its entry is recommended by writing "Enter — 312," "Do Not Enter" or "Enter In Part" thereon in red ink in the upper left corner. For IFW processing, **>the examiner should print the first page of the amendment and write either "Enter – 312" or "Do Not Enter" in the upper left corner, and have the page scanned into IFW with the appropriate document code.<

In addition, the amendment must comply with the provisions of 37 CFR 1.121. >See MPEP § 714.<

If the amendment is favorably considered, it is entered and a Response to Rule 312 Communication (PTO-271) is prepared. The primary examiner indicates his or her recommendation by stamping and signing his or her name on the PTO-271. Form paragraph 7.85 may also be used to indicate entry.

¶ 7.85 Amendment Under 37 CFR 1.312 Entered

The amendment filed on [I] under 37 CFR 1.312 has been entered.

Examiner Note:

Use this form paragraph both for amendments under 37 CFR 1.312 that do not affect the scope of the claims (may be signed by primary examiner) and for amendments being entered under 37 CFR 1.312 which do affect the scope of the claims (requires signature of supervisory patent examiner). See MPEP § 714.16.

If the examiner's recommendation is completely adverse, a report giving the reasons for nonentry is typed on the Response to Rule 312 Communication form PTO-271 and signed by the primary examiner.

Form paragraph 7.87 may also be used to indicate nonentry.

¶ 7.87 Amendment Under 37 CFR 1.312 Not Entered

The proposed amendment filed on [1] under 37 CFR 1.312 has not been entered. [2]

Examiner Note:

The reasons for non-entry should be specified in bracket 2:

-- The amendment changes the scope of the claims.--; or

-- The amendment was filed in a reissue application and was not accompanied by a supplemental reissue oath or declaration, 37 CFR 1.175(b). --

In either case, whether the amendment is entered or not entered, the file, drawing, and unmailed notices are forwarded to the supervisory patent examiner for consideration, approval, and mailing.

For entry-in-part, see MPEP § 714.16(e).

The filling out of the appropriate form by the technical support staff does not signify that the amendment has been admitted; for, though actually entered it is not officially admitted unless and until approved by the supervisory patent examiner.

See MPEP § 607 and § 714.16(c) for additional fee requirements.

II. AMENDMENTS WHICH EMBODY MERELY THE CORRECTION OF FORMAL MATTERS IN THE SPECIFICATION, FORMAL CHANGES IN A CLAIM WITHOUT CHANGING THE SCOPE THEREOF, OR THE CANCELLATION OF CLAIMS

The examiner indicates approval of amendments concerning merely formal matters by writing "Enter Formal Matters Only" thereon. Such amendments do not require submission to the supervisory patent examiner prior to entry. See MPEP § 714.16. The Response to Rule 312 Communication form PTO-271 is date stamped and mailed by the TC. If such amendments are disapproved either in whole or in part, they require the signature of the supervisory patent examiner. **>IFW processing is substantially the same, with the first page of the amendment being printed, the examiner writing "Enter" and the page being scanned into IFW with the appropriate document code.<

III. AMENDMENTS REQUIRED BY THE OFFICE OF PATENT PUBLICATION

In preparation of a patent for issuance as a patent grant, if the Office of Patent Publication (PUBS) discovers an error in the text, or drawings of a patent application, including any missing text, or an inconsistency between the drawings and the application papers, PUBS may require an appropriate amendment to the specification or drawings. 37 CFR 1.312, however, does not permit an amendment after the payment of the issue fee without withdrawal of the application from issue. In order to be able to accept such an amendment as may be required without having to withdraw an application from issue, effective February 24, 2004, PUBS has been delegated the authority to waive the requirement of 37 CFR 1.312 and accept an amendment filed after the payment of the issue fee. Furthermore, these amendments required by PUBS may be hand delivered to PUBS located at:

Office of Patent Publication
 **>South Tower Building
 2900 Crystal Drive, Room 8A24<
 Arlington, VA 22202

Applicants may also fax these amendments required by PUBS to (703) 746-4000.

714.16(e) Amendments Under 37 CFR 1.312, Entry in Part [R-3]

The general rule that an amendment cannot be entered in part and refused in part should not be relaxed, but when, under 37 CFR 1.312, an amendment, for example, is proposed containing a plurality of claims or amendments to claims, some of which may be entered and some not, the acceptable claims or amendments should be entered in the application >if the application is a paper file<. If necessary, the claims should be renumbered to run consecutively with the claims already in the case. The refused claims or amendments should be canceled in lead pencil on the amendment. For Image File Wrapper (IFW) processing, see IFW Manual.

The examiner should then submit a Response to Rule 312 Communication form PTO-271 recommending the entry of the acceptable portion of the amendment and the nonentry of the remaining portion together with his or her reasons therefor. The claims

entered should be indicated by number in this response. Applicant may also be notified by using form paragraph 7.86.

¶ 7.86 Amendment Under 37 CFR 1.312 Entered in Part

The amendment filed on [1] under 37 CFR 1.312 has been entered-in-part. [2]

Examiner Note:

When an amendment under 37 CFR 1.312 is proposed containing plural changes, some of which may be acceptable and some not, the acceptable changes should be entered. An indication of which changes have and have not been entered with appropriate explanation should follow in bracket 2.

Handling is similar to complete entry of a 37 CFR 1.312 amendment.

Entry in part is not recommended unless the full additional fee required, if any, accompanies the amendment. See MPEP § 607 and § 714.16(c).

714.17 Amendment Filed After the Period for Reply Has Expired [R-3]

When an application is not prosecuted within the period set for reply and thereafter an amendment is filed without a petition for extension of time and fee pursuant to 37 CFR 1.136(a), such amendment shall be ******>placed in< the file * of the application, but not formally entered. The technical support staff shall immediately notify the applicant, by telephone and letter, that the amendment was not filed within the time period and therefore cannot be entered and that the application is abandoned unless a petition for extension of time and the appropriate fee are timely filed. See MPEP § 711.02. ******

See MPEP § 710.02(e) for a discussion of the requirements of 37 CFR 1.136(a).

714.18 Entry of Amendments [R-3]

Amendments >in paper files< are stamped with the date of their receipt in the Technology Center (TC). It is important to observe the distinction which exists between the stamp which shows the date of receipt of the amendment in the TC ("Technology Center Date" stamp) and the stamp bearing the date of receipt of the amendment by the Office ("Office Date" stamp). The latter date, placed in the left-hand corner, should

always be referred to in writing to the applicant with regard to his or her amendment. ******

All amendments received in the technical support staff sections are processed and with the applications delivered to the supervisory patent examiner for his or her review and distribution to the examiners.

Every mail delivery should be carefully screened to remove all amendments replying to a final action in which a time period is running against the applicant. Such amendments should be processed within the next 24 hours.

The purpose of this procedure is to ensure uniform and prompt treatment by the examiners of all applications where the applicant is awaiting a reply to a proposed amendment after final action. By having all of these applications pass over the supervisory patent examiner's desk, he or she will be made aware of the need for any special treatment, if the situation so warrants. For example, the supervisory patent examiner will know whether or not the examiner in each application is on extended leave or otherwise incapable of moving the application within the required time periods (see MPEP § 714.13). In cases of this type, the applicant should receive an Office communication in sufficient time to adequately consider his or her next action if the application is not allowed. Consequently, technical support staff handling will continue to be special when these applications are returned by the examiners to the technical support staff.

Evaluation of the amendment after final rejection for compliance with 37 CFR 1.121 should be left to the examiner, and not treated by the technical support staff before forwarding the amendment to the examiner. If the examiner determines that the proposed amendment is not in compliance with 37 CFR 1.121, the examiner should notify applicant of this fact and attach a Notice of Non-Compliant Amendment to the advisory action. >See MPEP § 714.<

The amendment or letter is placed in the file, given its number as a paper in the application, and its character endorsed on the file wrapper in red ink. For IFW processing, ******>amendments are entered as papers into the IFW.<

When several amendments are made in an application on the same day no particular order as to the hour of the receipt or the mailing of the amendments can be assumed, but consideration of the application must be



US006928433B2

(12) **United States Patent**
Goodman et al.

(10) **Patent No.:** US 6,928,433 B2
(45) **Date of Patent:** Aug. 9, 2005

(54) **AUTOMATIC HIERARCHICAL CATEGORIZATION OF MUSIC BY METADATA**

6,248,946 B1 * 6/2001 Dwek 84/609
6,377,530 B1 4/2002 Burrows
2003/0016940 A1 * 1/2003 Robbins 386/46

(75) **Inventors:** Ron Goodman, Santa Cruz, CA (US);
Howard N. Egan, Capitola, CA (US)

(73) **Assignee:** Creative Technology LTD, Singapore (SG)

(*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 323 days.

(21) **Appl. No.:** 09/755,723

(22) **Filed:** Jan. 5, 2001

(65) **Prior Publication Data**

US 2002/0147728 A1 Oct. 10, 2002

(51) **Int. Cl. 7** G06F 17/30

(52) **U.S. Cl.** 707/4; 707/3; 707/102;
386/46

(58) **Field of Search** 84/609, 601, 602,
84/611-614; 707/104.1, 3, 4, 102; 386/46

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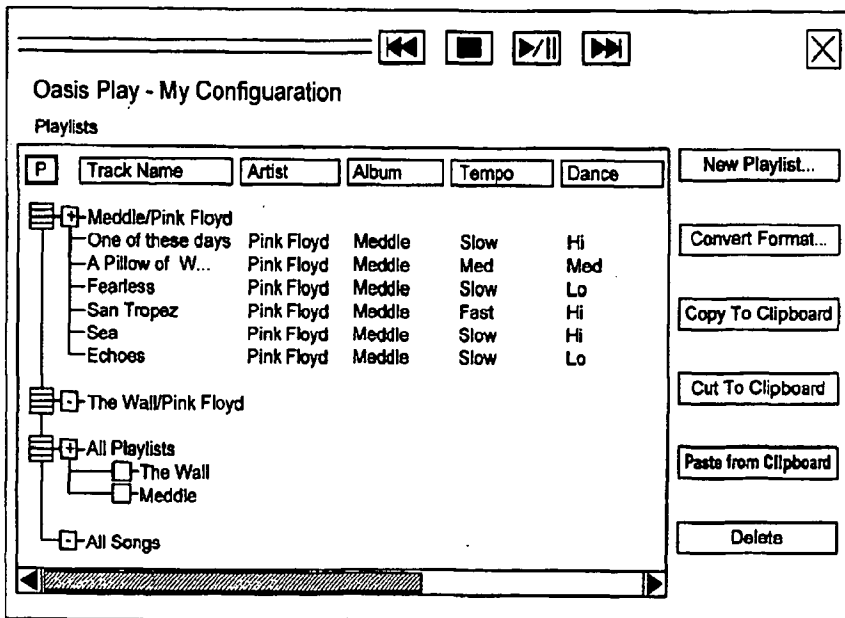
Primary Examiner—Charles Rones

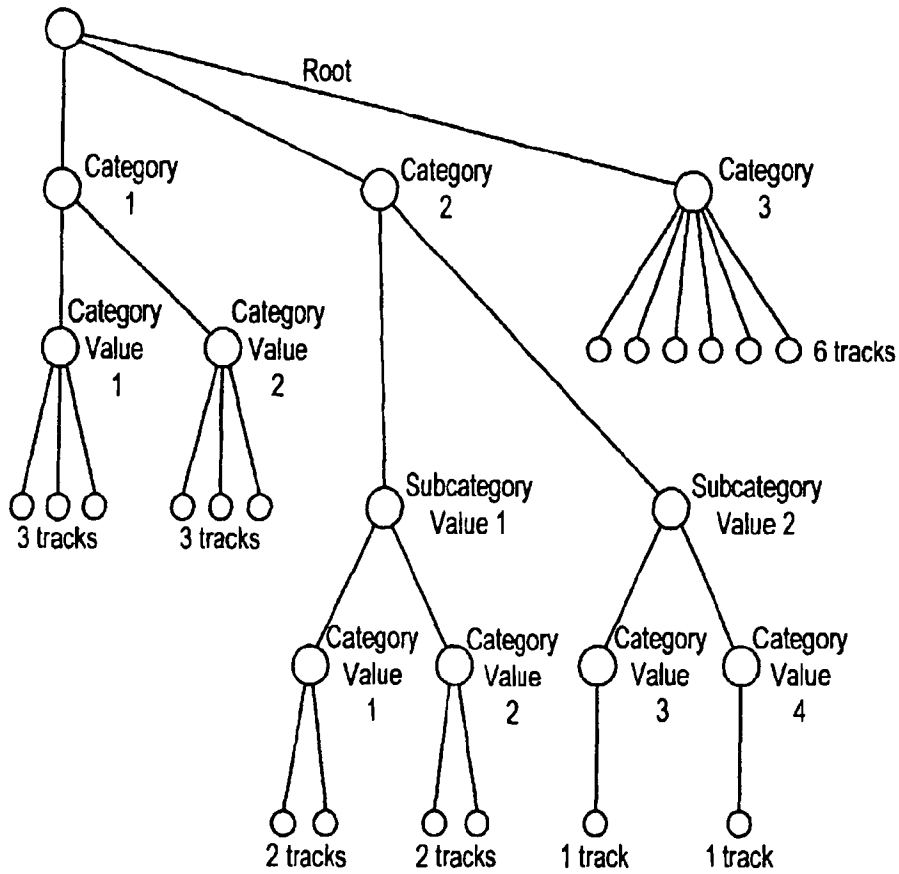
(74) **Attorney, Agent, or Firm**—Russell N. Swerdon; Creative Technology LTD

(57) **ABSTRACT**

A method, performed by software executing on the processor of a portable music playback device, that automatically files tracks according to hierarchical structure of categories to organize tracks in a logical order. A user interface is utilized to change the hierarchy, view track names, and select tracks for playback or other operations.

16 Claims, 12 Drawing Sheets





For example:

Category 1 = Album Name
Category Value 1 = Abbey Road
Category Value 2 = Hits from the 60's

Category 2 = Artist Name
Subcategory Value 1 = British Artists
Subcategory Value 2 = American Artists
Category Value 1 = The Beatles
Category Value 2 = Petula Clark
Category Value 3 = Mamas and the Papas
Category Value 4 = Nick Drake

Category 3 = All tracks

FIG. 1.

V1.0
Albums|0x01|BLBN
Artists|0x01|BCBMBN
All Tracks|0x01|BN

FIG. 2.

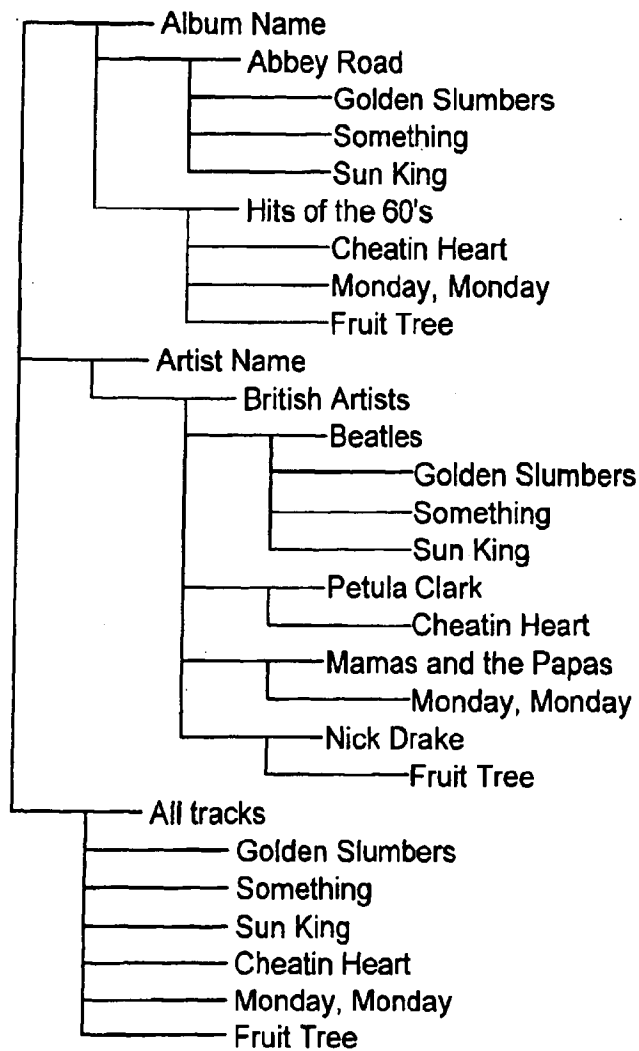


FIG. 3.

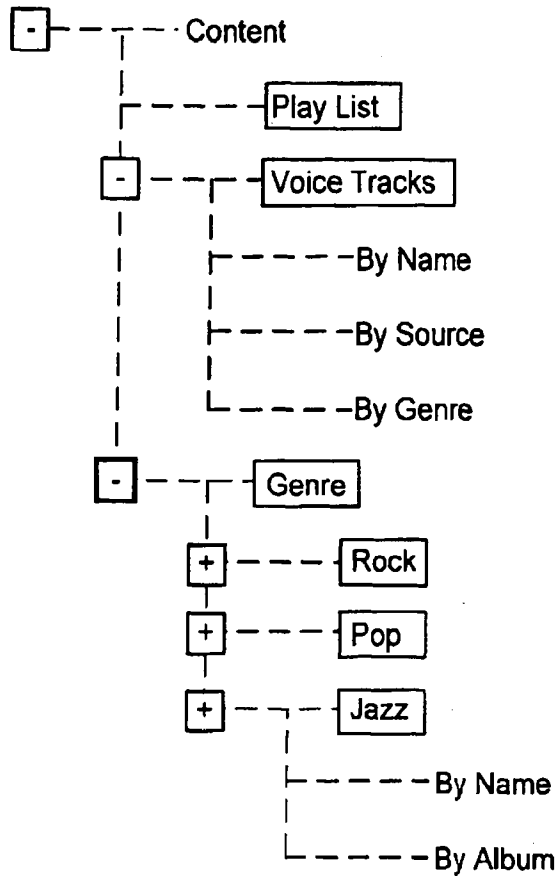


FIG. 4.

file data	album	name	genre	type
-----------	-------	------	-------	------

FIG. 5.

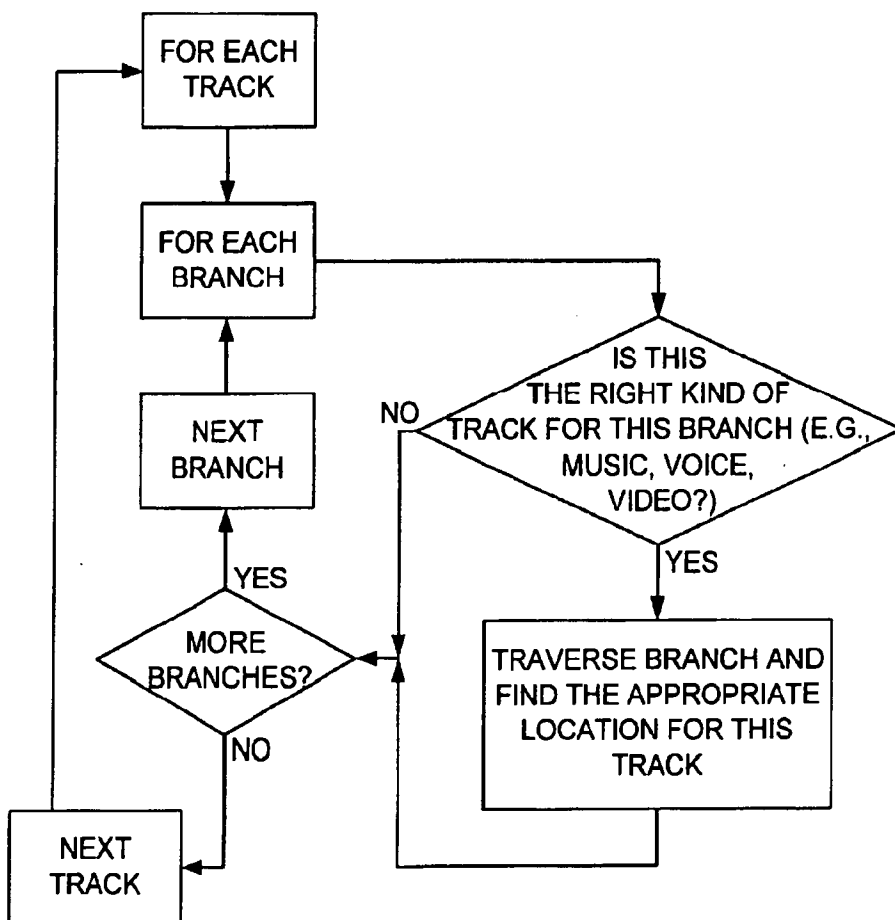


FIG. 6.

Albums	Full Moon Fever	Free Falling I Won't Back Down Love Is A Long Road The Boy In The Bubble Graceland	
	Graceland		
	Hotel California	Hotel California New Kid In Town	
	Unknown (Created for Items without Album attributes)	Track 1	
	Stardust		
Artist	Tom Petty	Full Moon Fever	Free Falling I Won't Back Down Love Is A Long Road
	Eagles	Hotel California	Hotel California New Kid In Town
	Paul Simon	Graceland	The Boy In The Bubble Graceland
Genre	Rock	Full Moon Fever	Free Falling I Won't Back Down Love Is A Long Road
		Hotel California	Hotel California New Kid In Town
		Graceland	The Boy In The Bubble Graceland

FIG. 7.

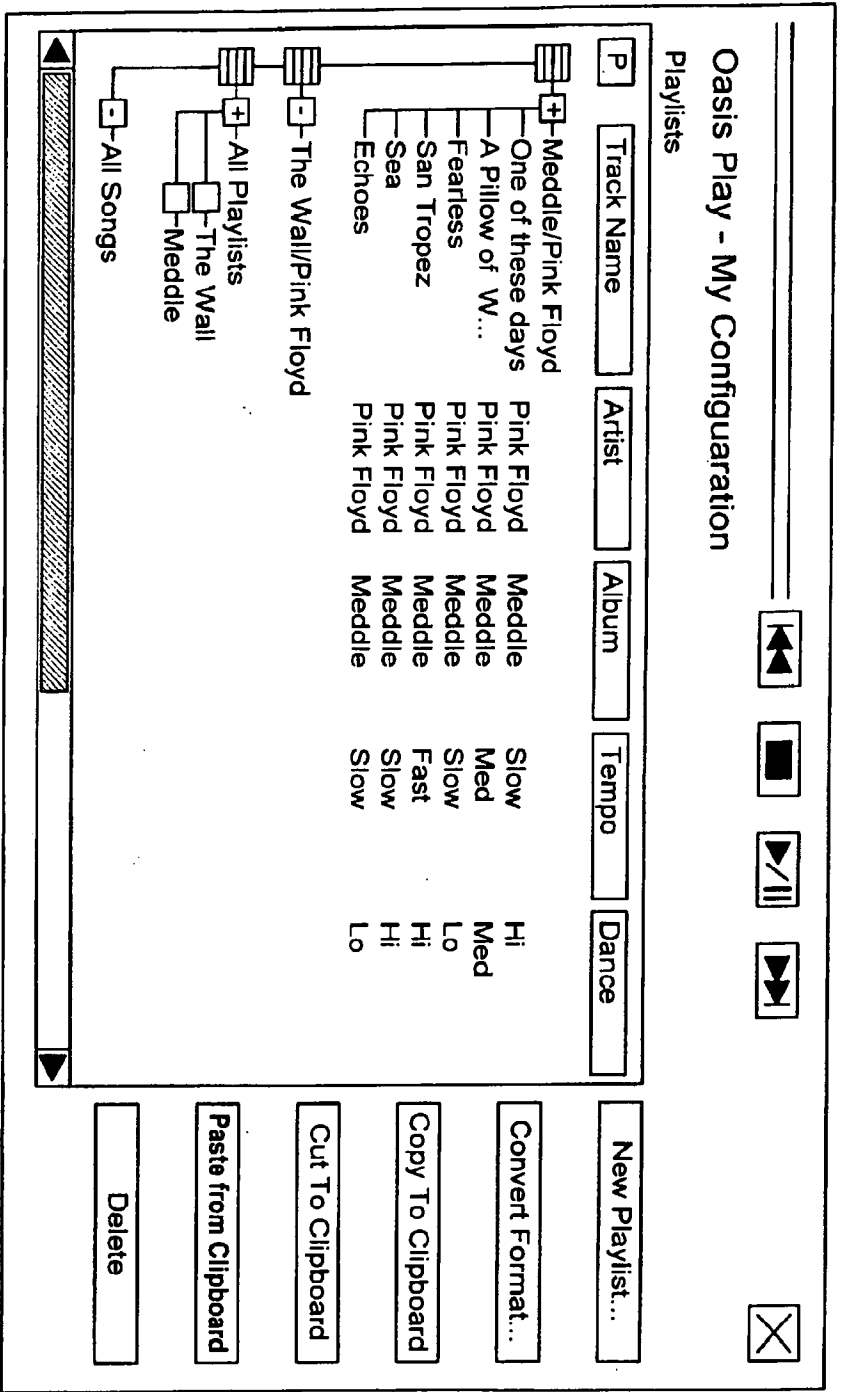


FIG. 8.

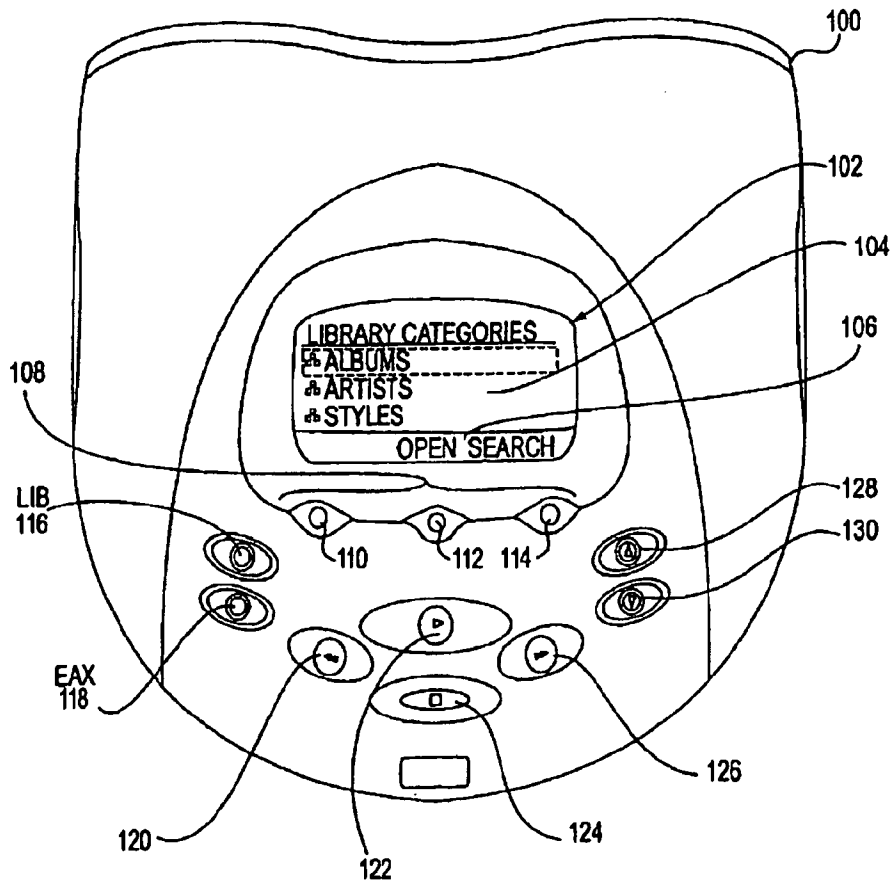


FIG. 9

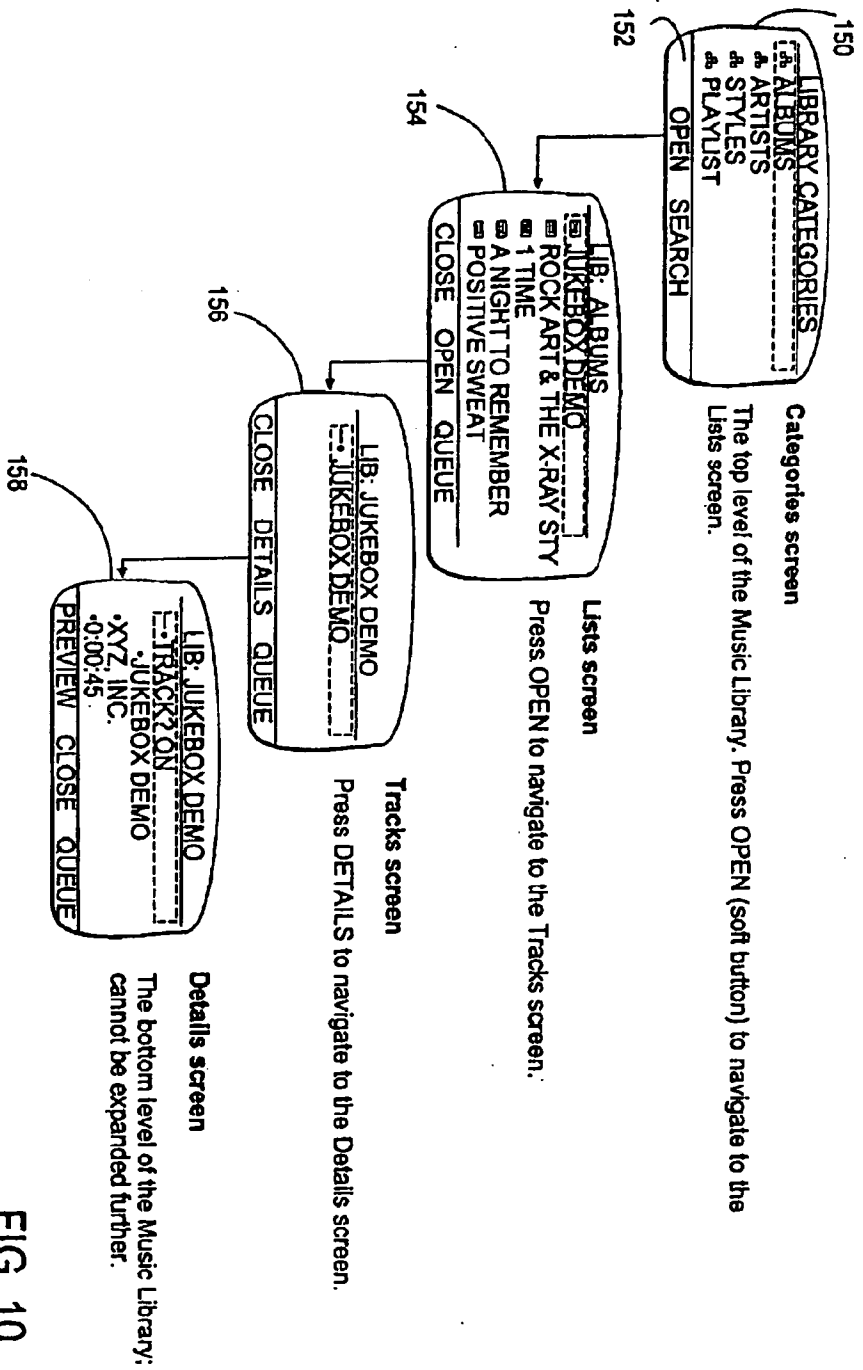


FIG. 10

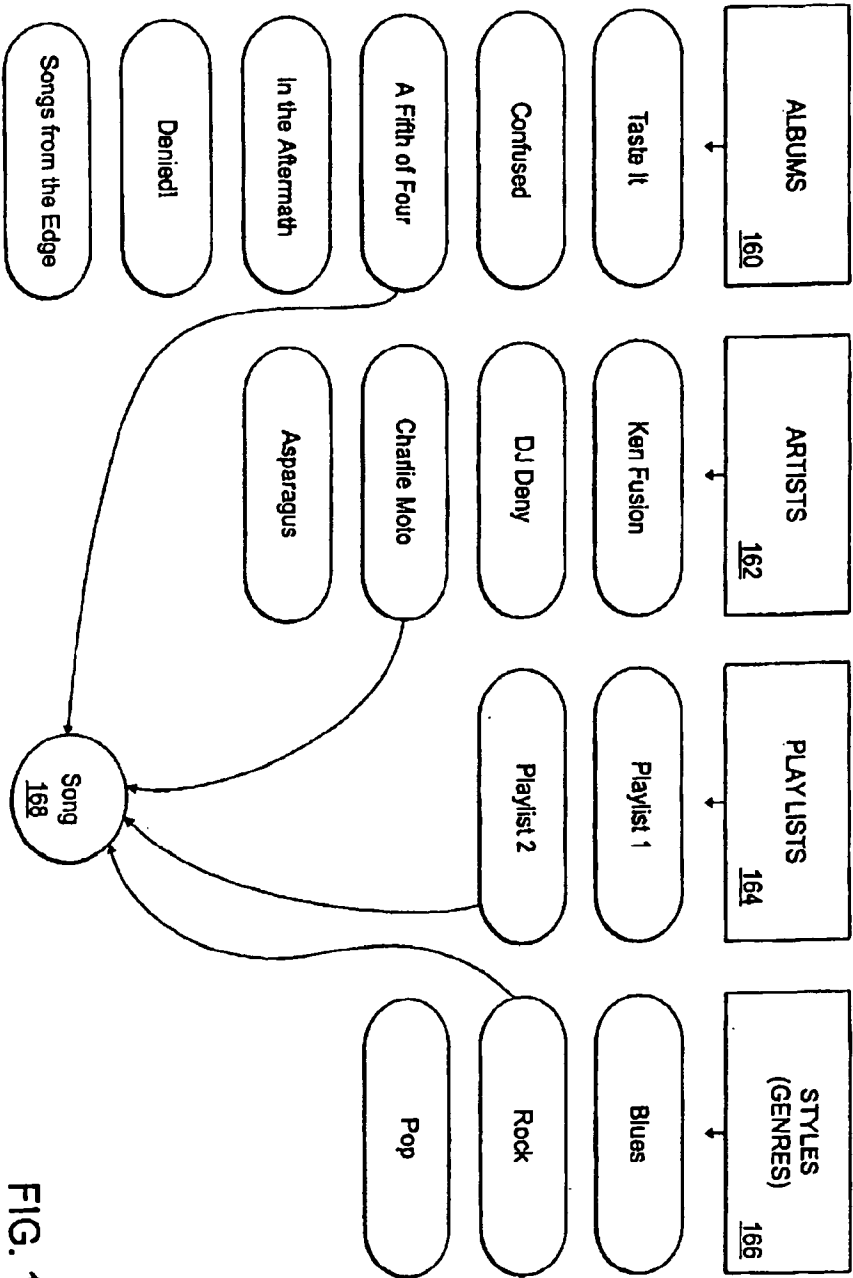


FIG. 11

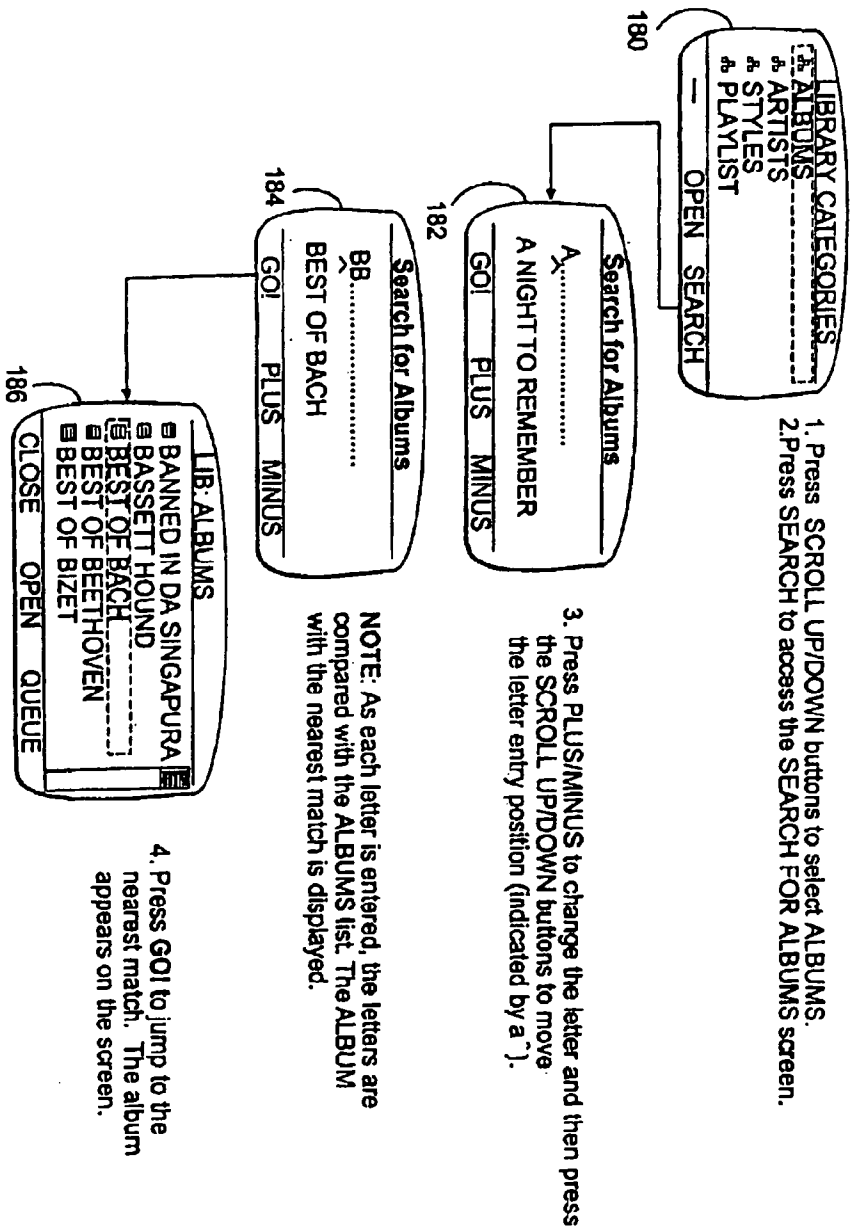
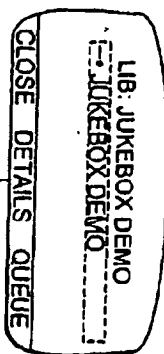


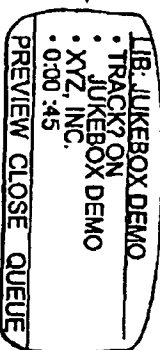
FIG. 12

View DETAILS accessed from the TRACKS screen:

1. Press DETAILS. The DETAILS screen displays the Track Order, Album, Artist, and duration of the track.

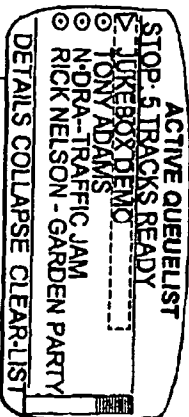


2. Press CLOSE to return to the TRACKS screen.



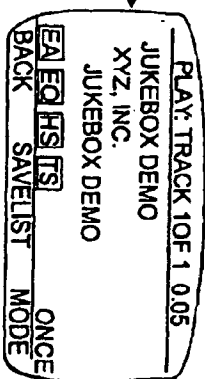
Viewing DETAILS accessed from the ACTIVE QUEUE LIST screen:

1. Press DETAILS. The DETAILS screen displays the Track Title, Artist, Album together with Audio Playback settings (see note below) and Play Mode (see "Setting Play Mode" on page 16).



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2. Press BACK to return to the ACTIVE QUEUE LIST screen.



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FIG. 13

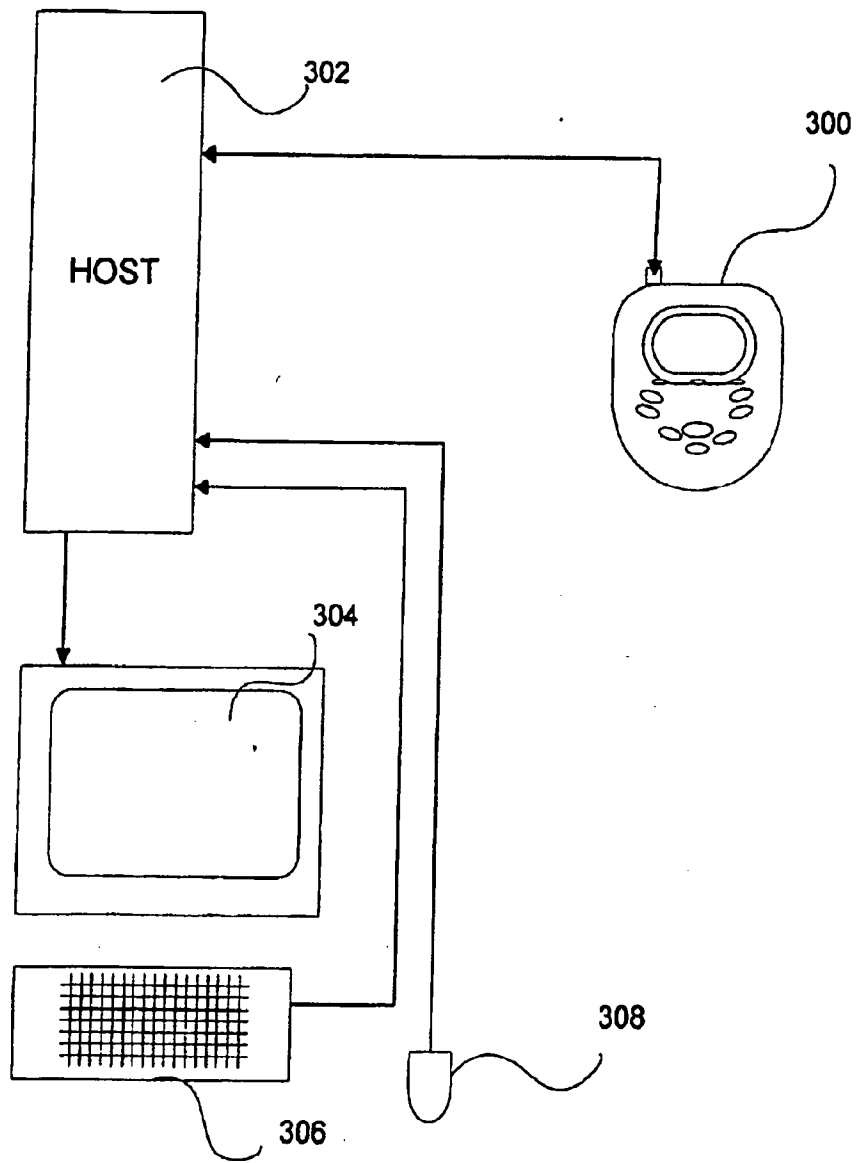


FIG. 14

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**AUTOMATIC HIERARCHICAL
CATEGORIZATION OF MUSIC BY
METADATA**

**CROSS-REFERENCES TO RELATED
APPLICATIONS**

This application is related to Application Ser. No. 09/755,629, entitled "System for Selecting and Playing Songs in a Playback Device with a Limited User Interface," now abandoned and Application Ser. No. 09/755,367, entitled "Audioplayback Device with Power Savings Storage Access Mode," issued as U.S. Pat. No. 6,590,730, all filed Jan. 5, 2001, the disclosures of which are incorporated herein by reference.

BACKGROUND OF THE INVENTION

Today, portable consumer electronic devices are more powerful than ever. For example, small, portable music playback devices can store hundreds, even thousands, of compressed songs and can play back the songs at high quality. With the capacity for so many songs, a playback device can store many songs from different albums, artists, styles of music, etc.

Music jukeboxes implemented in software executed by a digital computer and portable MP3 and CD players both provide facilities for forming playlists. For example, the OZIC player, distributed by the assignee of the present application, runs on a host PC and has a playlist feature that allows selection of tracks from the PC's hard disk to be included in the playlist.

As storage capacity increases and songs are compressed to shorter file lengths the number of songs that can be stored increases rapidly. Major problems facing the consumer are organizing and accessing the tracks.

Typically, portable devices have a user interface including a small screen and buttons. Such a display screen might be, e.g., 1"x2". This small display size is necessary because of the physical size of the device which is typically carried in the hand. The small size also limits the number, size, shape, and types of user input controls that can be mounted on the device. For example, a few pushbuttons are usually provided to perform all of the device's control functions. Using such a compact user interface to navigate and select among hundreds of songs is inefficient and often frustrating. The display screen can only show a few song titles at one time, and the limited controls make it difficult for a user to arbitrarily select, or move among, the songs.

The creation of playlists is one technique to organize the playing of songs. A set of songs can be included in a playlist which is given a name and stored. When the playlist is accessed, the set of songs can be played utilizing various formats such as sequential play or shuffle.

However, the creation of playlists itself becomes problematic as the number of songs increases, since the user often arbitrarily selects songs from a large number of tracks to form a playlist. This selection mechanism can be fairly tedious; does not necessarily produce playlists that are of interest to the user over the course of time; may not remain up-to-date if new songs are added that logically fit into a previously created playlist (e.g. "Favorites by Band X" might become out of date if a new favorite by Band X is added after the playlist was created); and leads to "lost" songs that are not members of any playlist.

Accordingly, improved techniques for organizing and grouping tracks useful in a portable music player are needed.

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Further, it is desirable to provide a user interface suitable for a small device. The user interface should allow a user to efficiently navigate among, and select from, many items stored in the device.

SUMMARY OF THE INVENTION

The present invention provides an efficient user interface for a small portable music player. The invention is suitable for use with a limited display area and small number of controls to allow a user to efficiently and intuitively navigate among, and select, songs to be played. By using the invention, very large numbers of songs can be easily accessed and played.

One aspect of the invention includes an overlapping hierarchy of categories. Categories include items that can also be included in other categories so that the categories "overlap" with each other. Thus, a song title can be accessed in multiple different ways by starting with different categories. For example, a preferred embodiment of the invention uses the top-level categories "Albums", "Artists", "Genres" (or styles), and "Play Lists". Within the Albums category are names of different albums of songs stored in the device. Within each album are the album tracks, or songs, associated with that album. Similarly, the Artists category includes names of artists which are, in turn, associated with their albums and songs. The Genre category includes types of categories of music such as "Rock", "Hip Hop", "Rap", "Easy Listening", etc. Within these sub-categories are found associated songs. Finally, the "Play Lists" category includes collections of albums and/or songs which are typically defined by the user.

Advantageous use is made of the overlapping hierarchy to allow the user to quickly designate a song for playback. The device uses three "soft" pushbuttons that have assignable functions. The interface maintains consistent button functionality whenever possible and uses uniform command names and operations in different types of items so that the interface is more intuitive. For example, the user can open and queue both albums and songs with predictable results.

The interface also provides for multiple functions for a single control. For example, a "Play" button can act, in a first function, to play a currently-selected song. The Play button can act, in a second function, to cycle through different playback modes. The modes can be, e.g., (1) playback of songs from a hard disk; (2) playback of music from a radio receiver built into the device; and (3) playback of voice messages. The first function for the Play button can be activated by momentarily depressing the Play button for a short period of time. The second function is invoked by depressing the Play button for a longer period of time whereupon the device cycles through the different modes. Other ways of invoking the functions are possible such as where the second function is automatically entered from a powered-down state.

In one embodiment, the invention provides a method for selecting songs to be played in an electronic audio device, wherein the device includes a display and one or more user input controls, wherein songs are organized into categories, albums, wherein songs and albums are associated with artist names. The method includes steps of displaying categories on the display; accepting signals from a user input control to select a category; displaying one or more songs in the selected category on the display; accepting signals from a user input control to select a displayed song; and entering selected songs into a playlist queue, wherein the device plays back songs in the playlist queue.

According to one aspect of the present invention, a technique is provided for organizing tracks on a portable music player by automatically filing tracks in a hierarchical order based on attributes of the tracks.

According to another aspect of the invention, metadata is associated with each track that is used to automatically define the track's appropriate place in the hierarchy.

According to another aspect of the invention, the hierarchy is displayed on the portable music player so that a user can traverse the organizational hierarchy to find individual tracks or find playlists composed of logical groups of tracks.

According to another aspect of the invention, the hierarchy is derived by using metadata associated with the audio content that was obtained through any source of metadata (e.g. CDDB metadata, id3v2 metadata, other obtainable metadata) and subsequently stored with or alongside the file that stores the track.

According to another aspect of the invention, a file is formatted so that an unaltered track is stored as file data and information about the track is stored in file attribute files.

Other features and advantages of the invention will be apparent in view of the following detailed description and appended drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic diagram of a tree structure for hierarchical filing of tracks;

FIG. 2 is a definition file that specifies the hierarchy depicted in FIG. 1;

FIG. 3 is a user's view of the hierarchy;

FIG. 4 is a schematic diagram of a user interface displaying the hierarchical category structure;

FIG. 5 is a diagram of a file format for storing filed data and file attributes;

FIG. 6 is a flow chart depicting steps for filing tracks according to the hierarchical tree structure;

FIG. 7 depicts a tree resulting from searching the tracks; and

FIG. 8 depicts a format for a user interface;

FIG. 9 illustrates the NOMAD Jukebox and its user interface controls;

FIG. 10 illustrates a sequence of display screens describing how to navigate to lower levels;

FIG. 11 illustrates associations among items;

FIG. 12 shows display screens used to search for a song or other item;

FIG. 13 illustrates details of different items; and

FIG. 14 illustrates a playback device coupled to a host computer system.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

A preferred embodiment of the invention will now be described in the context of a portable personal player that plays audio files stored in memory. The files may be in MP3, wav, or other digital formats.

In the presently described embodiment, users are able to see the tracks on their player in some organized fashion other than as a single list of tracks. As will be described in more detail below, in one embodiment tracks are sorted utilizing a tree structure having branches labeled according to types of metadata associated with the tracks

For example, a track recorded as "Golden Slumbers" by the Beatles that appears on their album "Hey Jude" might appear as a track under the album "Abbey Road" as well as a track under the list of tracks by the Beatles. It might appear as a track under the genre "Pop Rock" as well as "Songs

from the 60's." Furthermore, the organization can have more complex hierarchies. For example, the category of "Pop Rock" might contain subcategories "British Musicians," "American Musicians" and "Other Musicians". In all cases, the track is automatically filed into all appropriate locations without requiring user interaction.

In the currently defined embodiment, a tree structure is defined by a file having the following structure.

The first line of a TreeDef.inf file contains a version number:

V1.0

Each subsequent line (at least in v1.0) contains lines of the following format:

CATEGORY_NAME|TRACK_TYPE MASK|CATEGORY_STRUCTURE

CATEGORY_NAMES are the top-level names of the branch under which tracks are sorted. They include things like "Album," "Artist," "Voice Tracks," "All Tracks," etc.

TRACK_TYPE_MASKs tell which types of tracks are to be filed under this particular branch. The actual value is a hexadecimal numerical value (in '0X' format, e.g. 0X01) generated by ORing the following flags together as appropriate:

```
enum tTrackType
{
    kTTNothing=0x00,
    kTTSong=0x01,
    kTTVoice=0x02,
    kTTBook=0x04,
    kTTMacro=0x08,
    kTTPlaylist=0x10
};
```

So, for example, the "Album" branch has a TRACK_TYPE_MASK of kTTSong, because only songs are filed under that branch, but the "All Tracks" branch has a TRACK_TYPE_MASK of (kTTSong|kTTVoice|kTTBook).

Other elements might be added to tTrackType (e.g. kTTVideo) as appropriate.

CATEGORY_STRUCTUREs tell how to file the songs based on their metadata information. The CATEGORY_STRUCTURE is a string of characters that tell, from left to right, the order of hierarchy. The characters come from the following enum constants:

```
enum tFileTag
{
    kFTNone="@",
    kFTTrackType="T",
    kFTTitle="N",
    kFTAUDIOFile="F",
    kFTAArtist="M",
    kFTAlbum="L",
    kFTGenre="G",
    kFTSource="S",
    kFTYear="Y",
    kFTAArtistCountry="C"
};
```

Thus, a CATEGORY_STRUCTURE of LN tells to create a subcategory that is a list of Albums, each of which contains a list of Tracks.

In total, a line like:

Album[0x01]LN

Says to create a branch called "Album" which contains tracks of type kITTSong organized first by album name, and then by track name.

The following is an example of a tree definition file similar (though not identical) to the hierarchy presented in the Nomad Jukebox product (the 'B' before each FileTag was used to identify that these are basic tags so that we wouldn't run out of letters in the alphabet as we included more complex metadata—thus each group of two letters represents a level in the hierarchy):

```
V1.0
Album[0x01]BLBN
Artist[0x01]BMBN
Genre[0x01]BGBN
Voice Tracks[0x02]BSBGBN
Playlist[0x10]BN
Macros[0x08]BN
All Tracks[0x07]BN
```

FIG. 1 depicts a hypothetical organization hierarchy. The tree shows how tracks might be listed (as leaves in the tree) after having been organized. Example values for nodes in the tree are shown as well. The same track may appear more than once as a leaf in the tree, as described above, if it fits into multiple categories (e.g. a song that appears on the Abbey Road branch would also appear in the Beatles branch). In the example shown, the first branch contains tracks organized by album. As shown in the example, this music collection contains three tracks from "Abbey Road" and three tracks from "His from the 60's". The second branch contains tracks organized by artist, and sub organized by where the artist is from. Thus, a user browsing would first select the "Artists" branch and then choose between "British Artists" and "American Artists". Finally, they would select the particular artist. In the third branch, all tracks are shown.

The tree definition file that would specify the hierarchy shown in FIG. 1 is shown in FIG. 2.

The first line identifies the version of the tree definition file.

The second line defines the "Albums" branch. The first part of the line, "Albums" defines the name of the branch. The second part, "0x01," defines that all musical tracks should be categorized on this branch. The third part, "BLBN," defines that the branch lists first the names of all albums (BL) and then tracks on those albums (BN).

The third line defines the "Artists" branch. The first part of the line "Artists" defines the name of the branch. The second part, "0x01," defines that all musical tracks should be categorized on this branch. The third part, "BCBMBN," defines that the branch lists first the names of all countries where artists in this collection come from (BC) and under those items, the artists' names (BM), and then tracks by those artists (BN).

FIG. 3 shows what a user's view of this hierarchy might be if he/she were shown a fully expanded view of the 6-song tree. Notice that each song appears three times, once in each branch.

In consumer products the tree define file is not edited directly but through a user interface, one example of which is depicted in FIG. 4. An example of a user interface for viewing songs by category and editing the tree structure is depicted in FIG. 4.

An embodiment of the invention is utilized in the Nomad® Jukebox, manufactured by the assignee of the

present invention, and described more fully in the copending application, filed on the same date as the present application, entitled "System for Selecting and Playing Songs in a Playback Device with a Limited User Interface," (Attny. Docket No. 17002-020800).

In a preferred embodiment, metadata is associated with each track and includes such information as title, genre, artist name, type, etc. In the preferred embodiment, software stored in a portable player and executed by the onboard processor automatically files each track in the correct category utilizing the associated metadata and the tree define file. The program code can be stored in any computer readable medium including magnetic storage, CD ROM, optical media, or digital data encoded on an electromagnetic signal.

Thus, the user is automatically provided with a powerful and flexible tool for organizing and categorizing the tracks stored on the portable player.

If the tracks are formatted in MP3 format the metadata can be stored in ID3 tags included in the MP3 file. In one embodiment of the invention, the tracks are stored in alternate file format including file data and file attributes. The file data is the music track itself and the file attributes part of the file includes fields of arbitrary size which are used to store metadata characterizing the track stored as the file data. Again this metadata includes information about the track such as title, genre, artist name, type, etc.

There are several advantages to using the alternate file format. Metadata of types not easily included in an ID3 tag can be utilized. Further, the original track format is not changed, so that error correction data such as checksums are valid. Finally, any file format can be used (e.g. WAV, WMA, etc.) because the metadata is stored separately, and thus audio formats that have limited support for metadata can still be stored on the portable player in native format without transcoding. The formatted files are formed by software stored in the portable music player and executed by an on-board processor.

The metadata for each track is utilized to file each track, using the categories defined in the hierarchical structure as described above, without any input from the user.

FIG. 5 is a schematic diagram of the alternative file format including file data in the form of an MP3 track, and metadata fields for holding data indicating the name of the album the track is from, the name of the song, the genre of the song, and the type of track.

A particular embodiment of a file format will now be described. All tracks are created with some set of attributes as shown below:

Definition of TrackInfo Data Field			
Field	Offset	Size	Description
Attribute Count	0	2	The number of attribute follow for the track
Attr 1 type	2	2	Binary = 0, ASCII = 1
Attr 1 name len	4	2	Length of attribute name string
Attr 1 data len	6	4	Length of attribute data
Attr 1 Name	10	N	Attribute name string
Attr 1 Data	10 + N	M	Attribute data
...			
Attr N type			
Attr 1 name len			
Attr 1 data len			
Attr 1 Name			
Attr 1 Data			

-continued

Required Attributes		
Attribute Name	Value(s)	Remarks
TITLE	ASCII string	Required By Jukebox
CODEC	"MP3", "WMA", "WAV"	Required By Jukebox
TRACK ID	DWORD	Set By Jukebox
ALBUM	ASCII string	Optional
ARTIST	ASCII string	Optional
GENRE	ASCII string	Optional
LENGTH	In seconds	Optional
TRACK SIZE	In bytes	Optional
TRACK NUM	1-n (track within album)	Optional

These attributes can be subsequently changeable via a host application, running on a personal computer connected to the portable music player.

FIG. 6 shows a flow chart of an embodiment the process used to build the hierarchical database of tracks. It starts by iterating through each track, and, for each track, iterating through each branch to find if the track belongs on the branch, and, if so, where. In this case, the term track could refer to any content, e.g. a music track, a spoken word track, or even a video track.

Also, the hierarchical catalog of tracks can be used to form playlists in a structured manner. For example, if a user wants to hear Jazz and Blues the entire sub-categories can be selected to form one playlist.

An alternative hierarchical catalog generation technique will now be described. In this alternative embodiment, at system startup and as tracks are added or changed, the hierarchy is generated as an in-memory tree structure. Each track is added to the tree using the categories ALBUM, ARTIST and GENRE.

The following example shows the algorithm for adding a track. For clarity, only the attributes used by the tree are shown.

TITLE	"Free Falling"
ALBUM	"Full Moon Fever"
ARTIST	"Tom Petty"
GENRE	"Rock"
TRACK NUM	1

The following function is executed to build the in-memory memory tree.

Build Tree()
For each track,
Add Track To Category(Album, Track)
Add Track To Category(Artist, Track)
Add Track To Category(Genre,Track)
End of Build Tree

FIG. 7 depicts a tree which could result from implementing Build Tree() function. Note that "Stardust" does not have any entries for Album or Artist. The host software running on a computer connected to the portable music player could be utilized to add missing attributes to the "Stardust" track and, optionally, edit the title attribute. The Build Tree() function would then reinsert this track in the correct location in the tree.

FIG. 8 is an embodiment of a user interface according to another embodiment of the invention. In this example the root node is labeled "My Configuration" and the Playlist

category has been selected and the Playlist subcategory "Meddle" has been selected. Note that the types of Metadata, in this example, Track Name, Artist, Album, Tempo and Dance, are listed across the top of the screen, and the attribute values for each track are listed in a row across the screen. Various control buttons are displayed to the right of configuration window that facilitate quickly invoking selected processing on a selected track.

As noted above, a preferred embodiment of the present invention is incorporated into a product manufactured and distributed by Creative Technology, Ltd. The product is called the "NOMAD Jukebox." The following description describes further details of the display screens and interface controls.

FIG. 9 illustrates the NOMAD Jukebox and its user interface controls.

In FIG. 9, electronic audio device 100 measures about 5.5" wide by 5.5" tall by 1" thick. Display screen 102 is about 2" wide by 1" tall. Display screen 102 includes different regions such as main region 104 and soft button function description region 106.

Three soft buttons are located at 108; including buttons 110, 112 and 114. The specific command, or function, that any of the soft buttons perform when depressed is indicated by the label in soft button function description region 106. Thus, the function of soft button 112 (as shown in FIG. 9) is "open," the function of soft button 114 is "search" while soft button 110 is currently not assigned a function.

The other eight buttons on device 100 perform essentially the same functions at all times. In other words, they are not subject to function changes according to soft button function description area 106. These buttons include Library button 116, EAX and System button 118, Skip Backward button 120, Play button 122, Stop button 124, Skip Forward Button 126, Scroll Up button 128 and Scroll Down button 130.

However, as discussed below, these buttons (or any type of controls used with the device) can include alternate functionality that is invoked in different ways.

The device uses visual cues, or indicators, in the display. When an item is highlighted it indicates that the item is the "current" item, or currently-selected item, which is susceptible to be operated on by a subsequent user action—such as playback, or expansion of the item. In FIG. 1, screen 102 shows that the item, "ALBUMS," is highlighted. The highlighted item can be acted upon by using the soft buttons, or another button, as described below. The current item can be changed by using Scroll Up button 128 and Scroll Down button 130 to move the highlight up or down, respectively, throughout a list of displayed items.

Icons are used to provide additional visual cues for an item. In FIG. 1, each of the categories has a category icon to the left of it. The category icon, which may not be distinctly visible in the Figure, illustrates a first box connected by lines to additional boxes below the first box. The icon depicts a hierarchy and illustrates the property of categories, i.e., that categories can contain additional categories, songs or other items.

FIG. 10 illustrates a sequence of display screens describing how to navigate to lower levels.

In FIG. 10, library category screen 150 shows the display as it appears when the user depresses library button 116 of FIG. 9. A preferred embodiment of the device uses 4 first-level categories. These are "Albums", "Artists," "Styles" and "Play Lists". Each of these categories can "contain," or be associated with, other categories, songs, or items.

Note that in library category screen 150 ALBUMS is currently highlighted. By depressing soft button 112 of FIG.

9, the "open" command is performed on the highlighted category, as indicated by the labeling of soft button 112 and soft button function description area 152 of FIG. 10.

Lists screen 154 is displayed as a result of a user opening Album category of library category screen 150. Lists screen 154 shows items within the Albums category such as commercial albums of multiple songs from a record label, pre-made lists or collections created by a user, or other predefined lists or collections of songs or recordings.

In FIG. 10, lists screen 154 shows each item as a list of songs. This is shown visually by the icon to the left of each item which depicts a miniature list. Possible soft button commands are "Close", "Open" and "Queue". These commands correspond to soft button 110, 112 and 114, respectively. If the user selects the Close command, the display reverts to library category screen 150. If the user selects the Open command, the display shows tracks screen 156. Alternatively, the user can select the Queue command to instruct the device to place all the songs from the selected (i.e., highlighted) list into the play list for eventual playback. Yet another option allows the user to press play button 122 of FIG. 9 to cause any currently-selected songs or a list of songs (e.g., an album) to immediately be played.

Returning to FIG. 10, tracks screen 156 shows that a single song called "JukeBox Demo" is in the list. The list is also called JukeBox Demo as shown in lists screen 154. Tracks screen 156 shows possible soft commands assigned to buttons, namely "Close", "Details" and "Queue." The Close button performs the same function as before—it returns the user to the previous screen which, in this case, is lists screen 154. The user can also select the Details command to cause details of the song JukeBox Demo to be displayed in details screen 158 as shown in FIG. 10. The user can select the Queue command by soft button 114 to enter the selected song into the play list queue. As before, the user can also depress play button 122 of FIG. 9 to cause immediate playback of the selected song.

Details screen 158 shows information about the selected song including the name of the song, album (or list) name containing the song; the track number, if applicable, and track duration. Note that other information can be included. The user can preview the song, close the Details screen to return to the Tracks screen or queue the song on the play list queue.

The device provides the ability to "preview" audio files even while a current song, or playlist, is being played. When a user chooses to preview an audio file, the audio file is played for about 10 seconds while any currently-played file or playlist is suspended. After previewing is complete, the suspended file or playlist resumes playback. In other embodiment, the preview duration can vary, or be stopped by user selection.

FIG. 11 illustrates associations among items.

In FIG. 11, song 168 is one of many songs stored in the device. Categories such as albums 160, artists 162, play lists 164 and genres 166 each include sub-categories. For example, albums 160 includes the names of various albums. Songs are associated with albums, genres and playlists. Such association can be by using pointers, a data structure including items to be associated, etc. "Association" as used herein, includes a first item associated with a second item; and the second item associated with the first item. In other words, albums can be associated with one or more songs in the database of the device so that an automated search to find all songs associated with an album is easier. The direction of arrow pointers in FIG. 11 is not intended to limit the manner of associations among items in the present invention.

Similar to albums, the category of artists 162 includes names of artists, or performers, of songs. Each artist name is associated with one or more songs in the database. Playlists 164 includes names of playlists. These are collections of songs that can be defined by the user, the device manufacturer, or others. Each playlist can be associated with one or more songs. Genres 166 includes various styles of music which are associated with one or more songs. Genres 166 includes various styles of music which are associated with one or more songs in the database. Note that items can exist without being associated with a song. Also, items can be associated with other items as where an artist name is associated with the albums containing the songs that the artist has created.

Although not shown in FIG. 11, items can have additional information, such as properties, details, etc., associated with the item. For example, a song can have information such a play time, artist name, artist album, copyright owner, etc., associated with the song.

FIG. 12 illustrates display screens used to search for a song or other item.

In FIG. 12, screen 180 is the initial library screen, as discussed above. If the user invokes the Search command (via the appropriate soft button) with Albums selected then screen 182 is displayed. Note that the search function can be applied to any of the categories. The user can depress the Plus or Minus soft buttons to cycle through the alphabet and change the character in the current location as indicated by the cursor. The cursor position is changed by using the scroll up/scroll down buttons 128 and 130, respectively, of FIG. 9. As each letter is entered the letters are compared and the nearest match of the stored albums' names is displayed as shown in screen 184. When the desired match is displayed the user selects the Go! command. Screen 186 shows the result of selecting the Go! command. A list of albums is displayed with the matched album centered and selected. The user can close, open or queue the album as discussed above.

FIG. 13 illustrates details of different items.

In FIG. 13, screen 200 illustrates details displayed as a result of selecting the "Details" command from soft button 1A track is selected. Screen 200 shows that details of the track "JukeBox Demo" shows the name of the album that the track resides on, the creator, or copyright owner, of the track, and the playing time of the track.

Screen 202 illustrates details of an item on the active queue list. Items are placed onto the active queue list by selecting the "Queue" command when an album, song, track, or other item is selected, as discussed above. For example, screen 204 shows the active queue list where the track "JukeBox Demo" is selected. By invoking the "Details" command screen 202 is brought up to show details of the Jukebox Demo track.

As shown in screen 202, the Detail screen shows what track number the selected track is, which album the track is from; the creator, or copyright owner, of the track, and the title of the track. Additionally, the details for an item on the queue list also show playback settings. These are shown by two-letter abbreviations at the bottom of the screen. The settings are as shown in Table I, below.

TABLE I

EA	Environmental Preset
FQ	Parametric EQ
HS	Headphone Specialization
TS	Time Sealing

TABLE I-continued

4S	Four Channel Speaker Sound (only if speakers are connected)
----	--

These settings have their common meanings, as is known in the art. Note that the setting 4S is not shown in screen 202 as it is not currently active.

FIG. 14 illustrates the Nomad Jukebox coupled to a host computer system.

In FIG. 14, device 300 (e.g., the Nomad Jukebox) is coupled to host system 302. In a preferred embodiment host system 302 is a personal computer, such as an IBM-PC compatible computer. Host system 302 includes a user interface having display 304 and user input devices such as keyboard 306 and mouse 308. In other embodiments the host system need not be a full computer system. Any type of processing system having a user interface is possible. For example, it is possible to couple the device to a laptop computer, game console, web-enabled television, or any consumer electronic device or digital platform, in general. The host user interface need not provide a display and can be much more minimal than the keyboard and mouse shown in FIG. 14. A preferred embodiment of the invention uses a Universal Synchronous Bus (USB) connection but any type of connection such as IEEE 1394 (FireWire), Ethernet, Serial Port, etc. can be used. A wireless (i.e., optical or radio frequency) connection can be used.

Once device 300 is coupled to host system 302, a user of host system 302 can launch a bridge interface to allow for the transfer of files between device 300 and host system 302. In a preferred embodiment, once the bridge interface is launched, the controls of device 300 are inoperable. The user interface of host system 302 is used to operate the bridge interface to transfer files.

The invention has now been described with reference to the preferred embodiments. Alternatives and substitutions will now be apparent to persons of skill in the art.

What is claimed is:

1. A method of selecting at least one track from a plurality of tracks stored in a computer-readable medium of a portable media player configured to present sequentially a first, second, and third display screen on the display of the media player, the plurality of tracks accessed according to a hierarchy, the hierarchy having a plurality of categories, subcategories, and items respectively in a first, second, and third level of the hierarchy, the method comprising:

- selecting a category in the first display screen of the portable media player;
- displaying the subcategories belonging to the selected category in a listing presented in the second display screen;
- selecting a subcategory in the second display screen;
- displaying the items belonging to the selected subcategory in a listing presented in the third display screen; and
- accessing at least one track based on a selection made in one of the display screens.

2. The method of selecting a track as recited in claim 1 wherein the accessing at least one track comprises selecting a subcategory in the second display screen and playing a plurality of tracks associated with the selected subcategory.

3. The method of selecting a track as recited in claim 1 wherein the accessing at least one track comprises selecting a subcategory and adding the tracks associated with the selected subcategory to a playlist.

4. The method of selecting a track as recited in claim 1 wherein the accessing at least one track comprises selecting

an item in the third display screen and playing at least one track associated with the selected item.

5. The method of selecting a track as recited in claim 1 wherein the accessing at least one track comprises selecting an item in the third display screen and adding at least one track associated with the selected item to a playlist.

6. The method of selecting a track as recited in claim 1 wherein the accessing at least one track comprises one of playing or adding to a playlist at least one track associated with a selected one of the category, subcategory, and item.

7. The method of selecting a track as recited in claim 1 wherein the accessing at least one track is made after the presentation of the third display screen by reverting back to one of the second and first display screens, the second display screen presented sequentially after the third display screen.

8. The method of selecting a track as recited in claim 1 further comprising selecting one of the items displayed in the third display screen and presenting a listing of items associated with the selected item in a fourth sequentially presented display screen.

9. The method of selecting a track as recited in claim 1 wherein the category genre is selected in the first display screen from available categories that include at least artist, album, and genre; and the subcategories listed in the second display screen comprise a listing of at least one genre type and one of the at least one genre type is selected.

10. The method of selecting a track as recited in claim 9 further comprising displaying in the third display screen at least one album associated with the selected genre type and selecting one of the at least one albums displayed in the third display screen and presenting a listing of tracks associated with the selected album in a fourth sequentially presented display screen.

11. The method of selecting a track as recited in claim 1 wherein the category artist is selected in the first display screen from available categories that include at least artist, album, and genre; the subcategories listed in the second display screen comprise a listing of names of artists and a first artist name is selected; and the items displayed in the third display screen comprises at least one album associated with the first artist name.

12. The method of selecting a track as recited in claim 1 wherein the track is a music track, accessing at least one track comprises accessing a track title in the third display screen, and the track is played in response to the access.

13. The method of selecting a track as recited in claim 1 wherein receipt of the selection in the first display screen into the second display screen and receipt of the selection in the second display screen results in an automatic transition of the second display screen into the third display screen.

14. The method of selecting a track as recited in claim 1 wherein the category selected in the first display screen is from a top level of the hierarchy.

15. The method of selecting a track as recited in claim 1 wherein the category selected in the first display screen is a category from a level at least one level below the top level of the hierarchy.

16. The method of selecting a track as recited in claim 1 wherein the plurality of categories comprise a list of artist names, the plurality of subcategories comprise a list of album names and the plurality of items comprise a list of track names.

* * * * *

**Creative Labs., Inc. et. al. v. Apple Computer, Inc.
Non-Infringement Chart for the File Hierarchy Patent**

Claim	Preamble/Limitations of claim	Analysis of Apple's Accused Products
1.	A method of selecting at least one track from a plurality of tracks stored in a computer readable-medium of a portable media player	
	configured to present sequentially a first, second, and third display screen on the display of the media player,	
	the plurality of tracks accessed according to a hierarchy, the hierarchy having a plurality of categories, subcategories, and items respectively in a first, second, and third level of the hierarchy, the method comprising:	Unlike the hierarchical file structure used to organize and store data and metadata disclosed and claimed in the File Hierarchy Patent, data is stored and organized in all of Apple's accused products according to a flat list database. Moreover, because Creative unequivocally disclaimed claim scope in light of U.S. Patent No. 5,670,730 ("Grewe") during prosecution, Apple's accused products cannot infringe this element under the doctrine of equivalents.
	selecting a category in the first display screen of the portable media player;	
	displaying the subcategories belonging to the selected category in a listing presented in the second display screen;	Unlike the hierarchical file structure used to organize and store data and metadata disclosed and claimed in the File Hierarchy Patent, data is stored and organized in all of Apple's accused products according to a flat list database. Moreover, because Creative unequivocally disclaimed claim scope in light of U.S. Patent No. 5,670,730 ("Grewe") during prosecution, Apple's accused products cannot infringe this element under the doctrine of equivalents.
	selecting a subcategory in the second display screen;	
	displaying the items belonging to the selected subcategory in a listing	Unlike the hierarchical file structure used to organize and store data and metadata disclosed and claimed in the File Hierarchy Patent, data is stored and organized in



	presented in the third display screen; and	all of Apple's accused products according to a flat list database. Moreover, because Creative unequivocally disclaimed claim scope in light of U.S. Patent No. 5,670,730 ("Grewe") during prosecution, Apple's accused products cannot infringe this element under the doctrine of equivalents.
	accessing at least one track based on a selection made in one of the display screens.	

Creative has asserted that Apple's accused product infringe claims 2, 3, 4, 5, 7, 11, 12, 13, 15 and 16 of the File Hierarchy Patent. All of the asserted claims of the File Hierarchy Patent depend from independent claim 1. Because Apple's accused products do not infringe independent claim 1, Apple's accused products do not infringe any of the asserted claims. As discovery progresses, Apple reserves the right to assert additional bases in support of its assertion that its accused products do not infringe the File Hierarchy Patent.

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**Reference cited in Substitute PTO Form 1449
Attorney Docket No. 380786-108980
Reexam Control No. 95/001,274**

UNITED STATES INTERNATIONAL TRADE COMMISSION
WASHINGTON, D.C.
Before the Honorable Paul J. Luckern

In the Matter of

CERTAIN PORTABLE DIGITAL MEDIA
PLAYERS

Rel. Motion
573-002

Investigation No. 337-TA-573

**JOINT MOTION TO TERMINATE THE INVESTIGATION
BASED ON A BINDING TERM SHEET**

Pursuant to Commission Rule of Practice and Procedure 210.21(b) (19 C.F.R. § 210.21(b)), Complainants Creative Technology Ltd. and Creative Labs, Inc. (collectively "Creative") and Respondent Apple Computer, Inc. ("Apple") hereby jointly move to terminate this Investigation based on a binding Term Sheet ("Term Sheet") between the parties submitted concurrently herewith.

The Term Sheet includes Confidential Business Information within the meaning of 19 C.F.R. § 201.6. The parties, therefore, request that the Term Sheet (attached as Confidential Exhibit 1 to the confidential version of the Joint Motion) be treated as Confidential Business Information under the Protective Order in this Investigation. A public version of the Term Sheet is attached to this version of the Joint Motion to Terminate as required by Commission Rule 210.21(b) and 19 C.F.R. § 210.21(b). At this time, there are no other existing agreements, written or oral, express or implied, between Apple and Creative concerning the subject matter of this Investigation.¹

¹[

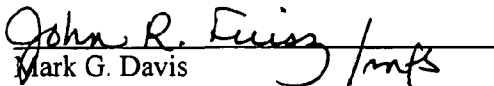
]

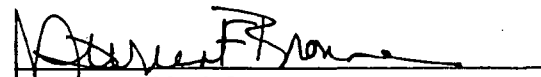
Counsel for Apple has consulted with the Commission Investigative Attorney regarding this Motion. The Commission Investigative Attorney will provide the position of the Office of Unfair Import Investigations after reviewing the attached papers in more detail.

Accordingly, Apple and Creative respectfully request that the Administrative Law Judge issue an initial determination terminating this Investigation on the basis of a Binding Term Sheet.

Dated: August 29, 2006

Respectfully submitted,


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**BINDING TERM SHEET AMONG APPLE COMPUTER, INC., CREATIVE
TECHNOLOGY LTD. and CREATIVE LABS, INC.**

This binding Term Sheet ("Term Sheet") is entered into effective August 22, 2006 (the "Effective Date") by and between APPLE COMPUTER, INC. ("Apple"), CREATIVE TECHNOLOGY LTD. and CREATIVE LABS, INC. (collectively "Creative"). As used herein, "Party" refers to Creative or Apple, and "Parties" refers to Creative and Apple collectively.

GENERAL

1. Apple and Creative agree to work diligently to finalize a final agreement between them respecting the terms set out herein (the "Final Agreement") as soon as reasonably practical. Unless and until a Final Agreement is executed, this Term Sheet is binding upon the Parties and the licenses and other terms set out herein are fully enforceable between the Parties.

DISMISSAL OF ACTIONS

2. Within seven (7) days after the signing of this Term Sheet, the Parties will file with the court or agency hearing each active lawsuit or complaint between the parties, a stipulation or agreed motion in a form adequate to effect a dismissal with prejudice of such lawsuit or complaint and all claims brought therein, with each party bearing its own costs and fees.

MUTUAL GENERAL RELEASE

3. Creative, on behalf of itself, its Affiliates, and its and their successors and assigns, releases and forever discharges Apple and its Affiliates, and, with respect to Apple products and services, all parties working by, for or with Apple and its Affiliates, from any and all claims or causes of action for known and unknown acts occurring prior to the Effective Date of this Term Sheet.
4. Apple, on behalf of itself, its Affiliates, and its and their successors and assigns, releases and forever discharges Creative and its Affiliates, and, with respect to Creative products and services, all parties working by, for or with Creative and its Affiliates, from any and all claims or causes of action for known and unknown acts occurring prior to the Effective Date of this Term Sheet.



5. The Parties, having specific intent to release all potential claims described in the foregoing sections, whether known or unknown, do hereby acknowledge and expressly waive the provisions of section 1542 of the California Civil Code (and similar provisions in other jurisdictions), which provides:

"A general release does not extend to claims which the creditor does not know or suspect to exist in his favor at the time of executing the release, which if known by him, must have materially affected his settlement with debtor."

LICENSES AND COVENANTS

6. a. Creative, on behalf of itself, its Affiliates, and its and their successors and assigns, grants to Apple and its Affiliates a nonexclusive, perpetual, irrevocable, worldwide license, without the right to sublicense, under the Zen Patent to make, have made, use, purchase, sell, offer for sale, license, lease, import, export, or otherwise dispose of all Apple or Apple Affiliate hardware and software products and services, and to practice any methods in connection therewith.

b.

c.

7. a. Apple, on behalf of itself, its Affiliates, and its and their successors and assigns, grants to Creative and its Affiliates a nonexclusive, perpetual, irrevocable, worldwide license, without the right to sublicense, under all Licensed Apple Patents to make, have made, use, purchase, sell, offer for sale, license, lease, import, export, or otherwise dispose of all Creative or Creative Affiliate hardware and software products and services, and to practice any methods in connection therewith; provided however, that no license is granted with respect to any Excluded Creative Product.

b.

c.

8.

9.

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BINDING TERM SHEET AMONG APPLE COMPUTER, INC., CREATIVE TECHNOLOGY LTD. and CREATIVE LABS, INC.

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BUSINESS COOPERATION

10. a.

b.

11.

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BINDING TERM SHEET AMONG APPLE COMPUTER, INC., CREATIVE TECHNOLOGY LTD and CREATIVE LABS, INC

JPC

12.

FINANCIAL

13. In addition to other consideration herein, Apple shall pay to Creative Technology Ltd. a non-refundable lump sum amount totaling one hundred million US dollars (\$100,000,000).

14.

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BINDING TERM SHEET AMONG APPLE COMPUTER, INC., CREATIVE TECHNOLOGY LTD and CREATIVE LABS, INC

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BINDING TERM SHEET AMONG APPLE COMPUTER, INC., CREATIVE TECHNOLOGY LTD. and CREATIVE LABS, INC.

JK

MISCELLANEOUS TERMS

17.

7

BINDING TERM SHEET AMONG APPLE COMPUTER, INC., CREATIVE TECHNOLOGY LTD. and CREATIVE LABS, INC

JK

18. Each of the Parties acknowledges and agrees that the monetary payments and other value provided herein in exchange for the license to the Zen Patent and other rights granted herein are made as a compromise in order to avoid the risks and uncertainty of litigation and to resolve the Parties' dispute.
19. The terms of this Term Sheet or Final Agreement are confidential.

The Parties agree that they will issue a joint press release upon execution of this Term Sheet, the language of which is attached hereto as Exhibit C. Except as provided herein, neither Party will make any other public statement regarding this Agreement or related matters, except that either party may refer to the terms of the joint release.

20. When executed by both Parties, this Term Sheet shall be deemed effective as of its Effective Date.

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21. Nothing in this Term Sheet is intended or shall be deemed to constitute a partnership, agency, employer-employee, or joint venture relationship among the Parties. No Party shall incur debts or enter into any commitments on behalf of the other Party. There is no fiduciary duty or special relationship of any kind among the Parties to this agreement.
22. This Term Sheet shall be binding on and shall inure to the benefit of the administrators, representatives, successors and assigns of the Parties.
23. This Term Sheet shall be governed by and construed in accordance with the laws of the State of California.
24. This Term Sheet shall not be construed against any Party preparing it, but shall be construed as if all the Parties jointly prepared the Term Sheet, and any ambiguity shall not be interpreted against any one Party.
25. Each Party represents and agrees that it has been thoroughly advised of its right to discuss all aspects of this Term Sheet with its attorney prior to signing this Term Sheet, and has been encouraged to do so, that each Party has carefully read and fully understands all of the provisions of this Agreement, and that it is voluntarily entering into this Agreement.
26. This Term Sheet may be executed in any number of counterparts, each of which shall be deemed an original, but all of which shall together constitute a single agreement. Signatures by facsimile are sufficient for execution of this Term Sheet.
27. This Term Sheet sets forth the entire agreement of the parties with respect to the subject matter herein, and replaces any prior oral or written communications.

DEFINITIONS

28. The following phrases have the definitions ascribed below:
 - a.
 - b. "Zen Patent" shall mean US patent number 6,928,433 and any and all worldwide continuations, continuations-in-part (but only

to the extent entitled to the same effective filing date as the original), divisionals, reexaminations, parents, reissues, or foreign counterparts thereof.

- c. "Licensed Apple Patents" shall mean U.S. patents number 5,504,852; 5,640,566; 6,157,363; 6,282,646; 7,046,230 (but only claim 25 thereof); 5,341,293; 5,479,602; 5,586,237; 5,799,280; 5,898,434; 6,047,342; 6,731,312; and any worldwide continuations, continuations-in-part (but only the claims therein that are entitled to the same effective filing date as the above enumerated patents), divisionals, reexaminations, parents, reissues, or counterparts thereof. In the case of patents or applications claiming priority to 7,046,230, only those claims claiming subject matter fully described in the specification of 7,046,230 and substantially similar to claim 25 thereof shall be included within Licensed Apple Patents.

d.

- e. "Affiliate" shall mean an entity that is controlled directly or indirectly by a Party (with "control" meaning ownership of more than fifty percent (50%) of the voting stock of the entity or, in the case of a non-corporate entity, an equivalent interest).

f.

g.

h.

i.

IN WITNESS WHEREOF, the parties herelo have caused to be signed by their duly authorized officers, this Agreement at the places and on the dates set forth below.

Apple Computer, Inc.:

Creative Technology Ltd.

Signature: 

Signature: _____

Name: Timothy Cook

Name: _____

Title: Chief operating officer

Title: _____

Creative Labs, Inc.

Signature: _____

Name: _____

Title: _____



EXHIBIT A



EXHIBIT B



EXHIBIT C
(FORM OF JOINT PRESS RELEASE PER SECTION 19)

**Apple & Creative Announce Broad Settlement Ending Legal Disputes
Between the Companies**

CUPERTINO, California and SINGAPORE – August 24, 2006 – Apple and Creative Technology, Ltd. today announced a broad settlement ending all legal disputes between the two companies. Under the agreement, Apple will pay Creative \$100 million for a paid-up license to use Creative's recently awarded patent, applicable to all of Apple's products. Apple can recoup a portion of its payment if Creative is successful in licensing this patent to others. In addition, the companies announced that Creative has joined Apple's "Made for iPod" program and will be announcing their own iPod accessory products later this year.

"Creative is very fortunate to have been granted this early patent," said Steve Jobs, Apple's CEO. "This settlement resolves all of our differences with Creative, including the five lawsuits currently pending between the companies, and removes the uncertainty and distraction of prolonged litigation."

"We're very pleased to have reached an amicable settlement with Apple and to have opened up significant new opportunities for Creative," said Sim Wong Hoo, chairman and CEO of Creative. "Apple has built a huge ecosystem for its iPod and with our upcoming participation in the Made For iPod program we are very excited about this new market opportunity for our speaker systems, our just-introduced line of earphones and headphones, and our future family of X-Fi audio enhancement products. We expect that the one-time licensing payment of \$100 million will contribute approximately \$.85 of earnings per share to our current quarter, ending September 30, 2006."

About Apple

Apple ignited the personal computer revolution in the 1970s with the Apple II and reinvented the personal computer in the 1980s with the Macintosh. Today, Apple continues to lead the industry in innovation with its award-winning desktop and notebook computers, OS X operating system, and iLife and professional applications. Apple is also spearheading the digital music revolution with its iPod portable music players and iTunes online music store.

About Creative

Creative (NASDAQ: CREAM) is a worldwide leader in digital entertainment products for PC users. Famous for its Sound Blaster sound cards and for launching the multimedia revolution, Creative is now driving digital entertainment on the PC platform with products like its highly acclaimed ZEN™ MP3 players. Creative's innovative hardware, proprietary technology, applications and services



leverage the Internet, enabling consumers to experience high-quality digital entertainment -- anytime, anywhere.

###

Press Contacts:

Steve Dowling
Apple
dowling@apple.com
(408) 974-1896

Phil O'Shaughnessy

Creative Labs, Inc.

(408) 546-6773

poshaughnessy@creative.com

EXHIBIT D



EXHIBIT E

one

BINDING TERM SHEET AMONG APPLE COMPUTER, INC., CREATIVE TECHNOLOGY LTD. and CREATIVE LABS, INC.

This binding Term Sheet ("Term Sheet") is entered into effective August 22, 2006 (the "Effective Date") by and between APPLE COMPUTER, INC. ("Apple"), CREATIVE TECHNOLOGY LTD. and CREATIVE LABS, INC. (collectively "Creative"). As used herein, "Party" refers to Creative or Apple, and "Parties" refers to Creative and Apple collectively.

GENERAL

1. Apple and Creative agree to work diligently to finalize a final agreement between them respecting the terms set out herein (the "Final Agreement") as soon as reasonably practical. Unless and until a Final Agreement is executed, this Term Sheet is binding upon the Parties and the licenses and other terms set out herein are fully enforceable between the Parties.

DISMISSAL OF ACTIONS

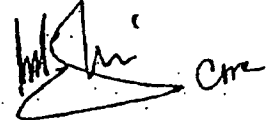
2. Within seven (7) days after the signing of this Term Sheet, the Parties will file with the court or agency hearing each active lawsuit or complaint between the parties, a stipulation or agreed motion in a form adequate to effect a dismissal with prejudice of such lawsuit or complaint and all claims brought therein, with each party bearing its own costs and fees.

MUTUAL GENERAL RELEASE

3. Creative, on behalf of itself, its Affiliates, and its and their successors and assigns, releases and forever discharges Apple and its Affiliates, and, with respect to Apple products and services, all parties working by, for or with Apple and its Affiliates, from any and all claims or causes of action for known and unknown acts occurring prior to the Effective Date of this Term Sheet.
4. Apple, on behalf of itself, its Affiliates, and its and their successors and assigns, releases and forever discharges Creative and its Affiliates, and, with respect to Creative products and services, all parties working by, for or with Creative and its Affiliates, from any and all claims or causes of action for known and unknown acts occurring prior to the Effective Date of this Term Sheet.

1

BINDING TERM SHEET AMONG APPLE COMPUTER, INC., CREATIVE TECHNOLOGY LTD. and CREATIVE LABS, INC.



5. The Parties, having specific intent to release all potential claims described in the foregoing sections, whether known or unknown, do hereby acknowledge and expressly waive the provisions of section 1542 of the California Civil Code (and similar provisions in other jurisdictions), which provides:

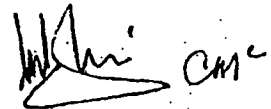
"A general release does not extend to claims which the creditor does not know or suspect to exist in his favor at the time of executing the release, which if known by him, must have materially affected his settlement with debtor."

LICENSES AND COVENANTS

6. a. Creative, on behalf of itself, its Affiliates, and its and their successors and assigns, grants to Apple and its Affiliates a nonexclusive, perpetual, irrevocable, worldwide license, without the right to sublicense, under the Zen Patent to make, have made, use, purchase, sell, offer for sale, license, lease, import, export, or otherwise dispose of all Apple or Apple Affiliate hardware and software products and services, and to practice any methods in connection therewith.

b.

c.



BUSINESS COOPERATION

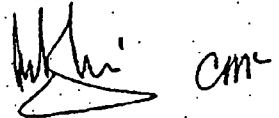
10. a.

b.

11.

4

BINDING TERM SHEET AMONG APPLE COMPUTER, INC., CREATIVE TECHNOLOGY LTD. and CREATIVE LABS, INC.

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12.

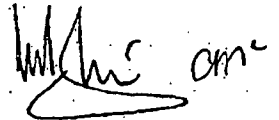
FINANCIAL

13. In addition to other consideration herein, Apple shall pay to Creative Technology Ltd. a non-refundable lump sum amount totaling one hundred million US dollars (\$100,000,000),

14.

5

BIDDING TERM SHEET AMONG APPLE COMPUTER, INC., CREATIVE TECHNOLOGY LTD. and CREATIVE LABS, INC.

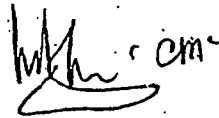
Handwritten signature and initials, possibly reading "W. H. C. amc".

15.

16.

6

BINDING TERM SHEET AMONG APPLE COMPUTER, INC., CREATIVE TECHNOLOGY LTD. and CREATIVE LABS, INC.

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MISCELLANEOUS TERMS

17.

7

BINDING TERM SHEET AMONG APPLE COMPUTER, INC., CREATIVE TECHNOLOGY LTD. and CREATIVE LABS, INC.

Handwritten signature

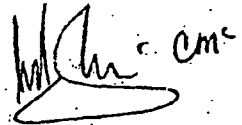
18. Each of the Parties acknowledges and agrees that the monetary payments and other value provided herein in exchange for the license to the Zen Patent and other rights granted herein are made as a compromise in order to avoid the risks and uncertainty of litigation and to resolve the Parties' dispute.
19. The terms of this Term Sheet or Final Agreement are confidential.

The Parties agree that they will issue a joint press release upon execution of this Term Sheet, the language of which is attached hereto as Exhibit C. Except as provided herein, neither Party will make any other public statement regarding this Agreement or related matters, except that either party may refer to the terms of the joint release.

20. When executed by both Parties, this Term Sheet shall be deemed effective as of its Effective Date.

8

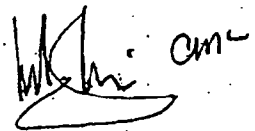
BINDING TERM SHEET AMONG APPLE COMPUTER, INC., CREATIVE TECHNOLOGY LTD. and CREATIVE LABS, INC.

A handwritten signature in black ink, appearing to read "John C. ...", is written over a horizontal line. The signature is slanted and includes a large, stylized initial.

21. Nothing in this Term Sheet is intended or shall be deemed to constitute a partnership, agency, employer-employee, or joint venture relationship among the Parties. No Party shall incur debts or enter into any commitments on behalf of the other Party. There is no fiduciary duty or special relationship of any kind among the Parties to this agreement.
22. This Term Sheet shall be binding on and shall inure to the benefit of the administrators, representatives, successors and assigns of the Parties.
23. This Term Sheet shall be governed by and construed in accordance with the laws of the State of California.
24. This Term Sheet shall not be construed against any Party preparing it, but shall be construed as if all the Parties jointly prepared the Term Sheet, and any ambiguity shall not be interpreted against any one Party.
25. Each Party represents and agrees that it has been thoroughly advised of its right to discuss all aspects of this Term Sheet with its attorney prior to signing this Term Sheet, and has been encouraged to do so, that each Party has carefully read and fully understands all of the provisions of this Agreement, and that it is voluntarily entering into this Agreement.
26. This Term Sheet may be executed in any number of counterparts, each of which shall be deemed an original, but all of which shall together constitute a single agreement. Signatures by facsimile are sufficient for execution of this Term Sheet.
27. This Term Sheet sets forth the entire agreement of the parties with respect to the subject matter herein, and replaces any prior oral or written communications.

DEFINITIONS

28. The following phrases have the definitions ascribed below:
 - a.
 - b. "Zen Patent" shall mean US patent number 6,928,433 and any and all worldwide continuations, continuations-in-part (but only

Handwritten signature and initials, possibly "W. Shi" and "amc", in black ink.

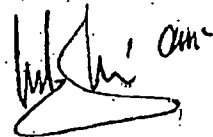
to the extent entitled to the same effective filing date as the original), divisionals, reexaminations, parents, reissues, or foreign counterparts thereof.

c. "Licensed Apple Patents" shall mean U.S. patents number 5,504,852; 5,640,566; 6,157,363; 6,282,646; 7,046,230 (but only claim 25 thereof); 5,341,293; 5,479,602; 5,586,237; 5,799,280; 5,898,434; 6,047,342; 6,731,312; and any worldwide continuations, continuations-in-part (but only the claims therein that are entitled to the same effective filing date as the above enumerated patents), divisionals, reexaminations, parents, reissues, or counterparts thereof. In the case of patents or applications claiming priority to 7,046,230, only those claims claiming subject matter fully described in the specification of 7,046,230 and substantially similar to claim 25 thereof shall be included within Licensed Apple Patents.

d.

e. "Affiliate" shall mean an entity that is controlled directly or indirectly by a Party (with "control" meaning ownership of more than fifty percent (50%) of the voting stock of the entity or, in the case of a non-corporate entity, an equivalent interest).

f.

Handwritten signature and initials, possibly "Am" or "Am-".

g.

h.

i.

IN WITNESS WHEREOF, the parties hereto have caused to be signed by their duly authorized officers, this Agreement at the places and on the dates set forth below.

Apple Computer, Inc.:

Signature: _____

Name: _____

Title: _____

Creative Labs, Inc.

Signature: Craig McHeslet

Name: Craig McHeslet

Title: PRESIDENT

Creative Technology Ltd.

Signature: [Signature]

Name: SIM WONG HOO

Title: CHAIRMAN & CEO

EXHIBIT A

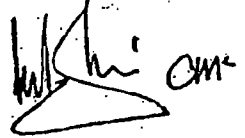
A handwritten signature in black ink, appearing to read "K. Chi" followed by a stylized flourish or mark.

EXHIBIT B

13

BINDING TERM SHEET AMONG APPLE COMPUTER, INC., CREATIVE TECHNOLOGY LTD. and CREATIVE LABS, INC.

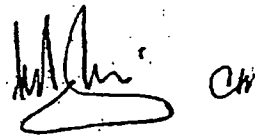
Handwritten signature and initials, possibly "J. A. Ch..." and "CW".

EXHIBIT C
(FORM OF JOINT PRESS RELEASE PER SECTION 19)

**Apple & Creative Announce Broad Settlement Ending Legal Disputes
Between the Companies**

CUPERTINO, California and SINGAPORE – August 24, 2006 – Apple and Creative Technology, Ltd. today announced a broad settlement ending all legal disputes between the two companies. Under the agreement, Apple will pay Creative \$100 million for a paid-up license to use Creative's recently awarded patent, applicable to all of Apple's products. Apple can recoup a portion of its payment if Creative is successful in licensing this patent to others. In addition, the companies announced that Creative has joined Apple's "Made for iPod" program and will be announcing their own iPod accessory products later this year.

"Creative is very fortunate to have been granted this early patent," said Steve Jobs, Apple's CEO. "This settlement resolves all of our differences with Creative, including the five lawsuits currently pending between the companies, and removes the uncertainty and distraction of prolonged litigation."

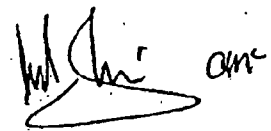
"We're very pleased to have reached an amicable settlement with Apple and to have opened up significant new opportunities for Creative," said Sim Wong Hoo, chairman and CEO of Creative. "Apple has built a huge ecosystem for its iPod and with our upcoming participation in the Made For iPod program we are very excited about this new market opportunity for our speaker systems, our just-introduced line of earphones and headphones, and our future family of X-Fi audio enhancement products. We expect that the one-time licensing payment of \$100 million will contribute approximately \$.85 of earnings per share to our current quarter, ending September 30, 2006."

About Apple

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About Creative

Creative (NASDAQ: CREF) is a worldwide leader in digital entertainment products for PC users. Famous for its Sound Blaster sound cards and for launching the multimedia revolution, Creative is now driving digital entertainment on the PC platform with products like its highly acclaimed ZEN™ MP3 players. Creative's innovative hardware, proprietary technology, applications and services

Handwritten signature and initials, possibly "Sim Wong Hoo" and "CWH".

leverage the Internet, enabling consumers to experience high-quality digital entertainment – anytime, anywhere.

###

Press Contacts:

Steve Dowling

Apple

dowling@apple.com

(408) 974-1896

Phil O'Shaughnessy

Creative Labs, Inc.

(408) 546-6773

poshaughnessy@creative.com

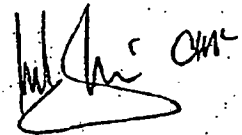


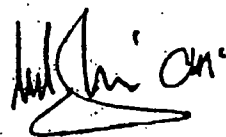
EXHIBIT D

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CM-

EXHIBIT E

17

BINDING TOWNSHIP AGREEMENT AMONG APPLE COMPUTER, INC., CREATIVE TECHNOLOGY LTD. and CREATIVE LABS, INC.

A handwritten signature in black ink, appearing to read "Michael Chen".

CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing **JOINT MOTION TO TERMINATE THE INVESTIGATION BASED ON A BINDING TERM SHEET (PUBLIC)** was served as indicated, to the parties listed below, this 29th day of August 2006:

The Honorable Marilyn R. Abbott
Secretary
U.S. INTERNATIONAL TRADE COMMISSION
500 E Street, SW, Room 112A
Washington, DC 20436
(VIA HAND DELIVERY -- Original + 6 copies)

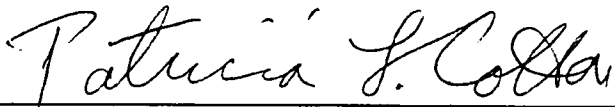
The Honorable Paul J. Luckern
Administrative Law Judge
U.S. INTERNATIONAL TRADE COMMISSION
500 E Street, SW, Room 317
Washington, DC 20436
(VIA HAND DELIVERY -- 2 copies)

T. Spence Chubb, Esq.
Supervisory Attorney
Office of Unfair Import Investigations
U.S. INTERNATIONAL TRADE COMMISSION
500 E Street, SW, Room 401
Washington, DC 20436
(VIA HAND DELIVERY)

**ON BEHALF OF COMPLAINANTS CREATIVE LABS,
INC. AND CREATIVE TECHNOLOGY LTD.**

Mark G. Davis
John R. Fuisz
Stephen K. Shahida
MCDERMOTT WILL & EMERY LLP
600 13th Street, NW
Washington, DC 20005
(VIA ELECTRONIC MAIL AND HAND DELIVERY)

Terrence P. McMahon
Lucy H. Koh
Catherine Shiang
MCDERMOTT WILL & EMERY LLP
3150 Porter Drive
Palo Alto, California 94304-1212
(VIA ELECTRONIC MAIL)



ADDUCI, MASTRIANI & SCHAUMBERG, L.L.P.
1200 Seventeenth Street, N.W., Fifth Floor
Washington, D.C. 20036

API00006-1.doc

G1

**Reference cited in Substitute PTO Form 1449
Attorney Docket No. 380786-108980
Reexam Control No. 95/001,274**



US005355302A

United States Patent [19]

[11] Patent Number: **5,355,302**

Martin et al.

[45] Date of Patent: **Oct. 11, 1994**

[54] **SYSTEM FOR MANAGING A PLURALITY OF COMPUTER JUKEBOXES**

4,412,292	10/1983	Sedam et al.	364/479
4,633,445	12/1986	Sprague	
4,667,802	5/1987	Verduin et al.	194/217
4,956,768	9/1990	Sidi et al.	395/425
5,058,089	10/1991	Yoshimaru et al.	369/32

[75] Inventors: **John R. Martin; Michael L. Tillery; Samuel N. Zammuto**, all of Rockford, Ill.

Primary Examiner—Gail O. Hayes
Attorney, Agent, or Firm—McAndrews, Held & Malloy

[73] Assignee: **Arachnid, Inc.**, Rockford, Ill.

[21] Appl. No.: **846,707**

[57] ABSTRACT

[22] Filed: **Mar. 6, 1992**

A method and apparatus is shown for managing a plurality of computer jukeboxes at different locations from a central station. Each jukebox includes processor means for controlling the computer jukebox, storage and retrieval means for data, display means for selection menus, audio production means for playing musical records, and a user interface enabling patrons to communicate with the processor means. The central station can be used to download musical recording data to each computer jukebox, and each computer jukebox can upload usage data to the central station.

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 538,981, Jun. 15, 1990, abandoned.

[51] Int. Cl.⁵ **G06F 15/44**

[52] U.S. Cl. **364/410**

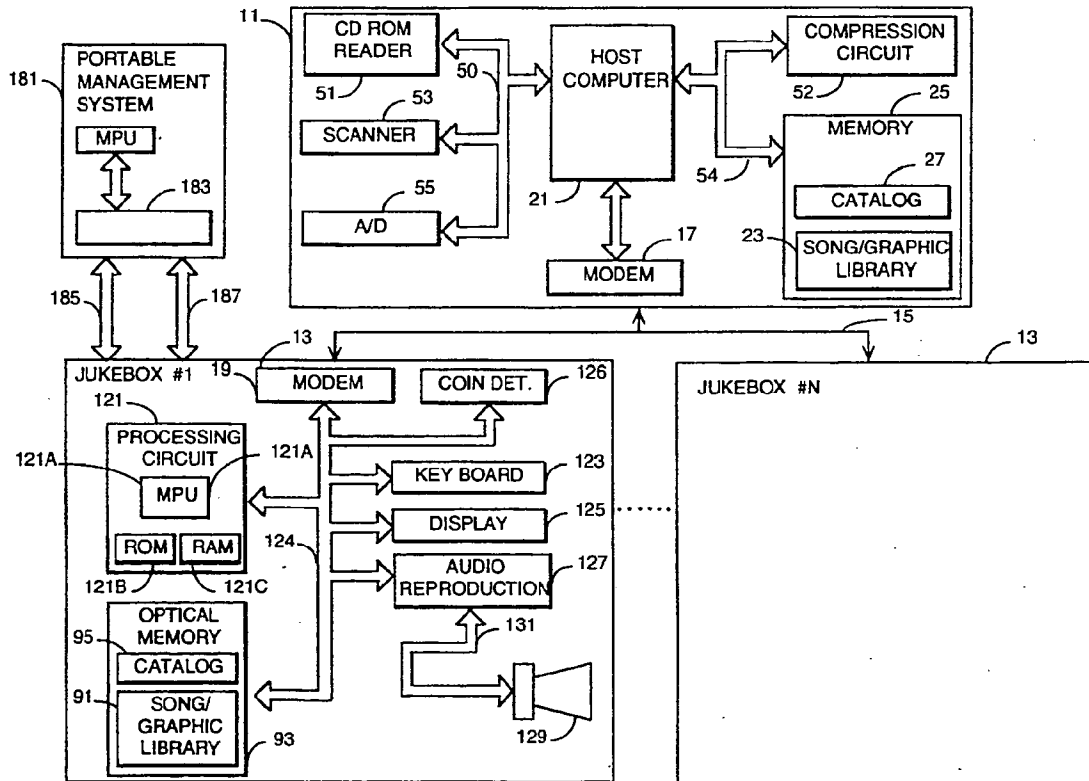
[58] Field of Search **364/479, 410; 395/600**

[56] References Cited

U.S. PATENT DOCUMENTS

4,232,295 11/1980 McConnell 340/152 R

12 Claims, 5 Drawing Sheets



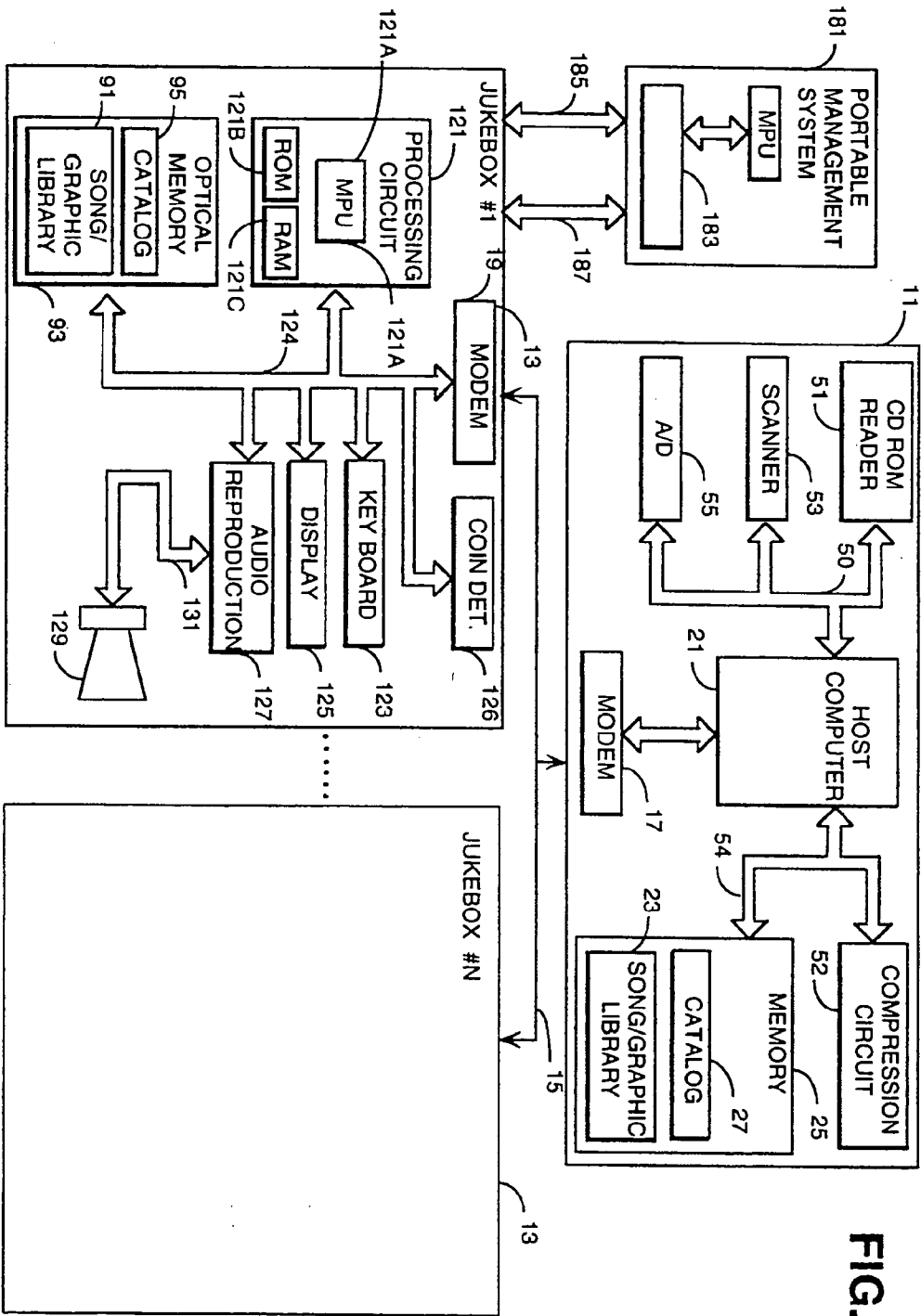


FIG. 1

FIG. 2

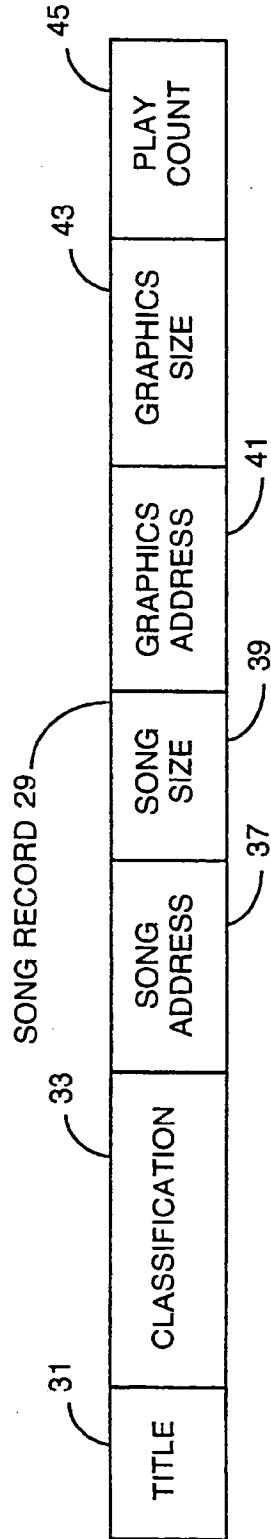


FIG. 3

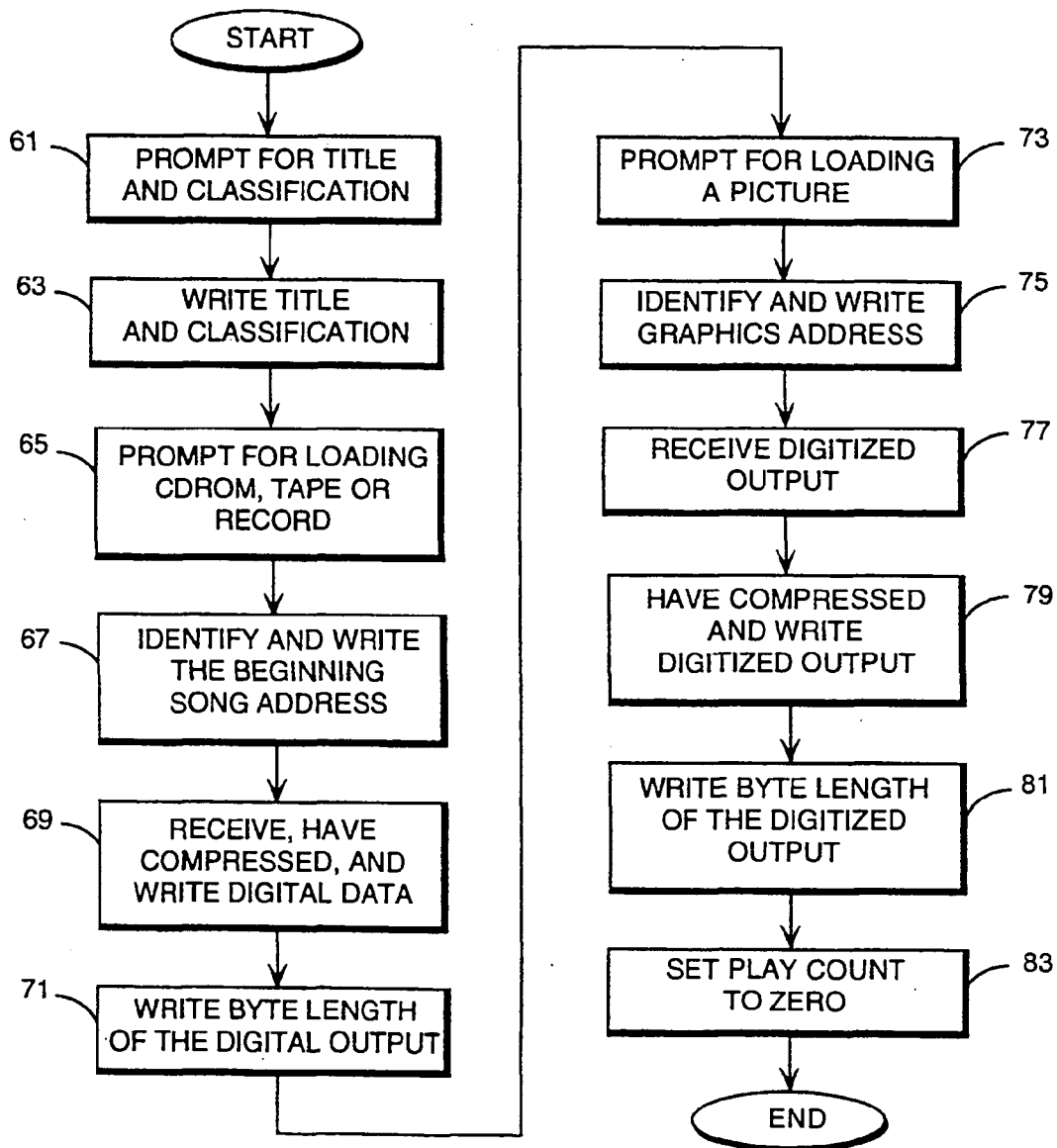


FIG. 4A

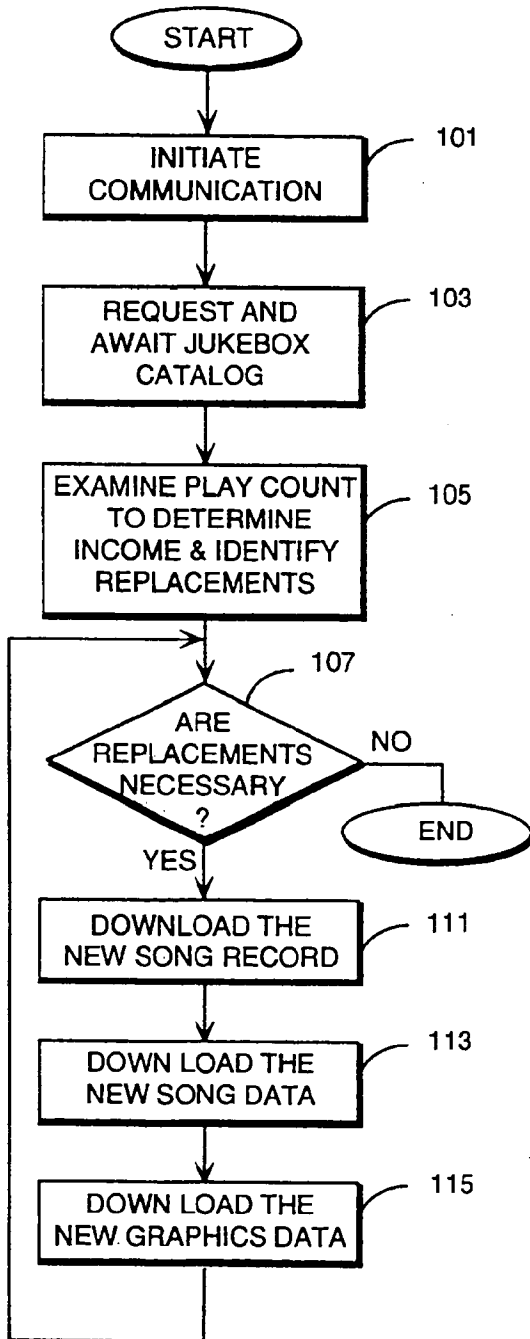


FIG. 4B

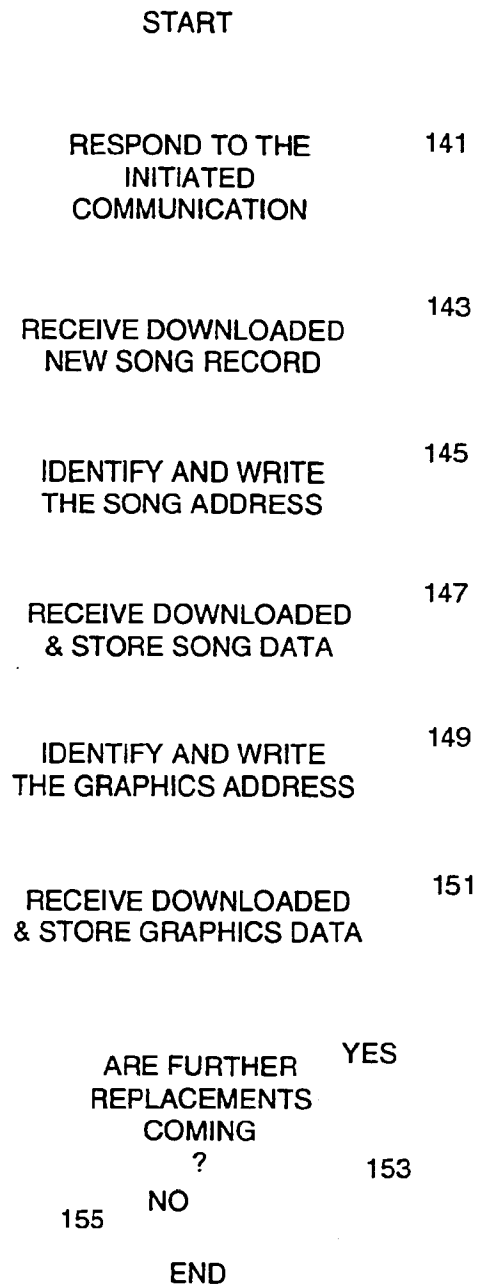
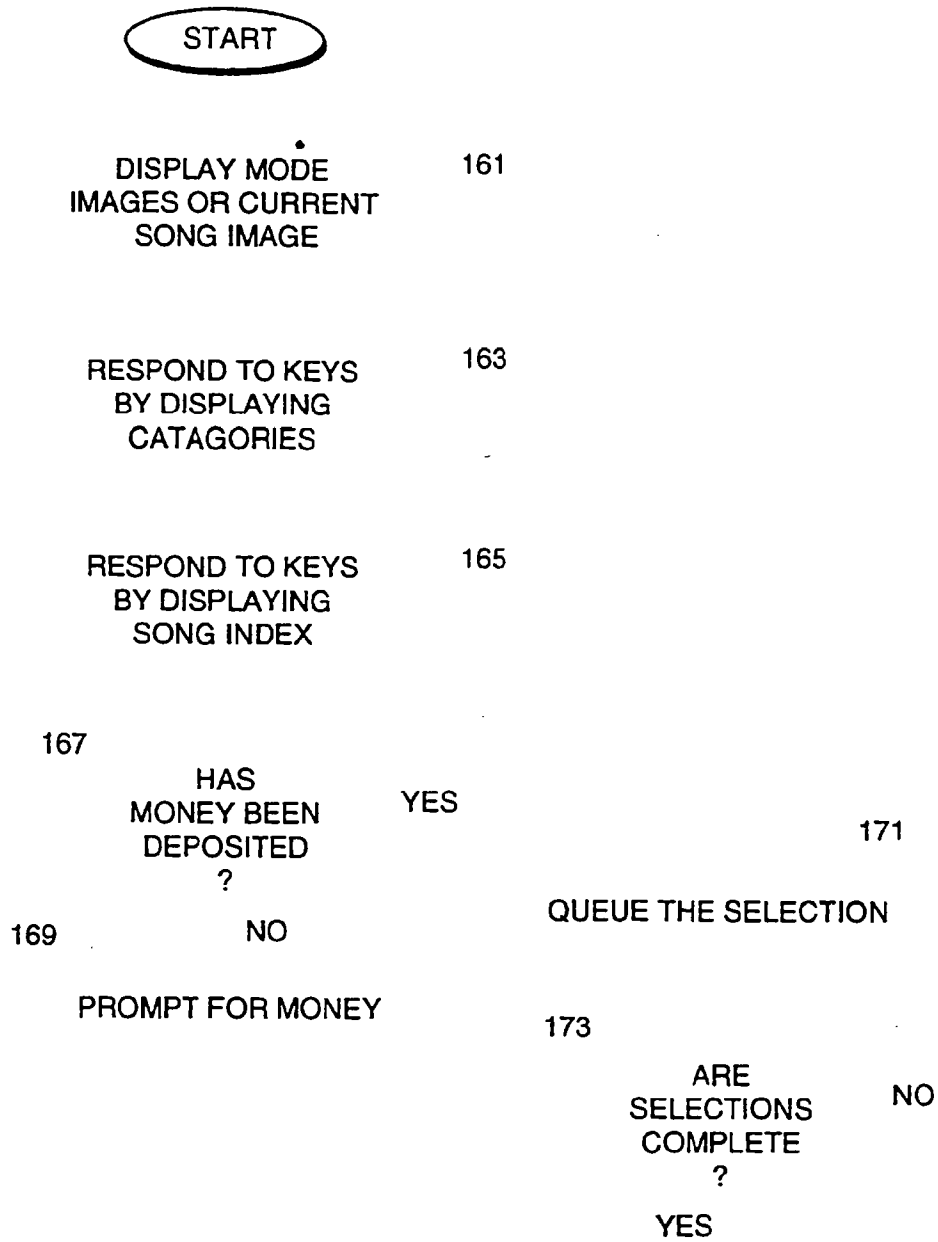


FIG. 5



SYSTEM FOR MANAGING A PLURALITY OF COMPUTER JUKEBOXES

This is a continuation-in-part of U.S. patent applica- 5
tion Ser. No. 07/538,981, filed Jun. 15, 1990 now abandoned.

FIELD OF THE INVENTION

The present invention relates generally to a jukebox 10
system, and more particularly to such a system including one or more computer jukeboxes that can be managed from a remote location.

BACKGROUND OF THE INVENTION

Heretofore, an assortment of musical recordings 15
found in a jukebox consists of a plurality of records, each record containing a specific recording. Traditionally, these records are grooved phonograph records. After a patron makes a selection, the selected phonograph record is mechanically removed from a storage rack within the jukebox, and the phonograph record is placed upon rotating platform. A stylus which is connected to a speaker system is then placed upon the rotating 20
phonograph record, resulting in the phonograph record being played by the jukebox. For each selection, a separate phonograph record must be removed from the storage rack in order to be played by the jukebox.

Conventional jukeboxes have also implemented compact disks as means for creating an assortment of musical 30
songs. Compact disks provide the improved sound quality made possible by digital recordings. The same technique, however, is used to play compact disks. A separate compact disk corresponding to each selection must be removed from a storage rack in order for the jukebox to play the selection. 35

Updating conventional jukeboxes is a costly and time consuming task. Routemen must periodically travel to each jukebox location and replace the existing recordings of each jukebox with up-to-date records. The exist- 40
ing recordings are no longer used by the jukebox once removed, thus making the conventional method wasteful.

Routemen must also travel to each jukebox location to keep a tally of the number of times each musical 45
recording is selected in order to determine royalty fees. It is known to provide a jukebox with a counter that keeps track of the number of times each musical recording is selected, but routemen must still travel to each jukebox location to obtain this information. Such a 50
process requires an excessive number of people to visit jukebox location periodically and visually read the information off the counter within each jukebox. Since the number of jukeboxes in operation is quite large, the employment of routemen to obtain such data involves a considerable expense. Furthermore, the ever changing nature of the recording industry requires that such data be gathered frequently in order to keep abreast of a continually changing market.

OBJECTS AND SUMMARY OF THE INVENTION

Accordingly, it is a primary object of the present invention to provide a method and apparatus for man- 65
aging a plurality of computer jukeboxes which is capable of eliminating the necessity for routemen to change records in the jukeboxes. The computer jukeboxes store recordings in memory, thus enabling routemen to sim-

ply load new recordings into the memory of each computer jukebox.

Another object of the present invention is to eliminate a necessity for routemen by enabling new recordings and selection menus to be downloaded to each computer jukebox via a transmission link. In that regard, it is an object of the present invention to provide a method and apparatus which eliminates the material waste usually associated with updating jukeboxes. Instead of throwing away old recordings and replacing them with new ones, as is the conventional procedure, the present invention eliminates this waste by enabling new recordings to simply be downloaded into the memory of each computer jukebox. The old recordings are simply erased, if necessary.

Another object of the present invention is to provide a method and apparatus which is capable of remotely obtaining jukebox usage data, thus eliminating a necessity for routemen to do this task. The present invention utilizes a computer jukebox, which as part of its software programming, stores the number of times each musical recording is played and the number of credits that have been awarded. This data is uploaded to a central control device via a transmission link.

An additional object of the present invention is to provide a method and apparatus utilizing modern computer technology to digitally store and play musical records. The jukebox of the present invention is basically a computer having a sophisticated audio production capability, the computer storing digitized song data in a computer memory. Because conventional jukeboxes maintain compact discs or records in the jukebox, theft of the compact disc/records has been a problem, this problem being eliminated by the present invention's utilization of a computer memory to store the digitized song data.

A further object of the present invention is to provide a method and apparatus capable of being used with the remote management of jukeboxes via public telephone lines without interfering with establishments' use of their own phone lines.

Other objects, features and advantages of the present invention will be readily apparent from the following description of certain preferred embodiments thereof taken in conjunction with the accompanying drawings, although variations and modifications may be effected without departing from the spirit and scope of the novel concepts of the disclosure.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a block diagram of the computer jukebox system of the present invention;

FIG. 2 is an illustration of the data structure of an individual song record stored in a master library catalog illustrated in FIG. 1;

FIG. 3 is a flow-chart illustrating the procedure for storing new songs in a bulk storage unit illustrated in FIG. 1;

FIGS. 4A and B are flow-charts illustrating the software procedures used by the central management system and the jukebox respectively in managing the song library of the jukebox; and

FIG. 5 is a flow-chart illustrating the specific operation of the jukebox in interfacing with a user.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

In accordance with the present invention as shown in FIG. 1, a central management system 11 monitors and updates the available selection of music at a number of remotely located jukeboxes such as a jukebox 13. Particularly, the central management system 11 monitors each jukebox 13 to determine the number of times each song has been played. From these numbers, the central management system 11 can calculate the royalty payments that are due. More importantly, the central management system 11 can identify those specific songs which need to be replaced in each jukebox on an individual basis, the central management system communicating replacement songs to each jukebox 13 to update the available music selection therein as needed.

Each jukebox 13 is basically a computer having sophisticated audio production capability wherein each computer jukebox 13 is programmed to play songs that have been digitally compressed and stored in a large-volume data storage unit 93. The storage unit 93 may be a optical memory or any other available large volume nonvolatile computer memory that provides both read and write access.

The central management system 11 communicates with each computer jukebox 13 via a transmission link 15. The central management system 11 and each jukebox 13 use respective modems 17 and 19 to maintain serial communication on the transmission link 15. The transmission link 15 may be a cable system such as public or private telephone lines or the like. However, the modems 17 and 19 may be replaced with RF (radio frequency) transceivers and associated antennas. In the latter instance the transmission link 15 is an RF link.

Specifically, the central management system 11 includes a host computer 21 which maintains a master library 23 of songs and associated graphics which are stored in a compressed digital form in a bulk storage unit 25. The bulk storage unit 25 is capable of storing vast amounts of digital data, and may be take the form of a read-write optical storage device. The host computer 21 indexes the master library 23 by using a master catalog 27 which is also maintained in the bulk storage unit 25.

The master catalog 27 stores a song record 29, as illustrated in FIG. 2, for each song stored in the master library 23. Each song record 29 associates information in the following fields: a) a title field 31, containing the name of the song; b) a classification field 33, containing the type of music, i.e., country, pop, jazz, classical, etc.; c) a song address field 37, containing the beginning address in the bulk storage unit 25 of the compressed digital data of the song; d) a song size field 39, containing the number of bytes in length of the compressed digital data; e) a graphics address field 41, containing the beginning address in the bulk storage unit 25 of the compressed digital data of a graphics image, if any, to be associated with the song; f) a graphics size field 43, containing the number of bytes in length of the compressed graphics image; and g) a play count field 45, containing a count which indicates the number of times this specific song has been played. By parsing the master catalog 27, the host computer 21 can quickly locate all available information relating to any available song. The master catalog 27 also stores data particular to each jukebox such as the number of times each available song has been played, the coin intake for that jukebox, etc.

The data particular to each jukebox is uploaded from the jukebox to the central management system 11 to update the master catalog 27.

Returning to FIG. 1, in order to add to the master library 23 and associated master catalog 27, the host computer 21 receives, has compressed and stores in the bulk storage unit 25 digital data representing the new song and associated pictorial graphics. The host computer 21 receives the digital data for storage from three sources: 1) a compact disc read only memory (CDROM) reader 51, which reads CDROMs; 2) a graphics scanner 53, which digitizes pictorial graphic images; and 3) an analog to digital (A/D) reader/converter 55, which reads analog data from both tapes and records and then converts the analog data into digital data. A compression circuit 52 using an adaptive-delta, pulse-code-modulation compression scheme compresses the digital data before it is stored. Other compression schemes may also be used. The compression circuit 52 might also be fully replaced by a software algorithm which is executed by the host computer 21.

FIG. 3 more specifically illustrates the operation of the host computer 21 in adding new songs to the master library 23. At a block 61, the user is initially prompted by the host computer 21 to enter a new song title and category. The host computer 21 writes this information into the title field 31 and classification field 33 of a new song record 29 at a block 63. Next, at a block 65, the host computer 21 prompts the user to place either a CDROM into the reader 51 or a record or tape into the reader/converter 55. After the user has completed this placement, at a block 67 the host computer 21 identifies available storage space in the bulk storage unit 25 by analyzing the space in use as described in the current list of song records 29 in the master catalog 23. The beginning address of this available storage space is placed in the song address field 37 of the new song record 29. Thereafter, at a block 69, the host computer 21 provides a read enable signal on a bus 50 to either the reader 51 or reader/converter 55. Either the reader 51 or reader/converter 55 responds by reading and sending digital data representing the new song to the host computer 21 via the bus 50. Utilizing a bus 54, the host computer 21 forwards the digital data received to the compression circuit 52, receives compressed digital data from the compression circuit 52 and writes the compressed digital data into the bulk storage unit 25. At a block 71, upon reaching the end of the digital data output, i.e., the end of a song, the host computer 21 writes the byte length of the digital output into the song size field 39.

The host computer 21 at a block 73 prompts the user to load a picture, such as an album cover, into the graphics scanner 53. At a block 75, the host computer 21 identifies further available storage space in the bulk storage unit 25 and places the beginning address thereof into the graphics address field 41. Once a picture is loaded, the host computer 21 at block 77, using the bus 50, provides a read enable signal to the scanner 53 which responds via bus 50 by digitizing the picture and transferring the digitized output to the host computer 21. At a block 79, using the bus 54, the host computer 21 forwards the digitized data of the picture to the compression circuit 52, receives compressed digitized data from the compression circuit 52, and writes the compressed digitized data into the bulk storage unit 25. At a block 81, upon reaching the end of the digitized output, i.e., the end of the picture, the host computer 21 places the byte length of the digitized output into the graphics

size field 43. Finally, at a block 83, the host computer 21 sets the play count field 45 to zero (0). This flow-chart is repeated as necessary until all of the new songs are added to the master library 27. It is noted that the operator can also delete, modify or replace any specific song record 29 found in the master catalog 23 and master library 27.

Returning to FIG. 1, each computer jukebox 13 plays songs and displays graphics which are stored locally in the large-volume data storage unit 93. The storage unit 93 of the jukebox 13 contains a subset of the songs found in the master library 27 maintained by the central management system 11. More specifically, the storage unit 93 of the jukebox 13 stores a song library 91 which is a corresponding subset of the master library 27. The song library 91 contains all of the currently available song selections and associated pictorial graphics for the jukebox 13. The storage unit 93 also stores a catalog 95 that is an index into the local song library 91. The catalog 95 is similar to the master catalog 23. Both the song library 91 and associated catalog 95 are monitored and updated by the central management system 11 as needed via the transmission link 15. The jukebox 13 permits this monitoring and updating at any time with no impact on its end-user performance.

The jukebox 13 also includes a processing circuit 121 which contains a microprocessor 121A, read only memory (ROM) 121B and random access memory (RAM) 121C. As in conventional computer systems, the microprocessor 121A operates in accordance with the software program contained in the ROM 121B and utilizes the RAM 121C for scratch-pad memory. The processing circuit 121 may also contain a decompression circuit (not shown) or may perform decompression using a software algorithm stored in the ROM 121B depending on the type of data compression scheme used by the central management system 11. In either case, decompression is necessary to decompress the compressed data received from the central control system 11 so that the song can be played and associated graphics image displayed.

The processing circuit 121 controls the operation and flow of data into and out of the jukebox 13 through the modem 19 via a bus 124. Using the bus 124, the processing circuit 121 also controls a visual display 125, one or more selection keys 123 and a coin/bill detector 126 to provide the user with an interactive interface to the jukebox 13. The keys 123 provide signals representing user inputs such as displayed song selection. The display 125 displays alpha numeric information as well as pictorial graphics to interface with the user. The coin/bill detector 126 is responsive to one or more coins or bills input by a customer to determine whether the proper amount of money has been input and to provide money detect signals coupled to the processing circuit. The processing circuit 121 further controls, via the bus 124, an audio reproduction circuit 127 coupled to a speaker system 129 along a bus 131 to provide an audio output to the user.

FIGS. 4A and 4B are flow-charts illustrating the software procedures respectively used by the central management system 11 and the jukebox 13 in managing the song library 91 of the jukebox 13. At a block 101, the central management system 11 initiates communication with one of the jukeboxes 13 via the transmission link 15. Immediately thereafter, at a block 103, the management system 11 requests that the jukebox data be sent including a copy of the catalog 95. At a corre-

sponding block 141, the jukebox 13 responds by sending the copy of the catalog file as well as other jukebox data including total money intake over a period of time. The data sent from the jukebox to the management station may also include customer requests for new songs, a customer utilizing the display and keyboard of the jukebox 13 to enter song request data as discussed below. Thereafter, at a block 105, by examining each play count field 45 in the copy of the catalog 95 received, the management system 11 determines the royalty amount due per song and whether to replace or update specific song entries stored in the jukebox 13. The management system 11 also determines the total money intake from the play count information and compares this value to the total money intake value received from the jukebox to provide a check. At an inquiry block 107, if no replacements are necessary, the management system 11 branches to a block 109 to terminate communication with the jukebox 13. If, however, replacements are necessary, the management system 11 branches to download the changes. Particularly, at a block 111, the management system 11 downloads to the jukebox 13 the song records 29 of both the song to be replaced and the replacement song. In a corresponding block 143, the jukebox 13 replaces the song record 29 in the catalog 95. Thereafter, the jukebox 13 identifies available storage space in the storage unit 93 based on the song size field 39 of the new song, and writes the beginning address thereof into the song address field 37 in a corresponding block 145. Afterwards, at a block 113, the central management system 11 downloads the compressed digital data of the song to the jukebox 13. At a corresponding block 147, the jukebox 13 receives and writes the data into the song library 91. Next, at a corresponding block 149, the jukebox 13 identifies available storage space in the storage unit 93 based on the graphics size field 43, and writes the beginning address thereof into the graphics address field 41 of the new song. Thereafter, at a block 115, the management system 11 downloads the compressed digitized data of the picture to the jukebox 13. The jukebox, at a corresponding block 151, receives and writes the data into the song library 91. Finally, the block 107 is again encountered. If further replacements need to be made, the blocks 111, 113 and 115 are repeated until complete. At a corresponding block 153, the jukebox similarly repeats the corresponding blocks 143 through 151 until no further replacements need to be made. A further block placed immediately above the block 107 may also be used, wherein the central management system 11 sends a delete, modify, add or replace command to the jukebox 13 before downloading into the song library 93. In this way, the management system 11 receives additional flexibility in updating the jukebox 13. It is noted that the jukebox 13 can also initiate communications with the management system 11 at predetermined times or if the jukebox determines that an event has occurred that the management system 11 should be aware of.

FIG. 5 is a flow-chart illustrating the specific operation of the processing circuit 121 of the jukebox 13 in interfacing with the user. At a block 161, if no song selection is playing, the processing circuit 121 operates in a user attract mode, displaying a random sequence of available graphic images on the visual display 125. More particularly, the processing circuit 121 randomly selects a starting address of the compressed graphics data from the available song records 29 in the catalog 95. From that starting address, the circuit 121 retrieves

the data from the song library 91 via the bus 124. The circuit 121 decompresses and transfers the data along the bus 124 to the visual display 125 for display. Thereafter, the circuit 121 again randomly selects a starting address of available graphics data and this cycle repeats. 5 If, however, a song selection is being played when the block 161 is encountered, the attract mode sequencing does not occur. Instead, the circuit 121 displays the associated graphics image of the song being played on the display 125. During the attract mode the processing 10 circuit 121 may also control the display 125 to present a prompt requesting customers to enter new song requests. The new song request data entered by a customer using the keyboard is stored and uploaded to the management system 11 to aid the system 11 in determining 15 whether new song data should be downloaded to the jukebox.

At a block 163, the processing circuit 121 responds to a signal indicating user interest from the selection keys 123 by providing on the display 125 those music categories, i.e., country, rock, jazz, etc., found in the catalog 95. At a block 165, the circuit 121 responds to a signal indicating a category selection from the keys 123 by providing on the display 125 an index of available songs, arranged alphabetically either by artist or title, which 25 can be scrolled and selected using the keys 123. Upon selection of a specific song, the circuit 121 encounters an inquiry block 167. If at the block 167 the circuit 121 determines from the signal received from the money detector 125 that a sufficient amount of money has not been deposited, a branch to a block 169 occurs. At the block 169, using the display 125, the circuit 121 prompts the user to deposit money into the coin/bill detector 126, then branches back to the block 161. However, if sufficient moneys have been deposited, the circuit 121 35 branches to a block 171 wherein the circuit 121 updates the play count field of the selected song's record in the catalog file 95 and money intake data stored in the memory. The circuit also places the song record 29 corresponding to the selected song into a queue of song records to be played. After the selection is queued, the circuit 121 encounters an inquiry block 153. If the total number of selections purchased have been selected, the circuit 121 branches back to the block 161. Otherwise, if 45 further purchased selections are forthcoming, the circuit 121 branches back to the block 163. In this manner, all of the selections are made and placed in the queue. Upon completion of playing a queued-up, selected song, the circuit 121 removes the corresponding song record 29 from the queue, selects the next song record in the queue, begins to play that next song, and executes the block 161. It is noted that the song queue can be displayed on the display 125 in order to show customers what songs have already been selected prior to making their selection. 55

More specifically, referring back to FIG. 1, once a specific song has been selected and queued-up, the processing circuit 121 first identifies the beginning address of the compressed digital data from the song address field 37 of the song record 29 in the queue. From this 60 address, using the bus 124, the circuit 121 reads the compressed digital data out of the storage unit 93, decompresses that data, and sends the decompressed digital data to the audio reproduction circuit 127. The audio reproduction circuit 127, commonly found in CDROM 65 readers and associated amplifiers, converts the digital data to an analog signal which is amplified and used to drive the speaker system 129 via the bus 131. After a

selected song finishes playing, the processing circuit 121 deletes the song record 29 of the selected song from the queue, increments the play count field 45 associated with that song in the catalog 95, and begins playing the next selected song in the queue if any exists. The process set forth in the flow-chart detailed in FIG. 5 is then repeated.

While the present invention is being described and illustrated in accordance with the preferred embodiment enabling new recordings and computer usage data to be transferred via the transmission line 15, the monitoring and updating may also be directly transferred. In this latter embodiment, routemen physically visit the location of each computer jukebox 13. During these visits, the routemen carry a portable management system 181 which has only a subset of potential replacement songs stored in a subset library and associated catalog (not shown) on a portable bulk storage unit 183. The subset library is loaded by the portable management system 181 onto the portable bulk storage unit 183 either directly from the bulk storage unit 25 or indirectly as is initially done by the central management system 11 (described above). In all other ways, the portable management system 181 operates the same as the central management system 11, collecting the catalog 95 of each jukebox 13 and updating or replacing as necessary. To accomplish this, the portable management system 181 communicates at a very high rate of speed with the jukebox 13 via a parallel communication link 185 and a direct memory access (DMA) link 187. 30

Additionally, the routemen may simply exchange the "old" storage unit 93 with a pre-loaded storage unit (not shown). The central management system 11 may later read the "old" storage unit 93 to gather the information from the catalog 95. Such an embodiment still enjoys the other advantages made possible by the computer jukeboxes 13 described herein.

Additionally, it is to be understood that the embodiments of the present invention described hereinabove are merely illustrative and that other modifications and adaptations may be made without departing from the scope of the appended claims.

We claim:

1. A computer jukebox capable of being updated upon the receipt of digital data representing a plurality of songs, data representing the identity of each of said songs and data representing the amount of storage space necessary to store said digital song data in said jukebox, comprising:

- 50 song selection means actuatable by a user for generating a signal representing a song selected from a plurality of songs stored in said jukebox;
- a programmable computer memory storing digital data representing each selectable song stored in said jukebox and a catalog file including data for each stored song representing the identity of said song and the location in said computer memory of the digital data representing said song;
- a communication interface for receiving said digital song data, said song identity data and said storage space data;
- audio speakers;
- a digital to analog converter coupled between said song storing computer memory and said audio speakers to convert digital song data to an analog signal coupled to said speakers; and
- 55 processing means responsive to a song selection signal for accessing said digital data representing a

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selected song from said computer memory to apply said song data to said digital to analog converter and said processing means being responsive to digital song data, song identity data and storage space data received by said communication interface to control the storage of said digital song data to update said jukebox.

2. A computer jukebox as recited in claim 1 wherein said song selection means includes means for displaying information identifying each song stored in said jukebox, said processing means being responsive to said catalog file data to control the information displayed on said display means to represent said updated jukebox song selections.

3. A computer jukebox as recited in claim 1 wherein said communication interface includes a modem.

4. A computer jukebox as recited in claim 1 wherein said communication interface includes a radio frequency receiver.

5. A computer jukebox as recited in claim 1 wherein said communication interface includes a direct communication interface port.

6. A computer jukebox as recited in claim 1 further including a money intake device, said device generating a money detection signal upon the receipt of money intake of a predetermined amount, said processing means being responsive to said money detector signal to update a money intake memory location in said computer memory, said location storing data representing the total intake of money for said jukebox over a period of time, said communication interface including means for transmitting said money intake data to a remote location under the control of said processing means.

7. A jukebox network comprising: a plurality of computer jukeboxes, each jukebox including

a programmable computer memory storing digital data representing a plurality of selectable songs and data for each stored song representing the identity of said song and the location in said computer memory of the digital data representing said song;

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a song selection device actuatable by a user to select a song stored in said memory;

a communication interface for receiving and transmitting digital data including digital song data; and processing means responsive to a song select signal for controlling the accessing of song data stored in said memory to control the playing of a song and to store song usage data in said memory, said processing means being responsive to the receipt of digital song data by said communication interface to control the storage of said song data in said computer memory;

a management station for updating said plurality of jukeboxes, said management station including a communication interface for receiving and transmitting data and a host processing means for controlling the transmission of digital song data to a computer jukebox to update the jukebox, said management station being operative for selectively transmitting digital song data to different ones of said jukeboxes in response to song usage data received from a respective jukebox.

8. A jukebox network as recited in claim 7 wherein said management station is remote from said plurality of jukeboxes and the communication interface of said management station and each jukebox provides a two way communication link between said remote management station and said jukebox.

9. A jukebox network as recited in claim 7 wherein said management station is portable.

10. A jukebox network as recited in claim 9 wherein said communication interface of said management station and a jukebox provides a direct connection between said station and said jukebox.

11. A jukebox network as recited in claim 7 wherein said song usage data comprises a play count for each song on a jukebox, said play count corresponding to the number of a song has been played on respective jukebox.

12. A jukebox network as recited in claim 7 wherein said processing means processes said song usage data to determine which songs should be replaced on a respective jukebox.

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Reexam Control No. 95/001,274**



US005481509A

United States Patent [19]
Knowles

[11] **Patent Number:** **5,481,509**
[45] **Date of Patent:** **Jan. 2, 1996**

[54] **JUKEBOX ENTERTAINMENT SYSTEM INCLUDING REMOVABLE HARD DRIVES**

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[75] **Inventor:** Norman Knowles, Richmond, Canada

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Attorney, Agent, or Firm—Christensen, O'Connor, Johnson & Kindness

[21] **Appl. No.:** 308,747

[57] **ABSTRACT**

[22] **Filed:** Sep. 19, 1994

[51] **Int. Cl.⁶** G11B 17/22

An audio/video jukebox has a plurality of hard disc drives each having digital audio/video data corresponding to a plurality of audio/video titles stored thereon. A computer system reads data corresponding to a selected audio/video title from the disc drives and converts the data to an analog audio and video signal. The video signal is applied to a television monitor while the audio signal is coupled to a karaoke-type audio amplifier. The jukebox further includes a video tape recorder and a video camera that allows a user to record a video image. A microphone can be coupled to the karaoke-type audio amplifier so that the user can sing along with a selected audio/video title. The jukebox allows a user to view lists of titles stored on the hard disc drives by format (music, karaoke and video) as well as by genre (new titles, rock/pop, comedy, and country).

[52] **U.S. Cl.** 369/30; 340/825.35

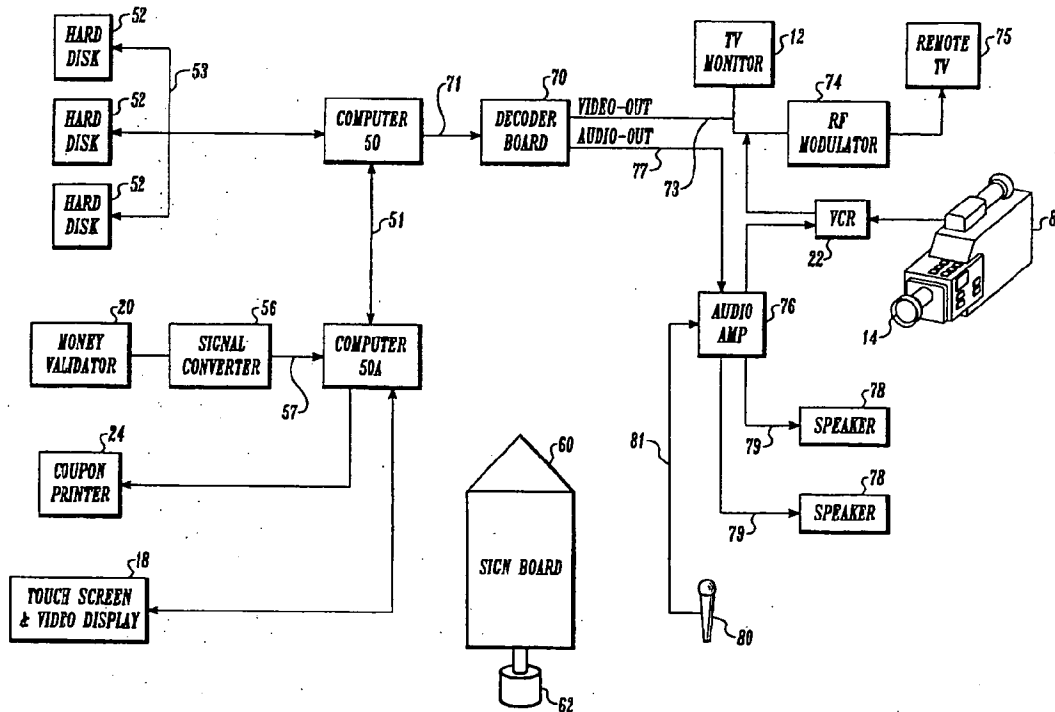
[58] **Field of Search** 369/30, 32, 36,
369/27, 38, 39, 34, 11, 12; 84/609, 625;
360/55, 92, 33.1, 137, 12; 194/217, 239;
358/335; 340/825.35; 379/67-68

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16 Claims, 7 Drawing Sheets



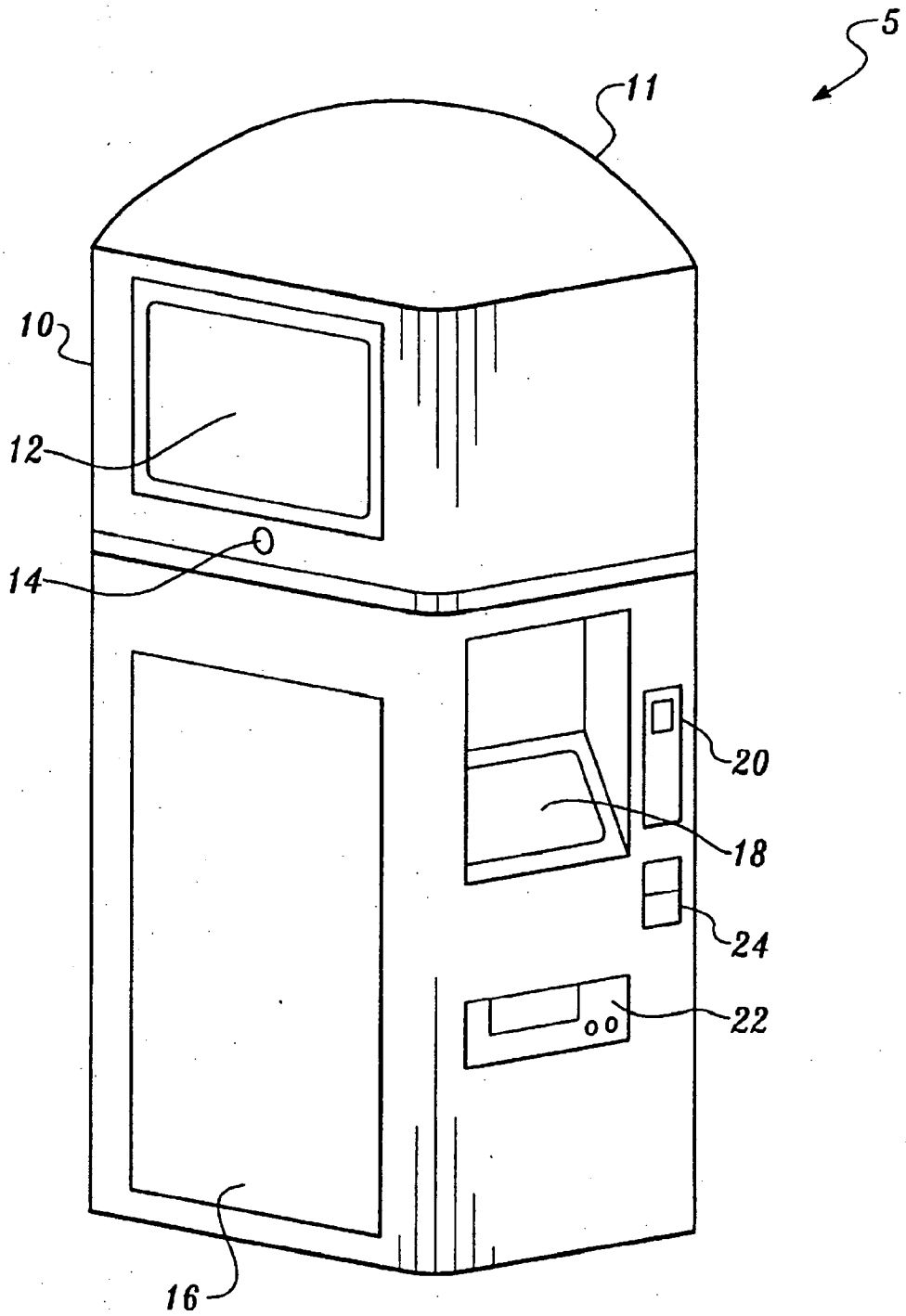


FIG. 1.

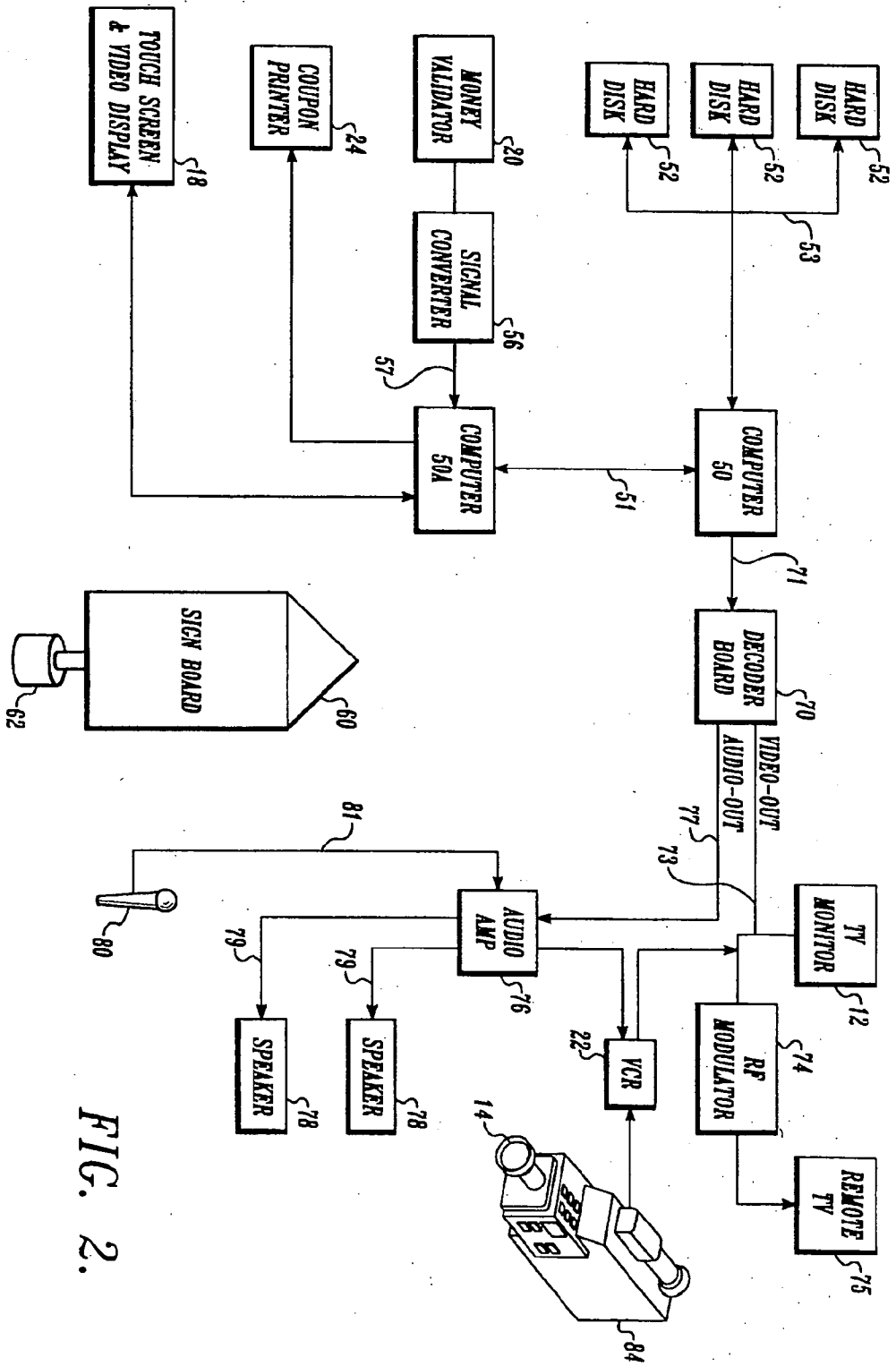


FIG. 2.

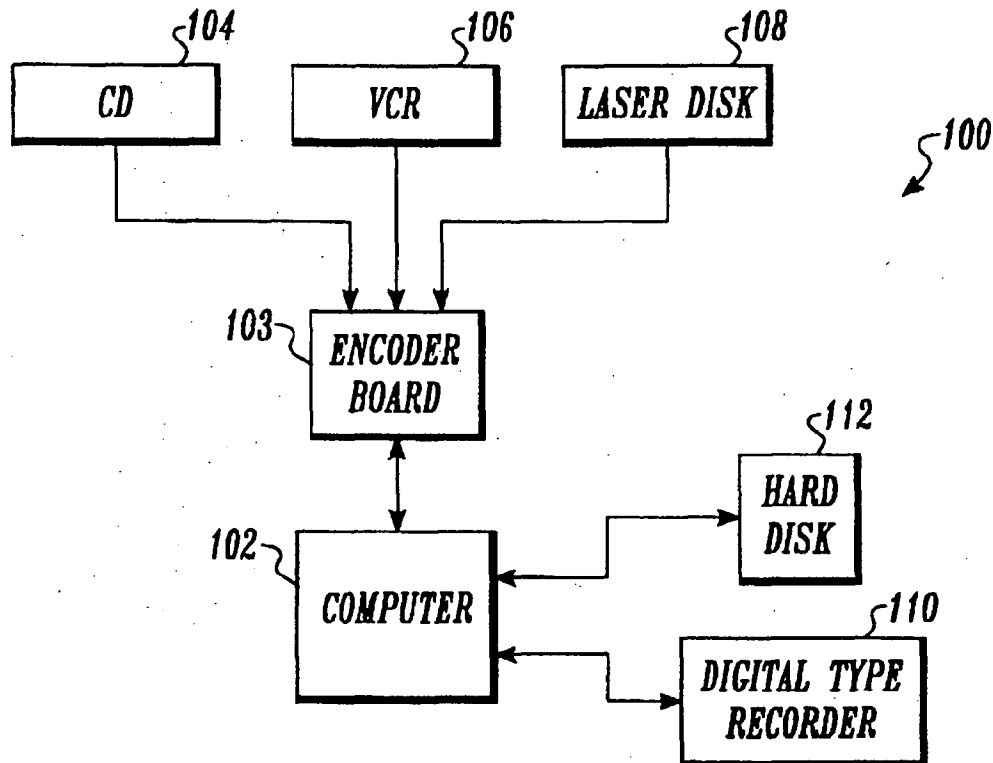


FIG. 3.

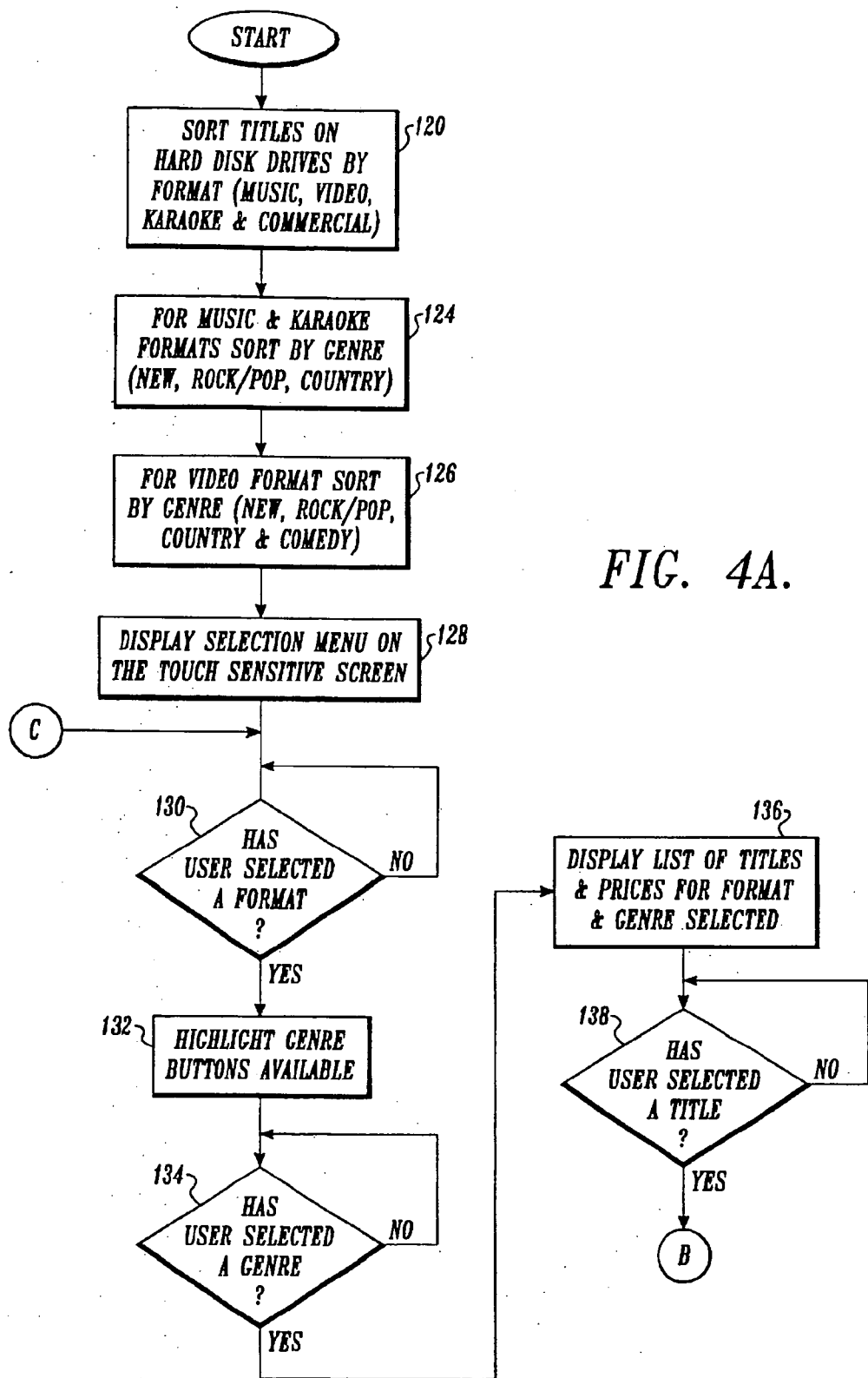


FIG. 4A.

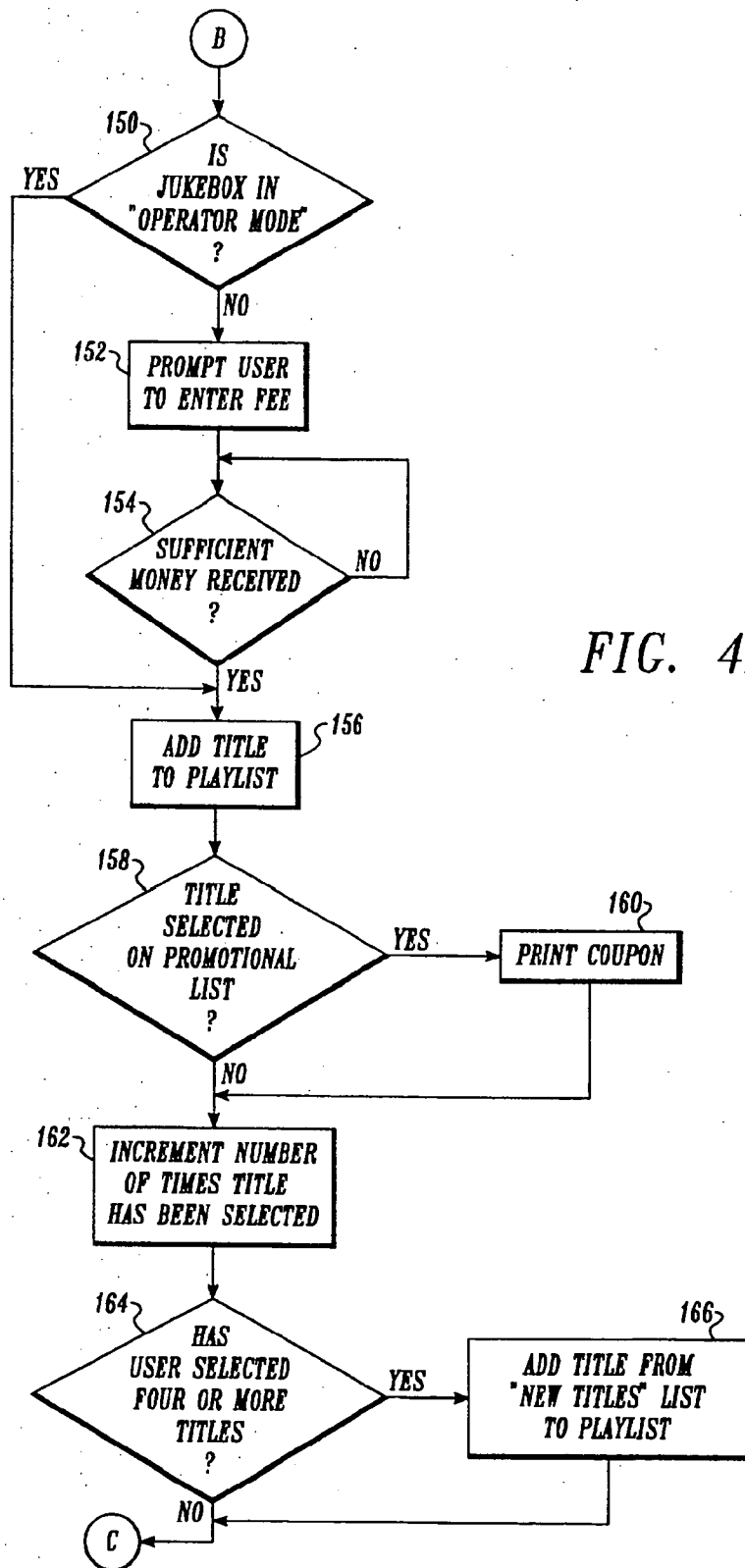


FIG. 4B.

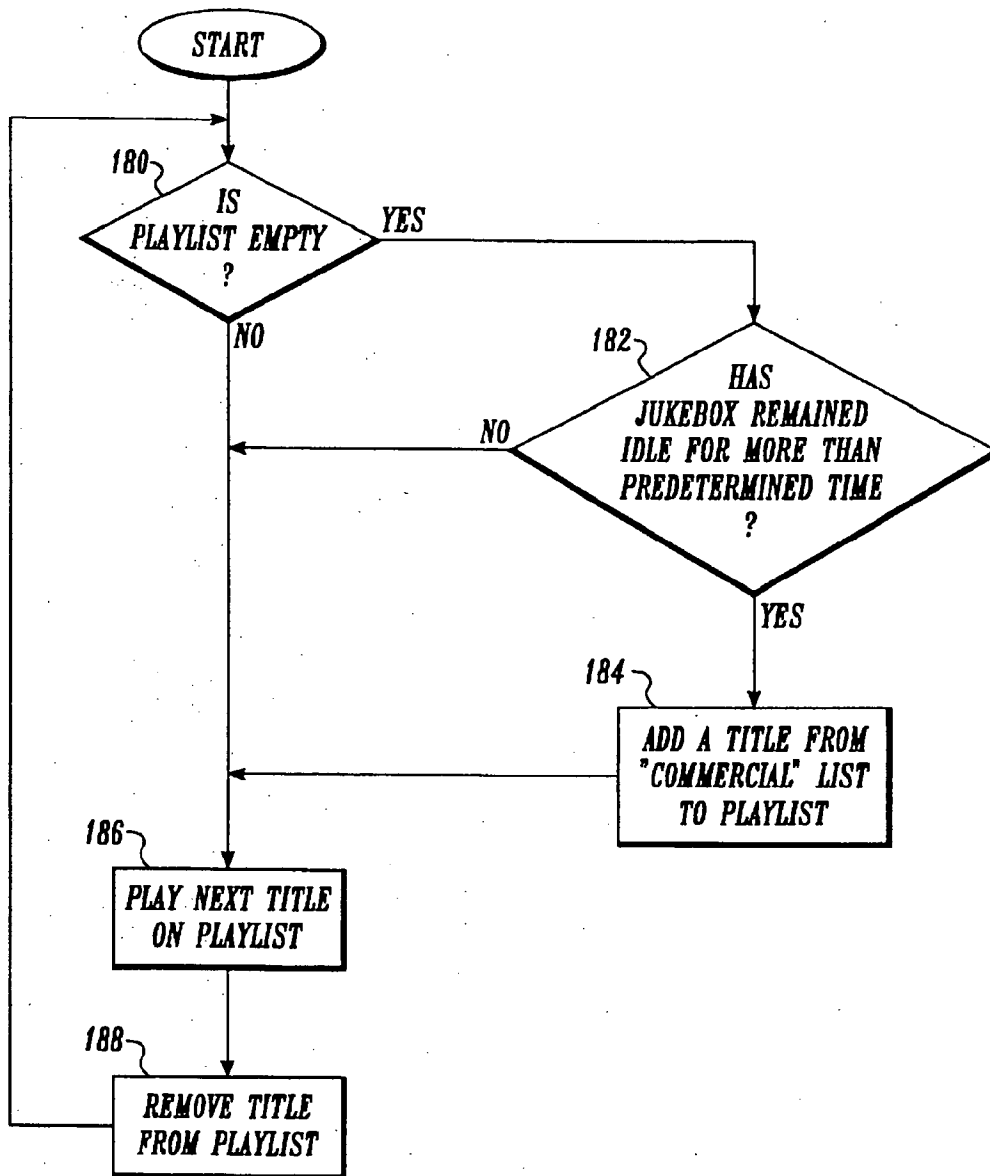


FIG. 4C.

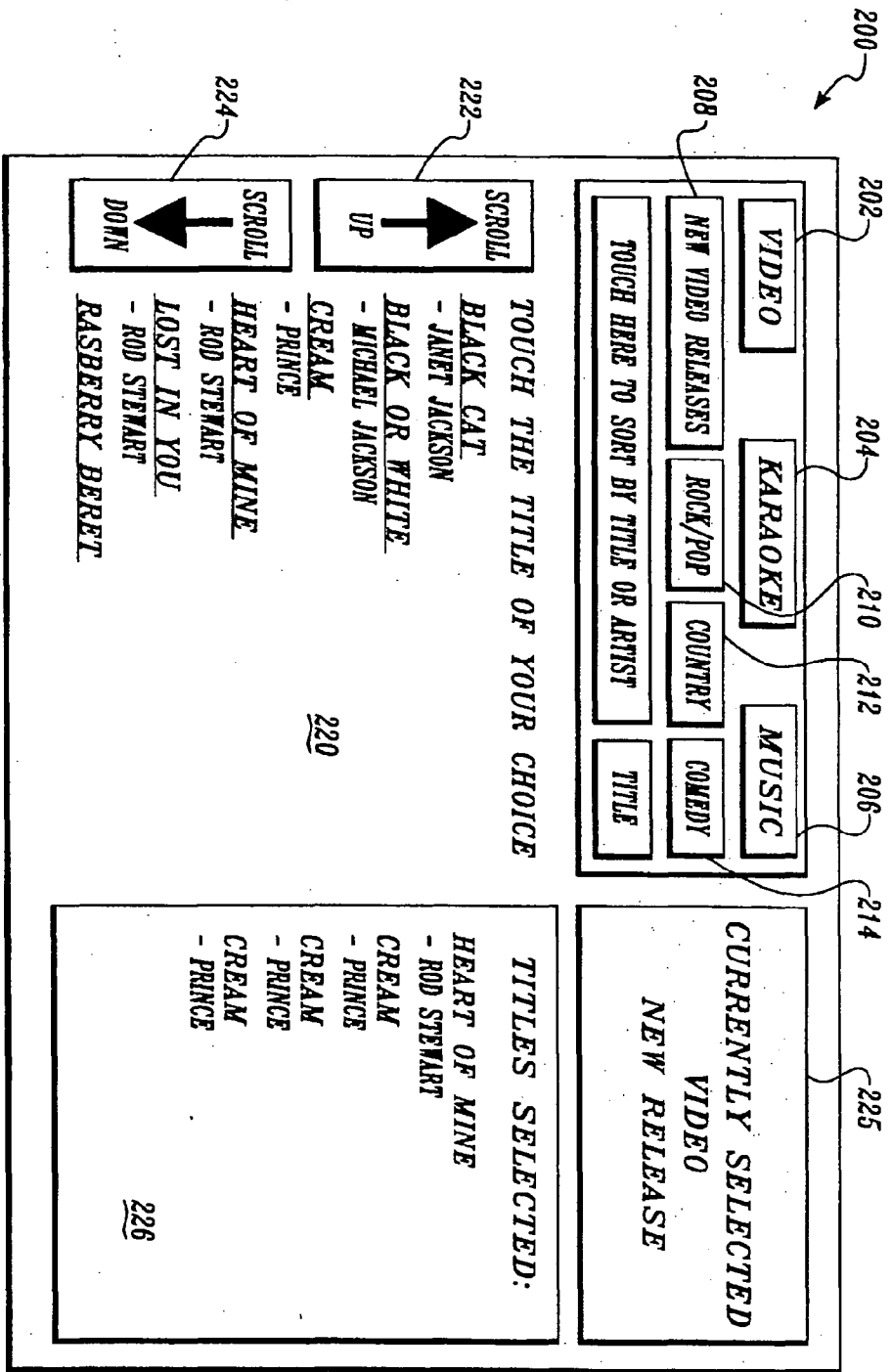


FIG. 5.

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JUKEBOX ENTERTAINMENT SYSTEM INCLUDING REMOVABLE HARD DRIVES

FIELD OF THE INVENTION

The present invention relates to entertainment systems in general, and in particular to jukebox entertainment systems.

BACKGROUND OF THE INVENTION

Despite recent advances in music recording and computer technology, the typical jukebox of the type found in bars, entertainment areas, and the like, has changed little since coin operated record players were first introduced. The failure of prior art jukebox systems to take advantage of modern technology, as well as their high cost of maintenance and repair, has contributed to a significant decline in the popularity of the jukebox as an entertainment system.

Even though modern jukeboxes have replaced old 45 rpm records with digital CDs, all modern jukeboxes still utilize complex CD changing mechanisms that move a selected disc from a storage rack to a CD player after the user has deposited a predetermined amount of money. The changing mechanisms are the most common cause of jukebox failure and the most expensive part to repair. There is therefore a need for a jukebox system that operates without a changing mechanism in order to increase reliability and decrease the need for periodic maintenance.

Another problem with prior art jukeboxes that has contributed to a decline in their popularity is a failure to take advantage of currently available entertainment formats. In the past, a jukebox could play only audio selections. However, now the public is demanding to see music videos that show the artists performing an audio selection or a display of other visual images as the audio selection is played. To meet the desire of customers who want to see such music videos, many entertainment establishments such as bars or dance clubs often play music video cable channels on one or more TV monitors located throughout the establishment. The disadvantage of this is that a user cannot select what music video he or she is shown and must endure any commercial interruptions shown by the cable channel.

One other type of currently popular entertainment not provided by prior art jukeboxes is karaoke. In karaoke, a participant sings the words of a song as they are displayed on a video screen while the background music to the song is played through a loudspeaker system. In the past, if a club wanted to provide karaoke entertainment it was necessary to purchase a separate karaoke system. Not only does this result in extra equipment that must be purchased and maintained, but a separate karaoke system typically requires an additional operator to play selections. Therefore, there is a need for a jukebox system that allows a user to enjoy these newer types of entertainment.

SUMMARY OF THE INVENTION

The present invention is an audio/video jukebox entertainment system that allows a user to enjoy both audio and video forms of entertainment. The jukebox system includes a first computer system having one or more hard disc drives coupled thereto, each of which has digital audio/video data stored thereon. A second computer system is networked with the first computer system and provides a selection means to allow a user to select one or more audio/video titles to be played. Once a user has selected an audio/video title, the selection is transferred to the first computer system which in

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turn reads the corresponding audio/video data from the one or more hard disc drives. A decoder is coupled to the first computer system for convening the digital audio/video data that has been read from the one or more hard drives to an analog audio/video signal. The analog video signal is supplied to an input of a television monitor in order to display the analog video signal. The analog audio signal is supplied to a karaoke-type audio amplifier that drives one or more loudspeakers in order to convert the amplified audio signal to sound.

The audio/video jukebox further comprises a video cassette recorder having a video output coupled to the television monitor and an audio output coupled to the karaoke-type audio amplifier. A video camera is also provided to allow a user to record his or her image onto a video tape. A microphone that is connectable to the karaoke-type audio amplifier is also provided. The microphone allows a user to sing along with a karaoke song played on the jukebox.

The jukebox may also include a coupon printer that is coupled to the second computer. As certain titles are chosen, a discount coupon to promote the sale or rental of an item associated with the title will print out.

The second computer system in the audio/video jukebox sorts and displays the audio/video data stored on the hard drives by format and genre. Each selection on the jukebox is sorted according to whether the selection is audio only, video (i.e., includes both a video image and accompanying audio), or karaoke (i.e., includes a video image and background audio). Within each type of format, each selection is sorted by genre, such as new selections, rock/pop, country, and comedy. The sorting functions allow a user to quickly view their favorite titles stored in the jukebox without having to read a single list of all the titles available.

The first computer system includes means for determining whether the jukebox has sat idle for more than a predetermined amount of time, and if so, causes a commercial to be played.

BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing aspects and many of the attendant advantages of this invention will become more readily appreciated as the same becomes better understood by reference to the following detailed description, when taken in conjunction with the accompanying drawings, wherein:

FIG. 1 is an isometric view of the audio/video jukebox according to the present invention;

FIG. 2 is a block diagram of the audio/video jukebox according to the present invention;

FIG. 3 is a block diagram of a computer system used to record audio/video data on a hard disc drive or a digital tape;

FIGS. 4A-4C are a series of flow charts showing the logic implemented by the computer systems within the audio/video jukebox according to the present invention; and

FIG. 5 is a screen display showing a selection menu produced by the audio/video jukebox system of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to FIG. 1, the audio/video jukebox system 5 according to the present invention is housed in a generally rectangular cabinet 10 having a front face, a rear face and two opposing side faces. The front and rear faces are slightly wider than the side faces of the cabinet. The cabinet has a rounded cover or dome 11.

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A television monitor 12 is disposed in the front face of the jukebox 5. A lens 14 of a video camera (not shown) is mounted substantially flush with the front face of the jukebox at a position below the center of the television monitor 12. Below the lens 14 is a commercial display 16 that can

On the right side face of the cabinet 10 is a touch sensitive computer display screen 18, a money validator 20, a video cassette recorder 22, and a coupon printer 24. The touch sensitive screen 18 lies recessed in the cabinet such that a front face of the computer display screen points upwardly so as to be easily read by a user. To the right of the touch sensitive screen 18 is the money validator 20. The money validator is mounted substantially flush with the side face of the cabinet. Below the touch screen 18 and the money validator 20 is the video cassette recorder 22. Below the money validator 20 is the coupon printer 24. The operation of each of the above-described components will be described in further detail below.

Referring now to FIG. 2, the audio/video jukebox of the present invention includes a pair of networked computer systems 50 and 50A. As will be described in further detail below, the computer system 50 is used to play digital audio/video data stored in the jukebox, while the computer system 50A allows a user to make selections of the titles which the user chooses. Each computer system 50 and 50A contains a network card (not shown) that allows the computers to communicate over a bus 51. In a representative embodiment, both computer system 50 and computer system 50A can be 486 IBM computer compatible.

Coupled to the computer system 50 by a set of common bus lines 53 are one or more hard disc drives 52. In addition to storing a computer program that causes the computer system to operate the jukebox, the hard disc drives store the titles that can be played on the jukebox. Preferably the hard drives 52 can be easily disconnected from the computer system 50 and removed from the jukebox so that the audio/video titles available on the jukebox can be easily updated by simply swapping the old hard drives with a new set of hard drives having new audio/video titles stored thereon.

Coupled to the computer system 50A is the money validator 20 and a signal converter 56. The money validator 20 receives currency from the user and generates an electrical signal each time a predetermined amount of currency has been received. The money validator 20 is a commonly available part, model number GL5, available from Mars Electronics International of 1301 Wilson Drive, West Chester, Pa. 19380 USA. The output signal produced by the money validator is coupled to a signal converter 56 model number MR2000KB, available from Specialized Digital Micro Systems, Ltd. of Richmond B.C., Canada. The signal converter produces an output signal on a lead 57 that is coupled to a keyboard input of the computer system 50A. The signal converter 56 is placed between the money validator and a keyboard input of the computer system. The signal converter 56 receives the electrical output signal produced by the money validator 20 and translates it to a serial ASCII signal representing a keyboard stroke that would be produced by a conventional computer keyboard. In the present embodiment of the invention, the signal converter 56 converts the electrical output signal from the money validator 20 to an ASCII "m" code and applies the code to the keyboard input of the computer system. Each time a minimum amount of money is received by the money

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validator (e.g., 25¢ or \$1), the "m" signal is produced by the signal converter 56 to be read by the computer system 50A. The computer system 50A counts the number of "m" signals to determine when a sufficient amount of money has been received from a user in order to allow a selection on the jukebox to be played.

The touch screen 18 is coupled to the computer system 50A in a conventional manner, thereby allowing the computer system to present the user with a menu including directions for operating the jukebox system as well as a list of audio/video titles that can be selected.

The jukebox system further includes a commercial display 16 that comprises either a single backlit poster as shown in FIG. 1 or could comprise a rotating sign board 60 as shown on FIG. 2. The rotating sign board 60 is a rotatable mechanism having a triangular frame that presents one of three different images to the front of the jukebox. If the rotating sign board 60 is used, a motor 62, and an appropriate drive system (not shown) is placed at the bottom of the jukebox. The motor 62 rotates the sign board 60 at the appropriate intervals.

Also coupled to the computer system 50A is the coupon printer 24 that is used by the jukebox system to print coupons for items when a particular audio/video selection is made. For example, the jukebox may print a coupon for a CD when a song from the CD is selected by a user. As will be described below, the information concerning the coupon such as the discount amount, the expiration date, the redeeming merchant etc., is stored on the hard disc drives along with the digital audio/video data that comprises the selection.

To convert the digital audio/video data stored on the hard disc drives 52 to an analog signal that can be displayed on a television monitor or played through a set of speakers, the jukebox system includes a decoder board 70. In the presently preferred embodiment of the invention, the decoder board 70 comprises a PC Motion Digital Video Player available from Optibase Inc. of Dallas, Tex. and Optibase Ltd. of Herzliya 46120 Israel. The decoder board 70 is coupled to the computer system 50 by one or more leads 71 to receive the digital audio/video data that is read from the hard disc drives 52. The decoder board 70 converts the digital audio/video data to an analog video-out signal on a lead 73 and an analog audio-out signal on a lead 77. The video-out signal is coupled to the television monitor 12 in order to display the analog video signal on the front of the jukebox. The jukebox also includes an rf modulator 74 coupled to the lead 73. The rf modulator receives the video-out signal and produces a modulated television signal that can be used to further display the video signal on one or more remote televisions that may not be cable television compatible. As will be appreciated, the rf modulator 74 allows the jukebox 10 to drive additional televisions, such as a projection screen television, so that music videos played on the jukebox can be shown on a large screen such as those found in dance clubs.

The audio-out signal produced by the decoder board 70 is applied to an input of a karaoke-type, stereo audio amplifier 76. The audio amplifier 76 amplifies the analog audio-out signal to a sufficient power level in order to drive one or more speakers 78. The power requirements of the audio amplifier 76 are determined by the environment in which the jukebox is to be used. For example, in large bars or dance clubs, it may be necessary to provide an audio amplifier having high output power capabilities. In general, an amplifier having 100 watts per channel is sufficient to adequately play music in most environments.

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An optional microphone 80 can be coupled to the audio amplifier 76 by a lead 81. The microphone 80 is provided so that a user can sing along with the audio-out signal produced by the decoder board when a karaoke song is played. For example, if a karaoke song is played on the jukebox, a background video image including the words of the song is displayed on the television monitor 12, while the audio background music (lacking a vocal track) is played through the speakers 78. The microphone 80 allows a user to sing the words to the song and have his or her voice combined with the audio-out signal and played through the speakers 78.

As previously indicated, the jukebox includes a video camera 84 that is coupled to a video tape recorder 22 in a conventional manner. A video output of the video tape recorder 22 is coupled to the video-out line 73 of the decoder board 70 such that the user's image can be shown on the television monitor 12 or the one or more remote televisions 75. The user may use the video camera 84 and the video tape recorder 22 to record themselves performing a karaoke song or may simply record an image of themselves to send as a "video greeting."

FIG. 3 is a block diagram of a computer system 100 that is used in conjunction with one or more remotely located jukeboxes. The computer system 100 is preferably located at a central location and is used to store a catalog of titles that can be placed on the hard disc drives found in the jukeboxes. The computer system 100 comprises a central computer 102 coupled to an analog-to-digital encoder board 103. In the presently preferred embodiment of the invention, the encoder board 103 is an MPEG Lab Pro Digital Video Compression Board made by Optibase Ltd. of Israel. The encoder board 103 operates to convert an analog audio/video signal to a digital signal which is then compressed and stored on a hard disc or on a magnetic tape.

Coupled to the encoder board are numerous audio/video players that provide the analog audio/video signals. A conventional CD player 104 is used to play compact discs into the encoder board. A video tape recorder 106 is used to play video tapes of music videos and the like, while a laser disc player 108 plays audio/video information stored in the laser disc format.

As indicated, the encoder board 103 receives the analog signals from one of the audio/video players and converts the analog signals to digital signals in the MPEG format. The digital signals can be read by the computer 102 and stored on a magnetic tape or a hard disc drive. A digital tape recorder 110, coupled to the computer 102, is used to record the audio/video information that has been converted to the MPEG format onto a magnetic tape. Alternatively, the digital signals produced by the encoder board 103 can be stored directly on a removable hard disc drive 112.

In addition to storing the digital audio/video signals on the hard disc 112 or a digital tape recorder 110, the computer system 100 stores a list of all the titles that can be copied to a hard disc drive and placed in one of the remotely located jukeboxes. To record a compilation of titles on the hard disc drive 112, a user of the computer system 100 first inserts a new hard disc into the disc drive 112. The user then records digital audio/video data that is stored in the computer system 100 or read from one or more digital tapes. Once the disc drive has a sufficient number of titles stored on it, the disc drive can be placed in one of the remotely located jukeboxes.

When not used to record the digitized audio/video information, the central computer system 102 can read a hard disc drive that has been retrieved from a remote jukebox and print out a report indicating how many times each title has been played. By determining how often a song was played, the operator of the computer system 102 can determine

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whether to leave the title on the hard disc or to remove the title and replace it with a more popular title. The data indicating the number of times each selection was played is also useful for calculating the amount of royalties that must be paid to the respective copyright holders of the titles. The central computer system 102 stores the selection's title, artist, and producer, as well as a file name that is used by the computer systems within the jukeboxes to read the selection from their hard disc drives. Finally, if a coupon is to be printed when a user selects the title, the information contained on the coupon is also stored on the hard disc. As indicated above, this information may include the coupon's value, the redeeming merchant, the expiration date and other information.

FIGS. 4A-4C are a series of flowcharts that show the logic implemented by a computer program that runs the computers within each of the jukeboxes. The computer program implemented by the computers is started when a user first turns on the jukebox. The program begins by sorting each title stored on the one or more hard disc drives into a plurality of lists. Beginning at a step 120, the computer system 50 within each jukebox reads each title on the hard disc drive and sorts the titles into one of the four format categories. The formats currently include "music" only, "video," "karaoke" and "commercial" selections. The titles on the commercial format list are not available for selection by the user, but are used to inform the computer when a coupon should be printed. The titles in the "music," and "karaoke" format lists are further sorted by genre at step 124. For example, the music and karaoke format lists are broken into three sublists for "new" titles, "rock/pop" titles, and "country" titles. Titles in the video format list are sorted into four genre categories: "new," "rock/pop," "country," and "comedy" at a step 126.

Once the titles on the hard discs have been sorted into the format and genre lists, the computer system 50A displays a selection menu that includes a series of buttons listing the available formats on the touch-sensitive screen at a step 128. The program then causes the computer system 50A to determine whether a user has selected one of the available formats at a step 130. If not, the program loops at step 130 until such a selection is made.

Once the user has selected a format, the computer program causes one or more available genre buttons on the selection menu to be highlighted on the touch sensitive screen at a step 132. At a step 134, the program determines whether the user has selected a particular genre. If no genre has been selected, the program loops back to step 134 until a genre is selected. Once a genre has been selected, the program displays the titles available along with the price to play each title for the format and genre selected at a step 136.

At a step 138, the program determines whether the user has selected a title. If no selection has been made, the program waits until a selection is made at which time the program proceeds to a step 150 (FIG. 4B).

As seen on FIG. 4B at the step 150, the program determines whether the jukebox system is operating in an "operator mode." As will be described in further detail below, when the jukebox is in the operator mode, selections can be played without depositing money into the jukebox. If the jukebox is in the operator mode, the program automatically proceeds to a step 156 and the selection is automatically added to the playlist. If the jukebox is not in the operator mode, the user is prompted at a step 152 to deposit the fee which is determined by the program in order to play the title selected. At a step 154, the program determines whether sufficient

money has been received to play the title. As indicated above, the computer system 50A does this by counting the number of "m" signals received from the signal converter and comparing the number to the price of the title selected.

Once a sufficient amount of money has been received by the jukebox, the program adds the title selected to the playlist at a step 156. After step 156, the program determines at a step 158 whether the title just added to the playlist is found on a list of promotional titles also stored on the computer system 50A. If the title selected is on the list of promotional titles, then the program causes the computer 50A to read the coupon information stored on the hard drive for the title selected and print a coupon at a step 160. The steps 158 and 160 are only performed by those jukeboxes having the optional coupon printer.

At a step 162, the program sends a message to a data base, maintained by the computer system 50A, that is designed to keep track of the day and number of times a particular title is played. The data base is stored on the hard discs and is later read by the central computer system 102 (shown in FIG. 3) in order to determine the popularity of each title and to account for royalties that must be paid. After step 162, the program determines whether the user has selected four or more titles at a step 164. If so, the program automatically adds another title from the "new titles" genre list for the particular format selected onto the playlist at step 166. After step 164 or step 166, the program returns to step 130 so that a user can add more titles to the playlist. If the user selects a new format and genre button, the computer will produce a new list of titles that can be selected. Otherwise, the user can continue making selections from the list of titles for the previously selected format and genre.

FIG. 4C shows the steps of a computer program implemented by the computer system 50. As indicated above, the computer system 50 operates to play titles that have been selected by a user. The program begins at a step 180 by determining whether the playlist is empty. If the playlist is empty, the program then determines at a step 182 whether an internal timer indicates the jukebox has remained idle for more than predetermined amount of time, e.g., 5 minutes. If so, then the program causes the computer system 50 to send a message to the computer 50A so that a title is added to the playlist at a step 184. After the title is added to the playlist at step 184, the internal timer used to keep track of the idle time of the jukebox is reset.

In the presently preferred embodiment of the invention, the title selected is made from the list of commercial selections described above. In this manner, the jukebox plays commercial messages during the time when no titles have been selected by the user and the jukebox has remained idle. However, as will be appreciated, other titles could easily be added to the playlist such as those on a selection from the "new titles" list for a particular format and genre, etc. Alternatively, titles from the commercials list could be added as soon as the playlist is empty, so that the jukebox is always active.

At a step 186, the next title on the playlist is played. In the present embodiment of the invention, if the title to be played is in the "music" format (i.e., a selection without a video component), the jukebox system can display either a blank screen, a still image, or a video clip that could be a promotional piece encoded with the audio only file at the time the song was recorded in the MPEG format by the central computer system 102 described above. If the title is not in the "music" format, then the title, including both audio and video components, is played. After the title has finished

playing, the title is removed from the playlist at a step 188. After step 188, the program loops back to step 180.

As indicated above, the presently preferred embodiment of the invention allows a user to play selections without depositing money. For example, if the owner of the jukebox wishes to act as a disc jockey, selections can be played without having to pay for each song separately. The jukebox is placed in the "operator mode" by pressing one or more points on the touch-sensitive screen either in a predetermined order or within a predetermined time interval so as to create an access code. However, as will be appreciated, other mechanisms for entering a code such as displaying a set of alphanumeric keys that are touched by user to enter a password that is compared to a password stored in the memory of the computer, could also be used. Once the user has placed the jukebox in the "operator mode," the jukebox adds the titles selected to the playlist without requiring the user to deposit money. The jukebox remains in the "operator mode" until the operator exists back to a "pay for play" mode by entering another code on the touch sensitive screen. When the computer within the jukebox is first started, the jukebox is automatically placed in a "pay for play" mode.

FIG. 5 shows a representative menu display 200 produced on the touch sensitive screen 18 shown in FIGS. 1 and 2. The display includes a plurality of "buttons" that are selected by the user by placing his or her finger at a location directly on the particular button displayed on the touch sensitive screen. At the top of the display are three format buttons 202, 204, 206 that allow the user to view titles on the jukebox by the various format types described above. The "video" format button 202 allows the user to view a list of all the video titles on the jukebox. To the right of the video format button 202 is a "karaoke" format button 204. By selecting the karaoke button, the user is able to view a list of all the karaoke titles on the jukebox system. A "music" format button 206 is located to the right of the karaoke button 204. When the user selects the music format button, the user is able to view a list of all the music titles on the jukebox.

Below the format buttons are four genre buttons. A "new video releases" button 208 allows a user to see a list of all the new video titles corresponding to the format selected. For example, if the user selects the "video" format button 202 and the "new video releases" genre button 208, the user is shown a list of the new video titles in a display area 220. The genre buttons also include a "rock/pop" button 210, a "country" button 212, and a "comedy" button 214. Preferably, each of the genre buttons is dimmed when the selection is not available for the format selected. For example, the "comedy" genre button is not available for the karaoke or for the music formats, and therefore is dimmed when the user has selected format buttons 204 or 206.

After selecting a format button and a genre button, the jukebox displays the titles available for that particular format in the display area 220 that is located below the format buttons. A user can review the entire list of titles displayed in the area 220 using a scroll up button 222 and a scroll down button 224 located at the left of the area 220.

In the upper right-hand corner of the display 200 is a second display area 225 that shows what format and genre the user has currently selected. In the example shown FIG. 5, the display area 225 indicates the user is being shown new release videos. Below the display area 225 is a title selected area 226 that shows which titles have currently been selected for play. By touching the touch sensitive screen at a position on top of the title and depositing the requisite amount of money, the title will appear in the title selected area 226.

As can be seen, the present invention is a jukebox entertainment system that allows numerous types of entertainment formats to be played on a single unit. For example, in addition to video, karaoke, and music selections, a user could play clips of favorite sporting or historical news events, etc. In addition, the jukebox offers greater flexibility than with prior art jukeboxes. For example, selections can be shown to the user based upon their popularity or by a particular format such as sports or comedy, etc. Furthermore, because the jukebox does not contain any complex mechanical mechanisms, the jukebox has a greater reliability rating than prior art jukeboxes, which require that records, CDs, or video tapes be mechanically loaded into a central player after selection by a user.

The preferred embodiment of the present invention has been described above. However, it should be apparent that various modifications may be made without departing from the spirit and scope of the invention.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. An audio/video jukebox entertainment system comprising:

a computer system;

one or more removable hard disc drives coupled to the computer system, each removable hard disc drive being adapted to read a hard disc having prerecorded digital audio/video data that comprises a plurality of audio/video titles stored thereon;

selection means, coupled to the computer system, for allowing a user to select one or more audio/video titles to be played, the computer system including means for reading the prerecorded digital audio/video data corresponding to the selected audio/video title from one or more of the removable hard disc drives;

a decoder coupled to the computer system for converting the digital audio/video data read from the one or more removable hard disc drives to analog audio/video signals;

a monitor coupled to the decoder for displaying the analog video signals;

an audio amplifier connected to the decoder board for amplifying the analog audio signals; and

one or more loudspeakers coupled to the audio amplifier for converting the audio signals to sound.

2. The audio/video jukebox of claim 1 wherein the computer system comprises:

a first computer system for reading the prerecorded digital audio/video data from the one or more removable hard disc drives and a second computer system networked to the first computer system for controlling the selection means.

3. The audio/video jukebox of claim 1, further comprising:

a video tape recorder having a video output coupled to the television monitor and an audio input coupled to the audio amplifier; and

a video camera having an output coupled to the video tape recorder, said video tape recorder and said video camera operating to allow a user to record their image on a video tape.

4. The audio/video jukebox of claim 1, further comprising:

a microphone that is connectable to the audio amplifier for amplifying the voice of a user with the audio title played by the jukebox.

5. The audio/video jukebox of claim 1, wherein the selection means includes a touch sensitive video screen.

6. The audio/video jukebox of claim 5, wherein the selection means further comprises:

means for receiving money from a user and for normally actuating the selection means only if at least a predetermined amount of money has been received; and

means for determining if a user has actuated one or more predetermined locations on the touch sensitive screen and, if so, allowing a user to play audio/video selections without receipt of money.

7. The audio/video jukebox of claim 1, including means for receiving money from a user, said money receiving means comprising:

a money validator for receiving money and for generating a signal indicative of the amount of money received; and

a signal converter circuit, connected to receive the signal indicative of the amount of money received, the signal converter circuit producing a computer keystroke signal that is applied to a keyboard input of the computer system to indicate money has been received by the jukebox.

8. The audio/video jukebox of claim 1, further comprising:

means for allowing a user to view a list of the audio/video titles stored on the one or more removable hard disc drives sorted by format

9. The audio/video jukebox of claim 8, further comprising:

means for allowing a user to view a list of the audio/video titles stored on the one or more removable hard disc drives sorted by format and genre.

10. The audio/video jukebox of claim 1, further comprising:

a coupon printer that prints a coupon for an item when a particular title on the one or more removable hard disc drives is selected by a user.

11. The audio/video jukebox of claim 10, further comprising:

means for storing a list of the titles on the one or more removable hard disc drives for which a coupon will be printed by the coupon printer.

12. The audio/video jukebox of claim 1, wherein a portion of the audio/video data stored on the one or more removable hard disc drives corresponds to a commercial message.

13. The audio/video jukebox of claim 12, further comprising:

means for determining if the jukebox has sat idle for more than a predetermined amount of time and, if so, for reading the audio/video data corresponding to the commercial message and applying the data to the decoder.

14. A jukebox entertainment system, comprising:

one or more removable hard disc drives having prerecorded audio data corresponding to one or more titles stored thereon as well as coupon information that is associated with at least one of the titles;

selection means for allowing a user to select a title to be played;

a computer system including means for reading the prerecorded audio data corresponding to a selected title from the one or more removable hard disc drives and for converting the prerecorded audio data to an analog audio signal;

an amplifier for amplifying the analog audio signal;

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one or more loudspeakers for convening the amplified analog audio signal to sound; and

means for printing a coupon with a coupon that contains the coupon information when a user selects a title that is associated with the coupon information.

15. The jukebox entertainment system of claim 14, wherein the digital memory device has video data stored thereon and the computer system further includes:

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means for reading the video data from the digital memory device and for convening the video data to an analog video signal.

16. The jukebox entertainment system of claim 15, further comprising:

a monitor for displaying the analog video signal.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 5,481,509
DATED : January 2, 1996
INVENTOR(S) : N. Knowles

Page 1 of 3

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

COLUMN **LINE**

10 (Claim 8, line 5)	28	After "format" insert --,--
11 (Claim 14, line 14)	1	"convering" should read --converting--
11 (Claim 14, line 16)	3	After "printing a coupon" delete --with a coupon--
12 (Claim 15, lines 4-5)	1-2	"digital memory device" should read --one or more removable hard disc drives--
12 (Claim 15, line 5)	2	"convering" should read --converting--

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 5,481,509

Page 2 of 3

DATED : January 2, 1996

INVENTOR(S) : N. Knowles

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

<u>COLUMN</u>	<u>LINE</u>	
1	15	"modem" should read --modern--
1	18	"modem" should read --modern--
2	3	"convening" should read --converting--
2	19	"primer" should read --printer--
2	53	After "by" delete --a--
2	64	"from" should read --front--
4	30	After "merchant" insert --,--
6	28	""music,"" should read --"music"--
7	40	After "than" insert --a--
8	17	"requiting" should read --requiring--
8	19	"exists" should read --exits--
8	36	"tight" should read --right--
8	61	After "shown" insert --in--

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 5,481,509

Page 3 of 3

DATED : January 2, 1996

INVENTOR(S) : N. Knowles

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

<u>COLUMN</u>	<u>LINE</u>	
12	2	"convening" should read --converting--.

Signed and Sealed this
Sixth Day of August, 1996

Attest:



BRUCE LEHMAN

Attesting Officer

Commissioner of Patents and Trademarks

G3

**Reference cited in Substitute PTO Form 1449
Attorney Docket No. 380786-108980
Reexam Control No. 95/001,274**



US005530235A

United States Patent [19]

[11] Patent Number: **5,530,235**

Stefik et al.

[45] Date of Patent: **Jun. 25, 1996**

[54] INTERACTIVE CONTENTS REVEALING STORAGE DEVICE

5,183,404 2/1993 Aldous et al. 439/55

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Primary Examiner—Harold Pitts
Attorney, Agent, or Firm—Richard B. Domingo

[73] Assignee: **Xerox Corporation**, Stamford, Conn.

[21] Appl. No.: **389,670**

[22] Filed: **Feb. 16, 1995**

[51] Int. Cl.⁵ **G06K 19/06**

[52] U.S. Cl. **235/492; 235/380; 235/487**

[58] Field of Search **235/380, 487, 235/492**

[57] ABSTRACT

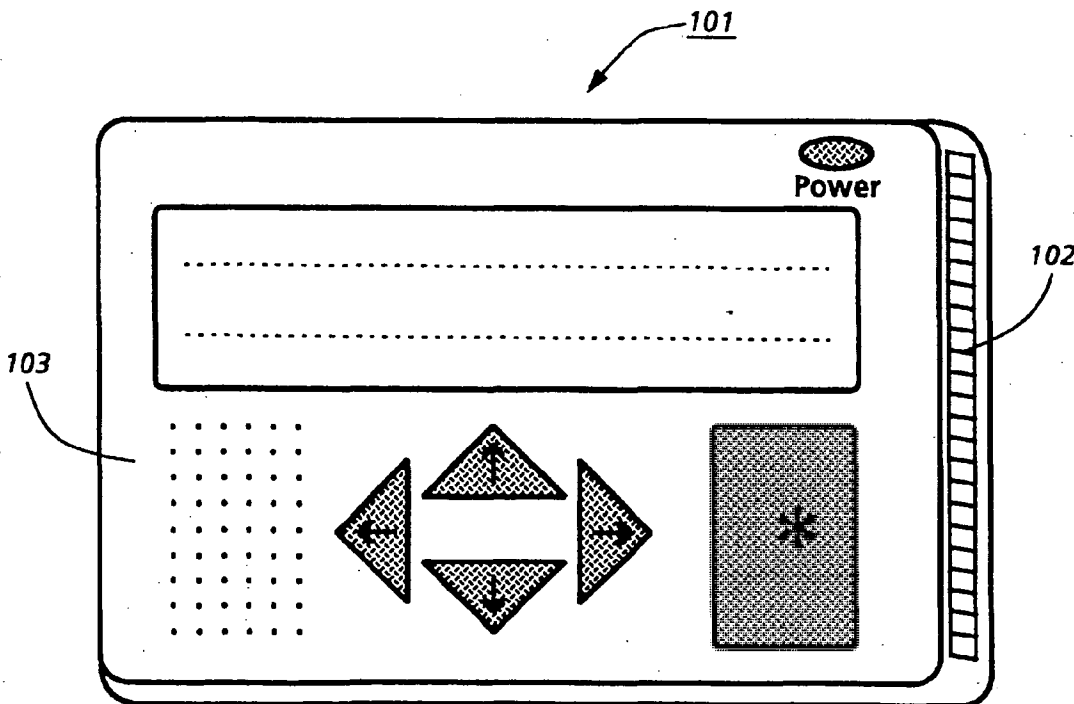
A Document Card (DocuCard) for storing documents and which is content revealing. The DocuCard is a transportable unit having a nonvolatile storage means for storing information in a digital form, a control processor for processing user initiated functions; an I/O port for interfacing to external devices for reading and writing digital information, and a user interface for allowing a user to directly interact with the DocuCard. The user interface on the DocuCard includes a display for displaying lists of functions and documents and information responsive to user invoked functions and a user input portion for allowing a user to traverse the lists of functions and documents, as well as information generated responsive to an invoked function. The control processor of the present invention include features for controlling access to documents stored therein.

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23 Claims, 10 Drawing Sheets



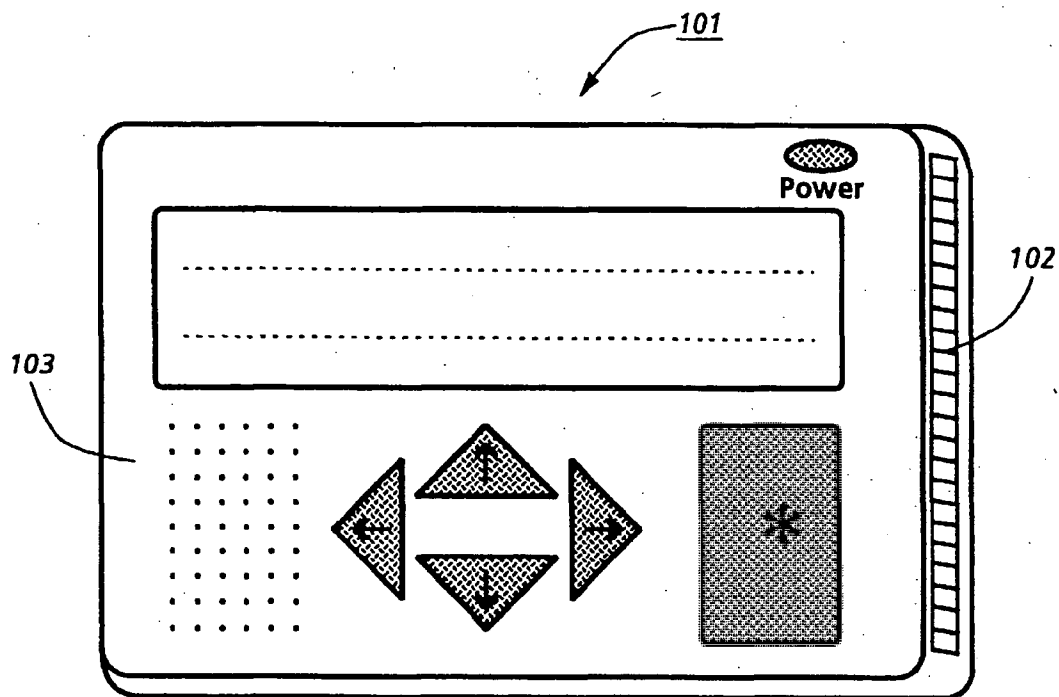


Fig. 1

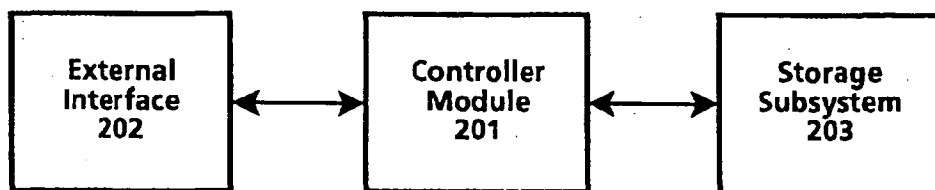


Fig. 2

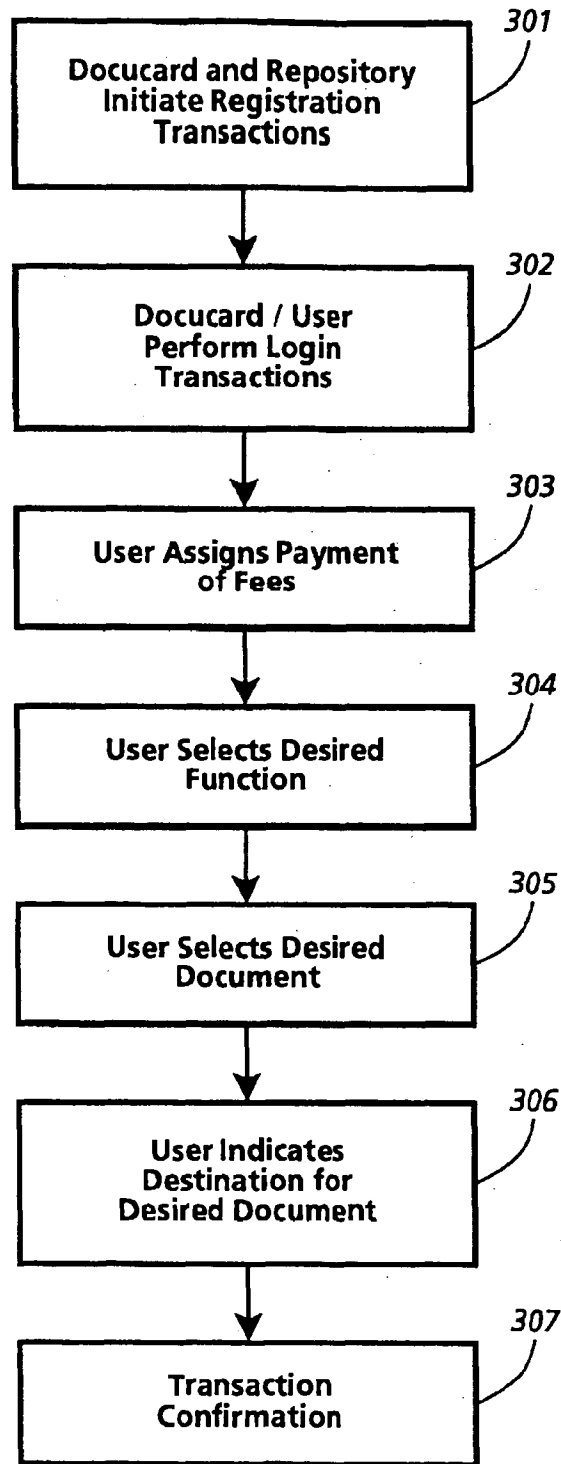


Fig. 3

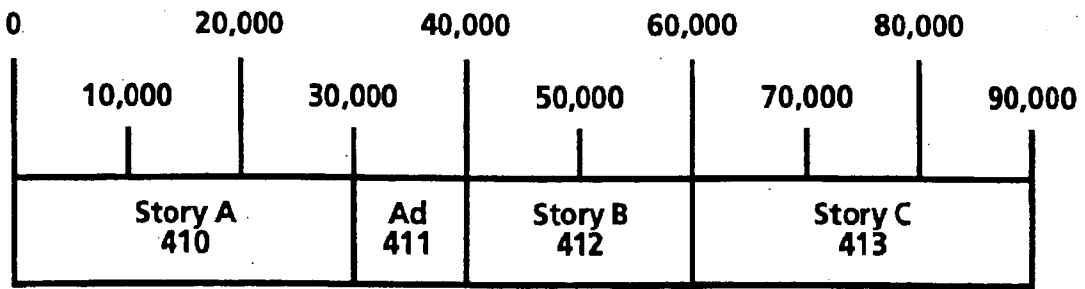


Fig. 4

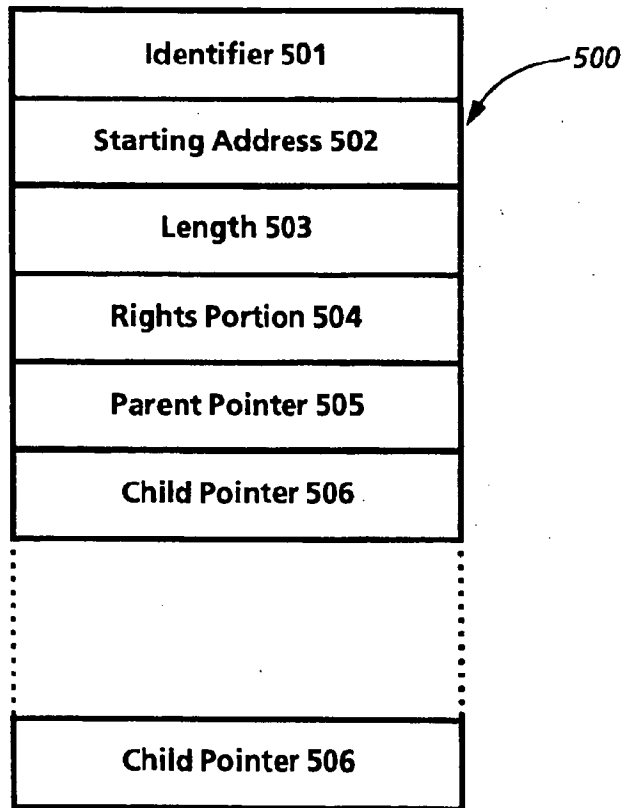


Fig. 5a

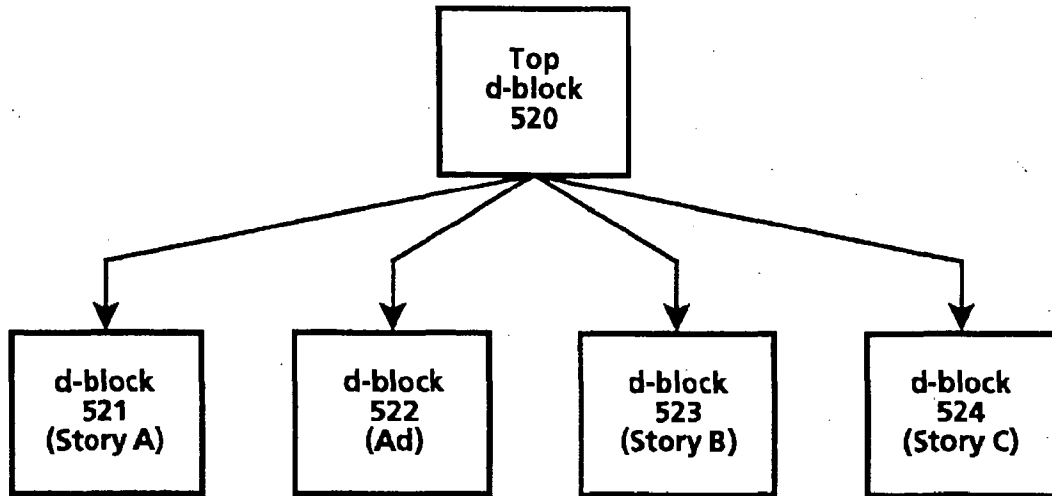


Fig. 5b

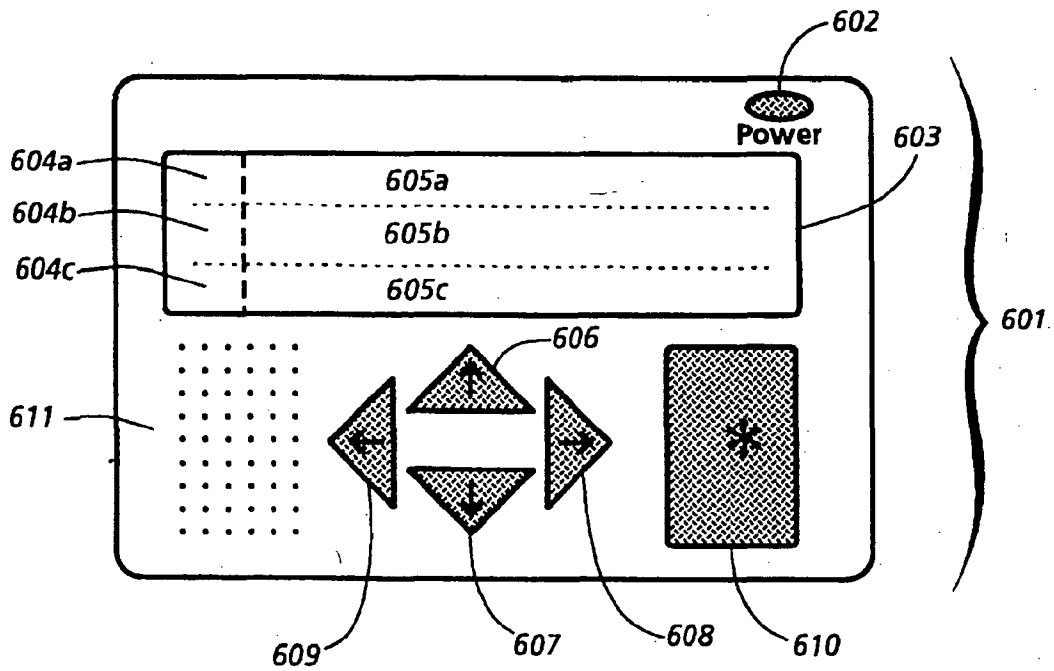


Fig. 6

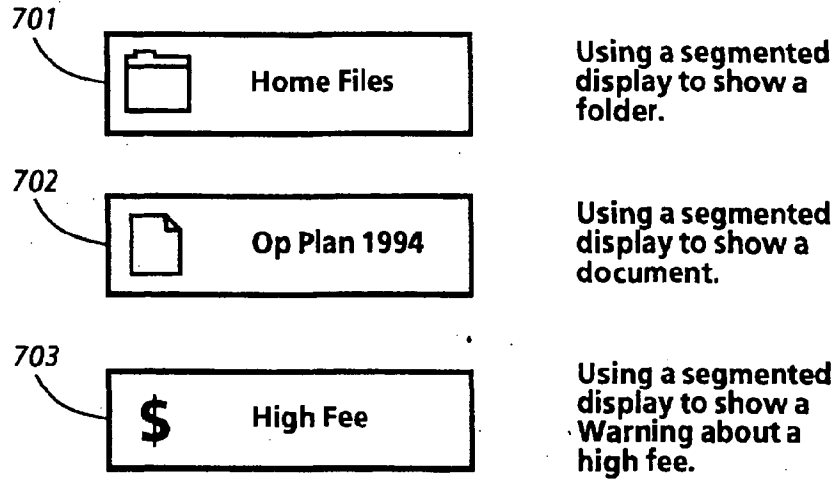


Fig. 7

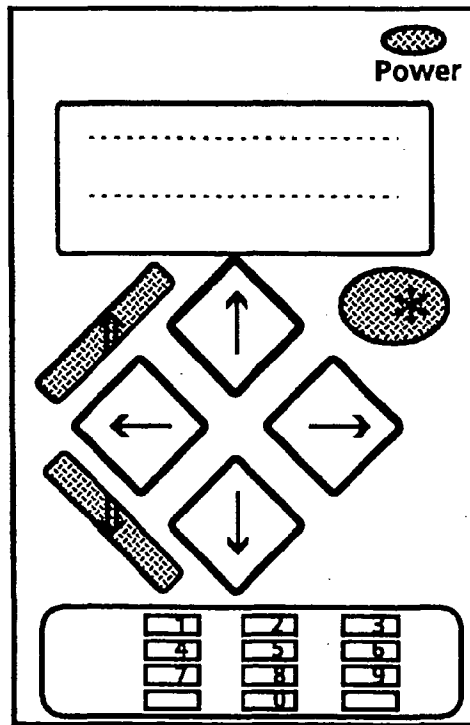


Fig. 8

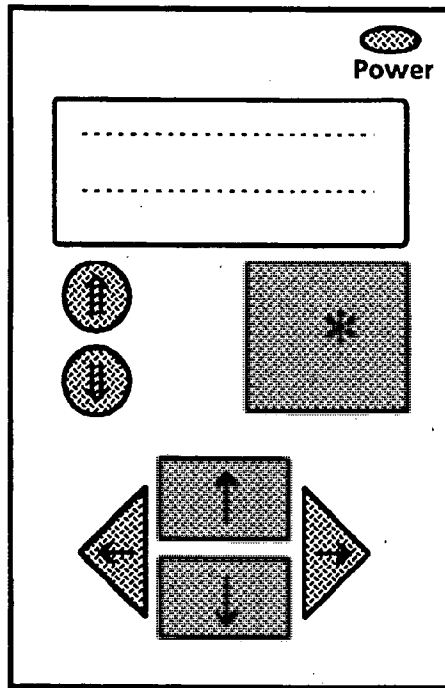


Fig. 9

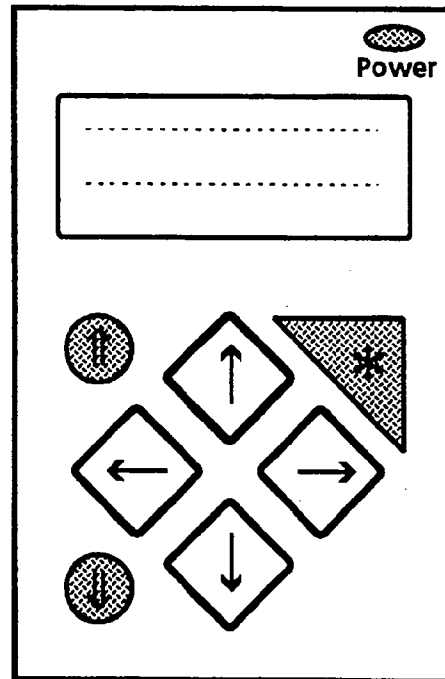


Fig. 10

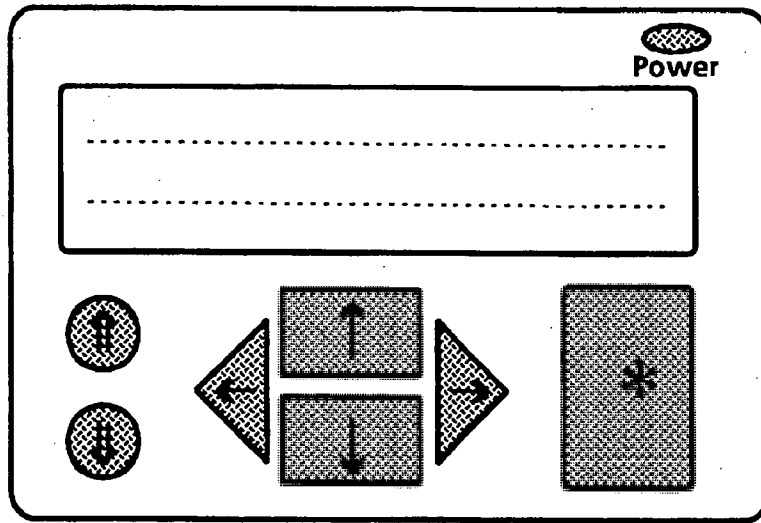


Fig. 11

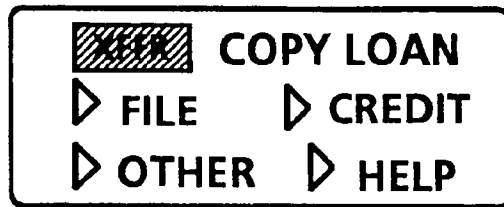


Fig. 12

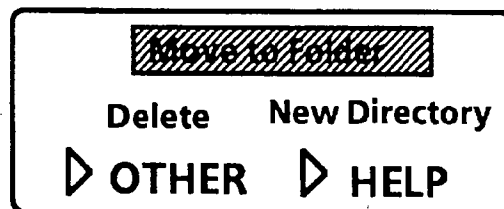


Fig. 13

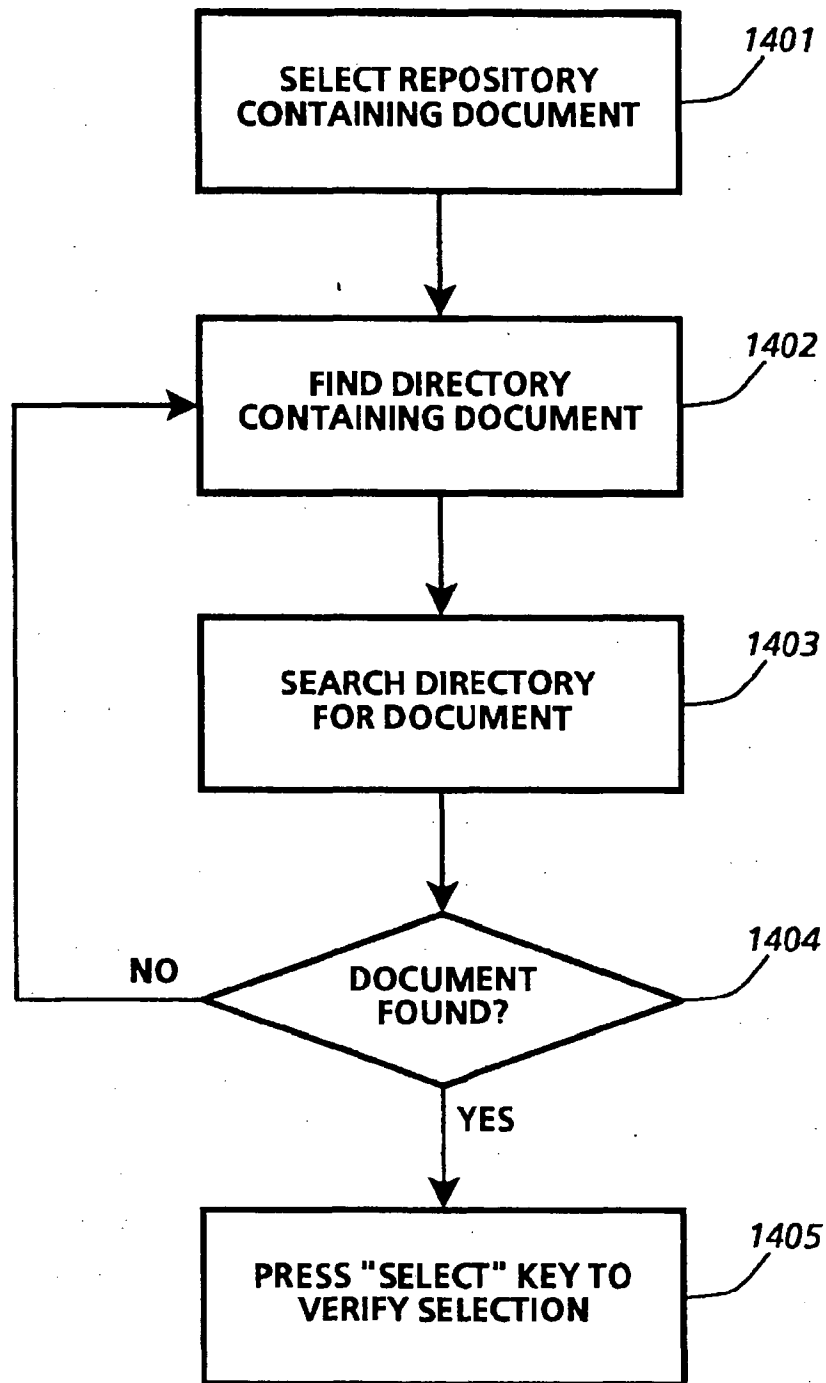


Fig.14

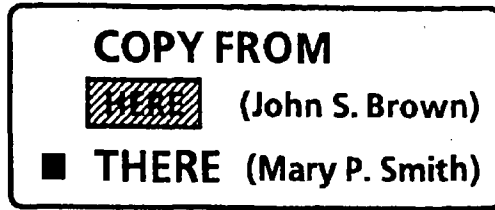


Fig. 15

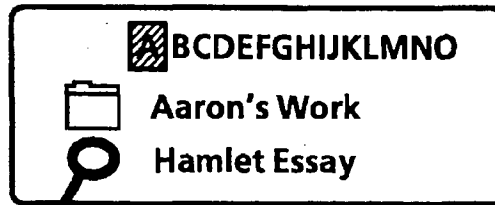


Fig. 16

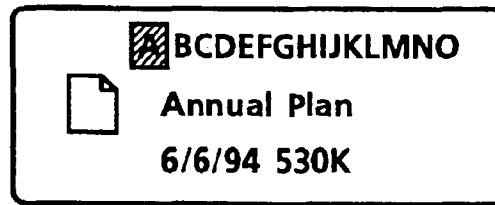


Fig. 17

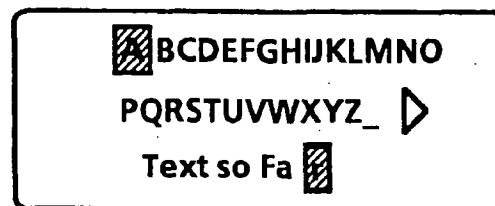


Fig. 18

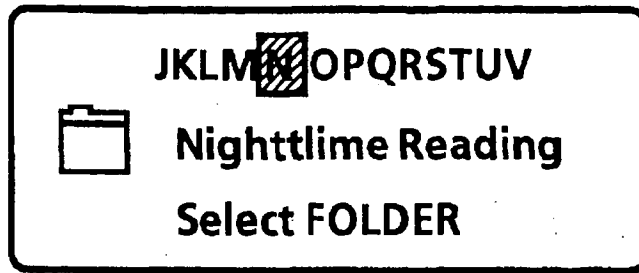


Fig.19

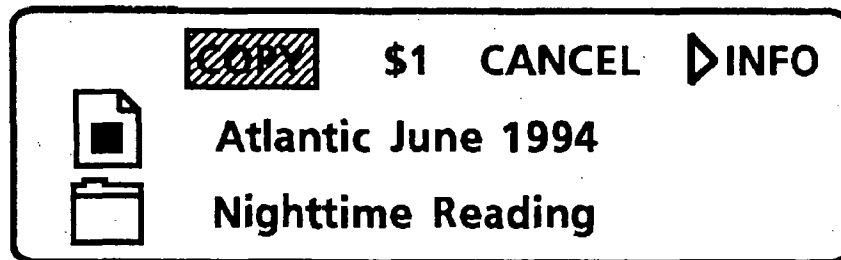


Fig.20

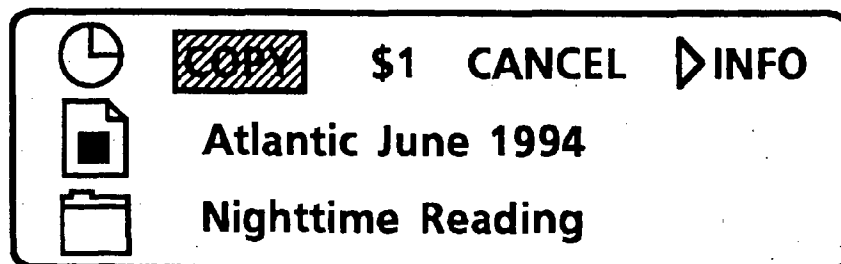


Fig.21

INTERACTIVE CONTENTS REVEALING STORAGE DEVICE

FIELD OF THE INVENTION

The present invention relates generally to the field of storage mediums, and in particular to transportable storage mediums for storing and retrieving documents.

BACKGROUND OF THE INVENTION

Digitally created works, for example music or software, are commonly distributed on a transportable storage medium such as an optically or magnetically encoded disk. Means for retrieving and interpreting the contents of the transportable storage medium are typically embodied in a playing/rendering device, e.g. a computer system or a Compact Disc Player. While such distribution of digital works is common, it is not ideal. A deficiency of transportable storage mediums is that they are not contents revealing. That is, the contents of the storage medium cannot be determined by merely looking at the storage medium. An example of a contents revealing storage medium is paper. Absent any encoding, by simply looking at the paper, its contents can be determined.

A simple way of identifying the contents of storage mediums, e.g. an optical or magnetic disk, is to affix a written label to the medium. Unfortunately, every time the disk is reused, the label must be updated or a new label created and attached. It requires diligence to relabel floppy disks as they are used. Moreover, as storage capacity increases, a label big enough to list the entire contents may become impractical. In the case of optical disk medium, content information is typically printed onto the medium itself. This is satisfactory for the current state of optical disk technology since such disks typically cannot be reused. However, writable optical disk products are now available. Such products will cause optical disks to have the same deficiencies as other storage mediums. Absent a label, the only way of verifying the contents of a transportable storage medium is to insert it into a suitable playing/rendering device and invoke commands to list the contents.

It is anticipated that the distribution of works in digital form will increase dramatically. For conservation and convenience reasons, it would be desirable to collect desired works on a personal transportable storage medium which is inherently contents revealing. Further, it would be desirable to perform basic storage management functions, such as deleting a file or organizing the content of the storage medium, without having to insert the storage medium into a playing/rendering device. This would enable a user to "make room" or organize the contents of the storage medium when necessary.

A technology which is related to the present invention is in the area of "smartcards". Smartcards are generally implemented to increase the convenience of performing various transactions, e.g. financial transactions. An example application of a smartcard would be as a smart financial services card. In such an application, the smartcard could provide Automatic Teller Machine (ATM) access as well as perform functions such as limiting the ATMs at which the card could be used and maintaining a record of ATM transactions. U.S. Pat. No. 4,868,376 to Lessin et al. entitled "Intelligent Portable Interactive Personal Data System" describes a smartcard having an alphanumeric keypad for user input, an alphanumeric display for displaying the results of various commands, a microprocessor, an operating system for controlling the smartcard, storage for storing one or more

application programs and an Input/Output port for sending and receiving information. The smartcard described in Lessin et al. can be programmed for specific applications.

As noted above, smartcards have a focus that is primarily on enabling and/or recording certain transactions. As a result, their storage requirements are fairly modest. Known smartcard implementations are inadequate for use as a transportable storage medium due to their limited storage capacities.

A further related technology is for Personal Digital Assistants (PDAs), such as the Newton (TM) PDA, available from Apple Computer, Inc. of Cupertino, Calif. PDAs are typically portable computer systems, often characterized as having a "pen" based input device. PDAs are typically distributed with packages which perform various personal organization (e.g. calendaring, address book) and communication (e.g. messaging) functions. Alternatively, PDAs can be programmed to perform desired applications.

Another related technology area is hardcards. Hardcards are storage medium such as a hard disk which is coupled to and packaged with a storage controller (rather than having separate controller and hard disk devices). The hardcard is then coupled to the computer system. Hardcards are typically used as a "permanent" storage medium which remains coupled to the computer system and are not meant to be transportable. Further, hardcards are not contents revealing.

SUMMARY OF THE INVENTION

A Document Card (hereinafter referred to as DocuCard) is disclosed. The DocuCard performs the function of a storage medium whose contents can be viewed and managed autonomously from a computer based system. In the currently preferred embodiment of the present invention, the DocuCard is a transportable unit having a nonvolatile storage means for storing information in a digital form; a control processor for processing user initiated functions and requests to access documents stored therein; an I/O port for interfacing to external devices for reading and writing digital information, and a user interface for allowing a user to directly interact with the DocuCard. The user interface comprising a plurality of traversal keys for allowing a user to traverse lists of functions and documents, a select key to allow a user to select highlighted functions or documents, a processing means for processing user invoked functions, and a display for displaying lists of functions and documents and information responsive to user invoked functions.

The currently preferred embodiment of a DocuCard is an instance of a repository, as defined in co-pending application entitled "System for Controlling the Distribution and Use of Digital Works", serial number not yet assigned, which is assigned to the assignee of the present invention and which is herein incorporated by reference. A repository is a device which enables access to documents through enforcement of usage rights which are attached to the documents. Usage rights define how and under what conditions a stored document may be used or distributed. For example, a user may request that a particular document be printed. The document cannot be printed unless it has an attached print right. A condition associated with the right may be that the document can only be printed once.

The user interface of the present invention enables a user to interact with a DocuCard to manage the contents contained therein, as well as to obtain Documents stored in other repositories.

The general steps for accessing a document stored in another repository comprising the steps of: coupling the

DocuCard to said repository; displaying on the display of the DocuCard a list of functions for accessing a document stored in the repository, each of said functions representing an instance of how a selected document is used, each of said functions corresponding to an instance of a usage right; selecting a function from said displayed list of functions; displaying on the display of said DocuCard a list of the contents of the repository; selecting a desired document from the list of contents of the repository; the repository determining if the desired document has said instance of a usage right corresponding to the selected function; if the desired document has attached thereto the usage right corresponding to the selected function, the repository granting access to said document; and if the desired document does not have attached thereto the usage right corresponding to the selected function, the repository denying access to said document.

Because of the transportable nature of the DocuCard, its size will be relatively small. Accordingly, the display size will be limited. It is typical that all of the functions for accessing a document cannot be present on the display at one time. The present invention provides a means for traversing the list of available functions. What will initially be displayed is a list of commonly used functions and one or more indicators to sub-lists of less frequently used functions. To find the desired function the user will: determine if the desired function is displayed; if the desired function is displayed, highlighting the function and selecting it; and if the desired function is not displayed, highlighting an indicator to sub-lists of less frequently used functions, selecting it and repeating until the function is displayed.

Similarly, it may not be possible to list all of the documents stored in a repository. Documents are stored in a hierarchical file system and in a lexical ordering. What is initially displayed is an indicator of lexical position within the repository at a current directory level and a list of documents. A user traverses the list using the traversal keys on the DocuCard until the desired Document is highlighted, wherein the select key is depressed.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the currently preferred embodiment of a Document Card (DocuCard).

FIG. 2 is a block diagram of the operational components of a DocuCard.

FIG. 3 is a flowchart describing the interaction between a DocuCard and a repository in the course of accessing a document stored in the repository as may be performed in the currently preferred embodiment of the present invention.

FIG. 4 illustrates a contents file portion of a document representation for a document stored on a DocuCard of the currently preferred embodiment of the present invention.

FIGS. 5a and 5b illustrates a description block and a description tree portion for the document representation of the contents file illustrated in FIG. 4.

FIG. 6 is a detailed illustration of the user interaction area of a DocuCard in the currently preferred embodiment of the present invention.

FIG. 7 illustrates different forms of information provided on a DocuCard display in the currently preferred embodiment of the present invention.

FIGS. 8-11 illustrate various alternative embodiments of a user interaction area having different key arrangements.

FIG. 12 is an illustration of the display area displaying a function selection interface as may be used in the currently preferred embodiment of the present invention.

FIG. 13 is an illustration of the display area when a function group has been selected and the user is presented with the particular functions within the group.

FIG. 14 is a flowchart illustrating the steps performed for selection of a document or directory in the currently preferred embodiment of the present invention.

FIGS. 15-17 are illustrations of the display area for document or directory selection in the currently preferred embodiment of the present invention.

FIG. 18 is an illustration of the display area for entering text in the currently preferred embodiment of the present invention.

FIGS. 19-21 are illustrations of the display area for a COPY function transaction as may be performed in the currently preferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

A Document Card (hereinafter referred to as DocuCard) for storing digital information (documents) and which its contents revealing is disclosed. A DocuCard is used for storing digital information which may be accessed by a system that is capable of playing or rendering the digital information, such as a computer system, digital copier, audio CD player and the like. Such systems are referred to herein collectively as rendering systems. A DocuCard is also used for obtaining documents from a repository of documents. An example of such a repository is a kiosk which is used for the secure distribution of documents.

The utility of a DocuCard can be viewed from varied perspectives. From one perspective, a DocuCard is an intelligent storage medium which enables a user to manage and view its contents in a standalone fashion. From a second perspective, the DocuCard is a secure repository of documents. A DocuCard implements the functionality of a repository as defined in the co-pending application entitled "System For Controlling the Distribution and Use of Digital Works", serial no. not yet assigned. Usage rights are attached to digital works and control how the digital work can be used or distributed, and are further used to specify any fees associated with use or distribution of digital works. When a repository receives a request to access a digital work, the repository examines the usage rights attached to the digital works to determine if access may be granted.

As used herein, the terms digital work and document are used interchangeably and refer to a work that has been reduced to a digital form. This would include any textual, audio or visual work, as well as to software programs.

Overview of a Physical Design of a DocuCard

FIG. 1 is a perspective view of the currently preferred embodiment of a DocuCard. The DocuCard of the present invention is preferably implemented in accordance with standards promulgated by the Personal Computer Memory Card International Association (PCMCIA) of Sunnyvale, Calif. However, it would be apparent to one of skill in the art to implement the present invention having features different from the PCMCIA standard without departing from the spirit and scope of the present invention. In any event, the PCMCIA has defined an open standard for personal computer cards intended for use with portable computer systems. The standard can be used on any personal computer system supporting bus structures such as the Industry Standard Architecture (ISA) or Extended Industry Standard

Architecture (EISA). PCMCIA cards are desirable because of their small size and support for plug and play applications (which means that the computer system will automatically recognize insertion of a card in a slot and enable its use). Utilization of such plug and play applications does require Basic Input/Output System (BIOS) and operating system level software coding. Specifications for designing products for support of PCMCIA cards and creating the requisite BIOS and operating system level software is available from the PCMCIA Headquarters, located in Sunnyvale Calif. Thus, no further discussion of PCMCIA and the attendant standards is deemed necessary.

Physically, the DocuCard is included in a housing 101 that is compliant with PCMCIA Type II or III standards. The physical dimensions of PCMCIA Type II or III compliant cards are 85.6 millimeters long, 54 millimeters wide with a thickness of 5.0 or 10.5 millimeters, respectively. The choice of Type II or III will depend on the desired storage capacity. The length and width are roughly the size of a credit card which makes it easily transportable. The PCMCIA standard further defines a signal protocol for communication between a PCMCIA device and a computer based system. Such communication is carried out through pins 102. On a "top" side of the currently preferred embodiment a user interaction area 103 is defined. The user interaction is comprised of a display, a plurality of buttons for scrolling, selection and entry of alphanumeric data and speaker for output of audio information. The user interaction area 103 of the currently preferred embodiment is described below with reference to FIG. 6.

The operational components of the DocuCard are described with reference to FIG. 2. Referring to FIG. 2, a controller module 201 provides the overall control function for the DocuCard. The controller module 201 may be implemented using a suitable controller integrated circuit chip (or chipset) such as a Motorola 6808 (available from Motorola Corporation of Chicago, Ill.) or an Intel 8051 (available from Intel Corporation of Santa Clara, Calif.). The controller module 201 may also be implemented using a general purpose microprocessor such as one of the members of the Intel X86 family of microprocessors. The controller module 201 further comprises a time keeping means or clock for maintaining a timebase for documents stored therein and an internal memory means (e.g. a Read Only Memory or ROM). The internal memory means contains programming instructions needed for carrying out the various DocuCard functions that are described herein.

The controller module 201 performs traditional disk controller functions (e.g. storage management, formatting, etc.) as well as processing in response to user initiated functions. Such user initiated functions will be described in further detail below. The controller module 201 may also be used to perform additional functions as needed, such as data encryption/decryption, or data compression/decompression. Finally, the controller module 201 enforces usage rights attached to documents, initiation of usage fee transactions, and controls the DocuCard User Interface.

An external interface 202 enables the DocuCard to be in communications with another repository or to a rendering system. Communications to external system in the currently preferred embodiment is through well known networking protocols. However, the protocol by which documents are stored and accessed are transport layer independent. So for example, the DocuCard may look to the coupled computer system as if it were networked attached via a TCP/IP session while the actual exchange of documents may be enabled using a higher level protocol.

The controller 201 manages access to storage subsystem 203. The storage subsystem 203 is comprised of two distinct parts. A first part residing on a low power nonvolatile solid state memory will contain the directory structure for the storage system. Use of a low power solid state memory in part enables the performance of the standalone functions under battery power of a DocuCard that are described herein. The directory structure would include the description file, which is described in greater detail below, for each of the documents stored in the DocuCard. The first part is readily accessible to the controller 201 to facilitate quick display of the DocuCard directory on the DocuCard display. A second part resides on a high capacity storage medium and will contain the digitally encoded contents of each of the documents. Suitable high capacity storage mediums would be magnetic or optical disks or a nonvolatile solid state memory. Partitioning of the data in this manner reduces memory and power requirements for viewing the contents of the DocuCard when operating in standalone mode. The manner in which documents are organized in the currently preferred embodiment is described in more detail below.

Although not illustrated, a DocuCard may also have stored within it a credit server for reporting usage fees that are associated with the access to a document.

The list of operational components described herein is not meant to be exhaustive. DocuCards will typically be implemented in accordance with the desired functionality and the type of documents that it will support.

DocuCard Coupling

The repositories and rendering systems to which a DocuCard may interface would fulfill the functional requirements as defined in the aforementioned "System For Controlling The Distribution and Use of Digital Works" application. For a direct coupling, the repository or rendering system would typically have at least one PCMCIA compliant slot. So for the electrical connection to occur, the DocuCard is merely inserted into the PCMCIA slot.

Further, as mentioned above, a DocuCard may also couple to another DocuCard. Such coupling would occur via a mating interface device which would electrically connect the PCMCIA external interfaces of the respective DocuCards.

FIG. 3 is a flowchart describing the interaction between a DocuCard and a repository in the course of accessing a document stored in the repository. Referring to FIG. 3, the DocuCard and repository initiate registration transactions, step 301. Registration is a process by which two repositories establish a secure and trusted session. By secure and trusted it is meant that the session is reasonably safe from intrusion and that the respective repositories have established themselves as bona fide (i.e. not an intruder). The registration process is automatic and is triggered by the establishment of the electrical connection between the DocuCard and repository. The steps performed during registration as may be used in the currently preferred embodiment is described in the aforementioned co-pending application entitled "System For Controlling the Distribution and Use of Digital Works."

Following the registration transaction, a Login transaction is performed, step 302. A Login transaction is the process by which a user logs onto a repository, typically by entering a Personal Identification Number (PIN). In this case, the user of the DocuCard is logging onto the DocuCard. This logging in process may also activate credit accounts.

The user on the DocuCard now uses the user interface to assign payment of any fees associated with the transaction to

be executed, step 303. The fees may be assigned to either the user of the DocuCard or to the owner of the repository. Of course the acceptance of fees by the repository may be a prerequisite to the continuation of the process.

Now, the user of the DocuCard selects the desired function for obtaining the document, step 304. The particular function will correspond to a particular usage right and indicates how the user wishes to use the document. A list of available documents on the repository is then presented wherein the user selects the desired document, step 305 and the destination where the document is to be placed, step 306. The DocuCard will then present the transaction for confirmation, step 307 where it can be confirmed or rejected.

The steps for selection of documents and functions is part of the user interface of the present invention and are described in greater detail below.

Organization and Representation of Documents In A DocuCard

In the currently preferred embodiment, documents are stored in a hierarchical file system. Organization of documents in a hierarchical file system is well known in the art but is briefly described herein. Documents are stored within directories. Directories and subdirectories are comprised of a collection of documents and/or subdirectories. The contents of a directory or subdirectory are organized for display in alphabetical order. Documents will have types for identifying document properties. It is worth noting that it would be apparent to one skilled in the art to store digital data in other types of organizational structures, e.g. hyper-linked or as a flat directory. Implementations incorporating other organizational structures would not depart from the spirit and scope of the present invention.

The file information for a document is comprised of a "contents file" and a "description file." The contents file is stored independently from the description file. The "contents" file is a stream of addressable bytes whose format depends completely on the computer based system used to play, display or print the document. The description file contains the usage rights for the document and a pointer to the document in the content part. For composite documents comprised of multiple individual digital works, the description part is an acyclic structure (e.g. a tree structure) wherein each node corresponds to one or more of the multiple individual digital works.

FIG. 4 illustrates the layout of a contents file. Referring to FIG. 4, a digital work 409 is comprised of story A 410, advertisement 411, story B 412 and story C 413. It is assumed that the digital work is stored starting at a relative address of 0. Each of the parts of the digital work are stored linearly so that story A 410 is stored at approximately addresses 0-30,000, advertisement 411 at addresses 30,001-40,000, story B 412 at addresses 40,001-60,000 and story C 413 at addresses 60,001-85 K. Note that the data in the contents file may be compressed (for saving storage) or encrypted (for security).

From FIG. 4 it is readily observed that a digital work can be represented by its component parts as a hierarchy. The description tree for a digital work is comprised of a set of related descriptor blocks (d-blocks). The contents of each d-block is described with respect to FIG. 5a. Referring to FIG. 5a, a d-block 500 includes an identifier 501 which is a unique identifier for the work in the repository, a starting address 502 providing the start address of the first byte of the work, a length 503 giving the number of bytes in the work,

a rights portion 504 wherein the granted usage rights and their status data are maintained, a parent pointer 505 for pointing to a parent d-block and child pointers 506 for pointing to the child d-blocks. In the currently preferred embodiment, the identifier 501 has two parts. The first part is a unique number assigned to the DocuCard upon manufacture. The second part is a unique number assigned to the work upon creation. The rights portion 504 will contain a data structure, such as a look-up table, wherein the various information associated with a right is maintained. The information required by the respective usage rights is described in more detail below. D-blocks form a strict hierarchy. The top d-block of a work has no parent; all other d-blocks have one parent.

Each d-block may further contain a document thumbnail or a pointer to a document thumbnail. The document thumbnail is a fixed representation of the document. In some instances the document thumbnail is a textual description. In other instances the document thumbnail is pictorial representation (for documents comprised of video data, the thumbnail could be one or more video frames) or an audio clip (for documents comprised of audio information). In any event, the thumbnail will convey the essence of the content of the corresponding document. It should be noted that each of the subdocuments has associated with it a thumbnail. However, it would be apparent to one skilled in the art to only provide a thumbnail for the main document. Further, it should be noted that visual thumbnails would preferably be stored in some compressed image format (e.g. MPEG, JPEG or run-length encoded). Accordingly, the display of the thumbnail would require that the DocuCard display have at least a portion of which is bit-mapped.

FIG. 5b illustrates a description tree for the digital work of FIG. 4. Referring to FIG. 5b, a top d-block 520 for the digital work points to the various stories and advertisements contained therein. Here, the top d-block 520 points to d-block 521 (representing story A 410), d-block 522 (representing the advertisement 411), d-block 523 (representing story B 412) and d-block 524 (representing story C 413).

DocuCard User Interface

The user interface enables a user to direct the DocuCard to access documents stored in a repository and to manage the contents of the DocuCard. The user interface is comprised of a plurality of switches for entering input, a display for presenting information and predetermined and programmed sequences of steps for carrying out the various operations. FIG. 6 illustrates in greater detail the user interaction area for a DocuCard in the currently preferred embodiment. Referring to FIG. 6, the user interaction area 601 takes up substantially one side of the DocuCard housing. A button 602 is used for turning on and off battery power to the DocuCard. A display area 603 is comprised of three (3) lines. Each of the three lines is capable of displaying an icon in the first position (604a-604c, respectively) and 15-16 characters after it (605a-605c, respectively). Each of the areas 605a-605c is a segment display. The areas 604a-604c may be either a small bitmap display or a segment display (where the icons are designed to use a limited set of segments). A suitable display for display area 603 is one that has low power consumption. Construction of such displays is well known in the art, so no further description of a low power display is deemed necessary.

FIG. 7 shows various examples of a line on the display area 602. Referring to FIG. 7, line 701 illustrates a directory where the icon representing the directory is a file folder (a

common metaphor for a directory) and the text portion identifies the directory as "Home Files". Line 702 illustrates a document where the icon representing the document is a sheet with a folded corner and the text portion identifies the document as "Op Plan 1994". Note that each document type would preferably have its own icon to allow a user to quickly visibly scan the document information to determine if it is of the type that they are searching for. The display area 603 may also be used to indicate the status of a transaction and error or warning messages. Line 703 of FIG. 7 illustrates a warning message being displayed indicating that a transaction being executed has a high cost.

Referring back to FIG. 6, directional arrow keys 606-609 are used for controlling motion of a cursor along and between the lines 605a-605c of the display 603. Such motion allows for traversal among the items on the display 603. Key 606 is referred to as the "up-arrow" key and provides for moving the cursor up one line. Key 607 is referred to as the "down-arrow" key, and provides for moving the cursor down one line. Key 608 is referred to as the "left-arrow" key and provides for moving the cursor left along a line. Key 609 is referred to as the "right-arrow" key and provides for moving the cursor right along a line. Operationally, the left arrow key 608 and right arrow key 609 will move a single character (or item) position if pressed only once. If held down, the cursor will move multiple positions (with increasing speed as the key is held down).

It should also be noted that the directional arrow keys 606-609 may be used to enter private identification data (for use analogous to a Private Identification Number). As will be seen in alternative embodiments illustrated below, a DocuCard may also include a numeric keypad for entry of a Private Identification Number.

The directional arrow keys 606-609 may also be used for enabling scrolling through thumbnails of documents.

Button 610 is referred to as the "select" key. When the select key 610 is pressed, the desired transaction (e.g. copying of files or entering of text) is selected and carried out. Such operation is roughly analogous to the enter key on a computer terminal keyboard.

Finally, the user interaction area 601 includes an area 611 for placement of a speaker for the output of audio information. A suitable speaker to be utilized would have low power consumption. Construction of such low powered speakers is well known in the art.

Various layouts of the User Interaction area and shapes of the keys may be implemented. Each of the new layouts include a key for traversing directories (these have been eliminated above and are implemented by double-clicking the up and down arrow keys). FIGS. 8-10 have the display running the "short" dimension of the user interaction area. This reduces the display area, but increases the area for key placement. FIG. 8 illustrates a numeric keypad on the front top surface and the keys having different shapes. FIGS. 9-10 are layouts where the numeric keypad would be on the opposite side of the DocuCard. The layout of FIG. 11, is similar to the currently preferred embodiment, but with different sized keys and the elimination of the speaker area.

Although not illustrated, another implementation of the DocuCard User Interaction Area would have a display area taking up one entire side of the DocuCard, with the various keys being positioned along the sides or on the reverse side. As noted above DocuCards may be implemented having fewer functions and may not require various user interface features described herein.

Selecting a Function

When a user presses the "Power" key, the display area will show a function selection interface as illustrated in FIG. 12. Referring to FIG. 12, both specific functions and function classes are displayed. Function classes are distinguished by the arrowhead preceding the name of the class. The first line of the display indicates three functions, "XFER COPY LOAN". The second line indicates function classes "FILE" and "CREDIT". The third line indicates function classes "OTHER" and "HELP".

A "current" function capable of being selected is indicated by highlighting using reverse video, underlining or some other technique. Traversal is accomplished by using the "up-arrow" and "down-arrow" keys to go between the lines and the "left-arrow" and "right-arrow" keys to go across a line. Referring to FIG. 12, the XFER function is highlighted so that it is current and can be selected.

FIG. 13 illustrates what occurs when a function class is selected. Here it is assumed that the "FILE" function class is current. The "FILE" function class is selected by pressing the "down-directory arrow" key (or by double-clicking the "down-arrow" key). What is then displayed are the most commonly used functions of the class, "Move to Folder", "Delete" and "New Folder" as well as an "OTHER" indicator to denote other functions that can be displayed that fall within the same general function class designation. Other functions may include functions for making a back-up copy or changing directory information. Moving out of this function class would be accomplished by pressing the "up-directory arrow" key (or by double clicking the "up-arrow" key).

Selection of the "current" function is accomplished by depressing the "Select" key.

The DocuCard functions of the currently preferred embodiment are listed in Table A.

Selecting a Document

As noted with respect to FIG. 3, once a function has been selected, the document on which the function is to be performed is selected (except for certain file management functions). The present invention provides a consistent interface for the selection of a document across the various functions. The steps for selection of a document are described with respect to the flowchart of FIG. 14 and exemplified for a COPY function in the screen displays of FIGS. 15-17. Referring to FIG. 14, after a function is selected, the user selects the repository containing the document on which the function will be performed, step 1401. Referring now to FIG. 15, the Copy function has been selected and the information illustrated in FIG. 15 is displayed. The first line displays "COPY FROM" to indicate the repository from which the document is copied is to be selected. The second and third lines of the display list the repositories. The second line containing "HERE" indicates the DocuCard while the third line containing "THERE" indicates the connected repository. Note that if the DocuCard was not connected to another repository or if the other repository did not permit copying, this dialog in the COPY function may not be needed. In any event,

TABLE A

DOCUCARD FUNCTIONS	
Function (Class)	Description
TRANSFER (XFER)	Move a document from a source repository to a destination repository.
COPY	Make a copy of a document from a source repository to a specified location in a destination repository.
LOAN	Make a copy of a document from a source repository which is accessible on the destination repository for a predetermined period time (i.e. the loan period).
MOVE TO FOLDER (FILE)	Move a document to a selected folder in the DocuCard.
DELETE (FILE)	Remove a document from the DocuCard.
NEW FOLDER (FILE)	Create a new folder on the DocuCard.
BACK-UP (FILE)	Create a back-up copy of a document on the DocuCard on another repository.
RESTORE (FILE)	Restore a back-up copy made on another repository to the DocuCard.
DIRECTORY	Display the contents of a folder on the DocuCard or in a folder on a coupled repository.
PRINT	Print a document on a printer attached to the DocuCard.
PLAY	Play a document on a playback device coupled to the DocuCard.
ASSIGN FEE (CREDIT)	Specify the payor of a usage fee.
HELP	Provides context sensitive help instructions.

presuming a choice must be made, the user would then use the up-arrow and down-arrow keys to move the cursor to the line corresponding to the desired repository. The selected repository is highlighted.

Referring back to FIG. 14, when the repository has been selected, the user searches for the document through the hierarchical directory structure of the repository. This begins with finding the desired directory, step 1402. The DocuCard display area will display the information illustrated in FIG. 16. Referring to FIG. 16, the first line shows the characters of the alphabet. A highlighted letter will indicate where the search is positioned (recall the alphabetical ordering of the directories/documents). The second line indicates the current directory being searched and the third line indicates a particular item within the directory (an item being either a document or sub-directory). In FIG. 16, the search position is located at documents or directories beginning with the letter A. The currently selected folder is named "Aaron's Work" and the first file inside the folder is named "Hamlet Essay".

A user will then search the directory using the search keys to find the desired directory. Note that the user changes a directory being searched by using the "move-down" key to search a sub-directory and the "move-up" key to enter a parent directory. When a user presses the right arrow key, the search will proceed down the lexical ordering (i.e. in the A-Z direction). When a user presses the left arrow key, the search will proceed up the lexical ordering (i.e. in the Z-A direction.) Note that as the directional arrow key is held down, the search speed will increase. When a desired directory is found, the directory is searched to determine if the desired document is there, step 1403. This is accomplished by invoking the "move-down" key to enter the directory. The directory is scanned by pressing the left and right arrow keys to go through the lexical ordering of files. FIG. 17 illustrates a display of an entry in a directory. As before, the first line

contains the alphabet which can be scanned as described above. The second line shows the name of the entry and the third line provides information about the entry. In FIG. 17, A document entitled "Annual Plan" which was created on Jun. 6, 1994 and has a size of 530 Kilobytes is selected.

It is then determined if the desired document is in the directory, step 1404. If the desired document is in the directory, the search is completed and the user presses the "select" key to confirm selection, step 1405. If not, the user would then go to another directory to find the documents as described with respect to steps 1402 and 1403.

Entering Text

There may be instances where text will be entered, e.g. for the name of a created folder. A "character selection" technique for entering text is illustrated with reference to FIG. 18. Referring to FIG. 18, the first and second lines indicate the characters that can be selected. The third line is a buffer, showing the text that has been entered so far. In the first two lines, highlighting indicates what character has been selected. In the third line, the highlighting indicates where the next character of text will appear. Traversal between the lines is accomplished using the "up-arrow" and "down-arrow" keys. The "left arrow" and "right arrow" keys provide for traversing a particular characters on a line. Selection of characters occurs by depressing the "select" key, which will cause the selected character to be displayed on the third line at the next (right most) character position.

When in the buffer area of line three, characters are deleted by moving the "left-arrow" key over the character position. Text is entered and deleted a character at a time. To cause the entered text to be used, the bottom line is selected using the "down arrow" key and the "select" key depressed.

Various schemes for entering text data from a numeric keypad (e.g. a telephone keypad) are known and would be suitable for use in the present invention.

Functional Examples

What follows are two examples of DocuCard functions and how they would be carried out. It should be noted that other functions in the currently preferred embodiment would be carried out in a similar manner.

Copying a Document

It is assumed that a user has selected a document (or directory) for copying as described above. The next step is to identify where the document will be copied to. The last location to which a copy operation has been performed is immediately presented to the user as a default. If this is the same location to copy to, the user simply presses the "select" key to initiate the copy. Otherwise, the user must select a destination directory. Selection of the destination directory is performed in a manner similar to selection of a document. A screen display for choosing the destination directory is illustrated in FIG. 19. As before, the first line has the alphabet to indicate the lexical position and the second line the name of the currently selected directory. The third line provides an indication of the step in the function that is being performed in terms of instructions to the user. When the desired directory is selected, the "select" key is depressed.

Once the destination directory is selected, a function confirmation and summary is displayed as illustrated in FIG. 20. Here, the first line indicates that it is a "COPY" function that will cost \$1.00 (One dollar) to perform. The first line further contains an option to "CANCEL" the function and an "INFO" indicator that can be selected to get other informa-

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tion about the transaction. The second line of the display indicates the document being copied and the third line of the display indicates the destination directory.

FIG. 21 illustrates a warning message being displayed as part of the transaction summary. Here, the clock on the first line could be flashing to indicate some warning about the transaction (e.g. that the copy may be only used for some limited amount of time.) The user would select the "INFO" option to get information about the warning.

When the user is ready to perform the transaction, the "select" key is pressed when in the confirmation/summary display of FIG. 20.

Organizing A Directory

A DocuCard may contain a single document or thousands of documents. It is clearly desirable to be able to organize the documents. As described, the documents in a DocuCard are organized in hierarchical directories. So the steps in organizing a directory would be to make an instance of a directory and to move documents and directories into the created directory. From the previous discussion of selecting a function described with respect to FIG. 13 it is observed that the NEW Directory function is found in the FILE function group. Accordingly, the user will select the NEW Directory function in the manner described above with respect to Selecting a Function. The user will then be asked to identify the repository to which the new directory will be created and to provide a name for the new directory. Once a name is provided, the user will be asked to identify the directory in which the new directory will be created. The steps and information display are similar to those described above with respect to the COPY function. Providing a name would be accomplished in the manner described above with respect to entering text.

Once the directory is created, documents (and other directories) can be moved into it. This is accomplished by the Move to Folder function. As we can see from FIG. 13, the Move to Folder function is also contained in the FILES function group. At this point the user needs to select two arguments: the item to be moved and the directory into which it is to be moved. Selection of the item to be moved and the destination directory is as described in the steps performed in the COPY function. Again, a summarization display is presented to the user where they can decide to cancel or complete the transaction by depressing the "select" key.

Thus, a DocuCard is disclosed. While the present invention is described with respect to a preferred embodiment, it would be apparent to one skilled in the art to practice the present invention with other storage, display, user interface or packaging technologies. Such alternative embodiments would not cause departure from the spirit and scope of the present invention.

What is claimed:

1. A transportable storage device for storing digital documents, said transportable storage device for exchanging documents with a repository, said repository storing documents having attached usage rights, said transportable storage device comprising:

- a rigid enclosure having a top surface and a bottom surface, said top surface defining a first aperture;
- a storage means positioned within said rigid enclosure, said storage means for storing documents having attached usage rights;
- a power source for providing power to enable standalone operation of said transportable storage device;
- an external interface extending through said rigid enclosure, said external interface for coupling to another repository;

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a controller module positioned within said rigid enclosure, said controller module comprising:
access control means for controlling access to documents stored in said storage means;

function processing means for performing functions responsive to user selections entered on a user interface; and

registration means for creating a trusted session with said repository through said external interface; and

said user interface comprising:

a display means positioned in said first aperture of said top surface, said display means for displaying a function list and a document list identifying documents stored in said storage means;

selection means coupled to said controller means, said selection means for enabling a user to find and select functions from said function list and documents from said document list.

2. The transportable storage device as recited in claim 1 wherein said storage means is further comprised of a read/write means and a storage medium, said read/write means for reading data signals from and writing data signals to said storage medium, and said storage medium for recording said data signals.

3. The transportable storage medium device as recited in claim 2 wherein said storage medium is a magnetic disk.

4. The transportable storage device as recited in claim 2 wherein said storage medium is an optical disk.

5. The transportable storage device as recited in claim 2 wherein said storage medium is a plurality of solid state memories.

6. The transportable storage device as recited in claim 1 wherein said top surface of said rigid enclosure further defines a plurality of second apertures and said selection means is comprised of a plurality of switches positioned to extend through said plurality of second apertures of said top surface of said rigid enclosure.

7. The transportable storage device as recited in claim 6 wherein said plurality of switches is comprised of: a set of traversal switches for traversing a function list and a document list, a selection switch for selecting a function or a document and a power switch for enabling a power source to activate said transportable storage device.

8. The transportable storage device as recited in claim 7 wherein said user interface is further comprised of means for entering textual information using said set of traversal switches and said selection switch.

9. The transportable storage device as recited in claim 6 wherein said display means is comprised of a segment display.

10. The transportable storage device as recited in claim 1 wherein said display means is a touch screen display and said selection means is a plurality of touch screen buttons defined on said touch screen display.

11. The transportable storage device as recited in claim 1 wherein said external interface means is compliant with Personal Computer Memory Card Industry Association standards.

12. The transportable storage device as recited in claim 1 wherein said function list comprises a first function to find document identifiers of the documents stored in said storage means and a second function to delete a document stored in said storage means.

13. The transportable storage device as recited in claim 1 wherein said access control means of said controller module is further comprised of a means for enforcing usage rights attached to documents.

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14. The transportable storage device as recited in claim 13 wherein said controller module is further comprised of means for reporting usage fees attached to documents for access to such documents.

15. The transportable storage device as recited in claim 1 wherein said bottom surface of said rigid enclosure defines a plurality of second apertures and said selection means is comprised of a plurality of switches positioned to extend through said plurality of second apertures of said bottom surface of said rigid enclosure.

16. The transportable storage device as recited in claim 1 wherein said top surface and said bottom surface of said rigid enclosure define a plurality of edges, said plurality of edges defining a plurality of second apertures and said selection means is comprised of a plurality of switches positioned to extend through said plurality of second apertures of said plurality of edges.

17. A method for accessing documents stored in a repository from a DocuCard, said documents stored in said repository having one or more usage rights attached thereto, said usage rights indicating a particular manner by which said document may be used, said DocuCard comprised of a display, a plurality of traversal keys and a select key, said method comprising the steps of:

- a) a user coupling said DocuCard to said repository;
- b) displaying on said display of said DocuCard a list of functions for accessing a document stored on said repository, each of said functions representing an instance of how a selected document is used, each of said functions corresponding to an instance of a usage right;
- c) said user selecting a function from said displayed list of functions;
- d) displaying on said display of said DocuCard a list of the contents of said repository;
- e) said user selecting a desired document from said list of contents of said repository;
- f) said repository determining if said desired document has said instance of a usage right corresponding to said selected function;
- g) if said desired document has attached thereto said usage right corresponding to said selected function, said repository granting access to said document; and
- h) if said desired document does not have attached thereto said usage right corresponding to said selected function, said repository denying access to said document.

18. The method as recited in claim 17 wherein said step of displaying a list of functions for accessing a document stored on said repository is further comprised of the steps of:

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- b1) displaying a list of commonly used functions; and
- b2) displaying an indicator to sub-lists of less frequently used functions.

19. The method as recited in claim 18 wherein said step of said user selecting a function from said displayed list of functions is further comprised of the steps of:

- c1) said user traversing to said function using said traversal keys coupled to said DocuCard; and
- c2) said user depressing said select key on said DocuCard.

20. The method as recited in claim 19 wherein said step of said user traversing to said function using said traversal keys coupled to said DocuCard is further comprised of the steps of:

- c3) said user traversing determining if said function is displayed on said DocuCard display;
- c4) if said function is not displayed on said DocuCard display, said user traversing to said indicator to sub-lists of less frequently used functions;
- c5) said user depressing said select key on said DocuCard; and
- c6) said user repeating per step c3) until said function is displayed on said DocuCard display.

21. The method as recited in claim 20 wherein said step of displaying on said display of said DocuCard a list of the contents of said repository is further comprised of the step of:

- d1) displaying one or more document identifiers; and
- d2) displaying a proximity indicator indicating a lexical positioning of the documents displayed on said DocuCard display.

22. The method as recited in claim 21 wherein said step of said user selecting a desired document from said list of contents of said repository is further comprised of the steps of:

- e1) said user traversing said list of contents using said DocuCard traversal keys until said desired document is displayed; and
- e2) said user depressing said select key on said DocuCard.

23. The method as recited in claim 22 where responsive to said step of said user traversing said list of contents using said DocuCard traversal keys performing the step of updating said proximity indicator indicating a lexical positioning of the documents displayed on said DocuCard display.

* * * * *

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Reexam Control No. 95/001,274**



US005864868A

United States Patent [19]

[11] Patent Number: **5,864,868**

Contois

[45] Date of Patent: **Jan. 26, 1999**

[54] **COMPUTER CONTROL SYSTEM AND USER INTERFACE FOR MEDIA PLAYING DEVICES**

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[76] Inventor: **David C. Contois**, 217 Pearl St., Essex Jct., Vt. 05452

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[51] Int. Cl.⁶ **G06F 17/30**

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[58] **Field of Search** **364/130, 400; 235/375; 395/902, 328, 615; 194/217; 84/602, 462, 609, 610, 622, 726; 369/30; 379/101.01; 707/104**

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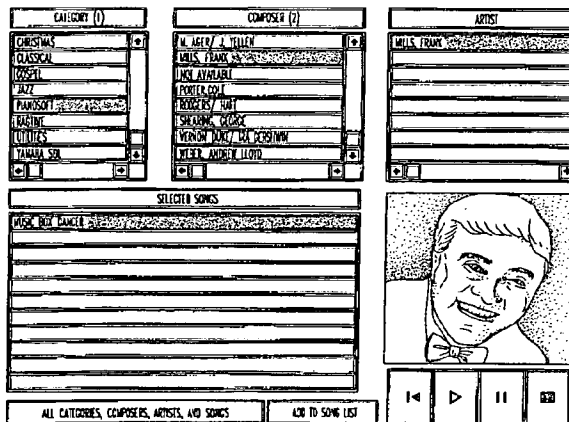
Primary Examiner—Thomas G. Black
Assistant Examiner—Charles L. Rones
Attorney, Agent, or Firm—Michael W. Starkweather; Valerie L. Starkweather

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[57] ABSTRACT

A computer system and method for controlling a media playing device. The system provides a user interface for allowing a user access to media pieces stored in a media database. The interface is also for controlling a media playing device, like a player piano or movie playing video device, that is coupled to the computer to play the accessed or selected piece of media. In one embodiment there is a computer interface that allows a user to display only music that relates to a selected category, like jazz or classical music. Another embodiment allows the user to direct the media playing device to automatically play selected music pieces that are related to a selected music category. Another embodiment allows a user to direct the media playing device to automatically play selected music pieces that are related to the selected music composer or artist.

20 Claims, 8 Drawing Sheets



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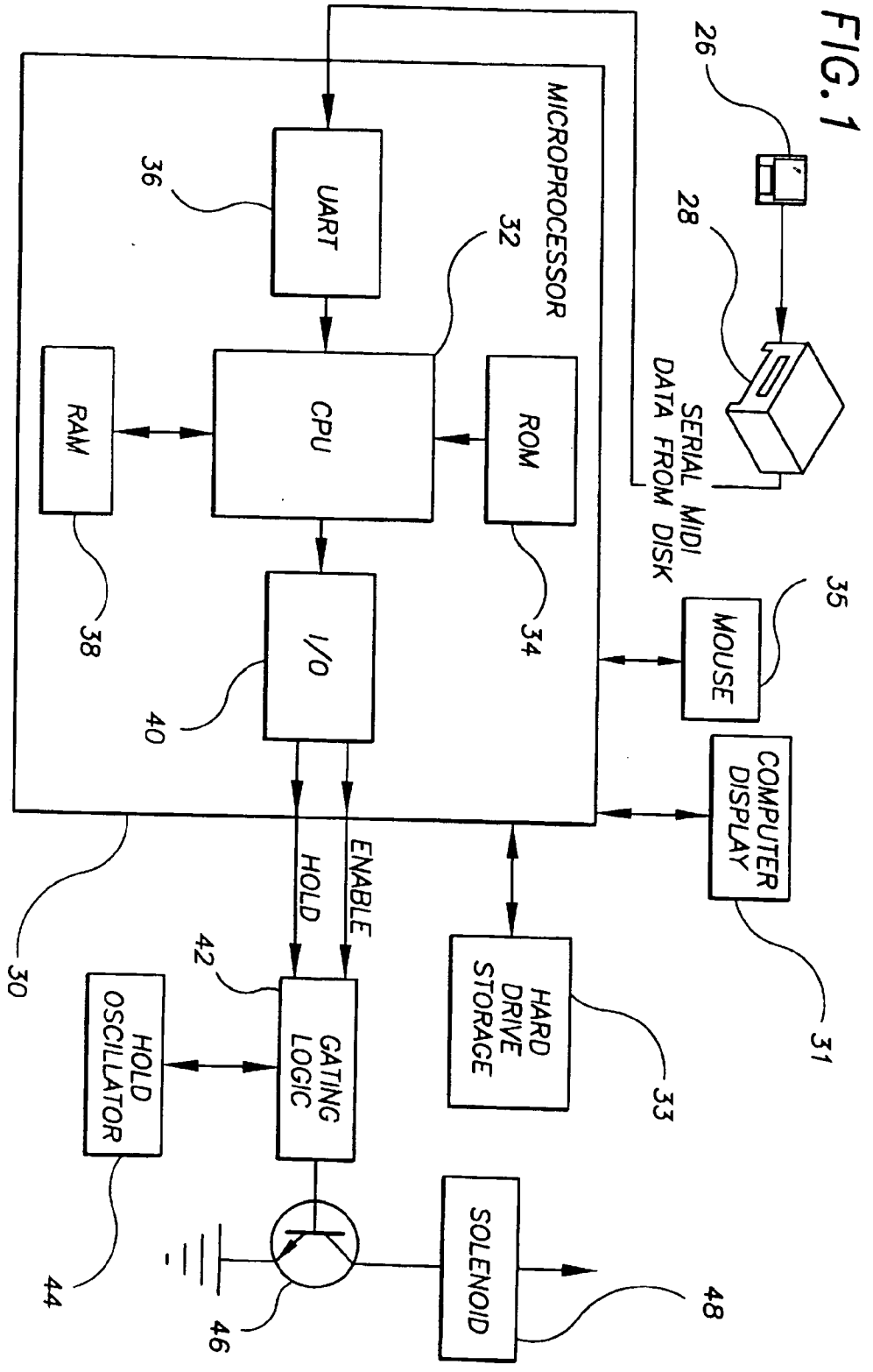


FIG. 1

FIG. 2

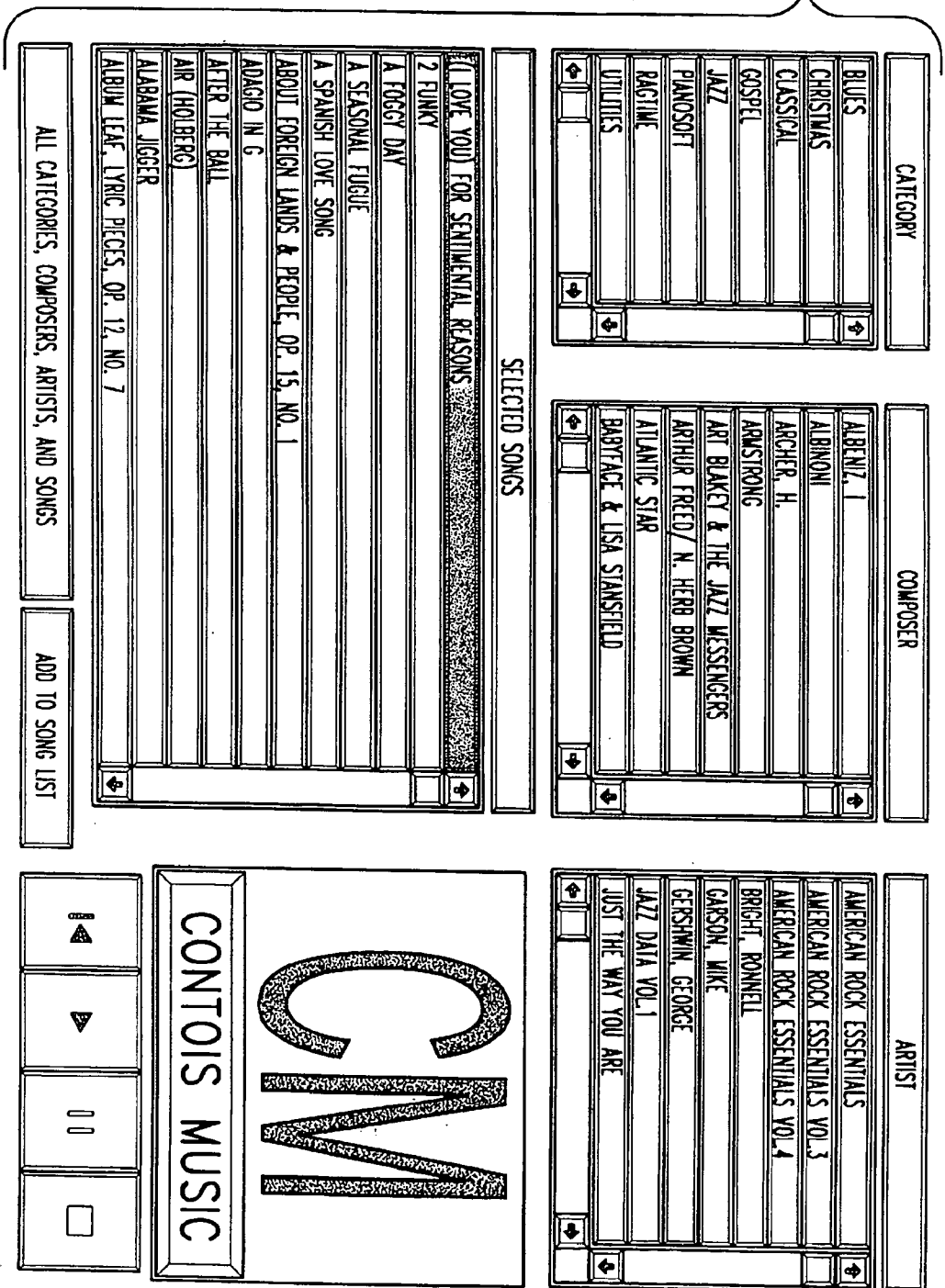


FIG. 3

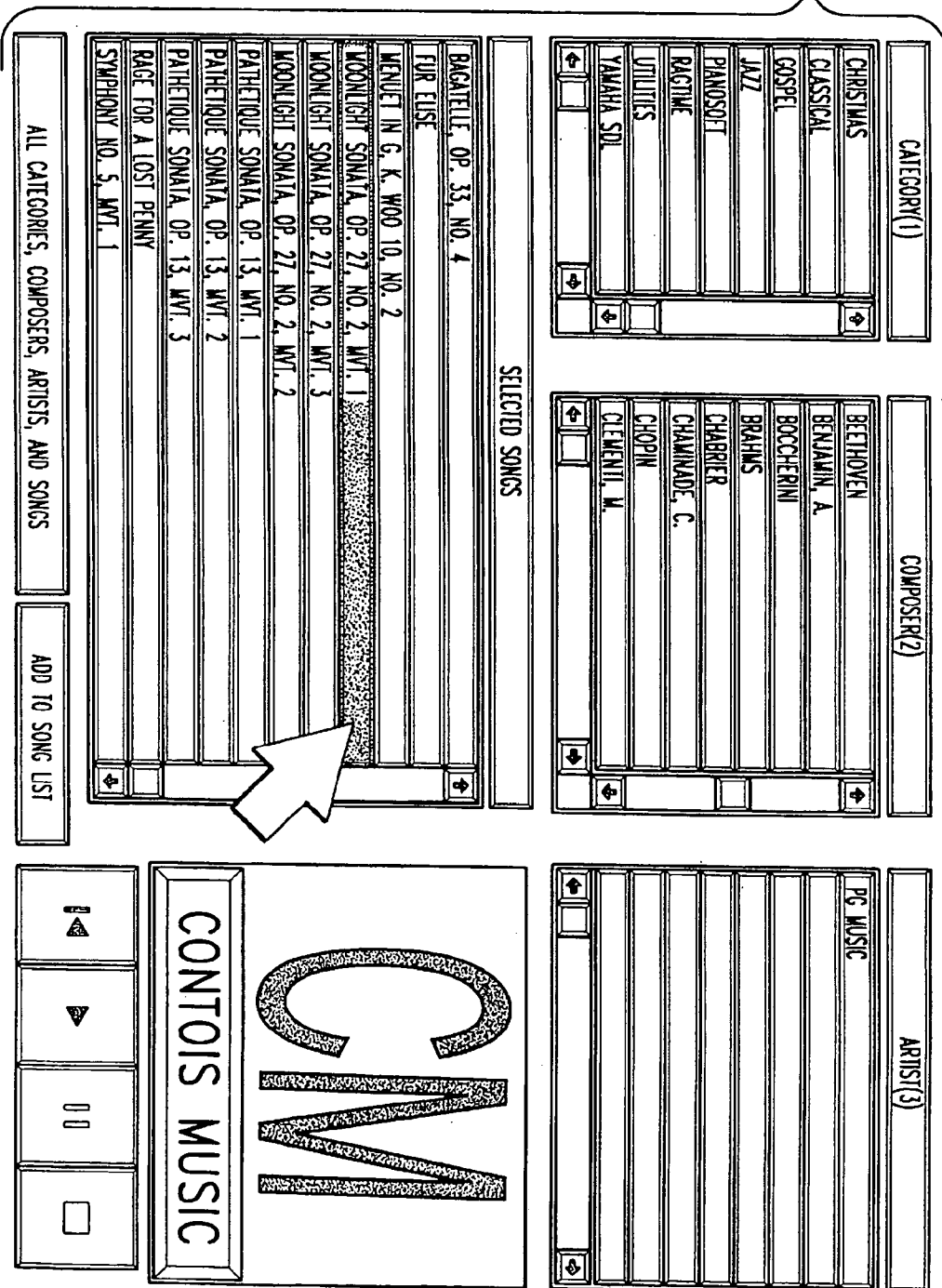


FIG. 4

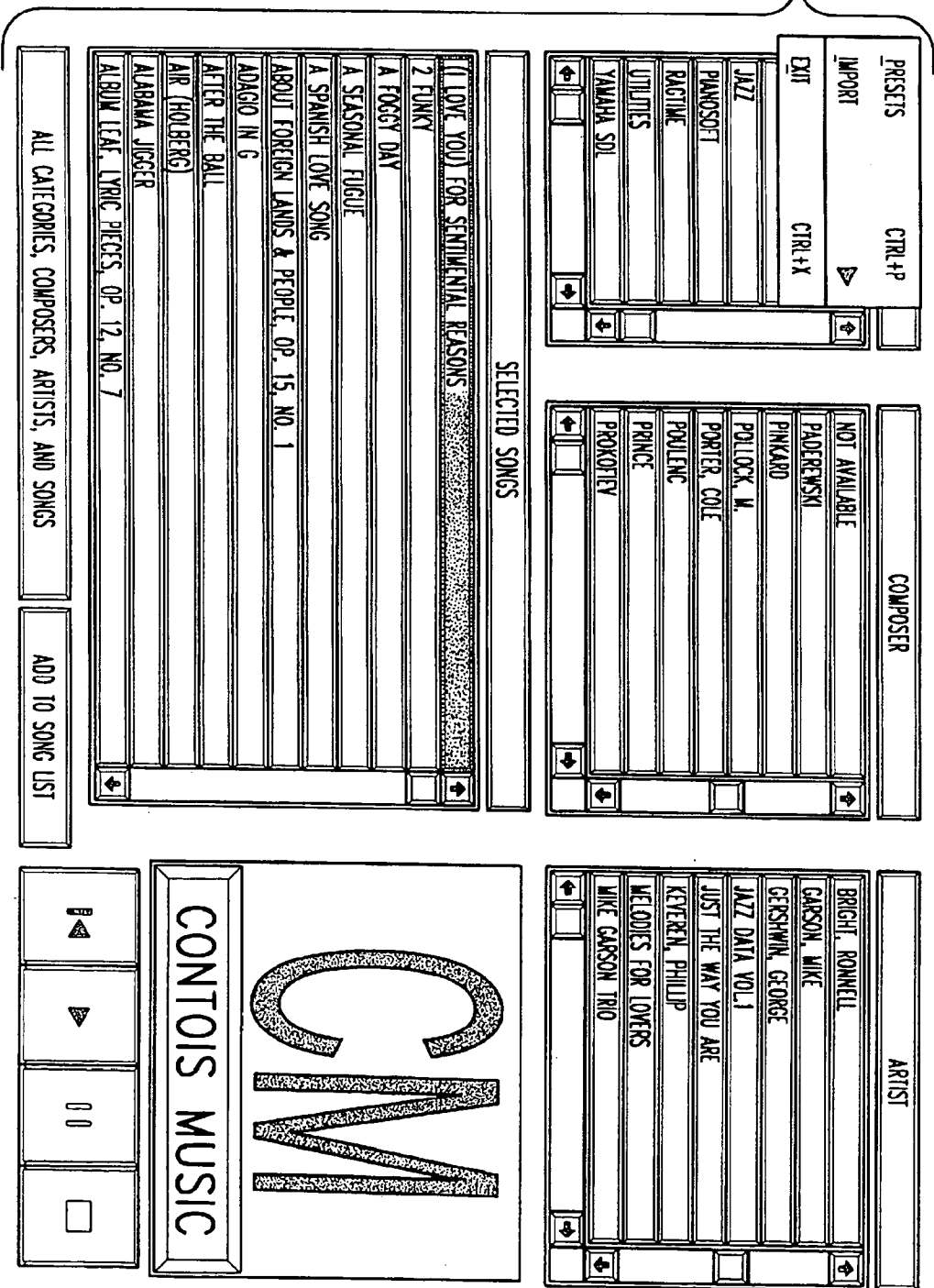


FIG. 5

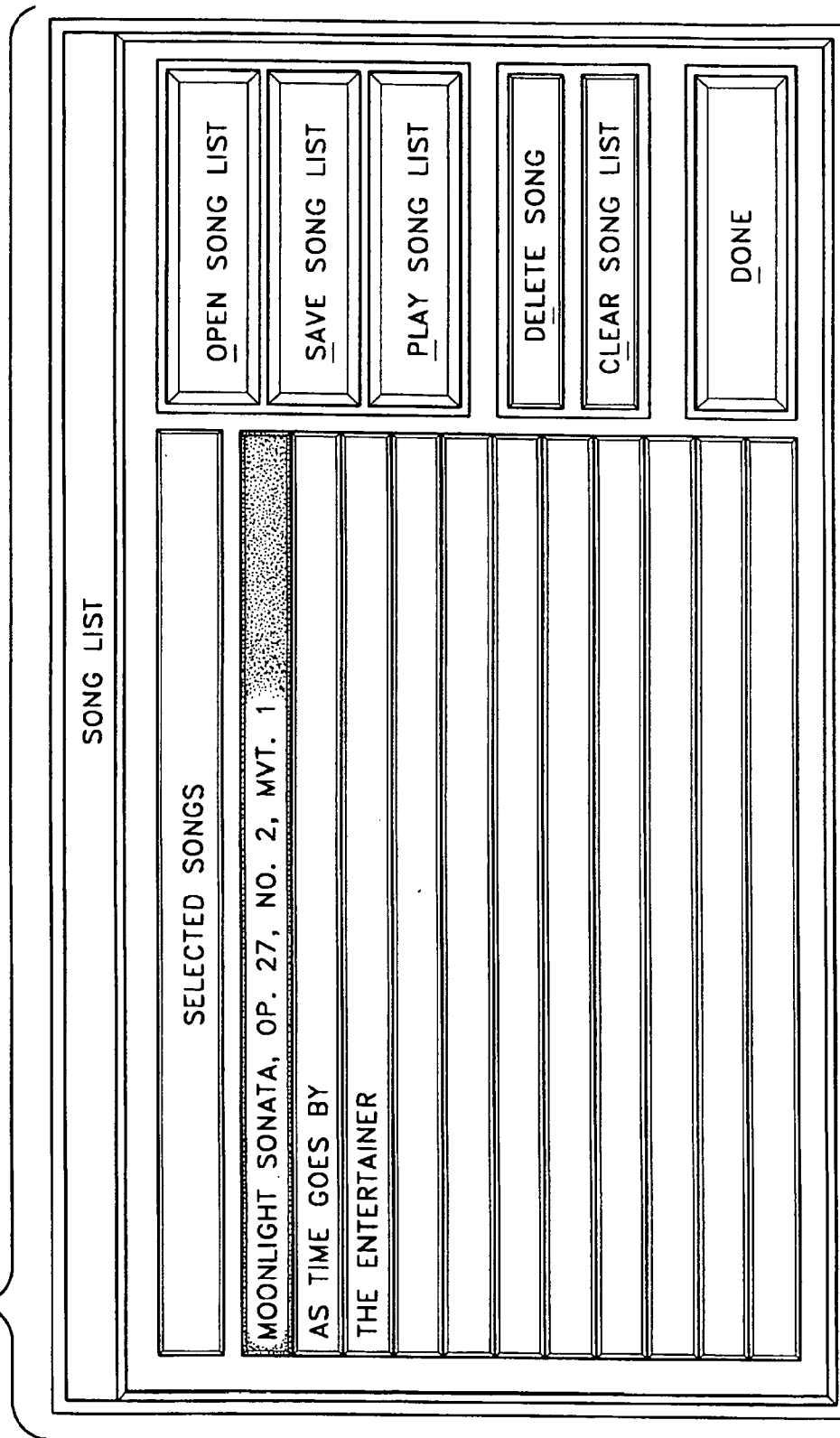


FIG. 6

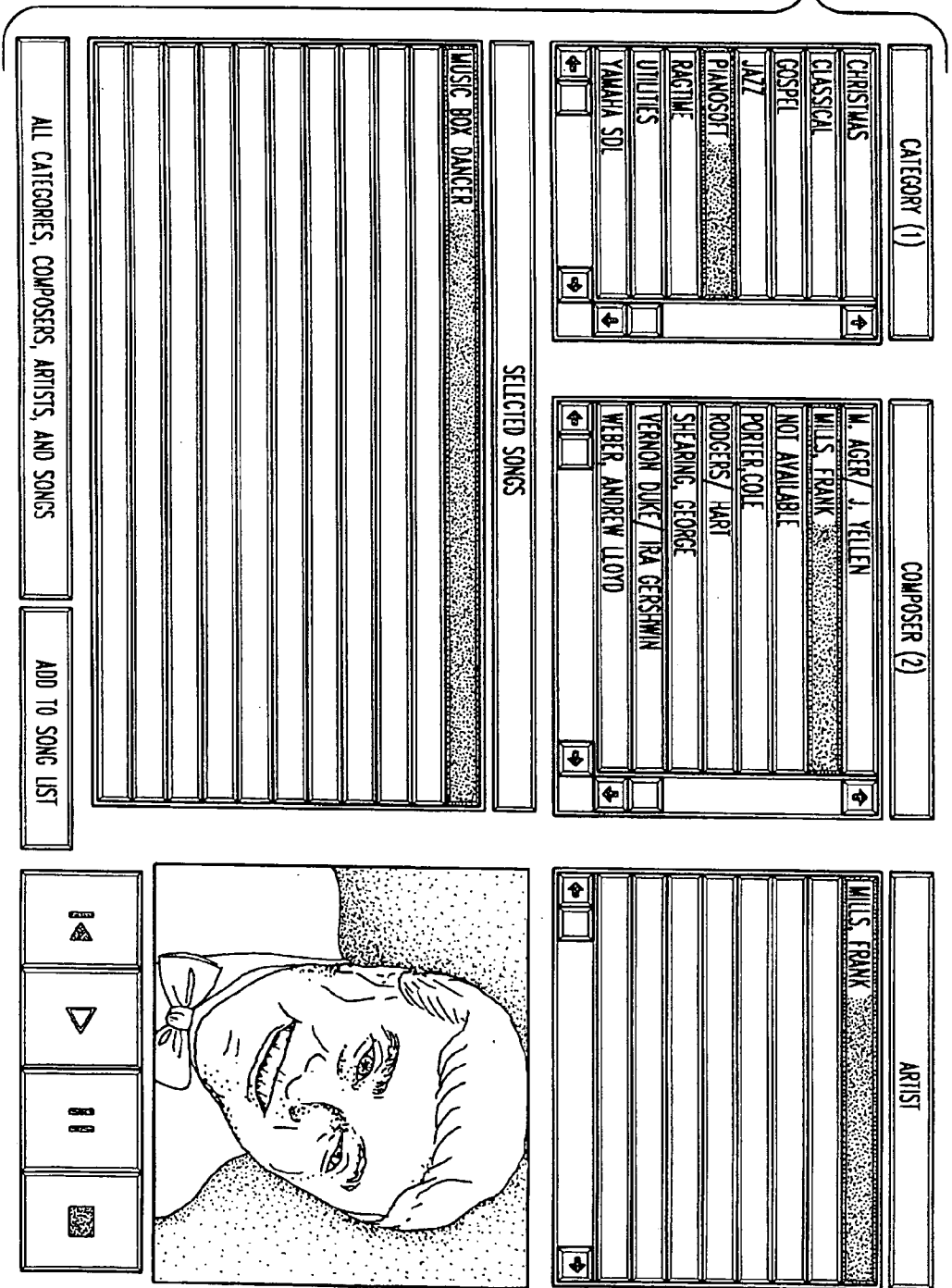


FIG. 7

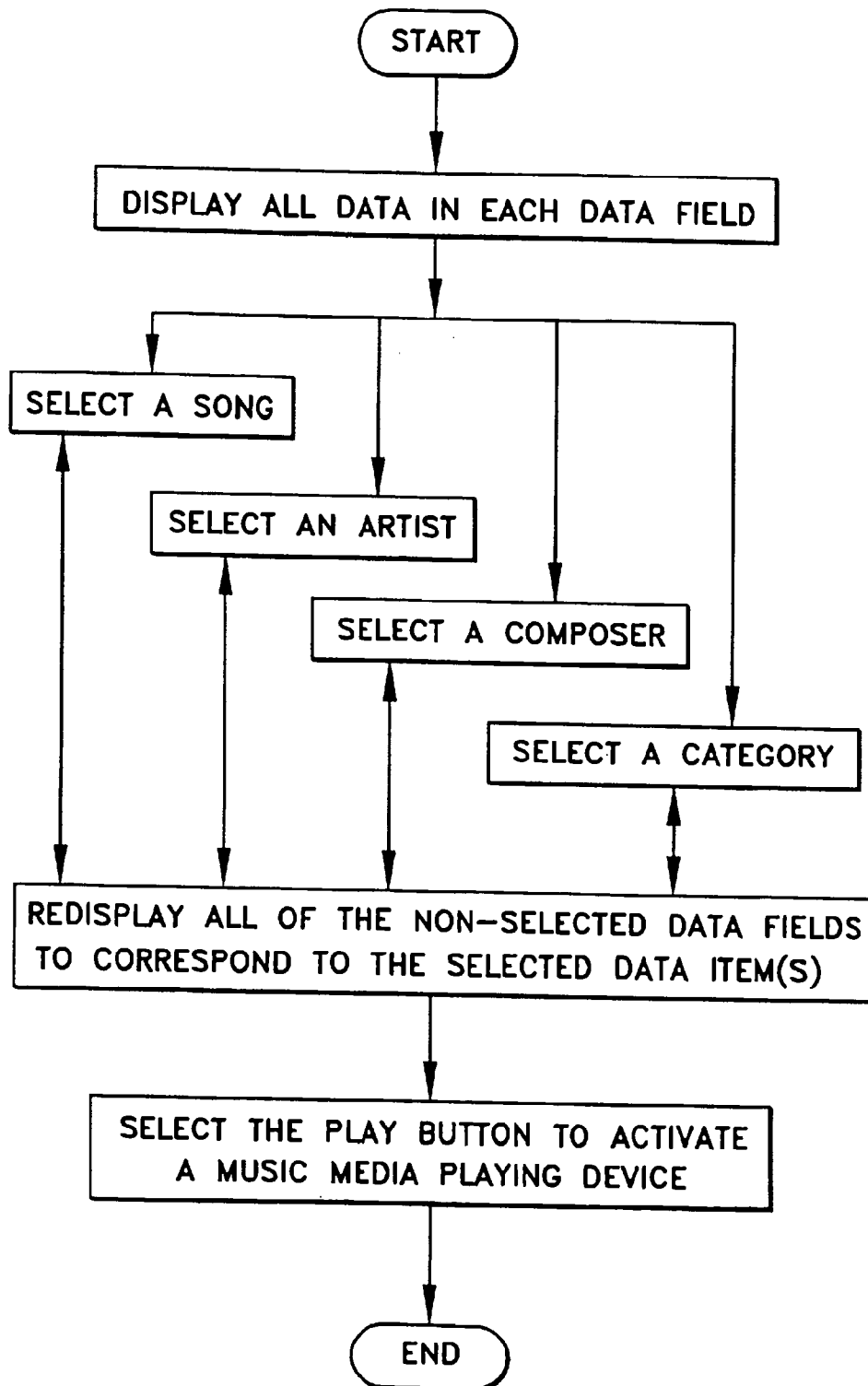
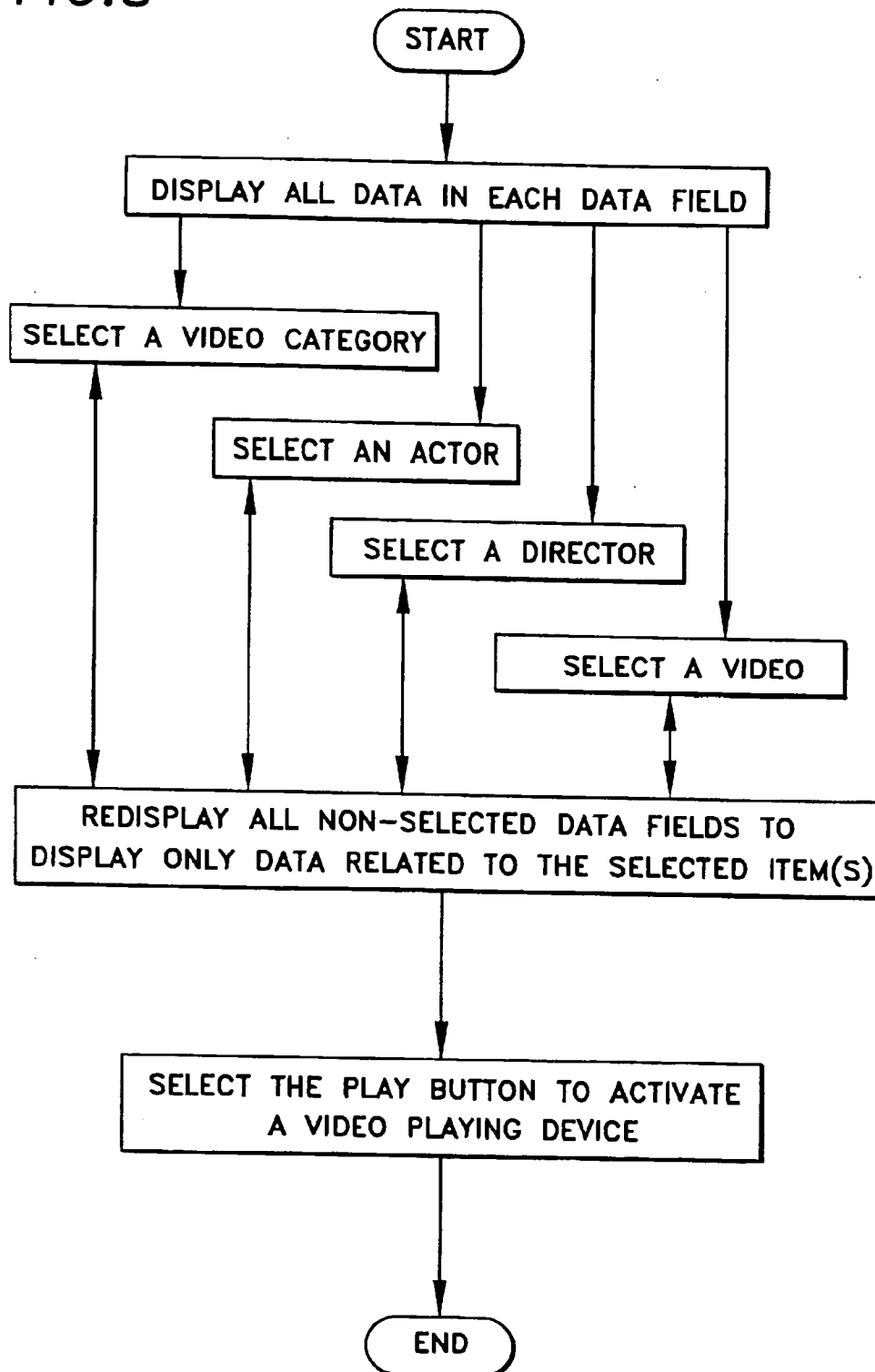


FIG. 8



COMPUTER CONTROL SYSTEM AND USER INTERFACE FOR MEDIA PLAYING DEVICES

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention generally relates to a computer system and user interface for allowing a user access to a selection of media pieces stored in a media database and for directing and controlling a media playing device to play the selected media piece.

2. Description of the Prior Art

There are many media mediums that have been developed in the last few decades. For example, there are several music mediums, like records, tapes, or CDs, there is the movie video medium, and there is the digital medium. For the purpose of this disclosure and illustration of an embodiment of the invention, the music media and a media playing device such as a player piano will be focused upon. The movie video medium will also be briefly discussed in the specification.

The advent of the player piano was a tremendous breakthrough in the music world. Whether someone was relaxing at home or entertaining a houseful of guests, a player piano would give someone the best of both worlds—a fine acoustic instrument for a pianist to perform on, and a way to enjoy the same vibrant sounds when no pianist was available or willing. Even Hotels, restaurants, clubs and other establishments could have live music on call at all hours of the day or night, using prerecorded music.

Those who are familiar with player pianos of old would not recognize its predecessor, being equipped with a whole selection of newly developed digital electronic musical innovations. The old music scroll containing only one song has been replaced by a computer disc storing many pieces of music. Player pianos can now record music and play it back with such preciseness that all but the most accomplished music listeners could be fooled. Music students can determine if they only want the left or right hand keyboard playing to assist them in learning music pieces. Music pieces can even be electronically transposed into most any key and moved up or down two octaves from the original key by the touch of a button. Even the old metronome has been replaced by a digitized version that can show elapsed time on a liquid crystal display (LCD). And for the recording studios and electronic musicians, the ability to link an acoustic piano with musical instrument digital interface (MIDI) equipment has lifted the king of instruments into a whole new realm.

Examples of patents that are related to the present embodiment of the music medium are as follows, wherein each of the following patents are herein incorporated by reference for the supporting teachings:

U.S. Pat. No. 5,393,926, is a virtual music system. There is included a multi-element actuator that generates a plurality of signals in response to being played by a user. The system also has an audio synthesizer that generates audio tones in response to control signals. There is a memory storing a musical score for the multi-element actuator, the stored musical score including a sequence of lead notes and an associated sequence of harmony note arrays. Each harmony note array of the sequence corresponding to a different one of the lead notes and contain zero, one or more harmony notes. The instrument also includes a digital processor receiving the plurality of signals from the multi-element

actuator and generating a first set of control signals therefrom. The digital processor is programmed to identify from among the sequence of lead notes in the stored musical score a lead note which corresponds to a first one of the plurality of signals. The digital processor is also programmed to map a set of the remainder of the plurality of signals to whatever harmony notes are associated with the selected lead note, if any. Moreover, the digital processor is programmed to produce the first set of control signals from the identified lead note and the harmony notes to which the signals of the plurality of signals are mapped. The first set of control signals causes the synthesizer to generate sounds representing the identified lead note and the mapped harmony notes.

U.S. Pat. No. 5,390,138, is a system for connecting an audio object to various multimedia objects to enable an object-oriented simulation of a multimedia presentation using a computer with a storage and a display. A plurality of multimedia objects are created on the display including at least one connection object and at least one audio object. Multimedia objects are displayed, including at least one audio object. The multimedia object and the audio object create a multimedia presentation.

U.S. Pat. No. 5,388,264, is a system for connecting a Musical Instrument Digital Interface (MIDI) object to various multimedia objects to enable an object-oriented simulation of a multimedia presentation using a computer with a storage and a display. A plurality of multimedia objects are created on the display including at least one connection object and at least one MIDI object in the storage. The multimedia object and the MIDI object are connected, and information is routed therebetween to create a multimedia presentation.

U.S. Pat. No. 5,317,732 is a process performed in a data processing system that includes receiving an input selecting one of a plurality of multimedia presentations to be relocated from a first memory to a second memory, scanning the linked data structures of the selected multimedia presentation to recognize a plurality of resources corresponding to the selected multimedia presentation, and generating a list of names and locations within the selected multimedia presentation corresponding to the identified plurality of resources. The process also includes renaming the names on the generated list, changing the names of the identified plurality of resources in the selected multimedia presentation to the new names on the generated list, and moving the selected multimedia presentation and the resources identified on the generated list to the second memory.

U.S. Pat. No. 5,262,940 is a portable audio/audio-visual media tracking device.

U.S. Pat. No. 5,247,126, is an image reproducing apparatus, image information recording medium, and musical accompaniment playing apparatus.

U.S. Pat. No. 5,208,421, is a method and apparatus for audio editing of MIDI files. The invention may be utilized to ensure the integrity of a source MIDI file, a copied or lifted section or a target file by automatically inserting matching note on or note off messages into a file or file section to correct inconsistencies created by such editing. Additionally, program status messages are automatically inserted into source files, copied or lifted sections, or target files to yield results that are consistent with the results that may be obtained by editing digital audio data. Timing information is selectively added or maintained such that MIDI files may be selectively edited without requiring a user to learn a complex MIDI sequencer.

U.S. Pat. No. 5,153,829, is an information processing apparatus. The invention has a unit for displaying on a

screen a musical score, keyboard, and tone time information to be inputted. There is also a unit for designating the position of the keyboard, and tone time information, respectively displayed on the display unit. Moreover, the invention includes a unit for storing musical information produced through designation by the designating unit of the position of the keyboard and tone time information displayed on the display unit. Additionally, there is a unit for controlling the display of the musical score, keyboard, and tone time information on the screen of the display unit. The unit also is for controlling the display of a pattern of musical tone or rest on the musical score on the display unit in accordance with the position of the keyboard and tone time information respectively designated by the designating unit. Finally, there is a unit for generating a musical tone by reading the musical information stored in the storage unit.

U.S. Pat. No. 5,142,961, is a method for storage, transcription, manipulation and reproduction of music on system-controlled musical instruments which faithfully reproduces the characteristics of acoustic musical instruments. The system comprises a music source, a central processing unit (CPU) and a CPU-controlled plurality of instrument transducers in the form of any number of acoustic or acoustic hybrid instruments. In one embodiment, performance information is sent from a music source MIDI controller to the CPU, edited in the CPU, converted into an electrical signal, and sent to instrument transducers via transducer drivers. In another embodiment, individual performances stored in a digital or sound tape medium are reproduced at will through the instrument transducers, or converted into MIDI data by a pitch/frequency detection device for storage, editing or performance in the CPU. In still another embodiment, performance information is extracted from an electronic recording medium or live performance by a pitch/frequency detection device, edited in the CPU, converted into an electrical signal, and sent to any number of instrument transducers. The device also eliminates typical acoustic musical instrument delay problems.

U.S. Pat. No. 5,083,491, is a method and apparatus for re-creating expression effects on solenoid actuated music producing instruments contained in musical renditions recorded in MIDI format for reproduction on solenoid actuated player piano systems. Detected strike velocity information contained in the MIDI recording is decoded and correlated to strike maps stored in a controlling microprocessor. The strike maps contain data corresponding to desired musical expression effects. Time differentiated pulses of fixed width and amplitude are directed to the actuating solenoids in accordance with the data in the strike maps, and the actuating solenoids in turn strike the piano strings. Thereafter, pulses of uniform amplitude and frequency are directed to the actuating solenoids to sustain the strike until the end of the musical note. The strike maps dynamically control the position of the solenoid during the entire duration of the strike to compensate for non-linear characteristics of solenoid operation and piano key movement, thus providing true reproduction of the original musical performance.

U.S. Pat. No. 5,046,004 is a system using a computer and keyboard for reproducing music and displaying words to the music. Data for reproducing music and displaying words are composed of binary-coded digital signals. Such signals are downloaded via a public communication line, or data corresponding to a plurality of musical pieces or songs are previously stored in an apparatus, and the stored data are selectively processed by a central processing unit of a computer. In the instrumental music data, trigger signals are

existent for progression of processing the words data, whereby the reproduction of music and the display of words are linked to each other. The music thus reproduced is utilized as background music or for enabling the user to sing to the accompaniment thereof while watching the words displayed synchronously with such music reproduction.

U.S. Pat. No. 4,744,281, is an automatic music player system having an ensemble playback mode of operation using a memory disk having recorded thereon a piece of music composed of at least two combined parts to be reproduced separately of each other. The parts being recorded in the form of at least two data subblocks, comprising a first sound generator to mechanically generate sounds when mechanically or electrically actuated, at least one second sound generator to electronically generate sounds when electronically actuated and a control unit connected to the first and second sound generators. One of the two or more subblocks of the data read from the disk is discriminated from another, whereupon the discriminated one of the data subblocks is transmitted to the first sound generator and another data subblock transmitted to the second sound generator. Additionally, the transmission of data to the second sound generator is continuously delayed by a predetermined period of time from the transmission of data to the first sound generator so that the two sound generators are enabled to produce sounds concurrently and in concert with each other.

These incorporated by reference patents reflect the state of the art of which the applicant is aware and are tendered with a view toward discharging applicant's acknowledged duty of candor in disclosing information which may be pertinent in the examination of this application. It is respectfully stipulated, however, that none of these patents teach or render obvious, singly or when considered in combination, applicant's claimed invention.

SUMMARY OF THE INVENTION

It is a feature of the invention to provide a computer user interface. The interface is for providing a user access to media pieces stored in a media database. The interface is also for controlling a media playing device, like a player piano or movie playing video device, that is coupled to the computer to play the accesses or selected piece of media.

It is another feature of the invention to provide a computer interface that allows a user to display only music that relates to a selected category, like jazz or classical. Where the user is then able to direct the media playing device to automatically play the selected music pieces related to the selected music categories.

A further feature of the invention is to provide a computer interface that allows a user to display music selections that are related only to a selected composer, like Duke Ellington or Gershwin. Where the user is then able to direct the media playing device to automatically play the selected music pieces related to the selected music composer.

Another feature of the invention is to provide a computer interface that allows a user to display only music that is related to a selected artist, like Dave Contois, or your own personal recordings. Where the user is then able to direct the media playing device to automatically play the selected music pieces related to the selected music artist.

Another feature of the invention is to provide a computer interface that allows a user to display only music that is related to a selected song or music piece, like Alexander's Rag Time Band or Andante & Rondo Capriccioso, Op. 14. Where the user is then able to direct the media playing device to automatically play the selected music piece.

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A feature of the invention is also to provide a computer system that can access others media recording data bases from other sources like internet or world wide web.

Yet a further feature of the invention is to provide a computer system that can access all types of media, like movie videos or music videos, from any multimedia data base source.

It is a further feature of the invention to provide a system for playing media information and implementing a computer as a control means. There is included therein a media playing means for playing media information for a user. Additionally, the control means is coupled to the media playing means. The control means is for allowing a user to automatically control the media playing means in playing the media information. The control means has a display means for displaying information to the user. The control means further has a data storage means for storing first and second categories and a respective first and second data fields, and for enabling data used for enabling the control means to control the media playing means in playing a selected item. Additionally, the control means has a user interface means, displayed on the display means, for displaying to the user at least a first category of media information, a respective first data field listing items related to the first category, and a second category of media information, a respective second data field listing items related to the second category.

The invention resides not in any one of these features per se, but rather in the particular combination of all of them herein disclosed and claimed and it is distinguished from the prior art in this particular combination of all of its structures for the functions specified.

There has thus been outlined, rather broadly, the more important features of the invention in order that the detailed description thereof that follows may be better understood, and in order that the present contribution to the art may be better appreciated. There are, of course, additional features of the invention that will be described hereinafter and which will form the subject matter of the claims appended hereto. Those skilled in the art will appreciate that the conception, upon which this disclosure is based, may readily be utilized as a basis for the designing of other structures, methods and systems for carrying out the several purposes of the present invention. It is important, therefore, that the claims be regarded as including such equivalent constructions insofar as they do not depart from the spirit and scope of the present invention.

Further, the purpose of the foregoing abstract is to enable the U.S. Patent and Trademark Office and the public generally, and especially the scientists, engineers and practitioners in the art who are not familiar with patent or legal terms or phraseology, to determine quickly from a cursory inspection the nature and essence of the technical disclosure of the application. The abstract is neither intended to define the invention of the application, which is measured by the claims, neither is it intended to be limiting as to the scope of the invention in any way.

Other features of the present invention will become more clear from the following detailed description of the invention, taken in conjunction with the accompanying drawings and claims, or may be learned by the practice of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a functional block diagram of one type of computer system capable of controlling a media playing device.

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FIG. 2 illustrates a window displaying a control screen for a preferred embodiment.

FIG. 3 illustrates a window displaying a control screen for a preferred embodiment.

FIG. 4 illustrates a window displaying a control screen for a preferred embodiment.

FIG. 5 illustrates a window displaying a basic Song List screen with the associated operational buttons.

FIG. 6 illustrates a control window displaying a nested graphical window.

FIG. 7 is a partial flowchart illustrating an embodiment of the invention related to a player piano and a music data base.

FIG. 8 is a partial flowchart illustrating another embodiment of the invention related to a movie video media and a videos data base.

It is noted that the drawings of the invention are not to scale. The drawings are merely schematic representations, not intended to portray specific parameters of the invention. The drawings are intended to depict only typical embodiments of the invention, and therefore should not be considered as limiting the scope of the invention. The invention will be described with additional specificity and detail through the use of the accompanying drawings.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Charter by the U.S. Constitution

This disclosure of the invention is submitted in furtherance of the constitutional purposes of the United States Patent Laws "to promote the progress of science and useful arts," as stated in Article 1 of the United States Constitution.

Introduction

The first embodiment relates to the use of a computer system and user interface to control which music is to be played upon a player piano. Although one skilled in the art will know how a MIDI system works and how a computer controlled solenoid operated player piano operates, these two topics are provided for background purposes. A second embodiment of the invention relates to the use of a computer system and user interface for allowing a user to select which movie video will be played upon a computer controlled video media playing device or the like. One skilled in the art of computers and video control will understand how the system operates in view of the discussion of the player piano operation.

MIDI Background

Musical Instrument Digital Interface (MIDI) defines an interface for exchanging information between electronic musical instruments, computers, sequencers, lighting controllers, mixers, and tape recorders as discussed in MIDI Manufacturers Association publication entitled, *MIDI 1.0 Detailed Specification* (1990). MIDI is extensively used both in the recording studio and in live performances and has had enormous impact in the areas of studio recording and automated control, audio video production and composition. By itself and in conjunction with other media, MIDI plays an integral role in the application of computers to multimedia applications. In comparison to digital audio, MIDI files take up much less space, and the information is symbolic for convenient manipulation and viewing. For example, a typical three minute MIDI file may require 30 to 60 Kilobytes on a disk, whereas a CD quality stereo audio file requires about two hundred Kilobytes per second, or 36 Megabytes for three minutes. MIDI data may appear as musical notation, graphical piano-roll, or lists of messages suitable for editing and reassignment to different instruments. Gen-

eral MIDI has standardized instrument assignments to greatly motivate the multimedia title producer.

MIDI input and output ports are used to route time-stamped MIDI packets from one media component to another. MIDI ports act as mailboxes for the communication of MIDI packets across address spaces. Many interesting MIDI applications can be created by connecting media components that contain MIDI ports. For example, a MIDI player and a MIDI interface, can be used to play a music device, like an electronic player piano, connected to a computer. MIDI packets are sent from the MIDI player to the MIDI interface. The MIDI interface converts the MIDI packets to MIDI data that is sent to the player piano for playback.

Background for the Operation of a Solenoid Actuated Player Piano

Solenoid actuation of a player piano key is a complex set of mechanical interactions. The mass of the key mechanism is accelerated by the magnetic force created in the solenoid. The solenoid must be dynamically controlled during the entire period of the key strike for two significant reasons. First, the force of the solenoid is non-linear because it changes as the plunger travels. Second, the mass of the key is also non-linear since the key damper increases the mass of the key to accurately recreate music with true reproduction of expression effects.

Each of the eighty-eight keys on a typical player piano is actuated by a vertical solenoid working on the far end of the key. The solenoids are arranged so as to lift the end of the key, and thus accelerate the key mechanism and hammer to strike the string. The force produced by the solenoid is non-linear and can vary as much as ten to one from the start to the end of the strike; of course the shape of the force curve varying according to the solenoid design and construction.

Each piano key includes a damper mechanism which can ride on the key to dampen the string after the strike. The damper interaction takes effect at some point during the key travel, and thus throws an increased mass onto the key when it is engaged. In addition, the damper may be raised by the pianist so that it will not interact with the key, thus allowing the string to sustain after being struck by the hammer.

Each of the solenoid actuators typically consists of a wound coil housed in a steel frame. The solenoid plunger travels within the center of the winding, and exerts mechanical force to lift the piano key. Flexible rubber tips are used between the plunger push-rod and the bottom of the key to reduce the impact noise of the mechanism. However, this also introduces an additional non-linear component into the key travel.

In general terms, it is necessary to "map" the travel of the solenoid into discrete steps of time, or intervals. The mapped information takes into account the foregoing non-linear characteristics of solenoid operation and key movement. Typically, one strike of the solenoid may contain over fifty such intervals. Each of these intervals is then selectively activated by a controlling microprocessor. The microprocessor determining the configuration of the map by analysis of various key interactions. Also, the microprocessor, using instructions stored in memory, translates recorded musical information into driving signals for each solenoid, the object being to reproduce the recorded music as accurately as possible. Essentially, it is the velocity information contained in the recording that is processed into driving signals. Since velocity is the combination of force and mass, the microprocessor is able to determine the force of the solenoid at any given point in time and, in combination with the known key mass, determine the required change in force to produce the desired key acceleration and velocity.

The force required to accelerate the key can be substantial. Therefore, it is essential to provide for a high power strike period, followed by a low power holding period. This allows maximum force during the critical strike period, while still allowing key hold down times without excessive power dissipation.

This system must convert the recorded musical information into discrete driving signals representing strike velocity. The driving signals are then separated in strike signals and hold signals. The strike signals consisting of time differentiated pulses of fixed width and amplitude, the number and timing of the pulses being dependent upon the information in the drive map that controls the recreation of the expression of the musical notes. The pulses are then directed to the solenoid that in turn, causes the strike hammer to strike the piano string. When the strike period is over, a hold signal that comprises pulses of uniform amplitude and timing are directed to the solenoid so that the strike hammer can be held fixed in place until the end of the musical note.

Background for a Computerized Player Piano System

FIG. 1 illustrates a functional block diagram of a possible computerized player piano system of the preferred embodiment. A recorded media 26 containing music to be reproduced is read by a playback unit 28. Coupled to playback unit 28 is control microprocessor 30 that selects the strike map for each driving signal 10 corresponding to a particular velocity factor of a hammer to hit a piano string. A core element of control microprocessor 30 is central processing unit (CPU) 32. Coupled to CPU 32 is ROM 34, which is a read only memory, and contains the strike maps for the various velocity factors as well as the operating software for CPU 32. Also coupled to CPU 32 is UART 36, a serial data receiver that receives the serial MIDI data from playback unit 28 and routes it to CPU 32. RAM 38, which contains changeable program data, is also coupled to CPU 32, as are drivers 40, which couple control microprocessor 30 to gating logic 42. Microprocessor 30 is coupled to a computer display terminal 31 for allowing a user to access the information stored in the microprocessor memory and hard drive storage 33. Conventional circuitry and circuit elements are utilized throughout.

Control microprocessor 30 decodes the velocity factor from the recorded media 26 and assigns a particular driving signal 10 to the velocity factor. During the period of strike signal 12, control microprocessor 30 sends an enable signal to gating logic 42. Individual strike pulses 18 activate switch 46 that energizes solenoid 48 according to the strike map. At the end of strike signal 12, control microprocessor 30 switches gating logic 42 to accept hold signal 14 that consists of hold pulses 22 produced by hold oscillator 44.

The ROM 34 contains all programs that the CPU uses to interface with all of the present invention's circuits. This ROM memory also contains all of the programs required to enter, store, retrieve, edit and delete all items in the data base stored on the hard drive 33.

The mouse delivers its coded output to the microprocessor in response to a user actuating buttons and location sensors thereon. In response to receiving the coded output from the mouse, the microprocessor senses the meaning of the output and develops an output representative of its results, that is interpreted by the CPU.

The microprocessor controls the computer display by sending control signals from the CPU to the display. Thus, when the mouse 35 is activated, signals are sent to the CPU where the signals are interpreted. The CPU interpreted signals are sent to the display to cause changes to the information that is displayed thereon. Thus, by double

clicking a mouse button at a certain location on the display screen, it is possible to cause many changes to the displayed information. More specifically, data stored in the hard drive can be accessed and displayed, and by properly selecting with the mouse, new stored data can be displayed where the old data was once displayed.

The platform or form that the display uses to present the information that is stored in a data base, for example, is often referred to as a graphical user interface, or user interface. The interface design is often the most important part of a computer system, since a poor interface will prevent all but the most skilled to gain access to the stored information. Poor performance of an interface has caused many products to fail in the market place. Thus, it is essential to provide an interface that is both intuitive and easy to operate. The next sections will primarily deal with the design of the interface used to allow users access to a stored data base through the use of a mouse and cursor.

Computer Interface For A User To Control the Operation of A Player Piano

FIGS. 2 through 6 are graphical illustrations of user interface computer screens that may be used to access the music database and control the operation of a player piano.

It is noted that references to the phrase "data field" is meant to mean a listing of items relating to a category of information found in the data base. For example, the illustrated "Composer" category can list in the data field all of the composers found in the music data base, like Liszt, Debussy, Gershwin, Mendelssohn, etc.

It is pointed out that term of "selecting" means that a pointer or cursor, which is illustrated as a white arrow in FIG. 3 that is located on a song title, is placed over the desired item while the user usually clicks a mouse button once or twice. The pointer is also known as a selection means.

It is also noted that the word "item" is meant to mean a single piece of data found in the data field related to a selected category. For example, "Jazz" is an item found in the data field related to the category of music Category (labeled as Category for short), or "A Foggy Day" is an item found in the data field related to the category of "Selected Songs."

The interface has a button, labeled "All Categories, Composers, Artists, and Songs," also known as a "select all" button. This button can be activated any time by the user to enable the user to display all of the individual items in each data field that is found in the entire data base. This feature of "select all" is activated when first starting the user interface screen, thus allowing a user to view all of the available data in each data field before making any item selections.

Operation of Data Fields

Displayed on the user interface screens of FIGS. 2, 3, 4, and 6 are four categories of data that may be accessed from the player piano data base. Specifically, the data base categories are labeled as: Category (a short form for music category), Composer, Artist, and Selected Songs. Located below each data base category is a respective data field that list the items or data found in the data base that are associated with the particular category. A description of each data field will now be provided.

The data field labeled as "Category," as the title signifies, displays all of the general music category items found in the data base. For example, blues, Christmas, classical, gospel, jazz, pianosoft, and ragtime music category items are illustrated. Selection of a single or multiple items in this data field provides the user with control over what items may be

displayed in the other data fields. For example, in reference to FIG. 3, a user has selected the music category of "Classical." As a result, all of the remaining data fields would replace the currently displayed items in the data field list and display only items found in the music data base that are directly related to the music category of "Classical."

It is pointed out that "displaying a data field" is automatically accomplished by the player piano control system and the relevant software control. Displaying of data is accomplished after a selection of an item is made. First, once a user has selected an item with the mouse, the CPU interprets the coding sent from the mouse and determines which item has been selected and thus highlights the selected item on the display. Second, the player piano control system eliminates the current list or lists of items found in the remaining relevant data fields. Third, the control system will search for all data related to the selected item. Forth, the control system receives signals from the various data storage devices and uses this information to direct the display to display those identified items that will be related to the selected item in the proper data fields.

The data field labeled as "Composer," as the title indicates, can display all of the original composers of each piece of music found in the data. For example, the items of Albeniz, Albinoni, Archer, and Armstrong etc. are illustrated in FIG. 2. This data field also allows the user to control what may be displayed in the other data fields in the same fashion as the music "Category" operation. For example, regarding FIG. 3, by selecting Beethoven as shown, all of the other data fields may be directed to only display data found in the data base that pertains to the composer Beethoven. The user may now display only items in the Artist and Selected Songs categories that are related to Beethoven. By providing a user with these features, hundreds or thousands of items are eliminated from being displayed on the user display, thereby allowing the user to more easily make selections of music to be played upon the player piano.

The "Artist" data field, as the title suggests, would display all of the artists that have played the various pieces of music that are found in the entire music data base. For example, Dave Contois, Phillip Keveren, and PG Music are illustrated. When this data field is selected, it allows the user to control what may be displayed in the other data fields. The Artist data field operated just as the composer and category data fields have. For example, by selecting with the selection means by clicking with the mouse button while the cursor is located over Phillip Keveren, for instance, all of the other data fields may only display data that pertains to this artist if it were the first item selected. In an illustrated example, both the Categories and Composer data fields have already had selections. Thus only the Selected Songs data field will be redisplayed to relate to all of the above selections of Artist, Composer, and Category.

The "Selected Songs" data field, as the title indicates, allows the user to display all of the songs or music pieces found in the music data base. As with the previously described data fields, a user can select at least one of the music pieces in the selected songs data field. As before, once a certain item has been selected, only information related to that selection may be displayed in the other data fields that did not have previously selected items. Besides determining what items may be displayed in the associated data fields, this data field allows the user to select specific Songs that will be played by the attached media playing device, i.e., the player piano.

Operation of Play Buttons

Further regarding FIGS. 2, 3, 4, and 6, are four media playing device control buttons illustrated on the bottom right

side of the interface screen. The operation of each button works much like a typical tape recorder. The first button on the left is typically known to one skilled in the art as the "play" button. This play button is shaped as an arrow pointing to the left. When the play button is actuated, the player piano will begin to play the first selected music piece as indicated in the Selected Songs data field.

The second from the left button, called the rewind button, will cause the selected item, the song "All I Ask of You," to stop playing and "rewind" the music selection. The rewind button is an arrow pointing to the right. By rewind, it is meant to cause the music to stop at the current frame, let's say frame 80 of the music piece, and move back a given number of music frames and potentially all the way back to the beginning. As with a tape recorder, the amount of time that the rewind button is actuated will control how far back in the music the user wants to restart the player piano.

The next button is typically known as the "pause" button. The pause button is indicated by two vertical lines. This button allows the user to temporarily suspend the playing of the player piano. Upon activating the pause button again or by reactivation of the play button, the player piano will start playing at the exact spot that it had been stopped.

The last button on the right is typically recognized as the "stop" button. The stop button is indicated by a square shape. This button is used when the user is finished listening to the selected piece of music and is no longer interested in listening any further. To restart the player piano another music piece is generally selected from the music data fields and the start button is then reactivated.

Process of Creating Lists of Songs

Another feature of the preferred embodiment regards the creation of a specialized list of music pieces to be played on the player piano. In operation, once a piece of music is selected, a user may activate the button labeled "Add to Song List," which is located at the bottom center of each screen. By using this button, a user can create their own personal record album or compact disk that contains only those songs that have been individually selected. Thereby, the player piano can be directed to play each song one after the other in sequence or in a random order.

Once a list of songs has been selected using the "Add to Song List" button, the user can view, customize, and edit the created list. A user selects "File" from the menu bar as illustrated in FIG. 4, and selects "Song List" or by actuating the control and S keys simultaneously.

FIG. 5 illustrates a basic Song List screen with the associated operational buttons. Note, that the songs listed under the Selected Songs heading (Moonlight Sonata, As time Goes By, and The Entertainer) were recently added to the song list. The user has several options to use on these newly listed songs. First, by activating the "Save Song List" button, the user could save the song list and give the list a name that could be used latter to both identify and access this newly created list. Second, by activating the Play Song List button, the user could also play the displayed list of songs on the player piano without ever having saved the created song list. Third, the user could edit the song list by using the "Delete Song" button, thereby eliminating any song that was highlighted or selected.

There are additional features provided by the Song List screen or window. For instance, the user could select the "Open Song List" button to get a list of all previously created song lists. The user could either edit individual song lists by eliminating or adding individual songs or play selected song lists. When a user wishes to create a new song list from scratch, the "Clear Song List" button would be selected, which would clear the screen of any listed song titles.

The feature of creating your own music lists allows the every-day computer user to create their own music albums or collections and not be limited by what is prepackaged by music companies. For example, the user can now create whole musical events, like a list of children's birthday party music, teenager party music, young couples wedding music, old couples anniversary music, or all renditions of "A Foggy Day" by Dave Contois performed in the year 1995. It is even possible for a restaurant to program music for an entire evening beginning with lively after work music for happy hour and gradually changing the song selections to be quieter for the dinner crowd.

Regarding FIG. 6, there is a window illustrating the operation of the preferred embodiment and the use of a graphics window. As shown in the bottom right portion of the window above the play buttons, there is a graphics window. In operation, once a song title is selected to be played upon the player piano, the graphic window will display a picture of something associated with the selected piece of music. In this case, there is illustrated a portrait of the Artist and Composer, Frank Mills.

Overview of the Operation of the Preferred Embodiment

FIG. 7 is a partial flow chart of the general sequence of operation for the graphical user interface of FIGS. 2, 3, 4 and 6. Upon first accessing the interface window, all of the data in each data field will be displayed. More precisely, all of the data can be viewed by scrolling through the individual data fields. The user is then able to select what items are needed to find the specific song titles that are desired to be played upon the player piano. As illustrated, there is shown an interaction between the selection of an item in a data field and the redisplaying of all non-selected data field items to correspond to the selected items. The interactive process may continue with multiple rounds of selection and de-selection stages. Finally, the user will have a song title selected and will then select the play button to activate the music media playing device, or player piano.

Computer Interface For A User To Operate A Video Player

Reference is made to FIG. 8 for the following discussion. Specifically, there is a partial flow chart of the general sequence of operation for the illustrated embodiment related to a video player. Just as the previous embodiment related to the control of a player piano, the embodiment of the video player anticipates the operation of a substantially similar interface screen. However, the difference being that the new interface screen will have different categories with different data fields of items. Specifically, the paired categories and data fields would be labeled as: Video Category, Actor, Director, and Selected Videos.

The illustrated data fields are as follows: The "Movie Category" data field allows the user to view a complete list of all of the movie categories found in the accessed movie videos data base. For example, items such as Westerns, War, Romance, Comedy, and Documentaries might be listed. Similarly, for the "Actor" data field, items such as Robin Williams, and Sylvester Stalone may be listed. For the "Directors" data field you would find items like Penny Marshall, or Ron Howard. Of course, the data field of "Video" would show the titles of videos found in the data base, like Hook, or Die Hard.

The operation of the Video user interface in controlling the operation of a video player device is substantially like the operation of the player piano operation and control. Specifically, by selecting either single or multiple items in each data field a user may narrow down the listed items in the Video category to allow the user to find a movie video for viewing. Whereby, the user may then use the same four

control tape recorder-like buttons as with the player piano interface. The main differences from the music data base interface is that there are different data field titles and that different information is stored in the video data base.

Remarks About The Preferred Embodiment

It is noted that the selective displaying of data field items is sensitive to the item selection sequence. For example, if a Composers item was the first selected item, then the Categories items would be redisplayed to show only items related to the selected composer. For this reason, to assist the user to keep track of which category was selected in what order, a number in parentheses is displayed next to the category title after an item has been selected in that data field. Specifically, referring to FIG. 3, Category has a (1) next to it since Classical was the first selected item, Composer has a (2) next to it to indicate that Beethoven was the second item selected, and Artist has a (3) next to it to indicate that PG Music was the third item in the sequence of selection.

It is possible to select songs in a any order of categories. For example, it is possible to select songs in the order of a Composer, then an Artist, followed by a Category. It is even provided for a user to take back a selection with out starting from the beginning of the selection sequence. This is typically called "deselecting and item." As the phrase indicates, the third item selected can be deselected, then the second item could be deselected. In this situation, all of the remaining data fields would only have items related to the first selected item and not the other two previously selected items that had been cancelled. This operation allows the use a large degree of flexibility in choosing songs to be played on the player piano.

The user interface embodiment further provides for the user to select multiple items in a given data field in a very similar fashion to the selection on single items. Thus, for example, it is possible to select both classical or jazz music composed by both Liszt or Duke Ellington, and being played by Dave Contois.

Variations In The Preferred Embodiment

Although this embodiment focuses upon the application of the software to control a player piano or video player, one skilled in the art will realize that this software interface could be used on any media playing device where a user needs to select what media item is to be played from a vast media data base. For example, it is contemplated to operate an electric guitar, a computer controlled multimedia system, a pipe organ, a television, a movie video player, or a computer screen.

The current embodiment of the invention also anticipates the use of the invention to play all types of media information that needs to be accessed by the user. For example, other media information that can be accessed using the present invention are: music videos, homemade videos, computer games, or software programs (accounting, drawing, writing, etc.).

Although the embodiment only discusses the process of selecting a single piece of music or video it is easily understood that a user could have the music or video playing device to play a long pre-selected list of selected items in either a random or sequential order.

The preferred embodiment of the invention discusses the control of only a single media playing device, like a player piano. However, one skilled in the art would easily understand how to simultaneously control several media playing

devices with the same control system in view of this disclosure. For example, the coordination of the control of a player piano along with a music video is contemplated.

One skilled in the art will also understand that a computer hard drive storage device is not the only storage medium for storing accessible media data. For example, additional media data bases could be found on a world wide web, a satellite receiver, or an internet link system.

Although there are four specific data fields displayed in FIG. 2, it is also contemplated to have different and additional data fields. For example, another category and related data field could display a list of what year the music was created. Thus, for example, a user could request jazz music created on or after 1980 and before 1990.

It is noted that the embodiment of the invention discusses the use of a standard known computer, where in fact all components of the computer can be replaced with any new advancing technologies, like holographics or voice activated systems and still not depart from the intent of the invention of allowing easier user access to the underlying media data base information.

One skilled in the art will recognize that it is not essential to have the computer system separate from the media playing device. It is conceivable to have the computer system physically incorporated in part or in whole into the media playing device.

It is equally anticipated that a skilled artisan would be able to provide variations to the graphics window, as shown in FIG. 6. For example, it is anticipated to provide a motion picture of the artist playing the selected song. It is equally anticipated, for example, to provide a view of the musical score in the graphics window as the music is being played.

While the invention has been taught with specific reference to these embodiments, someone skilled in the art will recognize that changes can be made in form and detail without departing from the spirit and the scope of the invention. The described embodiments are to be considered in all respects only as illustrative and not restrictive. The scope of the invention is, therefore, indicated by the appended claims rather than by the foregoing description. All changes which come within the meaning and range of equivalency of the claims are to be embraced within their scope.

What is claimed and desired to be secured by United States Patent is:

1. A computer user interface menu selection process for allowing the user to select music to be played on a music device controlled by a computer, comprising the steps of:

- a) simultaneously displaying on a display device, at least two individual data fields selected from music categories, composers, artists, and songs;
- b) selecting at least one item from at least one of the data fields;
- c) in response to step b), redisplaying all data fields not having an item selected therefrom with data related only to the at least one item selected in step b), and simultaneously maintaining all items originally displayed in the data fields with at least one item selected therefrom;
- d) selecting an item in the songs data field in response to step c), and
- e) playing the selected song item from step d) on the computer responsive music device.

2. The process of claim 1, wherein the step of playing the selected song item comprises:

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- a) activating a play button located on the computer screen;
 - b) sending a data stream from the computer to the computer controlled music device in response to step a) for controlling the playing of the selected song;
 - c) receiving the data stream by the computer controlled music device from the computer; and
 - d) playing the selected song item on the computer controlled music device.
3. A method of enabling a user to select a song, which is stored in a music data base, that will be played on a player piano that is controlled by a computer, wherein the method comprising the steps of:
- a) simultaneously displaying, on a display device, both a songs data field that displays a list of song titles found in the music data base, and a music categories data field that displays a list of music category items of the song titles found in the music data base; and
 - b) selecting, by the user, a single music category item from the music category data field;
 - c) redisplaying the songs data field, and not the music category data field which still displays the list of music category items as previously displayed, to display only song titles that are related to the selected music category item, in response to performing step b);
 - d) selecting, by the user, a song that is displayed in the songs data field after performing step c); and
 - e) playing the selected song title on the player piano.
4. The method of claim 3, wherein the displaying step further comprises:
- displaying a composers data field for displaying a list of composers of the song titles found in the music data base.
5. The method of claim 4, further comprising the steps of:
- f) selecting, by the user, a composer from the composers data field before performing step e); and
 - g) redisplaying the songs data field with only song titles relating directly to both the selected composer and music category, in response to performing step f) and before performing step e).
6. The method of claim 5, wherein the displaying step further comprising:
- displaying an artists data field for displaying a list of artists of the song titles found in the music data base.
7. The method of claim 6, further comprising the steps of:
- h) selecting, by the user, an artist listed in the artists data field before performing step e); and
 - i) redisplaying the songs data field only with song titles relating to the selected artist, composer, and category, in response to performing step h).
8. The method of claim 7, wherein the step of playing, further comprises:
- a) selecting, by the user, a play button that will enable the player piano to receive a data stream that will control the operation of the player piano in playing the selected song title.
9. The methods of claim 8, wherein the step of playing, further comprises:
- b) selecting, by the user, a pause play button that will temporarily suspend the player piano from receiving the data stream;
 - c) selecting, by the user, the pause play button a second time to enable the player piano to continue to receive the data stream.

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10. The method of claim 9, wherein the step of playing, further comprises:
- d) selecting, by the user, a stop play button that will disable the player piano from receiving the data stream.
11. A system for playing media information on a media playing means, the system comprising:
- a) the media playing means for playing the media information for a user where the playing means is capable of playing musical sound; and
 - b) control means, coupled to the media playing means, for allowing the user to select media information and to automatically control the media playing means in playing the selected media information, the control means having:
 - b1) data storage means for storing the media information, the media information including:
 - 1) a first category of media information and a respective first data field containing a first list of items found in the data storage means that are related to the first category, and
 - 2) a second category of media information and a respective second data field containing a second list of items found in the data storage means that are related to the second category;
 - b2) display means for simultaneously visually displaying the first and second category of media information to the user; and
 - b3) user interface means, displayed on the display means, for displaying the first and second list of items so the user may
 - i) select at least one item from the first list of items and in response redisplaying the second list of items with items that are related only to the at least one item selected in the first list, and simultaneously maintaining all items originally displayed in the first list; and
 - ii) play the selected item from the first list on the media playing means, which is a capable of playing music.
12. The system of claim 11, wherein the user interface means further comprises:
- selection means for allowing the user to select a first data field item and thereby automatically change the second data field to display second data field items that are only related to the selected first data field item.
13. The system of claim 12, wherein the media information further includes a third category of media information and a respective third data field containing a third list of items related to the third category;
- the user interface means displays the third list of items so the user may select items therefrom for allowing the user to control what media information will be played on the media playing means; and
- the selection means will automatically change the third data field to display third data field items that are both
- i) only related to the selected first data field item and
 - ii) are found in the data storage means.
14. The system of claim 13, wherein the media information includes movie videos and the media playing means is a video player.
15. The system of claim 13, wherein the first category is a music category, and the first list of items is a list of music categories found in the data storage means, and the second category is a songs category, and the second list of items is a list of song titles found in the data storage means.

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16. The system of claim 15, wherein the third category is a composers category, and the third list of items is a list of music composers found in the data storage means.

17. The system of claim 16, wherein the media information includes piano music and the playing means is a player piano.

18. The system of claim 17, wherein the storage means is a hard disk drive for a computer.

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19. The system of claim 18, wherein the data storage means is located remote to the display means and media playing means.

20. The system of claim 19, wherein the display means is a computer monitor.

* * * * *

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Attorney Docket No. 380786-108980
Reexam Control No. 95/001,274**



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United States Patent [19]

[11] Patent Number: **5,870,710**

Ozawa et al.

[45] Date of Patent: **Feb. 9, 1999**

[54] **AUDIO TRANSMISSION, RECORDING AND REPRODUCING SYSTEM**

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[22] Filed: **Jan. 22, 1997**

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[51] Int. Cl.⁶ **H04M 15/00**

[52] U.S. Cl. **704/500**

[58] Field of Search **704/500, 201**

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Primary Examiner—David R. Hudspeth
Assistant Examiner—Robert Louis Sax
Attorney, Agent, or Firm—Limbach & Limbach L.L.P.

[57] **ABSTRACT**

An audio recording and reproducing apparatus includes a controller for controlling the entire behaviors, hard disc for write and read of audio data, audio compression/expansion circuit for expanding compressed audio data, and external I/O port. The audio recording and reproducing apparatus is connected to a network service center to obtain desired music data from storage of the network service center and to store it in the hard disc.

20 Claims, 7 Drawing Sheets

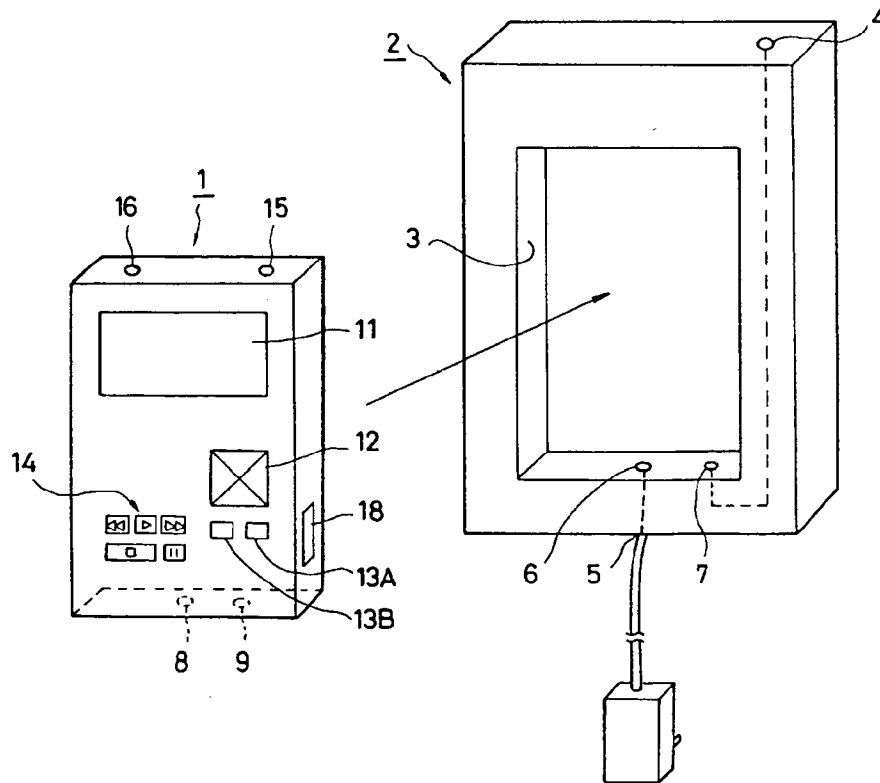


Fig. 1

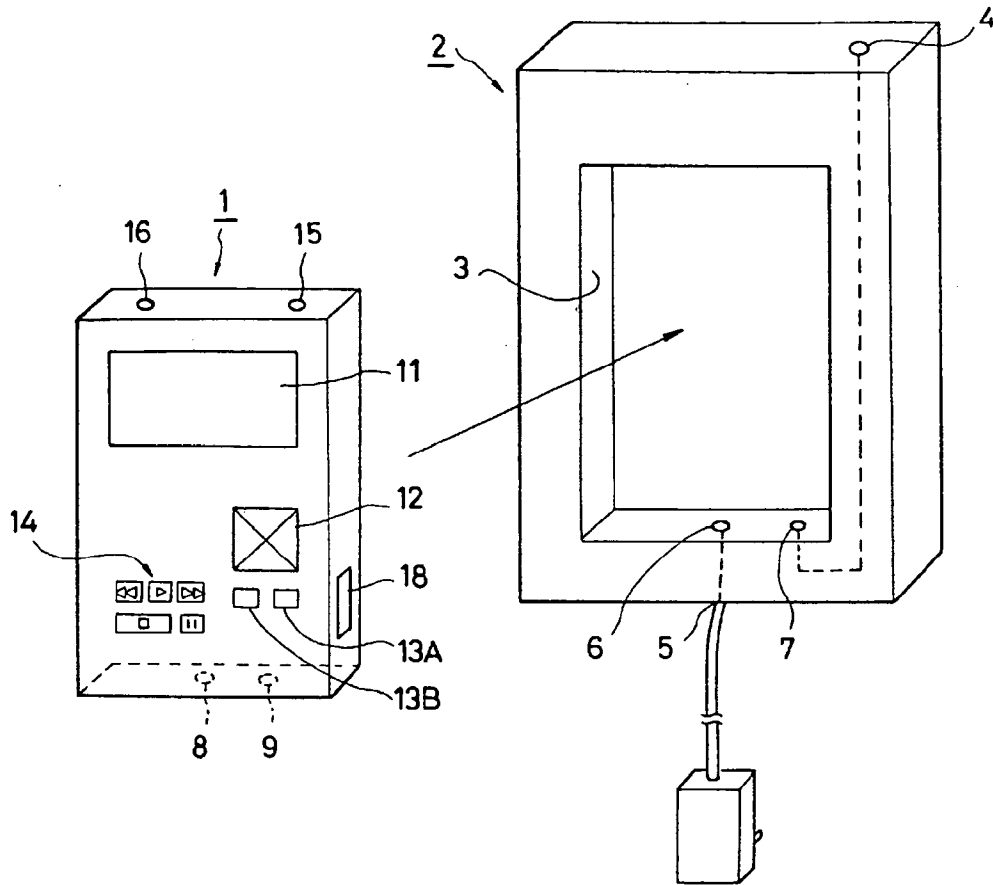


Fig. 5

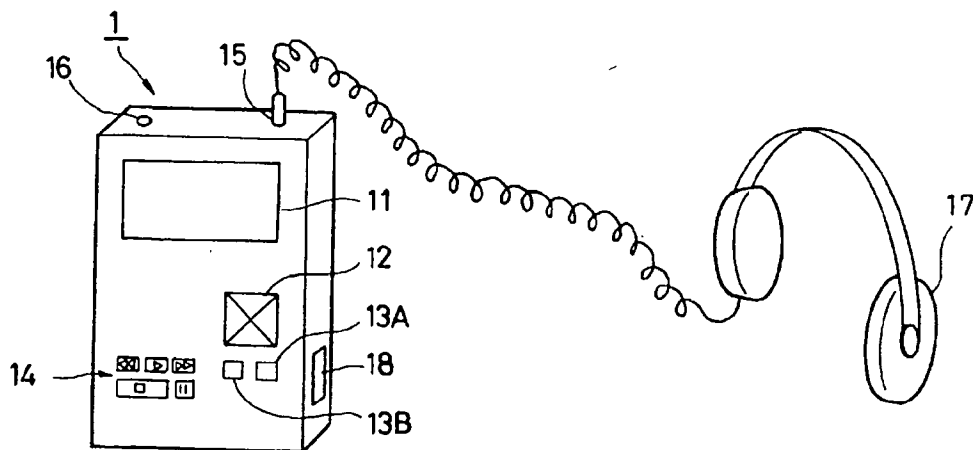


Fig. 2

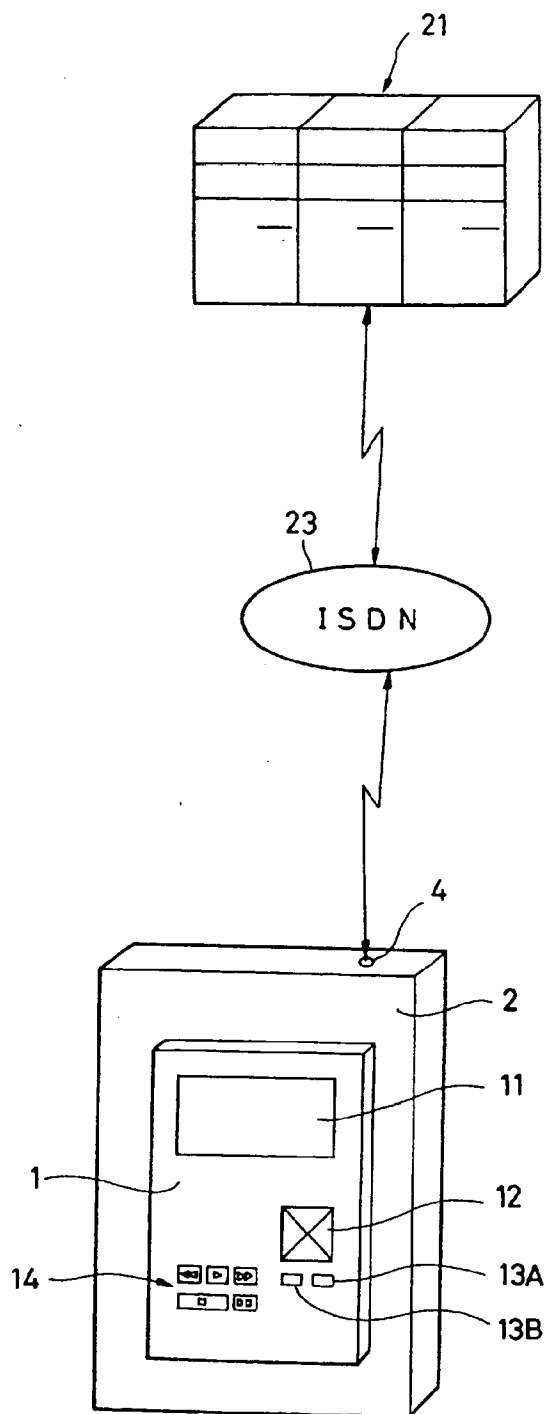


Fig. 3A

- ▷ 1 CLASSICAL
- 2 JAZZ
- 3 POP
- 4 COUNTRY

Fig. 3B

- 1 BEETHOVEN NO. 1
- ▷ 2 BEETHOVEN NO. 2
- 3 SCHUBERT NO. 1
- 4 SCHUBERT NO. 2

Fig. 4

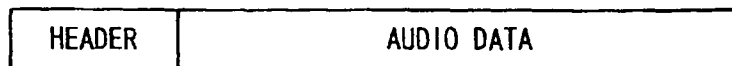


Fig. 6

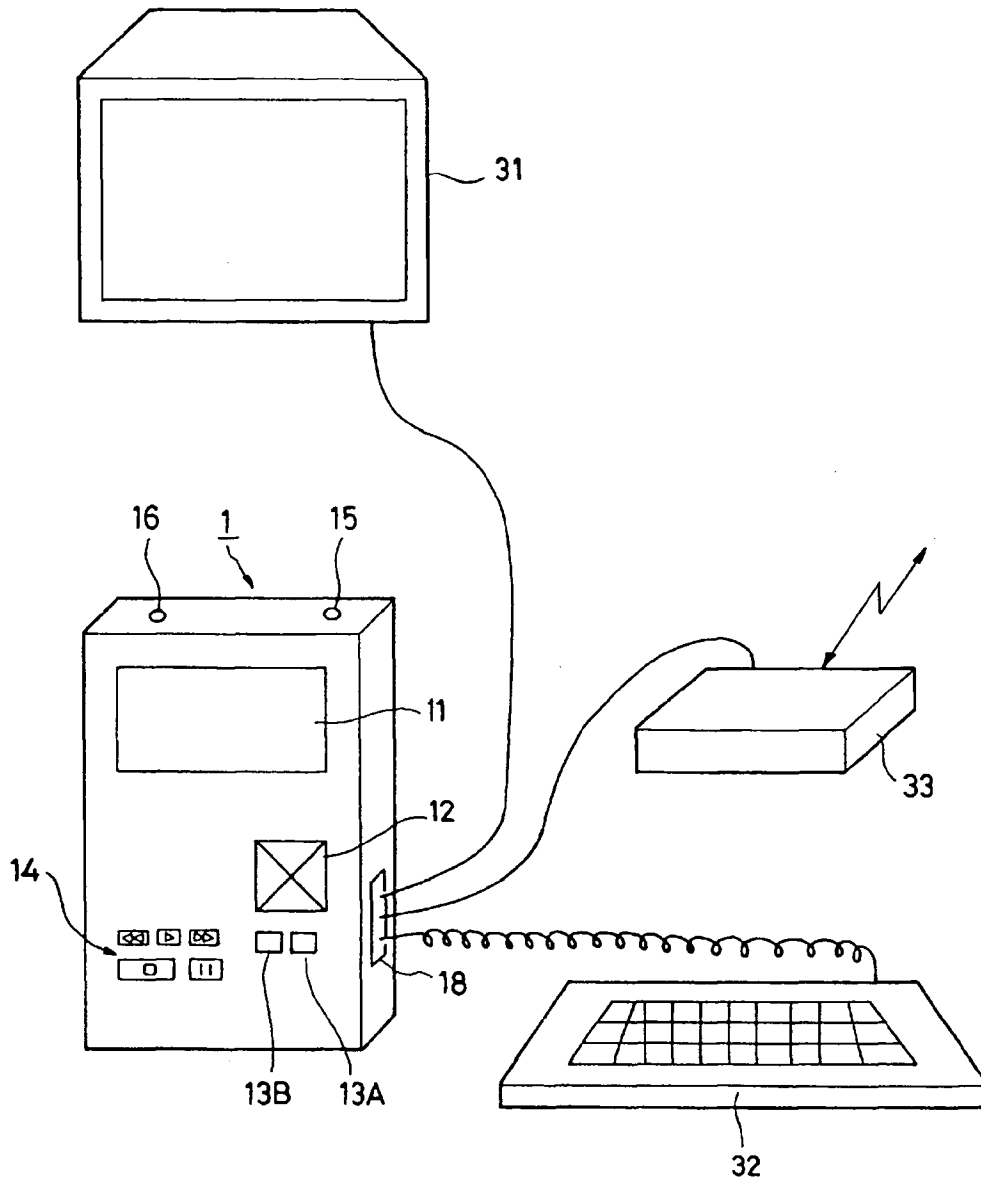


Fig. 7

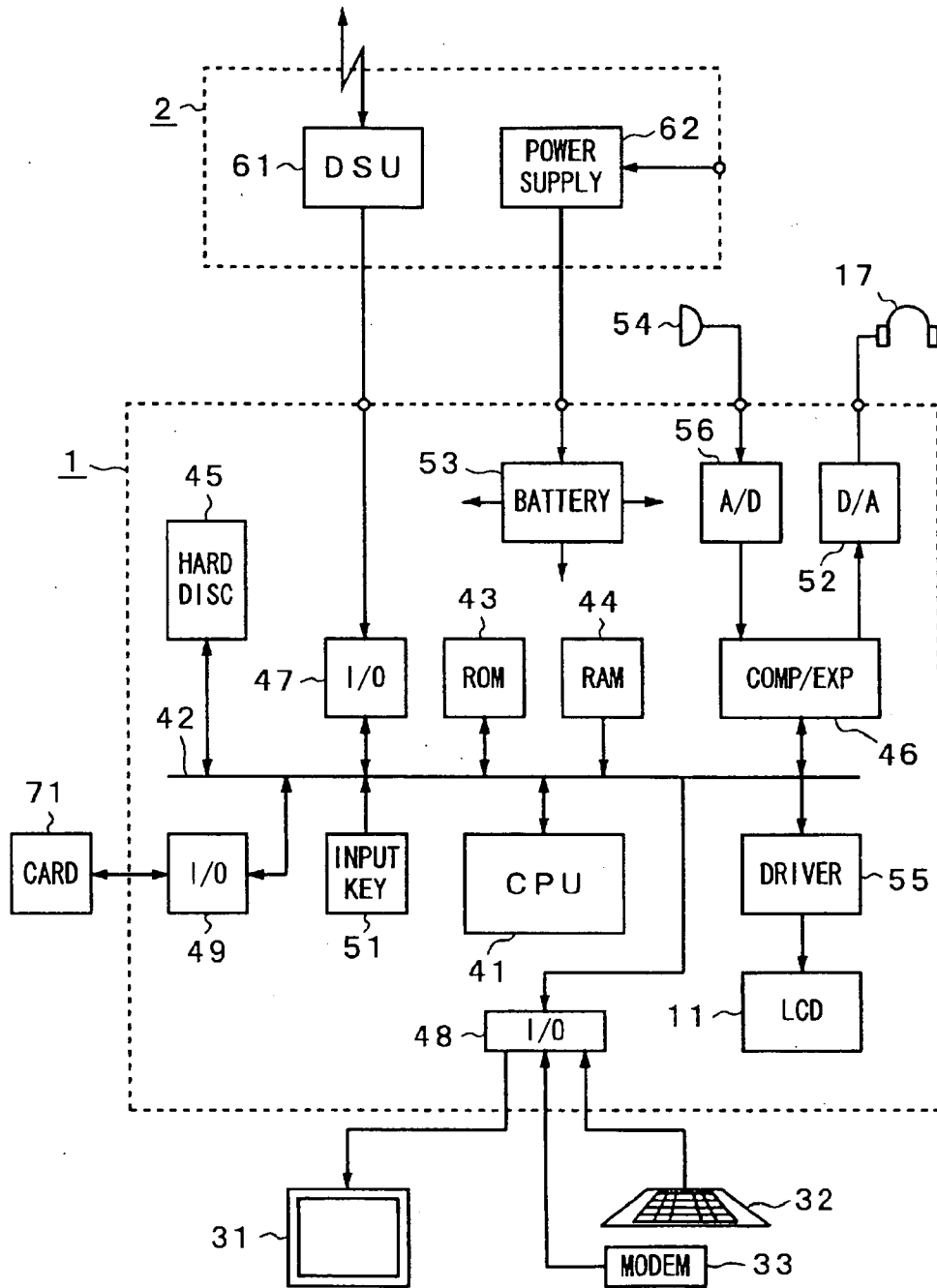


Fig. 8

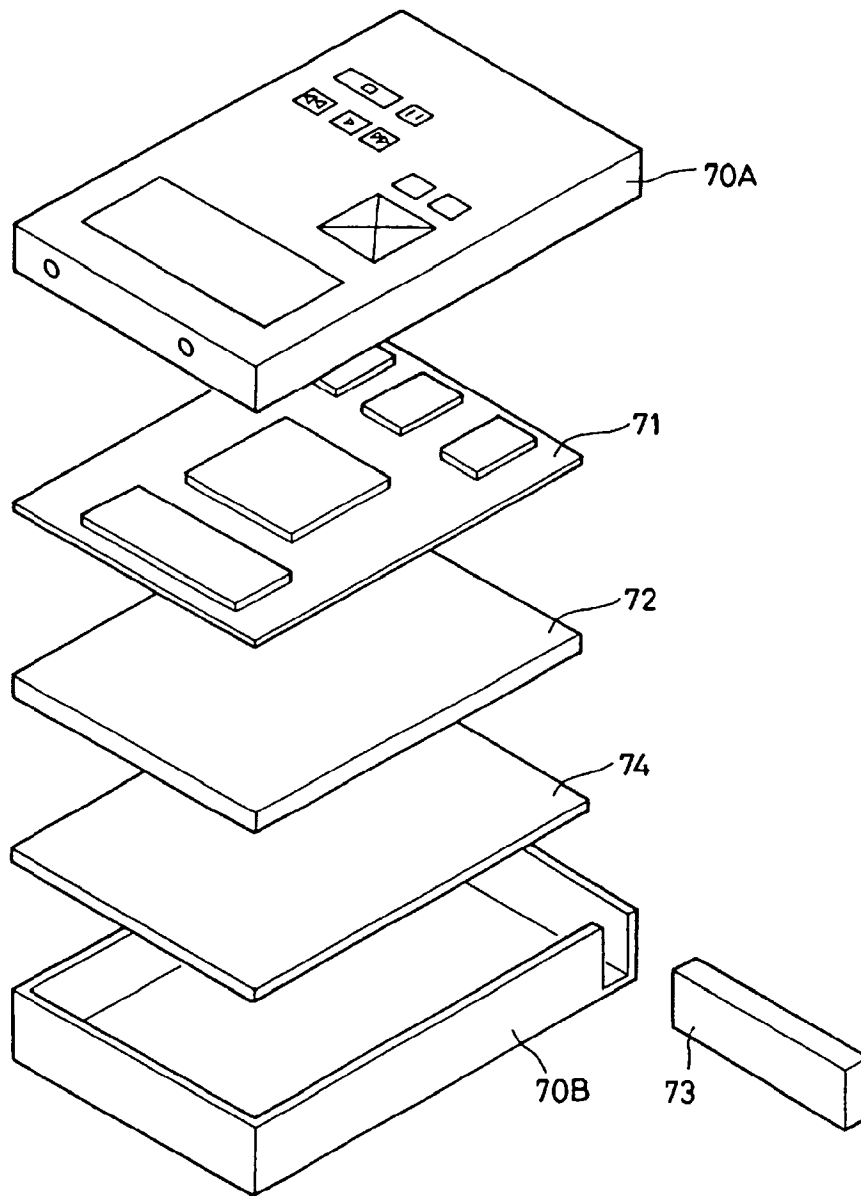


Fig. 9A

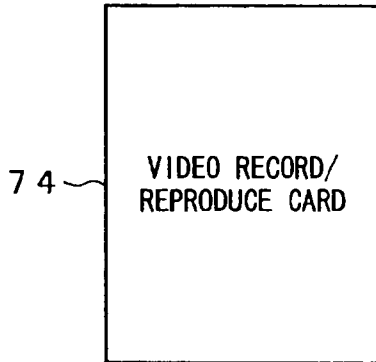


Fig. 9B

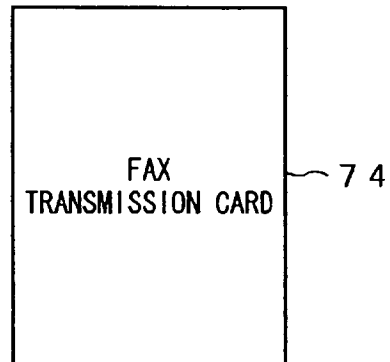


Fig. 9C

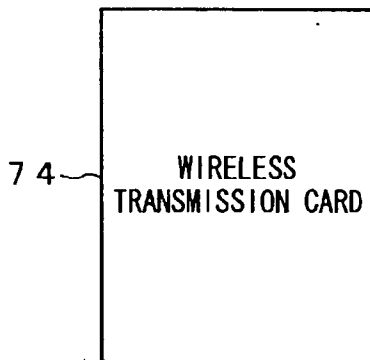


Fig. 9D

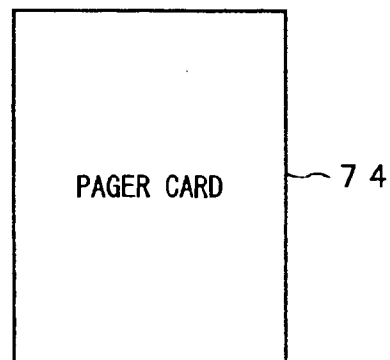


Fig. 9E

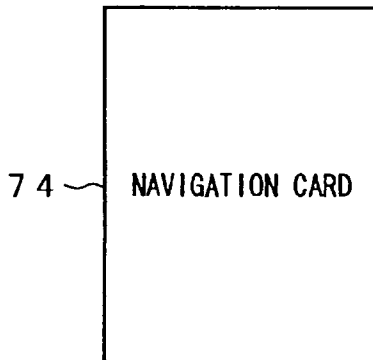
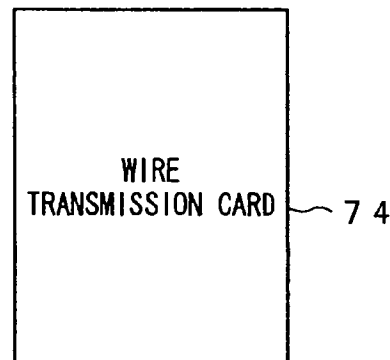


Fig. 9F



AUDIO TRANSMISSION, RECORDING AND REPRODUCING SYSTEM

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to an audio reproducing apparatus and method, audio recording apparatus and method, audio recording and reproducing system, audio data transmission method, information receiving apparatus, and recording medium which are particularly suitable for use in a headphone stereo, and in particular to those configured to store in a portable headphone stereo desired audio data externally transmitted to the portable headphone stereo.

2. Description of the Related Art

Among portable headphone stereo devices with which a user can enjoy reproduced music either during his walk or in an automobile, most widely distributed are those using an analog-recording magnetic tape such as compact cassette. A user of a portable headphone stereo using an analog-recording magnetic tape typically records in a compact cassette a desired piece of music selected from FM broadcasting programs, CDs (compact discs) or other music sources, and sets the compact cassette in his portable headphone stereo to enjoy audio reproduction either during his walk or in an automobile.

However, as long as compact cassettes or other analog-recording magnetic tapes are used, great improvements in quality of sound are not prospective, and dubbing causes deterioration of signals. Moreover, it takes a long time for a user to record desired pieces of music from CD or other magnetic tapes, the access time is slow, and a user cannot quickly search out, reproduce or repeat his desired music.

Some portable headphone stereos use CDs. Since CDs are media exclusive for recording, a user of portable headphone CD stereo buys CD recorded with his desired music, and places the CD in his portable headphone CD stereo to enjoy audio reproduction during his walk or in an automobile. CDs are digital recording media, the quality of sound is excellent. The access speed is high, and any desired music can be reproduced quickly. However, since CD headphone stereos are exclusively for reproduction, users cannot make their own music sources compiling their desired pieces of music. Moreover, CD headphone stereos are affected by vibrations, and sound is often skipped over due to external vibrations.

Also known are portable headphone stereo players using DAT (digital audio tape), NT (non-tracking tape(trade mark)) or other digital-recording magnetic tapes as their recording media. Deterioration of signals by dubbing hardly occurs in devices using DAT, NT or other digital magnetic tapes. DAT promises audio reproduction of a very high quality of sound. NT permits recording over a long time in a very small cassette. Here again, however, devices using magnetic tapes involve the same problems that the access speed is slow and it takes a long time for repeated reproduction or cue search of a desired piece of music.

Another type of portable headphone stereo players uses MD (mini-disk(trade mark)). MDs are media for both recording and reproduction, and users can record their desired pieces of music on MDs from CD or other music sources and can place them in their portable MD headphone stereos to enjoy reproduced music during a walk or in an automobile. MDs are digital-recording media, and promise an excellent quality of sound. The access speed is high, and any desired music can be reproduced quickly. As a shock-proof memory is used, devices are less affected by external vibrations.

As reviewed above, various kinds of recording media have been proposed for use in portable headphone stereos. However, none of these recording media used in conventional portable headphone stereos meet all requirements from the viewpoints of easy use and quality of sound.

Devices using analog-recording compact cassettes have a problem in quality of sound. Those using DAT, NT or other digital-recording magnetic tapes have a problem in access speed. CDs are exclusively for reproduction and weak against vibrations. MDs can be used for both recording and reproduction and can be miniaturized but, since the number of titles of MD on sale is not abundant, it is sometimes difficult for users to obtain their desired music. It takes time to dub CD or other music sources.

Another problem with MDs is the use of ATRAC (Adaptive Transform Acoustic Coding) compression and expansion ICs or other ICs developed for exclusive use in MDs and the use of a particular architecture, i.e., a particular circuit arrangement as a method for actually mounting the ICs in order to reduce the entire dimension and decrease the cost. Therefore, such devices cannot be used in different ways, namely, for recording and reproducing a recording medium other than MDs, for example.

Moreover, tastes of users for music are diverged more and more, and the fashion of music largely changes in a short time. It is difficult to exactly catch the fashion of music with conventional music recording media.

Taking it into account, the present Applicant previously proposed a portable headphone stereo disclosed in Japanese Patent Laid-Open No. hei 06-131371 U.S. Ser. No. 08/131,943, which is configured to write music information in semiconductor memory used as a recording medium to enable reproduction of the music information any time. However, its interior circuit arrangement comprises an exclusive IC and an exclusive architecture, and as in the case of MDs, cannot realize wider use and extensive use of the device.

OBJECTS AND SUMMARY OF THE INVENTION

It is therefore an object of the invention to provide an audio reproducing apparatus and method, audio recording apparatus and method, audio recording and reproducing system, audio data transmission method, information receiving apparatus, and recording medium that promise wider use and extensive use and promise easy use and a high quality of reproduced sound.

Another object of the invention is to provide an audio reproducing apparatus and method, audio recording apparatus and method, audio recording and reproducing system, audio data transmission method, information receiving apparatus, and recording medium that are prospective for developments and can quickly cope with users tastes for music and music in fashion.

According to the invention, there is provided an audio reproducing apparatus comprising: control means for controlling entire behaviors; storage means for writing and reading data; audio expanding means for expanding compressed audio data; external I/O means for exchanging incoming data; and a personal computer standard bus for transmitting data among the control means, storage means, audio expanding means and external I/O means, so that compressed audio data is stored in the storage means, and the compressed audio data is transferred to and expanded by the audio expanding means to be audibly reproduced.

According to another aspect of the invention, there is provided an audio recording apparatus comprising: control

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means for controlling entire behaviors; storage means for writing and reading data; audio expanding means for expanding compressed audio data; external I/O means for exchanging incoming data; and a personal computer standard bus for transmitting data among the control means, storage means, audio expanding means and external I/O means, in which data sent in a predetermined format is introduced through the external I/O means, and compressed audio data is taken out from the introduced data and stored in the storage means.

According to another aspect of the invention, there is provided an audio reproducing method comprising the steps of: storing compressed audio data in storage means; reading the compressed audio data stored in the storage means and delivering same to audio expanding means; and reproducing audio data in the audio expanding means.

According to another aspect of the invention, there is provided an audio recording method comprising the steps of: introducing data sent through external I/O means in a predetermined format; taking compressed audio data from the data introduced through the external I/O means; and storing the compressed audio data in storage means.

According to another aspect of the invention, there is provided an audio recording and reproducing system comprising: an audio recording and reproducing apparatus incorporating control means for controlling entire behaviors, storage means for writing and reading data, audio expanding means for expanding compressed audio data, and external I/O means for exchanging incoming data; first functional means removably attached to the audio recording and reproducing apparatus to add a supplementary function to the audio recording and reproducing apparatus; and second functional means removably attached to the audio recording and reproducing apparatus to add a new function to the audio recording and reproducing apparatus.

According to another aspect of the invention, there is provided an audio data transmission method for receiving desired audio data through a communication line from an audio data base storing a plurality of pieces of audio data, storing the audio data on the part of a receiver to reproduce it there later, the audio data base being configured to send out data to the receiver in a predetermined transmission format for and to charge fees for the service on the account of the receiver.

According to another aspect of the invention, there is provided an information receiving apparatus comprising: means for choosing desired audio data from an audio data base storing a plurality of pieces of audio data; means for receiving desired audio data through a communication line and for storing the chosen audio data; and means for reproducing the stored audio data.

According to another aspect of the invention, there is provided a recording medium that receives desired audio data through a communication line from an audio data base storing a plurality of pieces of audio data and stores the chosen audio data.

Digital portable stereo headphone players are connected to a network service center by public telephone line (for example ISDN) lines. Each player obtains desired music data from a number of pieces of music supplied from the network service center, stores it in a hard disc, and reproduces the music from the hard disc. Since the audio data is recorded in a digital form, a high quality of sound is promised. By using a card type hard disc, a high access speed and an increase in dimension and weight are promised. Since a user can choose desired music from the storage

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of the network service center, he can use his player conveniently by obtaining any desired music any time from a large storage in the service center. Therefore, the system can satisfy various users tastes for music and can follow the latest fashion of music. When a digital portable stereo headphone player is fixed on a base station, then a communication function is added to the player, and the battery of the player can be electrically charged simultaneously. Any new additional function can be added to a digital portable stereo headphone player by mounting an extensive function card, and this promises further developments of such players.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view for use in explanation of a digital portable headphone stereo to which the invention is applied;

FIG. 2 is a perspective view for use in explanation of an audio data transmission system to which the invention is applied;

FIGS. 3A and 3B are schematic diagrams for use in explanation of an audio data transmission system to which the invention is applied;

FIG. 4 is a schematic diagram for use in explanation of an audio data transmission system to which the invention is applied;

FIG. 5 is a perspective view for use in explanation of a digital portable headphone stereo to which the invention is applied;

FIG. 6 is a perspective view for use in explanation of a digital portable headphone stereo to which the invention is applied;

FIG. 7 is a block diagram showing a digital portable headphone stereo to which the invention is applied;

FIG. 8 is a perspective view showing the arrangement of a digital portable headphone stereo to which the invention is applied; and

FIGS. 9A to 9F are schematic diagrams for use in explanation of extensive cards in a digital portable headphone stereo to which the invention is applied.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

An embodiment of the invention is described below with reference to the drawings. Basically, a digital portable headphone stereo using the invention is connected through the public telephone line to a network service center that supplies a number of music data, so as to obtain desired music data from the network service center, record it in a hard disc, and reproduce the music data later to enjoy music.

FIG. 1 shows a home terminal system in a digital portable headphone stereo system using the invention. In FIG. 1, numeral 1 denotes the digital portable headphone stereo. The digital portable headphone stereo 1 contains a hard disc to store music data sent by data transmission as explained later in greater detail.

Numeral 2 denotes a base station having a cavity 3 for receiving and fixing the entirety of the digital portable headphone stereo 1 in the base station 2.

The base station 2 is typically fixed on an interior wall of a house, for example. The base station 2 is used to control communication with the network service station, explained later, and to supply power to the battery of the digital portable headphone stereo 1 inserted into the cavity 3. More

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specifically, a communication control terminal 4 extends from the base station 2, and coupled to ISDN or other communication line. A power supply terminal 5 also extends from the base station 2 to introduce power. In the cavity 3 of the base station 2, there are provided a power supply terminal 6 for supplying power to the battery of the digital portable headphone stereo 1 and a data IN/OUT terminal 7 for exchanging data between the network service station and the digital portable headphone stereo 1.

When a user wants to carry the digital portable headphone stereo 1 with him, he removes the digital portable headphone stereo 1 from the base station 2 and carries the headphone stereo 1 alone with him.

Upon recording data in the digital portable headphone stereo 1 or upon charging the battery of the headphone stereo 1 with power, the digital portable headphone stereo 1 is set in the cavity 3 of the base station 2.

Then the digital portable headphone stereo 1 fits in the cavity 3 of the base station 2, a power supply terminal 8 and a data IN/OUT terminal 9 on the bottom plane of the digital portable headphone stereo 1 mate with and electrically connected to the power supply terminal 6 and the data IN/OUT terminal 7 in the cavity 3 of the base station 2. As a result, the battery of the portable headphone stereo 1 is charged, and the portable headphone stereo 1 is ready for communication with the network service station through the ISDN line.

Provided on the front face of the digital portable headphone stereo 1 are a liquid crystal display 11, direction key 12, and input keys 13A, 13B. Further provided on the front face of the digital portable headphone stereo 1 are mode keys 14 such as fast-forward, play, rewind, stop and pause keys. The digital portable headphone stereo 1 also has a headphone terminal 15 and a microphone terminal 16 on its upper surface.

As explained above, the portable headphone stereo 1 is used for obtaining music data from the network service center, then recording the music data on the hard disc, and reproducing the music data recorded on the hard disc.

FIG. 2 shows an aspect of transmission of data from a network service center to a digital portable headphone stereo. In FIG. 2, numeral 21 denotes the network service center that prepares music sources to be supplied to users. The network service center 21 stores many pieces of music data and can be accessed from an external terminal through a public telephone line 23, for example an ISDN. The network service center 21 charges fees for the use of music data on users accounts under an agreement concluded with the users. Any appropriate fee system may be employed among charging a fixed fee per piece of music, charging a monthly or yearly fixed fee, charging a fixed fee per unit period of time, and so forth.

In addition to transmission of music data from the network service center 21 to users, the system may be configured to permit uploading of users own music to the network service center 21. In this case, it is desirable that an appropriate amount is paid to a user who supplied musical information to the service center 21, also taking his copyright into account. For example, any user who supplied musical information may be paid by an amount corresponding to the occurrence of download of his music, for example.

As stated above, when the digital portable headphone stereo 1 is set in the cavity 3 of the base station 2, then the digital portable headphone stereo 1 is invested with a communication function. Due to the communication function, the digital portable headphone stereo 1 is con-

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nected to the network service center 21 via the ISDN line 23. When the digital portable headphone stereo 1 is connected to the network service center 21, a menu image showing, for example, a general classification of music shown in FIG. 3A is sent from the network service center 21 to the digital portable headphone stereo 1 and displayed on the display 11. A desired class is selected by pointing it on the image through the direction key 12 and input keys 13A, 13B.

As a result, a list of titles of pieces of music in the class appears on the menu image. When a desired title is selected from the list by pointing it on the menu image, data of the piece of music is sent from the network service center 21 to the digital portable headphone stereo 1 through the ISDN line 23, and recorded in the hard disc of the digital portable headphone stereo 1.

A possible protocol for transmitting audio data from the network service center 21 is one adding a header to audio data and transmitting the data in packets as shown in FIG. 4. The protocol for transmitting audio data may be either an original protocol or a common protocol such TCP/IP.

Audio data may be transmitted in a compressed form. Although various modes of compression of audio data have been proposed, a compression mode which accounts for the quality of sound is desirable for use with the portable headphone stereo system. For example, ATRAC (Adaptive Transform Acoustic Coding), which is used with MDs, may be used. Alternatively, data may be transmitted in an encoded form to enable real time reproduction of transmitted music data.

Although the above example presents a menu image as means for selecting a desired piece of music, it is also possible to search out a desired piece of music through its title, singer and/or other materials. Alternatively, icons may be displayed on the image plane so that a user can select a desired piece of music by pointing to a corresponding icon through a pointing device.

When the digital portable headphone stereo 1 is carried with the user, it is removed from the base station 2, and a headphone 17 is connected to the headphone terminal 15. Music data stored in the built-in hard disc of the digital portable headphone stereo 1 is reproduced by pressing the fast-forward, play, rewind, stop, pause or other operation key 14, and the reproduced sound is output from the headphone 17.

As explained above, the digital portable headphone stereo 1 using the present invention is configured to store in the interior hard disc the music data transmitted from the network service center 21. Therefore, any latest music can be introduced from the network service center 21, and a variety of users tastes for music can be satisfied. Since the invention uses, for example, ISDN and transmits music data in a compressed form, it does not require a long time for transmission. Moreover, the hard disc used as a recording medium promises a high access speed and is less affected by vibrations than an optical disc.

Although the above-explained system is made up of the digital portable headphone stereo 1 and the base station 2, it is also possible to externally add a key board and a display to the digital portable headphone stereo 1. That is, as shown in FIG. 6, the digital portable headphone stereo 1 may have a connector 18 to connect a display 31, key board 32, modem or terminal adapter 33.

When a modem or a terminal adapter 33 is connected, the digital portable headphone stereo 1 can be connected to the network service center 21 by the modem or terminal adapter 33, and can be connected to a computer, without using the

base station 2. Instead of the modem or terminal adapter, a wireless connection controller can be used for wireless connection between the network service center 21 and the digital portable headphone stereo 1.

When the key board 32 is connected, more detailed commands can be input to use the portable headphone stereo 1 for various purposes. When the display 31 is connected, moving image data can be reproduced to use the network service center 21 as an audio and video data base. The display 31 may be a CRT display, liquid crystal display, plasma display, or any other appropriate display.

FIG. 7 is a block diagram of a digital portable headphone stereo system using the invention. In FIG. 7, the digital portable headphone stereo 1 has a CPU 41 for controlling the entirety. Connected to a bus 42 from CPU 41 are ROM 43 and RAM 44. Further provided are a hard disc 45 for storing audio data and a compression/expansion circuit 46 for compressing and expanding audio data. Additionally connected to the bus 42 are an I/O port 47 for connecting a DSU (Digital Service Unit) 61 of the base station 2, I/O port 48 for connecting an external key board 32, external modem 33 or external display 31, and I/O port 49 for connecting a card 71 to add various functions. An input key 51 (corresponding to direction key 12, input keys 13A, 13B and operation key 14) and a driver 55 for driving a liquid display 11 are further connected to the bus 42.

The bus 42 is a PC standard bus typically used in the field of personal computers, such as ISA (Industry Standard Architecture) bus widely used as an AT compatible external bus (also called extensive slot bus or system bus) and PCI (Peripheral Computer Interconnect) bus widely used as a local bus (also called processor direct bus). By employing a circuit arrangement of a compatible architecture that uses such a common bus in the field of personal computers, the invention not only decreases the manufacturing cost of the entire digital portable headphone stereo 1 but also realizes widest use and extensive use of the headphone stereo.

The base station 2 has DSU 61 and a power supply circuit 62. When the digital portable headphone stereo 1 is set on the base station 2, DSU 61 of the base station 2 is connected to the bus 42 of the portable headphone stereo 1 through the I/O port 47. Simultaneously, power is supplied to the battery 53 of the portable headphone stereo 1 to electrically charge the battery 53.

In order to store music data from the network service center 21 in the hard disc 45, the digital portable headphone stereo 1 is set on the base station 2. Thereafter, a command for connection to the network service center 21 is given through the input key 51, and DSU 61 connects the digital portable headphone stereo 1 to the network service center 21. The network service center 21 transmits data in packets by an original protocol or a common protocol like TCP/IP, for example. The packet data is decomposed to extract necessary compressed audio data. The compressed audio data is delivered to and stored in the hard disc 45.

To reproduce data stored in the hard disc 45, a reproduction command is given through the input key 51. In response to the reproduction command, compressed audio data is read out from the hard disc 45, and delivered to the audio compression/expansion circuit 46. The circuit 46 expands the audio data that has been compressed by ATRAC, for example. The expanded audio data is supplied to the headphone 17 through the D/A converter 52.

To store an audio signal from the microphone 54, a record command is given through the input key 51. In response to the record command, the audio signal from the microphone

54 is supplied to the A/D converter 56, and converted into a digital form. The audio data is then supplied to and compressed by the audio compression/expansion circuit 46. The compressed audio data is delivered to the hard disc 45 through the bus 42, and stored there.

In order to minimize the dimension and weight of the digital portable headphone stereo 1, a main circuit board incorporating major parts and a card-type hard disc are used. FIG. 8 is a perspective view of the interior structure of the digital portable headphone stereo 1. Shells 70A and 70B of the digital portable headphone stereo 1 contain the main circuit board 71, card-type hard disc 72, and a battery 73. Additionally, an extensive function card 74 can be set.

All major circuit parts including CPU 41, ROM 43 and RAM 44 are arranged on the main circuit board 71. Already developed are main circuit boards as small as PCMCIA cards using a CPU of the grade around 80386. Small-sized main circuit boards using a faster CPU will be developed in a near future.

The hard disc 72 may be one using a 1.8-inch disc and having approximately the same dimension as that of a PCMCIA card and the thickness of 5 mm. The digital portable headphone stereo 1 uses the card-type hard disc 72 to minimize the dimension of the device. Currently available is a card-type hard disc of 121 MB. In a near future, those of the capacity around 1 GB will be developed.

If the sampling frequency is 30 kHz, and the quantized bits are 16 bits, then a user can enjoy reproduction of music over approximately 33 minutes by using a 20 MB hard disc. If the compression rate is doubled, the user will be able to enjoy reproduced music over 30 minutes approximately by using a 50 MB hard disc. Since the duration around 30 minutes of reproduced music is considered sufficient in most cases, the use of a double compression rate and a 50 MB hard disc will be satisfactory for the time being. If a card-type hard disc of the capacity around 1 GB is developed in the near future, longer reproduction with a higher quality of sound will be realized.

Although the above example uses the card-type hard disc, a phase-change optical disc or optical magnetic disc may be used. If a card-type optical disc or magnetic disc is developed, it may be used in the same manner as a card-type hard disc.

The extensive function card 74 is used to add a further function to the digital portable headphone stereo 1. The extensive function card 74 has approximately the same dimension as a PCMCIA card. FIGS. 9A to 9F show proposed extensive function cards, namely, a video record/reproduce card for compression and expansion of MPEG or other moving images (FIG. 9A), facsimile transmission card enabling facsimile transmission (FIG. 9B), wireless transmission card enabling wireless transmission of data (FIG. 9C), pager card giving a pager function (FIG. 9D), navigation card for enabling navigation using GPS, for example (FIG. 9E), and wire transmission card for wire transmission of data (FIG. 9F). By connecting the extensive function card 74, the digital portable headphone stereo 1 is equipped with an additional function, and various modes of use of the digital portable headphone stereo 1 can be expected.

According to the invention, a network service center for supplying numerous pieces of music data and digital portable stereo headphone players are connected by ISDN lines so that desired music data is obtained from the network service center and recorded in a hard disc for later reproduction. Audio data is recorded in a digital form to improve the quality of sound. By using a card-type hard disc, the

invention can increase the access speed and can reduce the dimension and weight of the player. Since a user can choose desired music from the storage of the network service center, he can use his player conveniently by obtaining any desired music any time from a large storage in the service center. Therefore, the system can satisfy various users tastes for music and can follow the latest fashion of music. When a digital portable stereo headphone player is fixed on a base station, then a communication function is added to the player, and the battery of the player can be electrically charged simultaneously. Any new additional function can be added to a digital portable stereo headphone player by mounting an extensive function card, and this promises further developments of such players.

That is, used as the bus for connecting respective parts is a PC standard bus (for example, ISA bus or PCI bus) which is most standard in the field of personal computers. By employing a circuit arrangement of a compatible architecture that uses such a common bus in the field of personal computers, the invention not only decreases the manufacturing cost of the entire digital portable headphone stereo but also realizes widest use and extensive use of the headphone stereo.

What is claimed is:

1. An audio reproducing apparatus, comprising:
 - control means for controlling entire behaviors;
 - storage means for writing and reading data;
 - audio expanding means for expanding compressed audio data;
 - external I/O means for transferring incoming and outgoing data, the transferring of incoming and outgoing data operative to charge an account associated with the transfer of such incoming and outgoing data; and
 - a personal computer standard bus for transmitting data among said control means, said storage means, said audio expanding means and said external I/O means, so that compressed audio data is stored in said storage means, and said compressed audio data is transferred to and expanded by said audio expanding means to be audibly reproduced.
2. The audio reproducing apparatus according to claim 1, wherein said storage means is a card-shaped recording medium.
3. The audio reproducing apparatus according to claim 1, wherein said storage means is a card-shaped hard disc.
4. The audio reproducing apparatus according to claim 1, wherein said personal computer standard bus is one of external buses including an ISA bus used in AT compatible machines and local buses including a PCI bus.
5. An audio recording apparatus, comprising:
 - control means for controlling entire behaviors;
 - storage means for writing and reading data;
 - audio compressing means for compressing audio data;
 - external I/O means for transferring incoming and outgoing data; and
 - a personal computer standard bus for transmitting data among said control means, said storage means, said audio compressing means and said external I/O means, wherein incoming data sent in a predetermined format is transferred through said external I/O means, and compressed audio data is generated from the transferred incoming data and stored in said storage means, the transferring of incoming and outgoing data operative to charge an account associated with the transfer of such incoming and outgoing data.

6. The audio reproducing apparatus according to claim 5, wherein said storage means is a card-shaped recording medium.

7. The audio reproducing apparatus according to claim 5, wherein said storage means is a card-shaped hard disc.

8. The audio recording apparatus according to claim 5, wherein said personal computer standard bus is one of external buses including an ISA bus used in AT compatible machines and local buses including a PCI bus.

9. An audio recording and reproducing system, comprising:

- an audio recording and reproducing apparatus incorporating control means for controlling entire behaviors;
- storage means for writing and reading data;
- audio expanding means for expanding compressed audio data;
- external I/O means for transferring incoming and outgoing data, the transferring of incoming and outgoing data operative to charge an account associated with the transfer of such incoming and outgoing data;
- first functional means removably attached to said audio recording and reproducing apparatus to add a supplementary function to said audio recording and reproducing apparatus; and
- second functional means removably attached to said audio recording and reproducing apparatus to add a new function to said audio recording and reproducing apparatus.

10. The audio recording and reproducing system according to claim 9, wherein said first functional means has a structure that can contain the entirety of said audio recording and reproducing apparatus.

11. The audio recording and reproducing system according to claim 9, wherein said first functional means has a communication function and/or a power supply function.

12. The audio recording and reproducing system according to claim 9, wherein said second functional means is in form of a card that can be held within said audio recording and reproducing apparatus.

13. An audio recording and reproducing system comprising:

- an audio recording and reproducing apparatus incorporating control means for controlling entire behaviors, storage means for writing and reading data, audio expanding means for expanding compressed audio data, and external I/O means for exchanging incoming data;
- first functional means removably attached to said audio recording and reproducing apparatus to add a supplementary function to said audio recording and reproducing apparatus; and
- second functional means removably attached to said audio recording and reproducing apparatus to add a new function to said audio recording and reproducing apparatus,

wherein said second functional means adds the function of at least one of video compression, facsimile transmission, wireless transmission, pager, navigation and wire transmission.

14. The audio recording and reproducing system according to claim 13, wherein said first functional means has a structure that can contain the entirety of said audio recording and reproducing apparatus.

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15. The audio recording and reproducing system according to claim 13, wherein said first functional means has a communication function and/or a power supply function.

16. The audio recording and reproducing system according to claim 13, wherein said second functional means is in form of a card that can be held within said audio recording and reproducing apparatus.

17. An audio data transmission method, comprising the steps of:
receiving desired audio data through a communication line from an audio data base storing a plurality of pieces of audio data;
storing said audio data in a receiver to thereafter reproduce the audio data within the receiver, wherein said audio data base is configured to send out to said receiver data in a predetermined transmission format for and to charge the service to an account of said receiver, the data in a predetermined transmission format including the audio data.

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18. The audio data transmission method according to claim 17, wherein said receiver obtains audio data by decomposing the data in said predetermined transmission format.

19. The audio data transmission method according to claim 17, wherein said audio data base and said receiver are connected via public telephone line.

20. An information receiving apparatus, comprising:
means for choosing desired audio data from an audio data base storing a plurality of pieces of audio data;
means for receiving desired audio data through a communication line and for storing the chosen audio data; and
means for reproducing the stored audio data, wherein in response to receipt of the desired audio data an account associated with the receipt of desired audio data is charged.

* * * * *

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**Reference cited in Substitute PTO Form 1449
Attorney Docket No. 380786-108980
Reexam Control No. 95/001,274**



US005914941A

United States Patent [19]

[11] Patent Number: 5,914,941

Janky

[45] Date of Patent: Jun. 22, 1999

[54] PORTABLE INFORMATION STORAGE/
PLAYBACK APPARATUS HAVING A DATA
INTERFACE

[57] ABSTRACT

[75] Inventor: James M. Janky, Los Altos, Calif.

A digital replacement for an analog audio tape recorder can record audio programming digitally in a faster than real time format and can play back audio programming, where such programming has been digitized and stored in data files using a variety of compression/decompression algorithms. Audio programming is stored digitally on a non-volatile medium, such as a hard drive, or in a flash EPROM, or other solid state non-volatile memory. The device includes a hard drive, a modem for connection to a data base via an on-line service, a keyboard, a display, and an audio system. The device uniquely combines the remote data access capability resident in a personal computer with a set of tailored, streamlined control functions to simplify, automate, and render seamless the process of selecting audio program material; ordering the program material from a service; receiving acknowledgment of the order and receiving the program material via automatic download for storage in a hard drive; playback of the program material when and where the user desires, with fully streamlined control functions; and control of the user interface functionality on the keyboard through a setup mode of operation.

[73] Assignee: Information Highway Media Corporation, Cupertino, Calif.

[21] Appl. No.: 08/450,818

[22] Filed: May 25, 1995

[51] Int. Cl.^o G11B 20/10

[52] U.S. Cl. 370/313; 395/200.49

[58] Field of Search 348/7, 12, 13;
364/514 R, 400.01; 395/200.49; 370/313

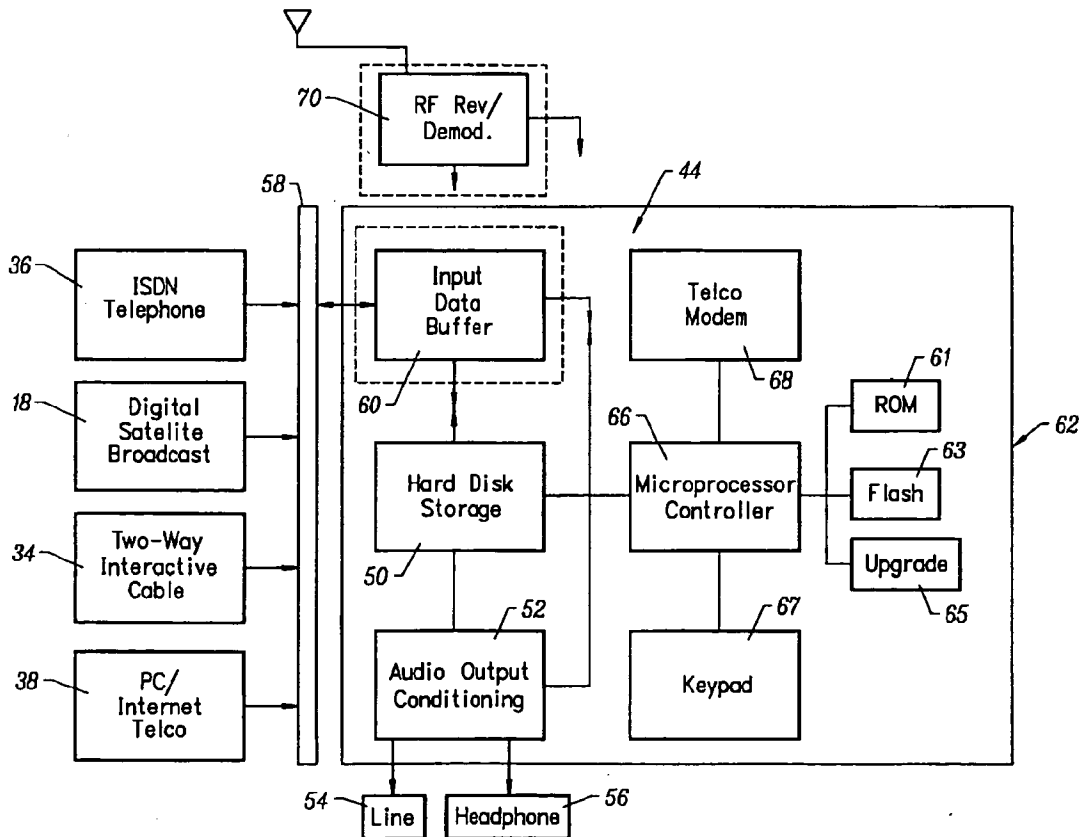
[56] References Cited

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5,440,336	8/1995	Buhro et al.	348/13
5,541,638	7/1996	Story	348/7
5,557,541	9/1996	Schulhof et al.	364/514 R

Primary Examiner—Min Jung
Attorney, Agent, or Firm—Michael A. Glenn

18 Claims, 5 Drawing Sheets



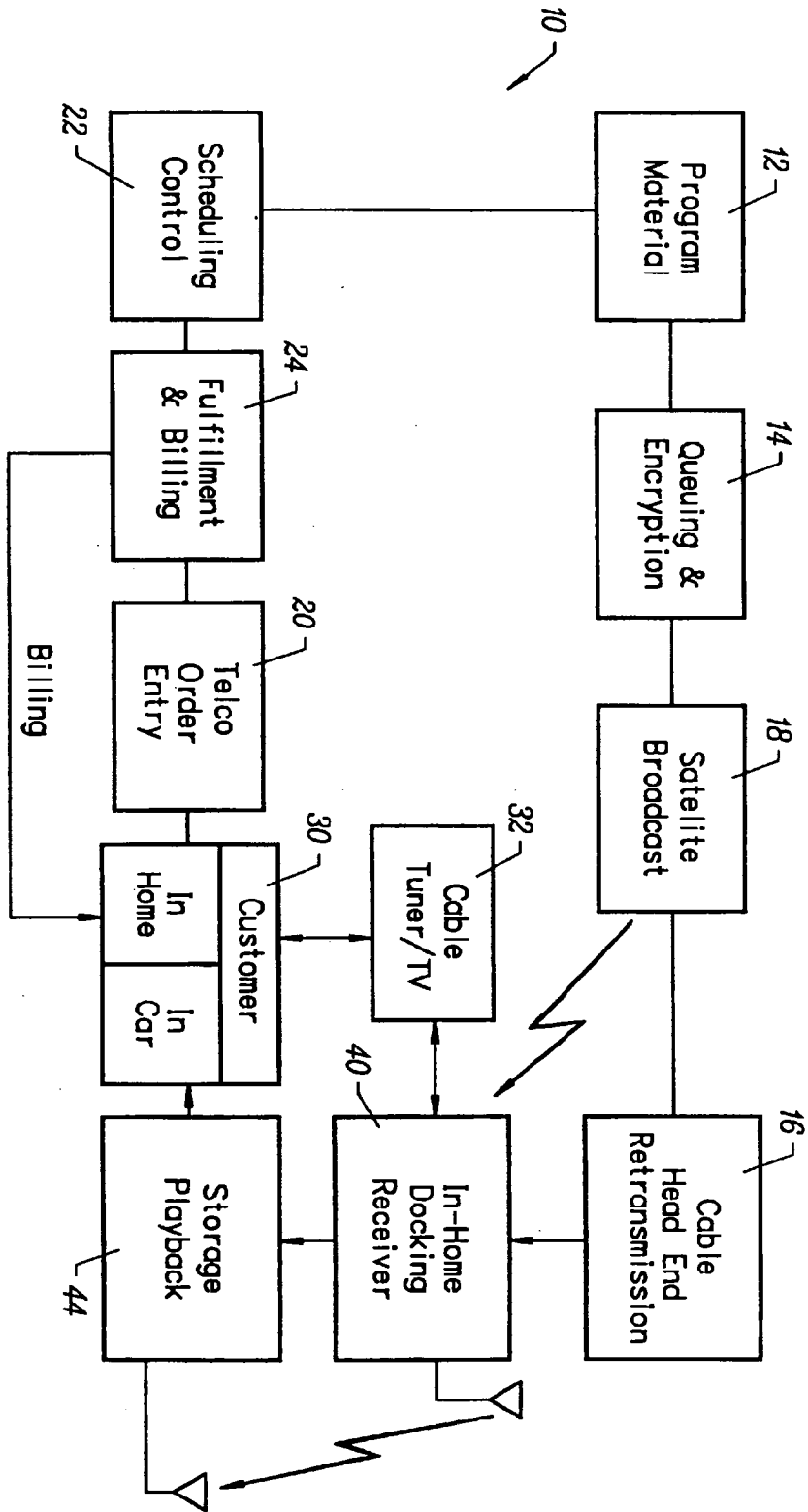


FIG. 1

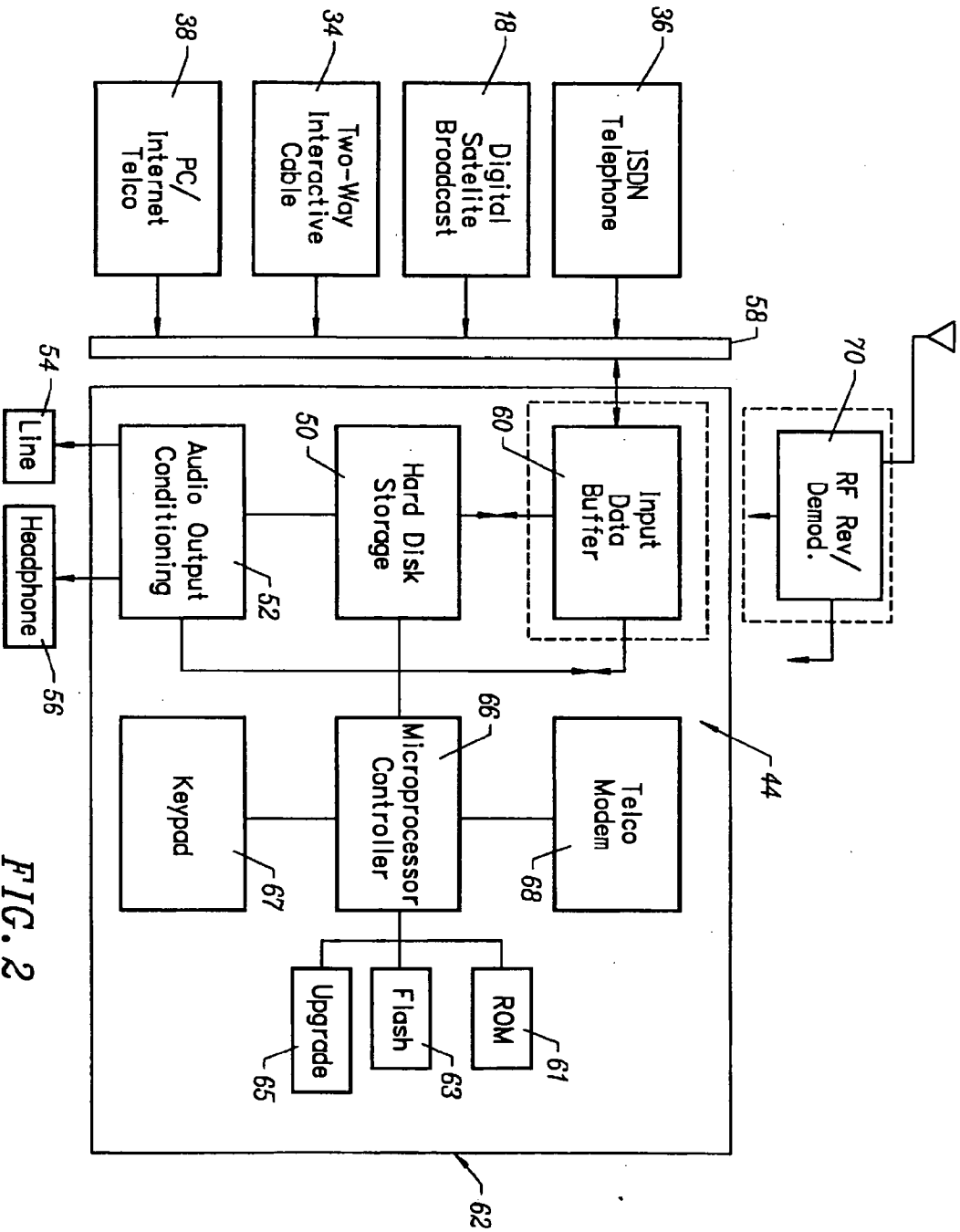


FIG. 2

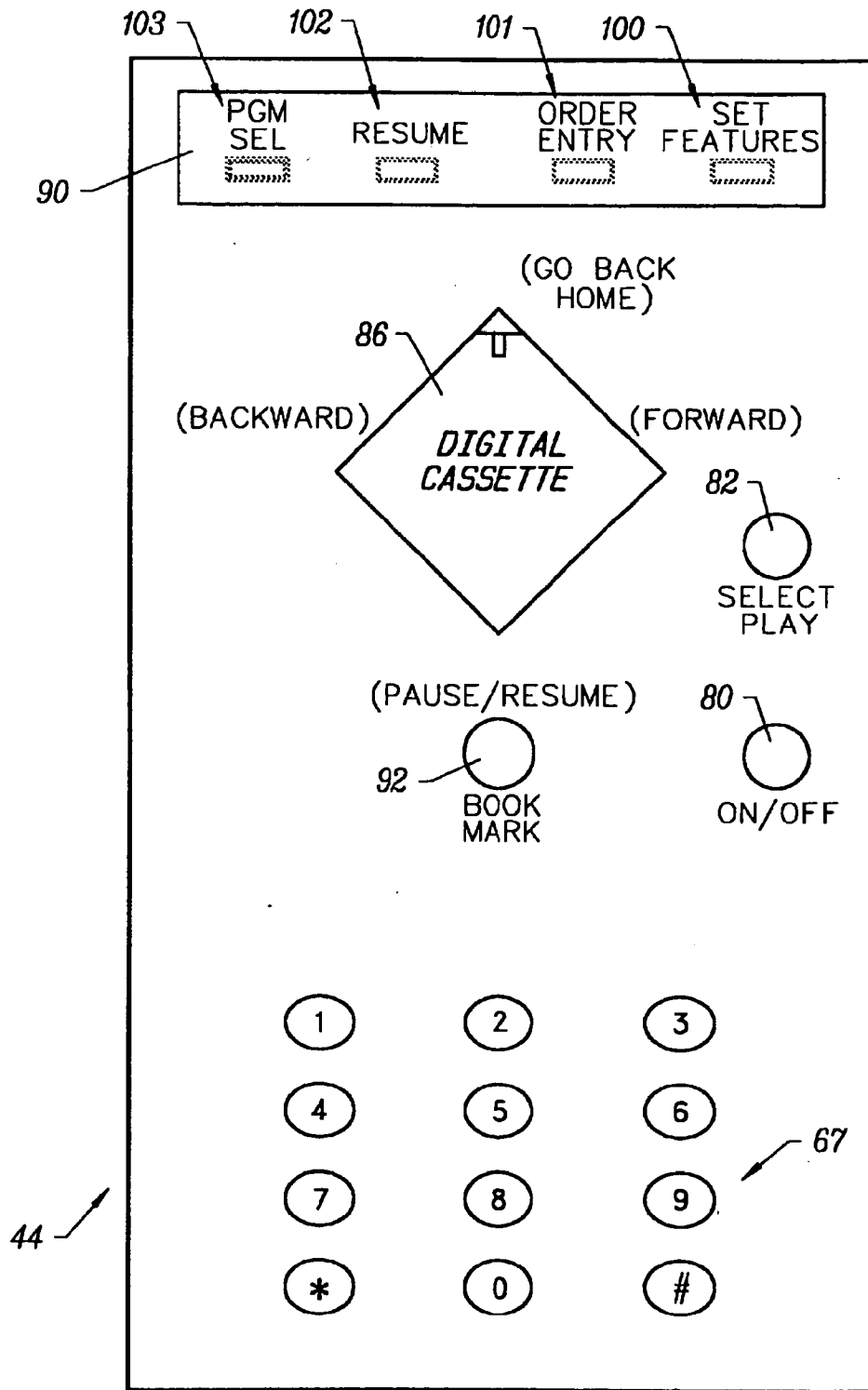


FIG. 3

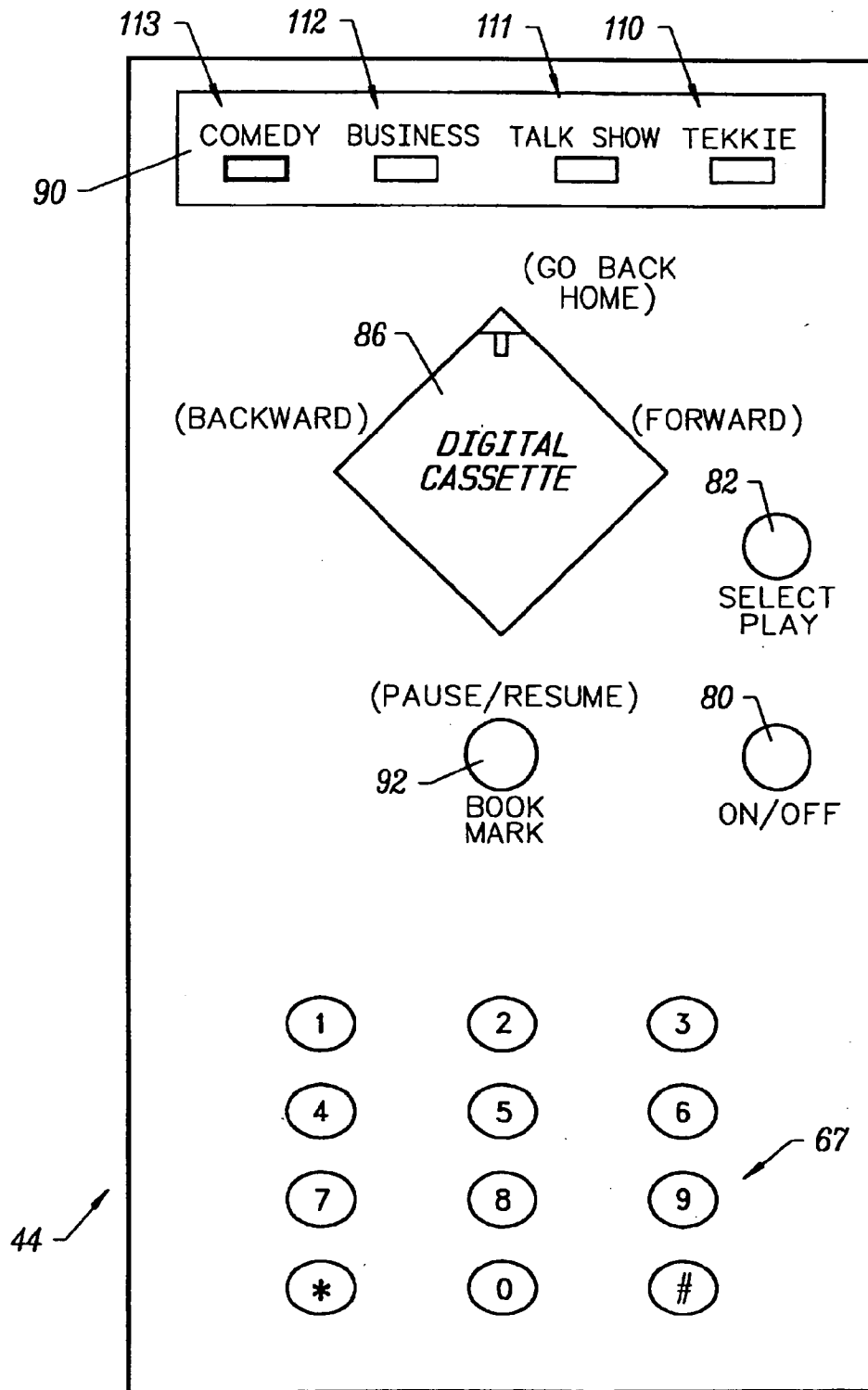


FIG. 4

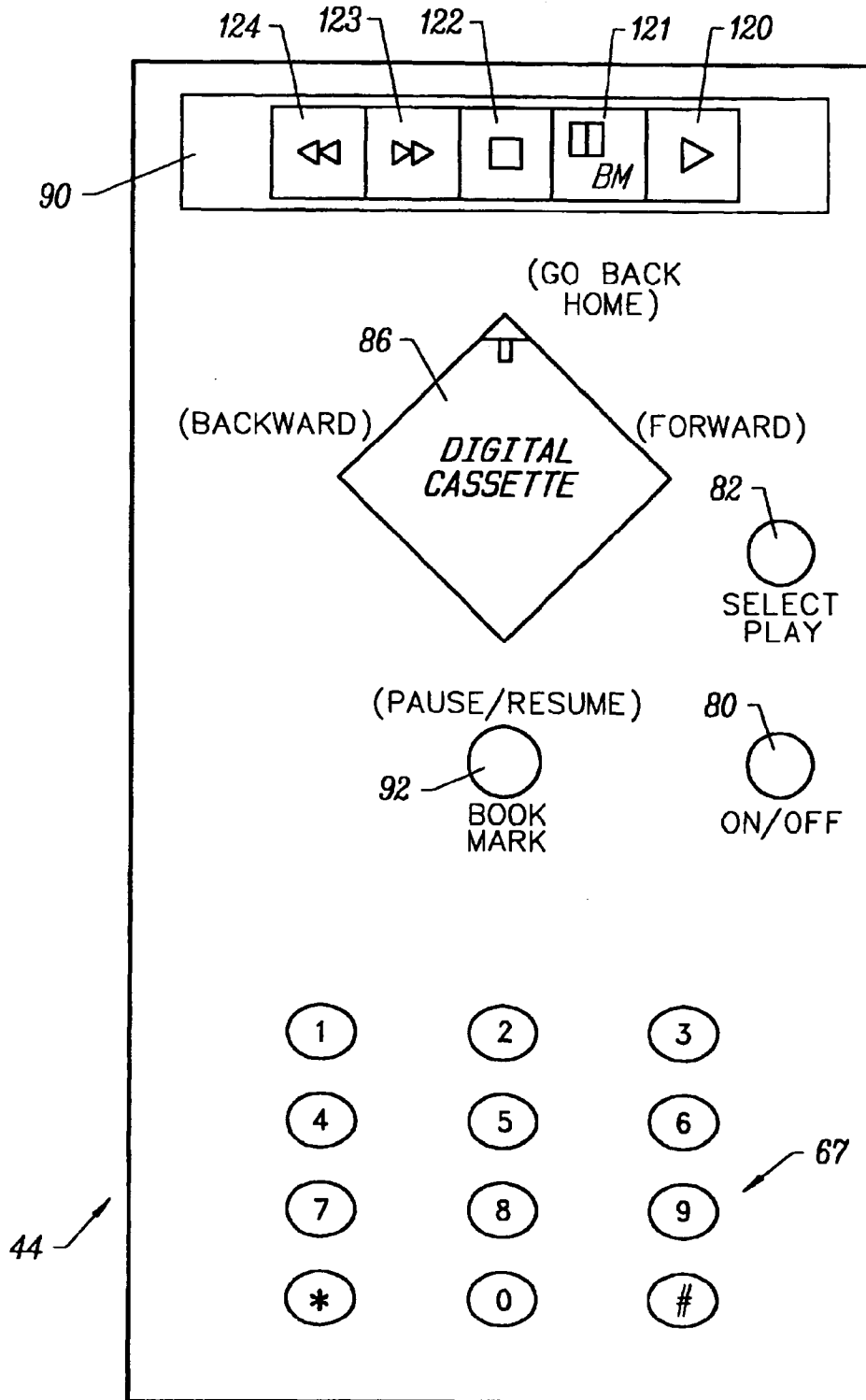


FIG. 5

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**PORTABLE INFORMATION STORAGE/
PLAYBACK APPARATUS HAVING A DATA
INTERFACE**

BACKGROUND OF THE INVENTION

1. Technical Field

The invention relates to the distribution of subscription and on-demand audio program material. More particularly, the invention relates to high speed recording of audio program material from a remote source on a subscription and/or on-demand basis using a portable high capacity audio recording and playback device.

2. Description of the Prior Art

Although much neglected by the public and the press in connection with the current fascination with pay-for-view movies, video-on-demand, and other multimedia services, sound remains the most compelling and informative element in any form of interpersonal or electronic communication. To understand this concept better, consider a television network news broadcast. If the picture portion of the broadcast is lost, one is still able to receive most of the content of the broadcast. However, if the audio portion of the broadcast is lost, one receives almost none of the content of the broadcast.

Radio was the most highly successful entertainment medium until sound motion pictures and television added the visual element to entertainment programming. The state of radio today is such that it provides a source of music, as well as talk and news, especially for those environments that require some level of visual concentration, such as operating a vehicle or machinery, or working in an office. Thus, radio has been pushed into the background as an ancillary form of entertainment.

One can listen to a radio and hear whatever is being broadcast at the time; or one can record a desired piece of music or other program as it is broadcast, and listen to the recording later, for example on an automobile cassette player. One can also transport prerecorded audio program materials, such as tapes and compact disks, and listen to them in the car or on a portable playback device, such as a Walkman®. Prerecorded audio programming that is available includes music, books on tape, and various educational and entertainment materials.

All known audio program delivery methods have been generally accepted by the public, but they are somewhat limited in their appeal because they are time-consuming to prepare, for example making a recording for later use is time consuming because the recording must be made in real time. They are expensive, for example a compact disk containing a musical performance or a book on tape may only be listened to once or twice, although the full purchase price must be paid for such materials. And they do not offer the variety of program material that is either now available from television cable services, or that is available from other media, such as print media, for example the New York Times or the Wall St. Journal.

There are other significant limitations inherent in an off-the-air recording system that include a lack of control of the choice of program material, and the time at which the subscriber can listen to this material. In current radio broadcast systems, the program material is broadcast when the station manager thinks it best. Such real time distribution requires that interested listeners tune in at the designated time, assuming that the station is willing or able to publicize

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its broadcast schedule in advance of the broadcast. Even so, a listener must typically endure several annoying interruptions for commercial messages, even if listening to the so-called public radio stations. Prerecorded materials are packaged by the manufacturer and must be used in the format provided, i.e. all of the materials must be listened to in the order they were recorded. Otherwise, the consumer must rerecord the prerecorded materials to edit the content and/or order of the materials, as well as adding other materials that were not included by the manufacturer of the prerecorded programming. As discussed above, the recording process is time consuming, requires a certain level of patience and skill, and is a significant barrier to use for the typical listener.

Thus, those persons listening to a broadcast while in their automobiles have less control because they cannot time shift a program by recording the program, although they may nevertheless want to listen to certain programs while traveling. Additionally, those persons listening in the automobiles may want to listen to program material that is not normally available on a public broadcast channel. While those persons listening in their automobiles may listen to recordings that they have purchased or recorded themselves when the program material was originally broadcast, the mobile listener cannot take control of the program selection process and the time at which the program is heard, nor can such materials be combined or edited without a significant commitment of the listener's time to assembling the desired materials, or portions of the desired materials, in the desired order.

The most limiting factor in the expansion of audio related news and entertainment services is probably the lack of program material having the form and content desired by the subscriber, coupled with the lack of a modern customer order and distribution system for such materials for conveniently delivering the program materials in the desired format.

The video-on-demand industry is just evolving. However, the video-on-demand industry has a fundamentally different focus than that of radio or other audio-based program delivery services, i.e. to duplicate a theater-like experience in the viewers home, not offer a commuter or other mobile listener an audio-on-demand or subscription service. The state of the art is therefore concerned with providing video services, not with informing a busy commuter during otherwise idle time spent in an automobile traveling to and from work.

For example, H. Brudner, Computer-Assisted Instruction Via Video Telephone, U.S. Pat. No. 3,654,708 (May 26, 1969) discloses a teaching system that uses a video telephone as a terminal. The video telephone is tied into a computer and information is fed into the video telephone, while other information is returned to the computer. A video tape recorder, containing a central bank of pre-recorded reels of video tape, is connected to the central processing unit of the computer and the video telephone, such that pictorial representations, as distinguished from the alpha-numerical representations, appear on the screen of the video telephone, enabling interaction with the student. The central bank of pre-recorded reels of video tape is connected to a buffer unit so that selected tape reels can be transfer recorded material into the buffer unit, where it is played back to the student selecting such tape. In this manner, the pre-recorded reels of video tape in the central bank are available almost simultaneously to a large number of students at different terminal units in the teaching system.

See, also, the following:

C. Coddington, J. Gold, D. Klika, D. Konkle, L. Litteral, J. McHenry, A. Richard III, PSTN Architecture For Video-On-Demand Services, U.S. Pat. No. 5,247,347 (Sep. 27, 1991), which discloses a public switched telephone network (PSTN) that provides digital video signals from a video information provider to one or more of a plurality of subscriber premises. A subscriber uses either a standard telephone instrument over the PSTN or a dedicated control device over an ISDN packet network to order video programming. The request is transmitted to a designated video information provider and digital transmission connectivity is established between the video information provider and the central office serving the subscriber. Connectivity between the central office and subscriber is provided by asymmetrical digital subscriber line interface units over a local loop. The interface units frequency multiplex digital video information with voice information to the subscriber and support transmission of a reverse control channel from the subscriber to the central office for transmission on the ISDN packet data network back to the video information provider. The interfaces also allow base band signaling and audio between the central office and the subscriber for conventional telephone instrument connectivity;

J. Fischer, K. McCalley, S. Wilson, Interactive Multimedia Presentation And Communications System, U.S. Pat. No. 5,191,410 (Mar. 2, 1993), which discloses a system for interactively and selectively communicating particular multimedia presentations to each of a plurality of subscribers along a CATV cable network. The subscriber communicates his selections, both for viewing particular presentations from a menu and for transactions with respect to the information and products being viewed, by entering codes on his Touch-Tone telephone pad. Subscriber input signals are communicated as digital signals through the intercommunications network and response signals are generated, ultimately as analog TV signals for viewing by the subscriber;

D. Rhoades, Telephone Access Information Service Distribution System, U.S. Pat. No. 5,181,107 (Jan. 19, 1993), which discloses a digital, interactive communication system designed to provide a plurality of remote subscribers with any one of a variety of stored information service software packages through the use of a home computing assembly maintained within the subscriber's home and structured to display video as well as generating audio on a standard television receiver. A bi-directional communication link is established over telephone lines between the home computing assembly and a central remote information storage center so that a selected one of the variety of information services is transmitted as a modulated carrier to the subscriber. Information service selection is controlled by a remote information storage center executive software program. Automatic billing is performed by computing equipment maintained in the remote information storage center and transmitted to a headquarters which also receives diagnostic messages associated with the remote information center and/or the associated plurality of home computing elements; and

D. Rhoades, Telephone Access Video Game Distribution Center, U.S. Pat. No. 5,051,822 (Sep. 24, 1991), which discloses a digital, interactive communication system that is designed to provide a plurality of remote subscribers with any one of a plurality of stored video games or like software packages through the use of a home computing assembly maintained within the subscriber's home. The assembly is structured to display video as well as generating audio on a standard television receiver, and further incorporates the

ability to use contemporary video gaming control devices for subscriber program interaction. A bi-directional communication link is established over the telephone lines between the home computing assembly and the central remote game storage center wherein the software programs are transmitted as a modulated carrier to the subscriber. Program selection is controlled by a remote game storage center executive software program. Automatic billing is performed by computing equipment maintained in the remote game storage center and transmitted to a headquarters which also receives diagnostic messages associated with the remote game center and/or the associated plurality of home computing elements.

And, also Pocock et al, U.S. Pat. Nos. 4,734,764 and 5,014,125 (a system for conveying still frame video with overlaid graphics and audio to a CATV channel during the vertical blanking interval of a television signal, including subscriber control and selection of display material via operation of a touch tone pad on a telephone); McCalley et al, U.S. Pat. No. 4,829,372 (packet transmission of digital information to a subscriber via a dedicated line/converter); Abraham, U.S. Pat. Nos. 4,567,512 and 4,590,516 (telephone subscriber request and scheduling system); Harrison, U.S. Pat. No. 4,584,603 (closed environment entertainment system including subscriber selection and control of program material); Bessler et al, U.S. Pat. No. 4,755,872 (pay for view system for use with cable system having one way addressable converters); Clark et al, U.S. Pat. No. 4,761,684 (telephone selection of video programming for cable television system); Gordon et al, U.S. Pat. No. 4,763,191 (telephone selection of video programming for cable television system); Monslow et al, U.S. Pat. No. 4,995,078 (telephone scheduling of real time video broadcast over a dedicated cable system); Lambert, U.S. Pat. No. 4,381,522 (telephone selection of video programming for viewing on a cable television system in which a directory channel displays program selections and schedules); Goodman et al, U.S. Pat. No. 5,010,399 (video transmission and control over residential phone lines); and Kleiner mann, U.S. Pat. No. 4,849,811 (simultaneous transmission of audio and image frames over standard telephone lines).

Form factor of an audio on demand apparatus may probably be even more critical to the development of such an audio information distribution system than the information content provided or the pricing of such content because the success of such system depends entirely upon consumer acceptance, and consumer acceptance is tied closely to perceived utility and ease of use of the device that captures, stores, and reproduces the audio information. The device must be unobtrusive and easy to operate, yet sophisticated enough that subscribers to an audio on demand service can easily obtain and listen to desired programming. Because most people do not want to learn to program a VCR, the device must therefore be significantly easier to operate than a VCR. In fact, the device should ideally be no more difficult to use than a CD player. The device must also be able to store significant quantities of digital data and to convert such data to audio information.

The state of the art provides an interesting starting point for the design of a data storage device that may be useful for audio-on-demand services. For example, a PCMCIA card is a well defined format for a package having a connector, and that provides a way of packaging an electronic device or devices, where the package size is 75 mm long, 50 mm wide and anywhere from 3½ to 7½ to 10½ mm high. A PCMCIA card that contains a solid state or disk drive memory provides, in effect, a storage component having a particular package configuration.

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Smart cards are typically used for debiting credit card accounts, and typically includes a memory, microprocessor, and data I/O.

A minidisk system offered by Sony Corporation of Japan permits recording and playback of any audio material on a 2-inch plastic disk that employs a dye laser approach to creating a miniature CD, using the same techniques as are used by CD manufacturers, and uses identical modulation and coding formats as are used by CD manufacturers. On the minidisk system, information is stored in real time and played back in real time. The system does not use data compression. Rather, it offers a straightforward approach to providing the highest possible fidelity for audio.

While video distribution systems are being developed and the video-on-demand industry proceeds apace, there is little or no effort going into delivering audio programming, even though many people spend two or more hours a day in their automobiles. Key to the success of audio on demand is consumer acceptance of the delivery and playback system. If such system is not transparent to the consumer, yet powerful enough to be fully featured, then consumers are likely to find the system too burdensome to use. Accordingly, an improved, easy to use audio program distribution system would find ready acceptance by the public.

SUMMARY OF THE INVENTION

The invention provides a device that is in part a digital replacement for an analog audio tape recorder. The device can record audio programming digitally and can play back audio programming, where such programming has been digitized and stored in data files using a variety of compression/decompression algorithms. Audio programming is stored digitally on a non-volatile medium, such as a hard drive, or in a flash EPROM, or other solid state non-volatile memory.

In contrast to such digital audio systems as Digital Audio Tape (DAT), the device herein uses a different storage medium, provides random access search ability, and stores information in accordance with various data compression algorithms. In contrast to such writeable audio storage devices as the Sony recordable mini-CD, the device herein uses a different storage medium, such as a hard drive, has intentionally limited audio bandwidth, i.e. it does not provide stereo full fidelity, and includes a novel integrated data communications protocol and data exchange port, including a modem, for automatic program material acquisition.

The invention provides two methods for a person using the device to obtain program material:

Through a digital data storage cartridge, which is the digital equivalent of a tape cassette, and in one preferred embodiment of the invention is a removable cartridge;

Through an electronic data transfer from a variety of sources such as a cable TV broadcasting system having an appropriate data transmission system.

The device uniquely combines the remote data access capability resident in a personal computer with a set of tailored, streamlined control functions to simplify, automate, and render seamless the process of selecting audio program material; ordering the program material from a service; receiving acknowledgment of the order and receiving the program material via automatic download for storage in a hard drive; playback of the program material when and where the user desires, with fully streamlined control functions; and control of the user interface functionality on the keyboard through a setup mode of operation.

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BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a block level schematic diagram of a subscription/on-demand information delivery system according to the invention;

FIG. 2 is a block level schematic diagram of a portable storage/playback apparatus having a universal data interface according to the invention;

FIG. 3 is an illustration of the portable storage/playback apparatus, showing an initial mode of operation according to the invention;

FIG. 4 is an illustration of the portable storage/playback apparatus, showing an information order/select mode of operation according to the invention; and

FIG. 5 is an illustration of the portable storage/playback apparatus, showing a transport mode of operation according to the invention.

DETAILED DESCRIPTION OF THE INVENTION

In its broadest application, the invention provides a device that is a digital replacement for an analog audio tape recorder. The device is able to record audio programming digitally and play back audio programming that has been digitized, where such audio information is stored in data files using a variety of known compression/decompression algorithms. Audio programming is stored digitally on a non-volatile medium, such as a hard drive, or in a flash EPROM, or other solid state non-volatile memory.

In contrast to such digital audio systems as Digital Audio Tape (DAT), the device herein uses a different storage medium, provides random access search ability, and stores information in accordance with various data compression algorithms. In contrast to such writeable audio storage devices as the Sony recordable mini-CD, the device herein uses a different storage medium, such as a hard drive, has intentionally limited audio bandwidth, i.e. it does not provide stereo full fidelity, and includes a novel integrated data communications protocol and data exchange port, including a modem, for automatic program material acquisition.

The invention provides two methods for a person using the device to obtain program material:

Through a digital data storage cartridge, which is the digital equivalent of a tape cassette, and in one preferred embodiment of the invention is a removable cartridge;

Through an electronic data transfer from a variety of sources such as a cable TV broadcasting system having an appropriate data transmission system.

Other alternative embodiments of the invention allow one using the device to obtain program material through a digital direct broadcasting satellite system, such as is offered by DirecTV, a high speed data transmission service over telephone lines using the ISDN data capability known as 2B1Q, and lower speed connections via ordinary telco modems to Internet-served databases. It is anticipated that one may also take advantage of higher speed successor technology that should become available as part of video on demand services from such vendors as telephone companies and cable television companies. Finally, it is expected that reception from a wireless system based on direct broadcast terrestrial links is likely when AM/FM radio signals are transmitted in a digital format, and as other high speed communication links become available, such as the Personal Communications Systems/Networks recently authorized by the FCC.

The device herein disclosed is similar to a dedicated personal computer, complete with a hard drive, modem for

connection to a data base via an on-line service, keyboard, video display, and audio system. However, the device uniquely combines the remote data access capability resident in a personal computer with a set of tailored, streamlined control functions to simplify, automate, and render seamless the process of:

- Selecting audio program material;
- Ordering the program material from a service;
- Receiving acknowledgment of the order and receiving the program material via automatic download for storage in a hard drive;
- Playback of the program material when and where the user desires, with fully streamlined control functions; and
- Control of the user interface functionality on the keyboard through a setup mode of operation.

FIG. 1 is a block level schematic diagram of a subscription/on-demand information delivery system according to the invention. Such system is disclosed in part in the following copending patent applications, both of which are commonly assigned to Information Highway Media Corporation, the assignee of the present application, and both of which are fully incorporated herein by reference: N. Schulhof, J. Janky, System For Distributing Subscription and On-Demand Audio Programming, U.S. patent application Ser. No. 08/279,243, filed Jul. 21, 1994; and N. Schulhof, J. Janky, Apparatus For Distributing Subscription and On-Demand Audio Programming, U.S. patent application Ser. No. 08/279,244, filed Jul. 21, 1994.

As shown in FIG. 1, the invention operates in a system that allows a subscriber to:

- Select audio program material from a remotely located library;
- Make the selection when he wishes to;
- Receive the material via a variety of communications means at a rate much faster than real time, such that it is not necessary to wait very long to receive the program material; and
- Transport the stored program material to a vehicle or other location for playback in a suitable mechanism;
- Perform playback at any desired time.

Thus, the invention herein disclosed is particularly well suited for use in a system that provides a very rich variety of program material via a wide-band high speed information channel for storage on a subscription and/or on-demand basis available from a much wider range of sources than is currently feasible on cable to the subscriber, and for use when desired. The invention is also intended for use in a system that transfers selected program material over a high speed data link at a rate much faster than real time.

The system 10 includes a library of program material 12, that contains a plurality of audio program materials stored in a digital format. The library may be implemented in any known digital storage technology, for example as a plurality of digital storage media, such as ultra fast hard drives. Program material may be introduced into the library from a variety of sources (not shown) that may be delivered electronically over a variety of data communications media at high speed from a plurality of locations, for example via modem transfer from a distributor, such as the Wall St. Journal.

It is anticipated that one important use of the invention is in conjunction with a subscription service. For example, a daily newspaper, such as the Wall St. Journal or the New York Times, may be transcribed each morning into an audio

version, that is then digitized and delivered to the library. In this way, the library may provide daily delivery of a morning newspaper in audio format that allows a subscriber to listen to the news in a way that the news is not interrupted by commercial breaks and is not truncated to fit into a tight broadcast schedule.

The program distribution system enables a subscriber to select desired programs, and to be charged for the service. The program distribution system includes a scheduling control module 22 that selects a series of stored program materials from the library 12 via a telco order entry module 20. The subscriber is billed for selected program materials by a fulfillment and billing module 24. Program selection may be made over a telephone line, as in shown in the prior art, or it may be made from the customer/subscriber location 30 and/or a standard interactive cable television converter 32. Orders placed by the subscriber are routed via a cable television system, or from residential phone lines via the telco order entry module 20.

The actual program material delivery system may be chosen to take advantage of an existing regional infrastructure. The system is well suited for such delivery means as cable television 16, interactive cable (34; FIG. 2), pay-per-view (not shown), telephone (38; FIG. 2) or ISDN (36; FIG. 2), and satellite distribution 18. Examples of such distribution vehicles, as well as new and emerging forms of distribution are discussed in D. Delodderie, W. Verbiest, H. Verhille, Interactive Video On Demand, IEEE Communications (May 1994); R. Jones, Baseband and Passband Transport Systems for Interactive Video Service, IEEE Communications (May 1994); and P. Baran, Satellite Communications System and Apparatus, U.S. Pat. No. 4,455,651 (Jun. 19, 1984).

During data transmission, program materials are transferred from the library at rates faster than those corresponding to real time playback rates for delivery via a queuing and encryption module 14 to a series of high speed data transmission systems, such as a satellite broadcast system 18. The broad band high speed data transmission system may also include a local delivery module that is similar those that are currently used for video program delivery to cable television head ends 16, except that in the system herein the program material is subsequently delivered in digital high speed format to an individual subscriber's home.

The transmission system routes the selected program material to the subscriber's residence via any known means, such as a cable television system 16, or the program material may be routed directly to the subscriber via satellite broadcast 18, as discussed above. Once received at the subscriber's residence, the standard cable television converter 32 routes the program material to a docking interface device 40. Alternatively, the cable system may be coupled directly to the docking interface device. The cable converter 32 and television set may then be selectively coupled to the cable system via control circuitry in the docking interface device 40.

FIG. 2 is a block level schematic diagram of a portable storage/playback apparatus having a universal data interface according to the invention. The invention herein resides in a portable program storage/playback system 44 that provides a specialized set of interrelated subsystems that together capture the selected audio program material, store the program material, and enable selective playback of the stored program material in a mobile environment, such as an automobile. Once program materials are stored on the storage medium 50, a playback system 52 permits the stored program material to be played back in real time, for example

over the AM/FM radio in an automobile via a line output 54 or through a speaker or pair of headphones 56.

More particularly, the system 44 comprises a digital data storage means, such as a hard disk drive 50 that is in communication with a universal communications interface 58 via an input data buffer 60. The universal communications interface 58 may be connected to a plurality of data sources, such as an ISDN telephone line 36, a digital satellite broadcast system 18, a two-way interactive television cable 34, and an Internet or other data source as may be supplied over standard telephones services 38.

Thus, data connections and sources to which the system is adapted include a telco modem system connected via a standard telephone system to an Internet access connection, either directly or through a personal computer; a specialized data modem for use with a cable TV system; a direct broadcast satellite digital television receiver system; a specialized modem for use with the telephone system known as an ISDN data link. Appropriate communications protocols are stored in a system memory 62, which may include a read only memory 61, flash memory 63, or other memory, such as an upgrade memory 65, or the communications protocols may be stored on the hard disk drive 50. Such protocols are accessed as appropriate under control of a microprocessor 66.

The microprocessor 66 controls storage and data retrieval functions, provides communications interface control to the high speed sending data source, provides communications interface control to a bidirectional low speed source, supervises order entry functions and order placement, and controls digital to audio conversion functions for playing back an audio program stored in a data file. The microprocessor 66 comprises a series of standard microprocessor elements that store a series of executable subroutines, for example in a read only memory 61, as discussed above.

The microprocessor 66 is connected to an interactive controller, such as a keypad 67, that allows external control of the system by a user. The microprocessor is also connected to an output system that includes an audio output and conditioning module 52 that is operable to deliver audio signals that are developed from data files stored on the hard disk drive, or on other storage means.

Finally, the microprocessor is also connected to a built in telco modem 68. The modem is used to make a direct connection to a telco-based order entry system that accepts previously entered user requests from the keypad that are stored in the system memory. It is expected that as modem speeds over telephone lines increase, the modem can be used to retrieve the programs ordered. In the presently preferred embodiment of the invention, a second modem is needed, which is not part of the system per se. The reason for a separate order entry modem has to do with speed because order entry can be low speed, but program transmission must be high speed if it is to be done in a timely manner. Further, while it may be possible to obtain material from more than one source, order entry is preferably performed by phone.

In an alternative embodiment of the input data buffer 60 is a PCMCIA-type format card that includes either or both of the universal communications interface 58 and the telco modem 68. Alternatively, an RF receiver/demodulator, either hardwired or in a PCMCIA-type format, may be used for wireless communication for either or both of program ordering and program reception. As shown in FIG. 1, such wireless communication with the system 44 may be with a local receiver 40 that is coupled to a cable television or other such service. In this way, the system may be left on a desk or in a car and automatically loaded with program informa-

tion when not in use. Another embodiment of the invention situates the telco order entry modem as a part of the receiver 40 (FIG. 1) which is connected to a cable television system 16.

In yet another embodiment of the invention, the input data buffer may include an audio input/digitizer circuit for digitizing live audio and then storing it, as in a conventional tape recorder or mini-CD recorder or DAT recorder.

The system 44 accepts digital data from a plurality of sources according to prearranged formats for both the data structure and the physical interface; controls the storing process in a digital data storage device; responds to commands initiated from the keypad 67 to execute various functions, including playback of audio programming that has been stored in a digital format in a file, and entering of catalog numbers of programs to be ordered; and responds to specialized commands for reconfiguration of operating modes, according to a pre-arranged series of options.

The system may be operated in any of at least four user-selectable modes:

1. Initial Mode: User Setup/Order Entry By User.

FIG. 3 is an illustration of the portable storage/playback apparatus, showing an initial mode of operation according to the invention. In the user setup mode, the user can configure the system to follow certain canonical paths through a built-in menu system, or the user may execute immediate jump-to commands. In this mode, the user can also configure the system for the desired communications access, and may also enter a personal user profile of automated features. In this way, the user may create an intelligent agent that automatically services the user's order and retrieval needs. For example, if the user is interested in listening to all regularly published information on a particular topic, the agent can be programmed to collate all such information for the user's review.

When the user wishes to make a selection for a next download of program material, he activates the system by pressing an ON/OFF switch 80, and then may set a profile of features 100 for the system and/or select an Order Entry mode 101, as displayed on a LCD display 90, using a select key 82. The user next copies order entry numbers from a catalog or schedule into the system via the keypad 67, marking the end of each selection with a pound sign # or a star sign *. The new requests are then stored in either solid-state memory 62 or hard drive memory 50 in the system until they are transferred to an order service center upon activation of an order entry mode. At any time during this operation, the user may pause and thereafter resume operation of the system by pressing a Pause/Resume button 92. Pause and resume modes of operation are indicated on the display 90 by a RESUME indicator 102.

FIG. 4 is an illustration of the portable storage/playback apparatus, showing an information order/select mode of operation according to the invention. The information order/select mode allows the user to browse selectively through various program categories and then through program files within each category by reading descriptions for both the categories and the titles in a display and/or by listening to the descriptions, as the descriptions are converted to audio information that is suitable for conveyance to any of a number of audio systems, including the automobile stereo cassette system, another portable audio playback system, or a audio speaker system attached to the digital cassette. The audio mode of information retrieval and selection is considered especially helpful for persons who cannot read, such as young children, and for visually impaired persons. It is also a benefit to a person operating an automobile, who cannot afford to be distracted by trying to read a display.

Thus, when this mode is selected, the display 90 is used in conjunction with a four position control switch 86 to navigate through a hierarchical or otherwise organized database of program material. In the figure, the materials shown organized in four categories, i.e. Tekkie 110, Talkshow 111, Business 112, and Comedy 113. The control switch may be used to navigate through a database hierarchy by pressing forward and backward to move up or down a level within the hierarchy, and by pressing to the left or right to move within a particular level of the hierarchy. The control switch may also have a center press position that is used to make a selection; or the Select/Play button 82 may be pressed to make a selection. Additionally, the keypad 67 may be used to navigate through the program database, for example by means of keyboard shortcuts, where a particular keystroke or combination of keystrokes is assigned to a specific database location. It is expected that order placement and database browsing may take place in real time, although it is also possible to download an updated catalog containing the database of program material each time program material is transferred into the system. In this way, it is not necessary to refer to a separate catalog for a listing of program material, and the expense of printing and distributing such a catalog is eliminated.

It should be appreciated that the specific arrangement of controls and modes of operation are herein provided for purposes of disclosing the presently preferred embodiment of the invention, but that the invention is not necessarily limited to these specific examples.

2. Transaction Mode A: Automatic Order Placement By Telco Modem When Mated To An Associated Docking Station.

The docking station 40 (FIG. 1) contains a high speed modem for receipt of data, a power supply, a connection to a data source, and optionally a low speed modem for access to the order entry system 20 via the telephone system, i.e. the low speed modem may be in the docking station instead of in the system.

A control algorithm is used to establish connection to an order entry host with prescribed information exchange protocols for automatic entry of programs to be downloaded to a particular customer's system. Automatic receipt of acknowledgment is provided by host to verify that system is authorized to receive the programs ordered. Order entry and acknowledgment preferably includes an appropriate time dependent encryption/decryption keys.

3. Transaction Mode B: Automatic Receipt Of Desired Program Material Via Automatic Connection To A High Speed Data Modem, Which In Turn Is Automatically Connected To The Broadcasting Host Computer.

A modem contained in the docking station 40 (FIG. 1) physically accepts the system and makes electrical connections thereto that are suitable for receiving high speed data and for sending order entry information via a low speed modem. The docking station contain a connector for establishing electrical communication between the system and the docking station. The docking station also contains a telco modem for relaying customer identification and customer program order information. A connector between the modem and the telco system may comprise, for example either a wire to/from an RJ-11 jack, or a wireless radio modem. This mode of operation is completely integrated for automatic, seamless, and effortless operation without customer assistance or intervention.

A high speed data demodulator is also provided in the communications interface 58 for receiving desired program material from plurality of data sources, and is connected to

the system to transfer the program material thereto. The high speed data demodulator may be connected to a cable television distribution cable with appropriate tuning circuits for selecting a desired data channel. The high speed data demodulator preferably operates in a signaling system in which the data to be transmitted are converted to a multilevel signal set, in which as many as four voltage levels are used to create a series of symbols, each symbol corresponding to a particular pattern of data bits, and which set is inserted into a standard NTSC/PAL/SECAM video composite signal. The demodulator preferably recovers the data from the series of symbols transmitted as video, and then delivers the data via the communications interface 58 to the data buffer 60. Alternatively, the high speed data demodulator is connected to a remote data source via a standard telephone system for communication with the subscription/audio-on-demand service via an Internet connection, or an on-line service, such as AmericaOnLine, Compuserve, or Prodigy.

In another, equally preferred embodiment of the invention, the high speed data demodulator is embodied in a telephone service known as ISDN, in which case the internal said high speed data demodulator associated with the docking station is bypassed, and data are delivered directly to the interface data buffer 60 for storage on the hard disk drive 50.

A control algorithm establishes a connection via any of the previous communications paths to a host computer system. The host computer system broadcasts audio program material in form of digital data files, and as part of an overall transmission of a catalog of available programs. The control algorithm associates program files in the broadcast data stream with identification tags by means of a header field that is attached to the beginning of each data file. The identification tags match those programs selected by the user and allow transmission of the program material to the user if a suitable enabling acknowledgment is received. The transfer of the selected files is enabled and, upon receipt by the system, the files are stored on the hard drive. Data storage is completed and the system is then ready to receive the next program in the broadcast data stream.

As discussed above, it is possible to dispense with any physical connection between the docking station and the system. Thus, program materials could be delivered to the docking system, and thence to a system in a user's automobile during the night while the user is asleep, such that the program material is ready for review during the next morning commute. Alternatively, the docking station may be dispensed with entirely and its functionality may either be integrated into the system itself, or it may be integrated into a cable system "set-top" box.

4. Transport Mode: Activation Of The Playback Mode Of Operation.

FIG. 5 is an illustration of the portable storage/playback apparatus, showing a transport mode of operation according to the invention. The system may be set by the Select/Play button 82 to display a number of user activated controls, such as playback 120, pause/book-mark 121, stop 122, fast forward 123, fast rewind 124. Other features, such as bookmark and resume, are described in more detail below.

A control algorithm supervises conversion of program material files that are stored on the hard drive from a highly compressed data format to audio via the audio output and conditioning module 52, as discussed above. The data are retrieved from the hard drive and converted to audio via any of a number of suitable well known algorithms, such as those defined by the Motion Pictures Experts Group (MPEG) in various embodiments, such as MPEG-1, layers

1, 2, or preferably layer 3, which is a 32 kilobit/second version, and subsequent versions, such as MPEG-2, as dictated by the format of the data retrieved. The algorithm may also include a decryption capability to decrypt and/or decompress the program material files, if the files are encrypted/compressed. Compression may take any standard form, for example the program material files may be sent as compressed ASCII text files, such that written materials may be sent via the subscription service after they are scanned into a computer. The text files are then converted to audio by the system using a text to speech algorithm (see, for example A. Milewski, Facsimile-To-Speech System, U.S. Pat. No. 5,091,931, Feb. 25, 1992). In this way, it is not necessary to have textual material, such as a newspaper, converted into speech prior to distribution to a subscriber.

Another feature of the invention is the provision of an automatic data format recognition system that determines to which service the system is connected, and that then implements the correct communications protocol for that service. The key to this technique is to include an identification marker in the header of each packet that identifies the subsequent format. Such a header could consist of a number in a particular field reserved for this use. The number used is predefined to represent a particular format. For example, the number "01" in a specified field could mean "use PEG-1 Layer 3 to decode this data." The number "02" could mean "use G.722 to decode this data." At the data link level, another field can describe the basic data setup for parity, number of bits/character, and number of stop bits, such as "N81," which is commonly used to indicate No parity, 8 bits, and 1 stop bit. Many other configurations are employed, but in the interest of creating standards, such companies as Apple Computer of Cupertino, Calif. have embedded the above standard in their product offering, e.g. Apple Remote Access, as a means to simplify the user setup activity. The technique involved herein extends that capability beyond a single setup to accommodate a plurality of other such setups automatically.

The invention herein therefore provides a system that operates under supervision of a microprocessor, and that includes a hard disk drive, a communications interface, a connection to an audio channel, and a keypad. The system is intended to collect data from a plurality of sources in a variety of formats, all of which may be reproduced as an audio signal. The system uniquely provides an automatic method for absorbing data from a variety of sources, recognize the source to which it is connected, and determine how to go ahead and implement a correct protocol.

With regard to data compression, one important feature of the invention is the fact that information is loaded into device at a faster than real time rate, and thereafter reproduced at real time rate. The compression algorithms used in the herein described system are similar (or may be identical) to those developed the Motion Picture Experts Group, referred to as MPEG1 and MPEG2. Other known compression algorithms include G.722, pioneered by AT&T. Such compression techniques provide specific algorithms in which audio is digitized and then compressed a great deal. Maximum compression achieved to date for listenable programming is on the order of 6 to 6½ kilobits. Typical compressed but high-quality audio data rates lie somewhere between 16 and 32 kilobits per second.

The invention uniquely exploits current development of fast, e.g. 10 megabit, delivery systems that are necessary to deliver video material. The inventor herein has recognized and applied to advantage the superiority of compressed audio versus compressed video, where the data transfer

capability is about three orders of magnitude greater for compressed audio. While it takes a significant amount of data to make an ordinary picture on a television screen, e.g. about two megabytes, an equivalent amount of bandwidth, when used for audio programming, could easily contain 10 to 20 minutes worth of program material. Thus, the invention herein takes advantage of the overlooked fact that audio is $\frac{1}{1000}$ as data intensive as video.

Although the invention is described herein with reference to the preferred embodiment, one skilled in the art will readily appreciate that other applications may be substituted for those set forth herein without departing from the spirit and scope of the present invention. Accordingly, the invention should only be limited by the claims included below.

I claim:

1. A portable audio information storage/playback apparatus, comprising:

a data interface;

a microprocessor, wherein said microprocessor operates in response to user operation of said keypad to select audio program material; receive said program material via automatic download for storage in a storage medium; and playback said program material when and where the user desires; and

said storage medium controlled by said microprocessor and on which audio programming received via said data interface may be recorded digitally in a faster than real time format and from which said audio programming may be retrieved for reproduction in a real time format, where such audio programming is provided in the form of digitized, compressed data files; and

an audio output and conditioning module for reproducing said retrieved audio programming in real time.

2. The apparatus of claim 1, further comprising:

a storage device for storing said received audio programming;

a modem for connection to a data base via an on-line service from which said audio programming is obtained on a subscription or on-demand basis;

a keypad for effecting control of said apparatus in any of one or more modes of operation; and

a display for visually indicating current apparatus mode of operation.

3. The apparatus of claim 2, further comprising:

a built in telco modem for establishing a direct connection to a telco-based order entry system that accepts previously entered user requests from said keypad that are stored in said memory.

4. The apparatus of claim 1, said data interface further comprising:

an input data buffer, wherein said data interface is adapted for connected to any one or more of a plurality of data sources, including an ISDN telephone line, a digital satellite broadcast system, a two-way interactive television cable, and an Internet or other data source as may be supplied over standard telephones services.

5. The apparatus of claim 4, wherein said microprocessor implements a plurality of communications protocols, such that said protocols are accessed as appropriate for establishing a data exchange between said apparatus and any one or more of a plurality of said data sources.

6. The apparatus of claim 4, wherein said input data buffer is a PCMCIA-type format card that includes either or both of said data interface and a telco modem.

7. The apparatus of claim 4, wherein said input data buffer further comprises:

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an RF receiver/demodulator, either hardwired or in a PCMCIA-type format, for wireless communication for either or both of program ordering and program reception.

8. The apparatus of claim 4, wherein said input data buffer further comprises:

an audio input/digitizer circuit for digitizing live audio and then storing it.

9. The apparatus of claim 1, wherein said microprocessor controls storage and data retrieval functions, provides communications interface control to a high speed sending data source, provides communications interface control to a bi-directional low speed source, supervises order entry functions and order placement, and controls digital to audio conversion functions for playing back an audio program stored in a data file.

10. A portable audio information storage/playback apparatus, for use in a system for distributing subscription and on-demand audio programming, that includes a library containing a plurality of audio program materials stored in a digital format; a program selection module that allows a subscriber to request program materials contained within said library; an information request manager that selects program materials chosen by said subscriber from said library and that forwards said selected program material to a data transmission system for distribution to the subscriber at rates faster than real time, the apparatus comprising:

a data interface;

a microprocessor, wherein said microprocessor controls said apparatus to accept digital data according to pre-arranged formats with regard to both data structure and physical interface; controls the storing process in a storage device; responds to commands initiated from said keypad to execute selected functions, including at least one of playback of audio programming that has been stored in a digital format in a file, and entering of catalog numbers of programs to be ordered; and responds to specialized commands for reconfiguration of operating modes, according to a pre-arranged series of user options;

said storage device controlled by said microprocessor and on which audio programming received via said data interface may be recorded digitally in a faster than real time format and from which said audio programming may be retrieved for reproduction in a real time format, where such audio programming is provided in the form of digitized, compressed data files;

an audio output and conditioning module for reproducing said retrieved audio programming in real time;

means for connection to said library via an on-line service from which said audio programming is obtained on a subscription or on-demand basis;

a keypad for effecting control of said apparatus in any of one or more modes of operation; and

a display for visually indicating current apparatus mode of operation.

11. The apparatus of claim 10, wherein said apparatus may be operated in any of:

a user setup mode, in which a user can:

configure the apparatus to follow selected canonical paths through a built-in menu system;

execute immediate jump-to commands;

configure the apparatus for desired communications access; and

enter a personal user profile of automated features;

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an order entry mode, in which a user can:

make a selection for a next download of program material;

set a profile of features for the system; and/or

navigate through said order entry mode, as displayed on said display, using a select key;

pause and thereafter resume operation of the apparatus by pressing a pause/resume button;

an information order/select mode, in which a user can:

browse selectively through various program categories and then through program files within each category by reading descriptions for both the categories and the titles in a display and/or by listening to the descriptions, as the descriptions are converted to audio information that is suitable for conveyance to an audio system;

a first transaction mode, in which a user can:

perform automatic order placement by telco modem when said apparatus is mated to an associated docking station that includes a high speed modem for receipt of data, a power supply, a connection to a data source, and optionally a low speed modem for access to an order entry system via a telephone system;

a second transaction mode, in which a user can:

automatically receive desired program material via automatic connection to a high speed data modem, which in turn is automatically connected to a broadcasting host computer, wherein said high speed modem is contained in a docking station that physically accepts the apparatus and makes electrical connections thereto that are suitable for receiving high speed data and for sending order entry information via a telco modem or a wireless radio modem; and

a transport mode, in which a user can:

set said apparatus with a select/play button to display a number of user activated controls, such as playback, pause/bookmark, stop, fast forward, fast rewind, and resume.

12. The apparatus of claim 10, wherein said microprocessor is operable to in response to a user to create an intelligent agent that automatically services the user's order and retrieval needs.

13. The apparatus of claim 10, further comprising:

a multiple position control switch for navigating through a hierarchical or otherwise organized database of program material, and wherein said control switch may also be used to make a program material selection.

14. The apparatus of claim 10, said microprocessor further comprising:

a control algorithm for establishing connection to an order entry host with prescribed information exchange protocols for automatic entry of programs to be downloaded to a particular customer's system, wherein automatic receipt of acknowledgment is provided by said host to verify that apparatus is authorized to receive the programs ordered, and wherein order entry and acknowledgment preferably includes an appropriate time dependent encryption/decryption keys.

15. The apparatus of claim 10, said data interface further comprising:

a wireless modem, wherein program materials are delivered directly to said apparatus.

16. The apparatus of claim 10, said data interface further comprising:

a high speed data demodulator for receiving desired program material from plurality of data sources, said

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high speed data demodulator being adapted for connection to a cable television distribution cable, wherein said high speed data demodulator operates in a signaling system in which data to be transmitted are converted to a multilevel signal set, in which a plurality of voltage levels are used to create a series of symbols, each symbol corresponding to a particular pattern of data bits, and which set is inserted into a standard NTSC/PAL/SECAM video composite signal, wherein said demodulator recovers the data from the series of symbols transmitted as video, and then delivers the data via a communications interface to said data buffer.

17. A portable audio information storage/playback apparatus, for use in a system for distributing subscription and on-demand audio programming, that includes a library containing a plurality of audio program materials stored in a digital format; a program selection module that allows a subscriber to request program materials contained within said library; an information request manager that selects program materials chosen by said subscriber from said library and that forwards said selected program material to a data transmission system for distribution to the subscriber at rates faster than real time, the apparatus comprising:

- a data interface;
- a microprocessor for supervising control of said apparatus to establish a connection via a selected communication path to a host computer system that broadcasts audio program material in form of digital data files as part of an overall transmission of a catalog of available programs, to associate program files in a broadcast data stream with identification tags by means of a header field that is attached to a beginning of each data file, said identification tags matching those programs selected by a user to allow transmission of program

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material to the user if a suitable enabling acknowledgment is received, wherein transfer of the selected files is enabled and, upon receipt by the apparatus, the files are stored;

a storage device controlled by said microprocessor and on which audio programming received via said data interface may be recorded digitally in a faster than real time format and from which said audio programming may be retrieved for reproduction in a real time format, where such audio programming is provided in the form of digitized, compressed data files;

an audio output and conditioning module for reproducing said retrieved audio programming in real time;

means for connection to said library via an on-line service from which said audio programming is obtained on a subscription or on-demand basis;

a keypad for effecting control of said apparatus in any of one or more modes of operation; and

a display for visually indicating current apparatus mode of operation.

18. The apparatus of claim 17, wherein said microprocessor implements a control algorithm that supervises conversion of stored program material files from a highly compressed data format to audio via said audio output and conditioning module, wherein said algorithm may also include a decryption capability to decrypt and/or decompress the program material files, if the files are encrypted/compressed, wherein said program material files may optionally be sent as compressed text files that are converted to audio by the apparatus using a text to speech algorithm.

* * * * *

G7

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Reexam Control No. 95/001,274**



US005963916A

United States Patent [19]
Kaplan

[11] Patent Number: 5,963,916
[45] Date of Patent: *Oct. 5, 1999

[54] NETWORK APPARATUS AND METHOD FOR PREVIEW OF MUSIC PRODUCTS AND COMPILATION OF MARKET DATA

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(List continued on next page.)

[75] Inventor: Joshua D. Kaplan, Berkeley, Calif.

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[73] Assignee: Intouch Group, Inc., San Francisco, Calif.

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[*] Notice: This patent is subject to a terminal disclaimer.

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[22] Filed: Oct. 31, 1996

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Related U.S. Application Data

(List continued on next page.)

[63] Continuation-in-part of application No. 08/668,327, Jun. 26, 1996, abandoned, which is a continuation of application No. 08/282,153, Jul. 28, 1994, abandoned, which is a continuation of application No. 08/035,661, Mar. 23, 1993, abandoned, which is a continuation of application No. 07/957,444, Oct. 6, 1992, Pat. No. 5,237,157, which is a continuation of application No. 07/582,253, Sep. 13, 1990, abandoned.

Primary Examiner—Emanuel Todd Voeltz
Assistant Examiner—Alexander Kalinowski
Attorney, Agent, or Firm—Dergosits & Noah LLP

[51] Int. Cl.⁶ G06F 17/60
[52] U.S. Cl. 705/26
[58] Field of Search 235/462; 705/10, 705/26, 27

[57] ABSTRACT

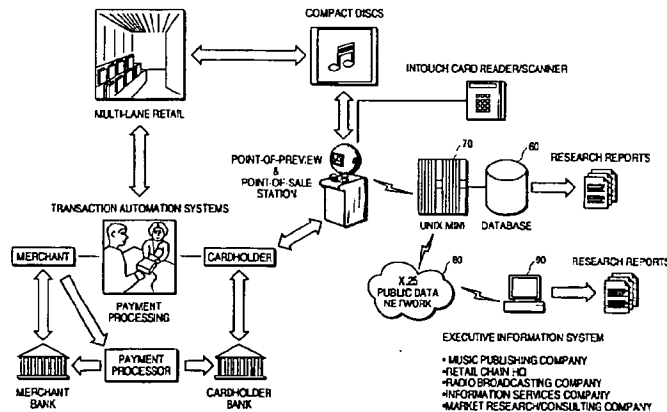
A system for on-line user-interactive multimedia based point-of-preview. The system provides for a network web site and accompanying software and hardware for allowing users to access the web site over a network such as the internet via a computer. The user is uniquely identified to the web site server through an identification name or number. The hardware associated with the web site includes storage of discrete increments of pre-selected portions of music products for user selection and preview. After user selection, a programmable data processor selects the particular pre-recorded music product from data storage and then transmits that chosen music product over the network to the user for preview. Subscriber selection and profile data (i.e. demographic information) can optionally be collected and stored to develop market research data. Since the system provides for multiple embodiments, the system contemplates previewing of audio programs such as music on compact discs, video programs such as movies and text from books and other written documents. Furthermore, it is contemplated that the network web site can be accessed from a publicly accessible kiosk, available, e.g. at a retail store location, or from a desk top computer.

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18 Claims, 82 Drawing Sheets



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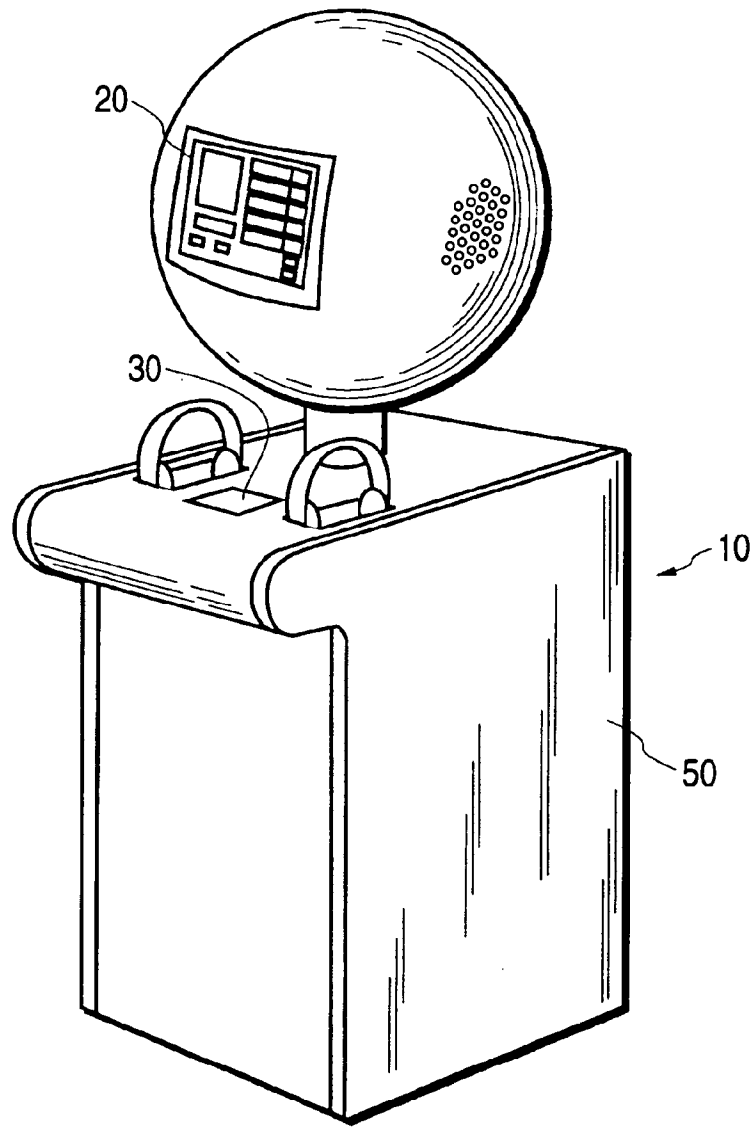


FIG. 1

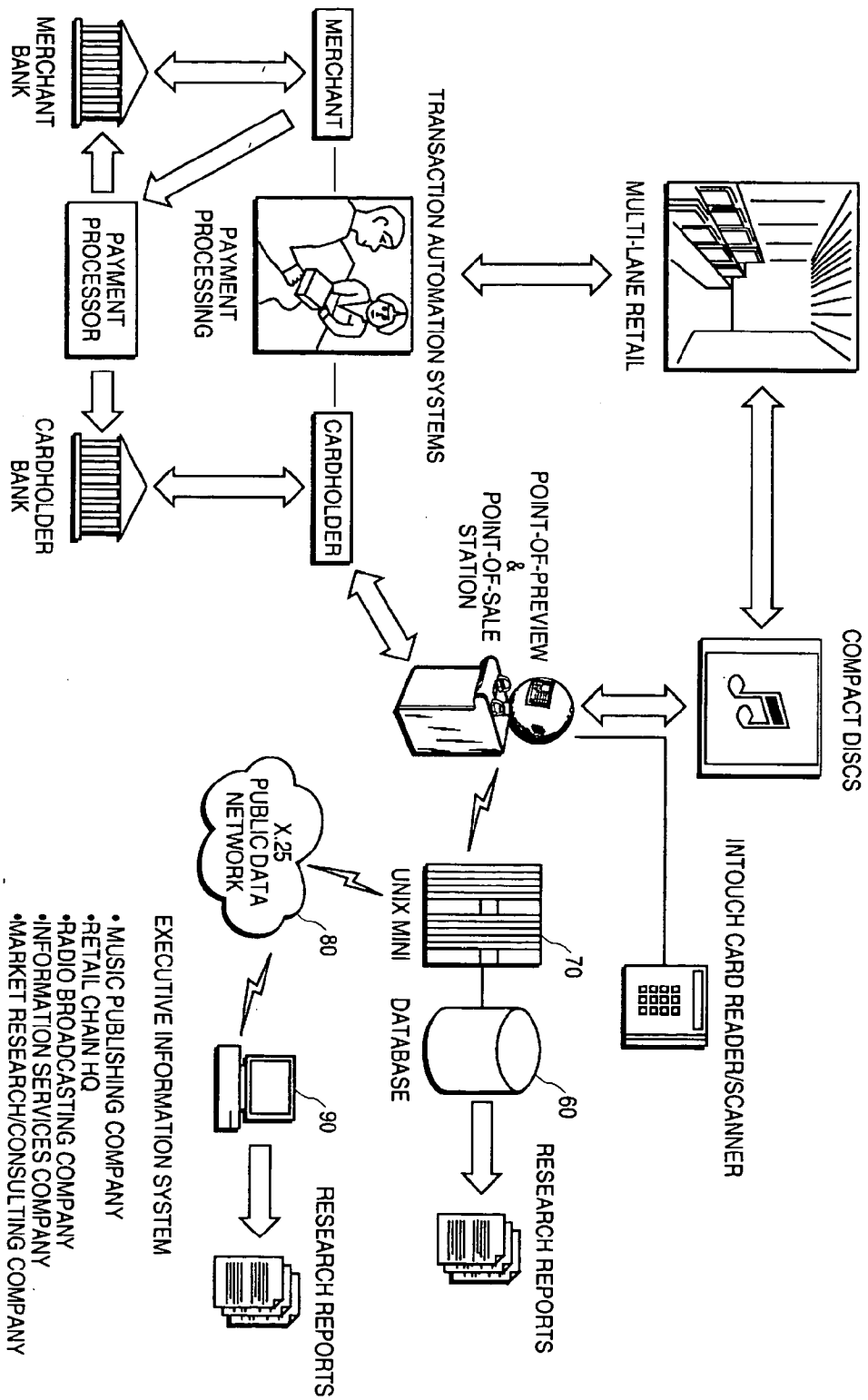


FIG. 2

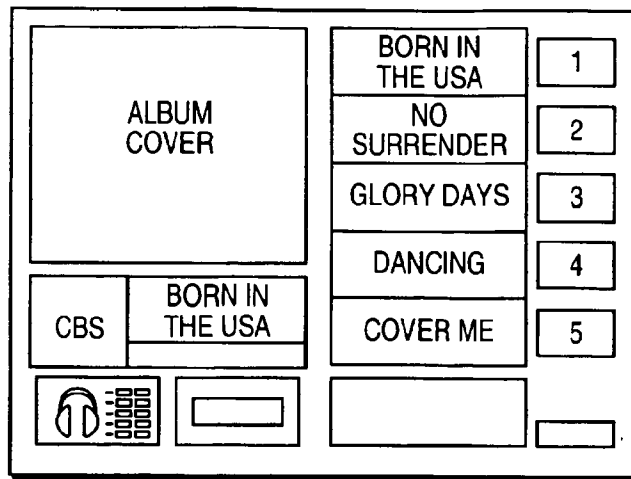


FIG. 3

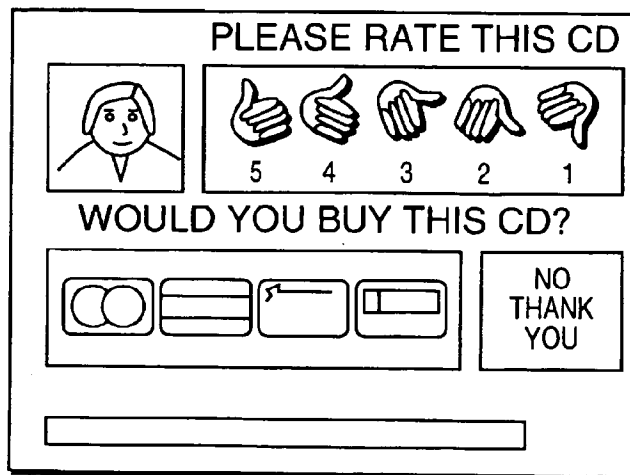


FIG. 4

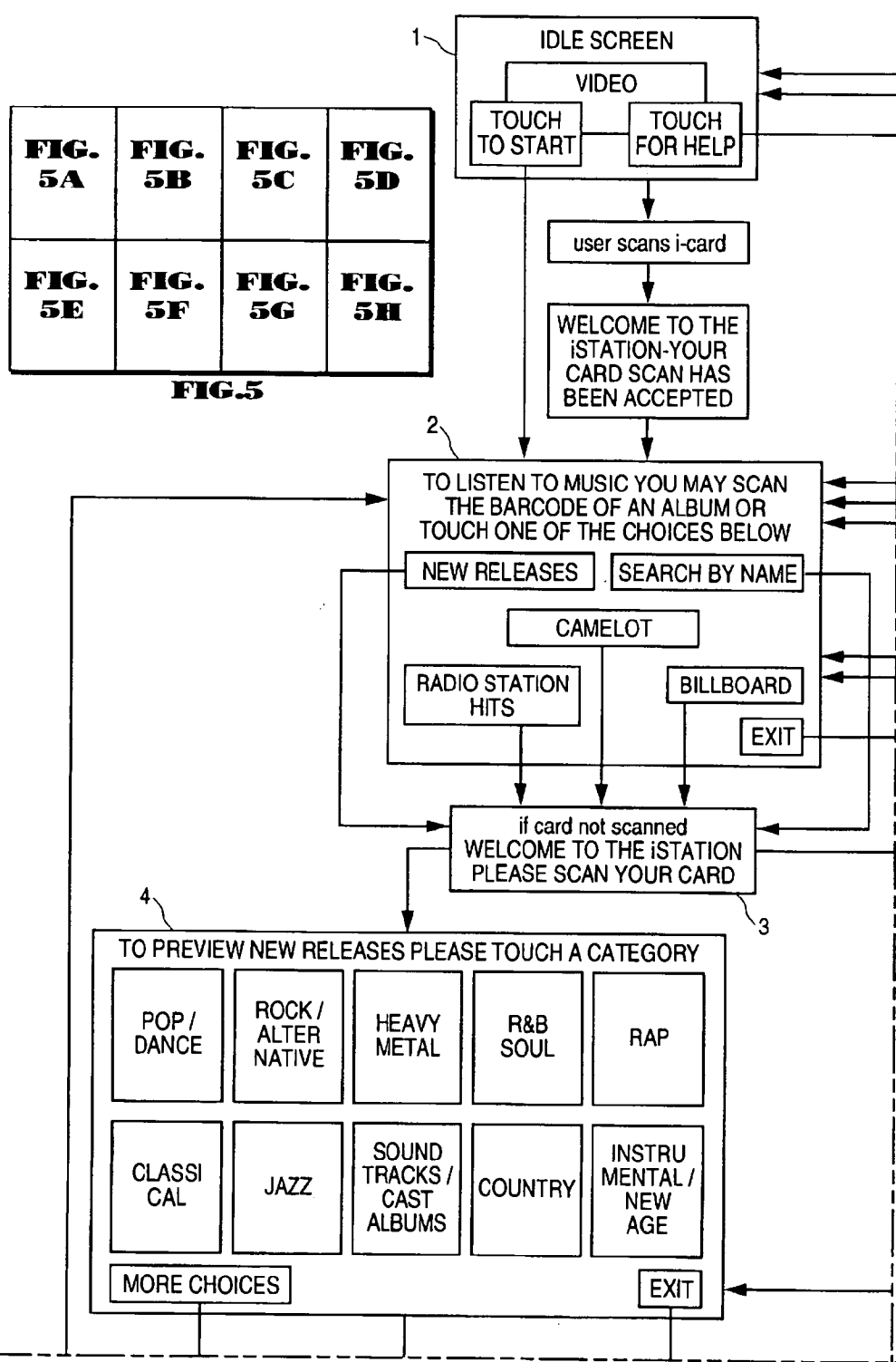


FIG. 5A	FIG. 5B	FIG. 5C	FIG. 5D
FIG. 5E	FIG. 5F	FIG. 5G	FIG. 5H

FIG.5

FIG.5A

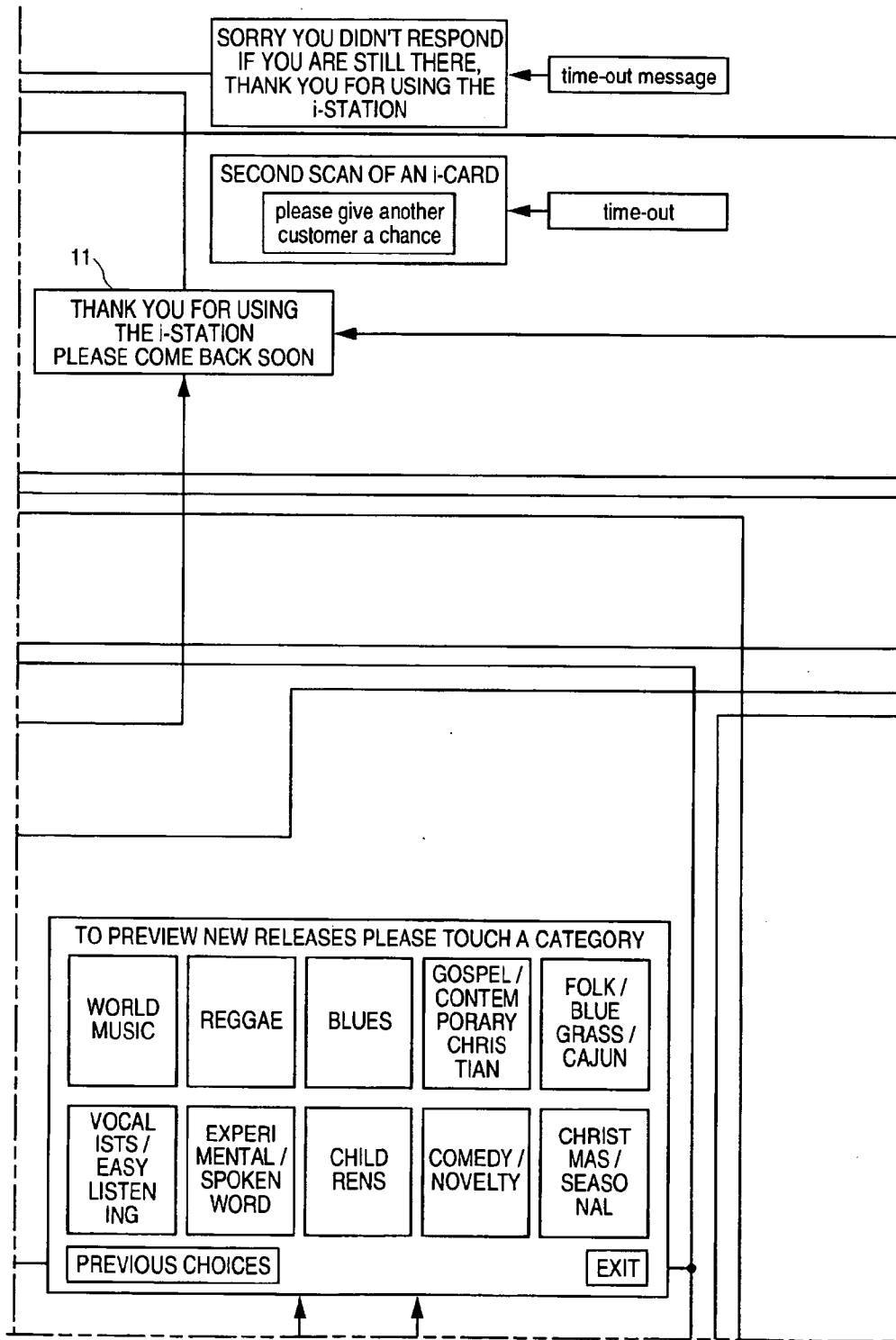


FIG.5B

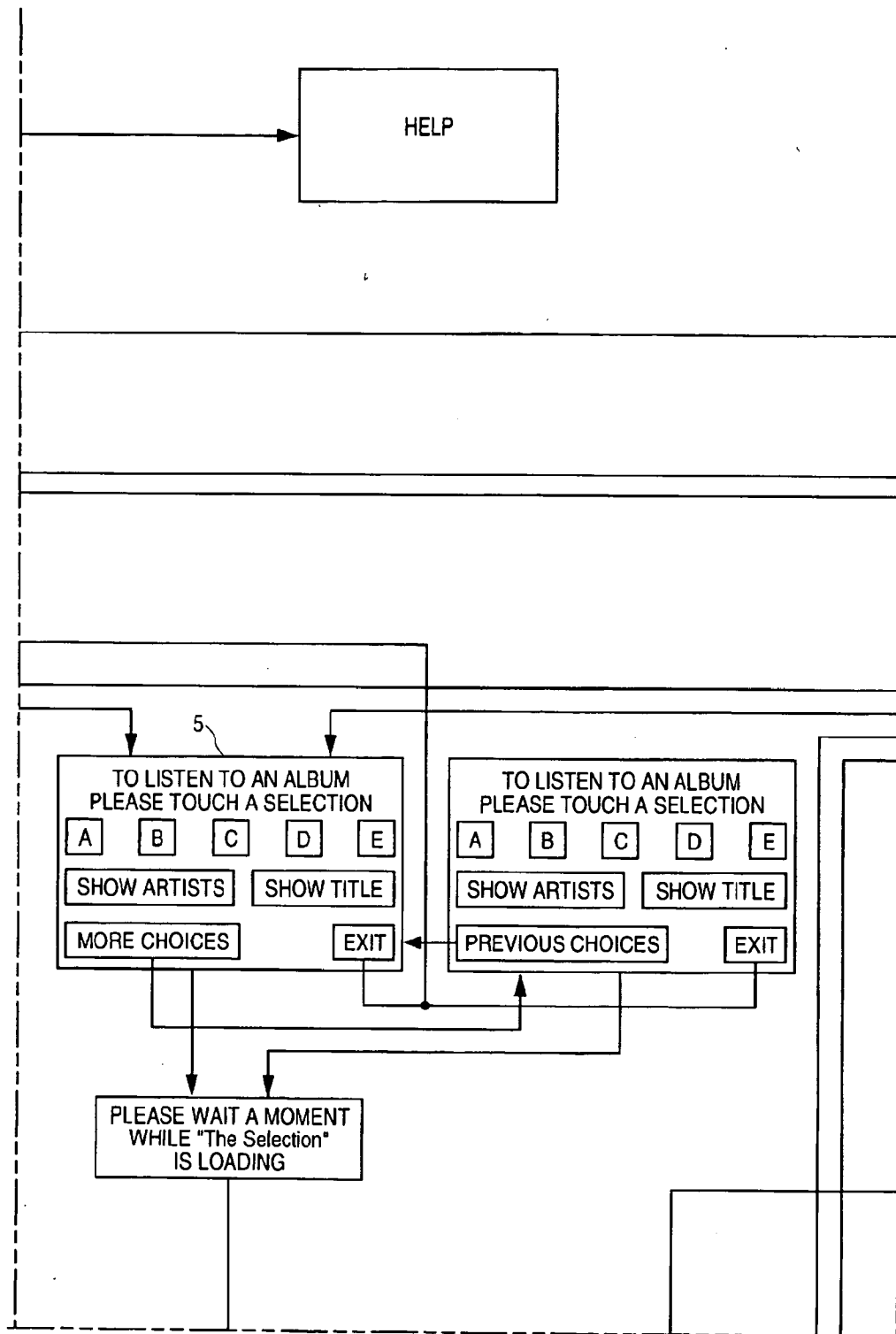


FIG.5C

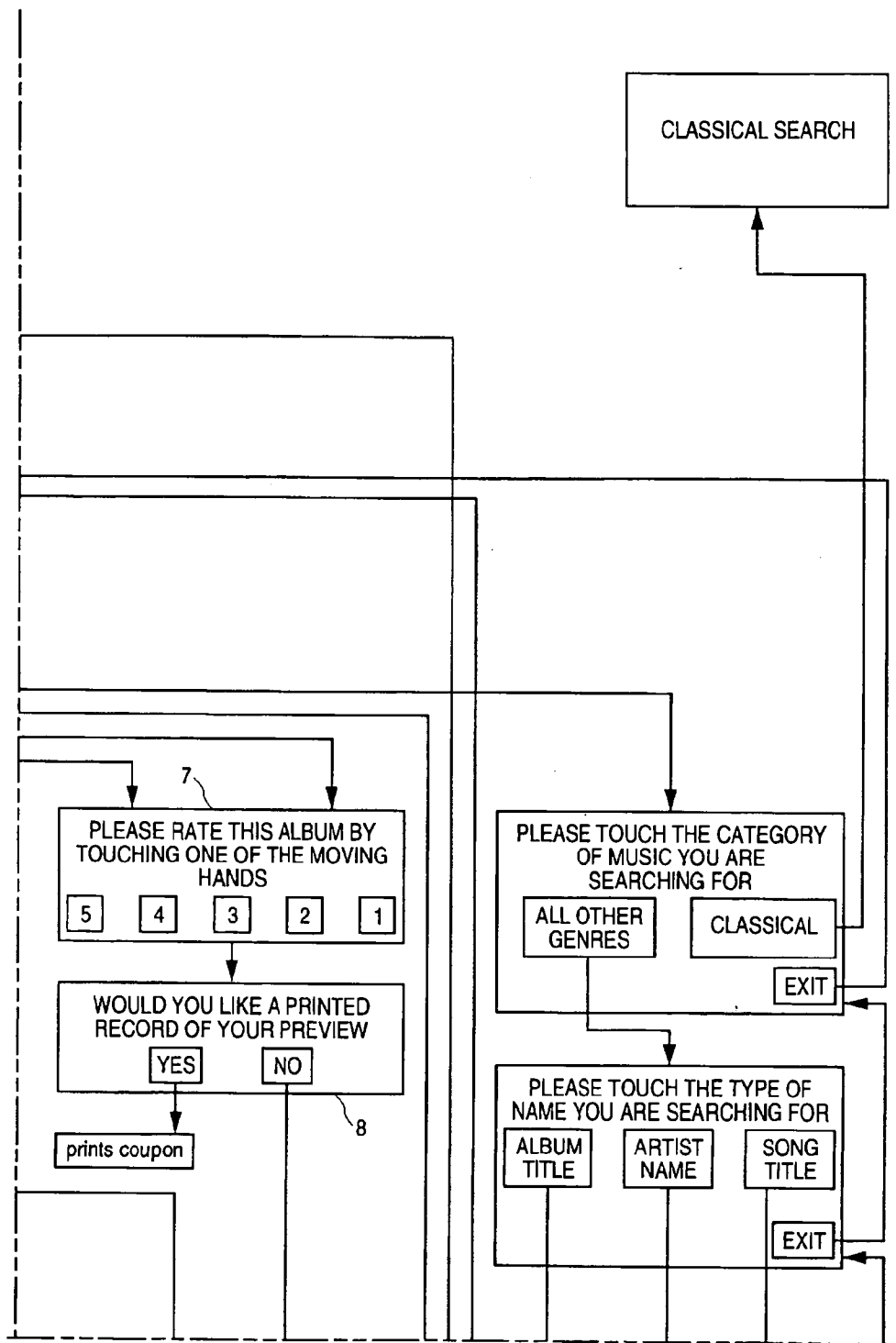


FIG.5D

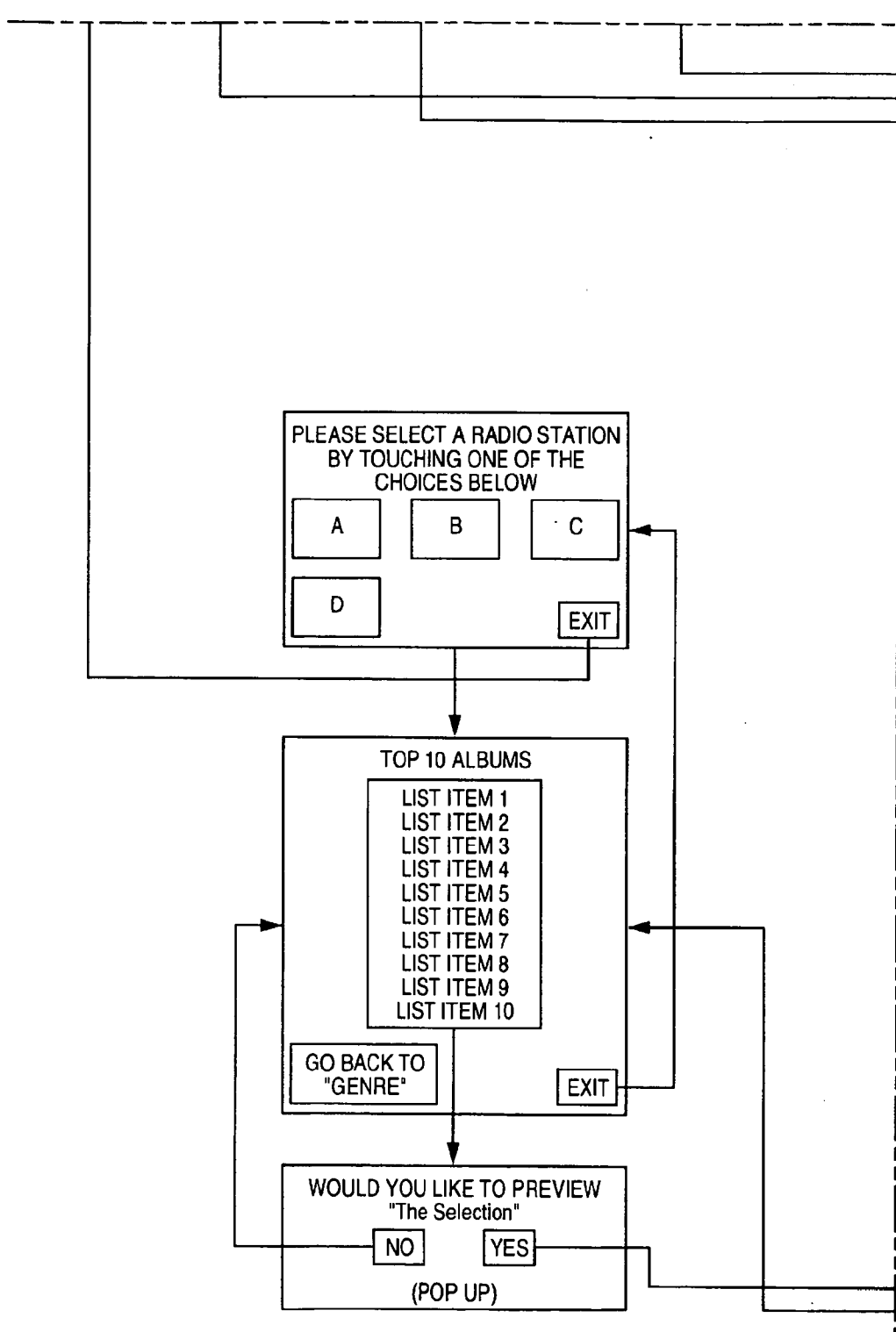


FIG.5E

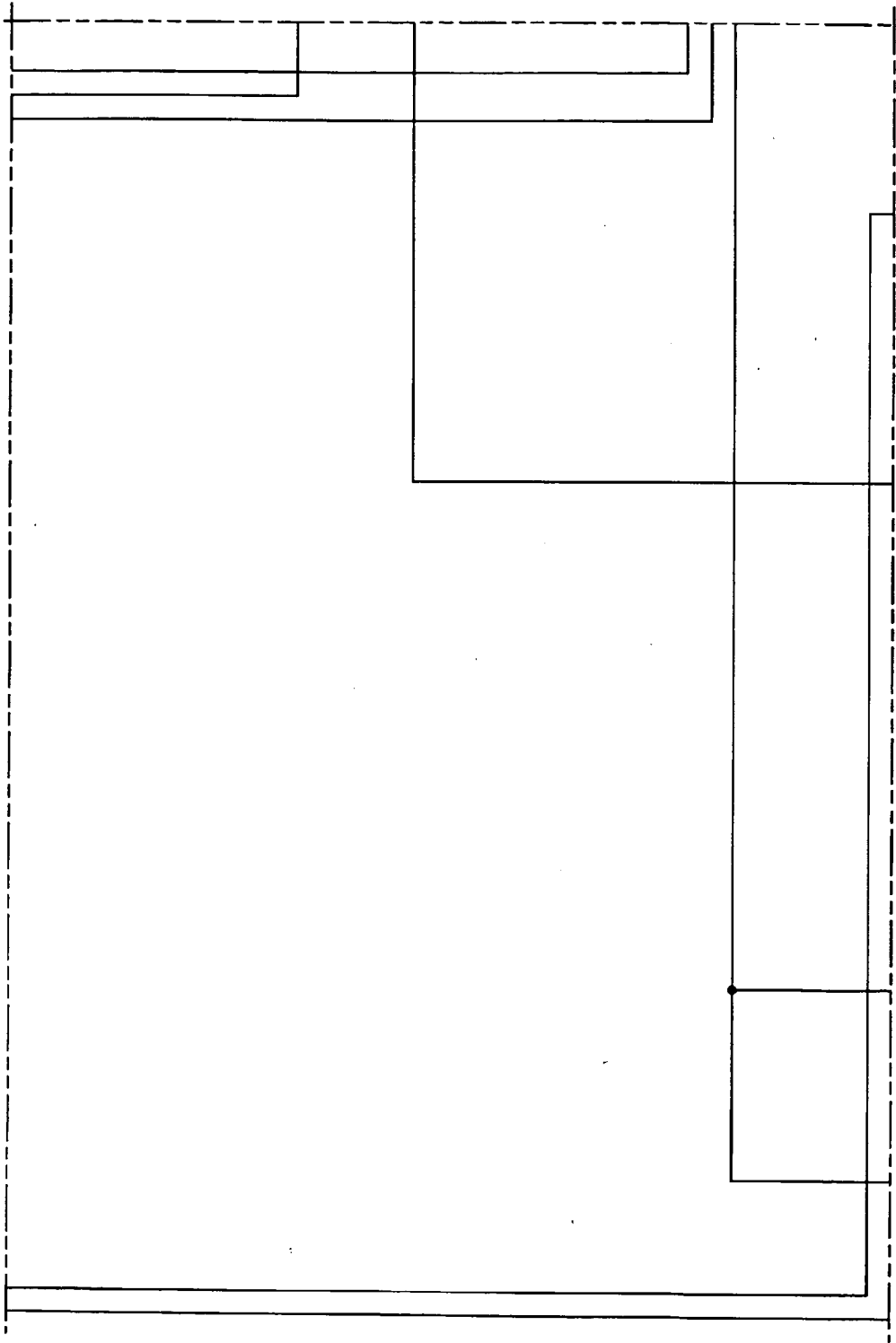


FIG.5F

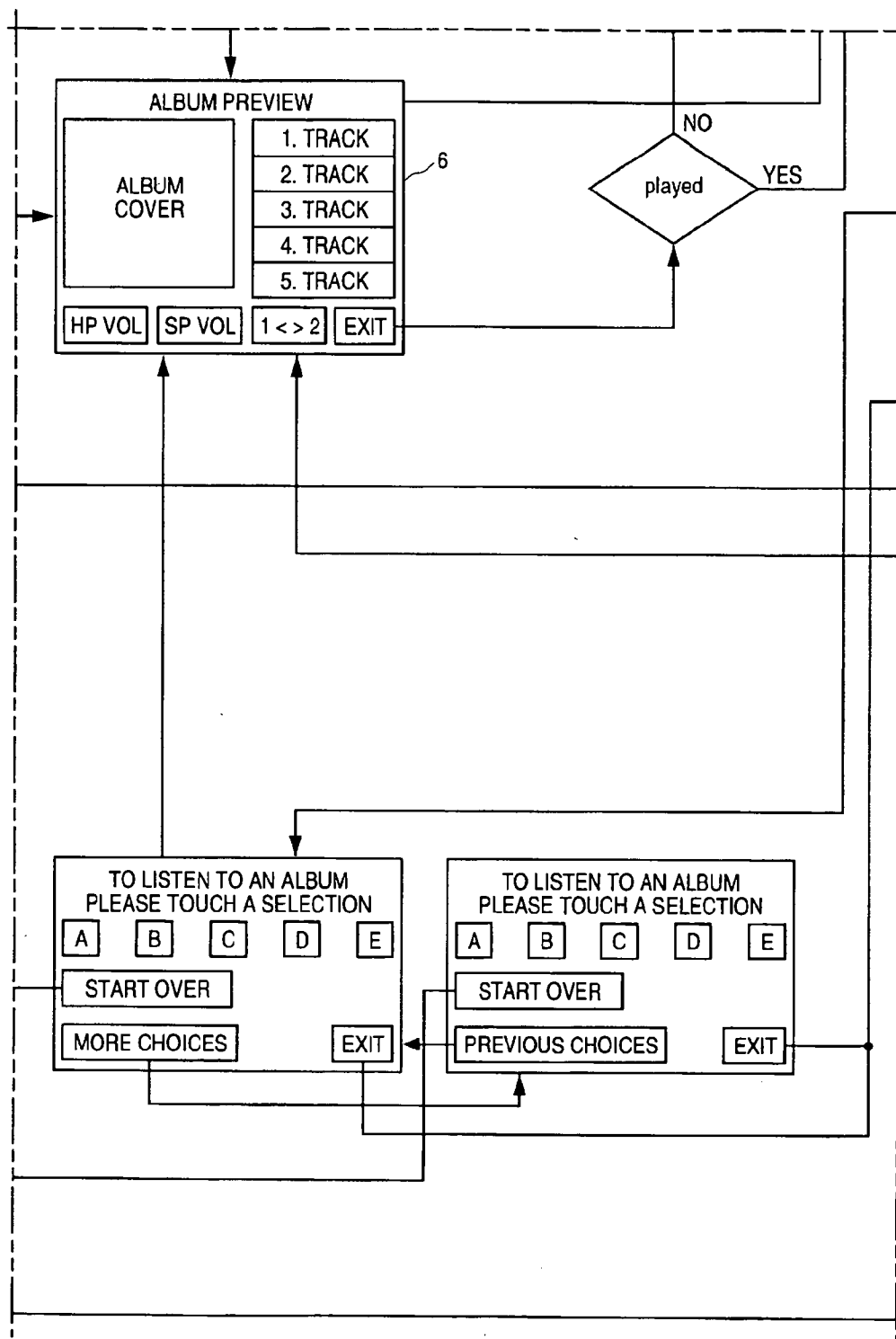


FIG.5G

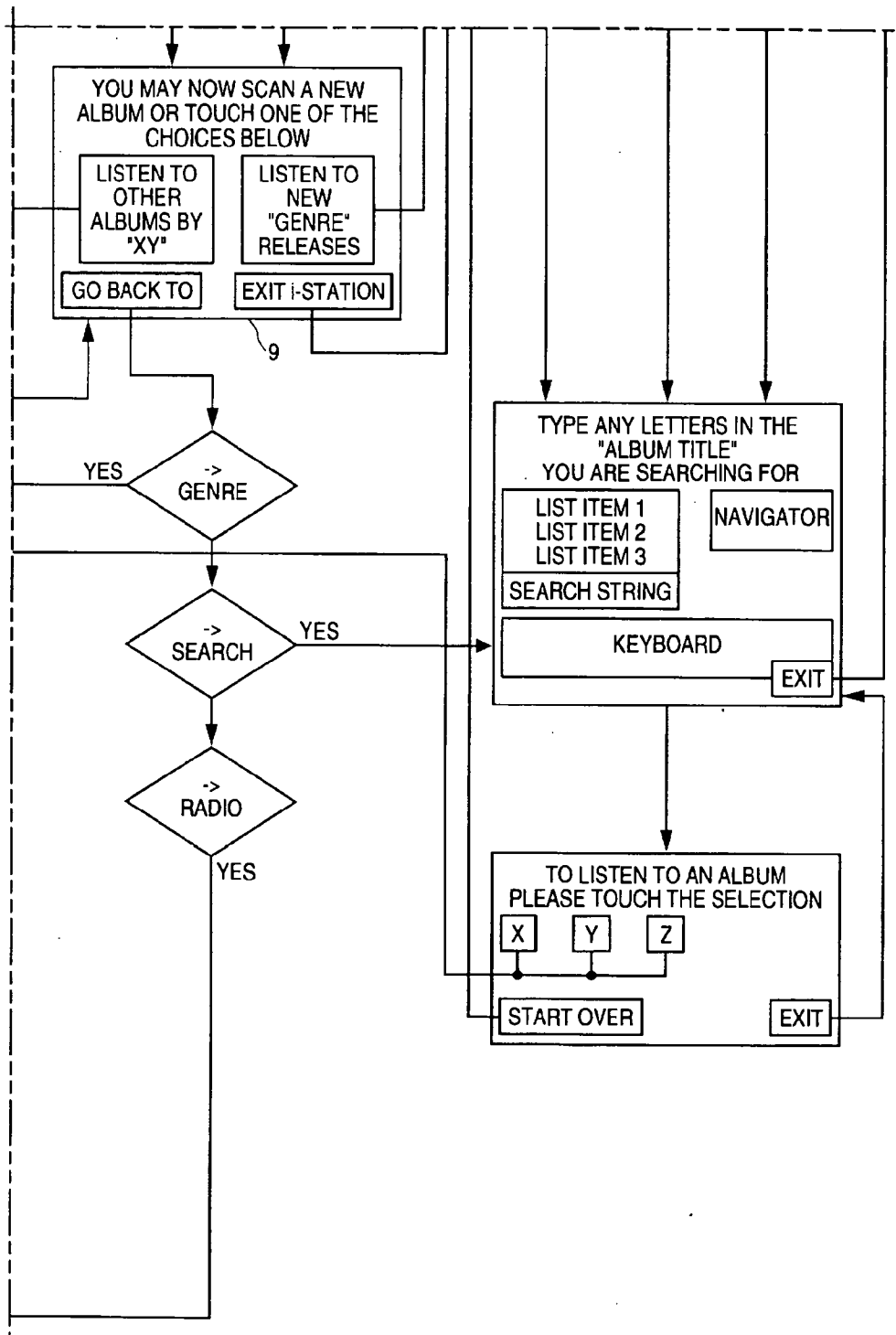


FIG.5H

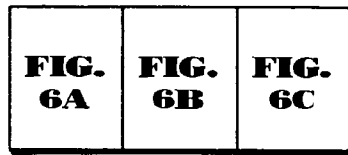


FIG.6

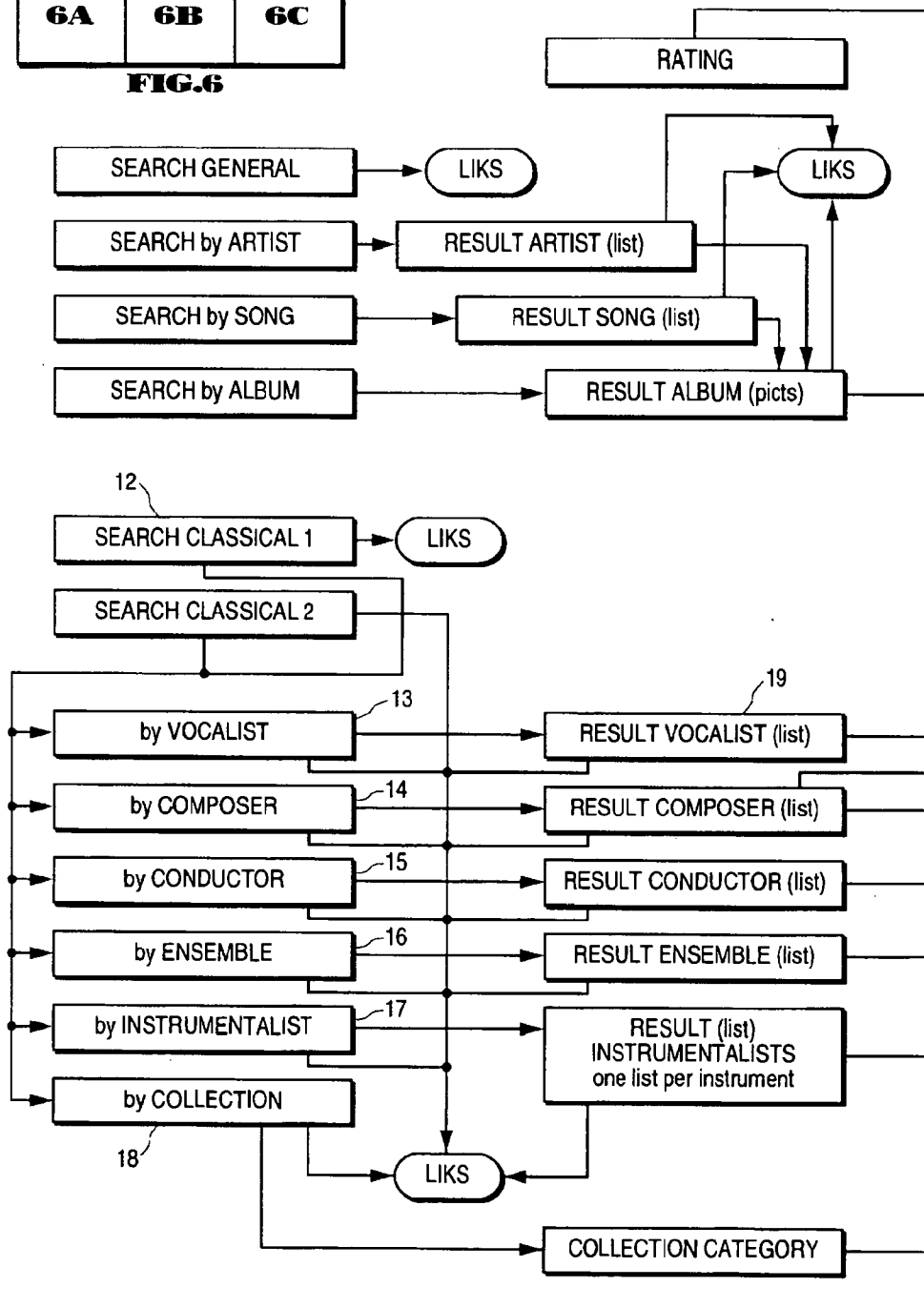


FIG.6A

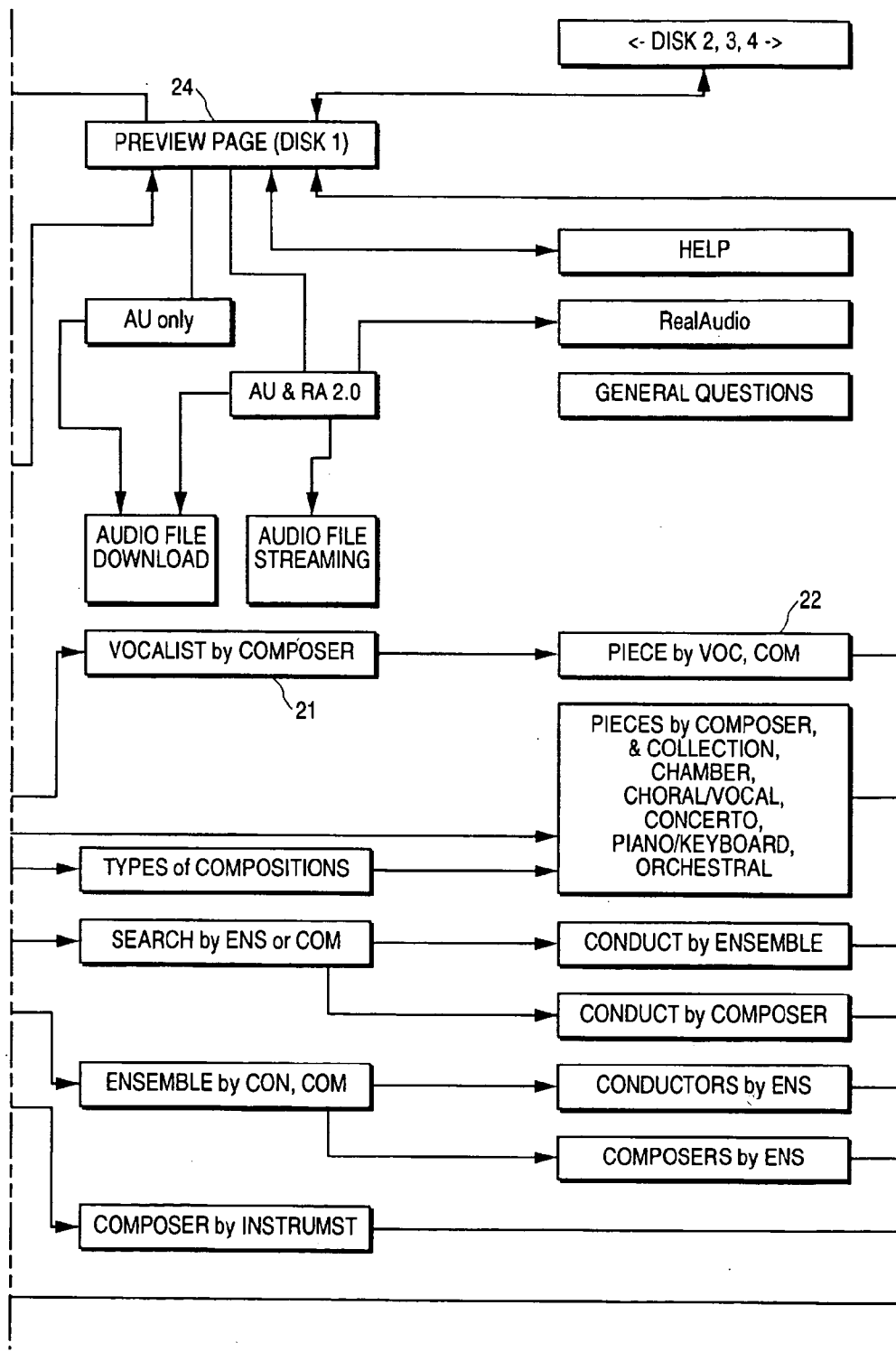


FIG.6B

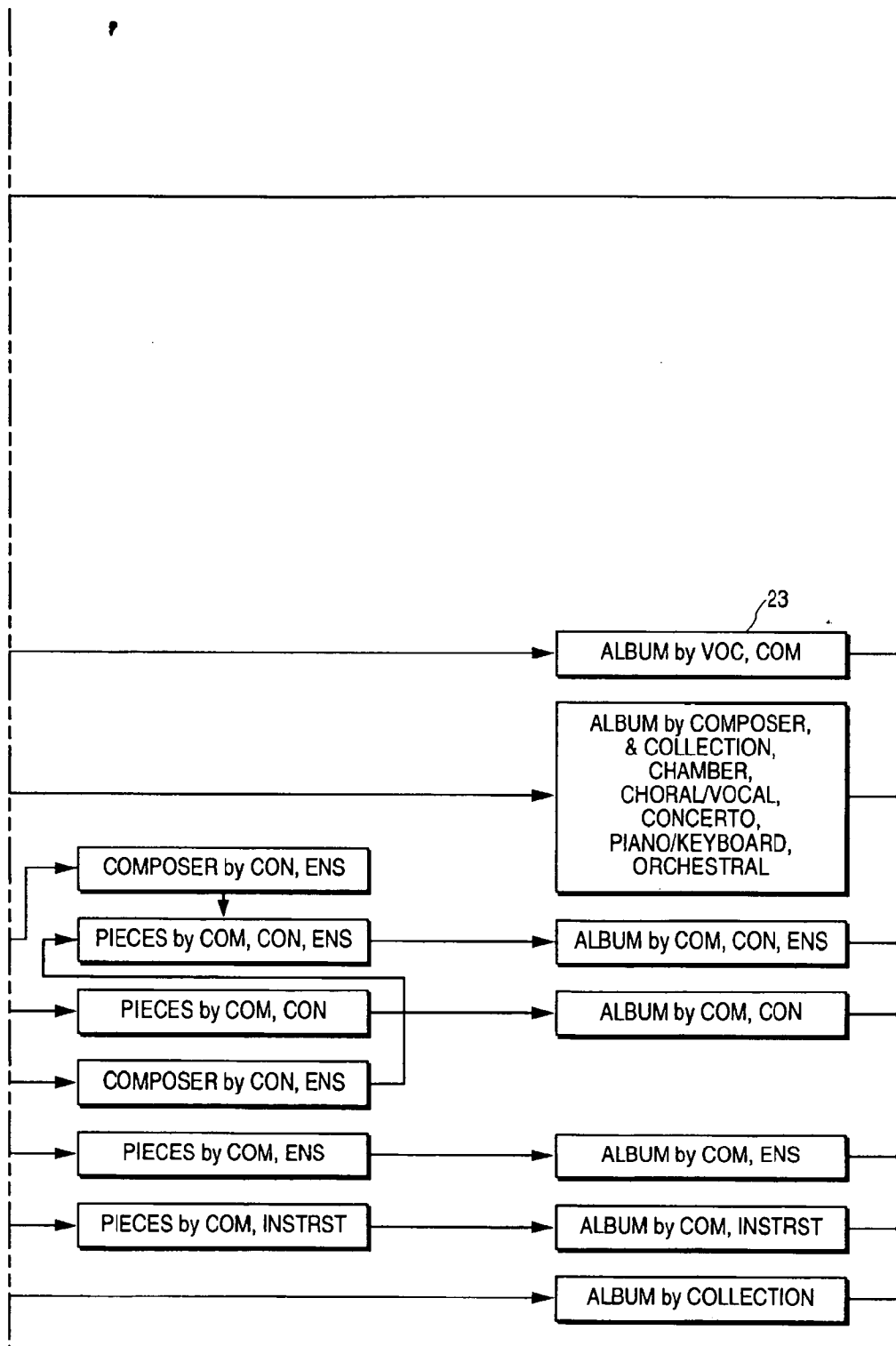


FIG.6C

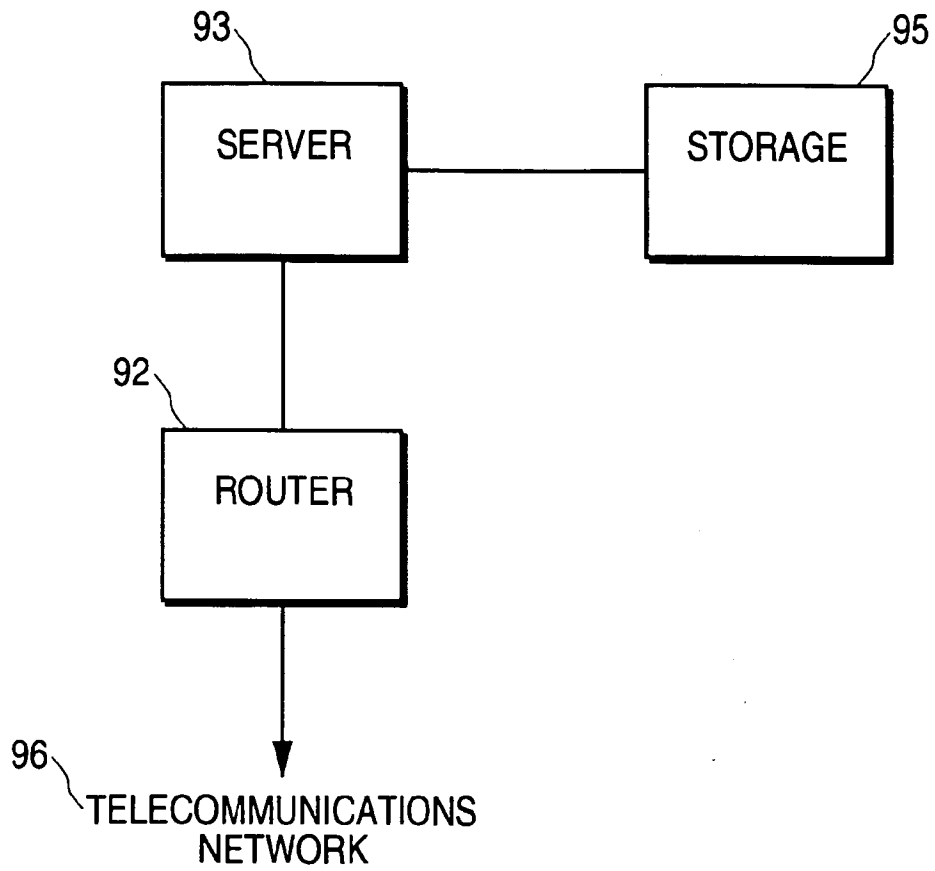


FIG.7

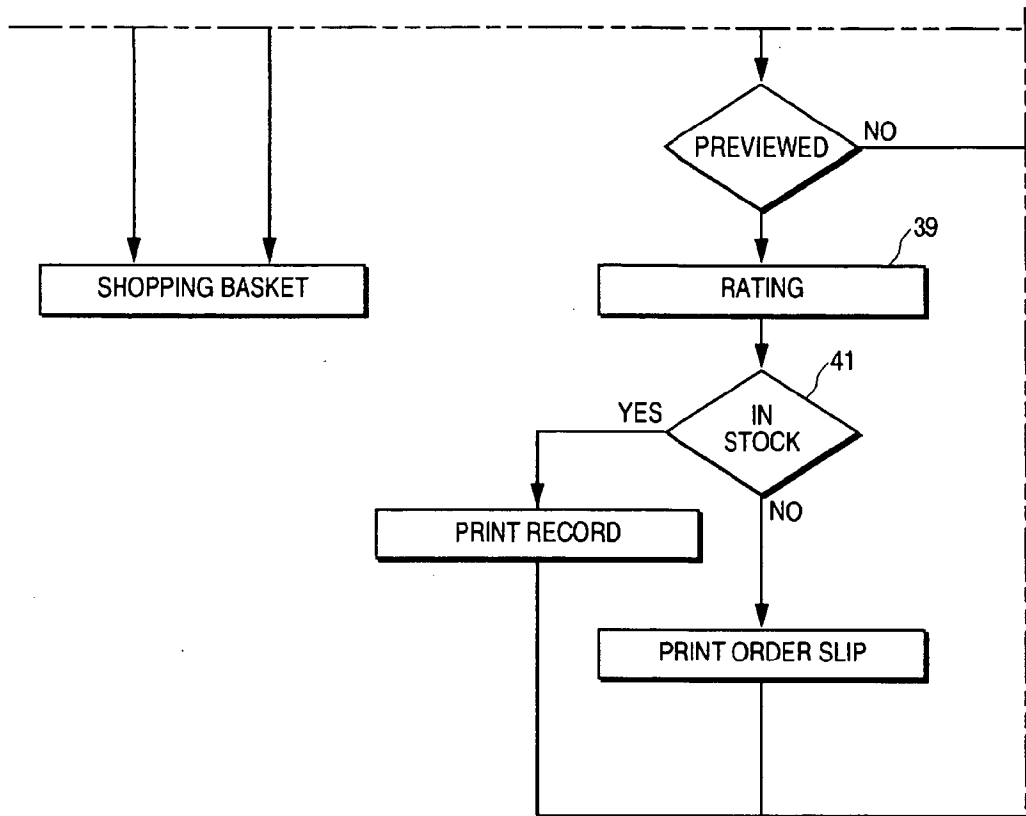


FIG. 8G	FIG. 8F	FIG. 8E	FIG. 8D
	FIG. 8A	FIG. 8B	FIG. 8C

FIG.8

FIG.8A

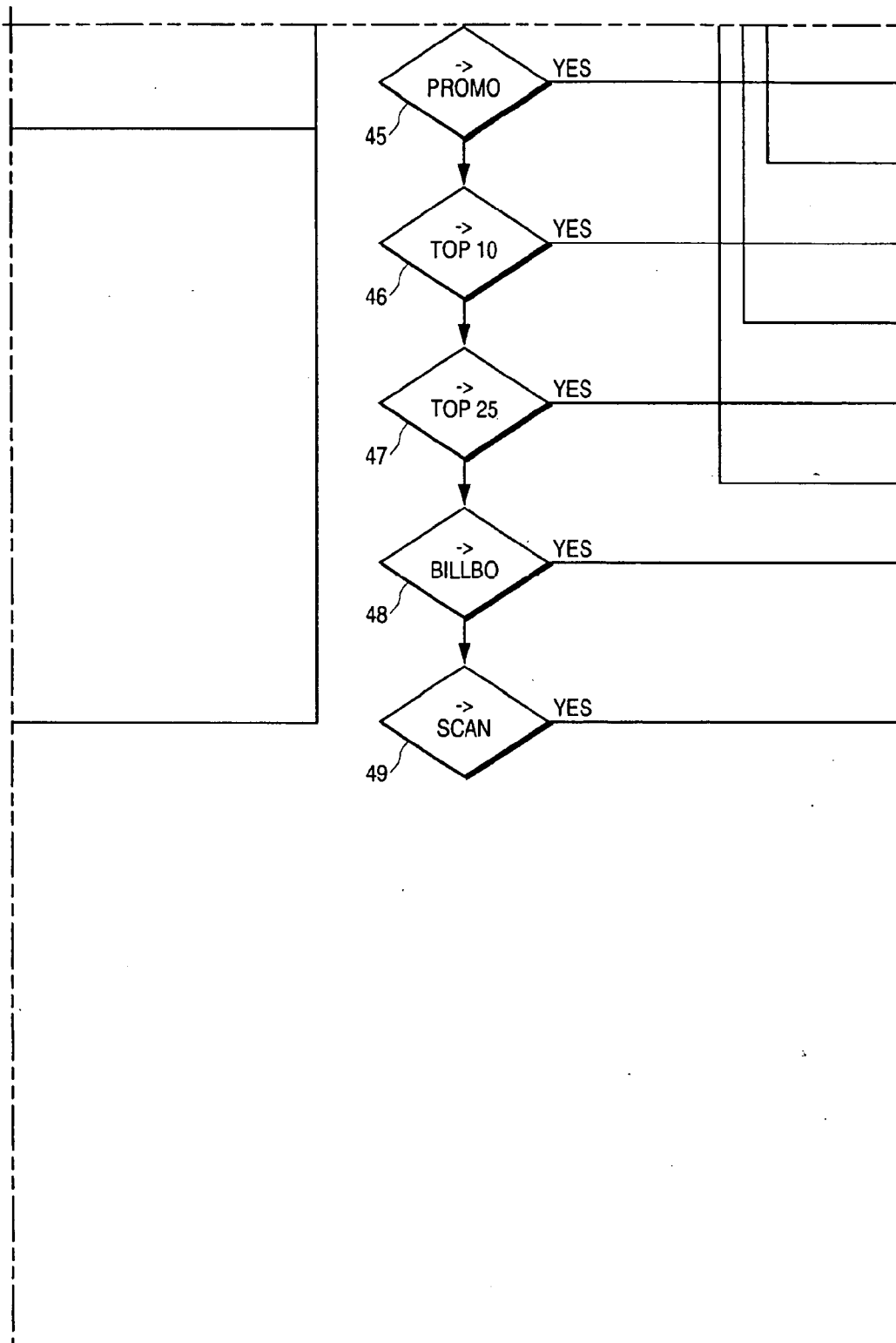


FIG.8B

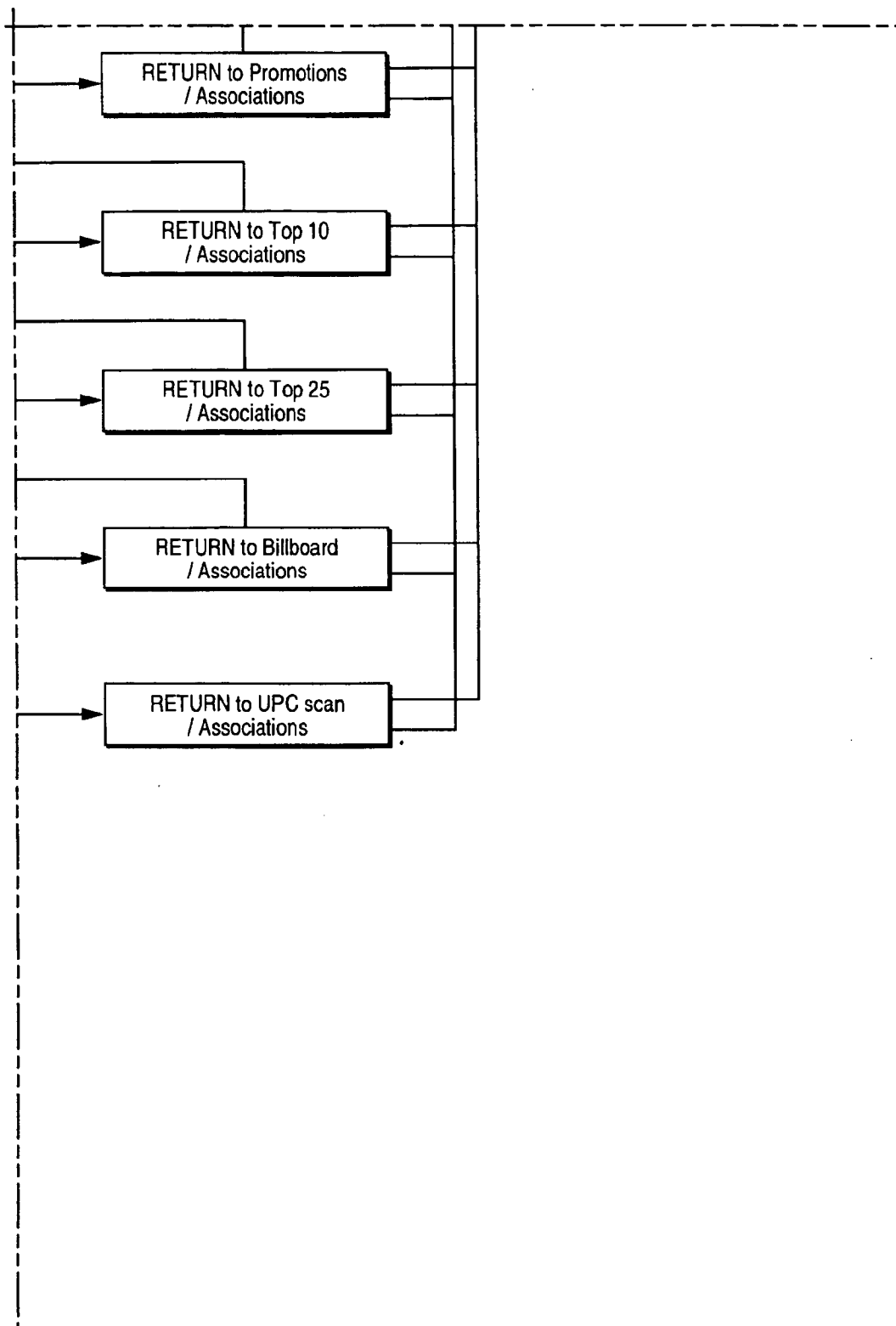


FIG.8C

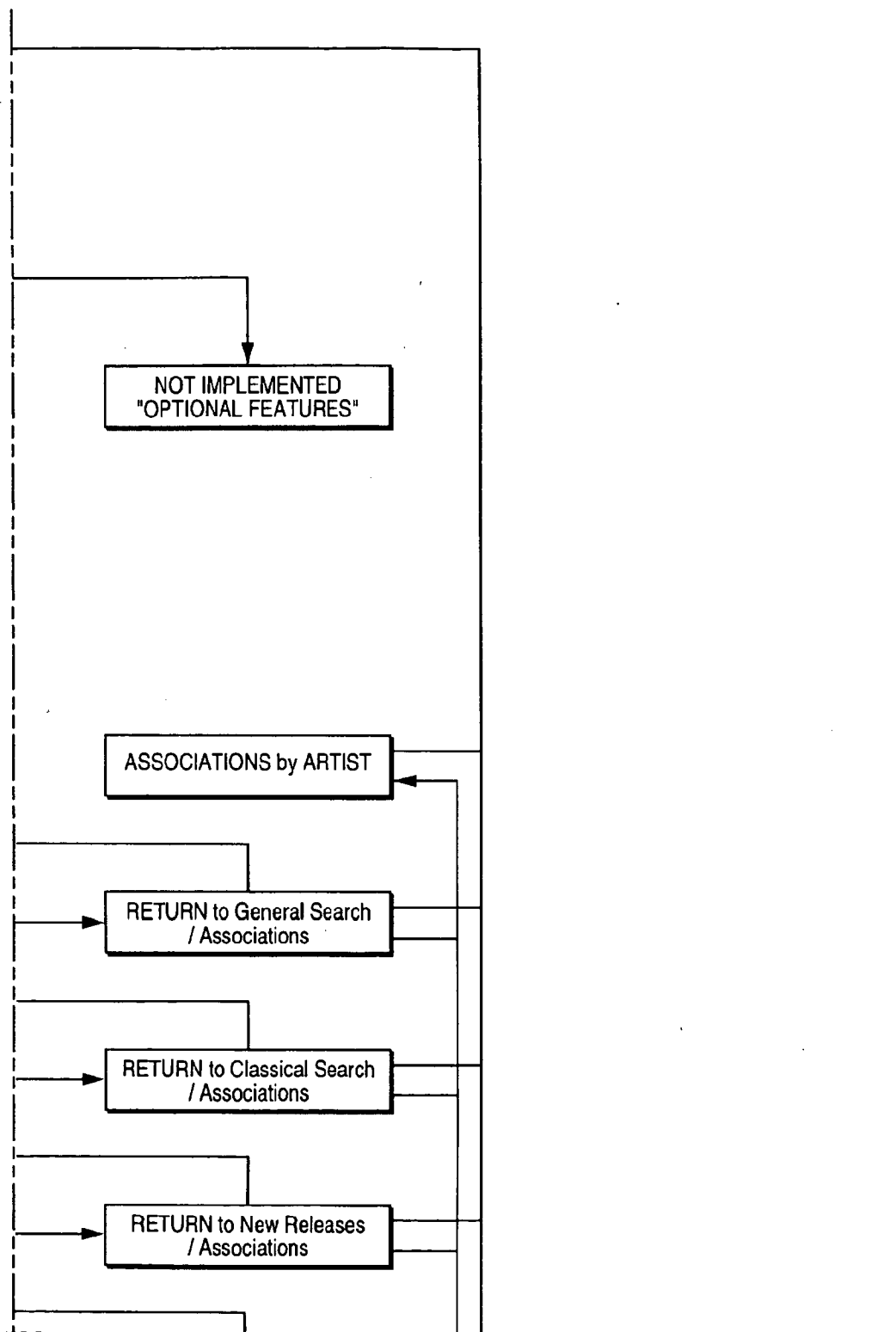


FIG. 8D

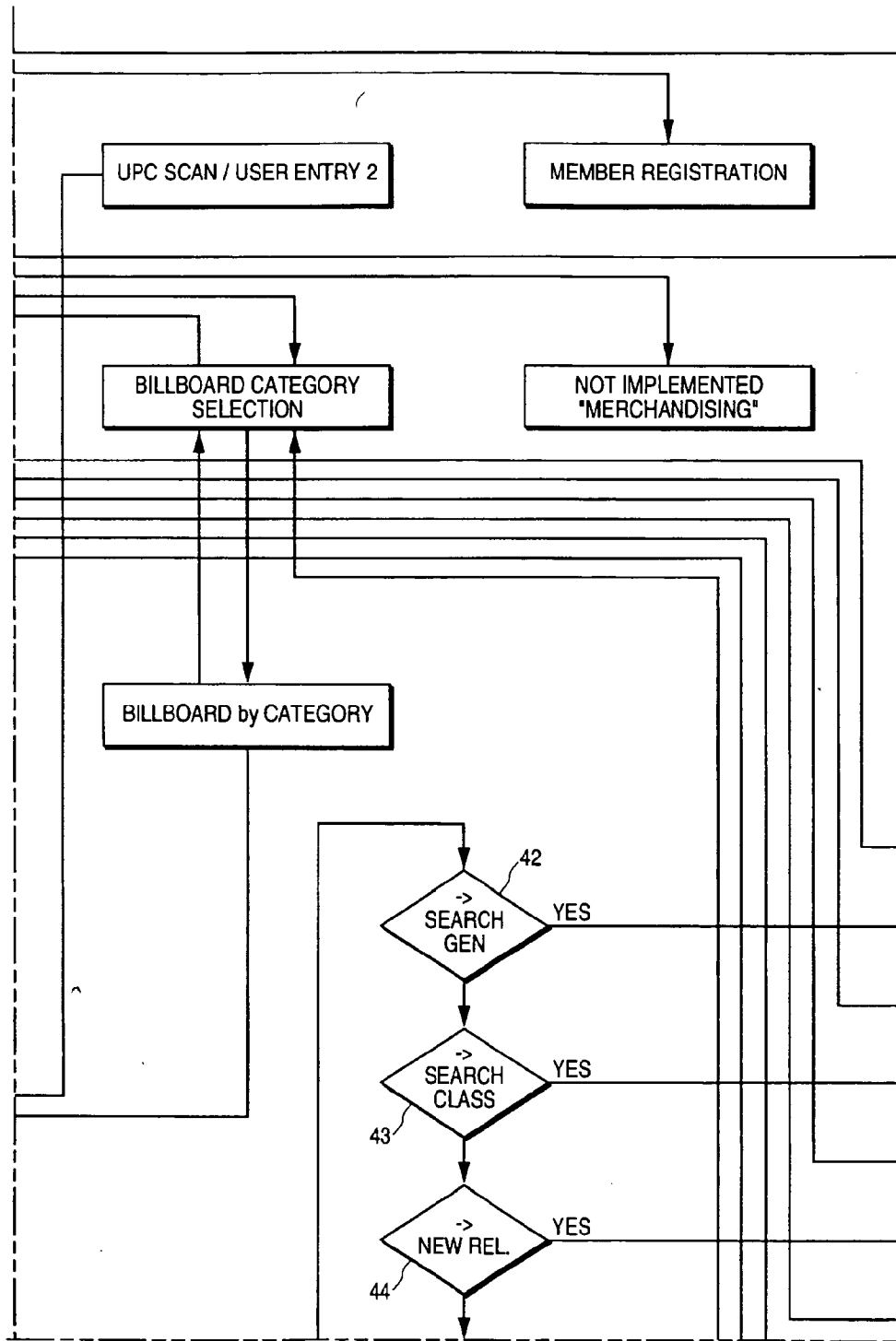


FIG. 8E

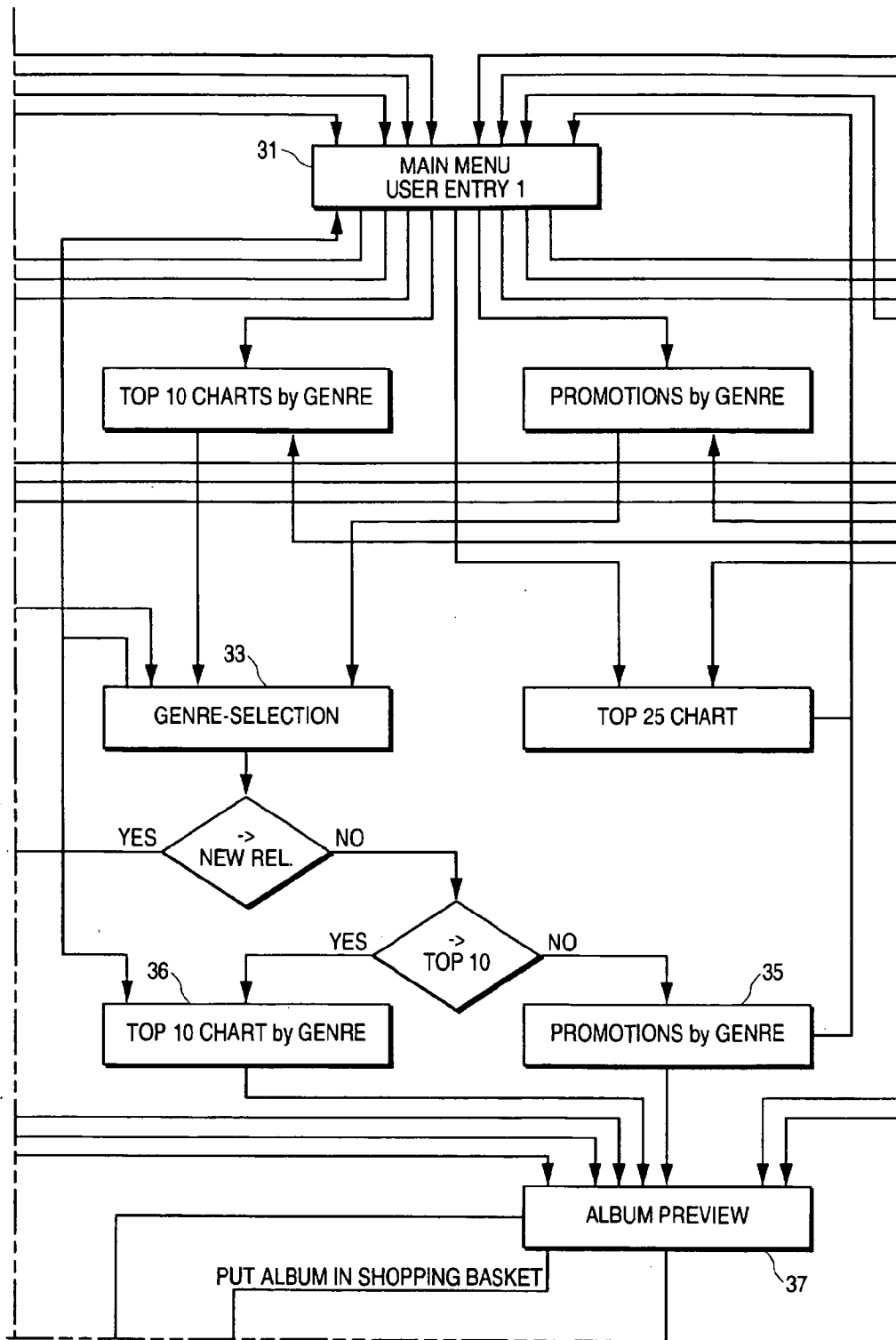


FIG. 8F

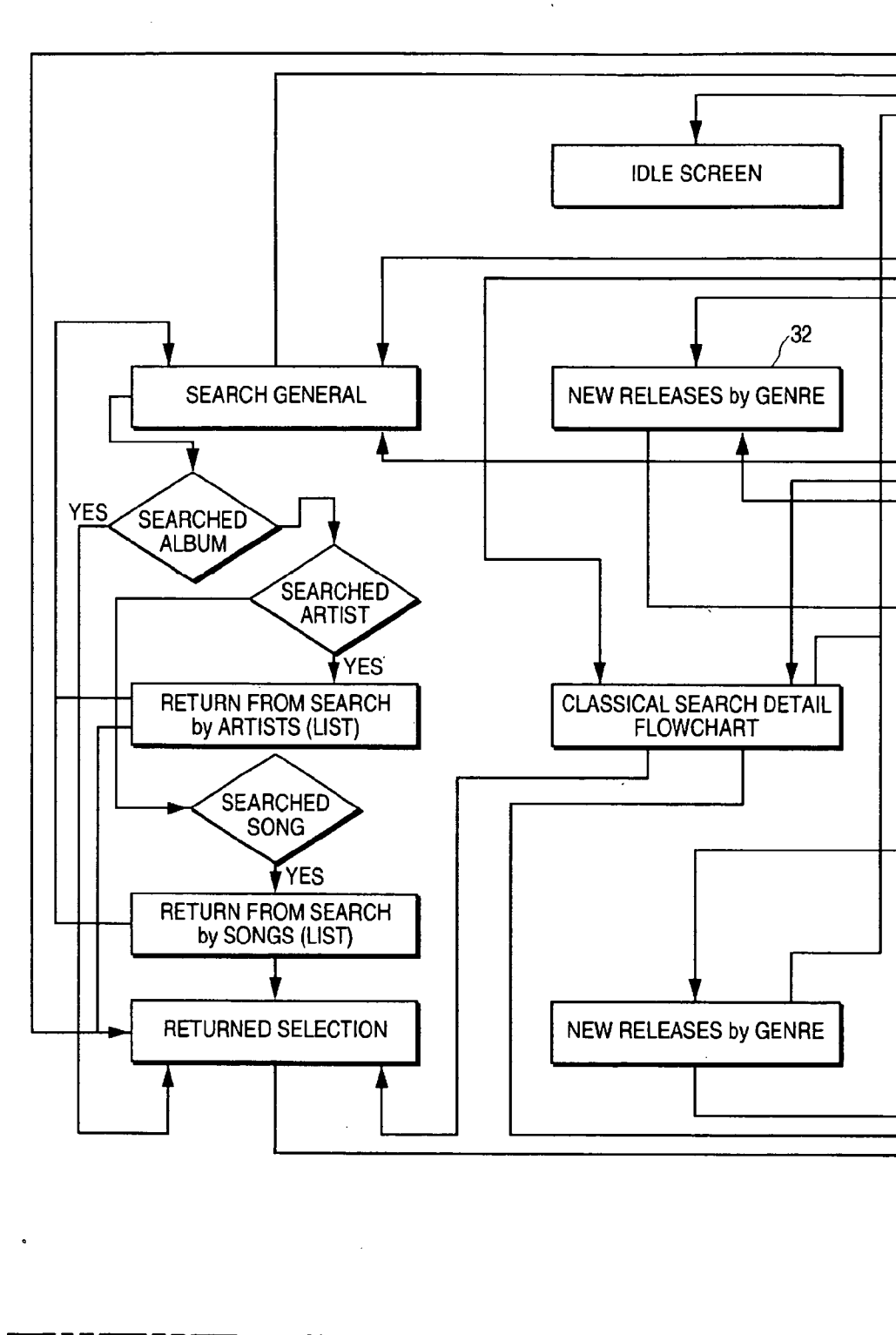


FIG. 8G

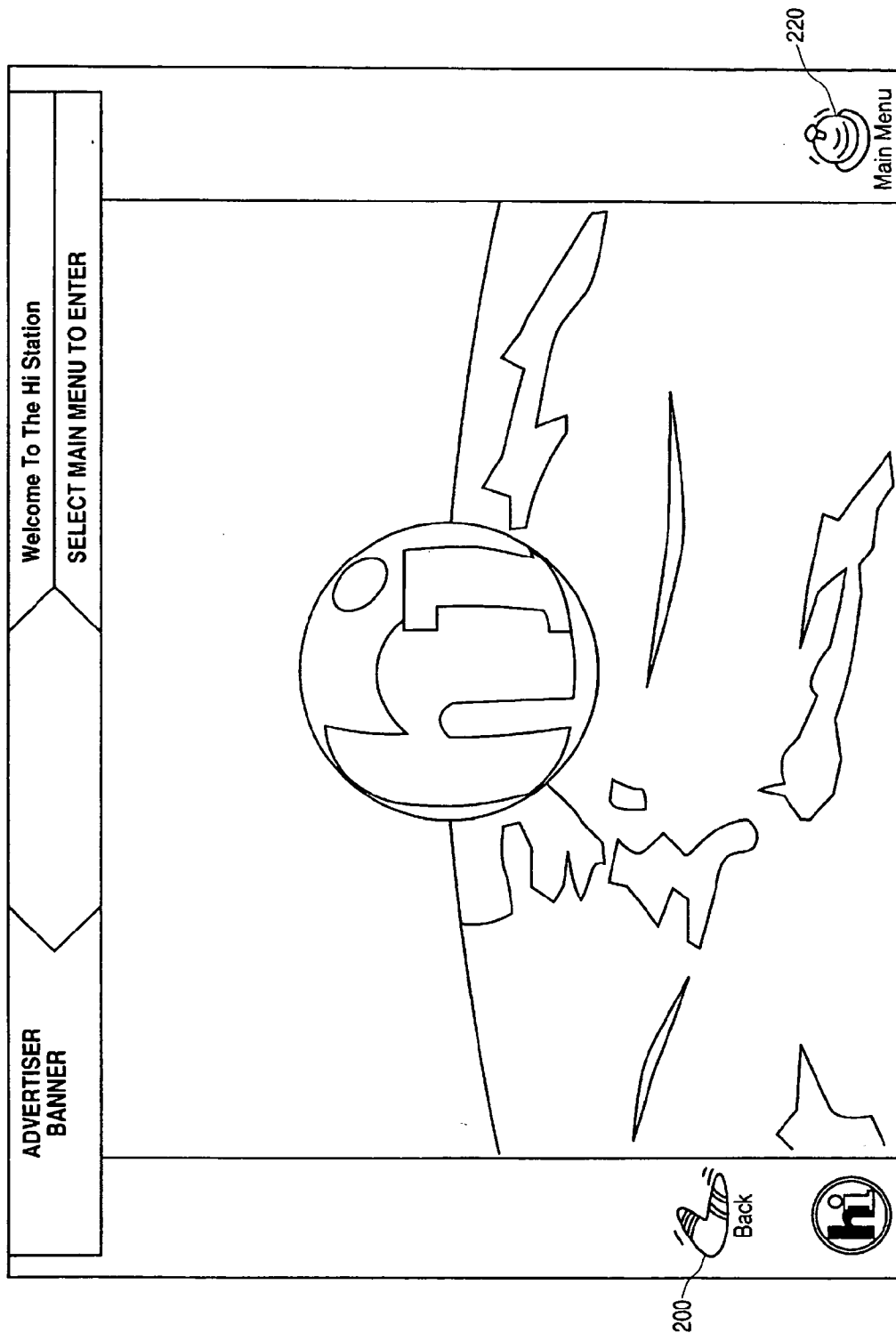


FIG. 9

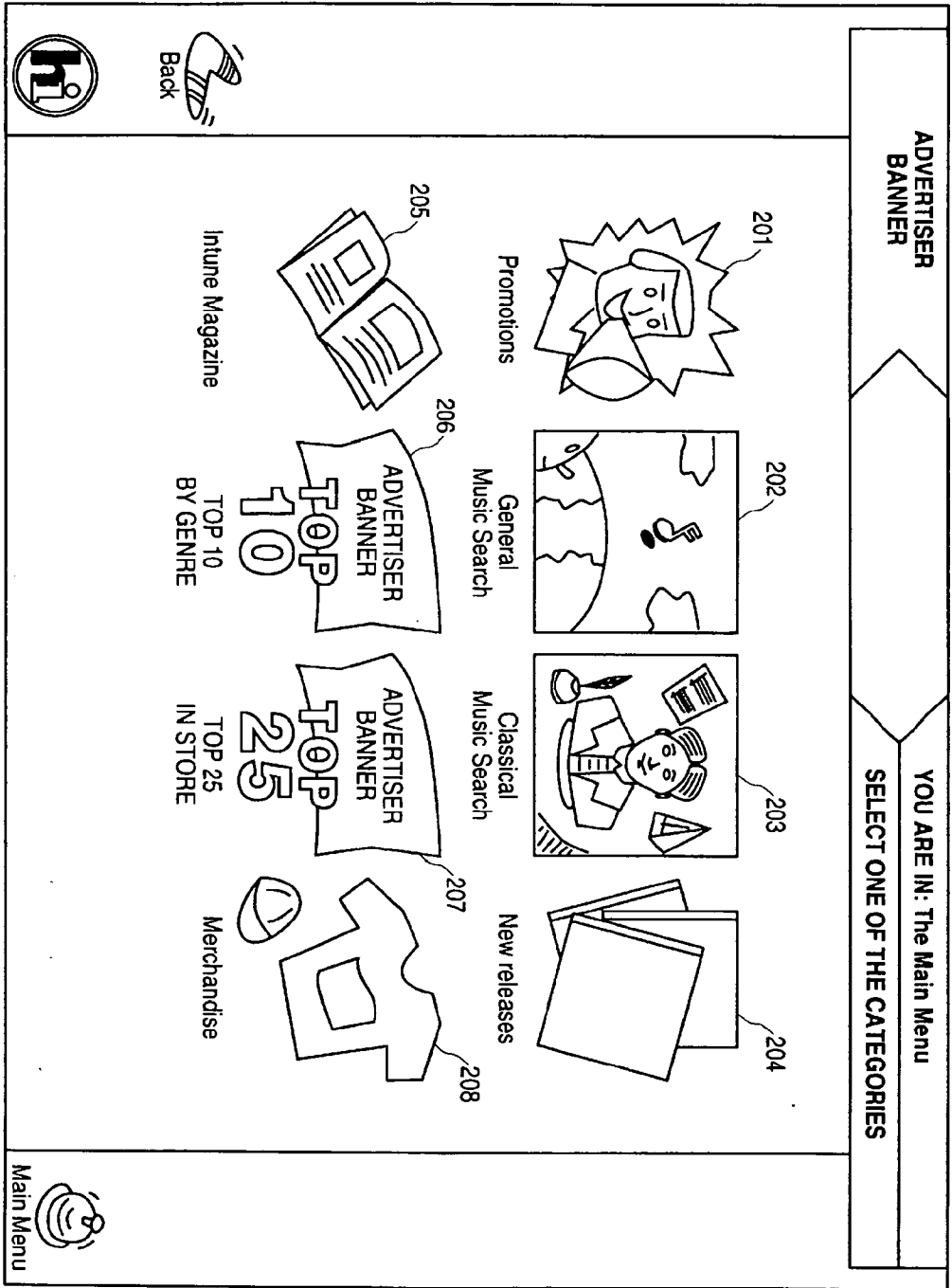


FIG. 10

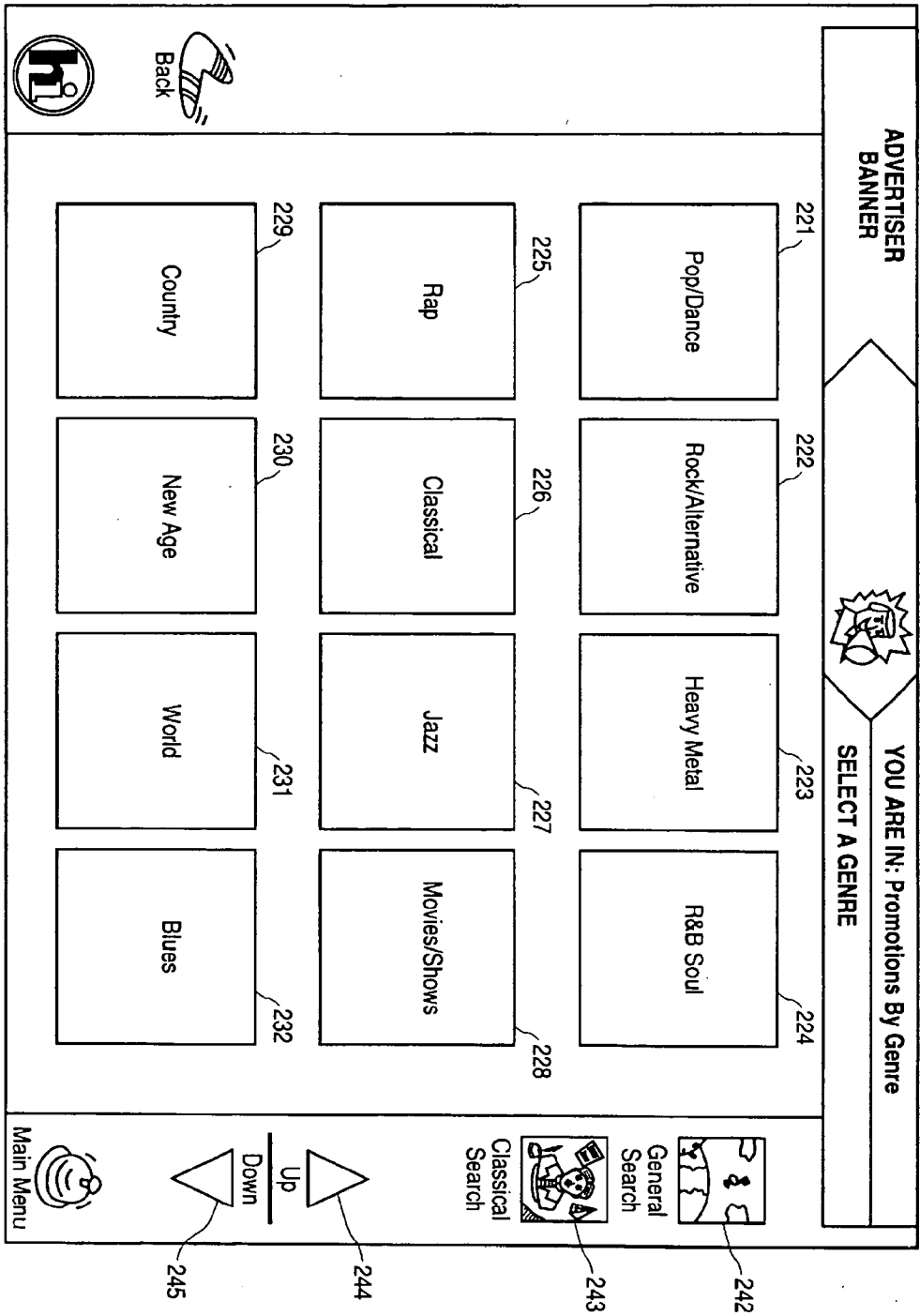


FIG. 1

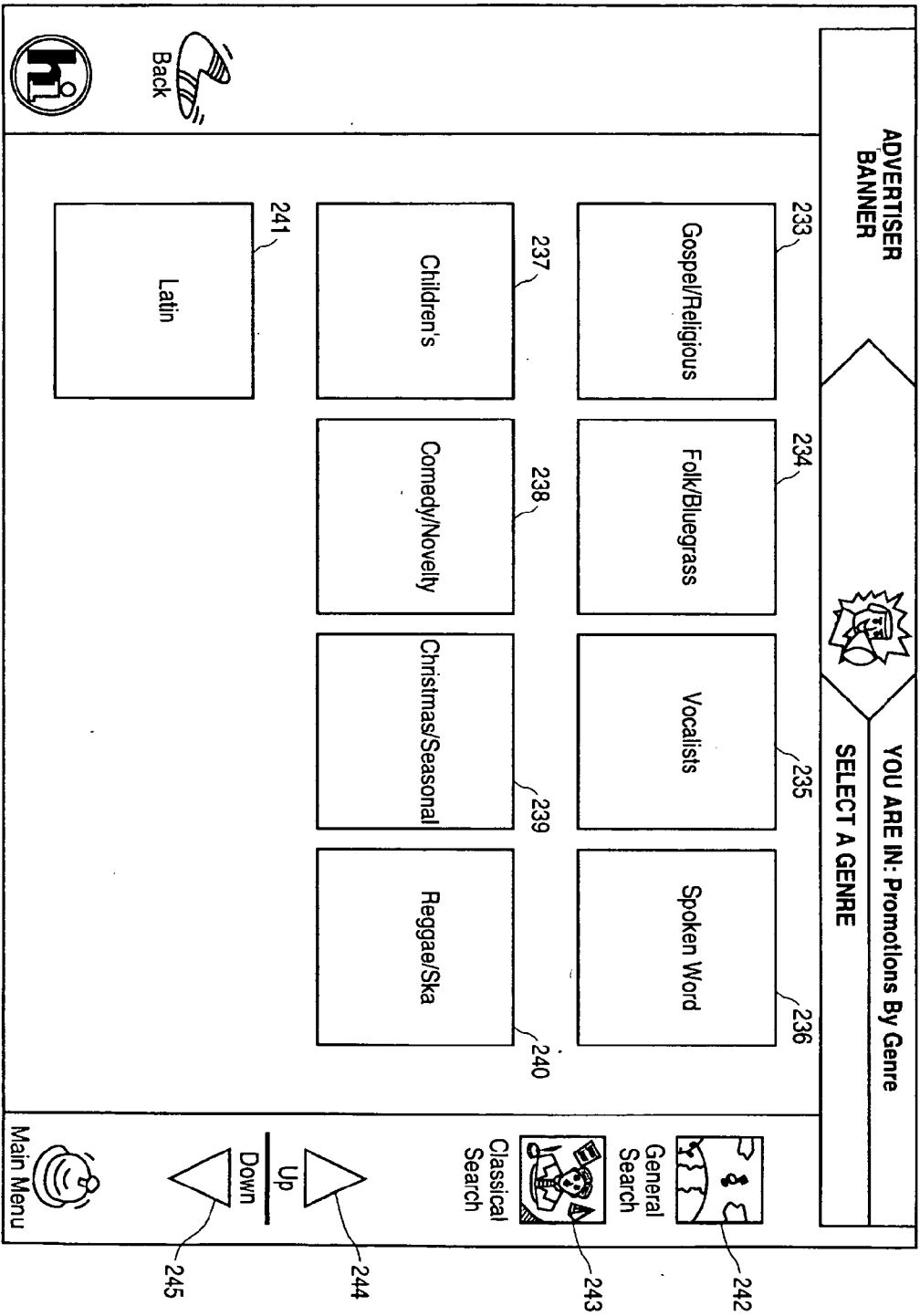


FIG. 12

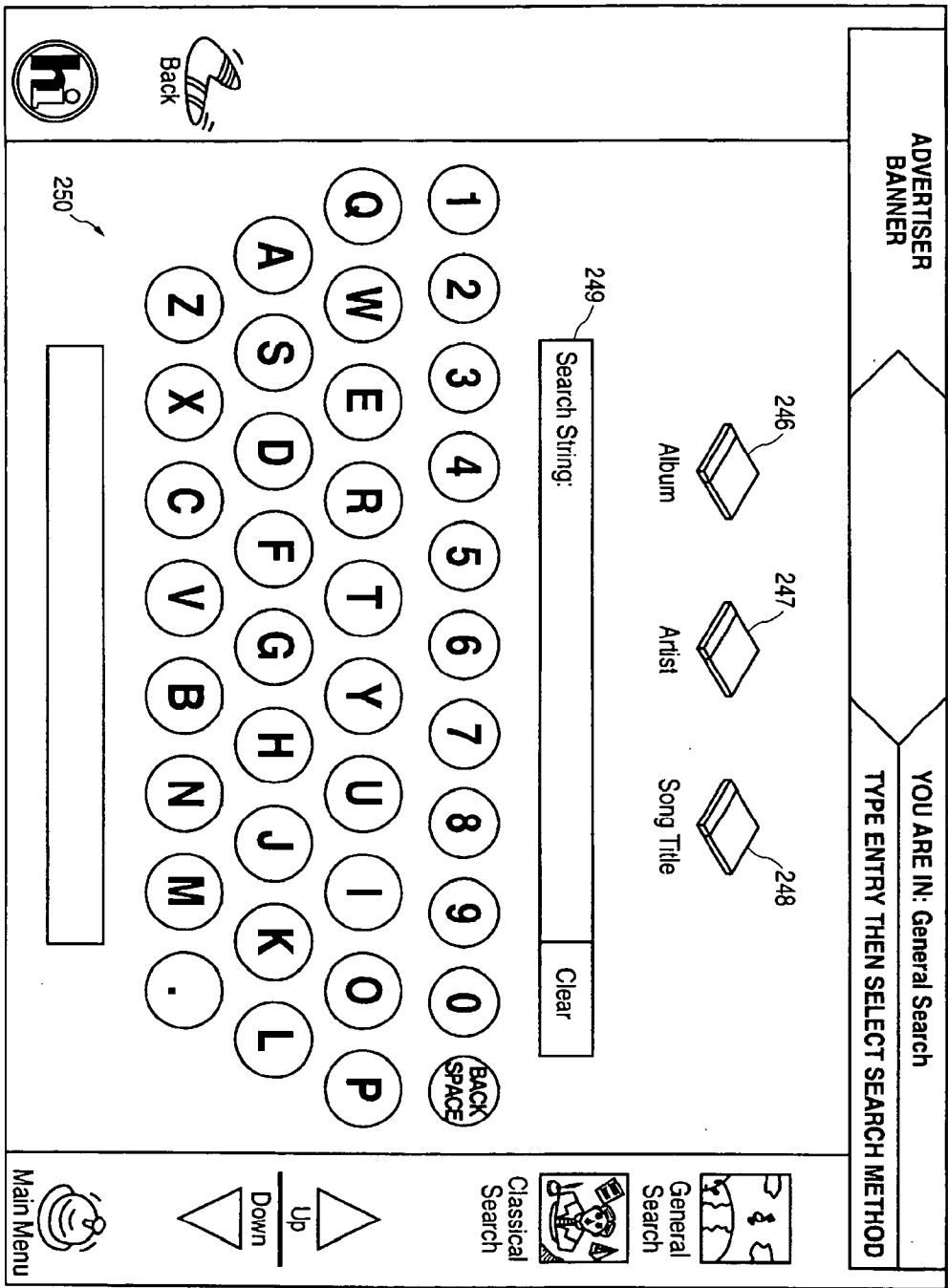


FIG. 13

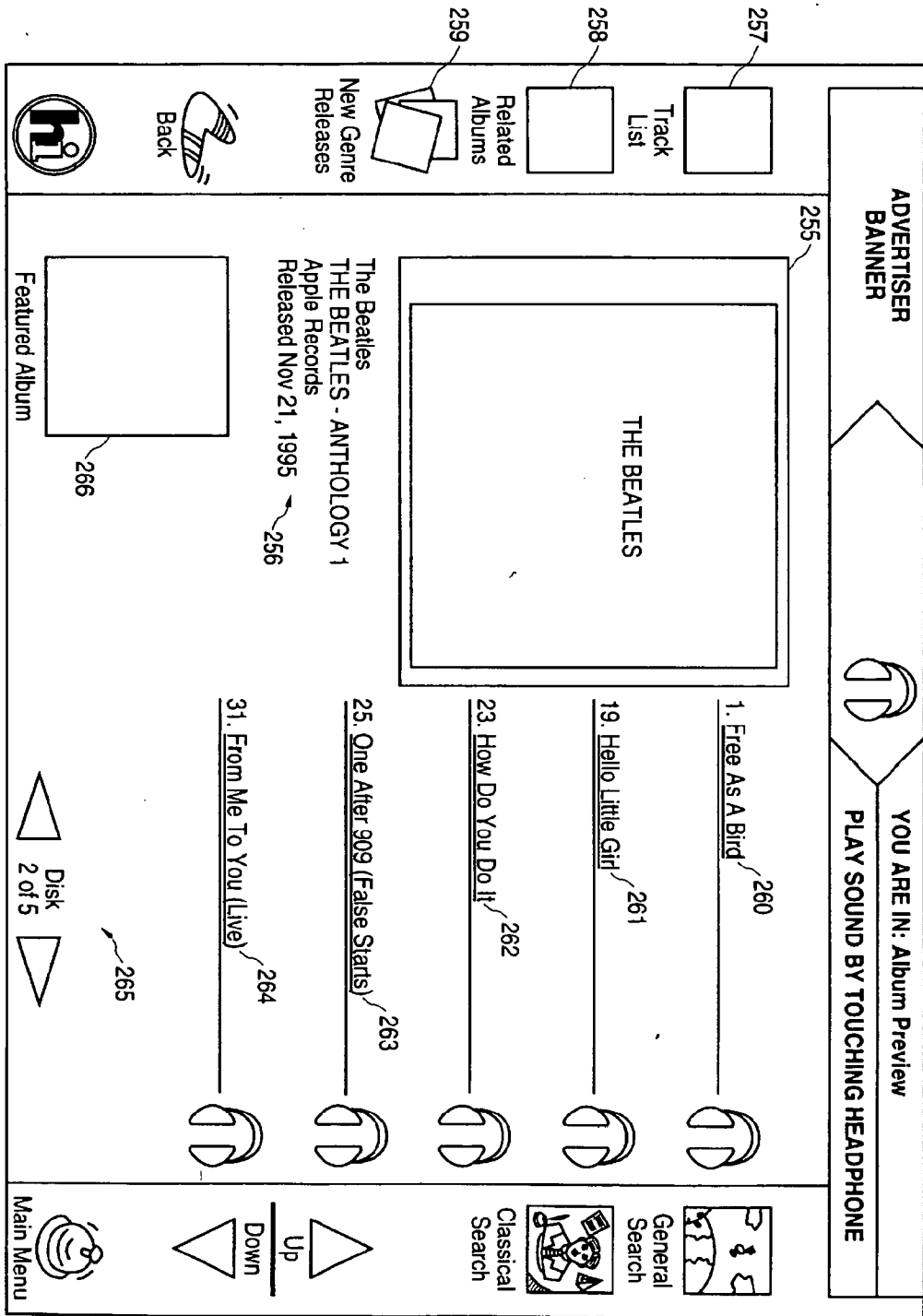


FIG. 14

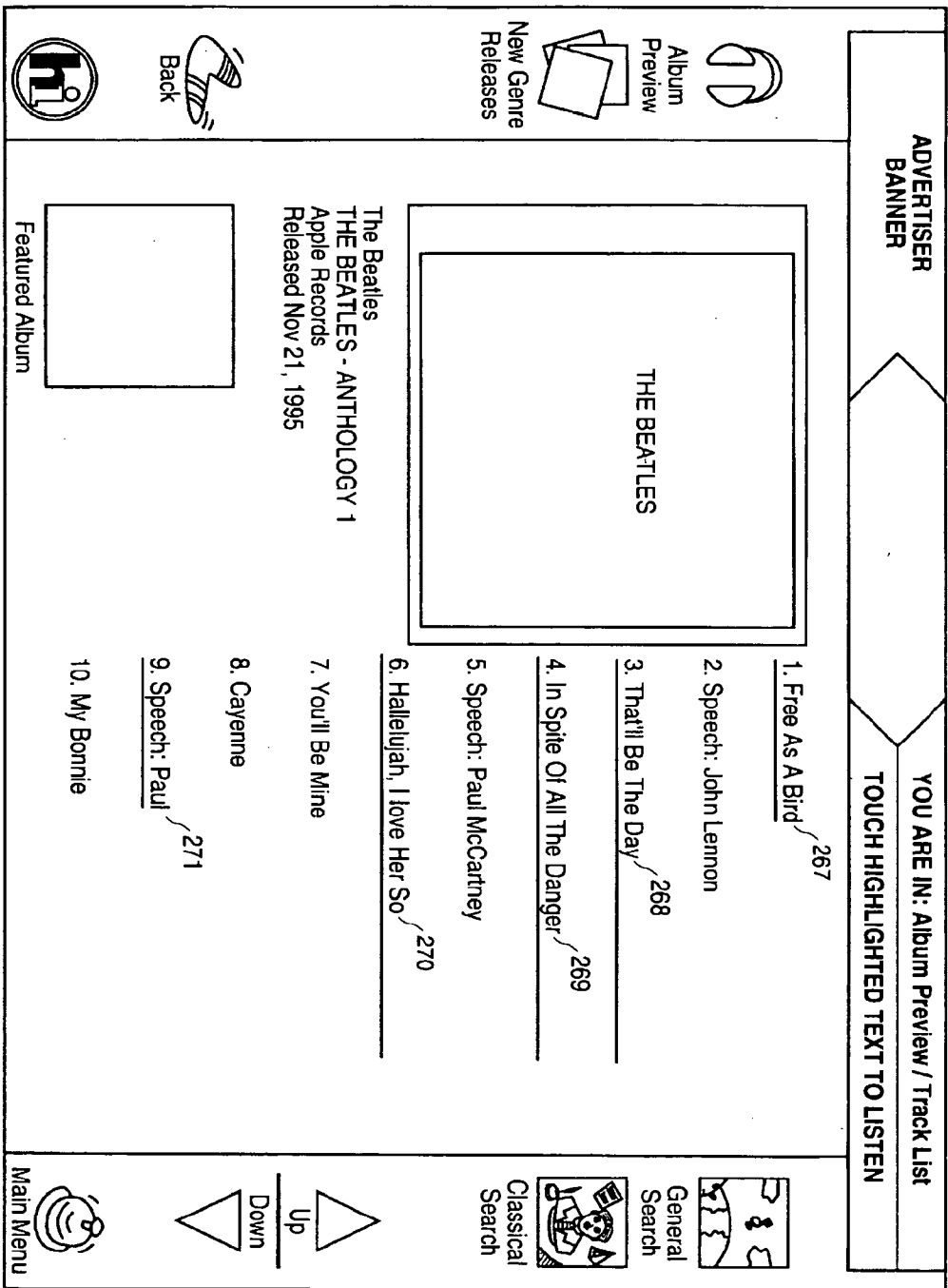


FIG.15

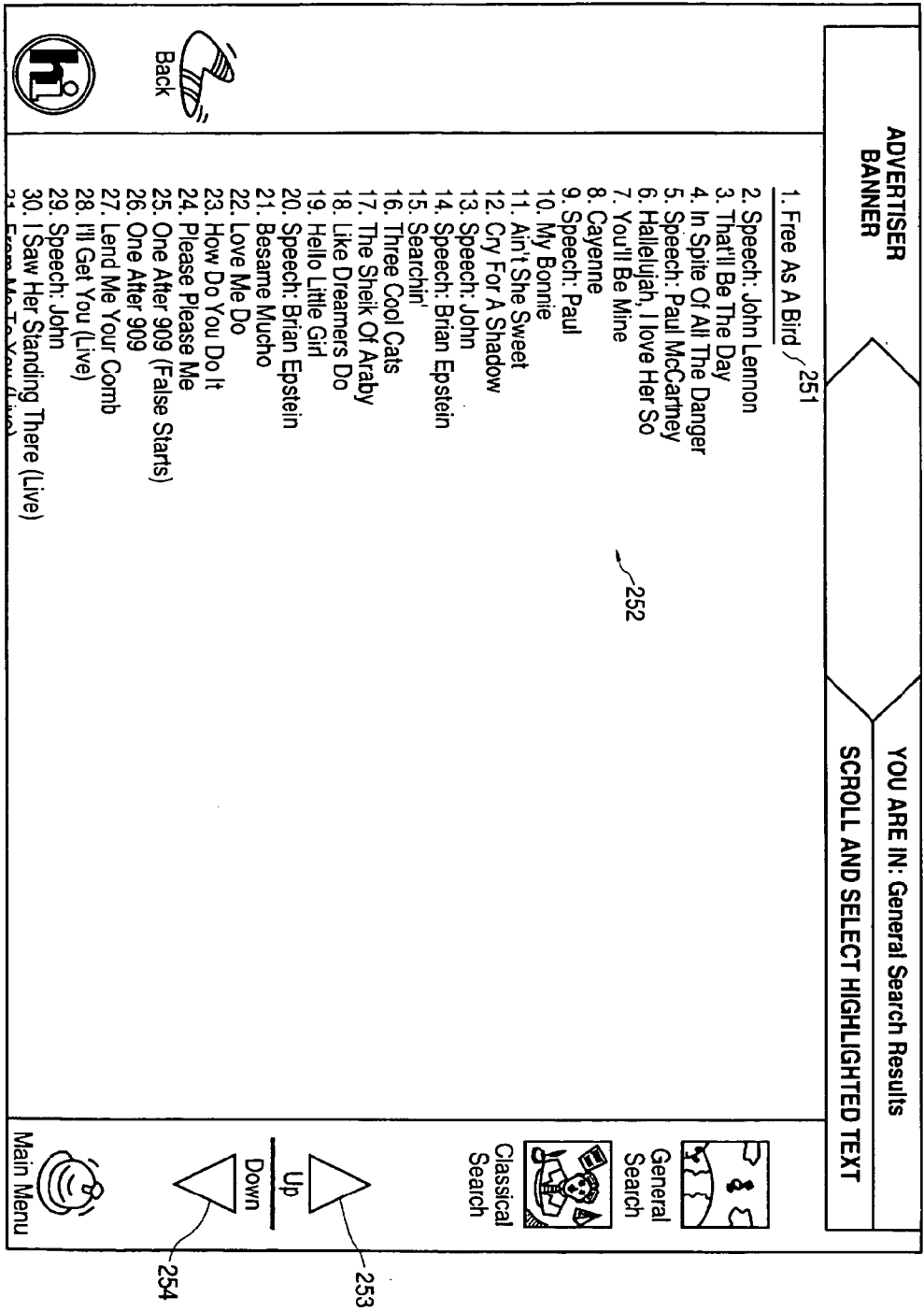


FIG. 16

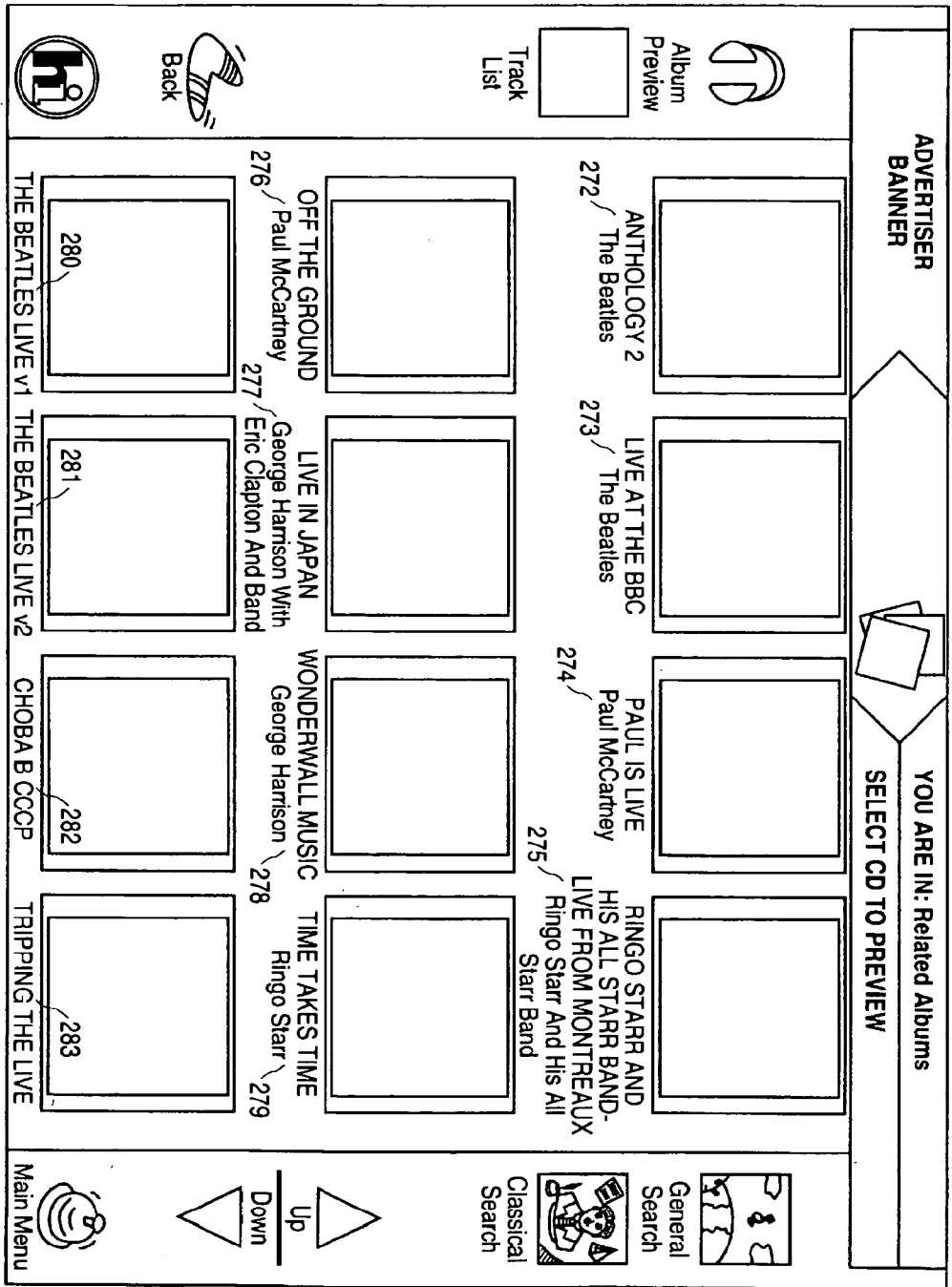


FIG. 17

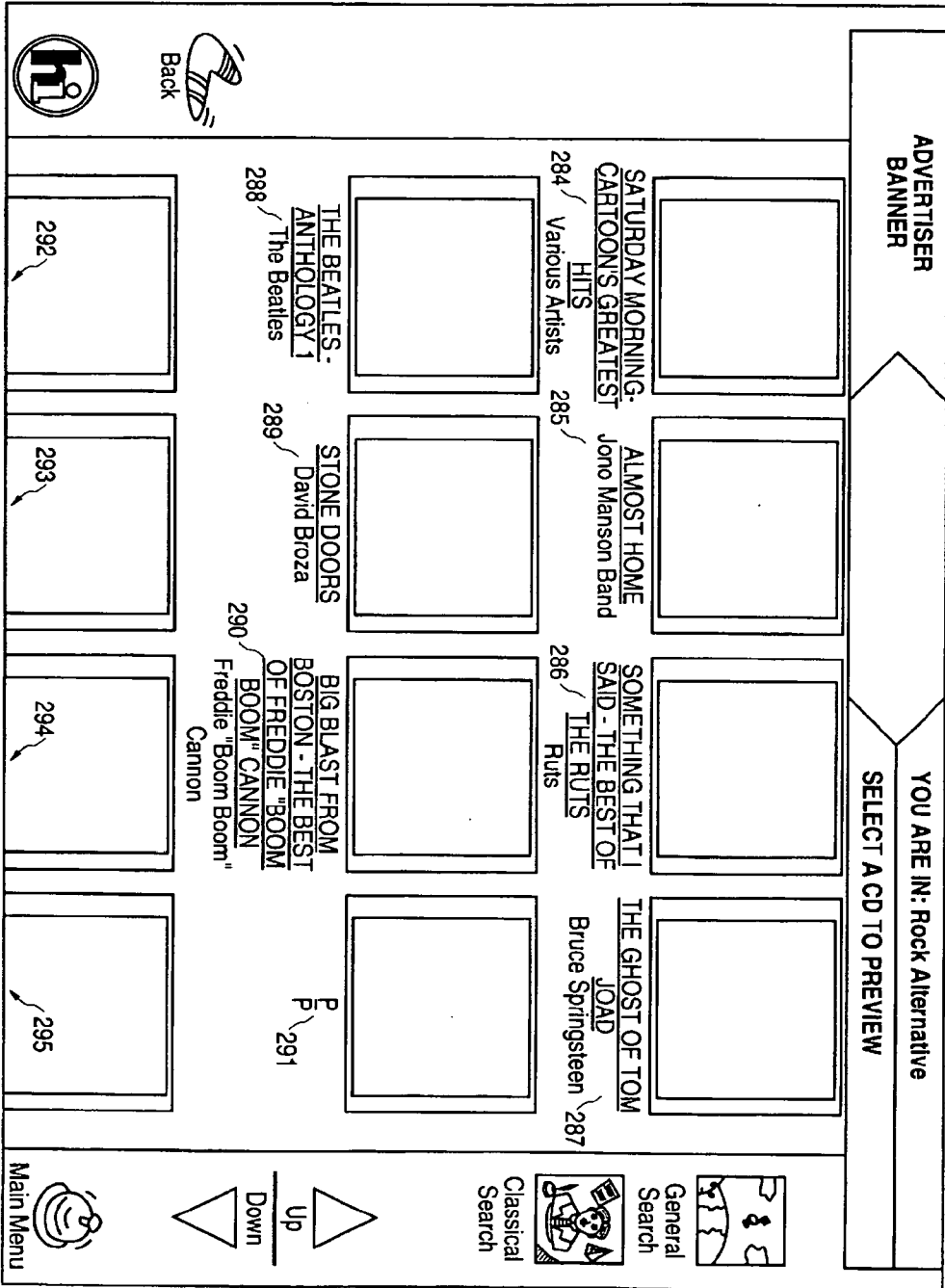


FIG. 1B

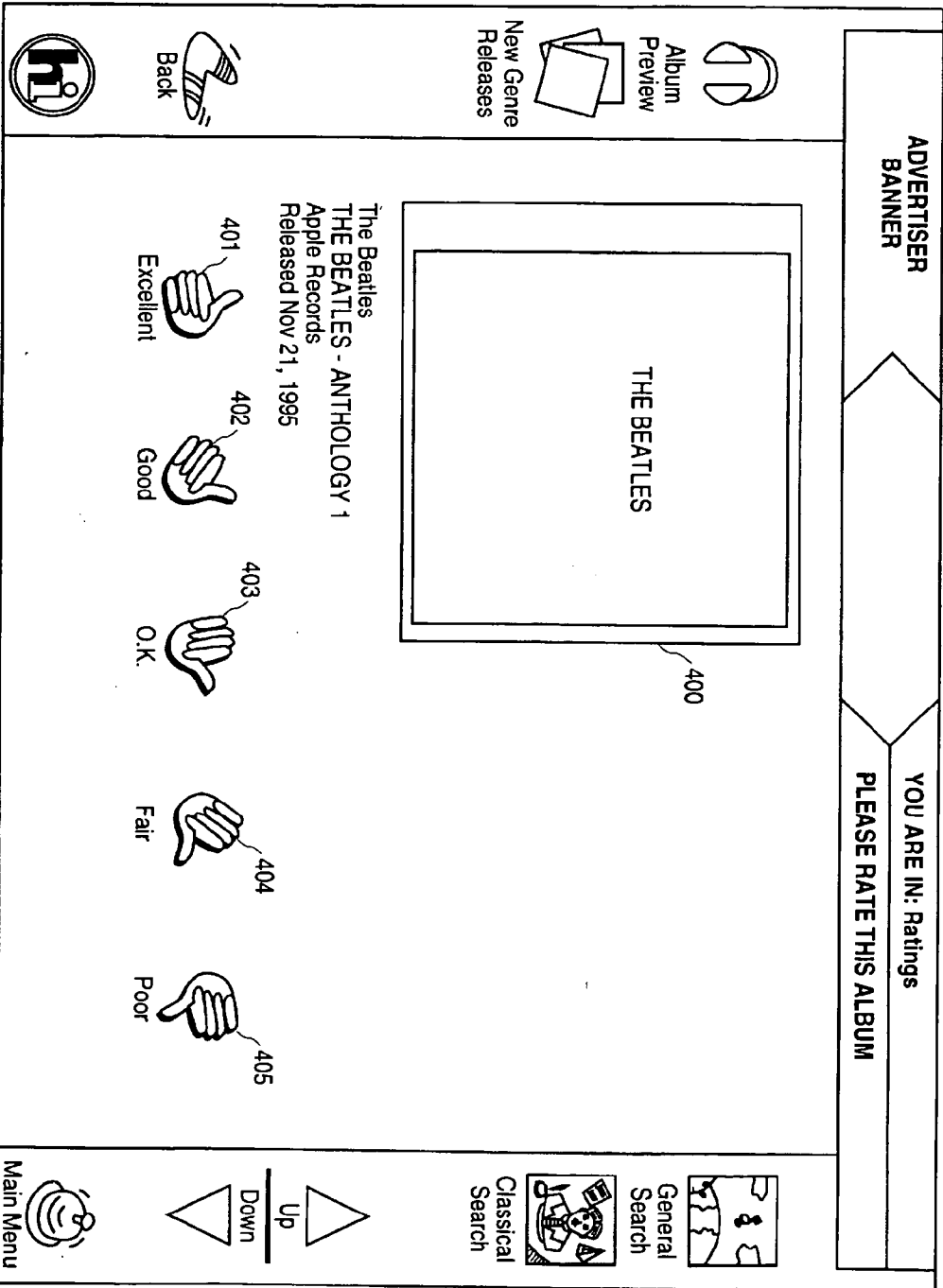


FIG. 19

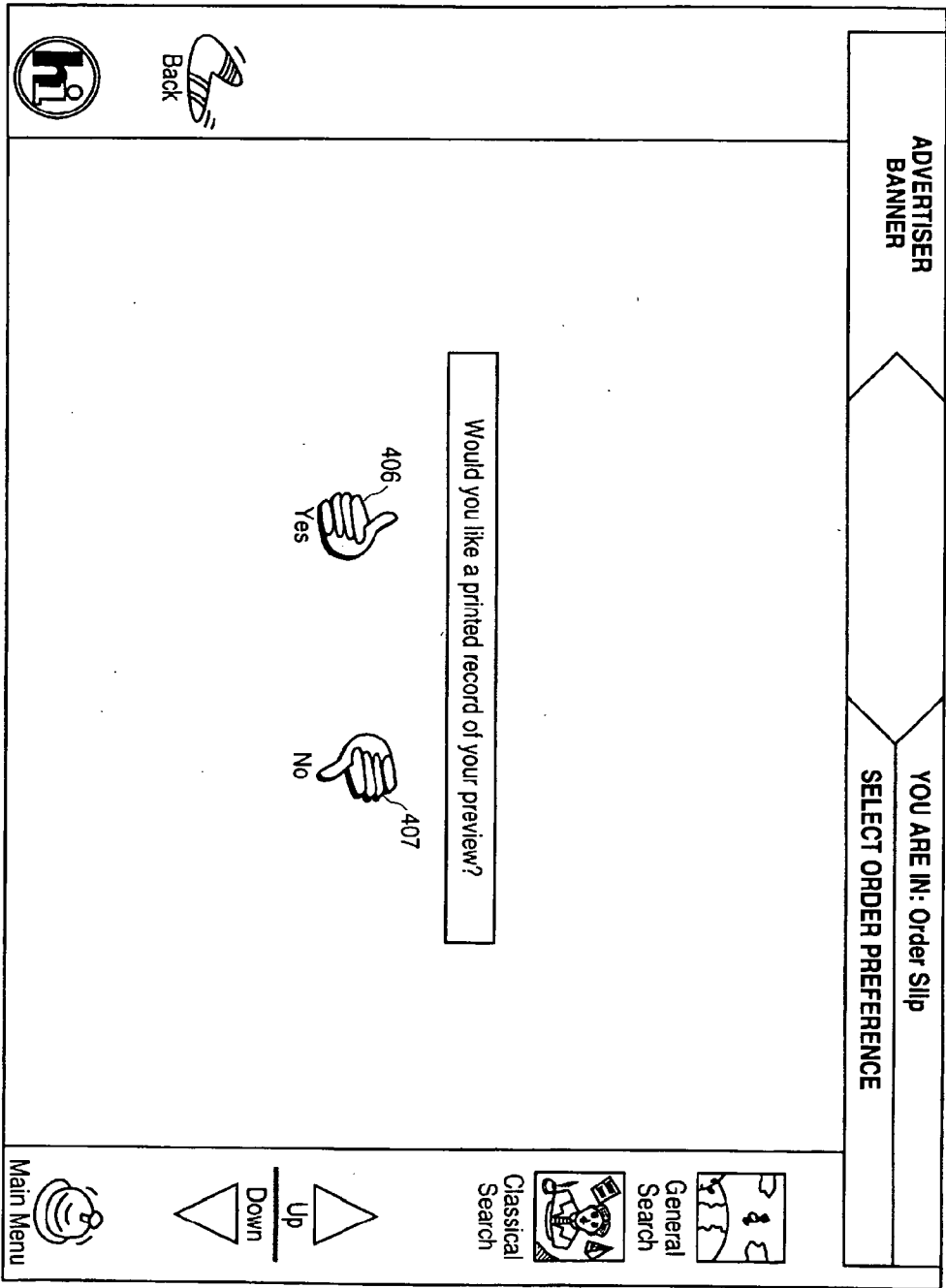


FIG.20

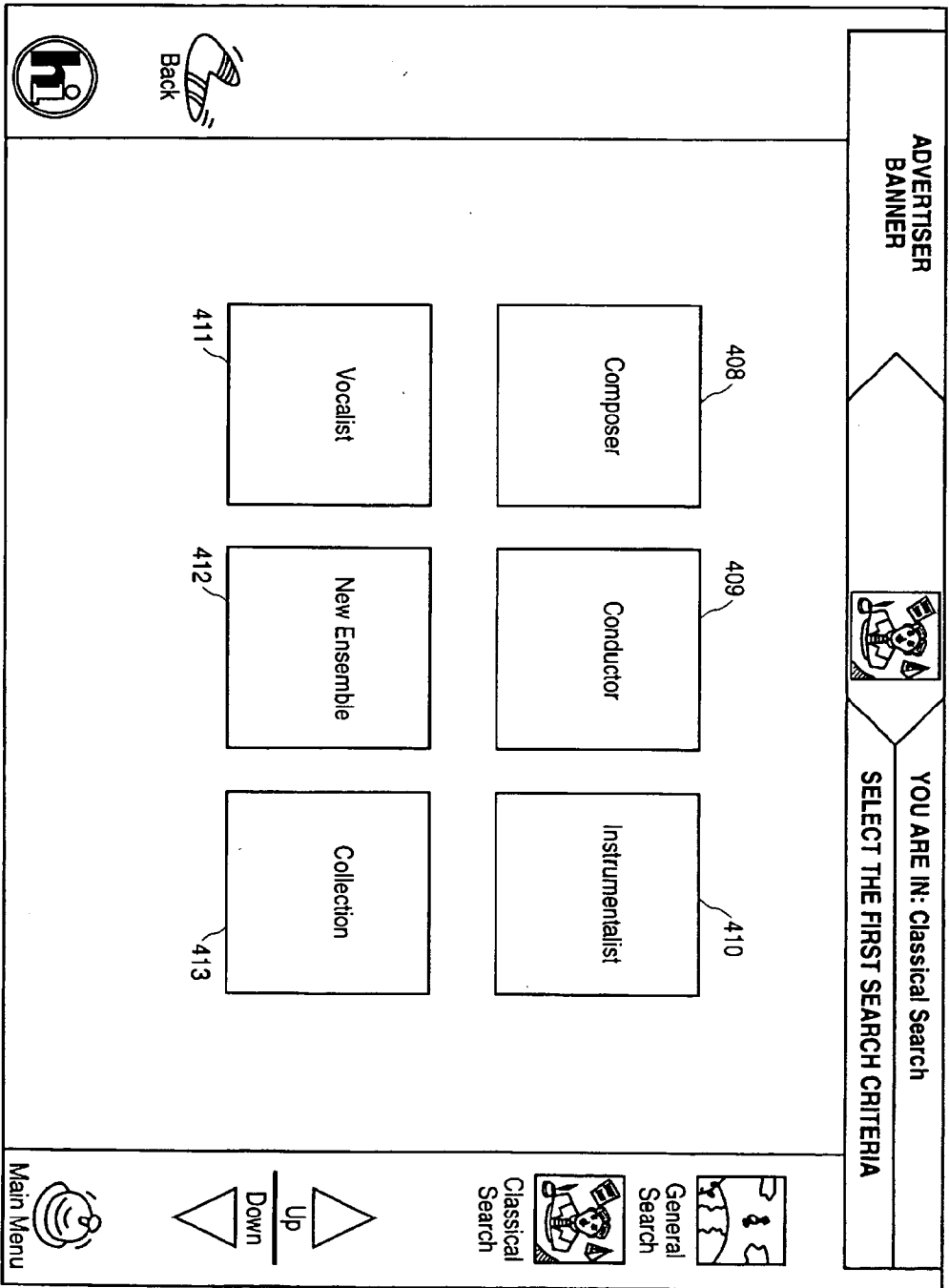


FIG.21

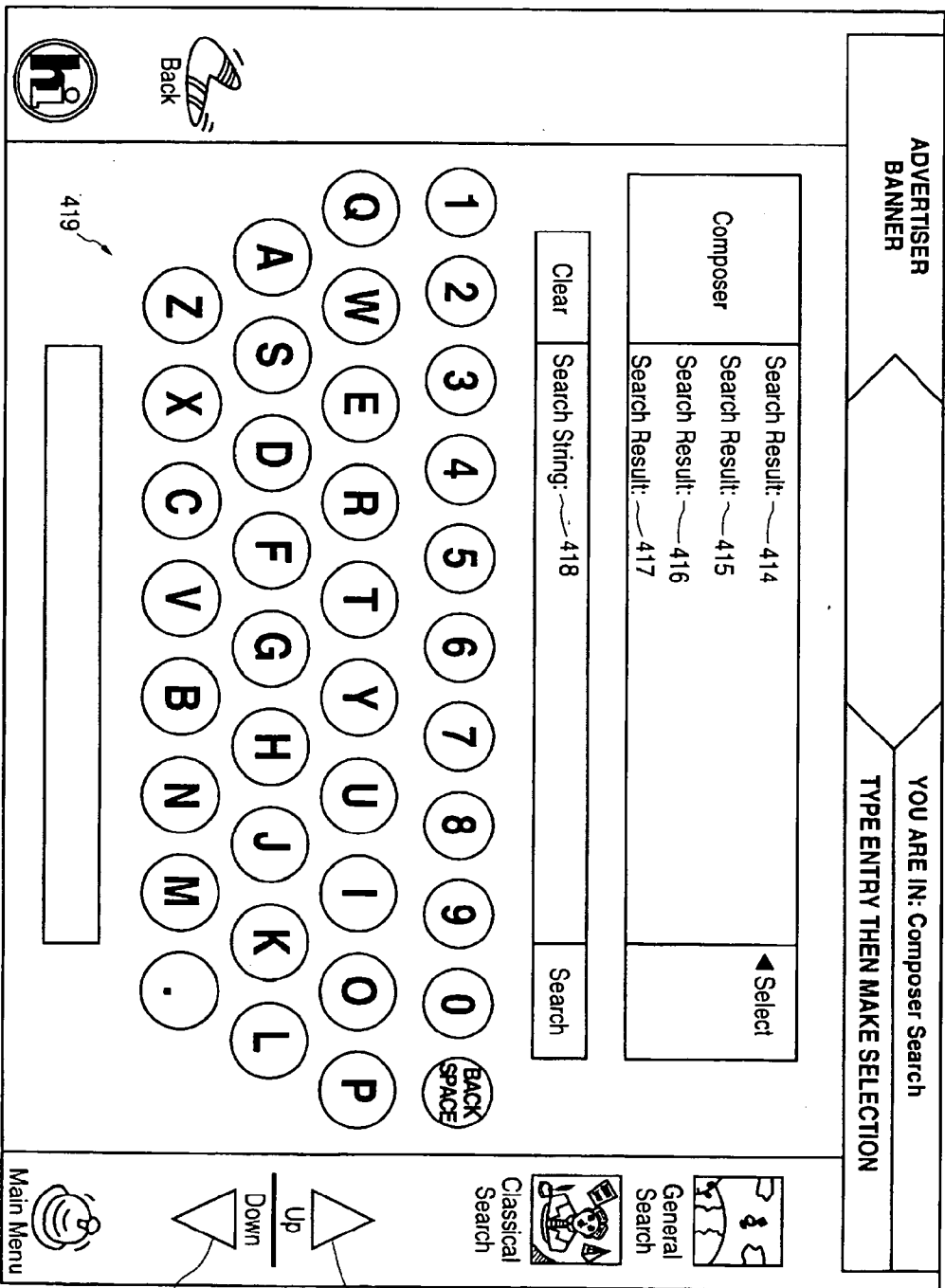


FIG. 22

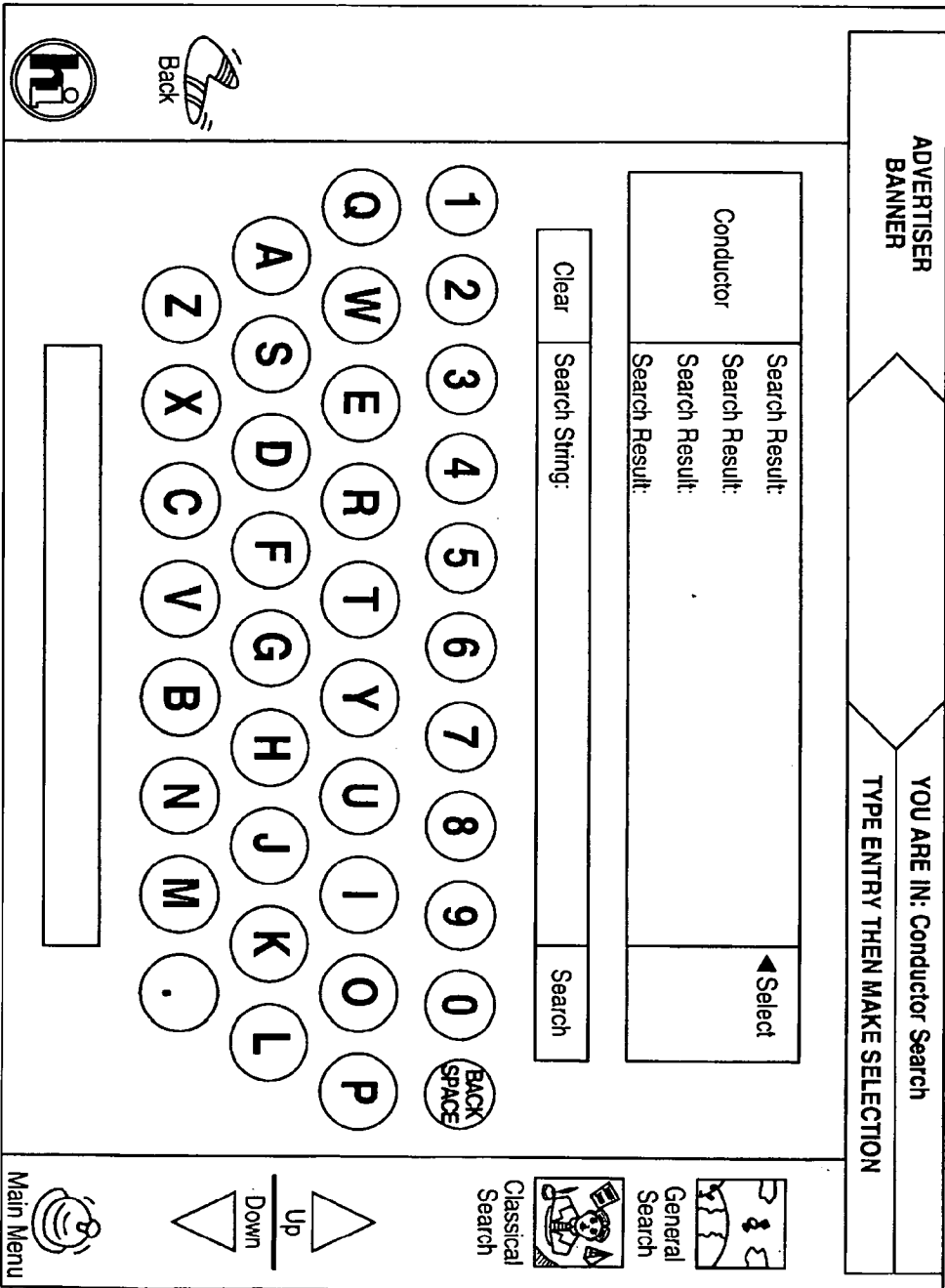


FIG. 23

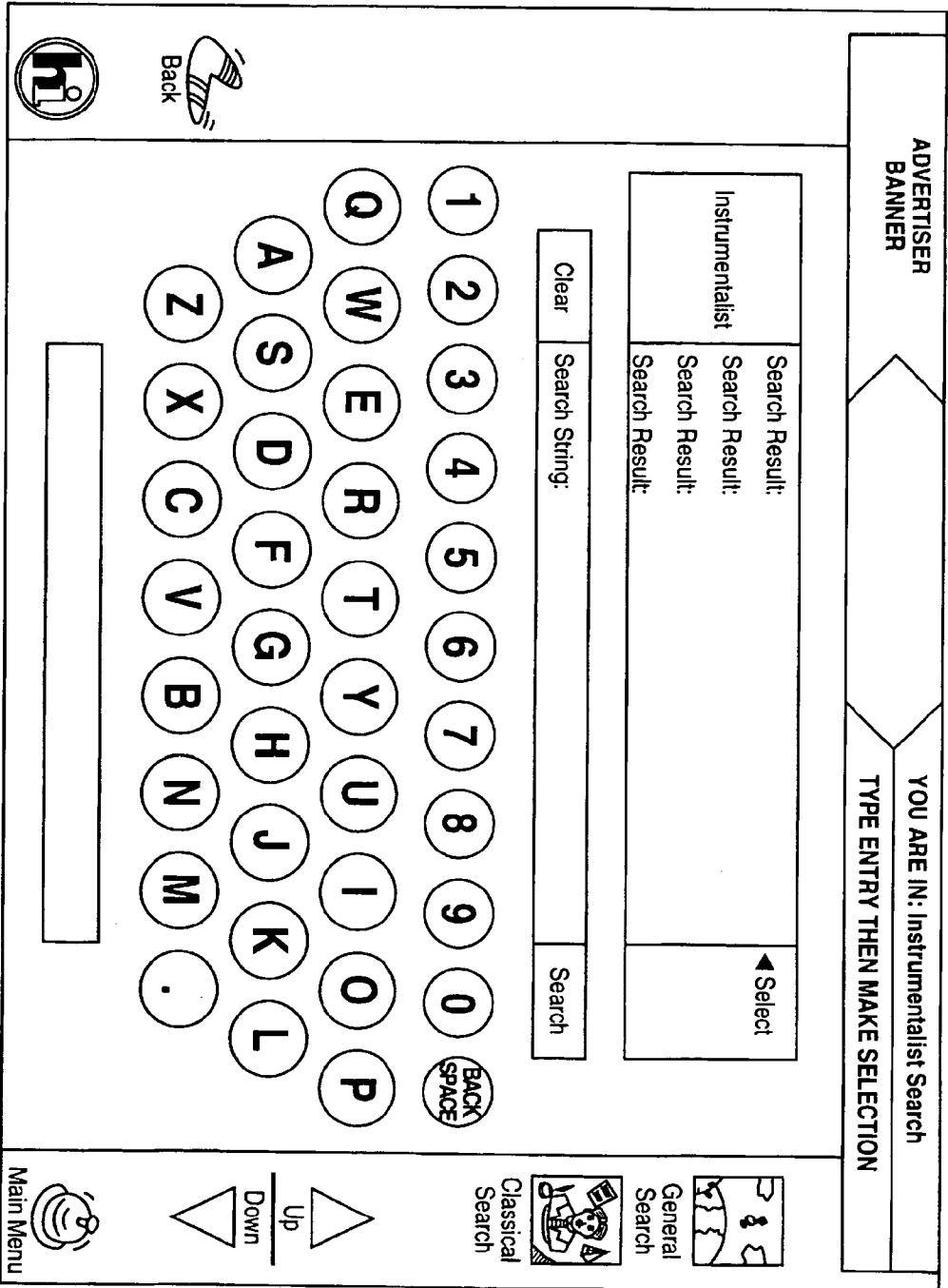


FIG. 24

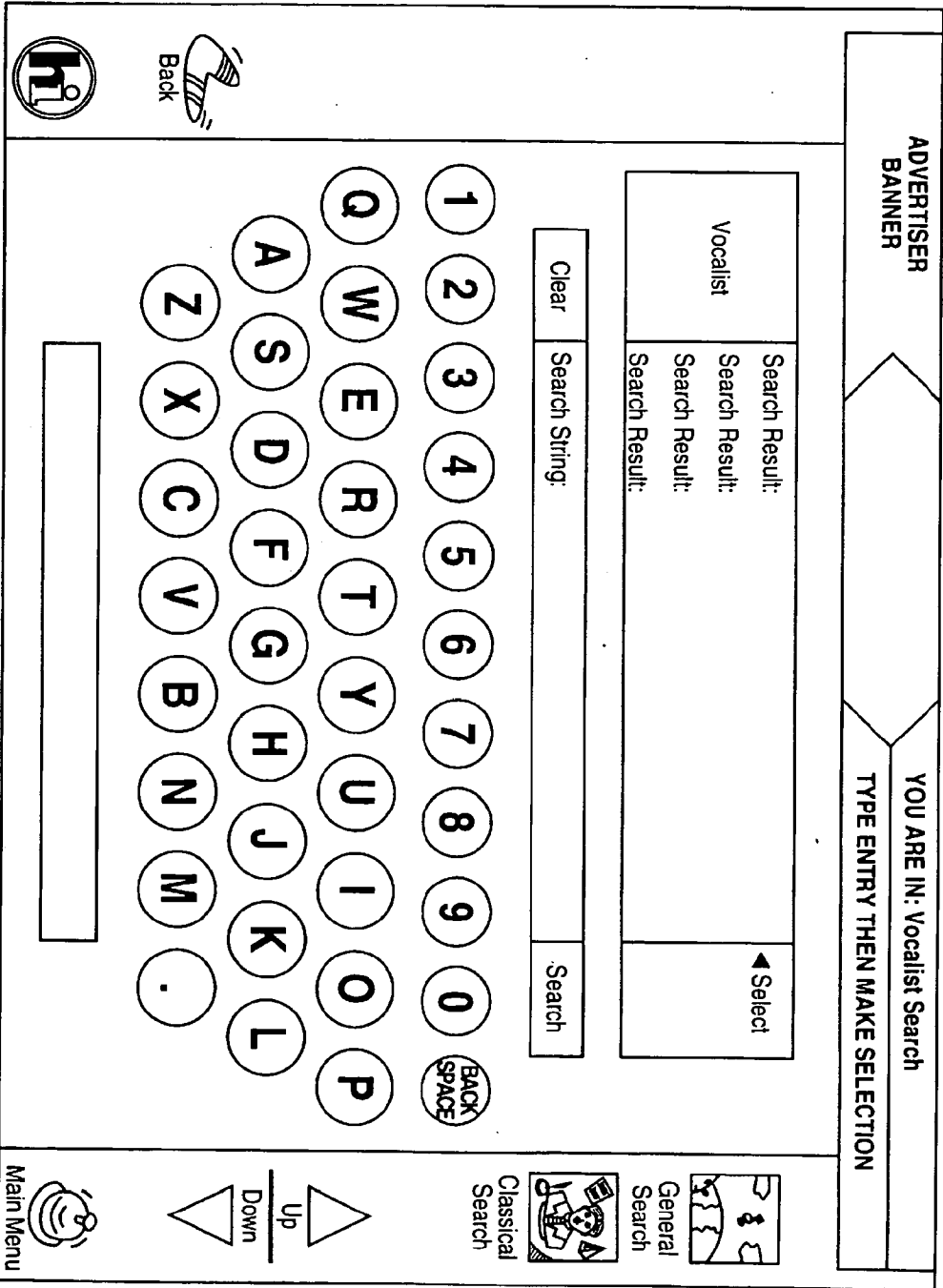


FIG. 25

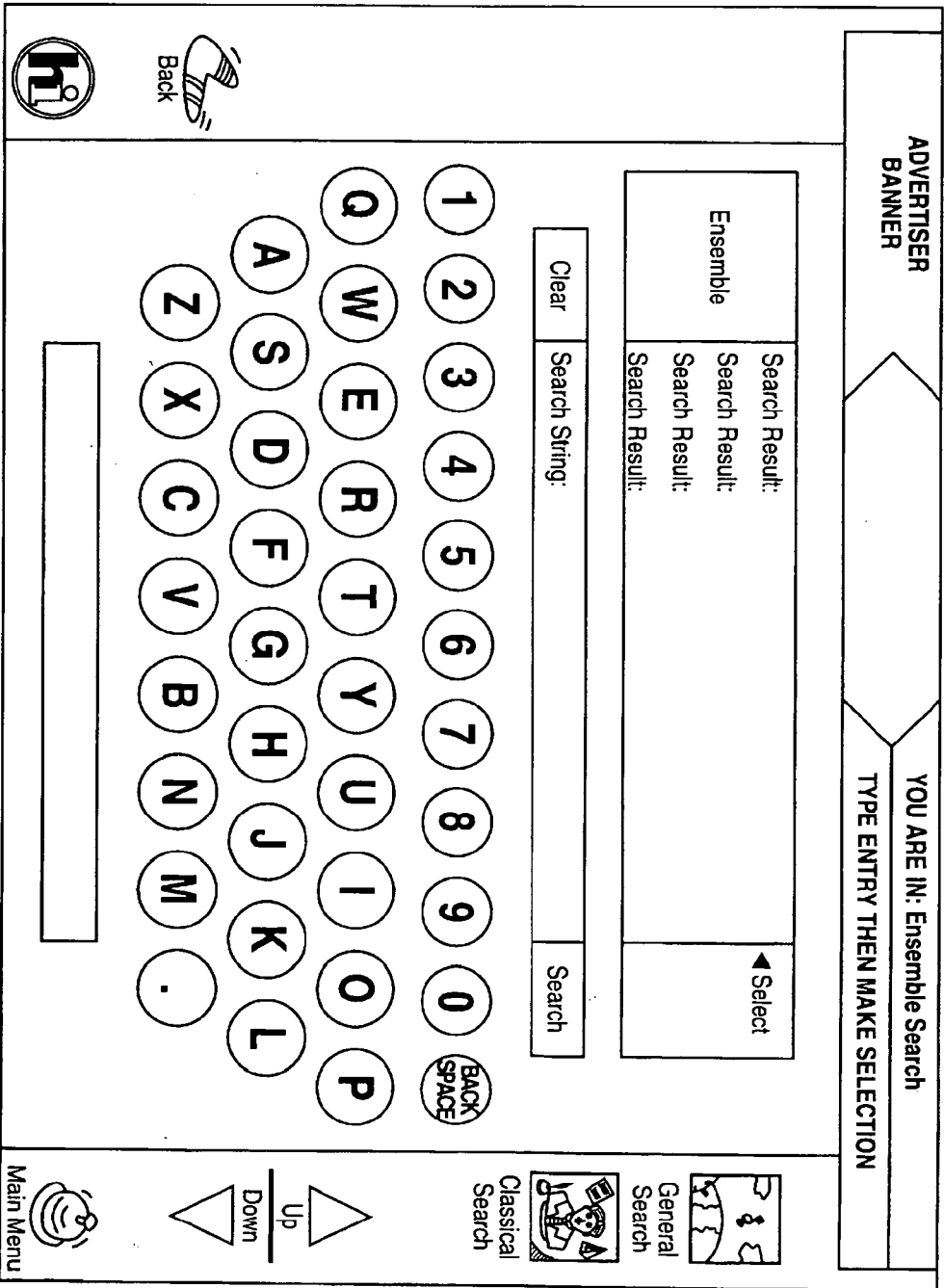


FIG. 26

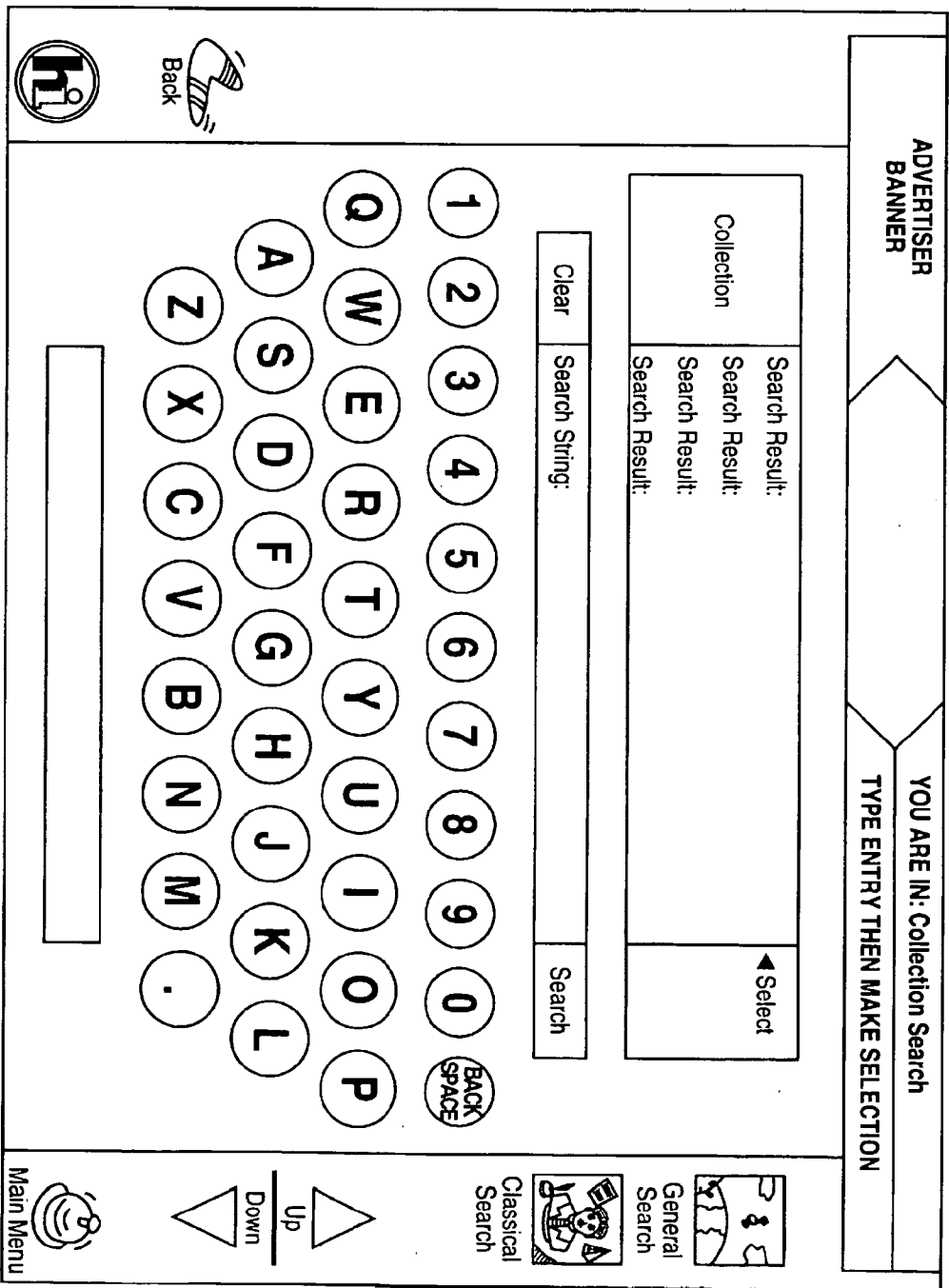


FIG.27

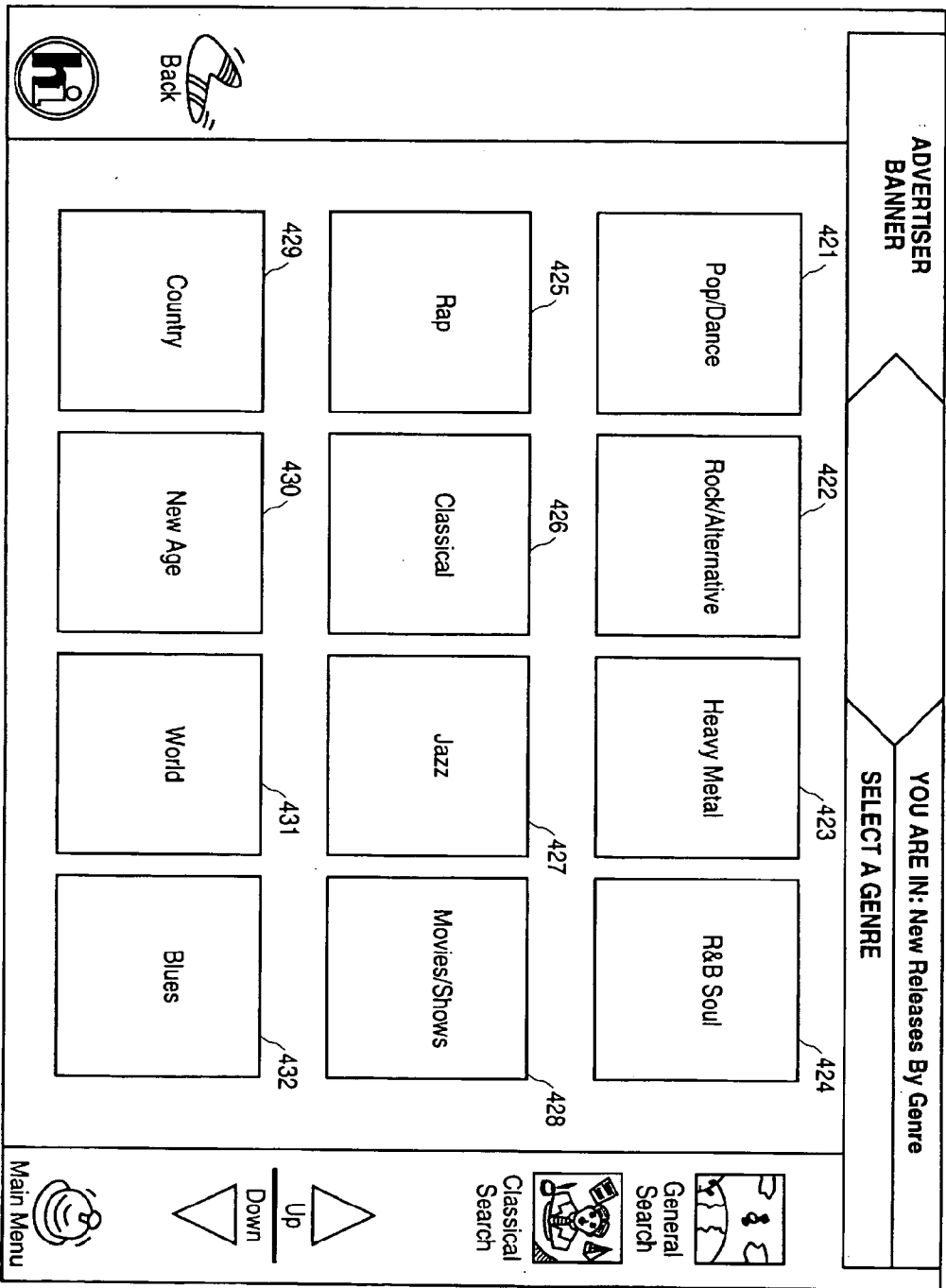


FIG. 28

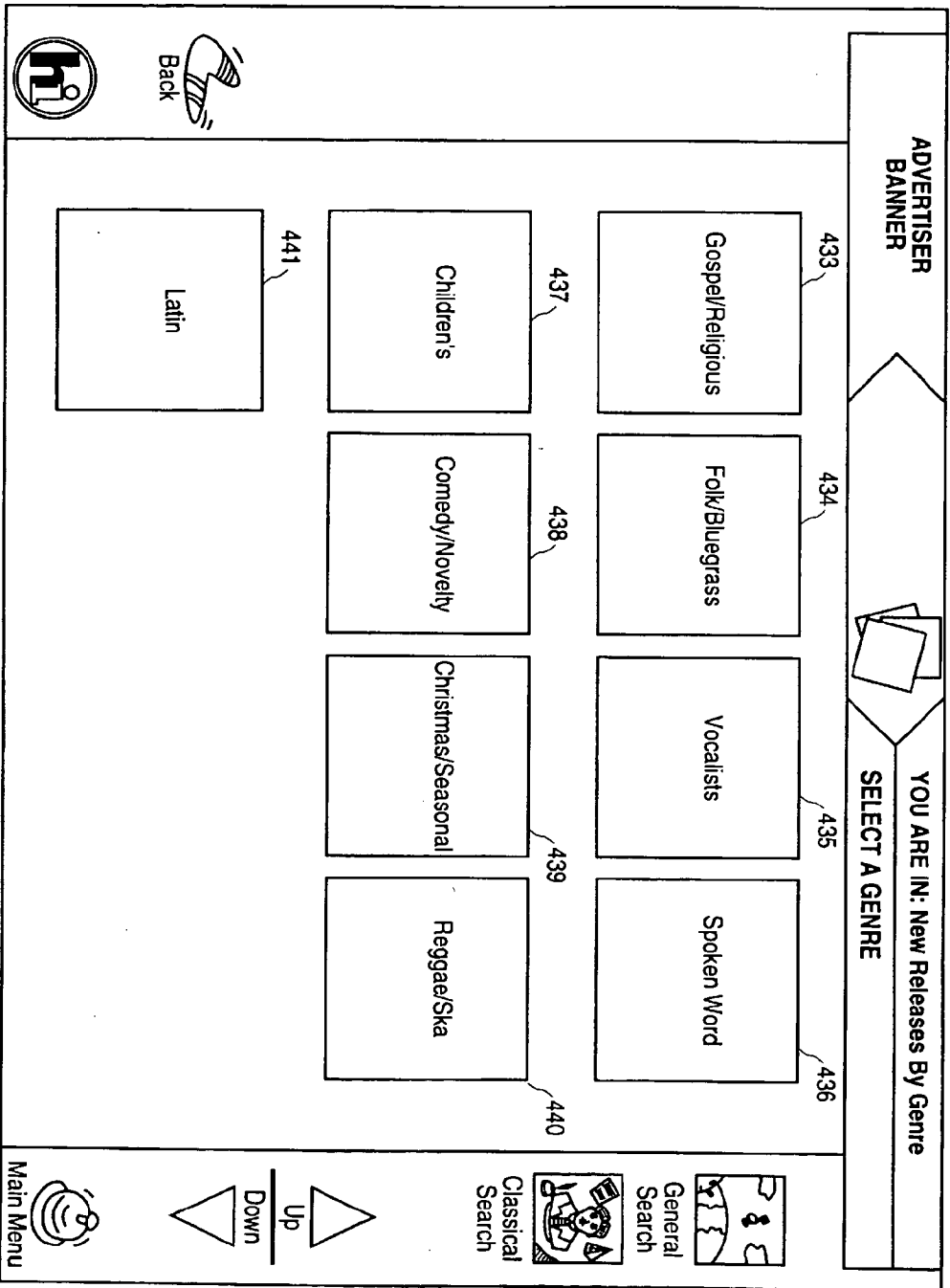


FIG.29

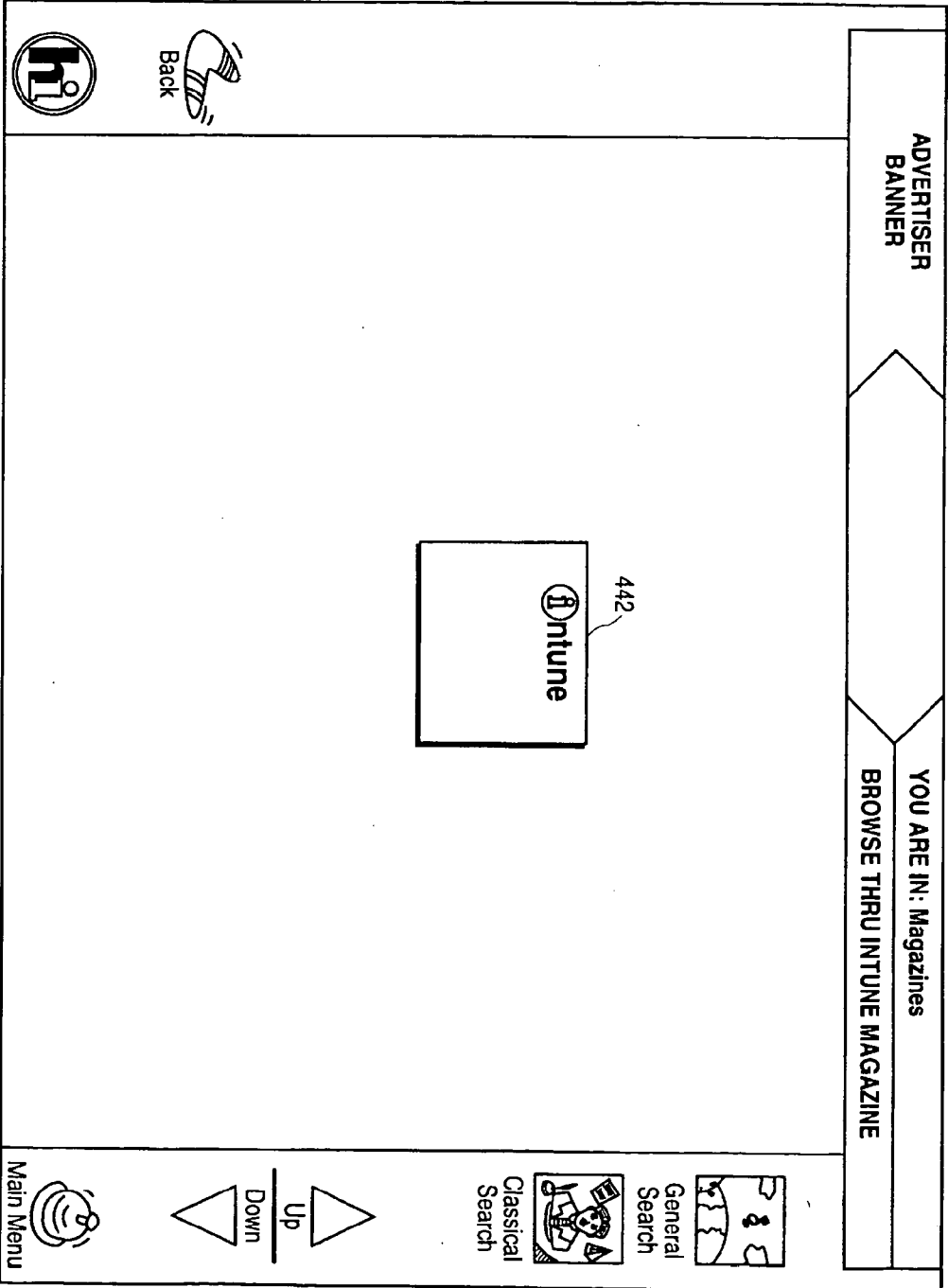


FIG. 30

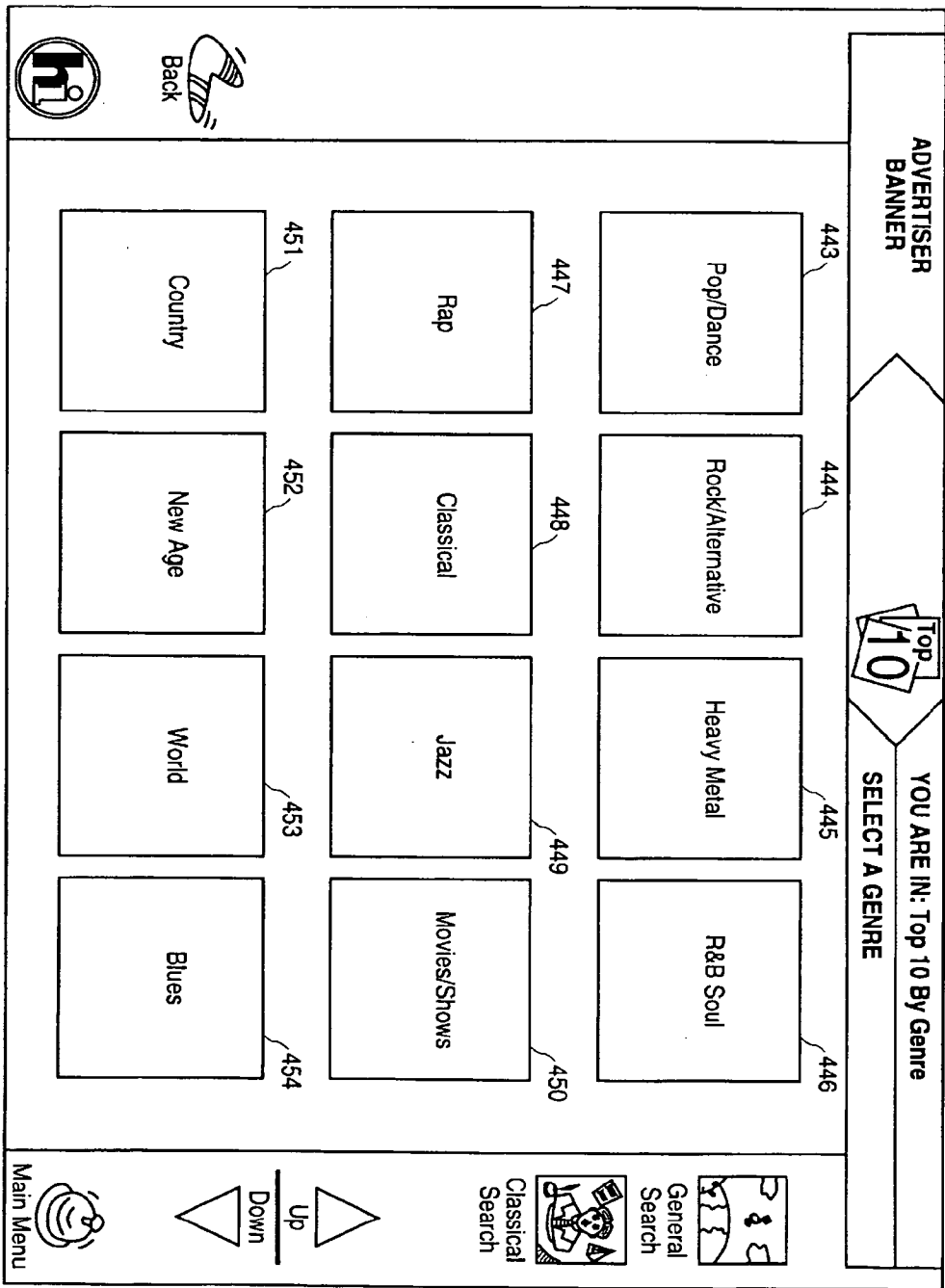


FIG.31

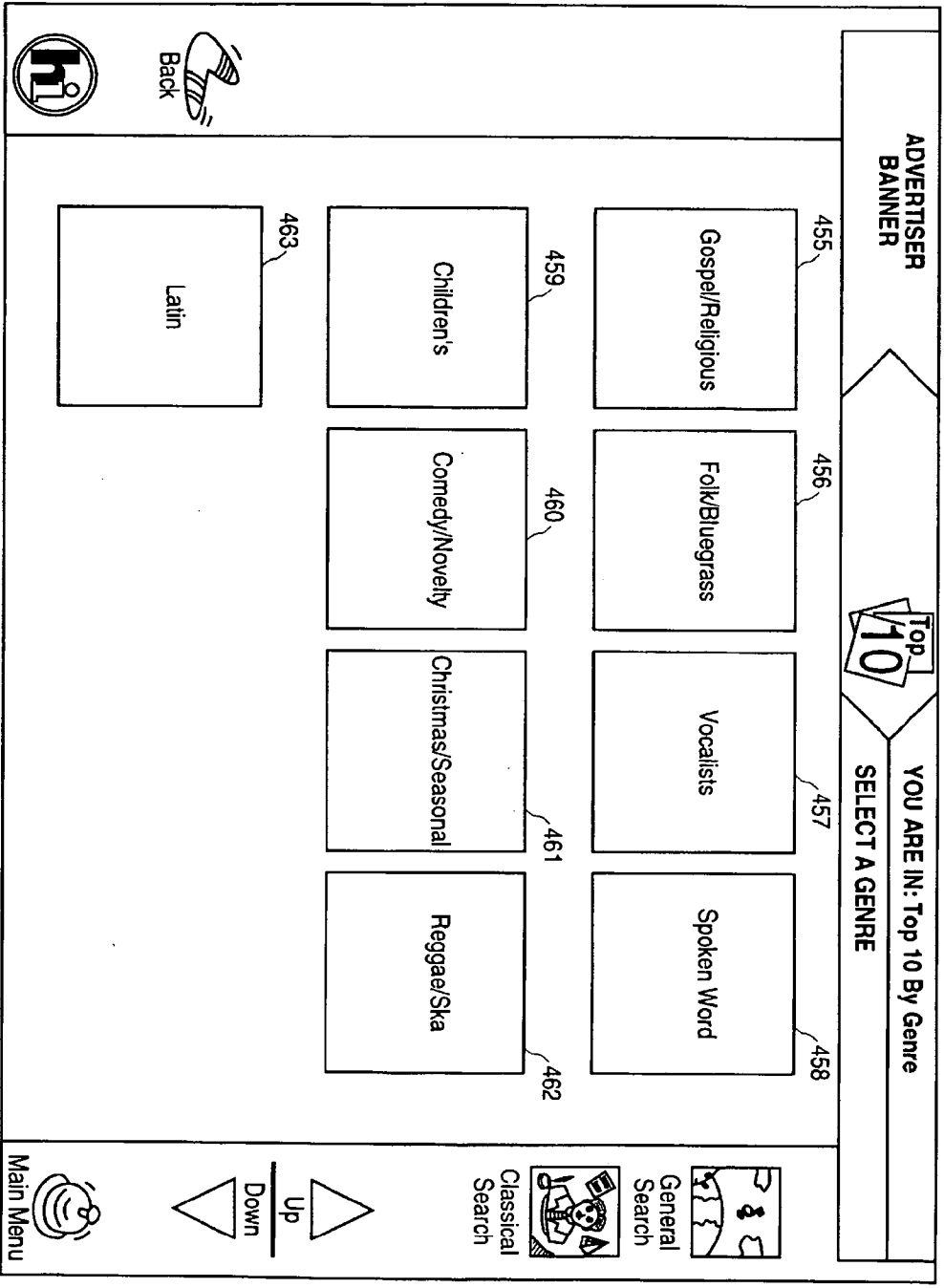


FIG.32

ADVERTISER BANNER

YOU ARE IN: Top 25

SELECT AN ALBUM TO PREVIEW

Top 25

<p>464 SATURDAY MORNING-CARTOON'S GREATEST HITS Various Artists</p>	<p>465 ALMOST HOME Jono Manson Band</p>	<p>466 SOMETHING THAT I SAID - THE BEST OF THE RUTS Ruts</p>	<p>467 THE GHOST OF TOM JOAD Bruce Springsteen</p>
<p>468 THE BEATLES - ANTHOLOGY 1 The Beatles</p>	<p>469 STONE DOORS David Broza</p>	<p>470 BIG BLAST FROM BOSTON - THE BEST OF FREDDIE "BOOM BOOM" CANNON Freddie "Boom Boom" Cannon</p>	<p>P 471 P</p>
472	473	474	475

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General Search

Classical Search

Up

Down

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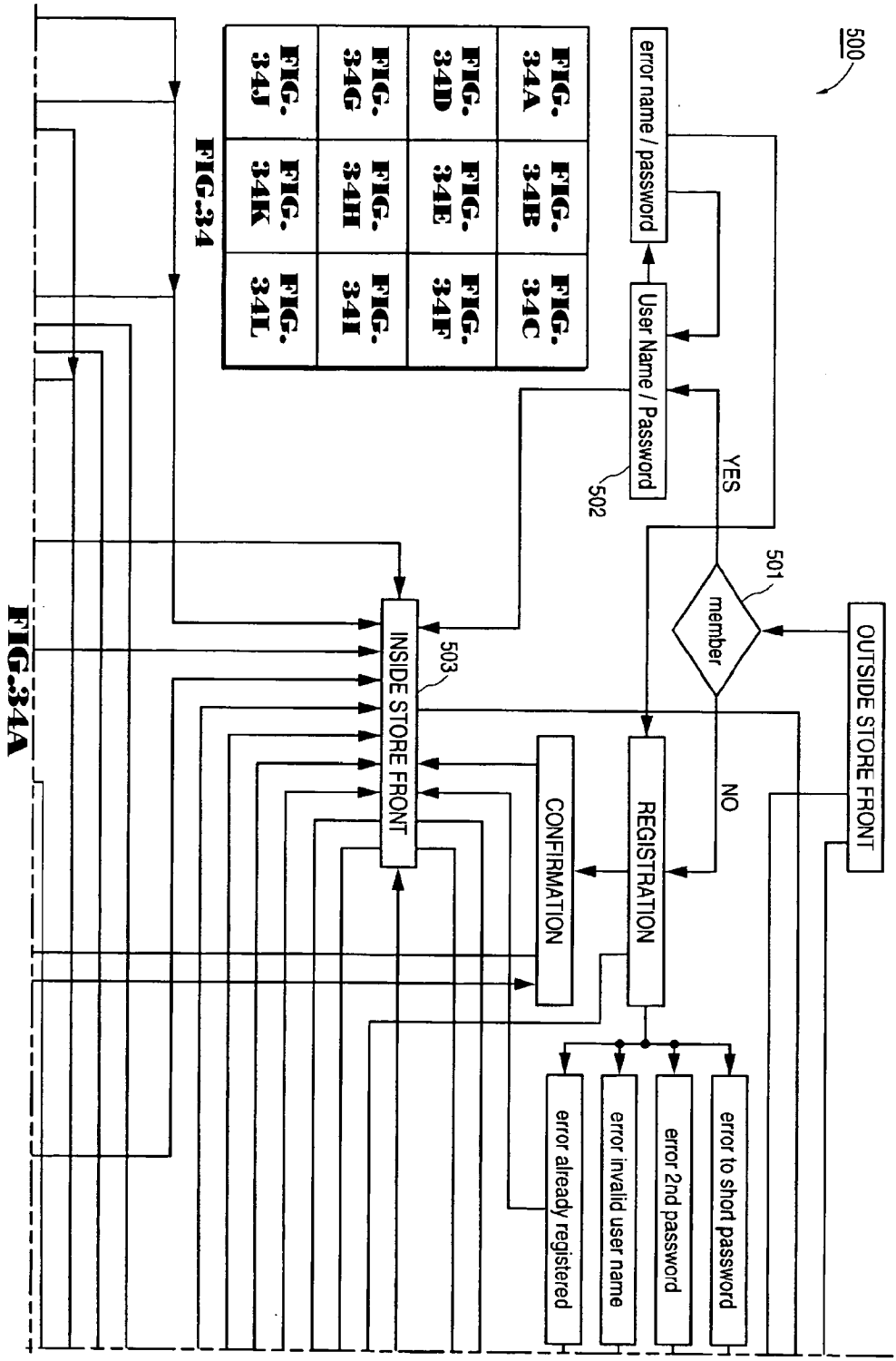








FIG. 33



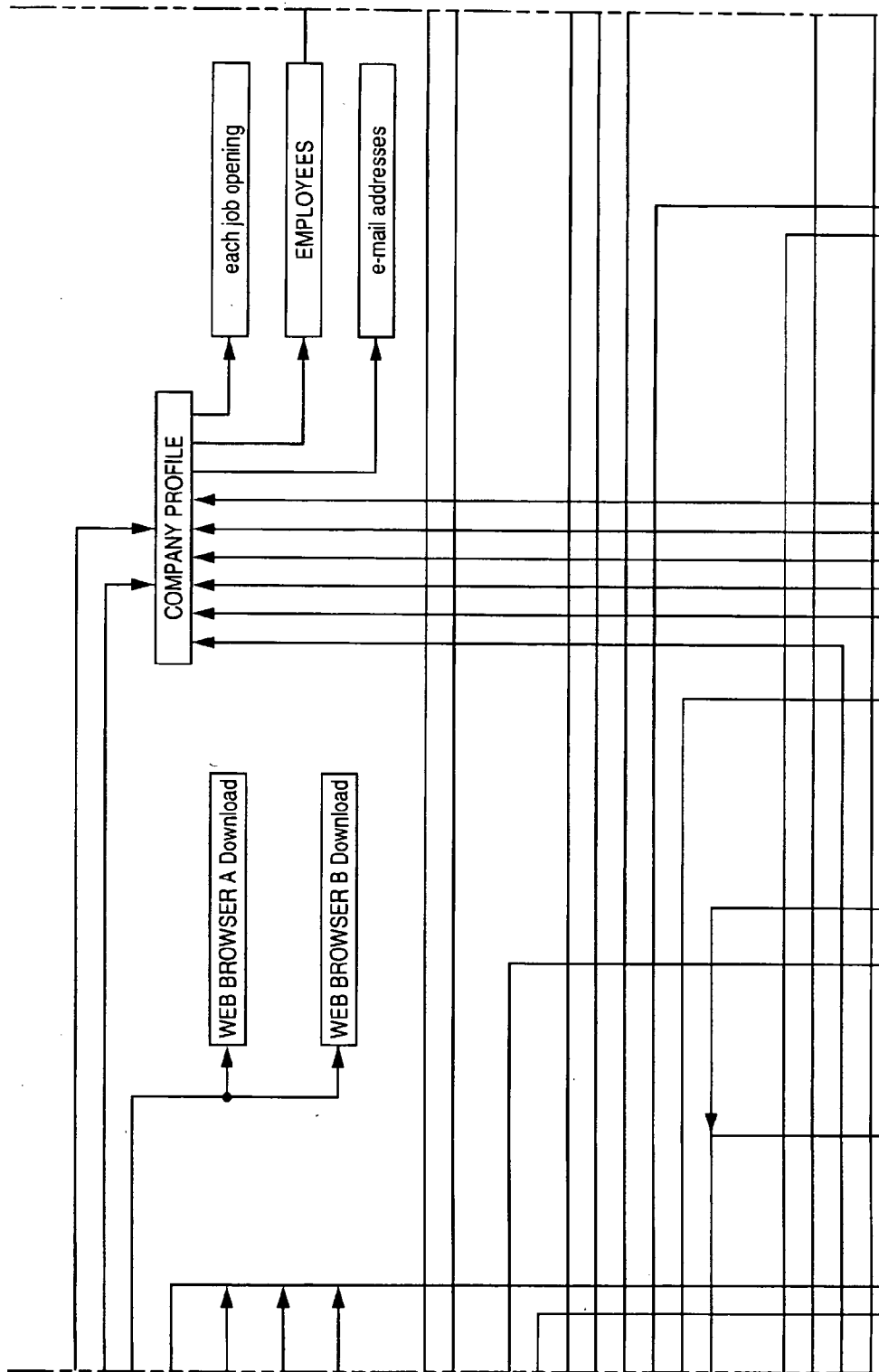
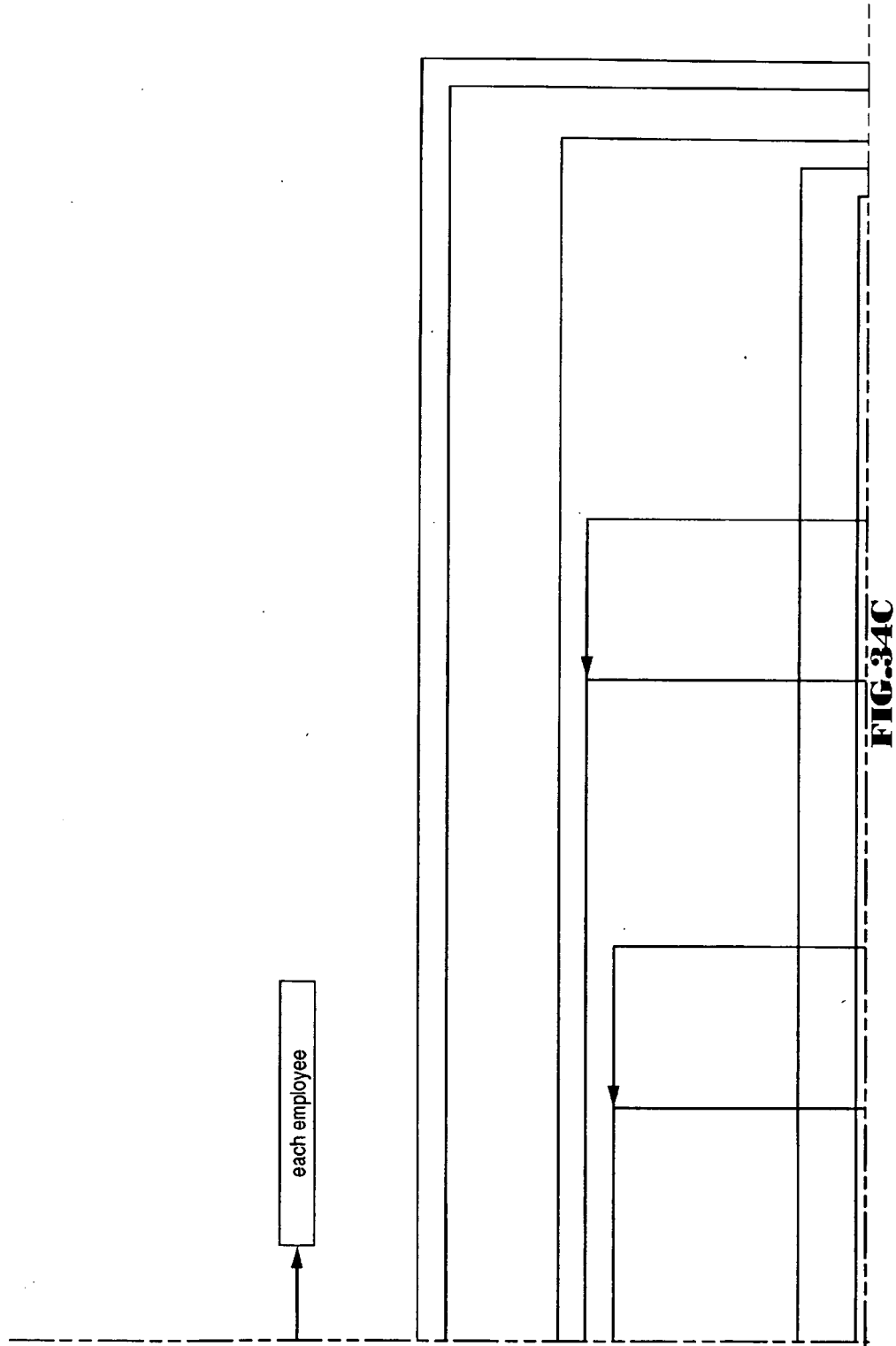


FIG. 34B



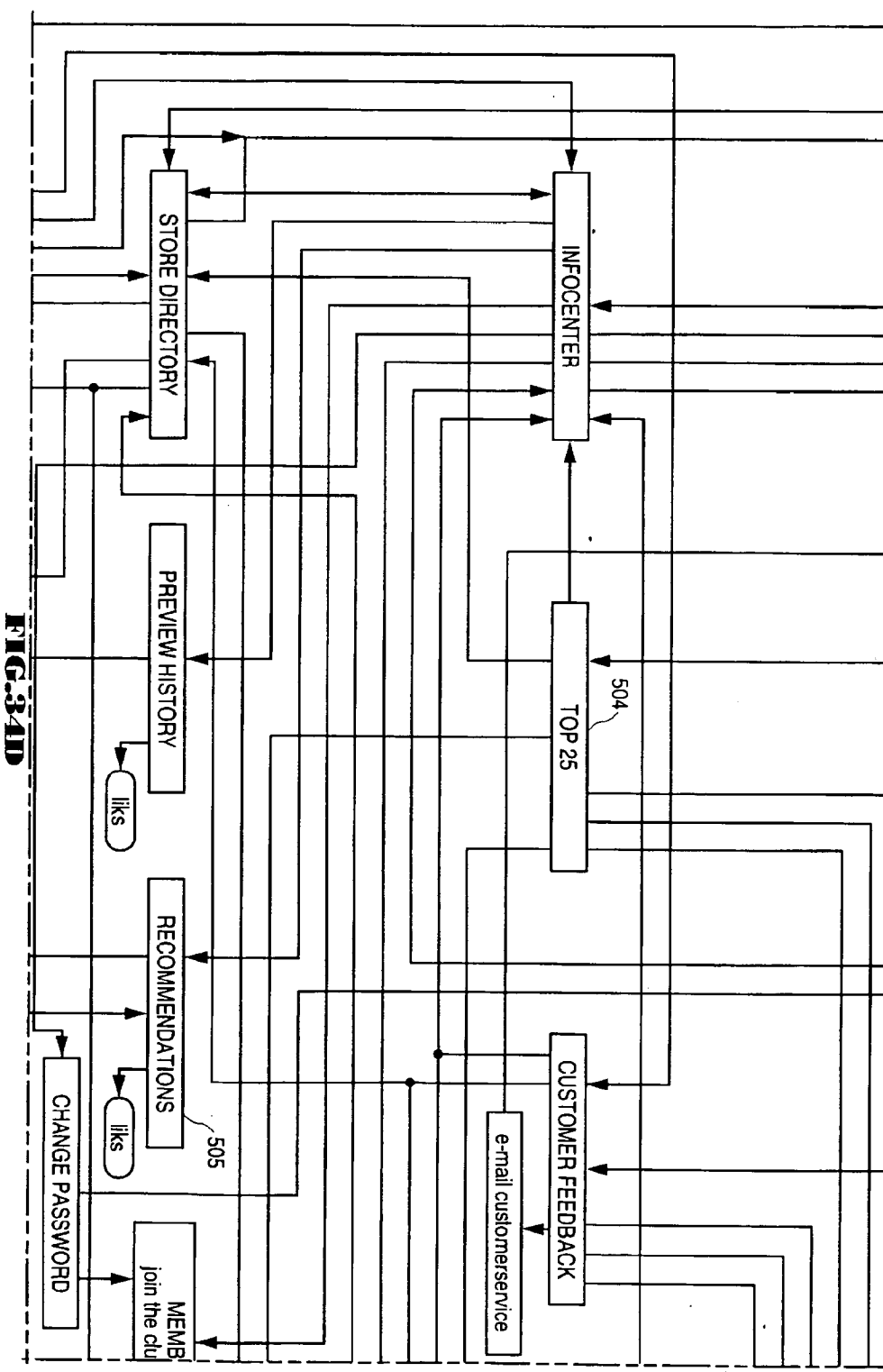


FIG. 34D

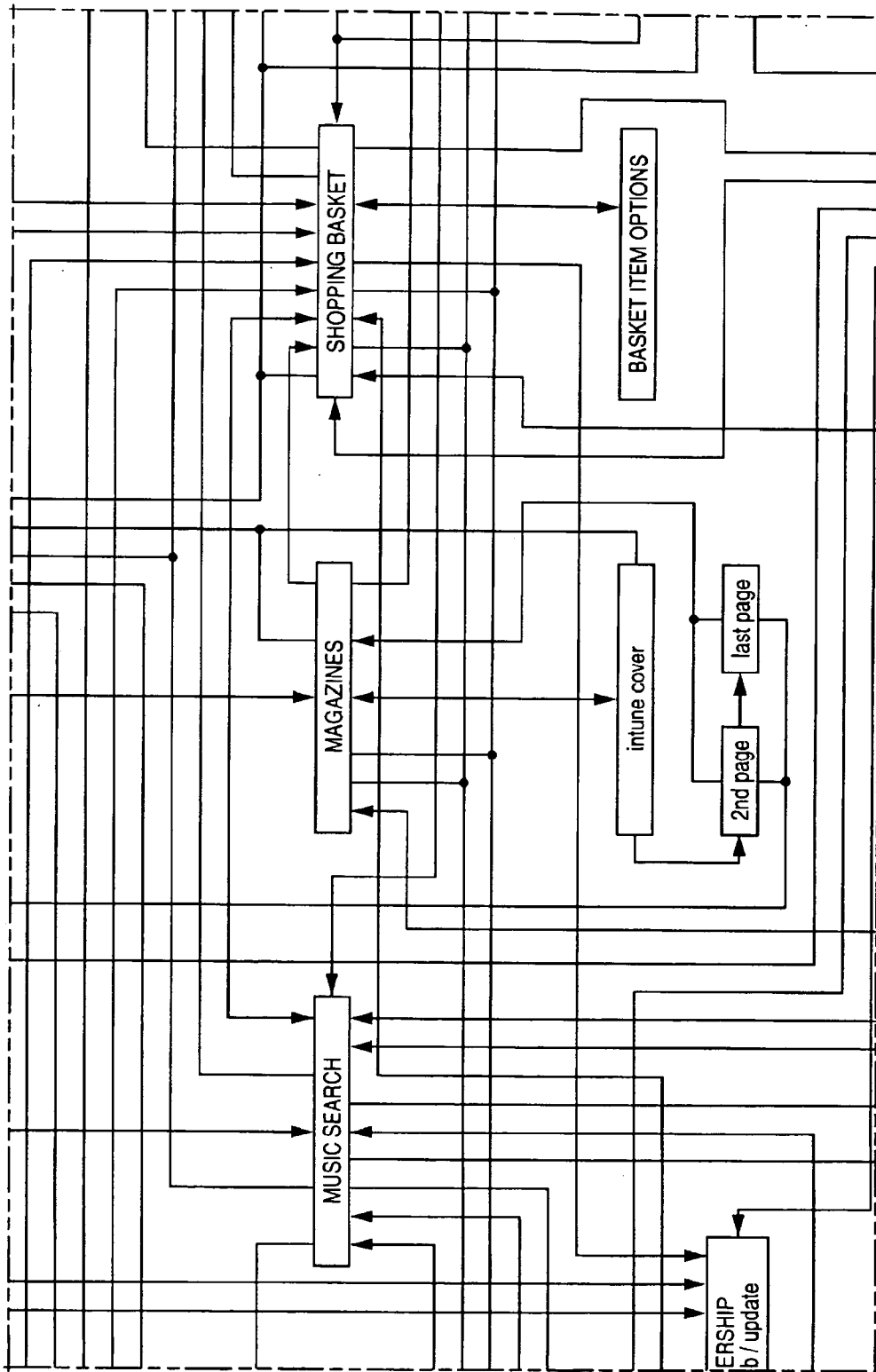


FIG. 34E

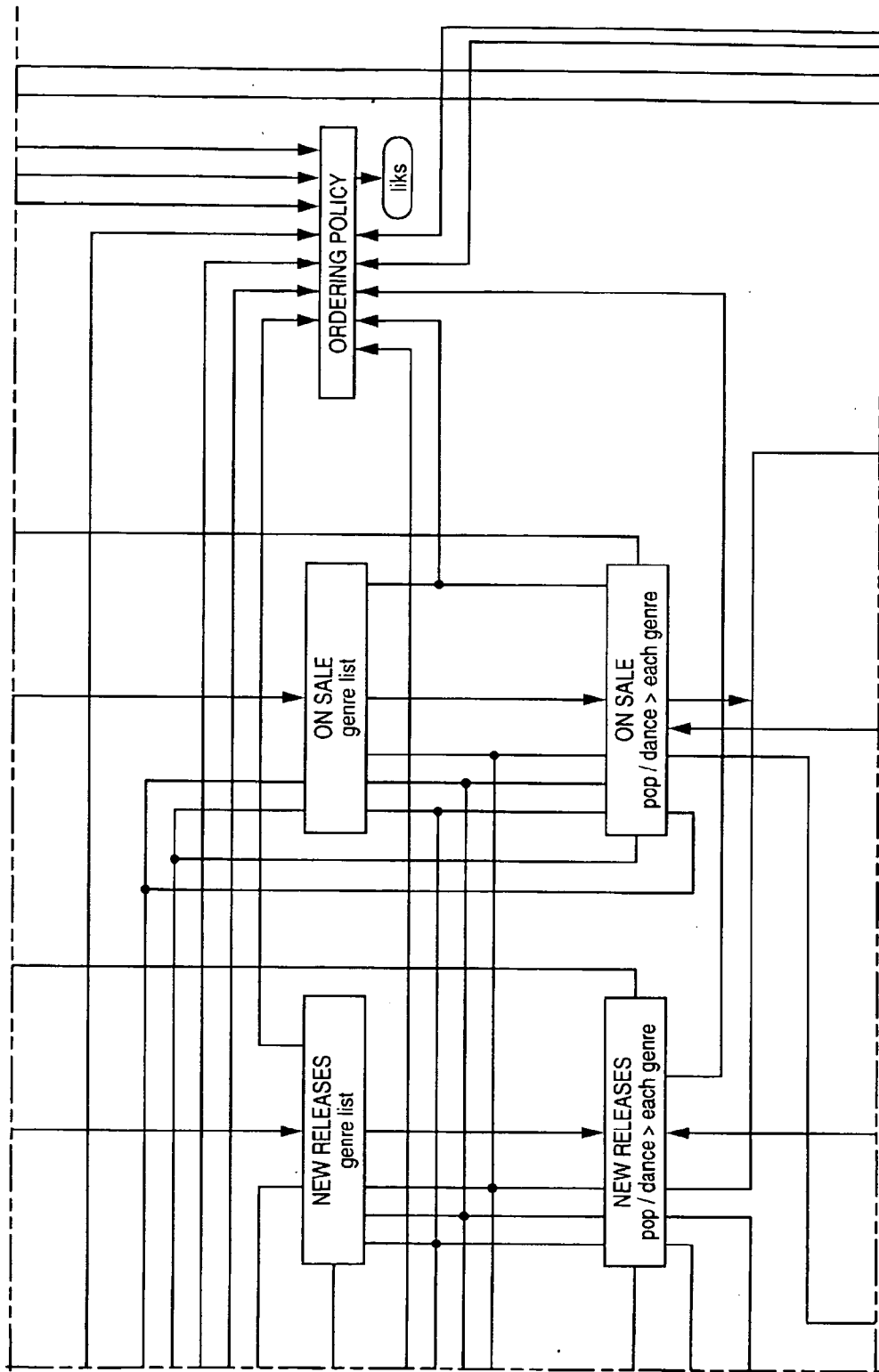


FIG. 34F

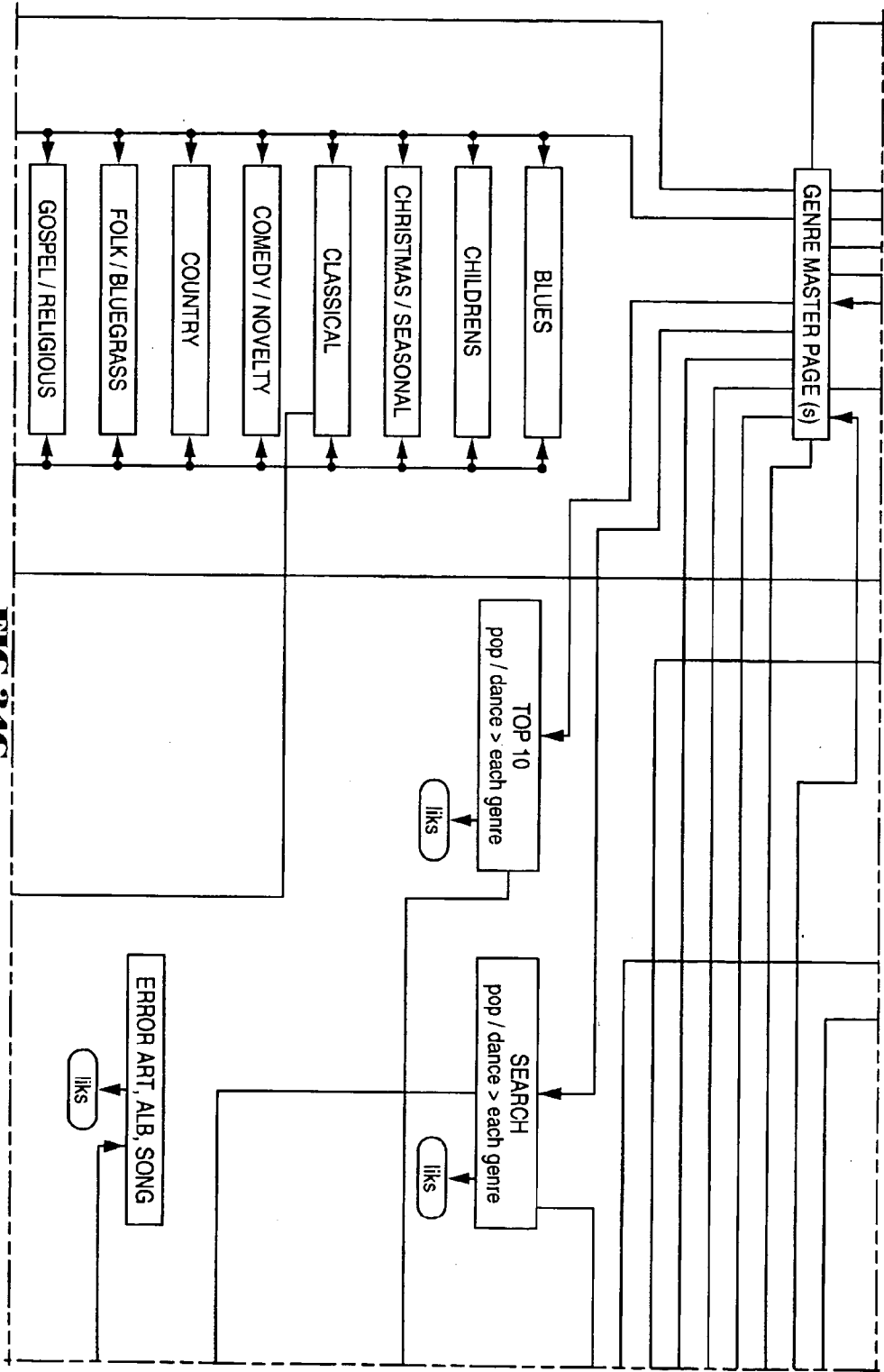


FIG. 34G

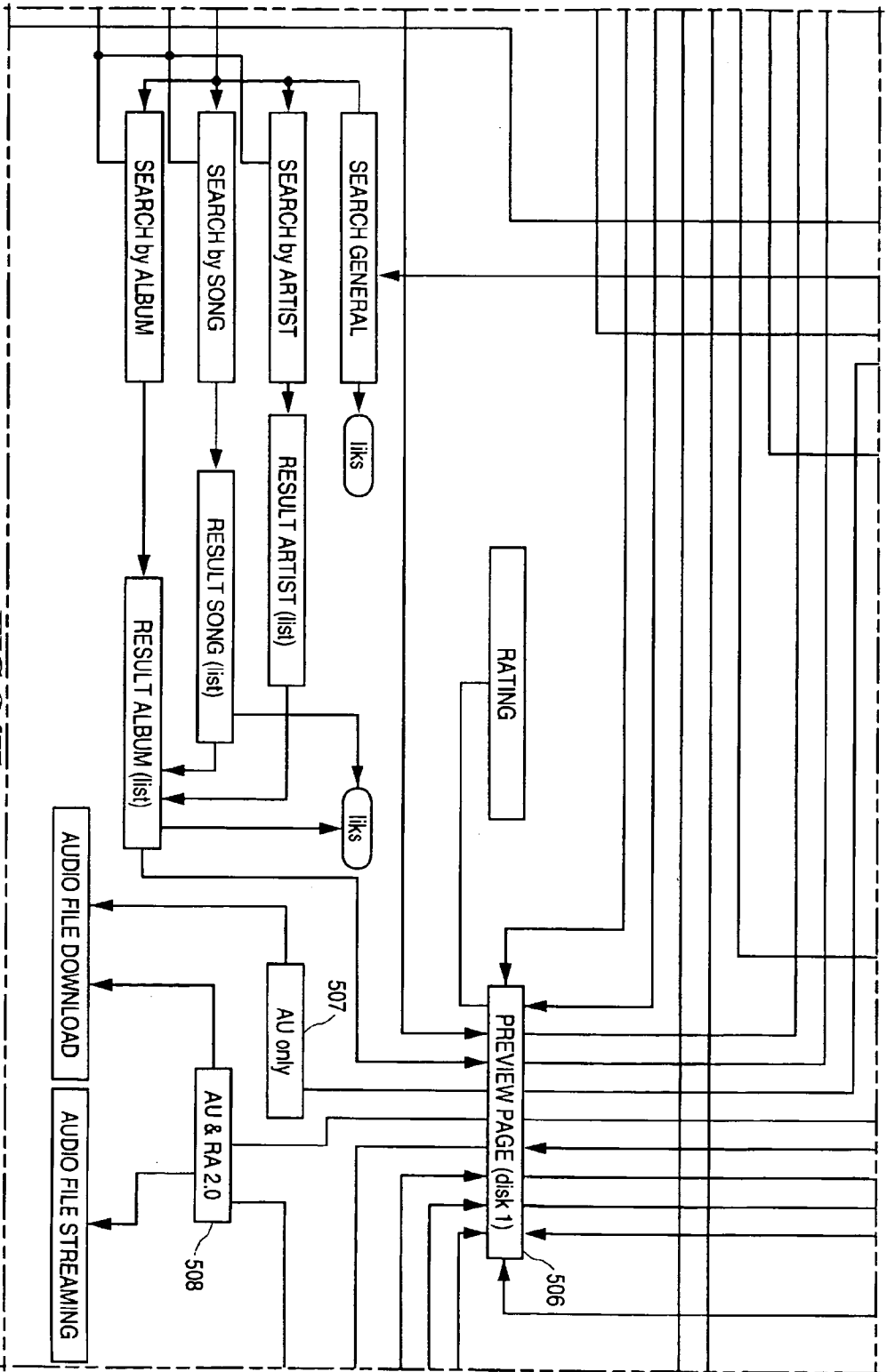


FIG. 34H

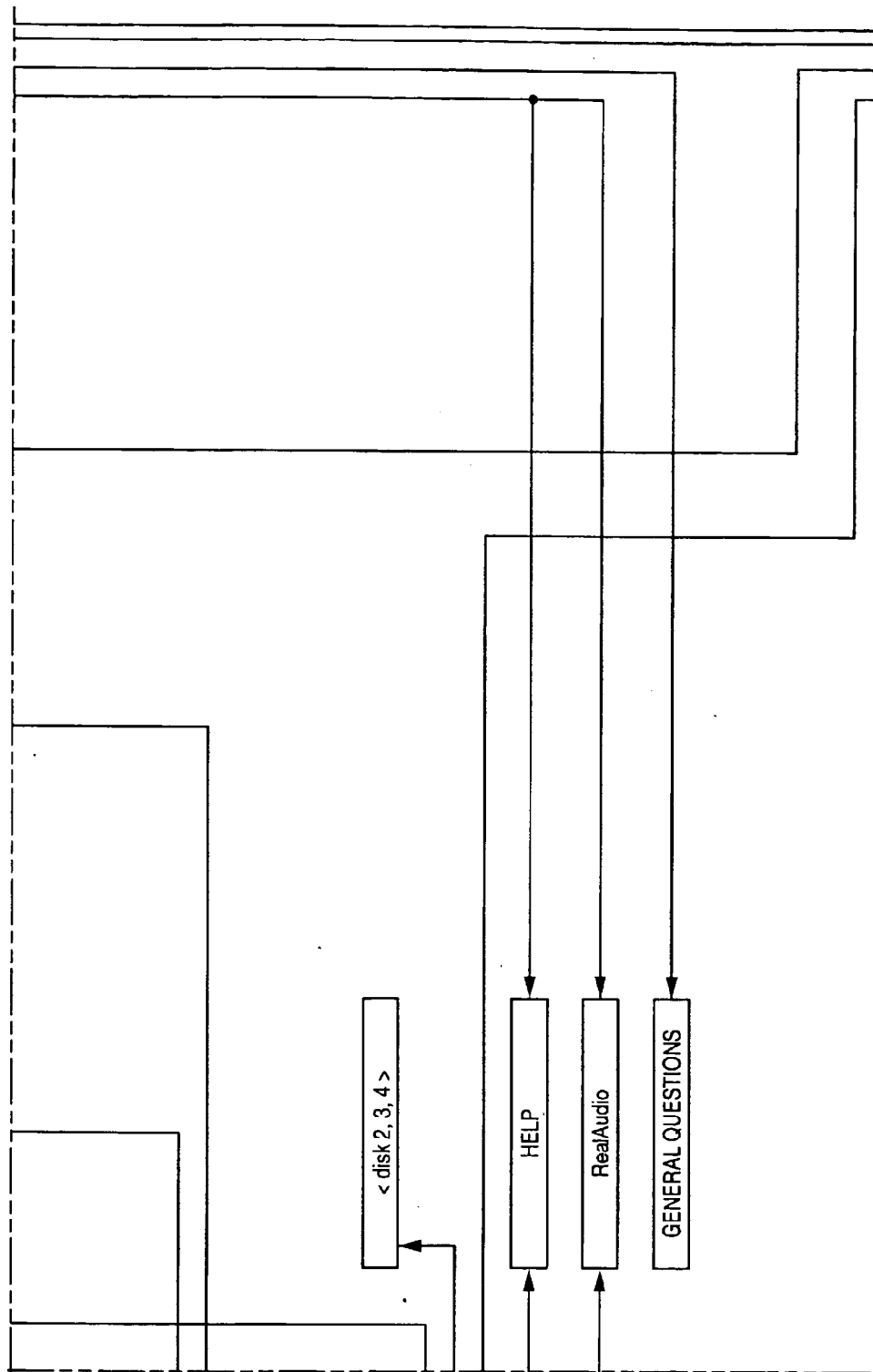


FIG. 34H

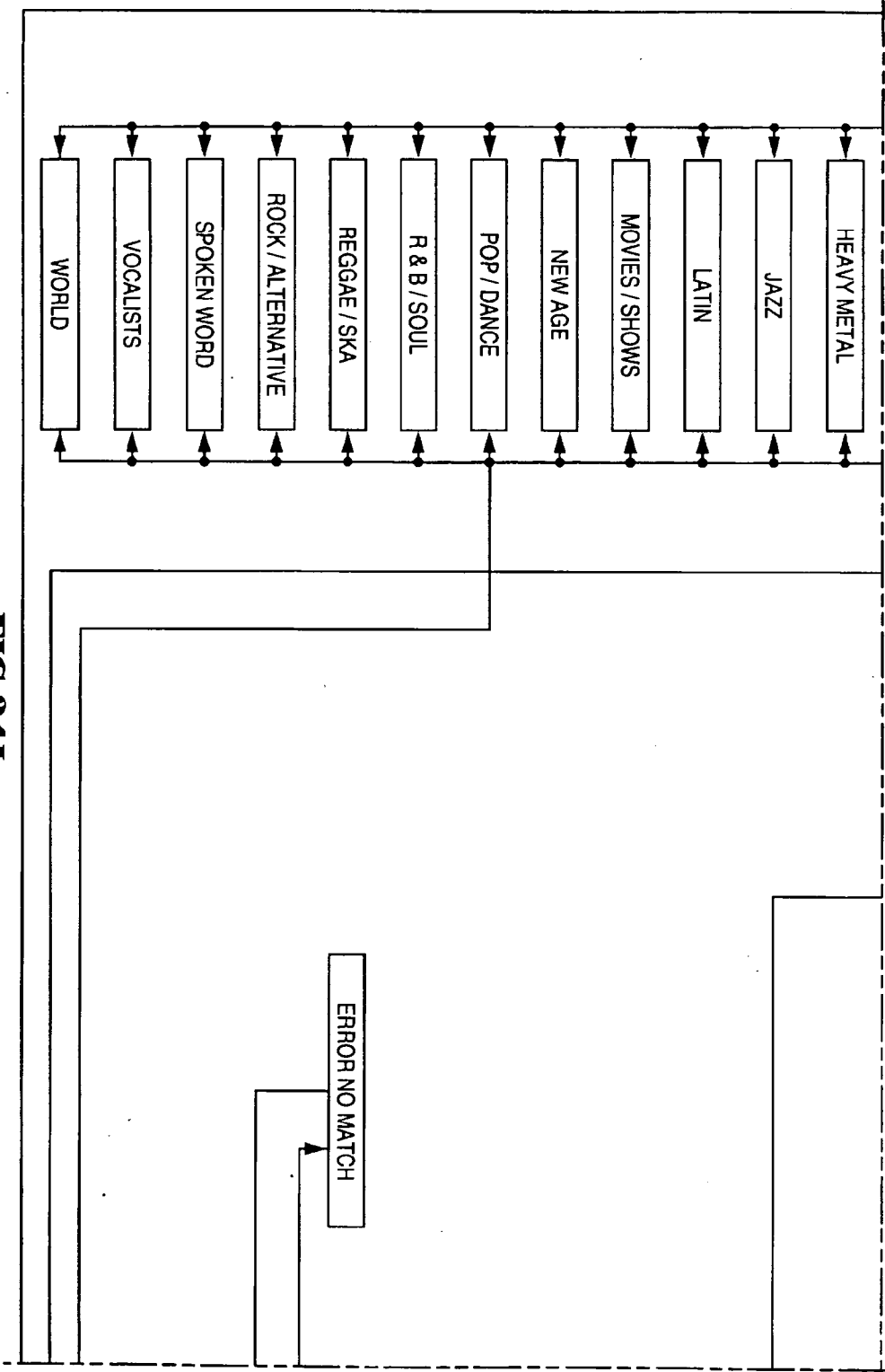


FIG. 34J

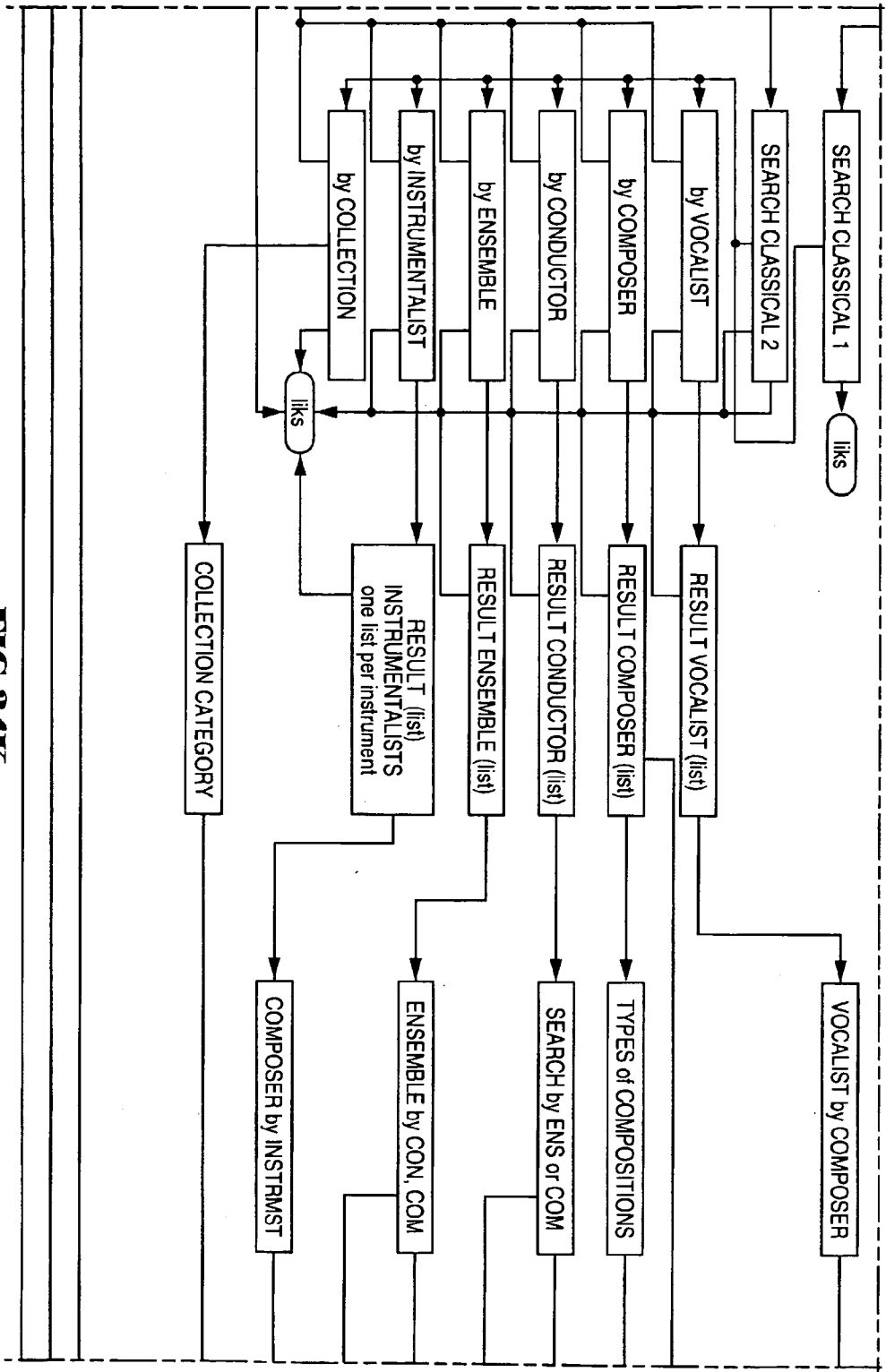


FIG. 34K

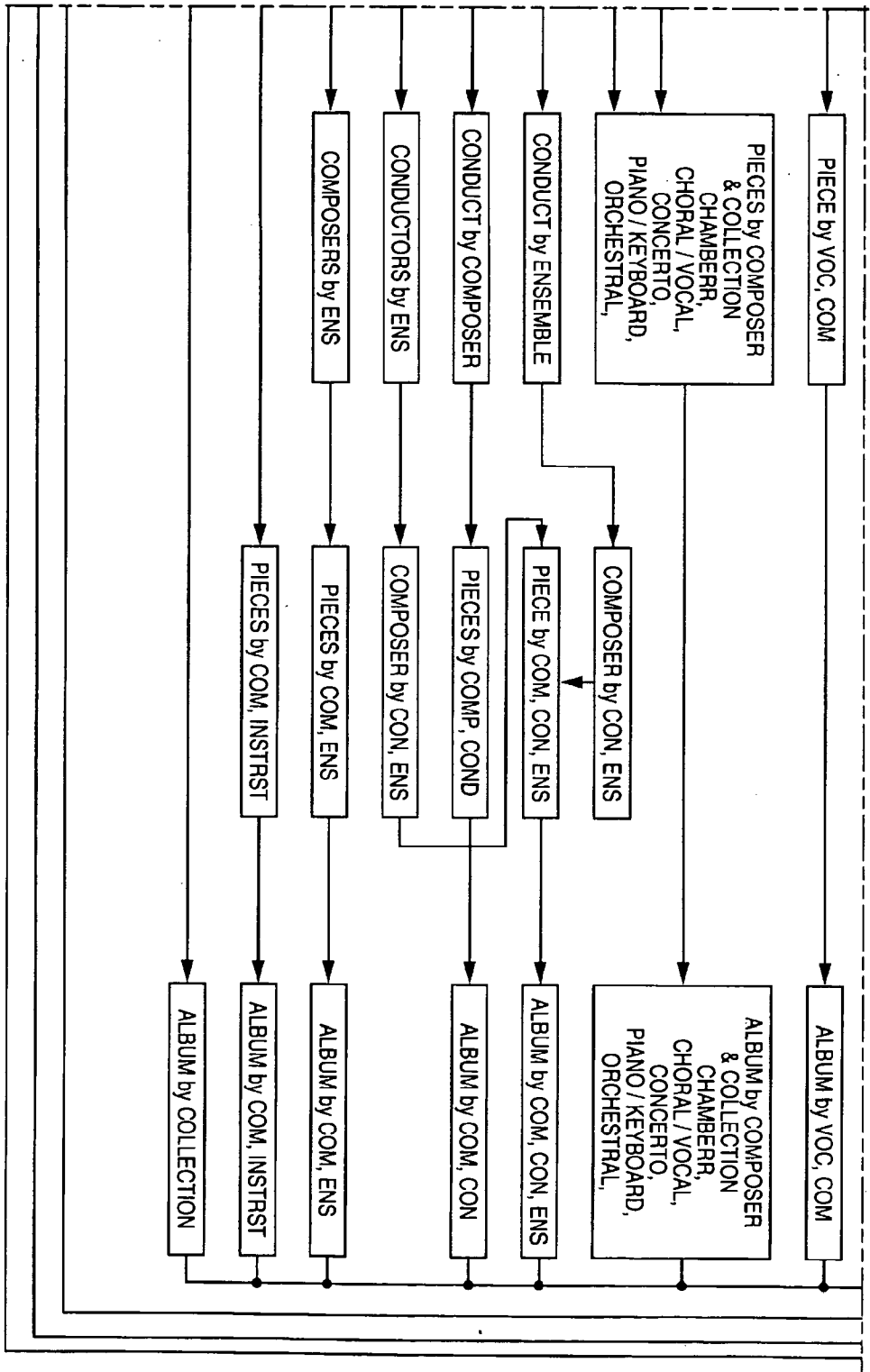


FIG.34L

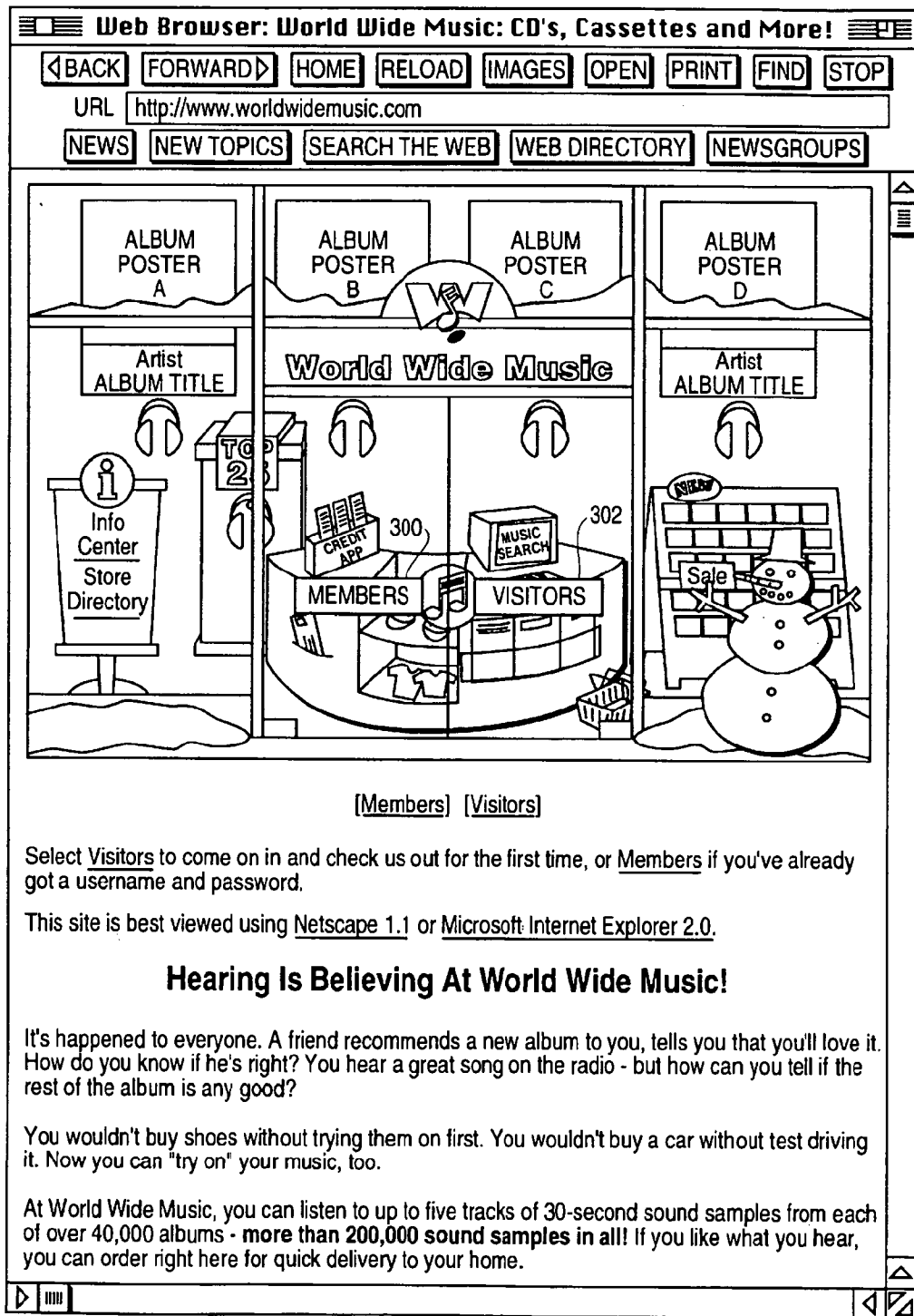
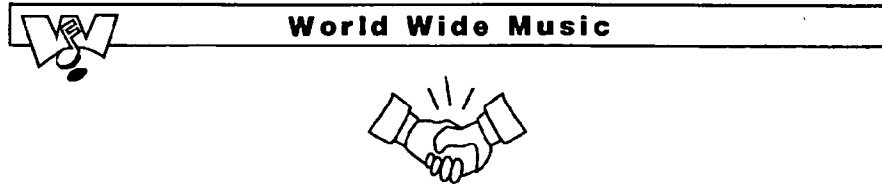


FIG.35



Update Your World Wide Music Club Membership Information

You can just change your username and a password if you want.

All your information is kept completely confidential.

First Name: Last Name:

E-mail Address:

Zip Code:

Date of Birth (MM/DD/YY)

Marital Status: Single Married

Gender: Male Female

Highest level of education you've completed:

Which best describes your ethnic or racial background:

Approximate annual household income (in US \$) (optional) :

Credit cards you use:

VISA Mastercard Discover American Express Other

Computers you use:

Mac-OS based Windows based DOS based UNIX based OS/2 based Other

Online services you use:

The Internet/The Web America Online CompuServe Prodigy Other
 Microsoft Network Genie Delphi Other

Slowest speed at which you often connect to the Web:

Video games machines you use:

Sega Nintendo 3DO Sony Playstation Atari Other

Hobbies/Interests (pick a few):

Cars Movies Sports Books Magazines Business/Financial
 The Web/The Internet

FIG.36

Video Games/CD-ROMs Software

User Name you would like to use:

Password you would like to use:

Please enter your password again:



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FIG.37

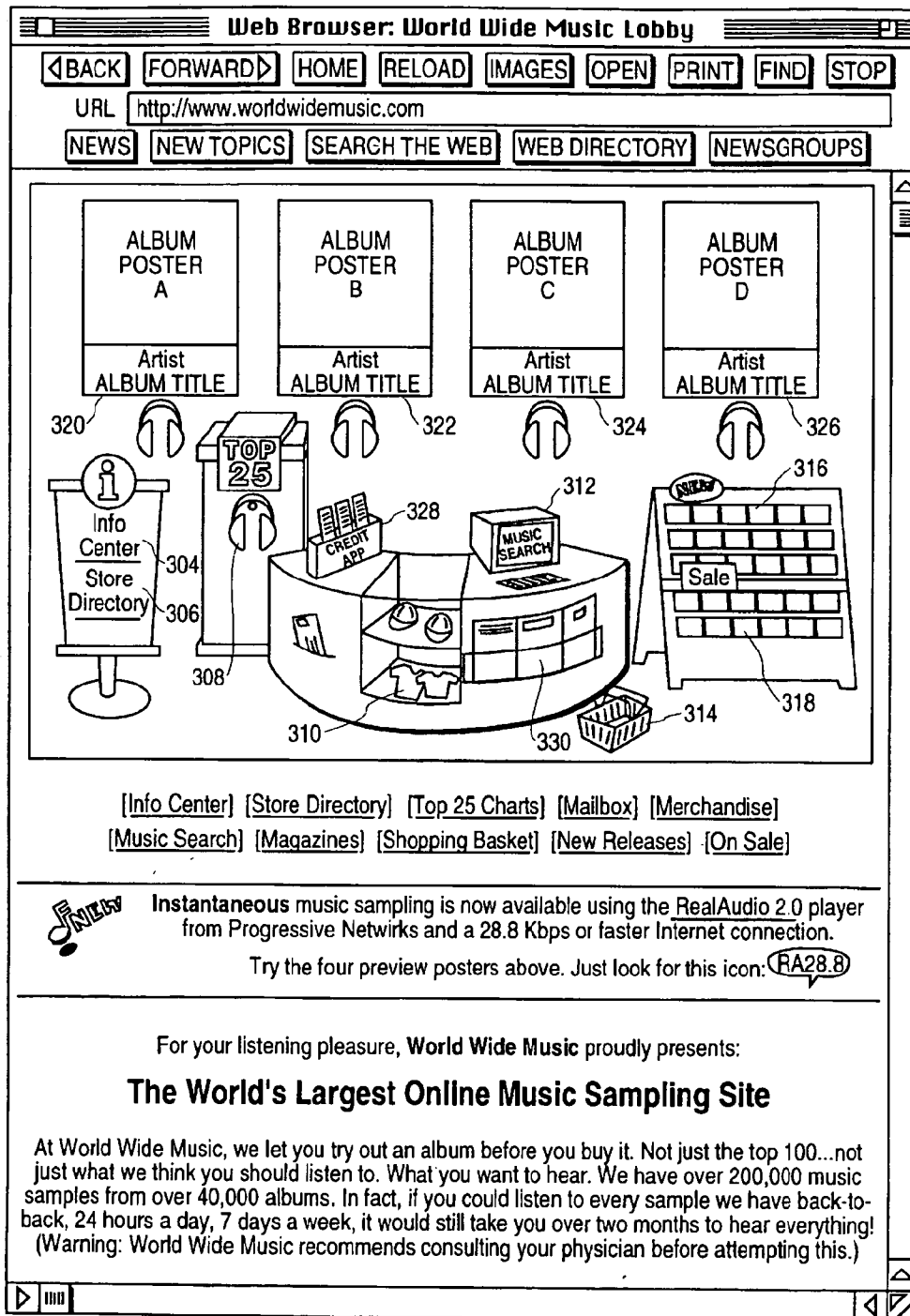


FIG.38

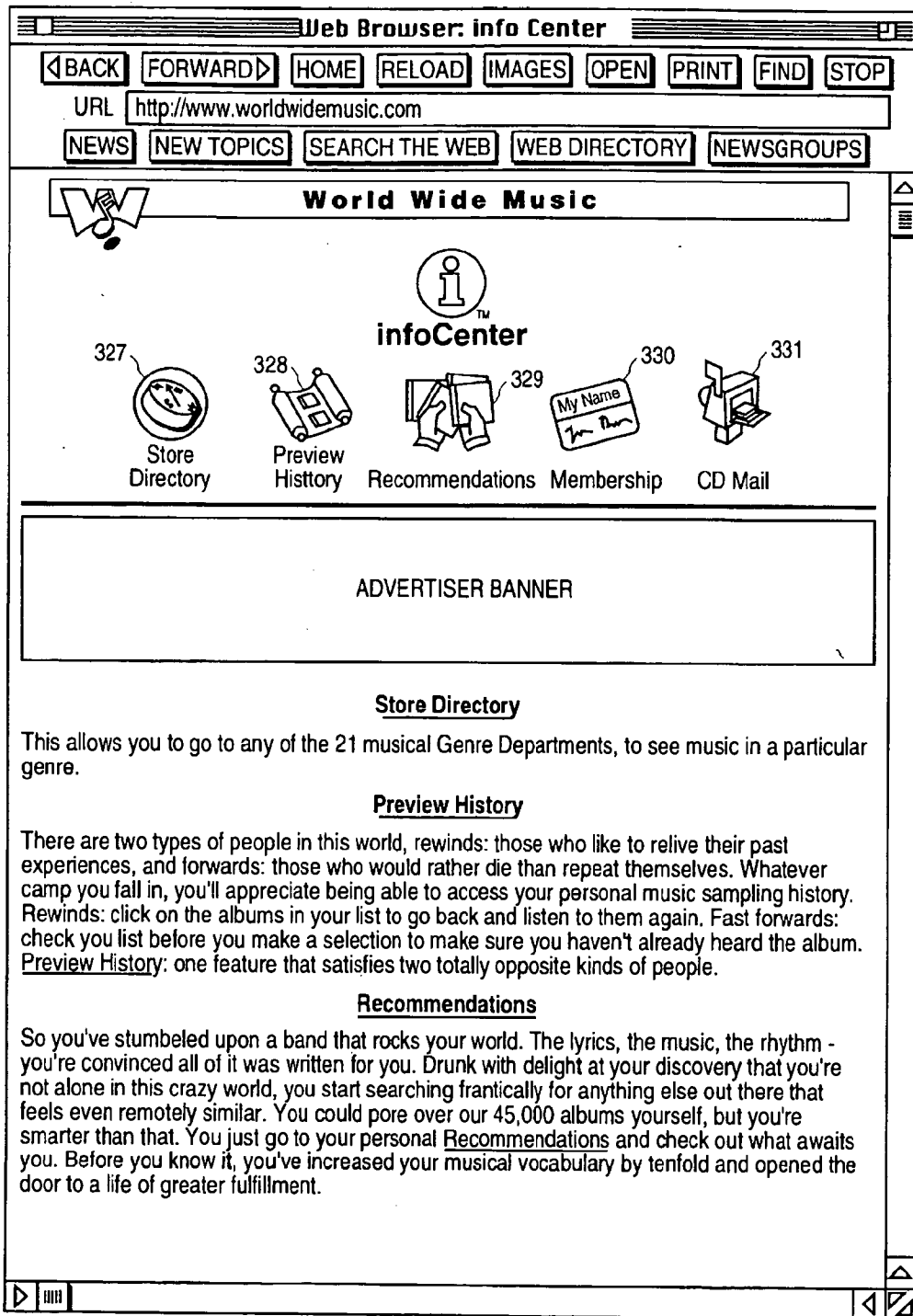


FIG.39

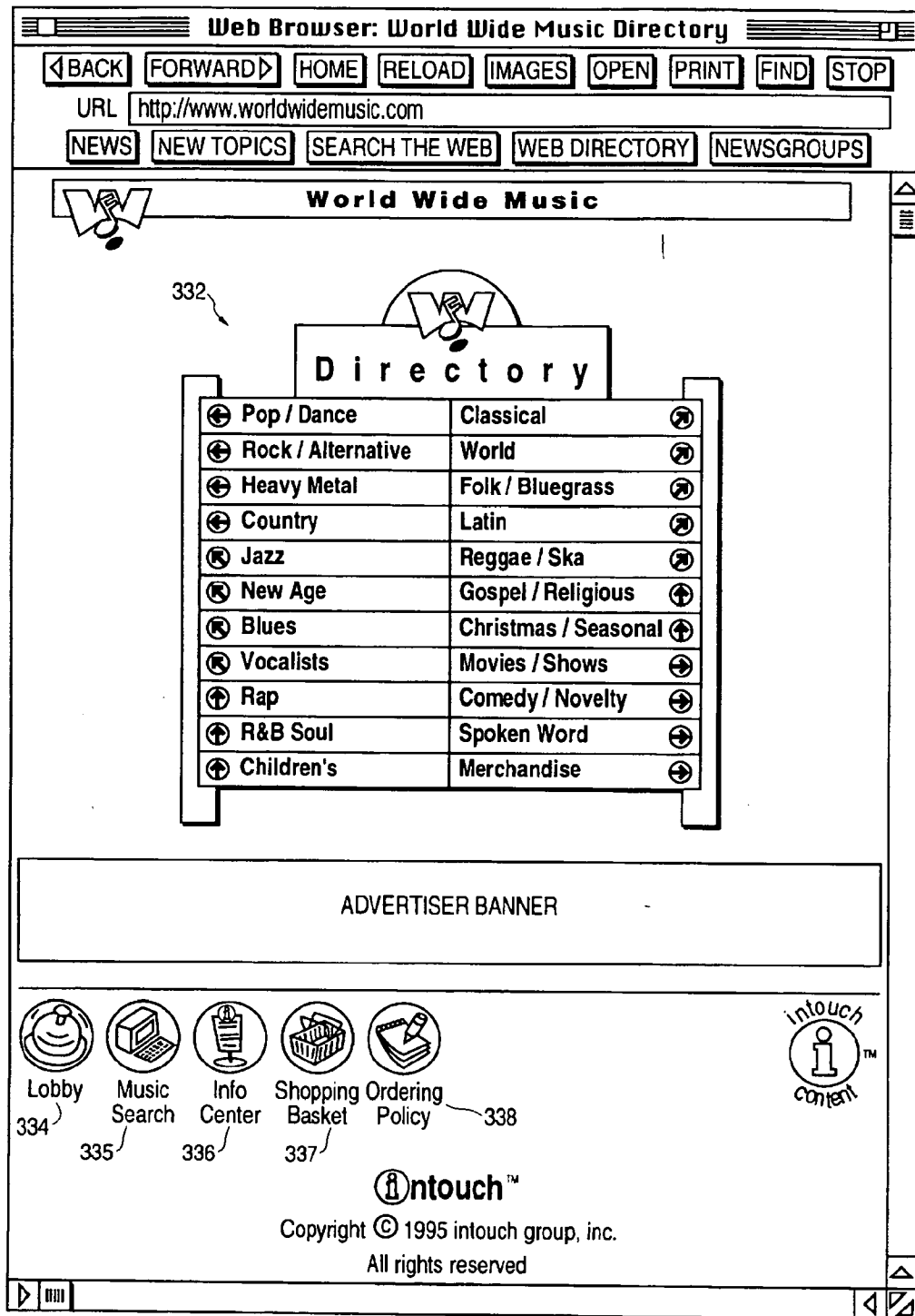


FIG.40

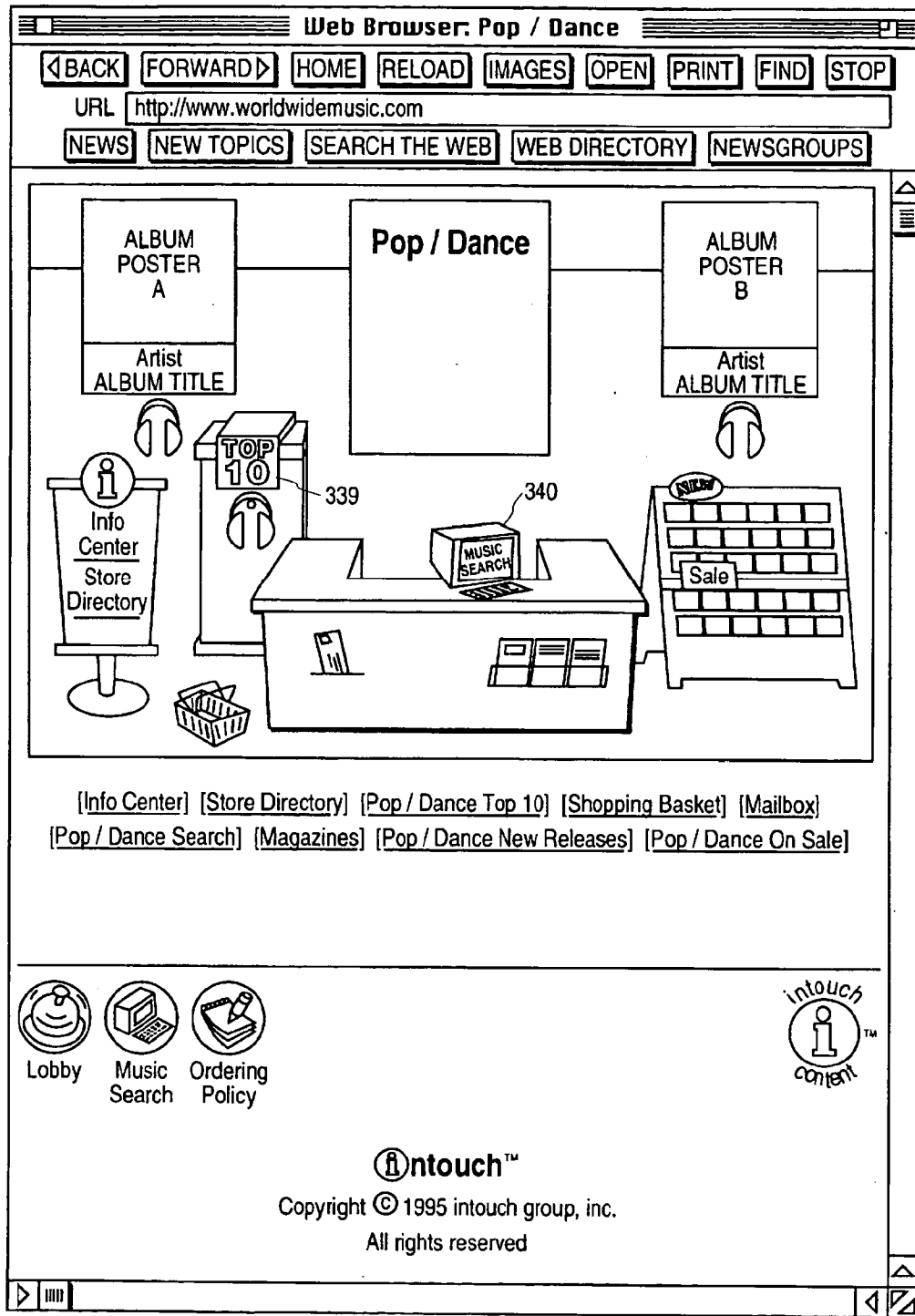


FIG. 41

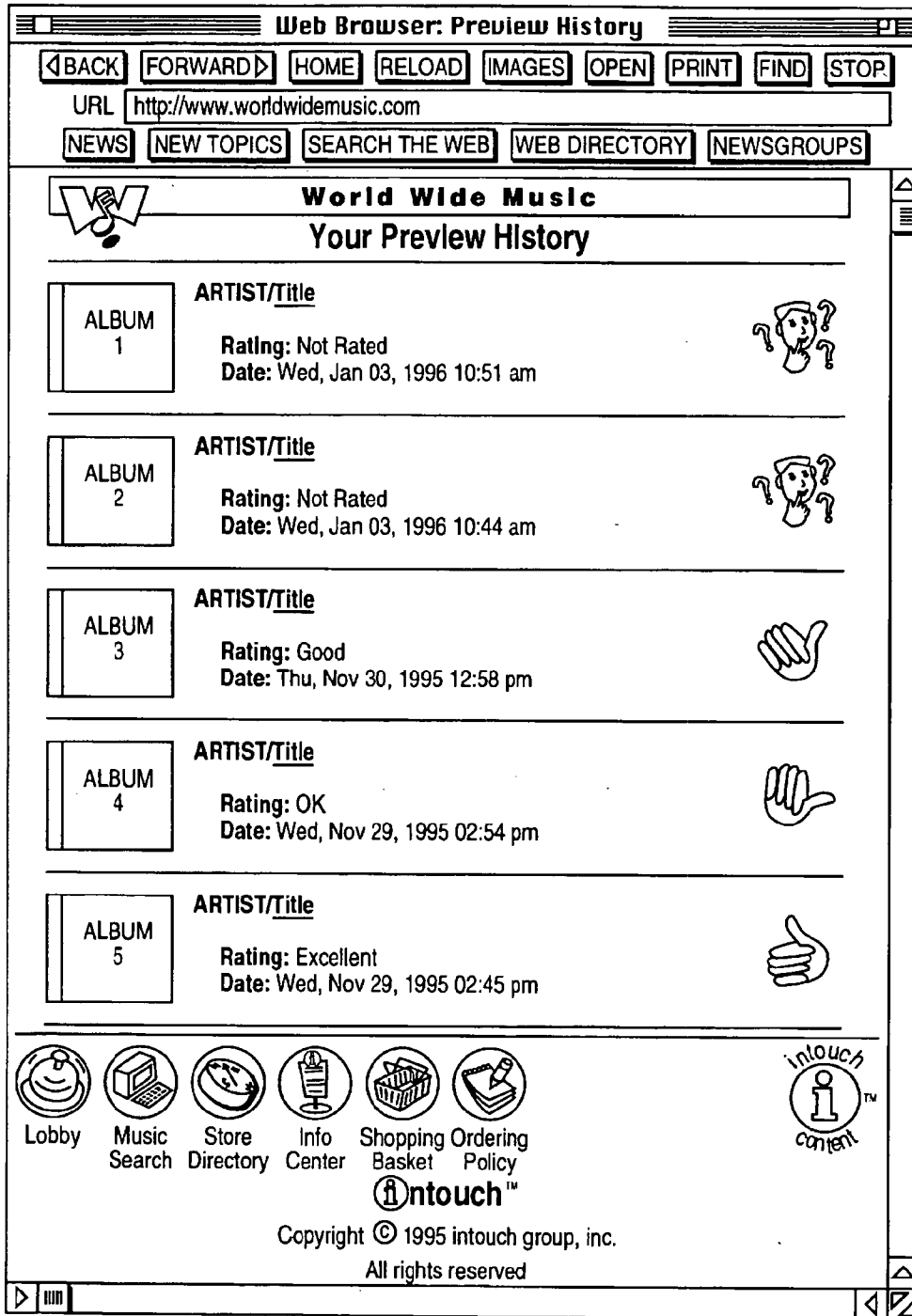


FIG.42

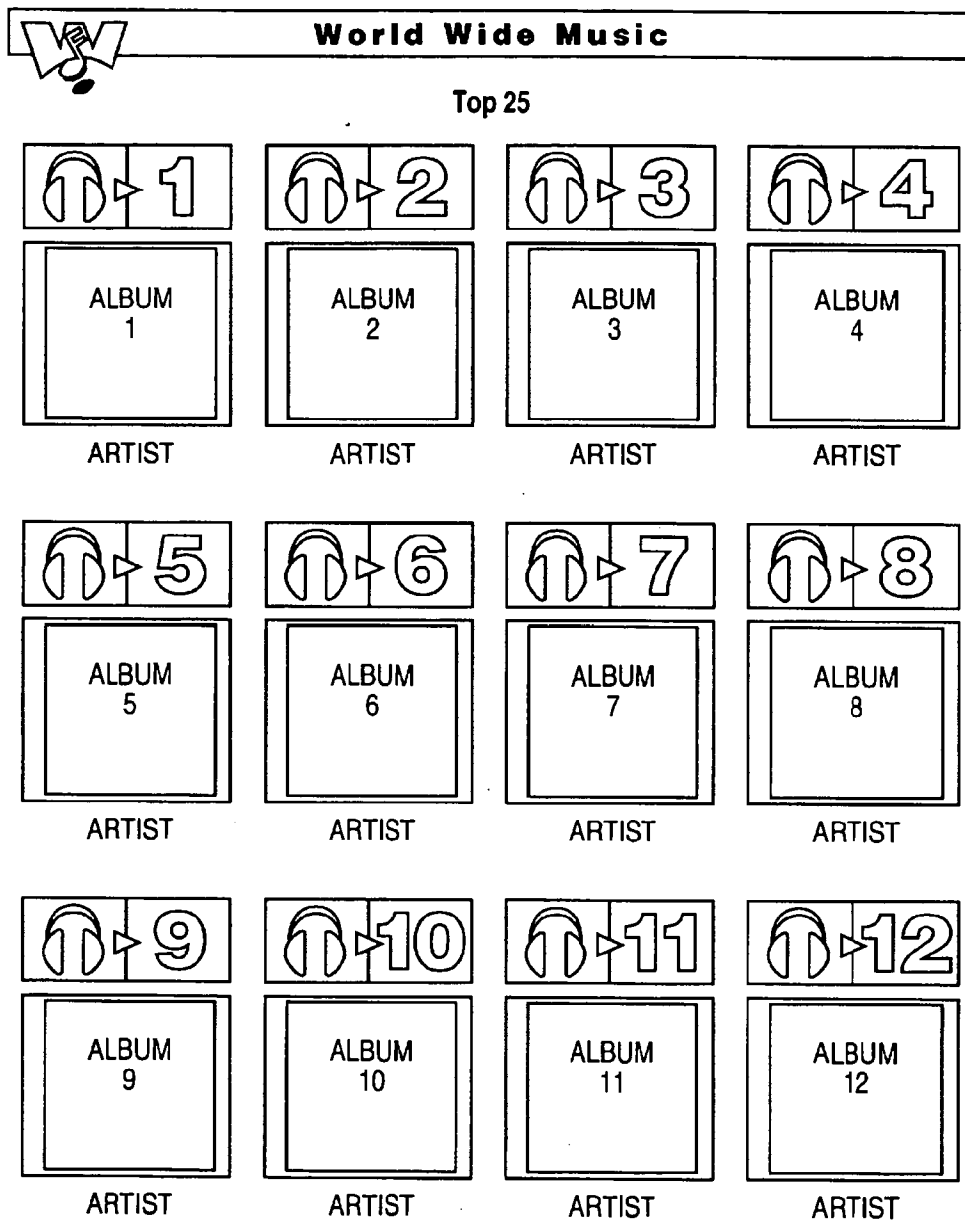


FIG.43

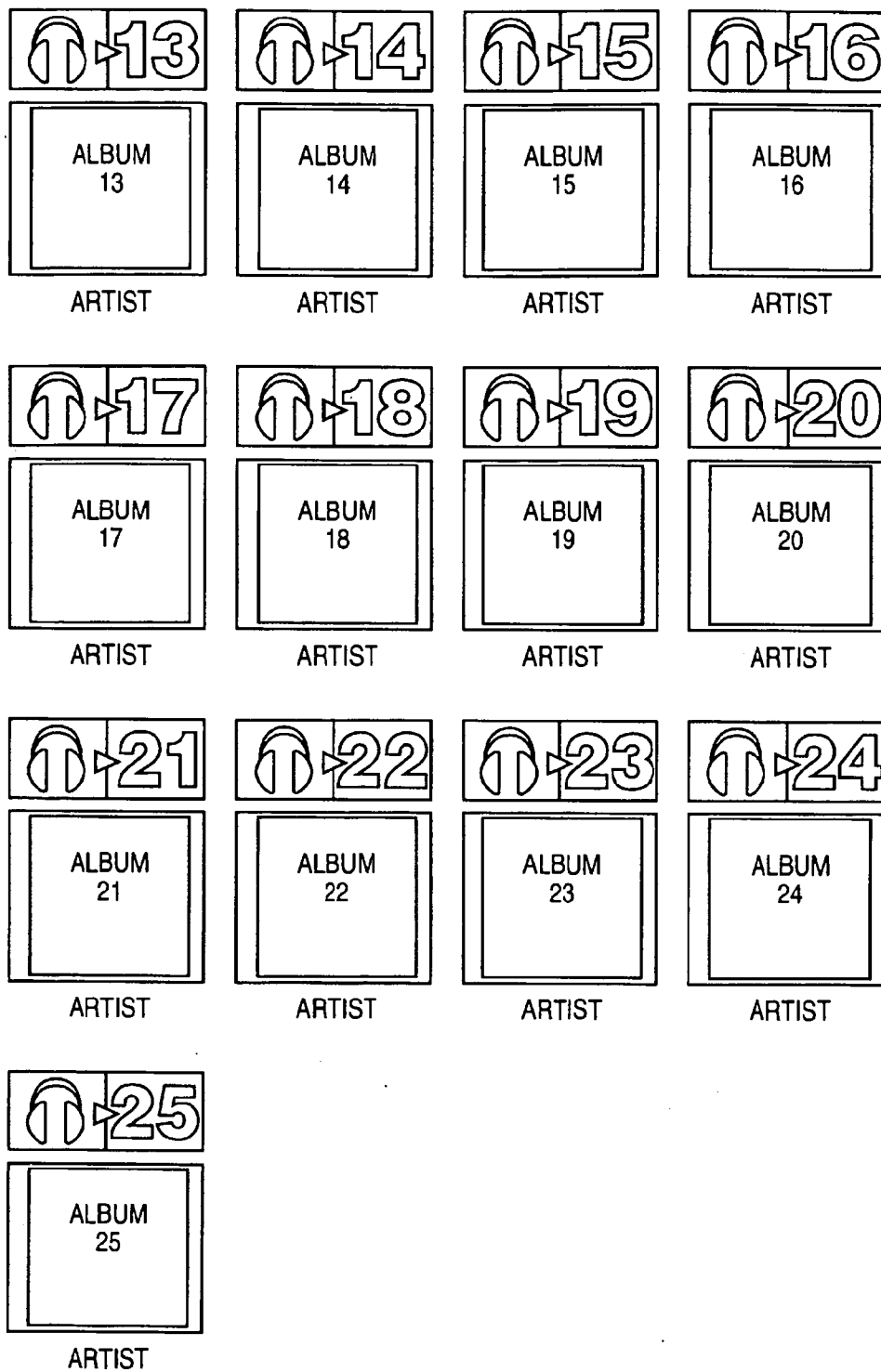
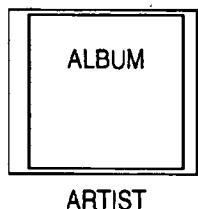


FIG.44



Lobby

Store
Directory

Info
Center

Shopping
Basket

Ordering
Policy



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FIG.45

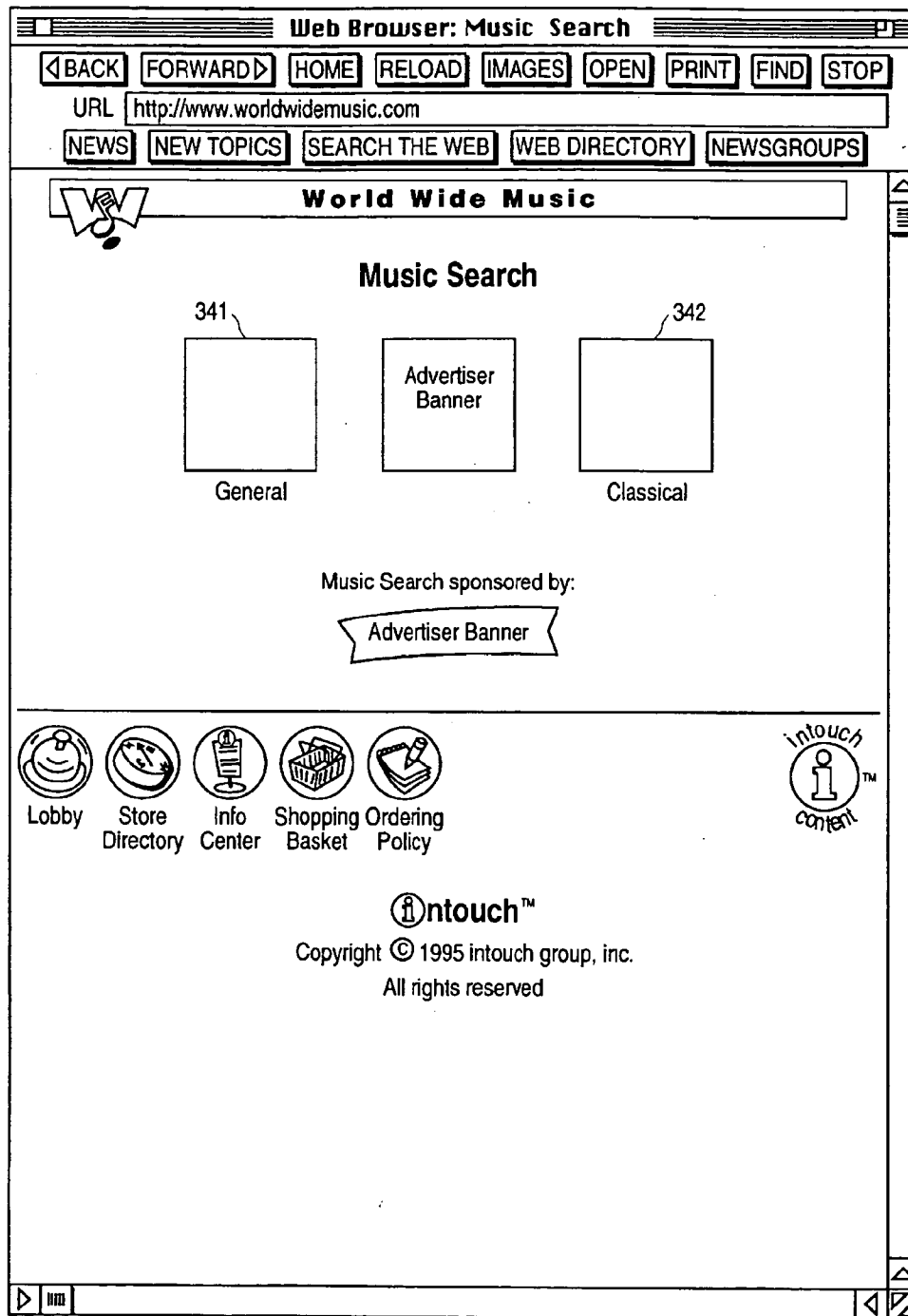


FIG. 46

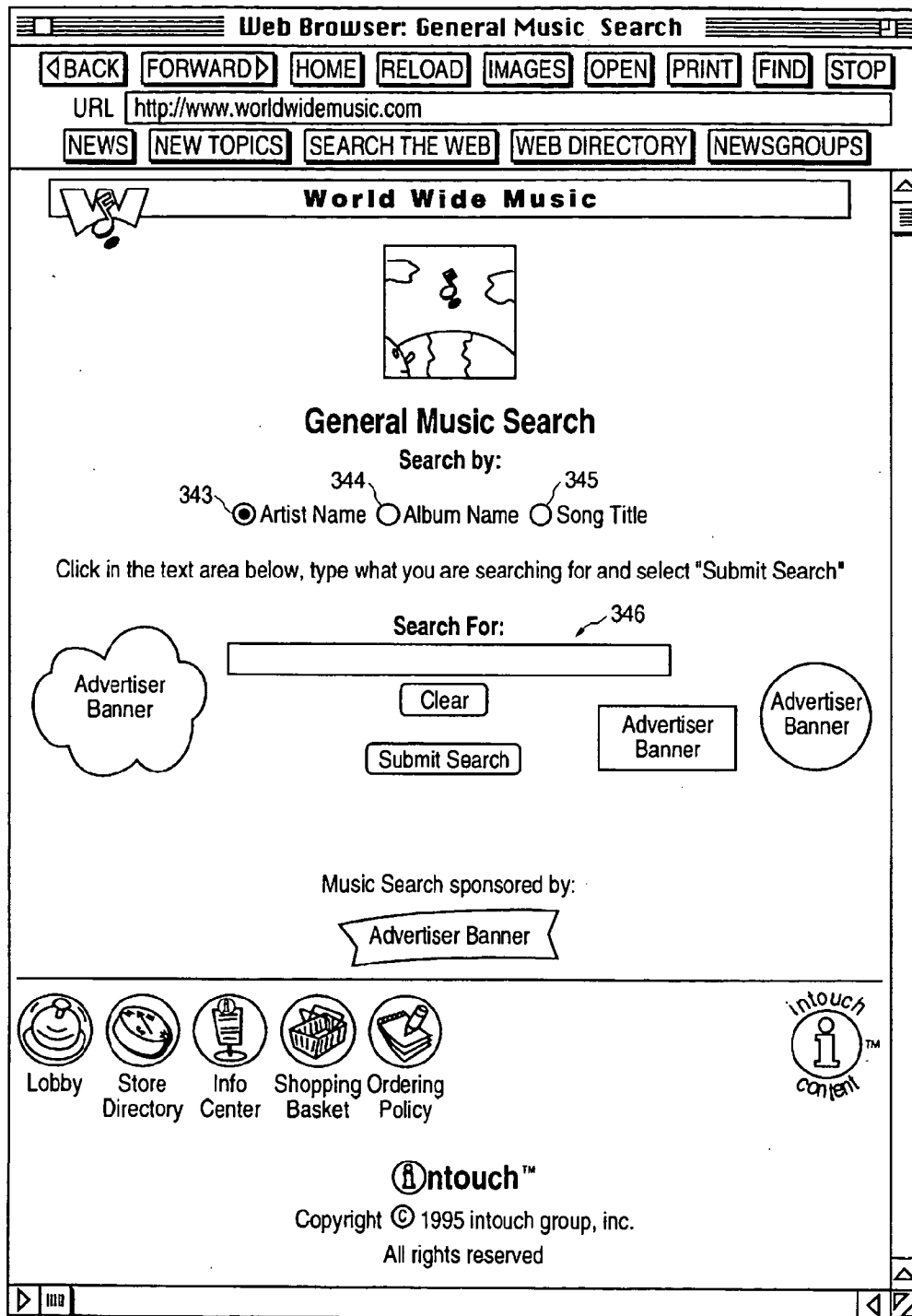


FIG.47

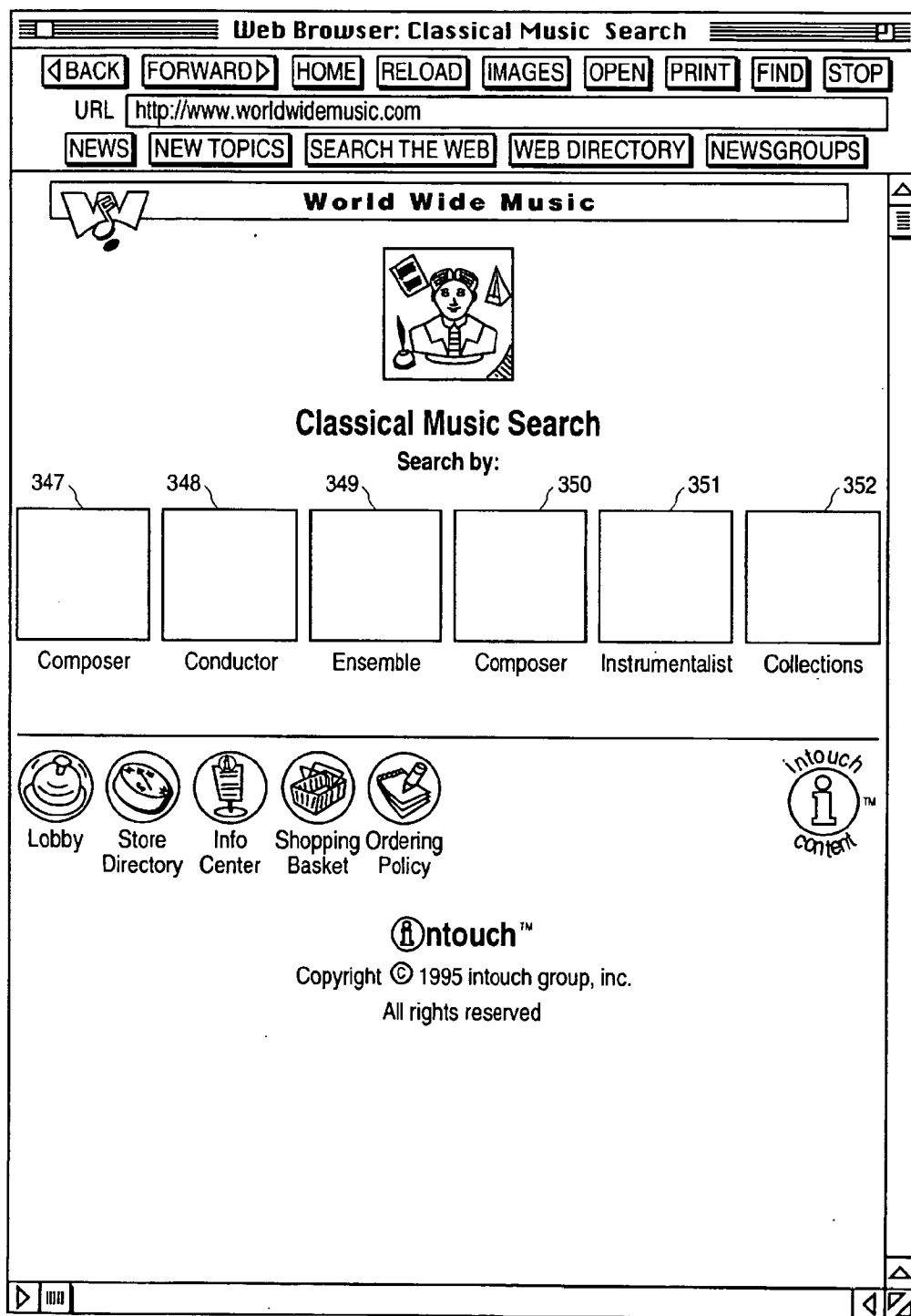


FIG.48

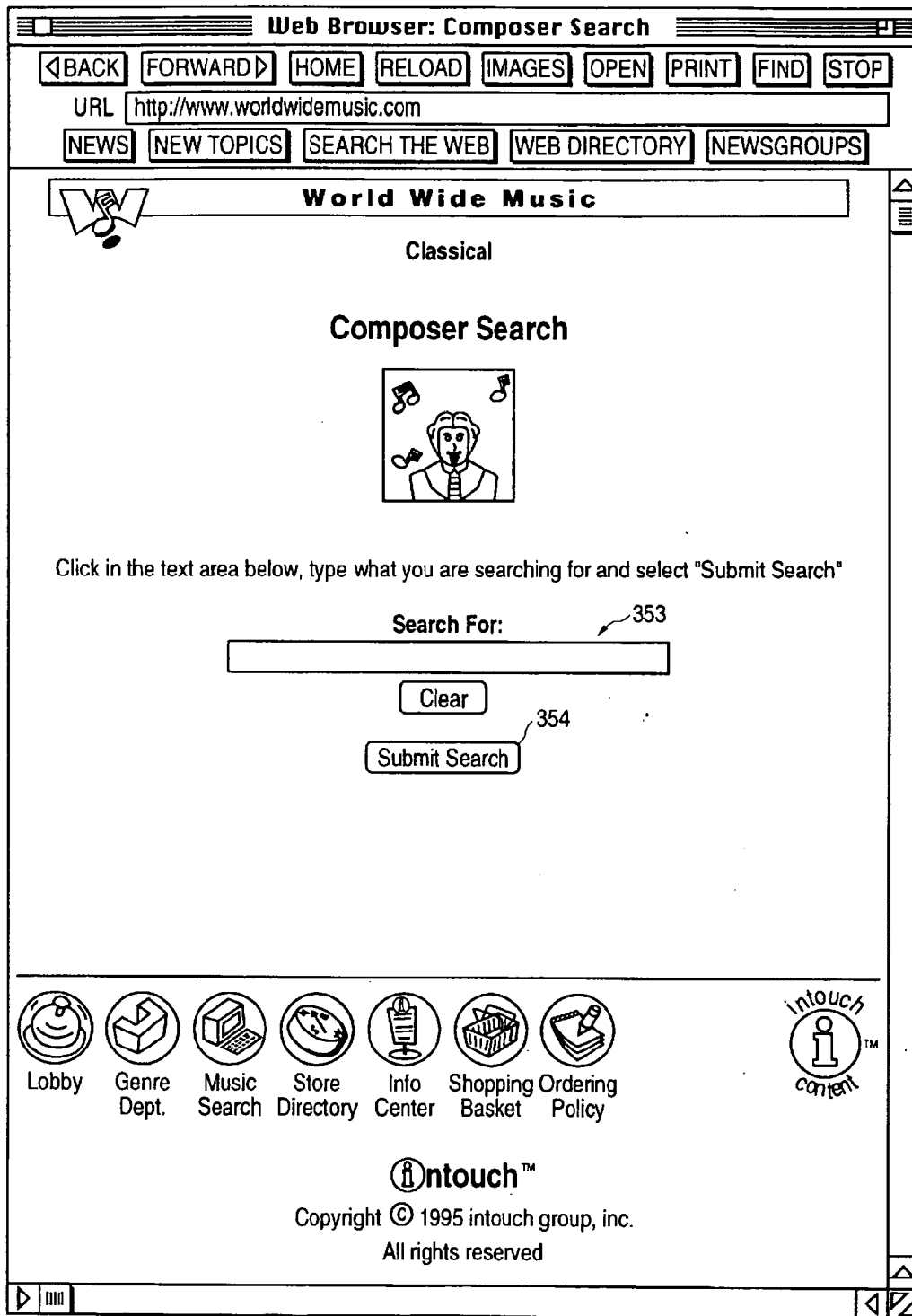


FIG.49

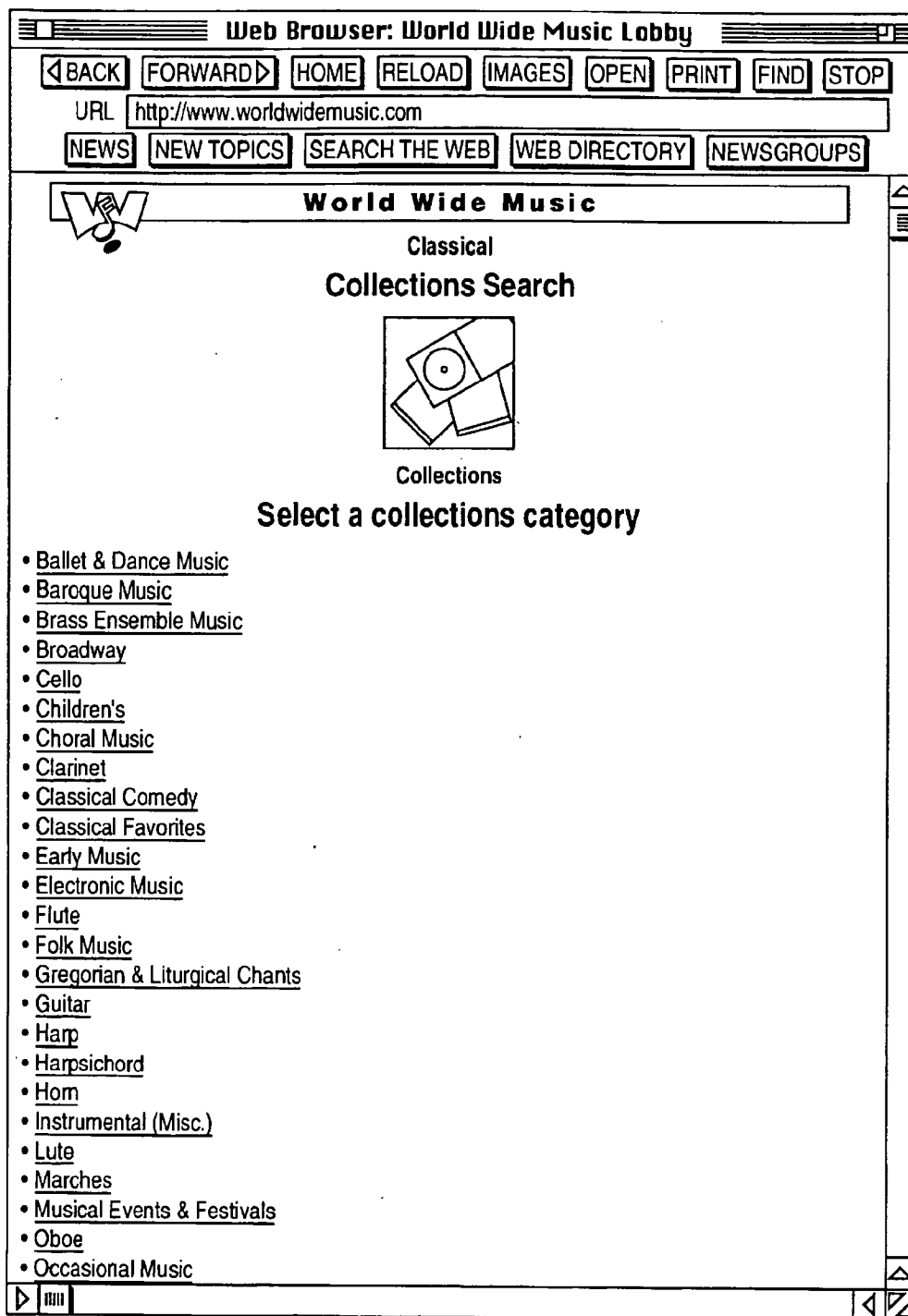


FIG.50

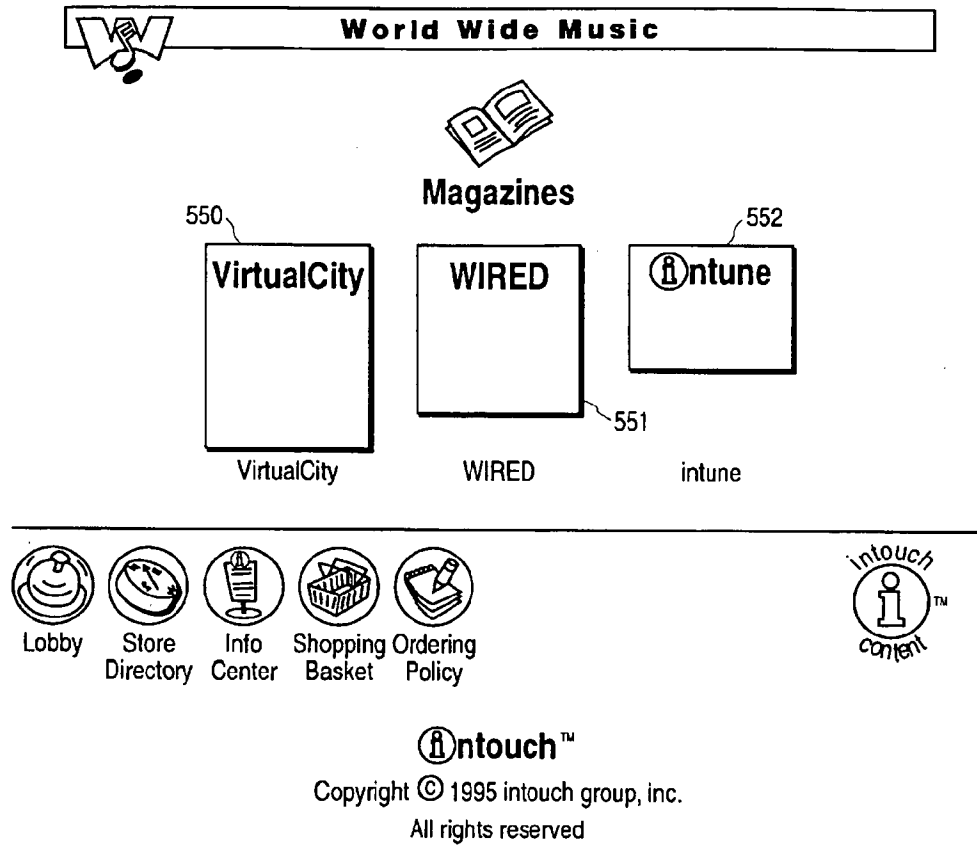


FIG.51

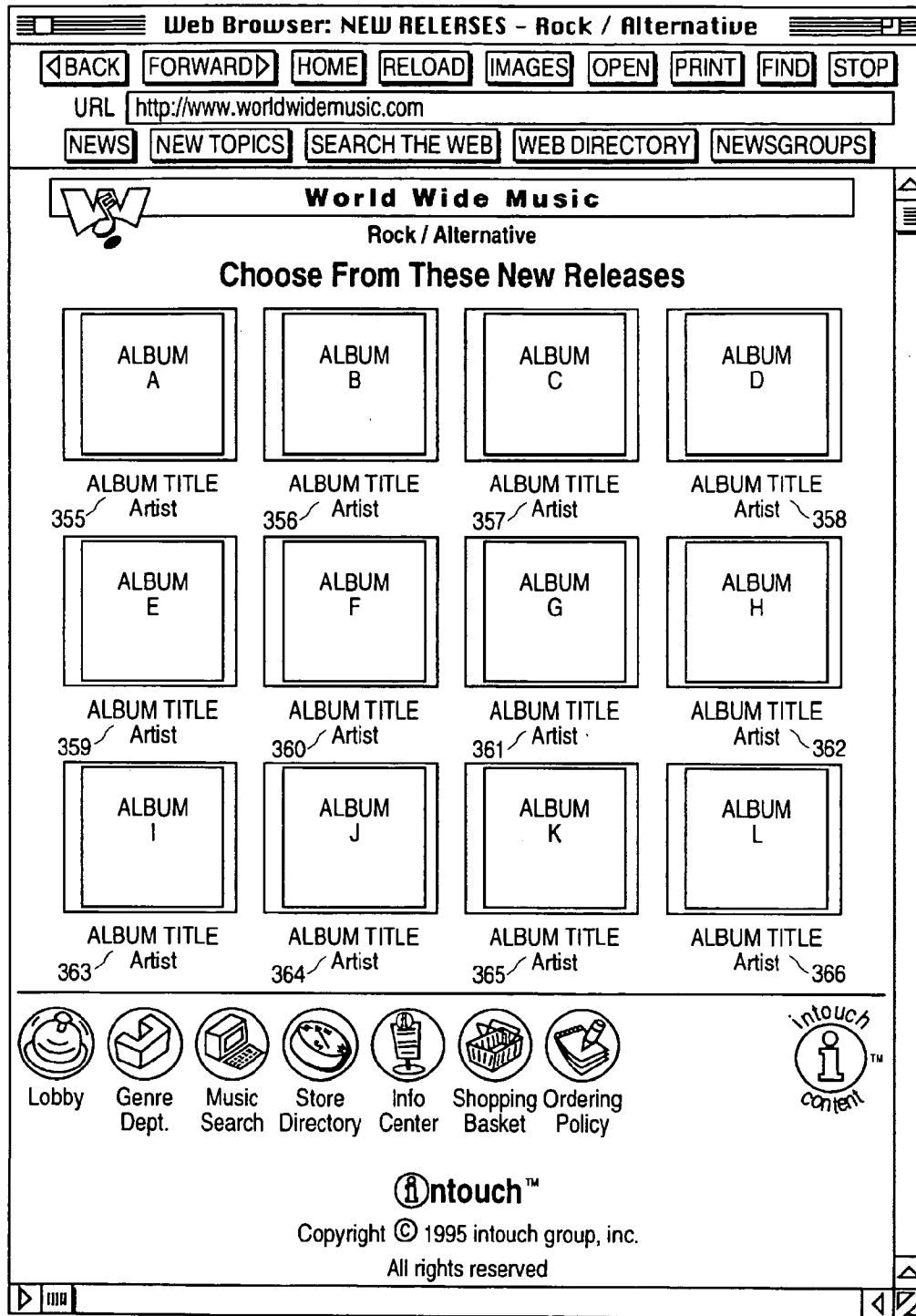


FIG.52

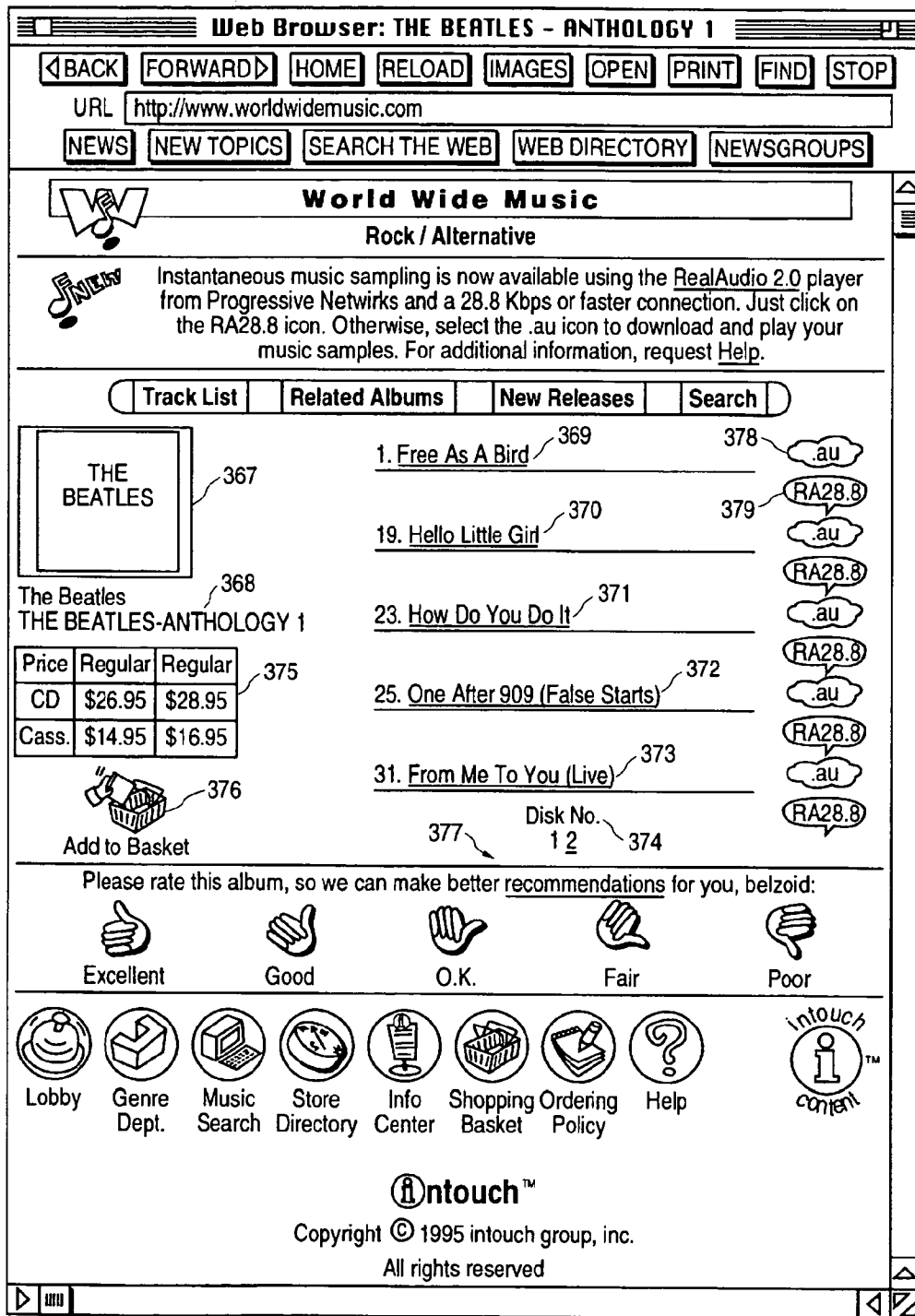


FIG.53

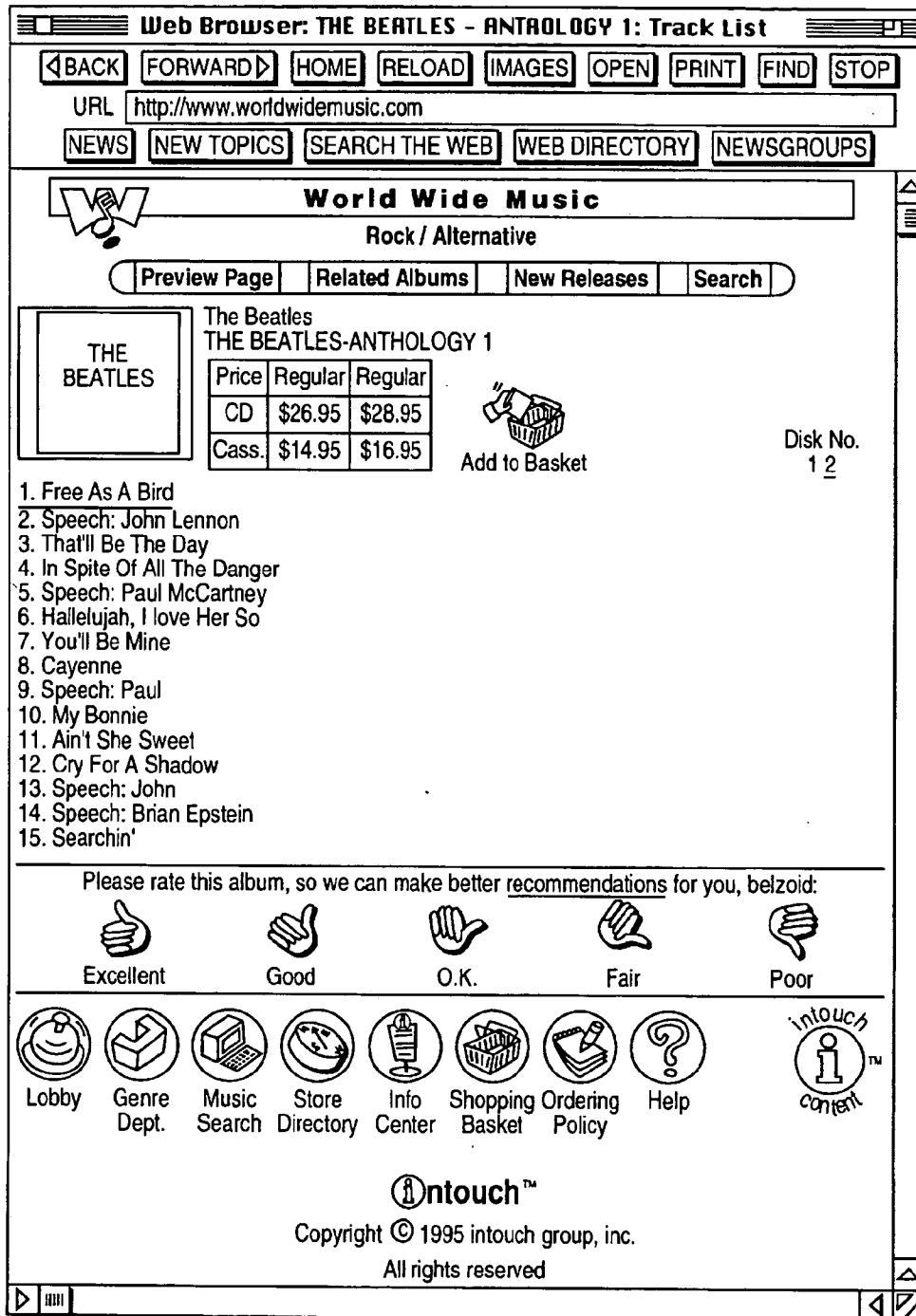



FIG.54


Web Browser: Shopping Basket/Order Form For Belzoid

◀ BACK FORWARD ▶ HOME RELOAD IMAGES OPEN PRINT FIND STOP

URL

NEWS NEW TOPICS SEARCH THE WEB WEB DIRECTORY NEWSGROUPS

 **World Wide Music**

 Advertiser Banner

Shopping Basket For Belzoid

The following items are in your shopping basket:

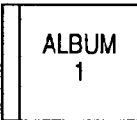
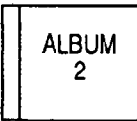
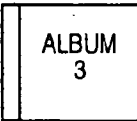
1		Album/ARTIST <input checked="" type="radio"/> CD (\$12.95) or <input checked="" type="radio"/> cassette (\$6.95) ? Quantity <input type="text" value="1"/> <input checked="" type="radio"/> Order now <input type="radio"/> Keep in basket <input type="radio"/> Remove from basket	\$12.45
2		Album/ARTIST <input checked="" type="radio"/> CD (\$13.95) or <input checked="" type="radio"/> cassette (\$7.95) ? Quantity <input type="text" value="1"/> <input checked="" type="radio"/> Order now <input type="radio"/> Keep in basket <input type="radio"/> Remove from basket	\$13.95
3		Album/ARTIST <input checked="" type="radio"/> CD (\$26.95) or <input checked="" type="radio"/> cassette (\$14.95) ? Quantity <input type="text" value="1"/> <input checked="" type="radio"/> Order now <input type="radio"/> Keep in basket <input type="radio"/> Remove from basket	\$26.95
YOUR MERCHANDISE SUBTOTAL IS:			\$53.35

FIG.55

Web Browser: Shopping Basket/Order Form For Belzoid

◀ BACK FORWARD ▶ HOME RELOAD IMAGES OPEN PRINT FIND STOP

URL

NEWS NEW TOPICS SEARCH THE WEB WEB DIRECTORY NEWSGROUPS

Order Form

Please fill in all of the information below, and then click the "Continue Order" button.

What is your address?


Please enter our BILLING address, and a shipping address if necessary, below. State sales tax will be displayed below and charged if your order is being shipped to California, Minnesota or Texas. Click the "Update" button to see the sales tax, if any.

First Name: M.I. Last Name:

Street Address: Apt.#:

Extra Address Line:

City: State: Zip:

 If this is a gift, or if you want your order shipped to an address other than the one above, please enter it below. If not, you can leave this blank.

First Name: M.I. Last Name:

Street Address: Apt.#:

Extra Address Line:

City: State: Zip:

Do you want to send a greeting with your order?

Greeting line one:

Greeting line two:

How do you want your order shipped?

US Mail Priority (\$4.95). Your order should arrive in 2-4 business days.

2nd Day Air (\$7.45). Your order will arrive in 2 business days.

Overnight (\$10.90). Your order will arrive the next business day.

Your merchandise subtotal is:

Your CA sales tax is: If we have this wrong, call 1-800-219-6752 9am-5pm Pacific Time.

Your shipping charge is:

Your total cost is:

FIG.56

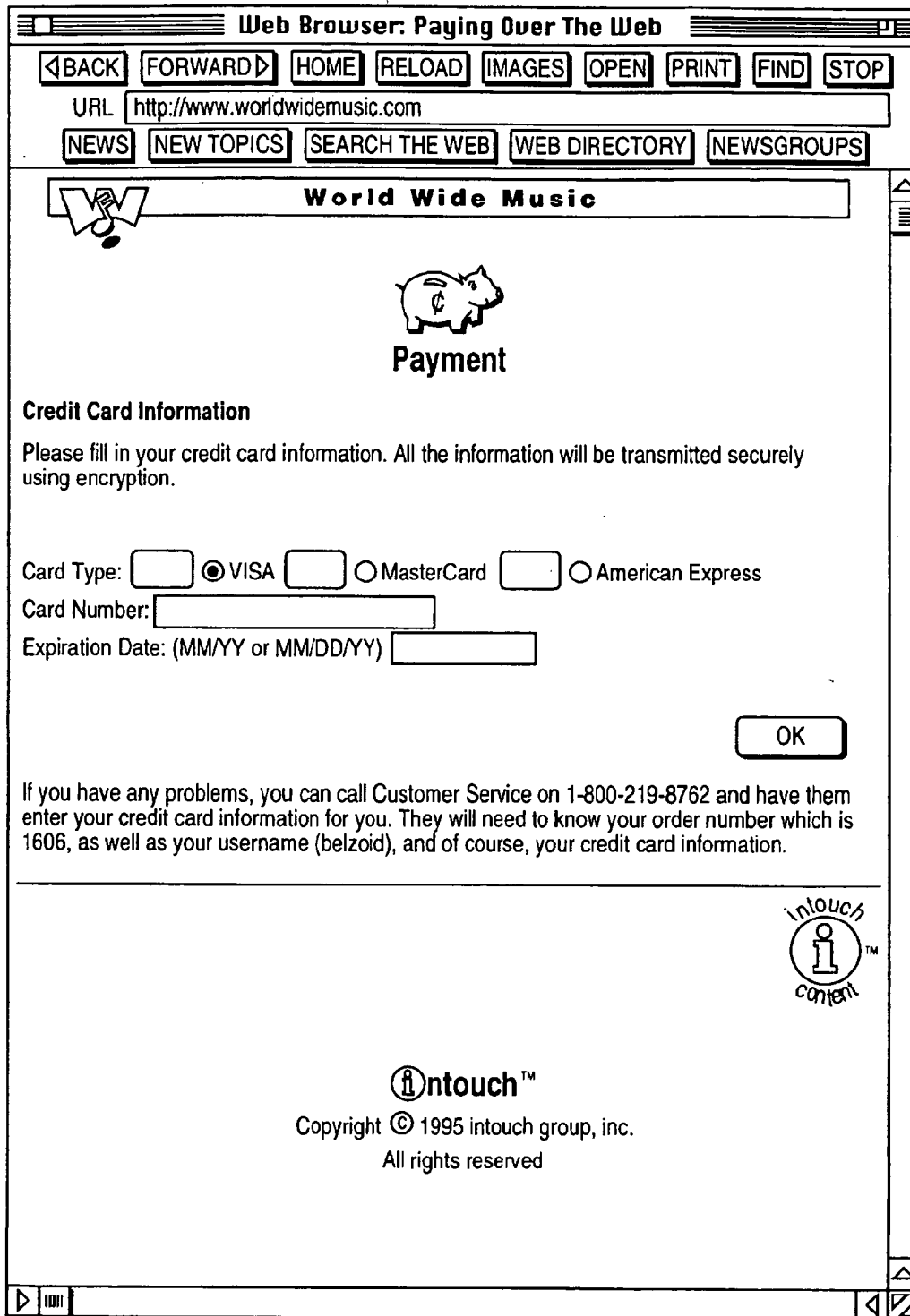


FIG.57

NETWORK APPARATUS AND METHOD FOR PREVIEW OF MUSIC PRODUCTS AND COMPILATION OF MARKET DATA

This is a continuation-in-part of U.S. patent application Ser. No. 08/668,327 filed on Jun. 26, 1996 abandoned which is a continuation of U.S. patent application Ser. No. 08/282,153 filed on Jul. 28, 1994 abandoned, which is a continuation of U.S. patent application Ser. No. 08/035,661 filed on Mar. 23, 1993 abandoned, which is a continuation of U.S. patent application Ser. No. 07/957,444 filed on Oct. 6, 1992, now U.S. Pat. No. 5,237,157, which is a continuation of U.S. patent application Ser. No. 07/582,253 filed on Sep. 13, 1990 abandoned.

FIELD OF THE INVENTION

This invention relates generally to user controlled preview of a plurality of different pre-recorded products. More particularly, this invention relates to the use of an on-line network web site for interactive preview of a portion of a pre-recorded product by the user.

BACKGROUND OF THE INVENTION

The 1980s witnessed a tremendous rise in consumer demand for home entertainment products, particularly, the compact disc (CD) player. Wide consumer acceptance has been the result of more affordable ownership costs, superior fidelity (compared with LPs and cassettes) and remarkable ease-of-use. In the United States alone, total sales of CD players skyrocketed from 1.2 million units in 1985 to over 17 million units in 1989 (over three times the growth rate of VCRs). CD players now represent one third of all new audio component sales with projections pointing to total U.S. sales topping 30 million players in the U.S. by 1991—making the CD player the fastest growing consumer electronics product in the last twenty-five years.

Despite the explosion of CD player sales, most consumers own very few CDs (studies indicate the average CD player owner possesses only nine discs). In large part, this is due to the fact that when it comes to purchasing a specific compact disc, the consumer is faced with several constraints and dilemmas. For example, compact discs are roughly twice the retail price (\$14–\$16) of LPs and cassettes and as a result, consumers are more reluctant to explore new and/or unproven artists for fear of wasting money. Moreover, there is the issue of “selection stress,” a common problem for the average music buyer who is confronted with an enormous catalogue from which to choose and few mechanisms to assist her in evaluating these choices. This is exemplified by typical retail music stores which have developed the “super-store” format in which to promote its products. Unfortunately, the salespeople generally have not kept up with the sophistication of the market. Hence, consumers are at a clear disadvantage. Consumers often cannot sample or interact with the product while in the music store and they cannot return products they do not like. Therefore, although many consumers wish to build larger music collections, purchasing decisions are often risky and mistakes can be costly.

At the artist level, the proliferation of new music markets, styles and tastes has caused the number of record labels to increase dramatically. The record industry has expanded from several major labels in the 1970s to more than 2,500 distributed and independent labels today. Each year more than 2,500 new artists are introduced into an already crowded market.

Currently, label executives have no way to test market their respective acts or albums before dollars are committed to the production, promotion and distribution process. Furthermore, there is no current methodology to provide consumer exposure to a particular artist's work outside of radio and television or concert tours. Therefore, print media is heavily utilized by retail music stores to draw attention to new and old labels and special promotions. Music labels recognize this and consequently subsidized these efforts to promote their individual artists.

The problem of consumer awareness is aggravated by the glut of records on the market which inhibits consumer exposure at the retail level and over the airways. Because each record label is responsible for the recruitment, development and promotion of their artists, some record companies have been compelled to establish marketing promotions where records are given away to promote awareness of certain acts.

Labels managers have also acknowledged that because a greater investment of time, money and creativity is required to develop many of today's acts, they are more likely than ever to cut short promotion in order to cut their losses quickly on albums that don't show early signs of returning the investment. This strongly limits the potential for success because some artists require longer and more diverse promotion in order to succeed.

In order to provide for greater consumer exposure to artist's works, a number of different inventions have been designed. For example, a music sampling device called PICS Previews has been developed. Although it permits some in store sampling, its use is severely limited because its primary format is based on a particular hardware configuration which is not easily modifiable.

The PICS preview device incorporates a television screen with a large keypad covered with miniature album covers, and these are locked into a laser disk player. A master disk which holds a fixed number of videoclips—usually about 80—is used as the source of music information. The consumer is permitted to view a video which represents a selection from the album. However, information from only those artists who have made a video and who are featured on the PICS preview system can be accessed. The consumer cannot make her own selection. The selections are not necessarily those that are in the store inventory.

Another in-store device, known as the Personics System, provides users with the ability to make customized tapes from selected music stored on the machines. A drawback with this device is that it is expensive to use and time consuming to operate. Furthermore, exposure to various artists is limited. Still further, the device is viewed by record production companies as cannibalistic. Therefore record production companies have been reluctant to permit new songs from their top artists to be presented on these devices.

Perhaps the greatest advance in market exposure of a prerecorded product as of its issuance is U.S. Pat. No. 5,237,157 (the '157 patent) to Kaplan, from which this application continues. The '157 patent is directed to a user-interactive multi-media based point-of-preview system. In particular, interactive digital music sampling kiosks are provided to the retail music industry. In essence, the listening booth of the 1950s has been reborn and through the application of software and hardware technology has been brought into the next century.

Through the kiosk station which acts as a computer age “listening booth,” the consumer, as a subscriber, is exposed to her potential purchases by being offered the ability to

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preview music before purchasing selections at record stores. The guesswork is thereby taken out of music purchasing by allowing consumers to make more informed purchasing decisions comparable with those available for other consumer products.

The kiosk station provides access to music products through the sampling of individual selections as discrete increments of information. This allows the subscriber to make more educated purchases. The kiosk station thereby dramatically changes the way in which consumers purchase music. This increases buying activity and improves overall customer satisfaction. Moreover, the kiosk system stimulates sales gains for the record stores and provides record companies a cheaper and more effective promotional alternative which can sample consumer opinions at the point-of-sale level.

The device described in the '157 patent utilizes a graphical interface software, a hi-resolution touchscreen monitor, and unprecedented storage capacity. Each system can offer the consumer the ability to preview selections from up to 25,000 albums, thus allowing more informed purchasing decisions by listening to songs on an album in a mode as uninhibited as using a telephone. The customer simply takes any music selection in the store display and approaches the kiosk. After scanning their user/subscriber card (free to the user and available at the store counter) across the UPC bar code reader, the customer scans their chosen audio selection. The touch screen monitor then displays an image of the album cover in full color with songs from the album. The user then simply touches the name of the desired song on the screen, and, through the privacy of headphones, listens to a 30 second clip of the audio program. Additional options include full motion MTV videos or Rolling Stone record reviews. The listening booth of the 1950s is effectively reborn and improved and through the application of software and hardware technology, brought into the 1990s.

Because of the high level of software content, the device described in the '157 patent remains flexible and dynamic. The interactive touchscreen can be programmed to accommodate multiple applications running under one environment on one system. Touchscreen interface can be continually modified with additional features added over time. This encourages subscriber interest and permits a competitive advantage over competitors who have locked their design into predominately hardware based configurations with little value-added software content.

The selection and input data from the subscriber is collected from each kiosk location and is transmitted to a central database for analysis by the central processing unit. Through the central processing unit, the subscriber selection and subscriber profile data can be analyzed, packaged, and distributed as information products to the entire music industry as timely and focused market research.

It was therefore an object of the '157 patent to provide a computer age "listening booth." Consumers would be offered the ability to preview music before purchasing selections at record stores. Preview and associated purchase data would be collected and stored to provide music industry market research data.

Another object of the '157 patent was to take the "guesswork" out of music buying by allowing for more informed purchasing decisions comparable with what was previously available. The '157 patent allows for access to prerecorded products through sampling of individual selections and allow the consumer to make more educated purchases. This increases buying activity and improves overall customer satisfaction.

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While the '157 patent provides for a convenient and effective system for allowing a user to preview selected portions of a pre-recorded product, improvements may be incorporated. What is needed is an improvement that allows for rapid and up-to-date changes in the pre-recorded product selections that are available to users located at multiple locations across the world. What is further needed is an improvement for providing convenient centralized reprogramming of the controlling software. What is still further needed is an improvement that allows for access to the system by subscribers using publicly accessible kiosks or from private computers. What is further needed is an improvement that allows for purchasing over a network such as the internet. What is still further needed is an improvement that allows for relational previewing wherein musical works related to the user's selected work, is conveniently available to the user.

SUMMARY OF THE INVENTION

The present invention provides for an improvement to the '157 patent by integrating a network web site as the source of the pre-recorded products and the controlling software.

In a preferred embodiment, the present invention provides for a method for enabling a user to preview a portion of a pre-recorded music product from a network web site containing pre-selected portions of different pre-recorded music products, using a computer, a computer display and a telecommunications link, the method comprising the steps of: a) using the computer to establish a telecommunications link to the network web site wherein the network web site contains pre-selected portions of different pre-recorded music products; b) transmitting user identification data from the computer to the network web site thereby providing user access to the network web site; c) choosing at least one pre-selected portion of the pre-recorded music products from the network web site; d) receiving the selected portion of the pre-recorded products; and e) interactively previewing the received chosen pre-selected portion of the pre-recorded music product.

The preferred method may also comprise the step of rating the chosen pre-selected portion of the pre-recorded music products. Furthermore, it is contemplated that the computer and the display are housed within a kiosk. The kiosk can further include a product code scanner coupled to the computer for allowing the user to scan a product code located on a product which the user desires to preview.

The preferred method may also include a plurality of compact disc-read only memory (CD-ROMs) or a RAID array drive for storing the portions of pre-recorded products.

The present invention also provides for a preferred network web site for allowing a remote user to preview a pre-selected portion of a pre-recorded music product, using a computer, a computer display and a telecommunications link, the network web site comprising: a) a processor for controlling the network web site; b) memory for storing pre-selected portions of a plurality of different pre-recorded music products, the memory coupled to the processor; c) identification (ID) means for recognizing a user ID which specifically identifies the user to the network web site; d) reception means for receiving and processing a request from the user to transmit a pre-selected portion of at least one of the pre-recorded products back to the user; e) transmission means for transmitting the requested pre-selected portion to the user; f) control means for providing the user with interactive control over the transmission of the pre-selected portion of the pre-recorded music products.

The preferred network web site also contemplates the portions of the plurality of different pre-selected pre-recorded music products being identified and called from the memory using unique product codes. The preferred network web site can further included a purchasing means for allowing the user to place an order for purchasing at least one of the portions of the pre-selected pre-recorded music products; a listing means for providing the user with dynamic lists of the pre-selected portions of the plurality of different pre-recorded music products that have been previewed the most; a recording means for providing the user with a record of previous previews by the user; a ratings means for prompting the user for a user rating of a particular one of the pre-selected portions of the plurality of different pre-recorded music products and storing the rating; a first market research means for correlating the user rating with the user ID, for compiling market research data and a second market research means for correlating the user ID with all previews performed by the user, for compiling market research data; and a means for collecting demographic information regarding the user. It is further contemplated that the demographic information is selected from the group of informational types consisting of age, sex, income, ethnicity, education level, marital status, hobbies, and occupation.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a typical apparatus used in the parent kiosk embodiment.

FIG. 2 is a block diagram showing the functions of devices which comprise the apparatus of the parent kiosk embodiment.

FIG. 3 is a view of a typical touchscreen software generated display interface used in the apparatus of the parent kiosk embodiment.

FIG. 4 is a different view of a typical touchscreen software generated display interface used in the apparatus of the parent kiosk embodiment, further having a point-of-purchase capacity.

FIG. 5 is a flow diagram of the possible paths accessible by a user of the original kiosk invention.

FIG. 6 is a flow diagram of the search engines used with the original kiosk invention, the kiosk-based network embodiment, and the network embodiment independent from a kiosk.

FIG. 7 is a block diagram of the hardware requirements for the network web site.

FIG. 8 is a flow diagram of the possible paths accessible by a user of the kiosk-based network embodiment.

FIGS. 9-33 are screen shots of display screens that are accessible by a user in the kiosk-based network embodiment of the present invention.

FIG. 34 is a flow diagram of the possible paths accessible by a user in the network embodiment independent from a kiosk.

FIGS. 35-57 are screen shots of display screens that are accessible by a user in the network embodiment of the present invention independent from a kiosk.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The Original Kiosk Embodiment

Referring to FIG. 1 of the drawings, there is a kiosk station 10 shown embodying the principles of this invention. The kiosk station 10 utilizes a custom, graphical interface (not shown), proprietary software, a hi-resolution touch-

screen monitor 20, and data storage capacity. Each kiosk station 10 is provided with data compression technology which is state-of-the-art. The data compression technology is available from Fredericks and Shoe (Chicago, Ill.). The core of the kiosk station 10 is this digital compression technology, coupled with the storage and playback design. An application specific integrated circuit (ASIC) chip serves in the data compression and decoding component of the kiosk station 10. This ASIC firmware is integrated onto a custom-designed board which delivers 24 bit graphics, full motion video digital signal processing and decompression of the audio information to the subscriber. The new combination of bus technology provides for a high resolution, high quality, user friendly subscriber interface at the kiosk station 10.

On an ongoing basis, music CDs are identified for addition to the kiosk station 10 storage. Once the audio samples are identified, the samples are encoded at the CD authoring station. Music CDs are digitized and encoded for storage on a CD ROM discs. The record jacket associated with each preview album is scanned and digitized. A MacIntosh Sound Tool, which is a stereo direct-to-disc recording and playback system is used to process the digital signal to the CD. A Topiz CD Premaster/Encoding System or the like is used. In addition, manufacturers' UPC bar code data corresponding to the selected albums is copied and stored. The compression technology permits high capacity storage on CD ROM discs in the kiosk body 50. Each kiosk station 10 can offer the subscriber the ability to preview selections from up to 25,000 albums, thereby allowing more informed purchasing decisions by listening to songs on an album in a mode as uninhibited as using a telephone. Preview selections may be expanded or changed by altering the data on the CD-ROM discs. The CD-ROM discs are stored in a CD automatic disc loader. For example, the Sony Auto Disc Loader CDK-006 can be used. This loader can house up to 60 CD ROM discs and is controlled by an external 8-bit microprocessor control system. When a subscriber scans an album and touches particular selections, the disc loader will automatically scan to the appropriate slot on the disk tray. An Apple MacIntosh platform is used with a CDSC which is like a CD-ROM drive capable of reading data and audio disks or the like. CD-ROM interface can be accomplished with a Hypercard or its equivalent. In addition, the database code will create a file for data collection each time a subscriber begins a preview session. This will identify a specific subscriber with the selections and ratings which were processed and the kiosk station.

To excite the subscriber, and inspire her to pick up an album from the CD rack and preview it on the kiosk station, the retail store can also be provided with a library of CD ROM discs. For example, 600 minutes of top 200 song cuts can be offered on a single CD ROM disc. These discs can be played for an entire 10 hours period without changing. The length of the CD means that there is no recurring pattern or loop. Musical selections will vary from Rock, to Jazz, to Classical, etc. with widespread appeal. This CD ROM disc sampler will contain songs from albums found on the kiosk station. In that way, a subscriber can become interested in a cut heard over the store's in-house sound system, approach the clerk and ask for the album or the artist responsible, and then proceed to pick out their selection.

To use the invention, the subscriber takes any music selection in the store display and approaches the kiosk station 10. The subscriber is provided with an access card, similar to a credit card, which is used to activate the kiosk station 10. The system interface is based on a touchscreen 20

and activated by the access card which is passed over a UPC scanner. There is no keyboard to add to levels of confusion or intimidation.

Each customer can complete a brief membership application which asks for basic demographic information, general music listening preferences and buying habits and an access card will then be generated for that subscriber. Each subscriber will have a bar code on their access card which will immediately identify them when beginning a session on the kiosk station 10. The subscriber identification can be further interfaced with the music store cash register so that with each music purchase following CD preview, the transaction will be identified as a kiosk-related sale.

A program similar to an airline frequent flyer club can be generated. The central database 60 can maintain a library of subscribers with subscriber profile information and specific preview activity. In order to provide subscribers with an incentive to use the kiosk station 10 regularly, subscribers will earn bonus points for answering the rating questions after previewing selections at the kiosk station 10. Earned bonus points will also accumulate for kiosk-related purchases. Through a combination of rating and purchase bonus points, subscribers will become eligible for discounted and even free music sponsored by music industry participants.

Subscribers may additionally be sent quarterly statements showing a list of albums previewed and kiosk-related purchases. Listings of new releases on the kiosk stations 10, as well as various promotions sponsored by recording labels and music stores, can be disseminated to the subscribers by generation of a news letter update. Subscriber mailing lists can be used to send additional promotional material.

After scanning the access card across the bar code reader 30 which can use multiple mirrors to enhance the scan rate for a dense scan (such as the MS 700 manufactured by Metrologic of Camden, N.J.), the subscriber scans the bar code of the CD chosen, and up on the touchscreen 20 appears the album cover in full color photographs along with songs from the album. The subscriber then touches the desired song at the desired location of the touchscreen 20 and through the headphones 40 listens to a 30 second clip. Additional options include full motion MTV videos or record reviews.

The access card which is used to activate the kiosk station 10 can be used to monitor all subscriber activities and generate, for example, demographic information and market research.

Referring now to FIG. 2 there is shown a block diagram demonstrating the apparatus including the storage and transmission to a centralized database 60 for analysis by the central processing unit 70. Each time a subscriber activates the kiosk at the scanner 50 to begin a session, a data file is created identifying the subscriber and generating a selection preview. Additional information in the form of responses to rating questions for the selected CD and purchase indications can also be captured in the data file. The centralized database 60 can poll each kiosk station 10 at all of the remote locations through a telecommunications link. The information gathered will be analyzed and packaged into market research products for distribution in the record industry and radio stations.

FIG. 2. demonstrates that the selection choice and subscriber data can be transmitted via a public data network 80 for analysis by use of an Execution Information System (EIS) 90. Such systems provide the capabilities to analyze vast amounts of data and to convert this data into useful information on a real-time basis. EIS's allow non-programmers access to large quantities of data through an

intuitive user interface. EIS's have built in tools which make modeling much easier than conventional spreadsheet or database software. The software and technical support of a major telecommunications and information network, such as Comshare, can be used. This EIS software operates in a distributed and portable environment. In addition, the EIS used will be supported on multiple platforms and operating systems. This provides for delivery of proprietary data and its analysis appropriate to the business needs of the record industry. A key attribute to most EIS systems is the provision for multidimensional data dimensions, which, in the music industry, may include unit sales, time periods, geographic markets, specific music categories, configuration breakdowns, and demographic profiles of the subscriber bases. The capabilities of CD-ROM discs will allow for the periodic delivery of market research to the record industry on CD-ROM discs.

FIGS. 3 and 4 show various software configured touchscreen display interfaces. Because the touchscreen display is matrix generated by software configuration, it is flexible and dynamic. The touchscreen display can be programmed to accommodate multiple applications running under one environment on one system as demonstrated in FIGS. 3 and 4. The software configuration provides for modifications with additional features added over time by software upgrades.

FIG. 5 is a flow diagram of the possible paths accessible by a user of the original kiosk invention. The different blocks are rough illustrations of the different screens viewed by users and the arrows illustrate the possible paths the users can follow through the original kiosk system. In order to better explain the flow diagram, an example path will be discussed.

A user starts at the idle screen 1 where she can touch the "start" section to begin. From there, the user is shown screen 2 where she is asked to select a category to search (i.e. new releases or radio station hits). If she selects "new releases" she is asked to scan her I-Station card subscriber card. This identifies her to the system. From there, she is shown screen 4 which illustrates the different music genres which can be searched (i.e. pop/dance or heavy metal). If a particular genre is selected, the user is shown screen 5 which illustrates the CD covers of the new releases in the chosen genre. After selecting a particular CD, the user is shown screen 6 which illustrates the CD cover and the tracks that can be previewed. After previewing a music sample, the user is shown screen 7 which requests a rating for that track. The user is then asked if she wants a printed record of her preview at screen 8. Screen 9 then asks the user if she wants to preview another selection. If not, the user is shown screen 11 which thanks the user for her use. The system then returns to the idle screen 1.

FIG. 6 illustrates an overview of the different search engines used with the original kiosk invention, the kiosk-based network embodiment (described below), and the network embodiment independent from a kiosk (described below). As with the previous figure, an example path will be described which will provide an understanding of the program's logical flow. This example discusses the search engines involved in a classical music search.

Starting at block 12, a user determines the initial search parameters (i.e. vocalist, composer, conductor). Depending on which parameter is chosen, the appropriate search engine is selected 13-18. Assuming the vocalist parameter 13 is selected, the vocalist list is provided to the user at block 19. The vocalist-by-composer search engine is then selected at block 21. The particular piece by the selected vocalist and composer is then selected at block 22. The particular album

is then produced at block 23. Finally, the preview page is provided at block 24 where the user can preview the selected album.

A Preferred Networked Embodiment for Incorporation with the Kiosk-Based System

While it can be appreciated that the in-store kiosk described above provides for a large selection of musical choices and a convenient access point for consumers, improvements can be made to increase the efficiency and capacity of the system. This embodiment provides for such improvements.

The kiosk-based network embodiment of the present invention utilizes many of the basic kiosk features as discussed above with the use of a telecommunications link to establish a point-of-preview on-line web site.

In the kiosk-based embodiment of the present invention, mass data storage capability is found at a central location, the web site, rather than at the kiosk itself. Furthermore, the operating environment is controlled via software resident on the web site instead of within memory at each individual kiosk. Instead of incorporating the memory and central processing of the system within each kiosk, this embodiment of the present invention provides for each kiosk to merely serve as an access terminal to the web site. The web site server therefore provides for a centralized location for storing the operating system software as well as data storage for the pre-selected portions of music products, associated artwork and text. As is conventional for this type of architecture, the web site server is able to service a plurality of kiosks across the country or across the world. Furthermore, by providing for a centralized storage and software point, updating the product data and software becomes a more efficient and cost effective process because the data and/or software need only be updated at the web site server instead of at each kiosk.

FIG. 7 illustrates a block diagram of the hardware requirements for the preferred kiosk-based network (i.e. internet) embodiment of the present invention. While described here using particular hardware elements, those skilled in the art will recognize that modifications can be made without departing from the scope and spirit of the present invention.

The preferred embodiment of the present invention incorporates an STI Silicon Graphics Unix Server (Model Name: "Challenge L") 93 which controls the basic operations of the web site. Stored within the server is the Silicon Graphics operating system and an Oracle database which has been created to contain all of the data for presentation the users, including but not limited to, the number of tracks within each music CD, the names of the tracks, etc. Additionally, the server 93 runs the Netscape Commerce Server which provides the http protocol for generating a web page. Additionally, the server 93 utilizes a RealAudio server (Progressive Networks, Seattle, Wash.) which streams the RealAudio data to the web site users through the network. This server 93 allows the user to play the audio selections directly from the web site on the kiosk. Additionally, the server 93 contains static HTML script files which are executed to provide users with the different web pages. In other words, the web pages are not stored and then merely displayed. Instead, the pages are dynamically generated whenever the web site user selects a page for viewing. In essence, these scripts tie the databases and their content together.

A 60 gigabyte RAID array drive 95 provides storage of data for generating the CD artwork and the pre-selected and pre-recorded portions of the music products (i.e., available audio samples) in two different formats, the "au" format and

the "RealAudio" format. The "au" format requires that the user download the data to her location where she can play the audio sample. Web site user control of the audio sample playback (i.e. stop, play, seek, fast forward, rewind, etc.) depends on the specific software the user uses to playback the audio sample once the sample is downloaded to the web site user's computer. The "RealAudio" data format allows the user to playback the audio sample directly from the web site without having to download the audio sample. The RealAudio server provides the web site user with control over playback of the audio sample.

Within the web site server 93 is a network interface card (i.e. an ethernet card) (not shown) which allows connectivity to outside users. This network interface card is provided with the STI Silicon Graphics Unix Server. The network card 94 is connected to a router 92 (SISCO, Model 2500, Redwood City, Calif.) which connects the server 93 to an internet provider.

In order for a web site user to use the kiosk-based network web site embodiment to preview music products, she must first identify herself to the network web site server. This identification allows the web site server to uniquely associate events during web site usage, such as, for example, the user's searches, ratings and purchase requests, with a particular user. This information is very important for insuring that the correct purchase order is delivered to the right user. In addition, the user identification can also be used to gather accurate demographic information which can be correlated with events during web site usage, such as, for example, the user's ratings.

The step of web site user identification to the web site server can be accomplished using a number of different known methods. It is not particularly critical which method is used. For example, the web site user can enter an identification (ID) name or number which is assigned by the web site server (or chosen by the user) upon completion of a membership application. Alternatively, a credit card number, phone number or address can be used to uniquely identify the web site user. These web site user IDs can be entered using a number of different methods. For example, using a keyboard or touchscreen display keyboard simulation to type in the web site user's name or number. A bar code reader can also be used to scan ID number from an ID card. Alternatively, the user identification can be automatically provided upon access (i.e. sign-on or log-on) to the web site server either by the internet service provider directly or by the local terminal. Each and every one of these different techniques of establishing a user ID with the web site server is considered to be within the scope of the present invention.

In the preferred kiosk-based network embodiment of the present invention, the user enters her unique identification in the form of the user's name and password in order to access the web site server. The first time a user gains access to the web site server, the user completes a membership application which requests specific demographic information about the user (e.g. age, sex, etc.). The user is then able to select a password which will correspond with her name. The user's name is then assigned an 11 digit ID. Upon all subsequent accesses to the web site, the user's events will be linked with the information provided in the membership application. The web site server maintains a database of which pages are accessed by the user, which pre-selected portions of music products are downloaded, and what ratings the users give to particular samples.

Once the user has identified herself and gained access to the web site server, she can then preview pre-selected

portions of music products and enter purchase requests. FIGS. 9-33 illustrate a sequence of screen displays from a preferred embodiment, the web site for incorporation with an in-store kiosk (the "HI Station"). This example is provided for illustrative purposes and is not intended to limit the present invention to these particular screen display layouts or the corresponding functions. It should be apparent to one skilled in the art that numerous layout designs and corresponding functions can be employed without departing from the scope and spirit of the present invention.

In order to provide for a more user friendly environment at the in-store kiosk, a touch screen format is employed wherein different "hot zones" are established on the screen. Thus, by touching one of these hot zones, a user is able to execute particular functions (i.e. go to the next screen, select an album for preview, etc.) without the need for operation of a separate hardware peripheral device such as a mouse or trackball. However, other well known means for allowing a user to enter commands can also be incorporated (i.e. a keyboard, a scanner, a mouse, etc.).

FIG. 8 illustrates a flow diagram of the possible paths accessible by a user of the kiosk-based network embodiment. This diagram is similar to FIG. 5 for the original kiosk invention.

Starting at screen 31, a user is shown the main menu (see FIG. 10). From here, she can select any of the different choices (i.e. general search, new releases by genre, Top 10 chart, etc.). If she chooses the new releases by genre, she is taken to screen 33 which illustrates the genre selections available. Depending on the user's selection from this screen 33, she can choose the Top 10 chart by genre screen 36 or the Promotions by genre screen 35. Once she chooses a CD from either of these screens, she is taken to the Album Preview screen 37. From this screen 37 she can preview any of the pre-selected and pre-recorded music products. If she previews one of the music products, she is asked at screen 39 to rate the previewed music product. Then depending on the availability of the selection, a printed record or order slip of the selection is provided. From there, the user can proceed through the web site again. This is accomplished by selecting one of the different paths 42-49 which returns the user to the corresponding branches from the original main menu screen 31.

It should be noted from this flow chart that regardless of which searching tool is used (i.e. General Search, New Releases By Genre, Top 10 Charts By Genre), the user always ends up at the Album Preview screen 37. The different searching tools merely vary the manner in which the user gets to the Album Preview screen 37.

Example screens of the kiosk-based network embodiment are now discussed in more detail. The start screen is illustrated in FIG. 9. This screen has two hot zones 200, and 220 which provide the user with control over her direction of travel through the web site. Hot zone 200 allows the user to travel back to the preceding screen and hot zone 220 allows a user to access the main menu. These hot zones are provided on each screen as the user travels through the web site.

FIG. 10 illustrates the main menu screen which allows the user to access particular paths by selecting (i.e. touching) specific hot zones 201-208. Although a number of different paths can be incorporated, the preferred embodiment described here includes a "Promotions" path (hot zone 201), a "General Music Search" path (hot zone 202), a "Classical Music Search" path (hot zone 203), a "New Releases" path (hot zone 204), an "Intune magazine" path (hot zone 205), a Top 10 By Genre" path (hot zone 206), a "Top 25 In Store"

path (hot zone 207) and a "Merchandise" (hot zone 208) path. These path names are self-explanatory.

By choosing the "Promotions" path (hot zone 201), a user is taken to the "Promotions By Genre" screens shown in FIGS. 11 and 12 which allow the user to select particular musical genres (see hot zones 221-241) in which their target musical interests fall. Although not limited to any particular number or types of genres, the preferred embodiment of the present invention includes a "Pop/Dance" genre (hot zone 221), a "Rock/Alternative" genre (hot zone 222), a "Heavy Metal" genre (hot zone 223), a "R&B Soul" genre (hot zone 224), a "Rap" genre (hot zone 225), a "Classical" genre (hot zone 226), a "Jazz" genre (hot zone 227), a "Movies/Shows" genre (hot zone 228), a "Country" genre (hot zone 229), a "New Age" genre (hot zone 230), a "World" genre (hot zone 231), a "Blues" genre (hot zone 232), a "Gospel/Religious" genre (hot zone 234), a "Vocalist" genre (hot zone 235), a "Spoken Word" genre (hot zone 236), a "Children's" genre (hot zone 237), a "Comedy/Novelty" genre (hot zone 238), a "Christmas/Seasonal" genre (hot zone 239), a "Reggae/Ska" genre (hot zone 240), and a "Latin" genre (hot zone 241)

By selecting a particular genre, the user is able to access promotional albums or singles which fall within that genre. The hot zones 242 and 243 allow the user to quickly access the General Search and Classical Search paths without having to backtrack to the Main Menu screen shown in FIG. 10. It should be noted that these hot zones or similar hot zones may be located in the right margin of the screens which allow the user to quickly access specific paths without having to backtrack to preceding screens. The Up and Down arrows 244 and 245 on the right of the screen allow the user to scroll through the different genre selections. It should again be noted that identical Up and Down arrows are located on many if not all of the screens utilized in the preferred embodiment of the present invention. They perform the same operations on the different screens.

By choosing the "General Search" path (i.e. hot zone 202 from FIG. 10 or hot zone 242 from FIGS. 11 & 12), a user is taken to the "General Search" screen shown in FIG. 13. This screen allows users to perform key word searches in different categories such of album genre (hot zone 246), artist genre (hot zone 247) and song title genre (hot zone 248). Because a touch screen is incorporated into this example embodiment, the user need only touch the appropriate letters on the keyboard 250 illustrated on the computer screen to enter her search terms.

It should be noted that once a particular musical piece (i.e. song or album) is selected, the proper data corresponding to that selection must be called from memory including the appropriate CD wherein the musical samples are stored. Although these musical pieces can be identified by any identification scheme, the preferred embodiment incorporates the product code established by the manufacturer or distributor. This allows for convenient and efficient ordering of the musical pieces once a purchase order is submitted. Therefore, even though a user may input an album or song title, the web site will translate that request into the corresponding product code in order to call the appropriate data. In the preferred embodiment, the audio samples are identified by the following designation: UPC_number.disk_number.track_number.format (au or RealAudio).

FIG. 14 illustrates an "Album Preview" screen which can be accessed by different preceding screens (i.e. from the search screens, the promotions screens, etc.). The Album Preview screen allows the user to view the album cover 255, information about the album 256 and a list of the song tracks

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that have been sampled 260-264. Portions of the sampled tracks 260-264 can be selected for playback by the user. As an optional feature, the system can be programmed to provide interactive control of the song playback wherein the user can control the speed of the playback, pause the playback, repeat a specific portion, skip to the next portion, etc. Also illustrated are back and forth arrows 265 which allow the user to select between any of the five disks included in the selection (i.e. *Beatles Anthology*).

Also illustrated in the left margin of FIG. 14 are hot zones for a "Track List" 257 which allows the user to view a complete list of the tracks on the illustrated album 255, a hot zone for "Related Albums" 258 which allows the user to sample albums related to the currently selected album, and a hot zone for "New Genre Releases" 259. In the lower left corner of the screen is a "Featured Album" hot zone 266 which allows the user to quickly access a "Featured Album" which may be pre-selected or randomly chosen by the system.

FIG. 15 provides a list of the album tracks which can be accessed by selecting the hot zone "Track List" hot zone 257 illustrated in the preceding screen. Those tracks that have been sampled 267-271 are underlined. By selecting any of these highlighted tracks, a user is able to listen to that sample.

FIG. 16 illustrates the complete track list from the album illustrated in FIG. 14. By scrolling with the Up and Down buttons 253 and 254 until the desired work is highlighted, the user can access the work and related information (i.e. information on which album the song is located). If the first element "Free As A Bird" 251 is selected, that selection is provided.

FIG. 17 provides cover illustrations of related albums 272-283 that can be accessed by selecting the "Related Albums" hot zone 258 shown in FIG. 14. The albums identified by the web site as related albums are determined by administrators of the web site server. When a new song or album is stored in the system storage, the administrator determines which albums will be accessed when the related albums function is accessed. The parameters used in determining which albums will be designated as a "related album" include, for example, other albums with the same artist. Once a related album list is generated, that list is linked with the new song or album. When a web site user selects the related albums feature, a script is executed which locates the appropriate related albums list and provides the web site user with access to the related albums on the list.

FIG. 18 illustrates the "Rock Alternative" screen which provides album covers 284-295 of alternative rock performers. This screen can be accessed, for example, by selecting the rock alternative hot zone 222 shown in FIG. 11.

According to the preferred embodiment of the present invention, once a user has previewed an album or a particular track from an album, the network web site prompts her for a rating of the selection. FIG. 19 illustrates a "Sample Ratings" screen wherein the user is provided with an image of the album or track 400 he or she has just previewed, and a five scale rating system 401-405. The system maintains the ratings in a database and correlates the ratings information with the user's ID and demographic information (c.g., age, sex, geographic location, etc.). These ratings and corresponding demographic information can be sold to music companies in the form of reports for market research. The format of the reports can be customized depending on the parameters chosen. It is a simple procedure to gather information from a database using particular parameters.

Following a user's preview of a selected album or track, FIG. 20 allows the user to receive a printed record of their

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preview ("Yes": hot zone 406, "No": hot zone 407). For example, the printed record can include the title of the album, the included tracks and the rating given by the user.

FIG. 21 illustrates the initial screen for conducting a classical music search. The screen illustrates six hot zones 408-413 which allow a user to perform searches in particular classical music categories (i.e. paths). Although not limited to particular types or a particular number of categories, the preferred embodiment of the present invention includes a "Composer" category (hot zone 408), a "Conductor" category (hot zone 409), an "Instrumentalist" category (hot zone 410), a "Vocalist" category (hot zone 411), an "Ensemble" category (hot zone 412) and a "Collection" category (hot zone 413). These path names are self-explanatory.

FIGS. 22-27 illustrate search screens for the different classical categories. For Example, FIG. 22 illustrates a search screen for the Composer category (hot zone 408 from FIG. 21). The user uses the simulated key pad 419 to enter the search terms for their composer search which appears in the "Search String Field" 418. The results of the search are listed as "Search Results" 414-417. The user can use the arrows 419 and 420 to scroll through the search results in order to select a particular result for preview. The search screens illustrated in FIGS. 23-27 operate similarly.

FIGS. 28-29 illustrate the "New Releases By Genre" screen which allows a user to preview selected new releases within a particular genre. Although the particular types or number of genre can vary, the genres included in the preferred embodiment of the present invention 421-441 are the same genres 221-241 included in the "Promotions By Genre" screen illustrated in FIGS. 11-12. FIG. 30 allows a user to browse through different magazines. Here, the Intune magazine 442 is available for viewing.

FIGS. 31-32 illustrate the "Top Ten By Genre" screen which allows the user to view the top ten singles or albums within a particular genre. Although the particular types or number of genre can vary, the genres included in the preferred embodiment of the present invention 443-463 are the same genres 421-441 included in the "New Releases By Genre" screen illustrated in FIGS. 28-29.

A unique feature of the present invention is that the creation of the "Top_" lists described above and below, is dynamic. In other words, the web site dynamically determines the "Top 10 or 25" albums or selections (for example) depending on the number of users that access the particular selection. This is as opposed to using a published top 10 or 25 list provided by Billboard Magazine for example. Each time an album or selection is selected by a web site user for preview, a counter for that album or selection is incremented. The counters with the highest counts are then located whenever a web site user selects a "Top_" list for preview. The albums or selections corresponding to those top counters are then provided to the web site user. A more accurate and up-to-date "Top_" list is therefore provided to the web site user.

FIG. 33 illustrates the "Top 25" screen which shows the covers of the top twenty-five albums 464-475. Again, as with all of the previous screens, the user is able to select a particular album for preview by merely touching the album cover which is programmed as a hot zone.

An alternate embodiment of the present kiosk-based network invention incorporates the bar code reader feature of the original kiosk invention. This allows the web site user to quickly and conveniently access a particular album or song without having to manually type in the selection's title. The bar code reader reads the UPC code on an album and

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searches for the stored data which corresponds to that UPC code. That information can include an album cover, track list, and pre-selected and pre-recorded music samples. Network Embodiment for Use Independent from a Kiosk

An alternate embodiment of the present invention provides for a network embodiment independent from a kiosk. A home-based computer system is therefore capable of providing a web site user with private access to the web site server. It should be noted that the same hardware and much of the operating software described above with regard to the kiosk-based invention are applicable here.

FIG. 34 is a flow diagram of the possible paths accessible by a user in the network embodiment independent from a kiosk. This figure is similar in logic to FIGS. 5 and 8.

Starting at the outside store front (see FIG. 35), a user is asked to enter as a member or a visitor. If she wants to enter to the web server as a member, she is asked to enter her name and password. at screen 52. This provides her with access to the virtual store lobby (see FIG. 38). From the lobby, the user can view the Top 25 albums screen 504 (see FIGS. 43-45). From there, the user can view a list of recommendations based upon certain albums in the Top 25 list or she can directly preview an album in the top 25 list at the preview page screen 506. From the preview page screen 506 (see, for example, FIG. 53) the user can sample one of the pre-selected pre-recorded tracks from the album at points 507 or 508 in the flow diagram. The details of these particular functions will be described in more detail below.

FIGS. 35-57 illustrate a sequence of screen shots from a preferred embodiment of a network web site ("World Wide Music") for use independent from a kiosk. It should be appreciated that while described here utilizing these screen shots, a wide variety of different screens and operations can be incorporated without departing from the scope of this invention. It should also be appreciated that network web sites and servers and their operation are widely known and understood in the art. Consequently, the following discussion will provide only a brief discussion of the operational mechanics.

FIG. 34 illustrates the initial screen which appears upon access to the web site server. The screen provides an image of a virtual retail music establishment (music store) from the outside as a web site user approaches the establishment. There are two hot zones on the screen 300 and 302, which allow the web site user to access the virtual music store as a "member" or as a "visitor" by simply selecting one of the choices. Both members and visitors have complete access to the web site server. Also, each user must enter a unique ID in order to gain access. The difference is that membership requires that the web site user provide the web site server with demographic information. In exchange for this information, the web site user will be able to take advantage of better prices when purchasing particular albums.

As with the kiosk-based network embodiment, a web site user must identify herself to the web site server. This identification allows the web site server to uniquely associate events during web site usage, such as, for example, the user's searches, ratings and purchase requests, with a particular user. This information is very important for insuring that the correct purchase order is delivered to the right user. In addition, the user identification can also be used gather accurate demographic information which events during web site usage, such as, for example, the user's ratings.

FIGS. 36-37 illustrate a sample membership application which requests identification information about the user as well as demographic information. Use of this information will be discussed in more detail below.

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FIG. 38 illustrates the lobby of the virtual retail music store with hot zones for providing web site users with quick and easy access to various departments of the store and the ability to engage various options. Hot zones 304 and 306 allow web site users to access the stores information center and store directory. The information center 304, illustrated in FIG. 39, provides the web site user with the ability to access particular features of the web site, such as the "Store Directory" (hot zone 327), "Preview History" (hot zone 328) which allows the web site user to preview her previous music selections, the "Recommendations" feature (hot zone 329) which allows the web site user to view recommendations on particular musical works. It is contemplated that the web server can create a profile of the web site user to determine works that will interested the user. This feature can combine the prior selections and ratings of the web site user and combine this information with the web site user's demographic information to determine other albums that may be of interest to the web site user. The "Membership" feature (hot zone 330) allows the web site user to become a member of the World Wide Music system. The "CD mail" feature (hot zone 331) sends the user e-mail on events or products of interest based upon the user's prior previews. For example, the CDmail feature can provide the user with an e-mail notifying her that a new Madonna album has just been released and can be sampled on the web site.

FIG. 40 illustrates the "Store Directory" accessible by selecting hot zone 327. This directory includes the different music departments within the virtual retail store divided by musical genre. A web site user can visit (i.e., access) any of these departments by selecting one of the genres 332 shown on the screen. Also illustrated in this screen are five hot zones 334-338 which allow provide the web site user with quick access to specific departments. For example, hot zone 334 allows the web site user to go back to the lobby, hot zone 335 allows the web site user to perform a music search, hot zone 336 allows the web site user to visit the information center which provides the web site user with information about the World Wide Music virtual retail store, hot zone 337 allows the web site user to see what she has in her shopping basket and hot zone 338 provides the web site user with information on ordering specific products. It should be noted that each of the different hot zones illustrated in the lobby of FIG. 38 can be provided at the bottom of the web site screens similarly to hot zones 334-338.

FIG. 41 illustrates the "Pop/Dance" department which can be accessed by selecting the "Pop/Dance" genre illustrated in FIG. 40. This department is similar to the main lobby illustrated in FIG. 38 with similar hot zones except that here, the different features relate to the pop/dance genre. For example, the "Top 10" hot zone 339 will provide the web site user with a list of the top ten pop/dance tracks. Similarly, selecting the "Music Search" hot zone 340 will allow the web site user to perform a search of only pop/dance works.

FIG. 42 illustrates the "Preview History" screen accessible by selecting hot zone 328 from FIG. 39. Here, a list of the musical selections previewed by the web site user is provided including the rating given by the web site user.

Referring back to FIG. 38, hot zone, 308 provides access to the "Top 25" albums or songs on a certain music chart. FIGS. 43-45 illustrate a sample Top 25 screen illustrating album covers of the top 25 albums.

Referring back to FIG. 38, hot zone 310 provides access to the "Merchandise" department providing merchandise which the web site user can purchase. Hot zone 312 provides access to the "Music Search" feature of the web site illustrated in FIGS. 46-50. This allows web site users to search for a particular musical work using a number of different formats.

FIG. 46 illustrates the starting music search screen wherein a web site user is able to search the different categories generally or by a specific genre such as classical music. The web site user can select a general search (hot zone 341) which will take her to the general search screen illustrated in FIG. 47. Here a web site user can perform a key word search. For example, the web site user can select a search by artist name (hot zone 343), album name (hot zone 344) or song title (hot zone 345) and then enter the search terms in the "Search For" field 346.

It should be noted that, as described above for the kiosk-based network embodiment, once a particular musical piece (i.e. song or album) is selected, the proper data corresponding to that selection must be called from memory. Although these musical pieces can be identified by any identification scheme, the preferred embodiment incorporates the product code established by the manufacturer or distributor. This allows for convenient and efficient ordering of the musical pieces once a purchase order is submitted. Therefore, even though a user may input an album or song title, the web site will translate that request into the corresponding product code in order to call the appropriate data.

If a user decides to search the "Classical" genre, the classical search screen illustrated in FIG. 48 will be provided. This screen prompts the user to select particular search parameters. For example, the user can search by "Composer" (hot zone 347), "Conductor" (hot zone 348), "Ensemble" (hot zone 349), "Instrumentalist" (hot zone 350), "Vocalist" (hot zone 351) and "Collections" (hot zone 352). Once the user has selected a particular parameter (i.e. Composer), the corresponding search screen (i.e. see FIG. 49 for the Composer search screen) allows her to search by key word by entering the key terms in the "Search For" field 353 and selecting "Submit Search" (hot zone 354).

FIG. 50 illustrates the different collections categories within which the user can perform her search.

Referring back to FIG. 38, hot zone 330 allows a user to view particular magazines. FIG. 51 illustrates covers of magazines 550-552 (i.e., Virtual City and Wired) which can be viewed.

Referring back to FIG. 38, hot zone 316 allows a user to view new music releases. For example, FIG. 52 illustrates a sample new release screen for the rock/alternative genre. Of course, from this screen a user is able to click on any of the albums (hot zones 355-366) to view specific information about the particular album and to sample portions of selected tracks from that album.

Referring back to FIG. 38, hot zones 320-326 illustrate featured albums which can be previewed by the user. For example, FIG. 53 illustrates an album preview screen for the "Beatles Anthology 1" album which provides an image of the album cover (hot zone 367), information on the album (hot zone 368), the price of the album (hot zone 375), selected tracks which may be sampled (hot zones 369-373), the disk being previewed (hot zone 374) and a request that the user rate the album (hot zone 377). Hot zone 376 allows the user to include this album in her shopping basket for use in purchasing selected items.

Next to each track pre-recorded track title are two hot zones 378 and 379. Hot zone 378 allows the user to download the music sample for playback by the user. Hot zone 379 allows the user to use the RealAudio 2.0 player to directly sample the musical recording.

FIG. 54 illustrates the track list for the album illustrated in FIG. 53. This screen allows the user to view the entire track list for particular albums including those tracks that have not been sampled. It should be noted that illustrated here, those tracks that have been sampled are underlined.

Referring back to FIG. 38, hot zone 314 allows a user to view her shopping basket which contains items he or she has selected for purchase. Selecting this hot zone takes the user to FIG. 55 which itemizes the contents of the user's shipping basket including a running total of the selected items. FIG. 56 illustrates an order form which prompts the user for information regarding where and how the selected items should be shipped. FIG. 57 allows the user to select a particular credit payment method (i.e., Visa or MasterCard).

10 Video Rental Embodiment

An alternate preferred embodiment contemplates the incorporation of the present invention with videos for aiding video renters. It is further contemplated that this alternate preferred embodiment incorporate both the network and stand-alone kiosk embodiments described above. In this embodiment, the system allows users to choose from a bank of different movie clips (i.e. movie trailers) in order to assist them in making their rental selections.

A common problem among many video renters is that they are faced with a wide selection of movies about which they do not have much information. While they may be familiar with many of the big name movies, or recently released movies, some of the more obscure movies may be completely unknown. For this reason, many of these movies may go unrented because of fear by the customer of renting a movie they will not like. In fact, the only practical source of information the customer has access to regarding these movies is what is written on the video box cover. What is therefore needed is a method for providing customers with access to a preview of the movie so that they can make a more informed decision as to whether they will enjoy a particular movie.

The present invention satisfies this need by providing for a bank of movie previews and possible critical reviews that the customer can view in much the same manner as music recordings as discussed above. The customer can select a particular video box cover and access the point-of-preview web site in order to view a preview of the particular movie. By scanning the box cover (i.e. the box cover's bar code) or typing the movie title into the system, the customer can view a short preview (i.e. film trailer) of the movie. If the customer likes the preview, the system can also be programmed to provide the customer with other similar movie titles which may be of interest to the customer.

Alternatively, if a customer does not have a particular movie in mind, he or she may input movie categories such as "Action," "Drama" or "Comedy." This will allow the customer to narrow her selections to only those movies within a specific category. Further query limitations can include movies including particular actors, directors or producers. This allows customers to further narrow the focus of their search based upon the type of movie they may be interested in. Once the customer has narrowed her choices, he or she can preview the selected choices.

It should be noted that while the present invention has been described in detail by way of illustration and example for purposes of clarity of understanding, it will be understood by those skilled in the art that certain changes and modifications may be made to the above-described embodiments without departing from the spirit of the invention and scope of the appended claims.

What is claimed is:

1. A method for enabling a remote user to preview a portion of a pre-recorded music product from a network web site containing pre-selected portions of different pre-recorded music products, using a computer, a computer display and a telecommunications link between the remote

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user's computer and the network web site, the method comprising the steps of:

- a) using the remote user's computer to establish a telecommunications link to the network web site wherein the network web site comprises (i) a central host server coupled to a communications network for retrieving and transmitting the pre-selected portion of the pre-recorded music product upon request by a remote user and (ii) a central storage device for storing pre-selected portions of a plurality of different pre-recorded music products;
- b) transmitting user identification data from the remote user's computer to the central host server thereby allowing the central host server to identify and track the user's progress through the network web site;
- c) choosing at least one pre-selected portion of the pre-recorded music products from the central host server;
- d) receiving the chosen pre-selected portion of the pre-recorded products; and
- e) interactively previewing the received chosen pre-selected portion of the pre-recorded music product.

2. The method of claim 1 further comprising the step of rating the chosen pre-selected portion of the pre-recorded music products.

3. The method of claim 1 wherein the central memory device comprises a plurality of compact disc-read only memory (CD-ROMs).

4. The method of claim 1 wherein the central memory device comprises a RAID array drive.

5. A method for enabling a remote user to preview a portion of a pre-recorded music product from a network web site containing pre-selected portions of different pre-recorded music products, using a computer, a computer display and a telecommunications link between the remote user's computer and the network web site, the method comprising the steps of:

- a) using the remote user's computer to establish a telecommunications link to the network web site wherein the network web site comprises (i) a central host server coupled to a communications network for retrieving and transmitting the pre-selected portion of the pre-recorded music product upon request by a remote user and (ii) a central storage device for storing pre-selected portions of a plurality of different pre-recorded music products;
- b) transmitting user identification data from the remote user's computer to the central host server thereby allowing the central host server to identify and track the user's progress through the network web site;
- c) choosing at least one pre-selected portion of the pre-recorded music products wherein the portion of the pre-recorded product is identified by a product code;
- d) receiving the chosen pre-selected portion of the pre-recorded music products; and
- e) interactively previewing the received chosen pre-selected portion of the pre-recorded music product.

6. A network web site for allowing a remote user to preview a pre-selected portion of a pre-recorded music product, using a computer, a computer display and a telecommunications link between the remote user's computer and the network web site, the network web site comprising:

- a) a central host server coupled to a communications network for retrieving and transmitting the pre-selected portion of the pre-recorded music product upon request by the remote user;

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b) a central storage device for storing pre-selected portions of a plurality of different pre-recorded music products, the central storage device coupled to the central host server;

5 c) identification (ID) means for recognizing a user ID which specifically identifies the user to the central host server; and

d) control means for providing the user with interactive control over the preview of the pre-selected portion of the pre-recorded music products.

7. The network web site of claim 6 wherein the portions of the plurality of different pre-selected pre-recorded music products are identified and called from the central storage device using unique product codes.

8. The network web site of claim 6 further comprising purchasing means for allowing the user to place an order for purchasing at least one music product.

9. The network web site of claim 6 further comprising a listing means for providing the user with dynamic lists of the pre-selected portions of the plurality of different pre-recorded music products that have been previewed the most.

10. The network web site of claim 6 further comprising a recording means for providing the user with a record of previous previews by the user.

11. The network web site of claim 6 further comprising a ratings means for prompting the user for a rating of a particular one of the pre-selected portions of the plurality of different pre-recorded music products and storing the user's rating.

12. The network web site of claim 11 further comprising a first market research means for correlating the user rating with the user ID, for compiling market research data.

13. The network web site of claim 6 further comprising a second market research means for correlating the user ID with all previews performed by the user, for compiling market research data.

14. A network web site for allowing a remote user to preview a pre-selected portion of a pre-recorded music product, using a computer, a computer display and a telecommunications link between the remote user's computer and the network web site, the network web site comprising:

a) a central host server coupled to a communications network for retrieving and transmitting the pre-selected portion of the pre-recorded music product upon request by a remote user;

b) a central storage device for storing pre-selected portions of a plurality of different pre-recorded music products, the central storage device coupled to the central host server;

50 c) identification (ID) means for recognizing a user ID which specifically identifies the user to the central host server;

d) control means for providing the user with interactive control over preview of the pre-selected portion of the pre-recorded music products; and

55 e) means coupled to the central host server for collecting demographic information regarding the user.

15. The network web site of claim 14 further comprising a ratings means for prompting the user for a user rating of a particular one of the pre-selected portions of the plurality of different pre-recorded music products and storing the rating.

16. The network web site of claim 15 further comprising first market research means for correlating the user rating with the user ID, for compiling market research data.

17. The network web site of claim 14 further comprising a second market research means for correlating the user ID

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with all previews performed by the user, for compiling market research data.

18. The network web site of claim 14 wherein the demographic information is selected from the group of

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information types consisting of age, sex, income, ethnicity, education level, marital status, hobbies, and occupation.

* * * * *

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US006182126B1

(12) **United States Patent**
Nathan et al.

(10) **Patent No.:** US 6,182,126 B1
(45) **Date of Patent:** *Jan. 30, 2001

(54) **HOME DIGITAL AUDIOVISUAL INFORMATION RECORDING AND PLAYBACK SYSTEM**

(75) **Inventors:** Guy Nathan, Yerres (FR); Tony Mastronardi, Pierrefonds (CA)
(73) **Assignee:** Touchtunes Music Corporation, Las Vegas, NV (US)

(*) **Notice:** This patent issued on a continued prosecution application filed under 37 CFR 1.53(d), and is subject to the twenty year patent term provisions of 35 U.S.C. 154(a)(2).

Under 35 U.S.C. 154(b), the term of this patent shall be extended for 0 days.

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§ 371 **Date:** Jun. 12, 1997
§ 102(e) **Date:** Jun. 12, 1997
(87) **PCT Pub. No.:** WO96/12259
PCT **Pub. Date:** Apr. 25, 1996

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(51) **Int. Cl.⁷** G06F 15/16; G06F 3/00; H04N 7/14; H04H 1/02
(52) **U.S. Cl.** 709/219; 345/327; 348/7; 348/10; 348/12; 455/5.1; 455/6.2; 455/6.3; 434/307 A
(58) **Field of Search** 345/326, 327; 455/3.1, 4.1, 4.2, 5.1, 6.1, 6.2, 6.3; 348/6, 7, 10, 12, 13, 563, 569, 14; 395/200.47-200.49; 434/307 R, 307 A; 709/217-219

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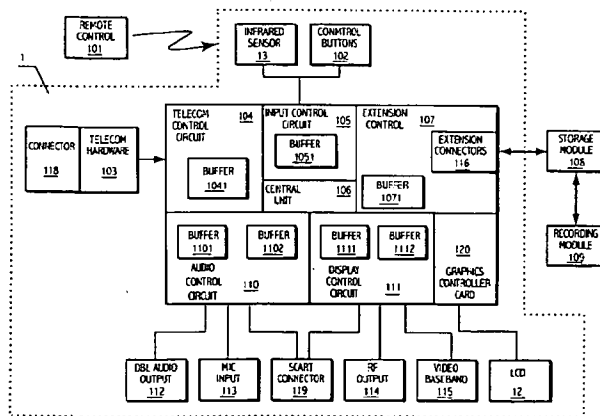
Primary Examiner—John W. Miller

(74) *Attorney, Agent, or Firm*—Nixon & Vanderhye P.C.

(57) **ABSTRACT**

A digital home audiovisual information recording and playback apparatus includes a microprocessor associated, through a digital interface, with a display, through another interface with sound playback structure and through a telecommunications interface with structure for loading audio selection or visual selection digital information. The system includes structure for controlling the display, enabling an operating mode to be selected from a menu of three modes, in which the device either plays back information stored in its mass memory, records new digitized information in its mass memory or combines analog information from a microphone with digitized information received from the mass memory.

11 Claims, 12 Drawing Sheets



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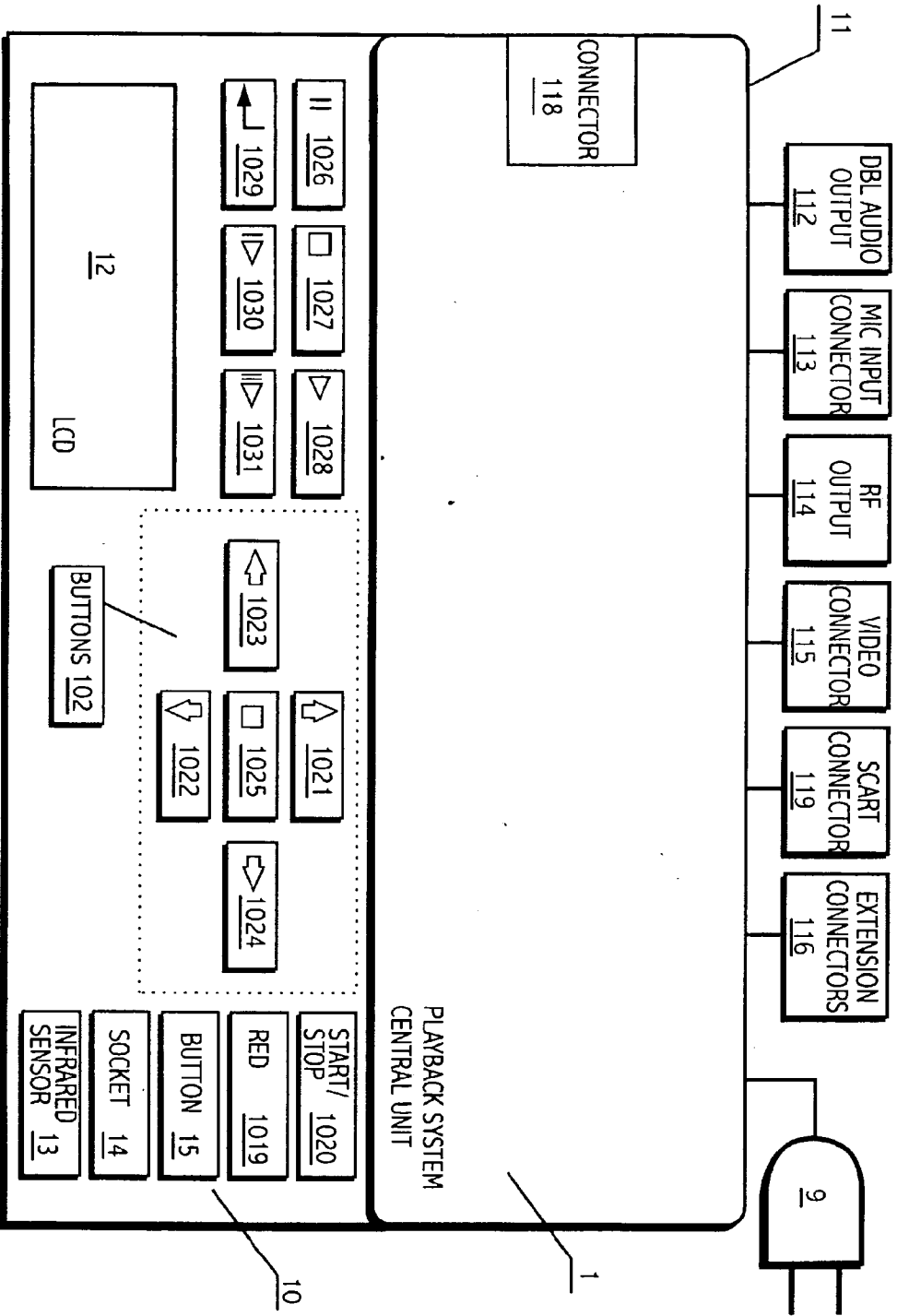


Fig. 1

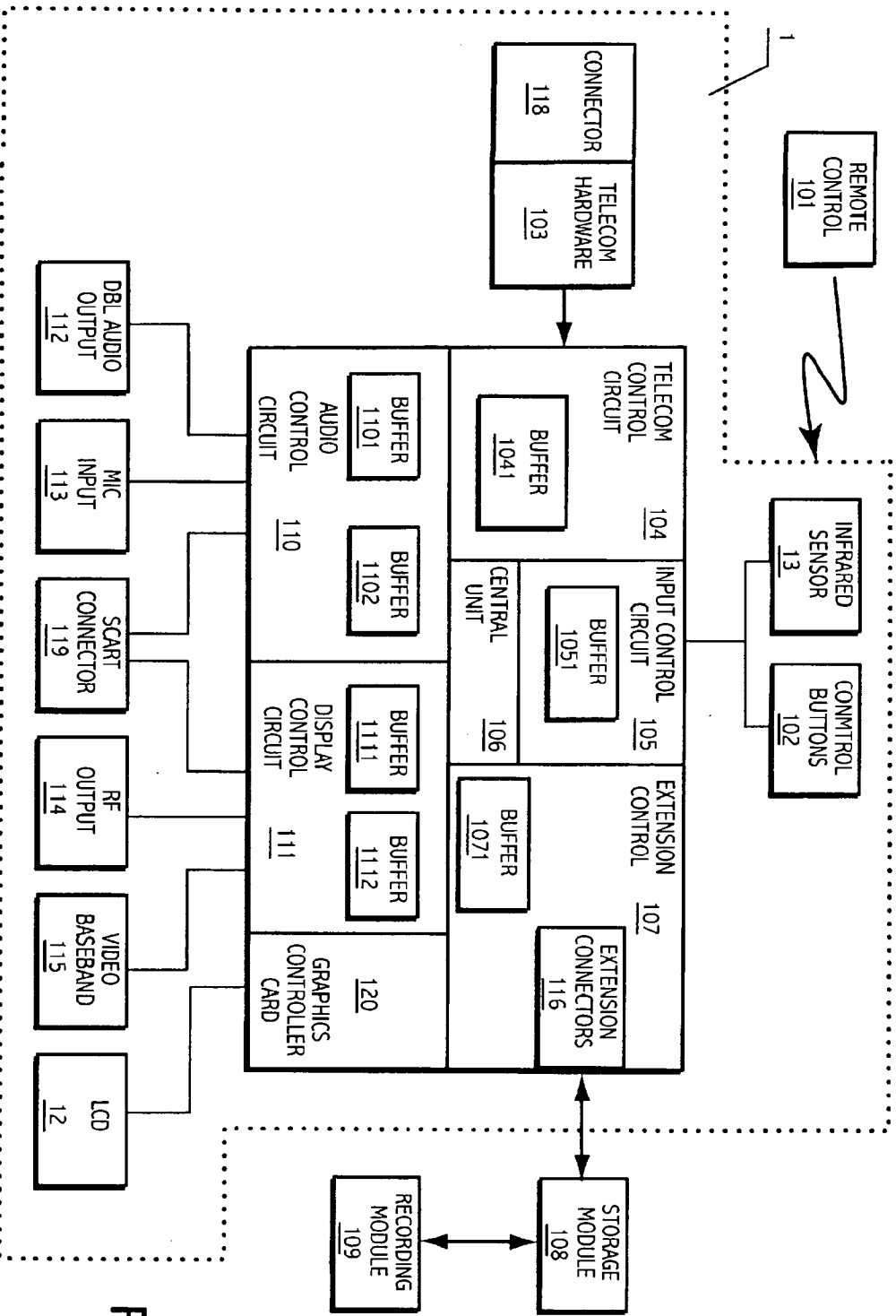


Fig. 2

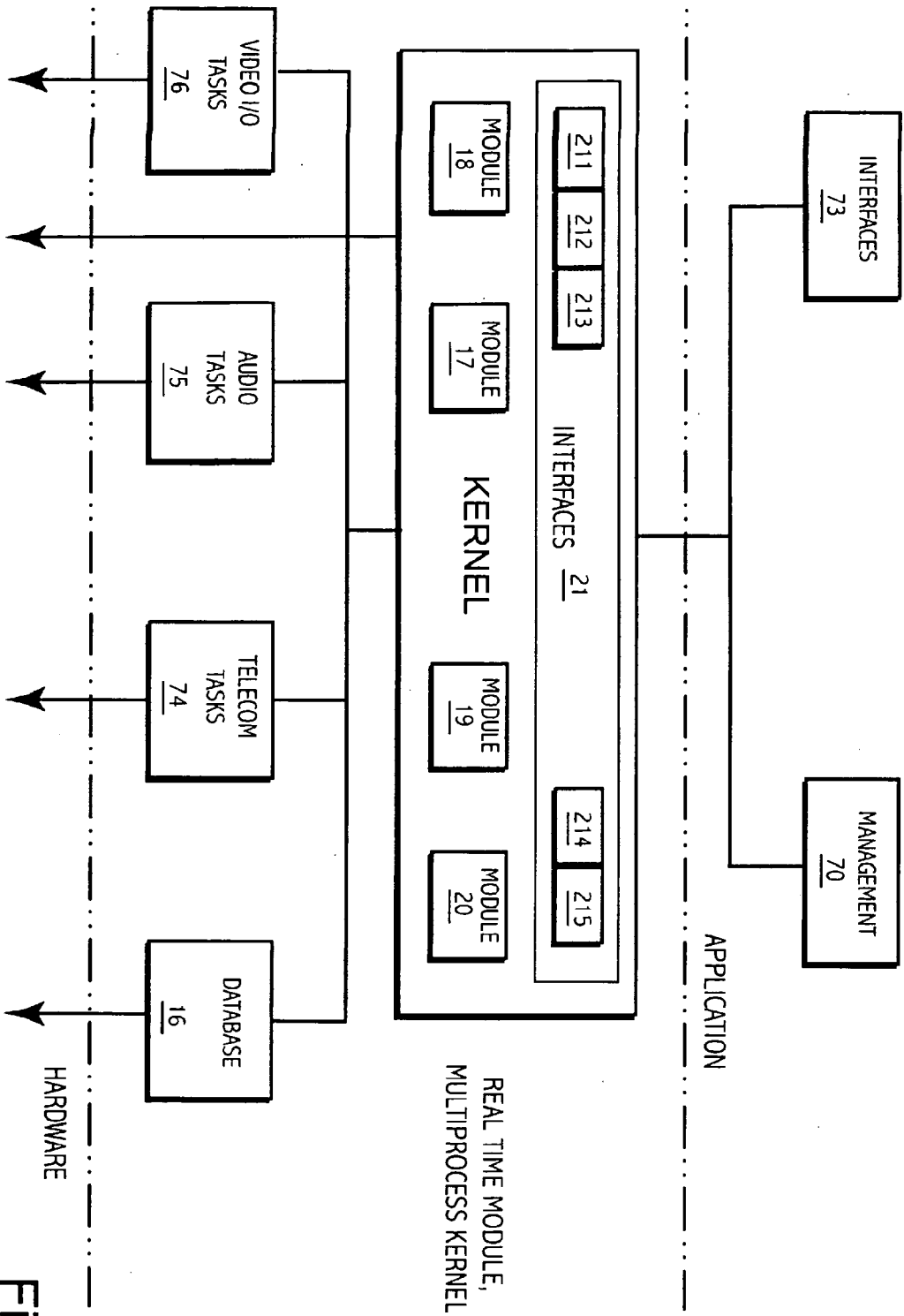
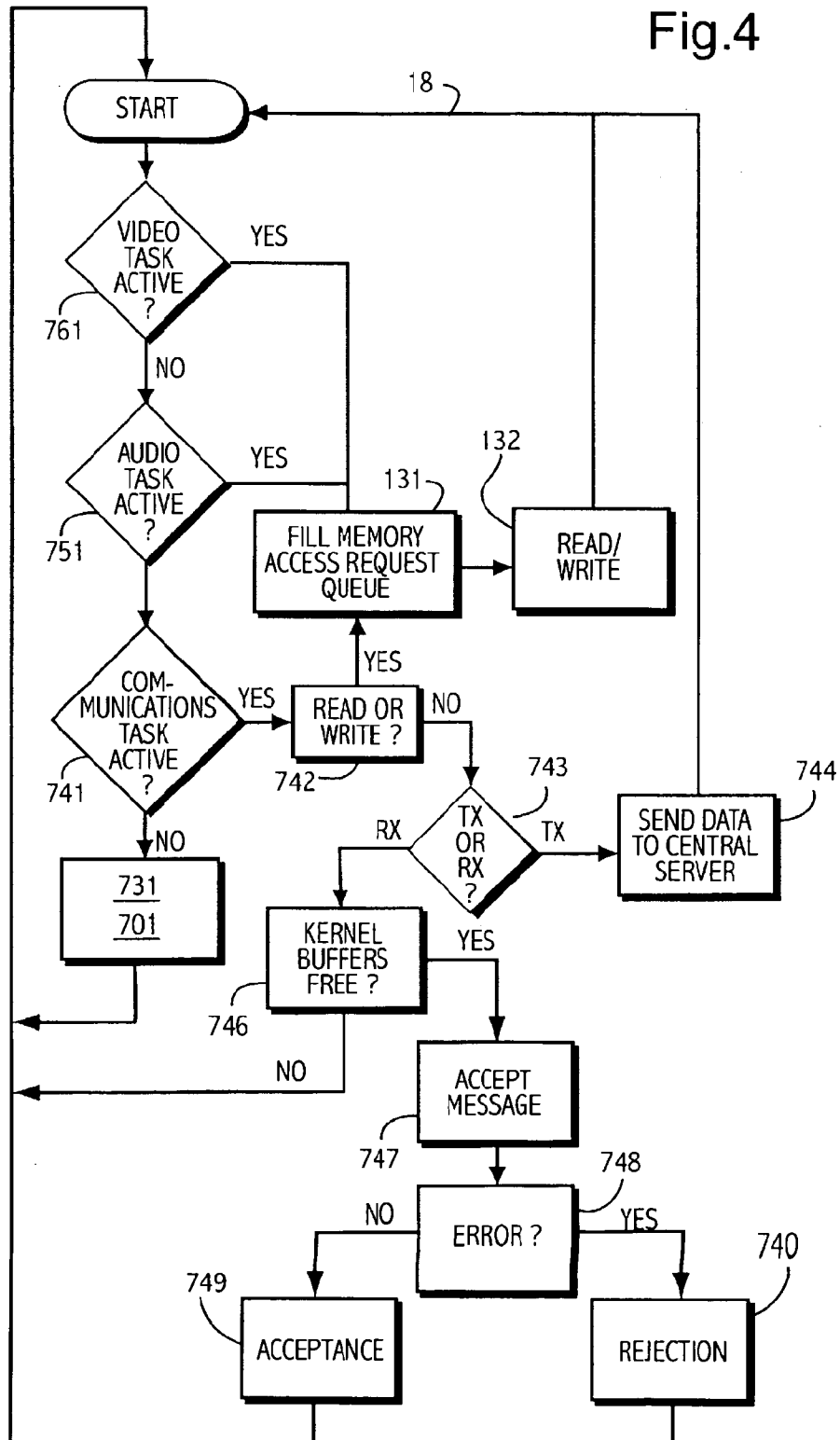


Fig. 3

Fig.4



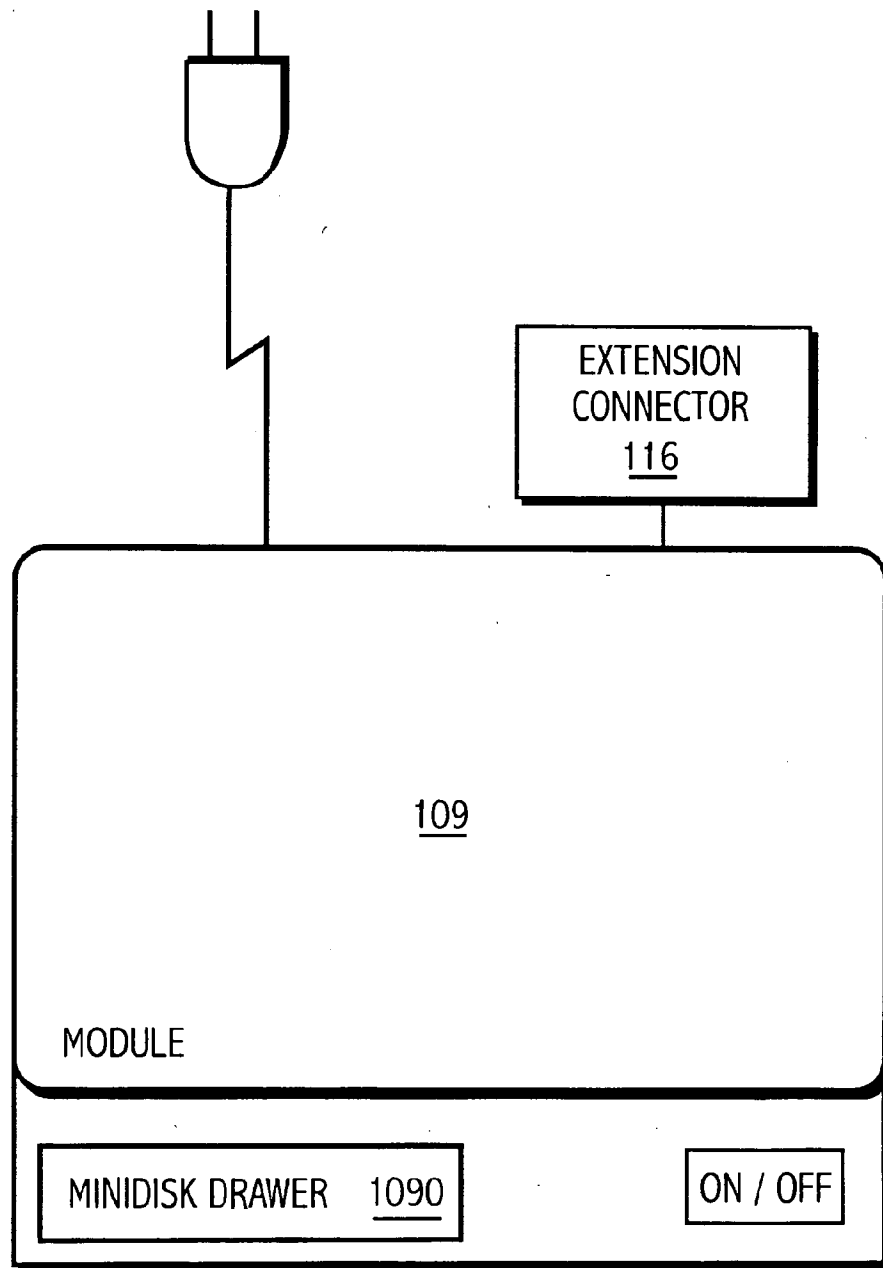


Fig.5A

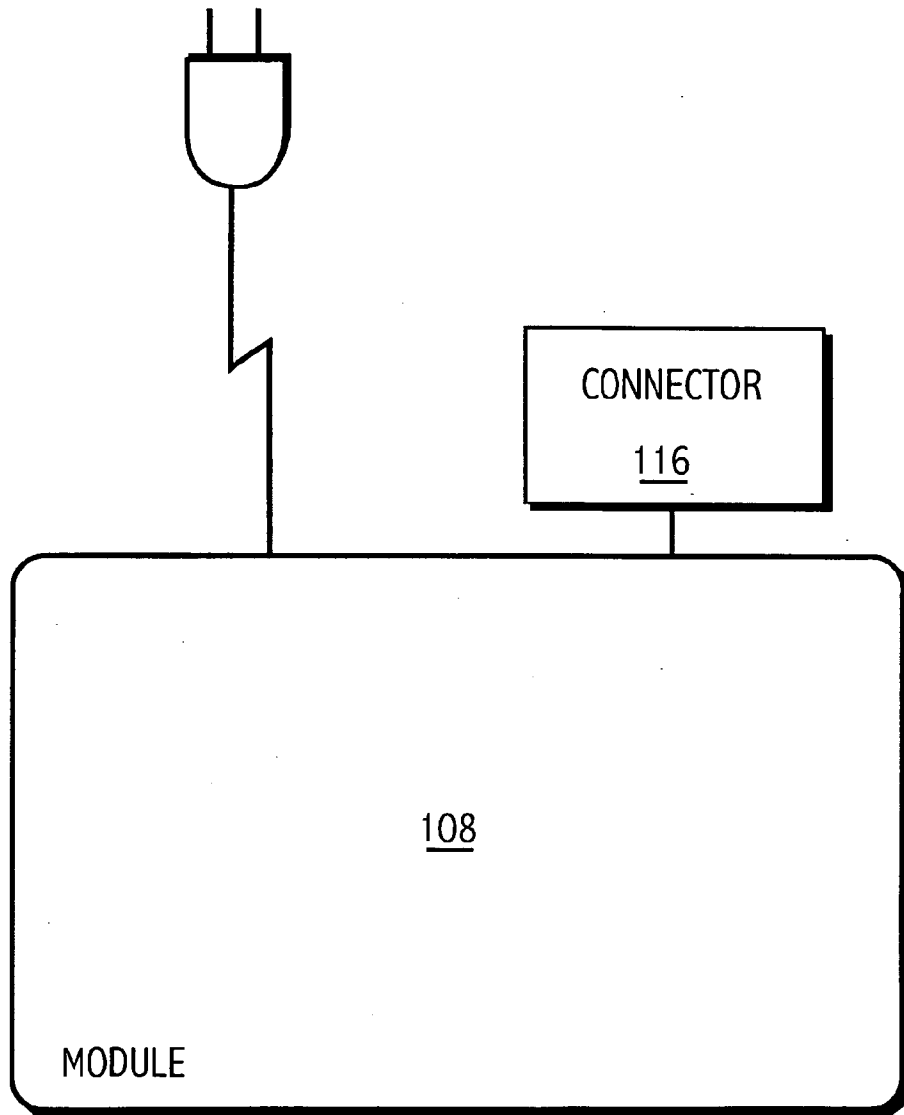
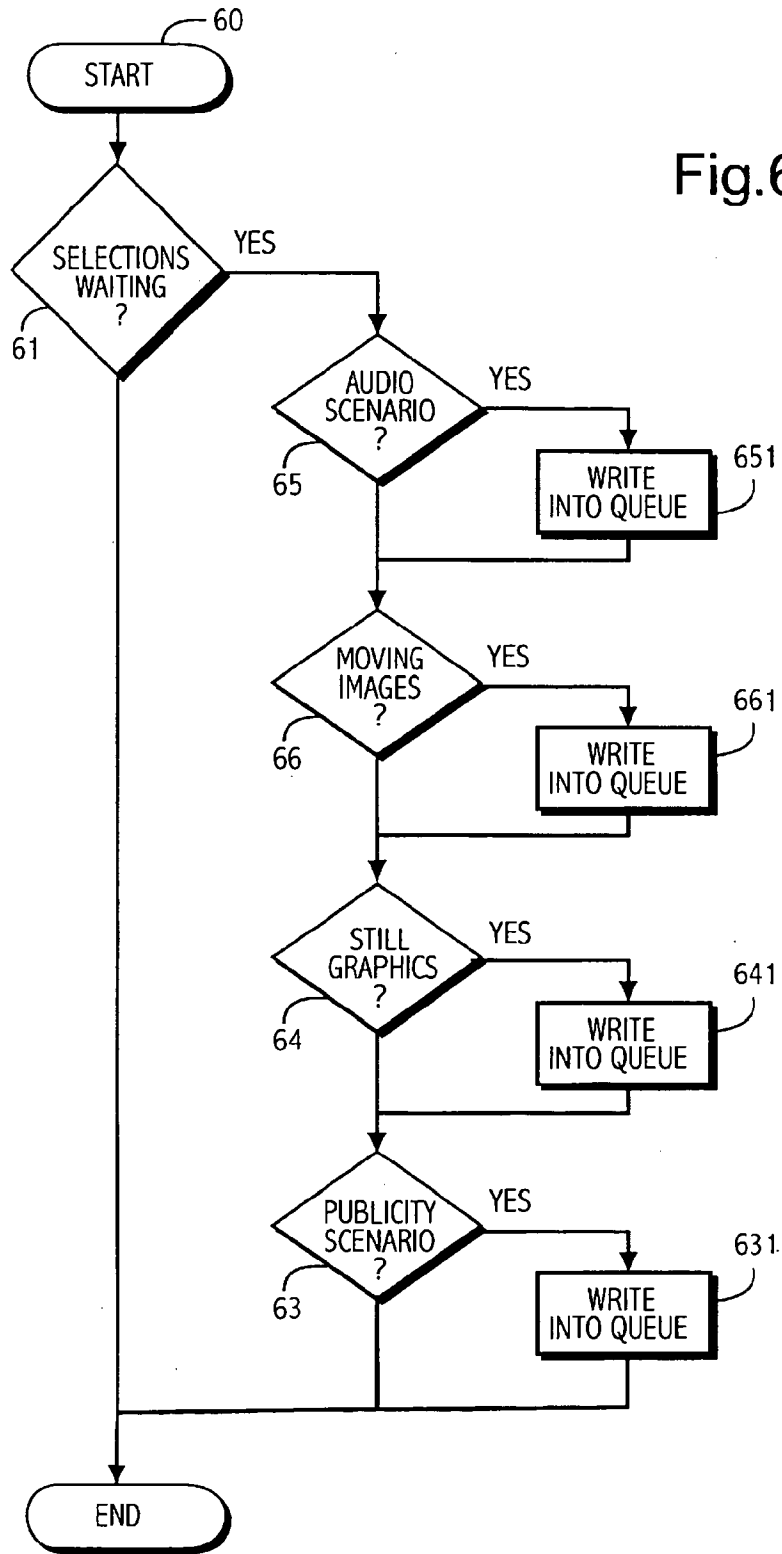


Fig.5B

Fig.6



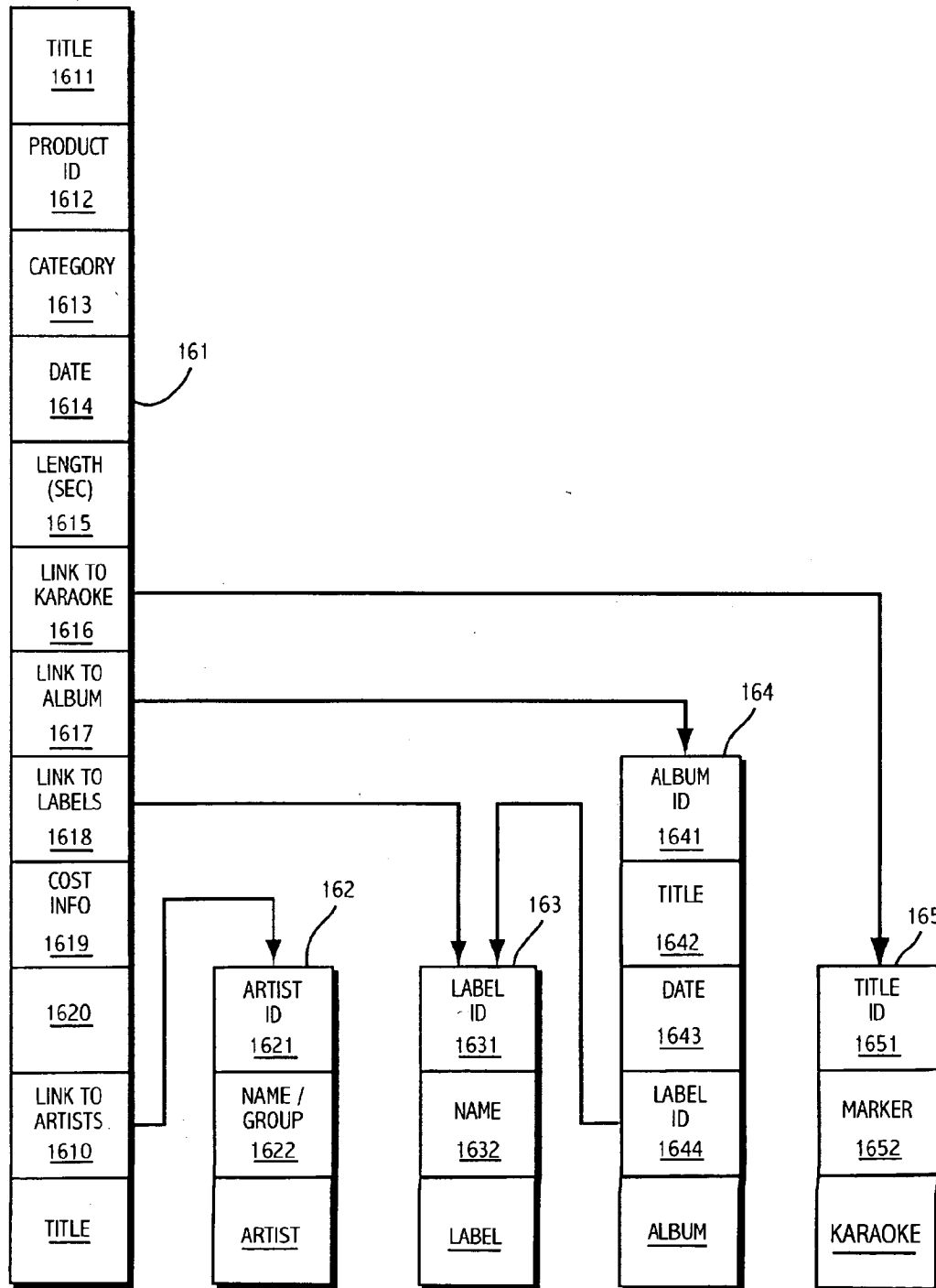


Fig.7

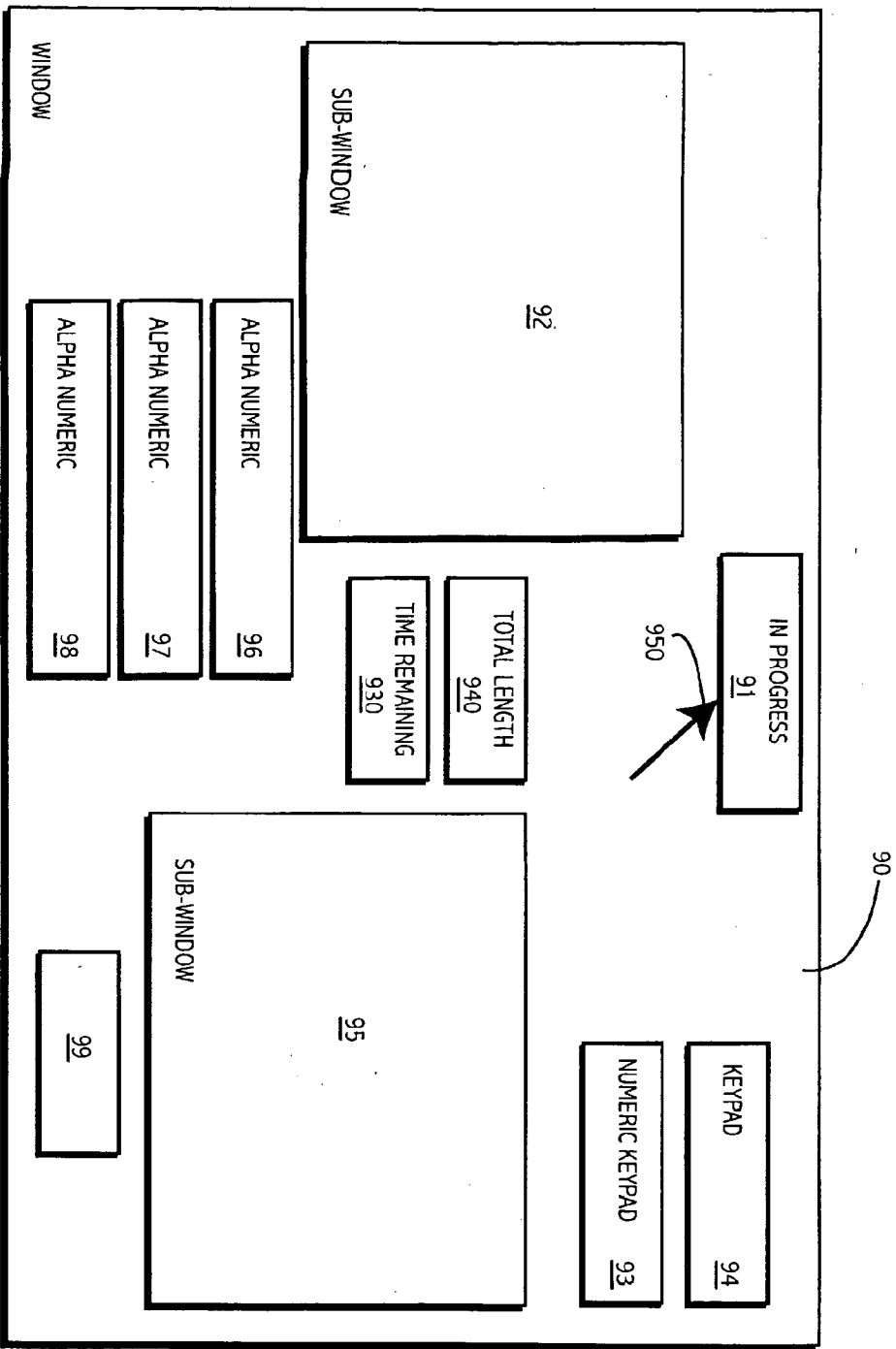


Fig. 8

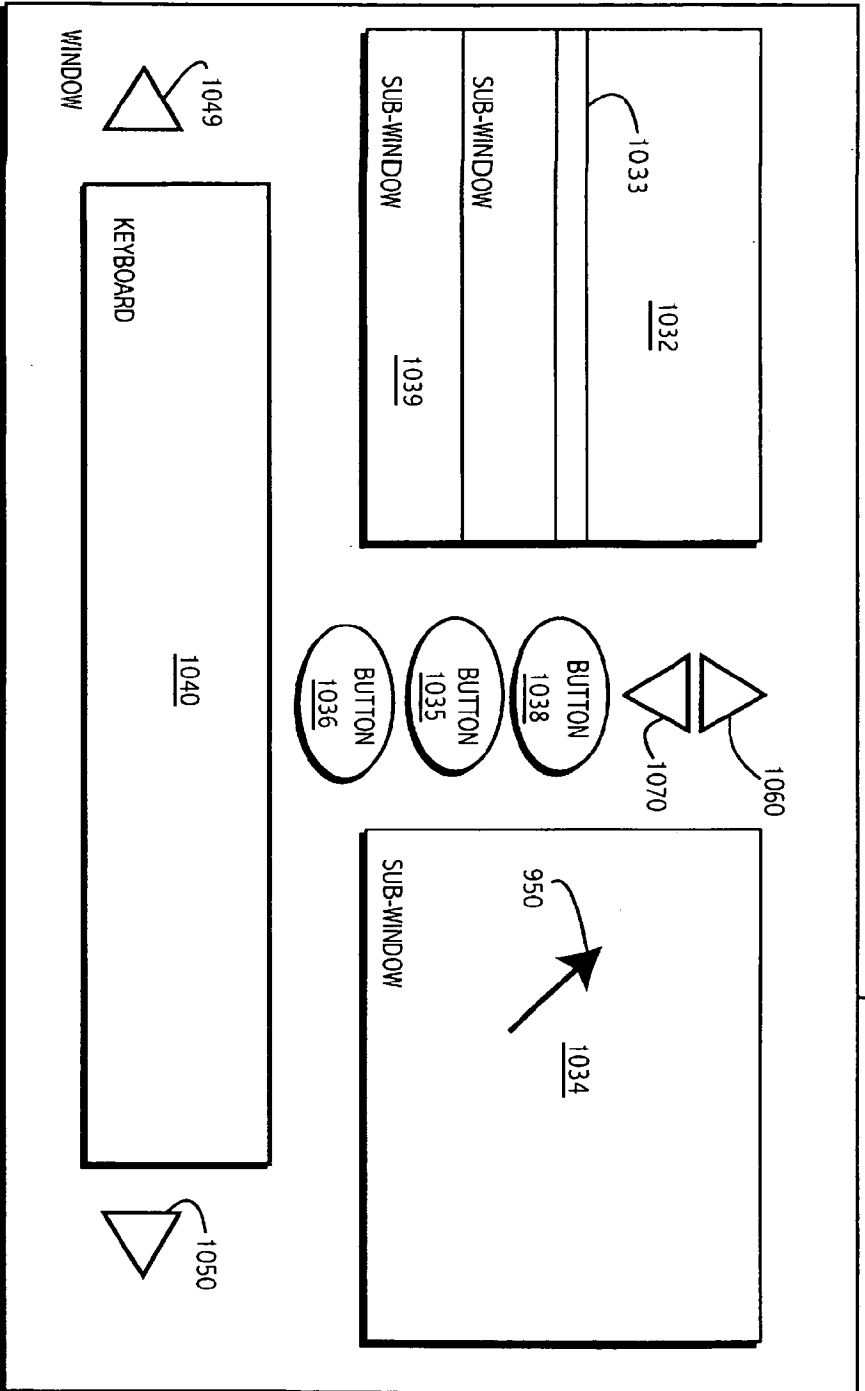


Fig. 9

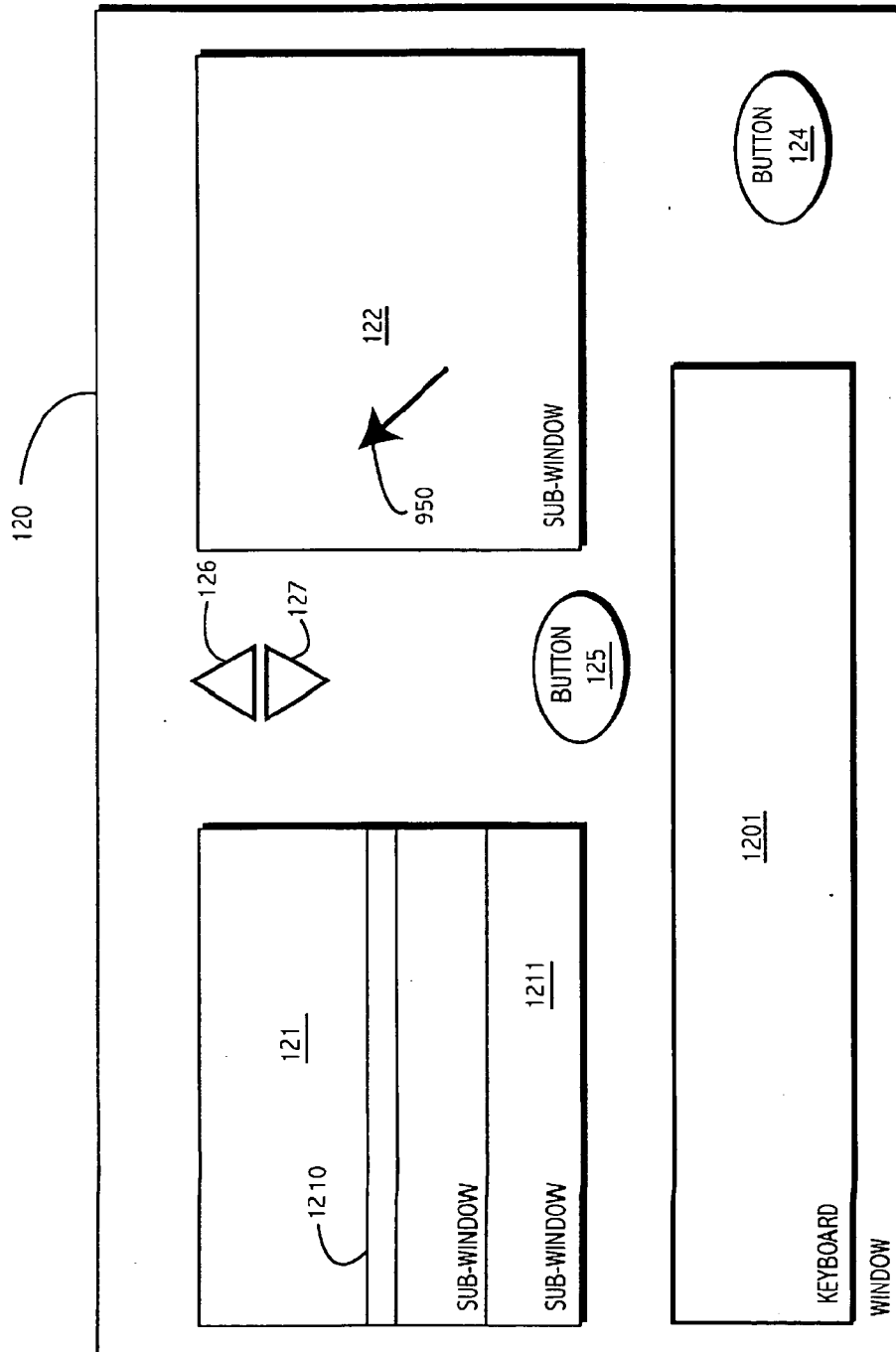


Fig.10

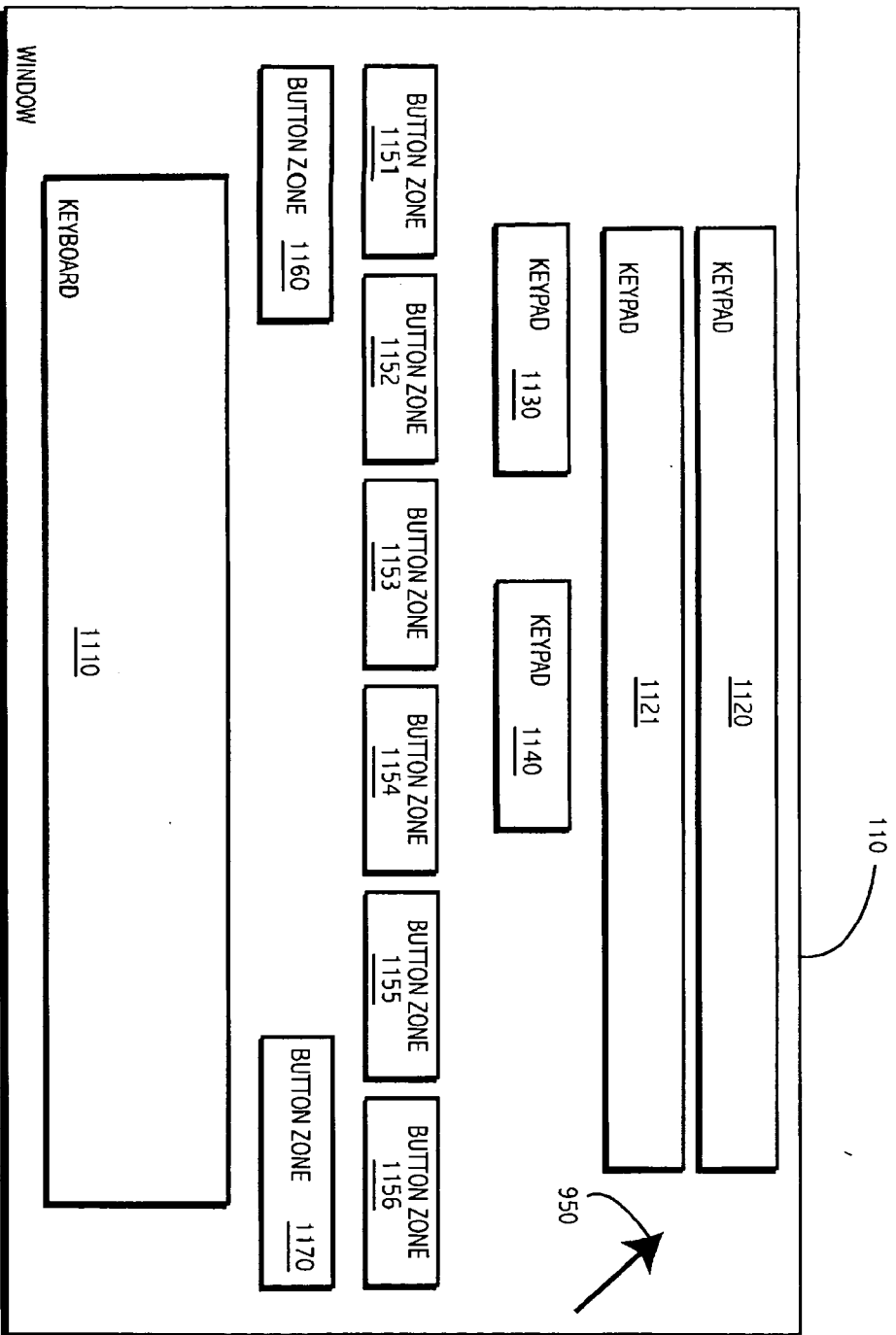


Fig. 11

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HOME DIGITAL AUDIOVISUAL INFORMATION RECORDING AND PLAYBACK SYSTEM

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is related to our copending commonly assigned applications:

U.S. Ser. No. 08/817,690 (Corres. to PCT/FR94/01185 filed Oct. 12, 1994);

U.S. Ser. No. 08/817,689 (Corres. to PCT/FR95/01333 filed Oct. 13, 1995)

U.S. Ser. No. 08/817,528 (Corres. to PCT/FR95/01334 filed Oct. 12, 1995)

U.S. Ser. No. 08/817,968 (Corres. to PCT/FR95/01335 filed Oct. 12, 1995)

U.S. Ser. No. 08/817,426 (Corres. to PCT/FR95/01337 filed Oct. 12, 1995)

U.S. Ser. No. 08/817,438 (Corres. to PCT/FR95/01338 filed Oct. 12, 1995)

BACKGROUND OF THE INVENTION

1. Field of the Invention

BACKGROUND AND SUMMARY OF THE INVENTION

The invention relates to a home digital audiovisual information recording and reproduction apparatus.

Audiovisual reproduction systems found generally in cafes or pubs and called jukeboxes are known. These devices are generally bulky including large storage capacities unsuited for home use. The object of this invention is to eliminate these defects of the prior art by proposing a device which allows a home user to acquire digital audiovisual data selections using his TV and to reproduce them using the TV screen for the visual part and the components of his stereo system for the audio part.

The first object of the invention is to propose an apparatus which allows selection and downloading of digital data, and reproduction of these digital data for domestic apparatus or use of the device for karaoke.

This first object is achieved with a home digital information audiovisual recording and playback apparatus developed around a microprocessor device linked via a digital interface to a display and by another interface to audio reproduction structure. The apparatus includes a telecommunications interface for downloading the digital data containing the audio selection or the video selection. The apparatus includes control structure that allows control of a display device and selection via a menu of one operating mode from among three in which the device either plays back data stored in its mass storage or allows recording of a new item of digitized data in its mass storage or mixes with the digitized data delivered by the mass storage of a piece of analog data delivered by a microphone.

A second object of the invention is to devise a modular apparatus which consequently allows continued development of the device to support recording of selections on a portable medium.

This object is achieved with a supplementary recording module connected by a specific interface to the primary apparatus, and a recording menu can be selected using the buttons of the control structure of the device of the primary apparatus.

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According to another feature, the recording module allows production of portable recording media to be played on another digital audiovisual information playback unit.

Another object of the invention is to devise a modular device which allows the user to develop a design allowing storage of a plurality of audio or video or audiovisual information selections.

This object is achieved by a second mass storage module allowing the recording of a plurality of digitized audiovisual data.

Another object is to devise an apparatus which allows selection of audio or video or audiovisual digital data to be downloaded while enabling this information to be reproduced on the audio and video systems which he already owns.

This object is achieved by providing the home digital audiovisual information recording and reproduction apparatus with a central unit, a telecommunications interface linked to a connector and managed by the central unit, an electronic input control circuit managing a plurality of control buttons and a sensor of infrared or audio emission originating from a remote control box, an emitter of the same waves, an electronic extension controller circuit connected to a connector, an electronic audio controller circuit linked to audio output connectors for stereo systems and a microphone input connector, and an electronic video controller circuit linked to connectors of a video peripheral apparatus. The set of electronic circuits managed by the central processor utilizes a multitask operating system and a computer operating program stored in a battery backed-up static RAM, which is part of the electronic circuit of the central unit. The static battery backed-up RAM is used as storage for at least one selection of audiovisual digital data and a graphics control circuit, which controls a liquid crystal display device.

The final object is to devise a method of downloading which ensures effective payment and non-selection of audiovisual data by individuals not skilled in the domestic system.

This object is achieved by providing an operating mode of link selection control which allows downloading with a server once the user has given for example his credit card number and confirmed the set of his selection or selections by supplying a personal identification number. This object can also be achieved by any other method of payment such as: prepaid chip card or automatic billing on the subscriber phone bill.

BRIEF DESCRIPTION OF THE DRAWINGS

Other features and advantages of this invention will be illustrated by the following description with reference to the attached drawings in which:

FIG. 1 shows a schematic of the front and back of the apparatus according to the invention;

FIG. 2 shows a schematic of the general architecture of the electronic circuit comprising the apparatus;

FIG. 3 shows the organization of the multitask system managing the hardware and software;

FIG. 4 shows a flowchart describing the operation of the multitask operating system;

FIG. 5A shows a first version of the extension of the module for the apparatus of FIG. 1;

FIG. 5B shows a second version of the extension module for the apparatus of FIG. 1;

FIG. 6 shows a flowchart of the queuing of the selections;

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FIG. 7 shows an organizational diagram of the database;

FIG. 8 shows an example of graphics display by the graphics module of the in service mode module;

FIG. 9 shows an example of graphics display by the graphics module of the new selection acquisition mode module;

FIG. 10 shows an example of graphics display by the graphics module of the browsing and selection mode module; and

FIG. 11 shows an example of graphics display by the graphics module of the category selection mode module.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Preferably, but in a nonrestrictive manner, the audiovisual reproduction system uses the aforementioned listed components.

The primary module is a high performance, PC microprocessor-compatible electronic device, with for example an Intel 80486 DX/2 type system which has storage means and the following characteristics:

- compatibility with the local Vesa bus,
 - processor cache memory: 256 kB,
 - RAM of 32 MB or more, battery backed-up
 - high performance parallel and serial ports,
 - graphics adapter with video baseband, radio frequency (RF) band output and SCART connector,
 - type SCSI/2 bus type controller as the extension controller
- Any other central unit with equivalent or superior performance can be used in the invention.

The central unit (106) controls and manages an audio control circuit (110), a telecommunications control circuit (104), an input control circuit (105), and a display control circuit (111).

Input controller (105) interfaces with a remote control (101) and control buttons (102) located on the front of the apparatus. Telecommunications controller (104) interfaces with various telecommunications hardware (103) to allow the system to use several media for communicating with the outside. Audio controller (110) is a D/A converter with multiple inputs/outputs to which the customer microphone and amplifier are connected. The video controller delivers the baseband and RF band video signals of the screens to be displayed. An extension controller (107) makes it possible to link the other modules (108, 109) to the primary module.

A communications link between the primary module and the distribution center is also required. This link can be either a modem for a classical telephone line or a specialized line with a speed of at least 28.8 kbps or a link by parabolic antenna and satellite, or an ISDN telecommunications link or by coaxial cable or by MMDS-receiving antenna.

For radio wave type links, requests are made by classical telephone line.

Audio reproduction of the musical selections is done by a digital/analog converter circuit provided to support a large number of input sources while providing an output with an audio quality similar to a compact disk. The microprocessor multimedia audio adapter Sound Blaster SBP32AWE from Creative Labs Inc. is one example in which two buffers (1101, 1102) are added.

Likewise, the control circuit of the display likewise includes two buffers (1111, 1112).

Operation and management of the system are performed using, either control buttons (102) of the apparatus or remote control (101). An infrared remote control linked to an infrared sensor with serial adapter can be used in the system.

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The diagram from FIG. 1 shows that the primary module has a RIAA stereo audio output, one microphone input for karaoke, a baseband and RF video output, and a connector for connecting it to the other expansion modules and a SCART connector.

Data are displayed on the TV set of the owner either by the RF connector or the baseband connector or the SCART connectors.

A battery system maintains the system memory when it is off. These long life batteries are recharged when electricity is supplied to the apparatus.

A thermally controlled and ventilated power supply powers the system. This power supply can be protected against surges and harmonics.

The electronic device is placed in a box which includes on one of its sides (11), for example, the back, an electric power cord with line socket (9), a double audio output (112) comprising RCA jack type sockets, a microphone input connector (113), a video connector (115) for the video baseband of the NTSC PAL or SECAM type and an RF radio frequency type output (114) and a SCART European connector (119). As FIG. 2 shows, audio output (112) and microphone input (113) are linked to audio controller card (110), RF video/audio output (114) is linked to video controller card (111) and to audio controller card (110) via an RF modulator with M-B/G or L standards, for example, SCART connector (119) is linked to video controller card (111) and to audio controller card (110), video baseband (115) is linked to video controller card (111), extension connectors (116) are linked to extension controller card (107), one connector (118) of the telephone line type is linked to telecommunications circuit card (103) which is linked to telecommunications controller (104). Finally, the box includes on its front (10) a set of buttons (102) containing arrow (1021) which allows a cursor to move up, arrow (1022) which allows the cursor to move down, arrow (1023) which allows the cursor to move to the left, arrow (1024) which allows the cursor to move to the right, and finally central button (1025) allowing activation or validation and corresponding to a down event equivalent to a mouse, the arrows allowing movement of a cursor and corresponding to a drag event. Release of button (1025) corresponds to a button release event, i.e., up for a mouse. Front (10) includes a red button (1019) which allows the "purchase" function described below. The front also includes a liquid crystal screen (12) linked to a graphics controller card (120) to allow minimum display in the case in which the user does not connect a TV screen at the video or RF output. The side also contains a button (15) allowing adjustment of the volume of headphones connected to a socket (14) for a hifi headset. Finally, device start and stop button (1020) is located on the front (10). A zone containing infrared sensor (13) itself connected to input controller card (105) allows reception of infrared signals from remote control (101). It is apparent that the type of sensor can be modified according to the type of remote control used without departing from the framework of the invention. Finally, the front may include a set of buttons which allows control of functions ordinarily used for CD playback, i.e., "pause" function (1026), "stop" function (1027), "read" function (1028), "return" function (1029), "advance" function (1030), "following" function (1031). These functions are linked to storage (108) and recording (109) modules when they are connected by extension connector (116) to extension card (107) as shown in FIG. 2.

Besides these components, a microphone connected to audio controller (110) allows use of this equipment as a karaoke machine.

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Two buffers (1101, 1102) are connected to audio controller circuit (110) to allow storage of one item of information corresponding to a quarter of a second of sound each in alternation. Likewise, two buffers (1111, 1112) are linked to video controller circuit (111) which are each able to store a tenth of a second of video alternately. Finally, a respective buffer (1041, 1051, 1071) is connected to each of the circuits of the communication controller (104), input interface (105) and extension (107).

The system operating software has been developed around a library of tools and services largely oriented to the audiovisual domain in a multimedia environment. This library advantageously includes an efficient multitask operating system which efficiently authorizes simultaneous execution of multiple fragments of code. This operating software thus allows concurrent execution, in an orderly manner and avoiding any conflict, of operations performed on the display, audio reproduction structure as well as management of the telecommunications lines via the distribution network. In addition, the software has high flexibility.

The library contains, as will be shown below, a programming interface for buttons (102) or remote control (101) connected to each graphics module which will be described below, and linking to the functions of the connected graphics module functions of reaction to activation by one or more external events. External events originate from the user and are processed by the interface to be able to be interpreted by the operating system as the equivalent of a mouse event.

Digitized and compressed audiovisual data are stored in the nonvolatile storage of CPU (106) such as a static RAM.

Each selection is available according to digitized formats: with hi-fi quality or CD quality.

It must be noted that while all these modules described separately seem to be used sequentially, in reality the specific tasks of these modules are executed simultaneously in an environment using the multitask operating system.

The first module, labeled SSM, is the system startup module. This module does only one thing, consequently it is loaded automatically when the system is powered up. It then directly enters the "in service" mode of the module labeled RRM.

The RRM module is the module of the "in service" mode. In this mode the system is ready to handle any request which can be triggered by various predefined events such as:

the user who touches one of control keys (102) on front (10) or remote control (101). In this case the system transfers control of its foreground session to the CBSM module of the customer browsing and selection mode.

The system remains in this "in service mode" until one of the above described events occurs.

Thus, the RRM module of the in service mode includes a module allowing graphics display corresponding for example to that of FIG. 8. The screen of this graphics module allows display of a window (90) which contains for example the display in zone (91) of the note "in progress" of execution. A second smaller window (92) included in first window (90) allows graphics display of the disk jacket during performance. In numeric keypad (93) the total time corresponding to pieces to be played which are stored in the queue is indicated. The number of songs in the queue is indicated in another digital keypad (94). A third smaller window (95) included in first window (90) displays a moving image such as a video clip, synthesized images or moving text if it is a karaoke title stored in the video files. In alphanumeric keypad (96) is the album title and in second alphanumeric keypad (97) the album name. In third alphanumeric keypad (98) the name of the artist or group is

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mentioned. This information originates from database (16) based on the title identification number and information stored in the database according to the access process explained below.

This reproduction screen displays the title which is performed, its total length (940), remaining time (930) and the disk jacket from which it originates. Use of the "action" function from the remote control or button (1025), cursor (950) being anywhere on the screen, allows the owner to pass to the screen of the selection shown in FIG. 10.

In the case in which the jukebox is not playing a song and when the songs of the queue have been exhausted, one of two windows (92, 95) will be able to be used to display promotional events or synthesized image animations.

A module specific to the remote control allows functions which command the system to accept an input requested by an infrared remote control device.

This remote control device can trigger display of the graphics screen located in FIG. 9 when the "purchase" key equivalent to (1019) of the remote control is pressed.

This remote control has keys with functions equivalent to those described above in FIG. 1, i.e.: (1026) to (1031), (1021) to (1025), (1019) to (1020).

The display of FIG. 9 allows the user to access the new selections acquisition mode in connection with the NSAM module.

This module shown in FIG. 9 contains a graphics module which allows display of window (1037). This window incorporates three subwindows (1032, 1033, 1034), the first (1032) in the form of a pull-down list makes it possible to have the selection list scrolled by pressing key (1025) by positioning a cursor (950) on pull-down arrow buttons (1060, 1070). This selection list can only be displayed either after having displayed the category selection screen (FIG. 11), after having pressed button (1036) beforehand, highlighting title (1033) by positioning the cursor on the desired title and pressing key (1025), or after having introduced in subwindow (1039) at least one character by keyboard (1040) using the cursor and key (1025).

Generally the zones of graphics buttons are actuated by positioning cursor (95) using arrows (1021 to 1024) and pressing button (1025) or via the equivalent function keys of the remote control.

Window (1034) allows display:

when selection order button (1038) is activated, the note "type in your PIN", in fact, purchase can only be possible if the personal identification number is accepted by central unit (1) of the playback system.

The user types his "PIN" on keyboard (1040); if the PIN is correct, window (1034) displays for example the note "credit card number" or if the purchase is billed on the telephone bill, window (1034) displays for example "purchase underway".

A catalog of musical titles is kept in the primary module. This catalog can be updated at the request of the owner or automatically during purchase. The cost of each entry is displayed as well as the bill total by using information (1619) from the database (FIG. 7).

During communication it is possible for the server center to use it in order to upgrade the system operating software.

When the "detail" button (1035) is pushed, various information linked to the highlighted title appears in window (1034), such as the price of the selected title, its length, the album name, the name of the artist or any other information characteristic of the selected title.

Button (1038) allows ordering of the selection which is then downloaded according to the above described mode.

Button (1035) allows display of the details on the selection. Third button (1036) allows selection of the category of music or the selection to be ordered. The user pressing this third button (1036) displays the screen shown in FIG. 11 which will be described below. Finally, the screen of FIG. 9 likewise contains an alphanumeric keypad representing keyboard (1040) which allows the user, by typing either the name of the album, artist or title written in subwindow (1039), to display in window (1032) a list of titles more or less restricted depending on the criterion used and the control keys allowing display of the preceding screen by arrow (1049) and the following screen by arrow (1050).

As stated above, the selection graphics screen shown in FIG. 10 is displayed by button (1025) from any zone of the playback graphics screen (FIG. 8). One example of the graphics module of the user browsing and selection mode module is shown in FIG. 10 in which window (120) includes three subwindows (121, 1211, 122), the first (121) being a pull-down subwindow. Pull-down of first window (121) is controlled by upper (126) and lower (127) pull-down arrows. As described above for the NSAM module, a title list can only appear in window (121) if a selection criterion has been introduced using keyboard (1201) connected to window (1211) of FIG. 10 or using window (110) triggered by category button (125) connected either to keyboard (1110) which can write an alphanumeric text in keypads (1120, 1121, 1130, 1140), or to zones (1151) to (1156) of window (110) shown in FIG. 11. Window (121) allows display of titles of selections in alphabetic order by song name. Window (122) allows display of the visual display unit corresponding to the song jacket. Button (125) allows selection of the song category and passage to the display of the following window shown in FIG. 11. Button (124) allows validation of the selection or selections for initiating their introduction into the queue or their immediate and successive performance if the queue is empty. Window (120) is completed by alphanumeric keyboard (1201) which makes it possible to directly enter the name of another singer or song title. Pressing category button (125) of FIG. 10 equivalent to (1036) of FIG. 9 calls up a subroutine of the graphics module which triggers display of window (110) of FIG. 11 in which an alphanumeric keypad makes it possible to introduce using alphanumeric keyboard (1110), the album name in zone (1120), a second alphanumeric keypad (1121) makes it possible to introduce the name of the artist in zone (1121), and third and fourth alphanumeric keypads (1130, 1140) allow introduction of a year or period and finally a line of buttons (1151 to 1156) allows selection respectively solely of "rock and roll", "dance", "country", "rap", "jazz" music albums or music for karaoke. Finally, window (110) contains button (1160) for cancellation in case of error, button (1170) for validation of the choice of selection, allowing return to window (120). Within subwindow (121) there then appears a list of one to several titles depending on a selection criterion, the user selects using cursor (950) the title which he wishes to hear, it is highlighted (1210) and simultaneously subwindow (122) displays the visual display unit corresponding to the album jacket containing the selected title. The user need simply press button (124) which causes changing of the graphics screen to display window (90) (FIG. 8) in which he will see appear in subwindow (92) the title jacket which he has selected and he will immediately hear it if the queue was at zero, in the opposite case he will see appear the title jacket will appear during performance and in keypad (94) the number of titles in the queue increased by the number of the titles which he has selected.

When the user presses button (1156) "karaoke", in the graphics screen of the category illustrated in FIG. 11, then

validates his choice by pressing graphics button (1170), the selection screen of FIG. 10 appears with a list of karaoke titles within the subwindow (121). By means of highlighting (1210) he chooses the title which he wishes to execute by then pressing button (124) which on the one hand causes display of reproduction screen (90) in FIG. 8 and on the other hand triggers reading of the pertinent title files which contain all the information necessary for operation in the karaoke mode described above.

The TSM module is the telecommunications services mode module between the central server and the audiovisual reproduction system. This module allows management of all management services available on the distribution network. All the tasks specific to telecommunications are managed like the background tasks of the system. These tasks always use only the processing time remaining once the system has completed all its foreground tasks. Thus, when the system is busy with one of its higher priority tasks, the telecommunications tasks automatically will try to reduce the limitations on system resources and recover all the microprocessor processing time left available.

A SPMM module allows the system to manage the musical song or video selections in the queue for their playback in the order of selection.

The multitask operating system comprises the essential component for allowing simultaneous execution of multiple code fragments and for managing priorities between the various tasks which arise.

This multitask operating system is organized as shown in FIG. 3 around a kernel comprising a module (17) for resolving priorities between tasks, a task scheduling module (18), a module (19) for serialization of hardware used, and a process communications module (20). Each of the modules communicates with application programming interfaces (21) and database (16). There are as many programming interfaces as there are applications. Thus, module (21) includes a first programming interface (211) for remote control (101), a second programming interface (212) for liquid crystal screen (12), a third programming interface (213) for audio control circuit (110), a fourth programming interface (214) for video control circuit (111), and a fifth interface (215) for telecommunications control circuit (104).

Five tasks with a decreasing order of priority are managed by the kernel of the operating system, the first (76) for the video inputs/outputs has the highest priority, the second (75) of level two relates to audio, the third (74) of level three to telecommunications, the fourth (73) of level four to interfaces and the fifth (70) of level five to management. These orders of priority will be considered by priority resolution module (17) as and when a task appears and disappears. Thus, as soon as a video task appears, the other tasks underway are suspended, priority is given to this task and all the system resources are assigned to the video task. At the output, video task (76) is designed to unload the video files from optional mass memory (108) alternately to one of two buffers (1111, 1112), while the other buffer (1112 or 1111) is used by video controller circuit (111) to produce the display after data decompression. At the input, video task (76) is designed to transfer data received in telecommunications buffer (1041) to the static RAM of the CPU. It is the same for audio task (110) on the one hand at the input between telecommunications buffer (1041), and mass memory (108) and on the other hand at the output between mass memory (108) and one of two buffers (1101, 1102) of audio controller circuit (110).

Task scheduling module (19) will now be described in conjunction with FIG. 4. In the order of priority this module

performs first test (761) to determine if the video task is active, i.e., if one of video buffers (1111, 1112) is empty. In the case of a negative response the task scheduling module passes to the following test which is second test (751) to determine if the audio task is active, i.e., if one of video buffers (1101, 1102) is empty. In the case of a negative response, third test (741) determines if the communication task is active, i.e., if buffer (1041) is empty. After a positive response to one of the tests, task scheduling module (18) at stage (131) fills the memory access request queue and at stage (132) executes this request by reading or writing between the mass memory or CPU memory and the buffer corresponding to the active task, then loops back to the first test. When test (741) on communications activity is affirmative, scheduler (18) performs test (742) to determine if it is a matter of reading or writing data in the memory. If yes, the read or write request is placed in a queue at stage (131). In the opposite case, the scheduler determines at stage (743) if it is transmission or reception and in the case of transmission sends by stage (744) a block of data to the central server. In the case of reception the scheduler verifies at stage (746) that the kernel buffers are free for access and in the affirmative sends a message to the central server to accept reception of a data block at stage (747). After receiving a block, error control (748) of the cyclic redundancy check type (CRC) is executed. The block type is rejected at stage (740) in case of error, or accepted in the opposite case at stage (749) by sending a corresponding message to the central server indicating that the block bearing a specific number is rejected or accepted, then loops back to the start tests. When there is no higher level task active, at stage (731 or 701) the scheduler processes interface or management tasks.

The kernel is occupied with rotation of the execution of tasks according to their priority and of communications between them. A task which manages video, one which manages audio, another which manages telecommunications and a last one which manages databanks are transferred to the kernel. Communications between the task and the kernel takes place by a common programming interface.

The number and type of active tasks is indicated to scheduler (18) by execution of selection management module SPMM whose flowchart is shown in FIG. 6. The management exercised by this module begins with test (61) to determine if selections are in the queue.

Consequently, if test (61) on the queue determines that selections are waiting, when a user chooses a title he wishes to hear, it is automatically written in a queue file of a non-volatile memory of the system, such as the static battery backed-up RAM.

Thus, no selection made will ever be lost in case of an electrical failure. The system plays (reproduces) the selection in its entirety before removing it from the queue file.

When the selection has been reproduced in its entirety, it is removed from the queue file and the system checks if there are others in the queue file. If there is another, the system immediately starts to play the selection.

The total time transpired between the end of one selection and the start of the next is less than 0.5 seconds.

Processing is continued by test (65) to determine if the selection contains an audio scenario. If yes, at stage (651) this scenario is written in the queue of tasks of scheduler (18). If not, or after this entry, processing is continued by test (66) to determine if the selection contains moving images. If yes, the video scenario is written at stage (661) in the queue of tasks of scheduler (18). If no or if yes after this entry, processing is continued by test (64) to determine if the

selection contains still graphics. If yes, at stage (641) this graphical presentation scenario is written in the queue of tasks of scheduler (18). If no or if yes after this entry, processing is continued by test (63) to determine if the selection contains a publicity scenario. If yes, at stage (631) the scenario is written in the queue of tasks of scheduler (18). Thus, scheduler (18) notified of uncompleted tasks can manage the progression of tasks simultaneously.

Due, on the one hand, to the task management mode assigning highest priority to the video task, on the other hand, to the presence of hardware or software buffers assigned to each of the tasks for temporary storage of data and the presence of status buffers relative to each task, it has been possible to have all these tasks managed by a single central unit with a multitask operating system which allows video display, i.e., moving images compared to a graphics representation in which the data to be processed are less complex.

Moreover, the multitask operating system which includes a library containing a set of tools and services greatly facilitates operation by virtue of its integration in the storage and the resulting high flexibility. In particular, for this reason it is possible to create a multimedia environment by simply and efficiently managing audio reproduction, video or graphics display and video animation. In addition, since the audiovisual data are digitized and stored in the storage, much less space is used than for a traditional audiovisual reproduction system and consequently the congestion of the system according to the invention is clearly less. Database (16) is composed, as shown in FIG. 7, of several bases.

A first (161) with the titles of the audiovisual pieces, second (162) with the artists, third (163) with the labels, fourth (164) with albums, fifth (165) with the words of karaoke selections. First base (161) contains first item (1611) giving the title of the piece, second item (1612) giving the identification of the product, this identification being unique. Third item (1613) makes it possible to recognize the category, i.e., jazz, classical, popular, etc. Fourth item (1614) indicates the date of updating. Fifth item (1615) indicates the length in seconds for playing the piece.

Sixth item (1616) is a link to the karaoke base. Seventh item (1617) is a link to the album. Eighth item (1618) is a link to the labels. Ninth item (1619) gives the purchase price for the user.

Tenth item (1610) is a link to the artist database. This link is composed of the identity of the artist. The artist database includes, besides the identity of the artist composed of item (1621), second item (1622) composed of the name of the artist or name of the group. The labels database includes first item (1631) composed of the identity of the label, establishing the link to eighth item (1618) of the title database, and second item (1632) composed of the name of the label. The album database contains a first item which is the identity of the album (1641) which constitutes the link to seventh item (1617) of the title base. Second item (1642) comprises the title, third item (1643) is composed of the date of updating of the album, and the fourth item (1644) is composed of the label identity. The karaoke base is composed of first item (1651) giving the identity of the title and corresponds to sixth item (1616) of the title base. Second item (1652) comprises for each title a file of each syllable and the time expired since the start of the song and at the end of which the singer must pronounce the syllable to have appear on the screen displaying the phases to be sung as a marker indicating the syllable at the instant determined by a timer. The timer is started at the time of karaoke use by the start of execution of the digital data of the music and counts up in

rhythm with the processor clock which is likewise the time base for the music and the audio controller card.

It is easily understood that database (16) thus makes it possible to notify the user of the costs and particulars for each of the artists or groups of artists whose songs and videos are being performed, and to display the words necessary to the user of the apparatus in the karaoke mode.

Finally, in one of the two versions of the invention, a first recording module corresponding to the representation in FIG. 5A can be added to the primary system shown in FIG. 1. This recording module is connected by extension connector (116) to primary module (1) and on the other hand by a socket to the electric grid. This module (109) is in fact a recording module which allows for example recording on a mini magneto-optical disk of one or more audiovisual pieces transferred to this medium via extension controller card (107) and extension connector (116) to device (109) which is able to operate with a SCSI/2 type bus. This thus makes it possible to consequently obtain mini magneto-optical disks (1090) on which the desired audiovisual pieces have been recorded for use on another player such as a car radio or any other equivalent device. In this example we have taken a mini magneto-optical disk unit, but this medium could be replaced very easily by digital tape recording allowing no loss of audio quality of the data recorded and operation on the marketed components of a stereo system or car radio.

Finally, the user can add to his central component (1) another module (108) which is composed of an external storage unit which can be comprised of a hard disk system or any other equivalent system allowing the user to store several audiovisual pieces, whereas primary system (1) can only store in its non-volatile memory a limited number of pieces; this number is limited by the size of the battery-backed-up static RAM which participates equally in operation of primary unit (1).

Operation is as follows:

a) listening

The user begins by connecting the jukebox to his stereo system and his TV set, then turns them on.

If he wants to hear or view a video, he presses the "action" function of the remote control to obtain the selection screen. Using the search options he makes his choice and begins playback. The new choice is queued if there is already an active piece.

A liquid crystal screen on the apparatus allows sequential access to a list in alphabetical order. A "play" button (1028) starts playback.

With the remote control or control buttons (1026 to 1031) the user can pause, stop, read, rewind, fast forward, or skip to the following title.

He can ask the system to play all the pieces in sequence or randomly.

b) at purchase

From the selection screen the acquisition screen is accessed. To purchase a title, the system demands the personal identification number (PIN). PIN use protects parents against wrongful billing which their children may cause. In this screen the user can purchase one or more musical pieces which have been offered to him based on a list which is resident in the apparatus and which is updated during communication with the distribution server center. Search on this list takes place by title, artist, category, alphabetical order and by release date. The cost of each piece is displayed as well as the total bill. Then he indicates to the system that he has finished making choices. The system then checks if there is enough memory to accommodate all the requested pieces. If there is a problem, the system advises

the customer thereof, otherwise it requests the credit card number of the customer or displays it if it is already in the memory. Then the system attempts to reconnect to the server center to complete the transaction either by phone line or satellite link or by dedicated line. Since the system is a multitask system, it can even play the audiovisual pieces during transfer.

c) by its telecommunications card each apparatus can be connected to a server center. This possibility allows a flexibility which cannot be equalled by other, similar apparatus. It allows:

- remote repair for minor problems,
- assistance to a technician in locating the defective part or parts,
- purchase of musical pieces without having to leave home,
- choosing only musical pieces of interest to us,
- access to an impressive list of musical pieces which are not always available at the record shop,
- updating or modification of the software.

When a software update is received, this new version will be used the next time the system is used.

It is also possible to include advertising on the screens. This advertising can be changed each time the system is connected to the server center.

Audio and video will be digitized using commercial software which uses standard file formats.

Digital audio and video data will be kept according to a standard compressed format. They will be decompressed during reproduction. The purpose of this is to minimize use of memory space and shorten the time of transfer to the server center.

The server center, since it is a computer, validates the credit card and bills the customer automatically without manual intervention and can answer several calls at the same time.

Any modification by one skilled in the art is likewise part of the invention. Thus, regarding buffers, it should be remembered that they can be present either physically in the circuit to which they are assigned or implemented by software by reserving storage space.

What is claimed is:

1. A home digital audiovisual information recording and playback apparatus comprising:

- a microprocessor device;
- a memory communicating with the microprocessor device, the memory storing a library of audiovisual information for reproduction;
- a display communicating with the microprocessor device via a first digital interface;
- audio reproduction structure communicating with the microprocessor device via a second digital interface, the second digital interface comprising a microphone interface; and

a telecommunications interface coupleable with a main server for remote downloading of digital data corresponding to selected audiovisual information,

wherein the microprocessor device controls the display to effect operation of the apparatus and selection of audiovisual information in one of three modes in which the apparatus reproduces audiovisual information stored in the storage with at least one of the display and the audio reproduction structure in a first mode, enables remote downloading of digital data after being ordered via the telecommunications interface in a second mode, and mixes analog data from a microphone via the micro-

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- phone interface with the reproduced audiovisual information stored in the storage in a third mode.
- 2. An apparatus according to claim 1, further comprising a supplementary recording module coupled via a specific interface to the microprocessor device.
- 3. An apparatus according to claim 2, wherein the supplementary recording module is portable, enabling reproduction of audiovisual data on another digital audiovisual information recording and playback apparatus.
- 4. An apparatus according to claim 3, wherein the supplementary recording module comprises mini magnetooptical disks.
- 5. An apparatus according to claim 1, further comprising a storage module coupleable with the microprocessor device, the storage module storing a plurality of digitized audiovisual data.
- 6. An apparatus according to claim 1, wherein the audio reproduction structure comprises structure that effects reproduction of the audiovisual information according to digitized formats with one of hi-fi quality and compact disk quality.
- 7. An apparatus according to claim 1, wherein the first digital interface is coupleable with a conventional TV set, and wherein the second digital interface is coupleable with a conventional stereo.
- 8. An apparatus according to claim 1, wherein the memory stores the library of audiovisual information in a compressed data format.
- 9. A home digital audiovisual information recording and playback apparatus comprising:
 - a central controller unit;
 - a telecommunications interface managed by the central controller unit;
 - an electronic input control circuit communicating with the central controller unit, the electronic input control circuit managing a plurality of control buttons and a sensor of infrared or audio emission originating from a remote control box;
 - an electronic audio controller circuit linked to an audio output connector and communicating with the central controller unit;
 - a microphone input connector communicating with the central controller unit;

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- an electronic video controller circuit linked to connectors for video peripheral apparatus and communicating with the central controller unit;
- a graphics control circuit communicating with the central controller unit, the graphics control circuit controlling a display; and
- a battery backed-up memory storing a multi-task operating system and a computer operating program, the memory storing at least one selection of audiovisual digital data.
- 10. An apparatus according to claim 9, wherein the multi-task operating system comprises a library of tools and services and a plurality of executable modules, the modules being executed simultaneously via the multi-task operating system.
- 11. A method of operating a home digital audiovisual information recording and playback apparatus, the method comprising:
 - displaying menus with user-selectable system operation options;
 - enabling a selection of desired audiovisual information for reproduction;
 - effecting payment for the desired audiovisual information;
 - inputting a user personal identification number; and
 - downloading from a main server the desired audiovisual information only after payment has been effected and a valid personal identification number has been supplied, wherein the displaying step comprises displaying menus effecting operation in one of three modes in which the desired audiovisual information is reproduced with at least one of a display and audio reproduction structure in a first mode, digital data is downloaded after being ordered via a telecommunications interface in a second mode, and analog data from a microphone is mixed with the reproduced audiovisual information in a third mode.

* * * * *

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**Reference cited in Substitute PTO Form 1449
Attorney Docket No. 380786-108980
Reexam Control No. 95/001,274**

⑫ 公開特許公報(A) 平4-11288

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審査請求 未請求 請求項の数 1 (全7頁)

⑭ 発明の名称 楽曲検索機能付きカラオケ装置

⑯ 特 願 平2-114726

⑰ 出 願 平2(1990)4月27日

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明 細 書

1. 発明の名称

楽曲検索機能付きカラオケ装置

2. 特許請求の範囲

(1) 画像表示機構と、

多数の楽曲の演奏情報及び歌詞情報を含む楽音情報と、前記各楽曲の検索情報とを格納した楽音情報記憶媒体と、

再生を希望する楽曲についての検索情報を入力するための検索情報入力手段と、

この検索情報入力手段から入力された検索情報に基づいてその検索情報に対応する楽曲を前記記憶媒体の格納情報から検索する検索手段と、

前記検索手段による検索結果を画像表示するように前記画像表示機構を制御する制御部と、

を含むことを特徴とする楽曲検索機能付きカラオケ装置。

3. 発明の詳細な説明

[産業上の利用分野]

本発明は、複数の楽曲についての楽音情報を有

し、その楽音情報に基づき伴奏音の再生並びに歌詞情報の画像表示を行うことのできるカラオケ装置の改良に関する。

[従来の技術]

近年において一般に広く普及しているカラオケ装置は、多数の楽曲情報を記録した媒体(例えばカセットテープ、レーザーディスク、コンパクトディスクなど)を供え、使用者の選択した楽曲をその媒体から探して順次再生を行っている。

また、楽曲情報の記録媒体としては、上記のような外部媒体だけではなく、カラオケ装置本体内にハードディスクなどの楽音情報記憶媒体を設け、この楽音情報記憶媒体に多数の楽音情報をデジタル信号として格納するものも開発されている。

そして、このようなカラオケ装置においても使用者の希望する歌の選択は、予め媒体に記録された楽曲のリストの掲載された本などによって行われる。すなわち、製本された楽曲リストから、例えば楽曲名や歌手名などから歌うことを希望する楽曲を捜し出すことによって行っている。

レーザディスクやコンパクトディスクの場合には、まずその再生すべき楽曲の記録されたディスクを捜し出し、それを再生装置にセットした後、入力手段などからその曲ナンバーをさらに指定することによって所望の曲の再生を行う。あるいは、カラオケ装置本体内の楽音情報記憶媒体に楽音情報を記憶しているものにあつては、捜し出した曲のナンバーを入力手段から入力することによってその楽曲の再生をスタートするようにしている。

[発明が解決しようとする課題]

上記従来のカラオケ装置では、希望の曲を捜すためには、製本された曲名のリストから各使用者が頁をめくって捜し出す必要があり、手間がかかるため選曲時間が長くなるという問題があつた。

また、希望する曲が不明な場合、例えば歌詞の出だしや、歌手名のみは分かるが、その題名が分からない場合には、選択が困難であり、捜し出すまでに長時間を要してしまうという問題があつた。

本発明は、上記問題点を解決することを課題としてなされたものであり、その目的は希望する楽

々のデータが検索情報として記録されている。

そして、使用者は曲名が不明な場合に、手掛りとなる楽曲に関するあるデータを検索情報として検索情報入力手段から入力することができ、この入力された検索情報に基づき、検索手段は、上記記憶媒体内に記録された検索情報から該当する楽曲を自動的に検索することができる。

そして、この検索状況は、制御部による画像表示機構の制御によって画面上に表示することができる。すなわち、入力したデータに該当する楽曲群を画面上に表示することができるので、使用者はその表示された楽曲名を見ながら希望する曲名を思い出すことが可能となる。また、検索情報入力手段から入力する検索情報としてのデータの数を増加させることにより、より検索対象の曲を絞り込むことができ、使用者による曲の捜索をより容易なものとするすることができる。

[実施例]

以下、本発明に係るカラオケ装置の実施例を図面に基づいて具体的に説明する。

曲が不明な場合に、各楽曲に関する種々のデータに基づき希望する楽曲を表示画面を用いて迅速に検索することのできる楽曲検索機能付きカラオケ装置を提供することにある。

[課題を解決するための手段]

上記目的を達成するため、本発明に係る楽曲検索機能付きカラオケ装置は、画像表示機構と、多数の楽曲の演奏情報及び歌詞情報を含む楽音情報と、前記各楽曲の検索情報とを格納した楽音情報記憶媒体と、再生を希望する楽曲についての検索情報を入力するための検索情報入力手段と、この検索情報入力手段から入力された検索情報に基づいてその検索情報に対応する楽曲を前記記憶媒体の格納情報から検索する検索手段と、前記検索手段による検索結果を画像表示するように前記画像表示機構を制御する制御部と、を含むことを特徴とする。

[作用]

上記構成のカラオケ装置によれば、楽音情報記憶媒体内には、各楽曲ごとにその楽曲に関する種

第1図は実施例に係るカラオケ装置の全体構成を示すブロック図であり、カラオケ装置本体内には、楽音情報記憶媒体10が設置されている。この楽音情報記憶媒体10は、例えば装置本体内のハードディスク内にデジタル情報としてのMIDI情報(Musical Instrument Digital Interface) (「MIDI」は登録商標)を多数曲分格納して構成されている。MIDI情報は、国際的に規格化された情報で、音程、音色、音量などを示すデジタル情報である。

そして、入力手段12は、使用者が希望する楽曲を選択するためのキーボードや入力パッドなどから構成されており、キーボードは本発明の特徴的構成事項である楽曲の検索情報を入力するための入力手段を有している。

楽音情報記憶媒体10及び入力手段12は、それぞれ中央制御部14に接続されており、この中央制御部14は、入力手段12から入力された情報に基づいて、楽音情報記憶媒体10からの楽曲の選択読出しや検索を行うものである。

そして、中央制御部14には、楽音再生手段16及び映像回路18がそれぞれ接続されている。楽音再生手段16は、例えばシンセサイザーなどで構成され、中央制御部14が楽音情報記憶媒体10から読み出した演奏情報をアナログの音楽信号16aに変換してオーディオアンプ20に送るものである。

映像回路18は、中央制御部14が楽音情報記憶媒体10から読み出した楽曲の楽音情報中の歌詞情報を受け、この歌詞情報を画像信号18aに変換して画像表示手段22に供給し画面上に表示させる。

なお、オーディオアンプ20には歌手の声を入力するためのマイクロホン24が接続されており、オーディオアンプ20はマイクロホンからの音声信号24aを増幅してスピーカ26に送り、上記音楽信号16aと共にスピーカ26から再生音として発生させられる。

また、映像回路18には映像情報発生手段28が接続されており、この映像情報発生手段28は

る場合には、他の検索情報を用いることなくその楽曲を選択して再生することができる。なお、ヘッダ32内の各データは、区切りコード34によって区切られており、その先頭部には先頭コード36が、終了部分にはヘッダ終了コード38がそれぞれ記録されている。

第3図は、上記実施例の入力手段12のキーボード13を示す図であり、ボード13上には、通常の数字キー40、再生開始キー42、ストップキー44の他に検索の開始及び終了を指示するための検索選曲キー46及び検索時におけるカーソル移動を行うためのスクロールキー48が設けられている。

次に、上記構成からなる実施例のカラオケ装置の動作を第4図のフローチャートに基づいて説明する。

まず、歌手が自分の歌おうとする曲の題名が明らかでない場合に、入力手段12のキー操作により検索を指示する(S1)。ここで、検索操作が行われない場合、すなわち曲が明らかである場

背景映像を画像表示手段22に表示するために背景映像情報28aを映像回路18に送り、映像回路18はこれを背景画像信号28bに変換し、歌詞の画像信号18aと共に画像表示手段22により画面上に表示する。

第2図は上記楽音情報記憶媒体10に格納される各楽曲の情報のデータフォーマットの一例を示している。このデータフォーマットの特徴は、演奏情報及び歌詞情報を含む楽音情報30の他に、その先頭にヘッダ32を設け、そのヘッダ32に各楽曲に関するデータである検索情報を記録したことである。この検索情報としては、例えば歌手名32a、作曲者名32b、ジャンル32cなどが用いられる。

検索情報としては、上記のようなデータに限られるものではなく、その他歌詞の出だし部分の情報や歌詞のキーワードなどを記録しておくことも可能である。

また、ヘッダ32には曲番32dや曲名32eも記録されており、これらが始めから明らかであ

合(S1がNoの場合)、曲ナンバーの入力及び再生キーの操作により、その登録曲が存在するかが判断され(S2)、存在する場合には再生が開始される(S3)。この再生は、中央制御部14が楽音情報記憶媒体10から該当する楽曲の楽音情報を読み出し、楽音再生手段16及び映像回路18に所定の情報を送ることによりそれぞれスピーカ26からの再生及び画像表示手段22での画面表示を行うものである。

なお、S2において登録曲がない場合(Noの場合)再びスタートに戻されキー操作が行われる。

次に、S1において検索選曲キー46が操作された場合(Yesの場合)、中央制御部14はこの入力信号に基づき、検索メニュー情報を映像回路18に送り、このメニューを画面上に表示する。この検索メニューの画像の一例が第5図(A)に示されている。検索メニューとして曲名、歌手名、作曲者名、ジャンルなどが挙げられる。なお、曲名をメニューとして上げた場合には、曲名が明らかである場合にも、製本されたリストを手摺りで

捲って捜すことなくカラオケ装置の自動検索手段によってその曲ナンバーを検索することが可能となる。

そして、キー操作が行われ検索項目が指定されると(S5)、すなわちスクロールキー48の操作により検索項目を指定して所定の実行キーを押すことにより検索項目が指定されると、中央制御部14は、その検索項目のメニューを画面上に表示させる(S6)。このメニューの表示画面が第5図(B)に示されている。これは、検索項目として、№2歌手名が選択された場合の例であり、歌手名のリストが画面上に表示されている。

次に検索項目中のデータの選択、すなわち歌手名の選択が行われたか否かが判断される(S7)。すなわち、所定のカーソル移動(S8)などの動作に基づき、歌手名が選択された後所定の実行キーが押されたことが判断されると(入力キーが「#」の場合)検索項目の取得、すなわちまず第1の検索項目が入力手段12の入力バッファに格納される(S9)。

の楽曲がピックアップされる(S104)。そして、一致しない場合(S3がNoの場合)、楽曲のピックアップを行うことなく検索事項が終了か否かが判断され(S105)、終了の場合には(Yesの場合)、検索が終了する。そして、他の検索項目が存在する場合(S105がNoの場合)には、再びヘッダ読み込み動作(S101)の動作から順次検索動作が繰り返される。

そして、検索が終了すると、検索結果として検索曲目が画面上に中央制御部14の制御によって表示される(第4図S14)。このときの画像表示の一例が第5図(C)に示されている。

次に、この検索結果に基づくキー操作が判断される(S15)。すなわち、使用者はこの曲目リストからスクロールキー48などの操作によるカーソルの移動によって(S16)、希望する曲目を選択することができ、選択した後その再生の指示である再生キー42が操作されると、S3における再生動作が行われる。

このようにして、予め定めた検索メニューの項

ここで、さらに他の検索項目を指定するか否かの判断がなされる(S10)。ここで、例えば、&キーによって他の検索項目を用いることを指示すると、再びS4に戻り同様の検索項目の取得(S9)までの動作が行われる。そして、全ての検索項目の取得が行われた後、例えば実行キーとして#キーが押されると、中央制御部14による検索項目の登録が行われる(S11)。

ここで、最終的な実行キーのキー入力を待って(S12)、実行キーとして例えば#キーが押されると中央制御部14による検索が行われる(S13)。

この検索動作の概略フローチャートが第6図に示されている。すなわち、中央制御部14は、楽音情報記憶媒体10に格納された各楽曲のヘッダ32を読み込み(S101)、そのヘッダ32内の検索情報を登録された検索項目のデータと比較する(S102)。そして、検索項目のデータとヘッダ32の情報との一致が判断される(S103)。また、一致した場合(Yesの場合)、そ

目により、希望する曲名が不明の曲を自動的に検索することができる。種々の検索データに合致する曲を最終的に検索結果として画面上に表示することができ、使用者はそのリストアップされた曲名を見て捜している曲を選択することができる。すなわち、例えば歌手名及び作曲者名が分っている場合に、その両者のデータと一致する楽曲が絞り込まれて画面上に表示されているので、使用者は本の捲り動作などを行うことなく画面上で簡単に希望曲を捜することができる。

[発明の効果]

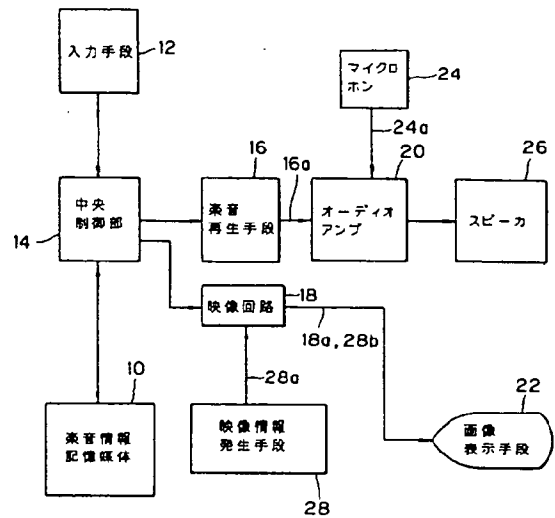
以上説明したように、本発明に係る検索機能付きカラオケ装置によれば、楽曲再生に必要な曲番号が不明の場合に、その楽曲に関する種々のデータに基づいてその楽曲を自動的に検索することができ、かつその検索結果が画面上に表示されるので、使用者は簡単かつ迅速に不明の希望曲を捜出し、直に再生を行って歌うことができる。これによって、希望曲の選曲時間の短縮が図られ、ひいては待ち時間の短縮も達成することができる。

4. 図面の簡単な説明

第1図は実施例のカラオケ装置の全体構成を示すブロック図、第2図は実施例の記憶媒体内に格納される情報のデータフォーマットの例を示す説明図、第3図は実施例の入力手段の操作ボードの一例を示す説明図、第4図は実施例のカラオケ装置の動作を示すフローチャート図、第5図(A)、(B)、(C)は検索状況及び検索結果の画面表示の例を示す説明図、第6図は実施例の検索動作を示すフローチャート図である。

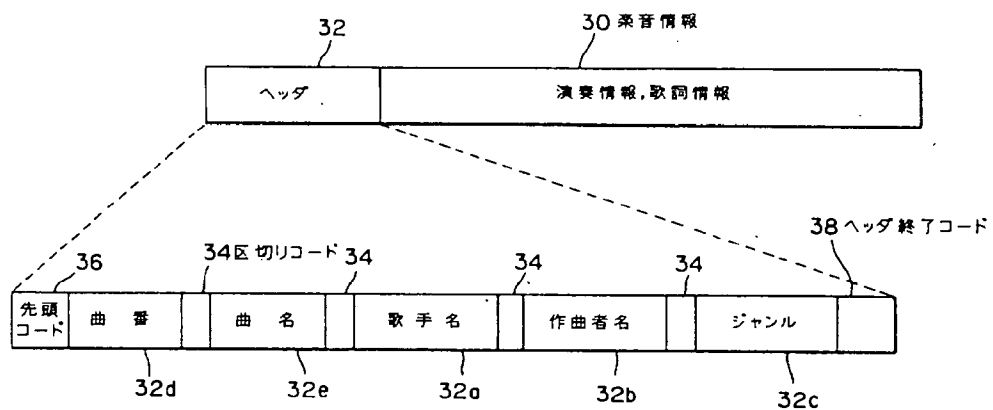
- 10…楽音情報記憶媒体、12…入力手段、
- 14…中央制御部、16…楽音再生手段、
- 18…映像回路、22…画像表示手段、
- 26…スピーカ、30…楽音情報、
- 32…ヘッダ。

第1図

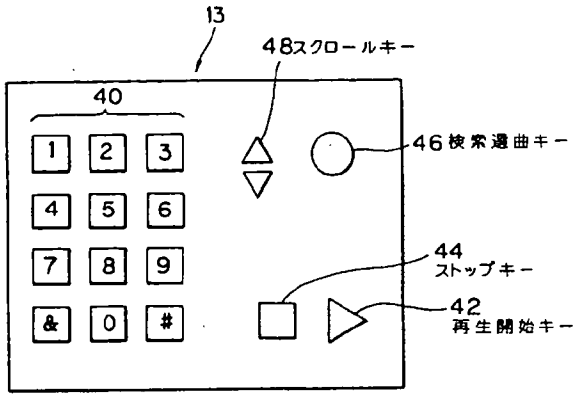


代理人 弁理士 井 上 一 (他2名)

第2図



第 3 図

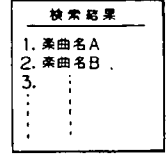
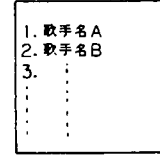
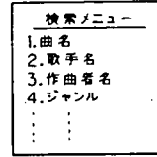


第 5 図

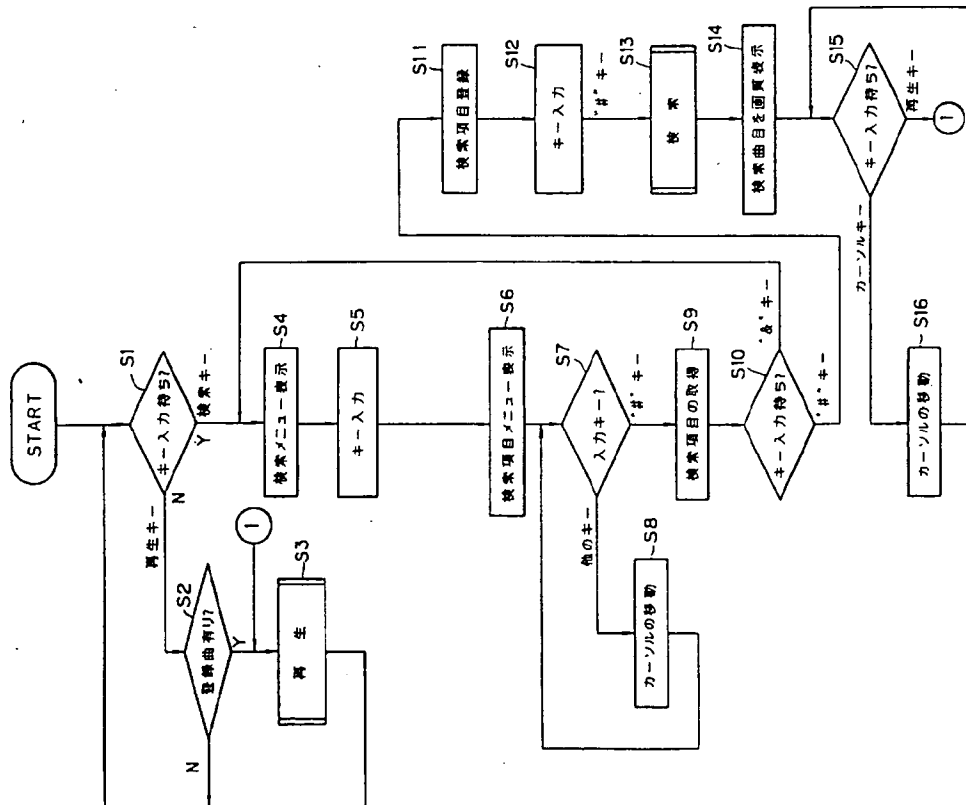
(A)

(B)

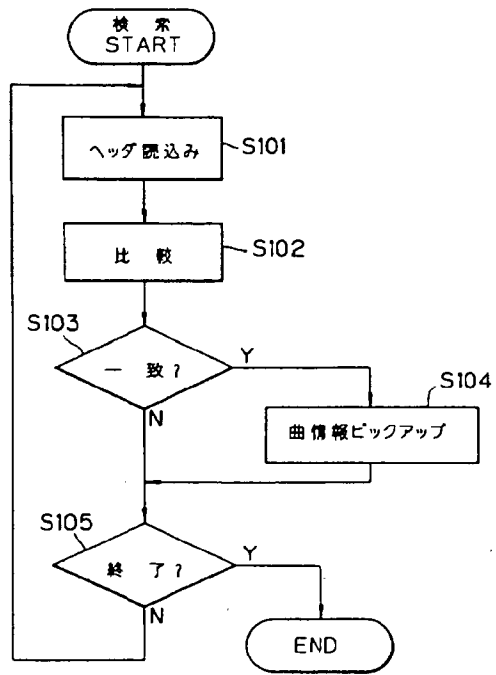
(C)



第 4 図



第 6 図



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(54) Title of the invention	KARAOKE DEVICE WITH SONG SEARCH FUNCTION	
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SPECIFICATION

1. TITLE OF THE INVENTION

Karaoke Device with Song Search Function

2. SCOPE OF PATENT CLAIMS

(1) A karaoke device with a song search function, characterized by comprising:
 an image display mechanism;
 a music data storage medium that stores music data comprising performance data and lyrics data for a large number of songs, as well as search data for the respective songs;
 a search data input means for inputting search data related to the desired song to be played;
 a search means that searches the stored data in said storage medium for the song corresponding to the search data based on the search data that have been input by the search data input means; and
 a controller that controls said image display mechanism so that the search results from said search means are displayed as images.

3. DETAILED DESCRIPTION OF THE INVENTION

(FIELD OF INDUSTRIAL APPLICATION)

The present invention relates to improvements

to a karaoke device having music data for a large number of songs, whereby accompaniment is played back and lyric data are displayed as images based on these music data.

(PRIOR ART)

Karaoke devices have been proliferating widely in recent years. These devices use a medium for storing song data for a large number of songs (e.g., cassette tapes, laser disks, compact disks). Songs that are selected by users are searched on this medium and played back in sequence.

In addition, song data storage media are not restricted to external media of the type described above. Devices are being developed in which a song data storage medium such as a hard disk is provided in the karaoke device main unit, and data for a large number of songs are digitally stored on this song data storage medium.

Thus, with this type of karaoke device as well, selection of a desired song by a user is carried out by a book that displays a list of songs that have been recorded in advance on the medium. Specifically, for example, this selection is carried out by searching for the desired song to be sung from among the song names or singer names in a song list that is bound in the form of a book.

With laser disks or compact disks, the disk containing the music to be played is first found. After placing the disk in the player device, the song number is then specified using an input means or the like, thereby carrying out playback of the desired song. Alternatively, with devices in which music data is stored on a music data storage medium inside the karaoke device main unit, the number of the selected song is input using an input means, and playback of the song is thus initiated.

(PROBLEMS TO BE SOLVED BY THE INVENTION)

With the conventional karaoke devices described above, in order to find the desired song, each user must visually search the pages of a list of song names in the form of a bound book, which takes time and creates problems with extended song selection periods.

Moreover, selection is difficult when the desired song is not known with certainty, e.g., when only the introductory lyrics or singer is known, and the song title is not known. There have thus been problems with long periods of time being needed to find a song.

An object of the present invention is to resolve the above problems by offering a karaoke device with a song search function whereby, when the desired song is not known with certainty, it can be rapidly found using a screen that displays the desired songs based on various data related to each song.

(MEANS FOR SOLVING THE PROBLEMS)

In order to attain the objectives described above, the karaoke device with a music search function pertaining to the present invention comprises: an image display mechanism; a music data storage medium that stores music data comprising performance data and lyrics data for a large number of songs as well as search data for the respective songs; a search data input means for inputting search data related to the desired song to be played; a search means that searches the stored data in said storage medium for the song corresponding to the search data based on the search data that has been input by the search data input means; and a controller that controls said image display mechanism so that the search results from said search means are displayed as images.

(OPERATION)

With the karaoke device having the configuration described above, various songs and data

related to the songs are stored as search data in the music data storage medium.

When a user is uncertain about a song name, data related to the songs that can serve as a clue may be used as search data and input using the search data input means. Based on this input search data, the search means can automatically search the relevant songs from the search data that are recorded in the aforementioned storage medium.

Thus, the search status can be displayed on the screen, with the screen display mechanism being controlled by a controller. Specifically, the group of songs corresponding to the input data can be displayed on the screen, and the user can then recall the desired song name while viewing the song titles that are displayed thereupon. In addition, by increasing the amount of data as search data that are input by the search data input means, the user can narrow down the song that is being searched for, thereby facilitating selection of the song by the user.

(EMBODIMENTS)

Embodiments of the karaoke device of the present invention are described in detail below in reference to the drawings.

Fig. 1 is a block diagram showing the overall configuration of the karaoke device of the embodiment. A music data storage medium 10 is provided in a karaoke device main unit. This music data storage medium 10 is configured, for example, by storing a large number of songs as digital data on the hard disk of the device main unit in the form of MIDI data (Musical Instrument Digital Interface) ("MIDI" is a registered trademark). MIDI data is an international standard digital data format that represents music pitch, tone and volume.

The input means 12 is constituted by a keyboard for the user to select the desired song, an input buffer, and the like. The keyboard has the input means for inputting music search data and is a characteristic constituent element of the present invention.

The music data storage medium 10 and the input means 12 are each connected to a central controller 14. This central controller 14 performs selective reading or searching of songs from the music data storage medium 10 based on the data input from the input means 12.

A music playback means 16 and a video circuit 18 are each connected to the central controller 14. The music playback means 16 is constituted, for example, by a synthesizer or the like. The central controller 14 converts the musical performance data read from the music data storage medium 10 into an analog music signal 16a, which is transmitted to an audio amplifier 20.

The video circuit 18 receives the lyrics data contained in the music data of the song read from the music data storage medium 10 by the central controller 14 and then converts the lyrics data into an image signal 18a, which is then supplied to the image display means 22 and is displayed on a screen.

A microphone 24 is connected to an audio amplifier 20 in order to input the voice of the singer, and the audio amplifier 20 amplifies the voice signal 24a from the microphone, transmitting the signal to a speaker 26, where it is reproduced as playback from the speaker 26 together with the aforementioned music signal 16a.

In addition, a video data generation means 28 is connected to the video circuit 18, and this video data generation means 28 transmits background video data 28a to the video circuit 18 in order to display background images on the image display means 22. The video circuit 18 converts these data into a background image signal 28b, which is displayed on the screen by the image display means 22 together with the image signal 18a for the lyrics.

Fig. 2 shows an example of the data format for the data of each song that is stored in the aforementioned music data storage medium 10. The defining characteristics of the data format are that music data 30 that comprise performance data and lyrics data are provided along with a header 32 that is situated in front of these data, and search data used as the data related to each song are recorded in this header 32. Examples of search data include the singer name 32a, the composer name 32b, the genre 32c, and the like.

The search data are not restricted to the types of data described above. Key words for the song as well as data concerning the introductory lyrics may also be recorded.

Moreover, the song number 32d or song title

32e is recorded in the header 32. When these are known from the start, they may be used in order to select and play back a song without using additional search data. The data contained in the header 32 are divided using a division code 34. The lead code 36 is recorded in the front part, and the header termination code 38 is recorded at the end.

Fig. 3 is a diagram showing the keyboard 13 of the input means 12 of the embodiment described above. In addition to common alphanumeric keys 40, a playback initiation key 42, a stop key 44, a search music selection key 46 for designating search initiation and termination are provided on the keyboard 13, along with a scroll key 48 for moving the cursor during a search.

Next, operation of the karaoke device of the embodiment will be described in reference to the flow chart of Fig. 4 using the above configuration.

First, if the title of the song that is to be sung is not known by the singer, a search is specified on the input means 12 by a keying operation (S1). When a search operation is not to be carried out here, in short, the song is known with certainty (a case in which S1 is No), the song number is input, the playback key is operated, and a determination is made as to whether the registered song is present (S2). If present, then playback is initiated (S3). For playback, the central controller 14 reads the music data of the corresponding song from the music data storage medium 10 and transmits the prescribed data to the music playback means 16 and video circuit 18, so that playback occurs via the speakers 26 and image display occurs via the image display means 22.

When the registered song is not present in S2 (in a case of No), the operation returns to the start, and a keying operation is performed.

Next, upon operation of the search music selection key 46 in S1 (in a case of Yes), the central controller 14 transmits the search menu data based on the input signal to the video circuit 18, and this menu is displayed on the screen. An example of an image of this search menu is presented in Fig. 5(A), where examples of the search menu categories include the song title, the singer name, the composer name and the genre. When the song name appears on the menu, if the song name is also clearly known, then the song number can

be searched by the automated search means of the karaoke device, without having to manually turn the pages of a bound list.

Thus, when a keying operation is performed to designate the search category (S5), specifically, when a search category is designated by operating the scroll key 48 and pressing the prescribed execution key to designate a search category, the central controller 14 displays a menu of the search categories on the screen (S6). The display screen of the menu is shown in Fig. 5 (B). This is an example of a case in which No. 2 Singer Name has been selected as the search category, and a list of singer names is displayed on the screen.

Next, a determination is made as to whether selection of data for the search category, specifically, selection of the singer name, has been carried out (S7). Specifically, after the singer name has been selected based on operation of the prescribed cursor movement (S8) or the like, if it is determined that the prescribed execution key has been pressed (a case in which the input key is "#"), then search category acquisition is performed, specifically, the first search category is stored in the input buffer of the input means 12 (S9).

In addition, a determination is then made as to whether another search category is designated (S10). If another search category is specified, for example, using the "&" key, then the procedure returns to S4, and the same operation is carried out up to acquisition of the search category (S9). Next, subsequent to acquisition of all of the search categories, if the "#" key that is used as the execute key, for example, is pressed, then recording of the search categories is carried out by the central controller 14 (S11).

At this point, the key input of the final execution key is waited upon (S12), and when the "#" key is pressed as the execute key, for example, the search is carried out by the central controller 14 (S13).

A schematic flow chart of the search operation is presented in Fig. 6. Specifically, the central controller 14 reads the header 32 of each song stored in the music data storage medium 10 (S101) and compares the search data in the header 32 with the registered search category data (S102). Next, a determination is made as to whether there is correspondence between the search category data and the data in the header 32 (S103). If there is

correspondence (in a case of Yes), then the song is picked up (S104). If there is no correspondence (a case in which S3 is No), then the song is not picked up, and a determination is made as to whether the search categories are complete or not (S105). If complete (in a case of Yes), then the search is terminated. If there are other search categories (a case in which S105 is No), then the sequential searching operation is repeated starting from the header reading operation (S101).

Upon termination of the search, the searched tracks are displayed on the screen as the search results under control of the central controller 14 (S14 in Fig. 4). An example of the screen display at this time is presented in Fig. 5(C).

Next, a keying operation is determined based on the results of the search (S15). Specifically, the user can select the desired track by moving the cursor through the track list through operation of the scroll key 48 or the like (S16). After selection, the playback operation is carried out in S3 by pressing the playback key 42 that is used for indicating playback.

In this manner, a song can be automatically searched using search menu categories determined in advance, even when the name of the desired song is uncertain. Songs that match the various search data can be displayed on a screen as search results, and the user can select the song by viewing the song names that are listed. Specifically, for example, if the name of the composer and the name of the singer are known, then the songs can be narrowed down to songs that correspond to the data of the two individuals, which are displayed on a screen. Consequently, the user can search for the desired song easily from the screen without having to perform an operation involving turning the pages of a book.

(EFFECT OF THE INVENTION)

As described above, the karaoke device having a search function of the present invention allows automatic searching of songs based on various data related to the song when the song number required for playing the song is uncertain. Moreover, because the results of the search can be displayed on a screen, the user can find a desired song that is unknown using a simple and rapid procedure, and singing can be started immediately upon playback. As a result, the time required for selecting the desired song can be reduced, and the waiting time can also be decreased.

4. BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a block diagram showing the overall configuration of the karaoke device of the embodiment. Fig. 2 is an explanatory diagram showing an example of the data format for the data that are stored in the memory medium of the embodiment. Fig. 3 is an explanatory diagram showing an example of the operating board of the input means used in the embodiment. Fig. 4 is a flow chart showing operation of the karaoke device of the embodiment. Figs. 5 (A), (B) and (C) are explanatory diagrams showing an example of the screen display for search status and search results. Fig. 6 is a flow chart showing the search operation in the embodiment.

10 ... Music data storage medium, 12 ... Input means, 14 ... Central controller, 16 ... Music playback means, 18 ... Video circuit, 22 ... Image display means, 26 ... Speaker, 30 ... Music data, 32 ... Header.

Agent: Patent attorney Hajime INOUE (and 2 others)

Fig. 1

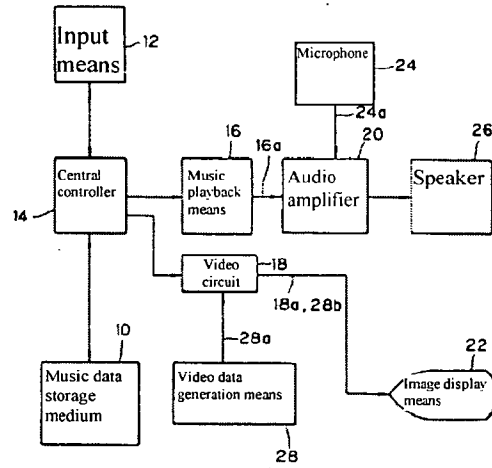
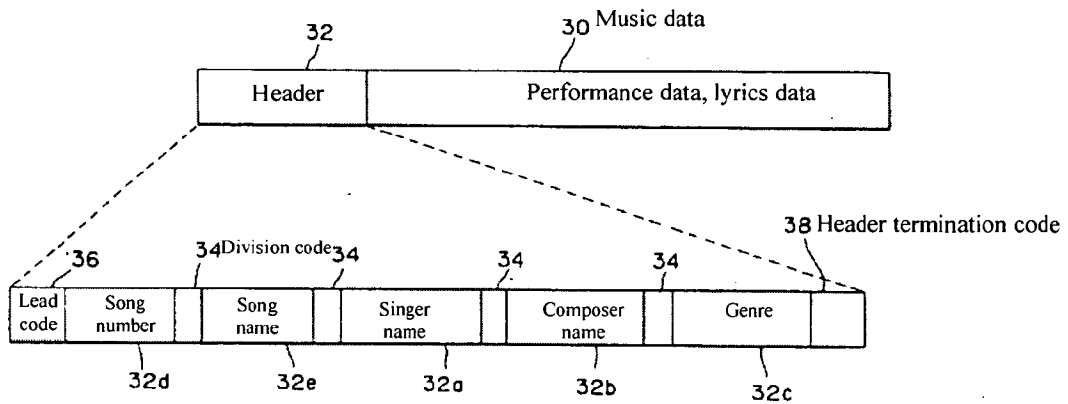


Fig. 2



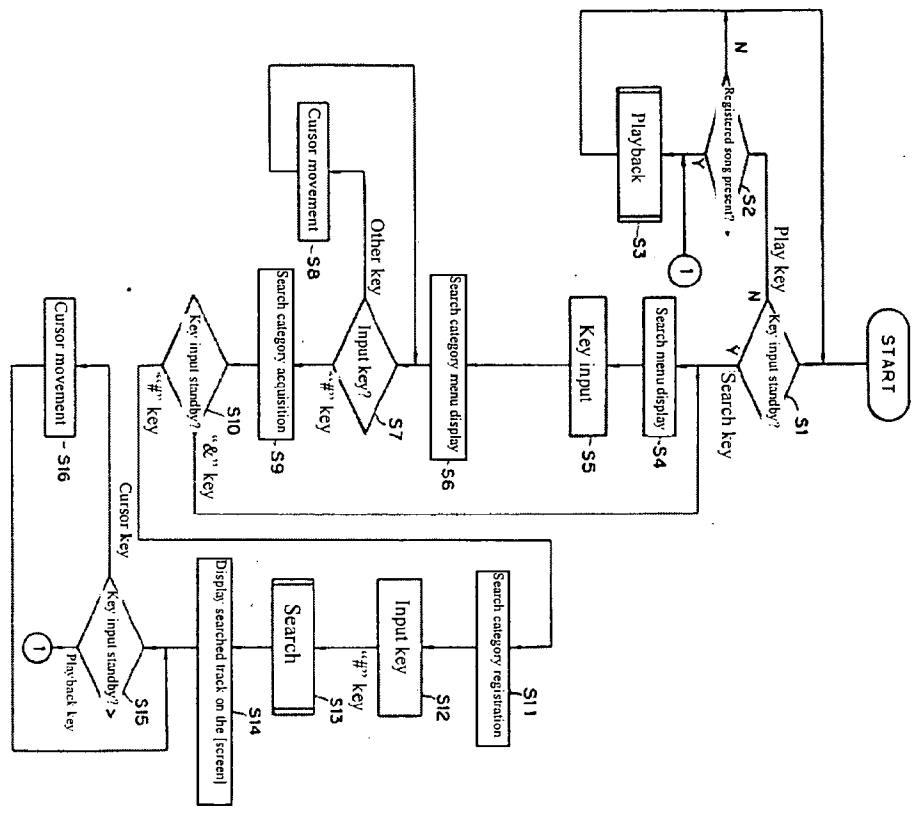


Fig. 4

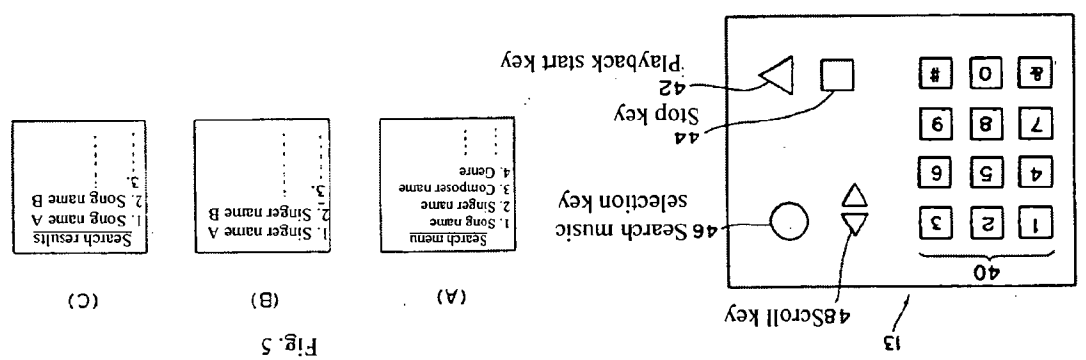
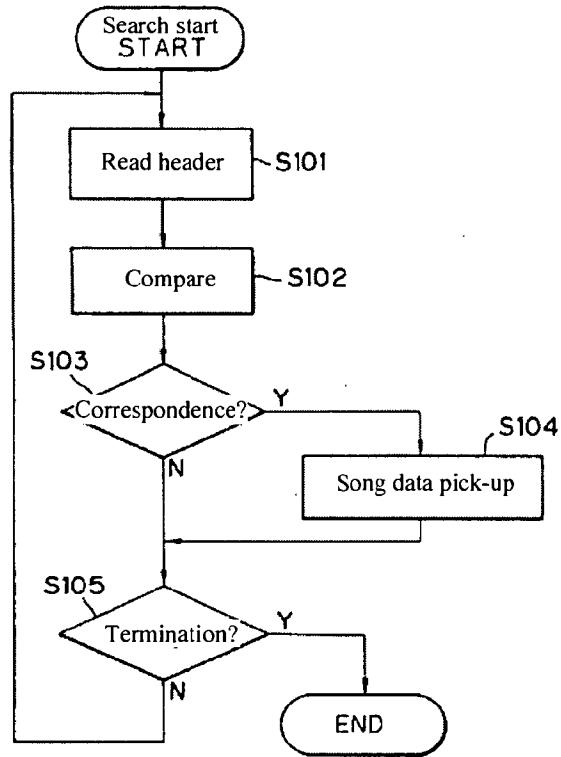


Fig. 5

Fig. 3

Fig. 6






TRANSPERFECT

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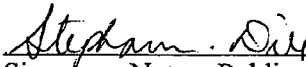
I, Kayoko Imori, hereby certify that the following is, to the best of my knowledge and belief, a true and accurate translation of the following document, "Japanese Patent Application H4-11288," from Japanese into English.



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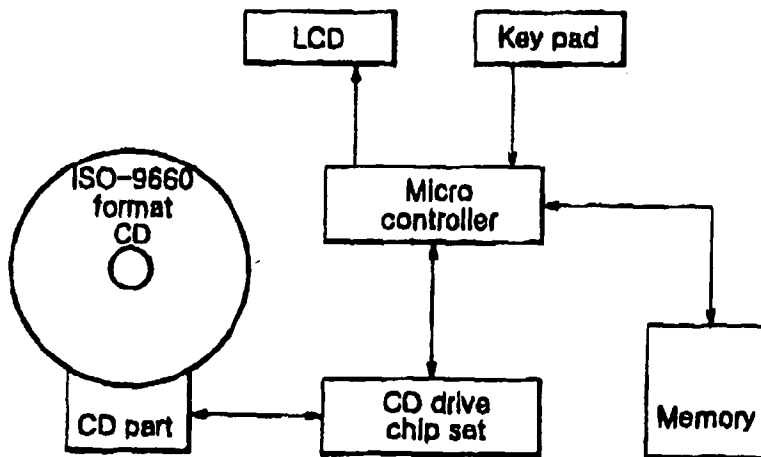
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<p>(21) International Application Number: PCT/KR00/00144 (22) International Filing Date: 23 February 2000 (23.02.00) (30) Priority Data: 1999/6058 24 February 1999 (24.02.99) KR (71) Applicant (for all designated States except US): HAVIN CO., LTD. [KR/KR]; #2518, Prime Center, 546-4, Guii-Dong, Kwangjin-Gu, Seoul 143-721 (KR). (72) Inventor; and (75) Inventor/Applicant (for US only): SEO, Yoon-deuk [KR/KR]; 661-23, Banghak2-Dong, Dobong-Gu, Seoul 132-022 (KR). (74) Agent: KIM, Young-chol; 10 floor Korea Coal Center, 80-6, Susong-Dong, Chongro-Gu, Seoul 110-727 (KR).</p>		<p>(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).</p> <p>Published With international search report. In English translation (filed in Korean).</p>

(54) Title: METHOD OF SORTING AND PLAYING AUDIO DATA RECORDED IN DIGITAL RECORDING MEDIA

(57) Abstract

The present invention relates to method of sorting and playing audio data recorded in digital recording media. The present invention includes, (a) step to organize supplemental data regarding the audio data recorded in a recording medium and the audio data's location within the recording medium, into a database and to store the database; and (b) a step to search data demanded by a user with a field of the database recorded in the said step (a) and to play the searched data accordingly. The present invention, by constructing a database of information on data recorded in digital

audio recording medium, makes it possible to search the database with a field that comprises such database, and consequently to play a piece requested by a user within a short period of time.



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METHOD OF SORTING AND PLAYING AUDIO DATA RECORDED IN DIGITAL RECORDING MEDIA

BACKGROUND OF THE INVENTION

5 1. Field of the Invention

The present invention relates to a method of sorting and playing audio data recorded in digital recording media.

2. Description of the Related Art

10 In a conventional compact disc, which is a typical digital audio recording medium, only track number and play period of time are provided to a user as supplemental data concerning audio data recorded by a record method of CD-digital audio that is a standard record method. Therefore, the track number is the only method allowing the user to select music.

15 However, if the audio data is recorded in a file system, supplemental data such as title of music, name of singer, genre of music and the likes can be inserted in music or files in the form of tag added to the music. By the above recording method, it is possible that the user can select and play music according to the user's demand, overcoming the limit that the user should select music with only the track number. It
20 depends on field constituting supplemental data regarding audio data. For example, when the supplemental data regarding singer and genre of music is given in the audio data stored, the user can select and play music of the singer or genre that the user wants. It is utilized usefully in case that lots of music are stored. Furthermore, this method for playing by sort can provide the user with a new service of a play method

by various selections.

In case of a CD including files compressed by a way of MPEG Audio Layer III (MP3 file), to read ID3 tag including supplemental data for sort, a play system must read a path table through a PVD, search directory record within the path table and a
5 file recorded in the directory and read the last sector. Therefore, even if the time of random access is 100ms, it takes at least 500ms. If 150 music files are stored in the CD, it takes about 75seconds for searching all music files and making sorted data. It will make the user inconvenient. Therefore, a method of promptly sorting and accessing data recorded in digital recording media is required.

10

SUMMARY OF THE INVENTION

It is, therefore, an object of the present invention to provide a method for efficiently playing by organizing supplemental data regarding audio data recorded in a recording medium and the audio data's location within the recording medium, into a
15 database.

To achieve the above object, the present invention provides a method of sorting and playing audio data recorded in digital recording media, the method comprising the steps of: organizing supplemental data regarding to audio data recorded in the recording medium and the audio data's location within the recording medium, into the
20 database and storing the database; and searching data demanded by a user with a field of the database recorded in the above step and playing the searched data accordingly.

In the step of organizing and storing the database, when the recording medium is manufactured, the database concerning supplemental data of the audio data and the

audio data's location within the recording medium can be stored in the directory of the recording medium, or a field to be created as a database into file name or directory name is introduced and the play system reads the file name and directory structure to store the database for sorting and playing, which is related to the audio data's location
5 within the recording medium, into a memory of the play system.

By constructing and storing the database of supplemental data for sorting and playing into the memory of the play system, a background processing can be utilized using the remaining period of time besides the data transmission period of time required when the audio data is played.

10

BRIEF DESCRIPTION OF THE DRAWINGS

Further objects and advantages of the invention can be more fully understood from the following detailed description taken in conjunction with the accompanying drawings in which:

15 Fig. 1 is a view of a configuration of a play system of digital recording medium;

Fig. 2 is a view showing an example of contents of a database stored in a route directory of ISO-9660 format CD in the play system of digital recording medium shown in Fig. 1;

20 Fig. 3 is a view of a directory structure, in which field value for creating a database is put in file name, according to another preferred embodiment of the present invention; and

Fig. 4 is a view showing a background processing for creating the database in a

memory of the play system.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The present invention will now be described in connection with preferred
5 embodiments with reference to the accompanying drawings.

Referring to the drawings, a method of sorting and playing audio data recorded
in digital recording medium will be described hereinafter in detail.

In this invention, 'audio data' means digitalized audio signal itself and
'supplemental data' means data for sorting and playing audio data such as a singer
10 who made the audio data, genre of music, publication date, album, title of music, sort
symbol and the likes. Furthermore, 'location data' means location information for
accessing audio data within the recording medium. Moreover, 'database' means a
database, which has a field of the 'supplemental data' and the 'location data' of the
audio data for playing by sort.

15 A preferred embodiment according to the present invention is a method of
constructing a database in the recording medium in itself. For example, when a CD
is constructed by storing music files in the CD, the database is made in the form of file
and stored in the CD. A play system reads the file to grasp all information necessary
for play of audio data stored in the CD by sort and to respond to a user's demand for
20 playing by sort.

Fig. 2 is an example of contents of the database stored in an ISO-9660 format
CD in the play system of the digital recording media shown in Fig. 1.

As shown in Fig. 2, the database stored in the CD stores title of music, singer,

genre, sort number, publication date, album and location information of music within the CD.

If the database is arranged in a rout directory of the CD, the access to the CD is quick and information for playing by sort is recorded into the database even though the play system reads only once. Therefore, the play system can search data directly by
5 sorting the constructed database and using the location data stored in the database without accessing ID3 tags of each file for playing by sort, so that the play system can respond promptly to the user's demand.

For example, if the user wants to play music by singers, the play system shows
10 a list of singers from the database. If the user wants to play the only singer A's music, the play system shows a list of the singer A's music from the database. According to the database shown in Fig. 2, music 1 and music 2 are indicated, and if the user selects music 1, the database immediately accesses music 1 using the location data of music 1, so that the period of time required for searching music file after analyzing path table,
15 directory information and each audio data can be saved.

In another preferred embodiment according to the present invention, a method of sorting and playing audio data recorded in digital recording media is that a database is constructed with only file name and directory name, in which field required for constructing the database is put, and the play system has a database in a memory using
20 record information and each file's location data of the database included in the file name and the directory name. That is, when the CD is constructed and manufactured, supplemental data required for sorting and playing is put in the file name and the directory name and the database is made in the memory of the play system using the

file name and the directory name. This method makes a quick construction of the database possible since each field information of the database can be filled by only searching the path table and the directory information without searching the ID2 tag of each music file. Because the database has the supplemental data and location data of music files required for sorting and playing music, music can be played by once random access after sorting.

Fig. 3 is an example of a directory structure, in which field value of the database is put in the file name, according to another preferred embodiment of the present invention.

Fig. 3 is the example of the directory structure made with long file name using expansion of ISO-9660 file system. Each music file located under each directory indicates file name with the supplemental data such as title of music, name of singer, title of album, genre of music, sort number and publication date.

The play system reads a PVD of the CD to grasp the location of the path table and the directory structure of the CD. By reading the record of each directory, the file name recorded in the directory can be read. At this time, the database is constructed in the memory by using the file's location data recorded in the directory and the field value data of the database put in the file name. By the constructed database, music files are played by sort at the user's demand.

Because the play system can have the database for playing by sort of music with only the ISO-9660 path table and the directory data, the period of time required for directly accessing and comparing each audio data to obtain the supplemental data concerning all audio data can be omitted.

As described above, it is also possible by the background processing that the database is constructed in the memory of the play system.

When the CD is inserted into the play system initially, the play system grasps the directory structure using the PVD and the path table, and then, reads the files while
5 entering into a user input queue mode to perform the sort work.

When the file selected according to the user's demand is played, the transmission rate of the required data is 128kbps. Since the transmission rate of encoded file is 16Kbyte/sec, the database can be constructed by using the period of time for transmitting the remaining rate of 134Kbyte/sec when 1X (speed of
10 transmission rate of about 150Kbyte/sec) operation is performed. In the same way, in case of 2X, the period of time for transmitting the rate of 284Kbyte/sec can be utilized for constructing the database. In this invention, it is called as 'background processing'.

Fig. 4 is a view showing the background processing for constructing the
15 database in the memory of the play system.

In Fig. 4, a CD part, a micro-control part and a MP3 decoder part are operated at the same time. The CD part reads music 1 and performs buffering. After the micro-control part transmits the buffered data, the CD part searches music 2 and reads ID3 tag to sort. After that, the CD part reads and buffers music 1 again. This
20 operation is continued in the same way also while music 3 and the others are read and sorted, so that it is possible to play using supplemental data for playing by sort after the whole database is constructed.

As previously described, according to the present invention, by constructing

the database concerning supplemental data regarding the audio data recorded in the recording medium and the audio data's location, it is possible to search by field constituting the database and to search and play music demanded by the user within the short period of time using the location data.

5 Furthermore, when the database constructed for playing by sort of music is obtained from a CD-ROM (or digital recording medium), if the supplemental data is recorded in the file name or the directory name, the play system can obtain all information required for the database by reading only the directory record. Therefore, in comparison with the conventional method, the method according to the present
10 invention can save the period of time required for searching all files and respond quickly to the user's demand for indicating and playing by sort.

 While the present invention has been described with reference to the particular illustrative embodiments, it is not to be restricted by the embodiments but only by the appended claims. It is to be appreciated that those skilled in the art can change or
15 modify the embodiments without departing from the scope and spirit of the present invention.

What is claimed is:

1. A method of sorting and playing audio data recorded in digital recording media, the method comprising:

5 (a) a step to organize supplemental data regarding the audio data recorded in a recording medium and the audio data's location within the recording medium, into a database and to store the database; and

(b) a step to search data demanded by a user with a field of the database recorded in the step (a) and to play the searched data accordingly.

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2. The method as claimed in claim 1, wherein in the step (a), when the recording medium is manufactured, the database concerning the supplemental data and location data regarding the audio data is created in the recording medium and stored in the form of file, and

15 wherein the step (b) is that searches contents of the file and responds to the user's demand for playing by sort.

3. The method as claimed in claim 1, wherein in the step (a), when the recording medium is manufactured, the field to construct the database for playing by
20 sort is introduced into file name or directory name and field value is recorded in the file name or the directory name of each audio data, and

wherein the step (b) is that searches contents of the file name or the directory name and responds to the user's demand for playing by sort.