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METHODS AND APPARATUS FOR PROGRAMMING
USER-DEFINED INFORMATION INTO ELECTRONIC DEVICES

Abstract of the Disclosure ~~Invention~~

     A device for programming user-defined information

5   into an electronic device is provided. The programmer
allows a user to program customized information, such as
user-selected audio, video, or Internet access
information into his or her programmable device. Such
electronic devices include wireless telephones, pagers,

10   and personal digital assistants. The programmer allows a
user to, among other things, customize the device to suit
his or her particular taste.

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5   METHODS AND APPARATUSES FOR PROGRAMMING
       USER-DEFINED INFORMATION INTO ELECTRONIC DEVICES

              This application claims priority from
       United States provisional application 60/169,158 filed
       December 6, 1999.

10   Background of the Invention

              This application relates to electronic devices,
       and more particularly to a programming apparatus that
       allows users to program user-defined information into
       their electronic device.

15   There are many types of electronic devices
       available to consumers today that have the ability to
       produce both audio sounds and video displays. Many of
       these devices provide users with the ability to select
       and play a particular piece of audio or video. A

20   television viewer, for example, may tune to a TV channel
       and watch a particular program, or connect a VCR or DVD
       player to the television in order to view a specific
       program not currently being broadcast. Similarly, an
       audio system user may tune a receiver to a particular

radio station to hear a certain genre of music, or
connect a CD or tape player to the system in order to
hear specific pieces of music. In both cases, the audio
and video is user-selectable.

5   Currently, however, there are many electronic
products that offer an audio/video playing capability
that are not fully user-programmable. Users of such
devices (e.g., wireless or cordless telephones, pagers,
personal digital assistants (PDAs), hand-held computers

10   and the like) have to choose from a limited selection of
pre-programmed information (e.g., audio clips, video
clips or frames, etc.) placed there by the manufacturer.
This severely limits the user's ability to customize the
device to suit his or her particular taste. Furthermore,

15   most pre-programmed audio tends to be rather generic and
can be confusing when a device of a nearby user generates
a sound similar to or the same as that of another user's
device. Although a programmable memory within many such
electronic devices could support user-defined audio,

20   currently, no system exists for programming such
information into an electronic device.

          The same is true for user-defined video. For
example, certain types of user-defined video information,
such as video clips, frames, and other digital or analog

25   images could be programmed into an electronic device
(e.g., PDA, wireless phone, or any portable display
device) and displayed at a time of the user choosing.
Although a programmable memory within such a device could
support user-defined video, currently, no system exists

30   for programming such information into the device.

Summary Of The Invention

          It is therefore an object of the present
invention to provide an apparatus that allows a user to

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program user-defined audio information into a programmable electronic device.

It is a further object of the present invention to provide an apparatus that allows a user to program

5   user-defined video information into a programmable electronic device.

These and other objects of the present invention are accomplished by providing methods apparatuses that allow a user to program user-defined

10   information into his or her electronic device. In one embodiment of the present invention, the programming apparatus includes processing circuitry and first and second communications links. In operation, a user selects a piece of information from a source such as a

15   computer disk drive, the Internet, or a remote database using the first communications link. The programming apparatus may download this information and compare its format with that required by the programmable device to determine format compatibility. If the two formats are

20   compatible, the programming apparatus may download the selected information into the programmable device. If the formats are not compatible, the programming apparatus may convert the downloaded file to a format compatible with that required by the programmable electronic device.

25   The programming apparatus may also provide the user with an opportunity to edit the converted file. Once editing is complete, the resulting file may then be programmed into the programmable device for subsequent use.

In another aspect of the invention, a user may

30   send customized information such as an audio or video file called a "signature" when placing a telephone call. This feature allows a user to select and send a signature file to the person receiving the telephone call such that the person receiving the call is alerted by that file.

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Brief Description Of The Drawings

The above and other objects and advantages of the present invention will be apparent upon consideration of the following detailed description, taken in conjunction with the accompanying drawings, in which like reference characters refer to like parts throughout, and in which:

FIG. 1 is a generalized block diagram of a system for programming user-defined information into an electronic device in accordance with one embodiment of the present invention.

FIG. 2 is a schematic diagram of a programmer constructed in accordance with one possible embodiment of the present invention.

FIG. 3 shows a computer based implementation of a programmer constructed in accordance with one embodiment of the present invention.

FIG. 4a shows an alternate embodiment of a computer based implementation of a programmer constructed in accordance with the principles of the present invention.

FIG. 4b shows an alternate network embodiment of the computer based implementation in shown in FIG. 4a.

FIG. 5 illustrates an imbedded implementation of the programmer shown in FIG. 2.

FIG. 6 shows yet another embodiment of a computer based implementation the programmer in shown in FIG. 4b.

FIG. 7 is a schematic diagram of one possible embodiment of a wireless telephone that can receive and play user-defined audio in accordance with one aspect of the present invention.

FIGS. 8-9 show a flow chart illustrating some of the steps involved in programming user-defined

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