horizontal or vertical viewing in response to a corresponding command received from the user.

53. A portable hand-held electronic device for use as a personal digital assistant, the device comprising:

a housing having a base portion and a cover portion connected by a foldable coupling;

a plurality of electronic displays with at least one of the plurality of electronic displays disposed within the base portion of the housing and at least one of the plurality of electronic displays disposed within the cover portion of the housing;

a processor disposed within the housing and in communication with the plurality of displays, the processor generating signals to selectively configure the plurality of displays as input and/or output devices for receiving information from a user and displaying information to a user, respectively.;

a transceiver disposed within the housing and in communication with the processor, the transceiver for selectively wirelessly transmitting and receiving digital information;

at least one communication port disposed within the housing and in communication with the processor for exchanging information with a computer;

a plurality of buttons located in the housing and in communication with the processor, the plurality of buttons in communication with the processor and selectively configurable by the processor to control at least one of the plurality of displays and/or functioning of the device; and

a removable computer readable storage medium engageable with the housing to be in selective communication with the processor, the computer readable storage medium including stored data representing instructions executable by the processor to selectively configure the device.

54. The portable hand-held electronic device of claim 53 wherein the processor is operative to selectively configure the plurality of displays for horizontal or vertical viewing in response to a corresponding command received from the user.

55. The portable hand-held electronic device of claim 53 wherein the processor selectively configures at least two of the plurality of displays to function as a single display.

56. The portable hand-held electronic device of claim 55 wherein the processor selectively configures the at least two displays to scroll text between adjacent displays.

57. The portable hand-held electronic device of claim 53 wherein the foldable coupling comprises at least one hinge.

58. The portable hand-held electronic device of claim 53 further comprising foldable electrical connecting means for connecting at least one of the plurality of displays to the processor through the foldable coupling between the base portion and the cover portion.

59. The portable hand-held electronic device of claim 53 wherein at least one of the plurality of displays comprises an LCD screen.

60. The portable hand-held electronic device of claim 53 wherein at least one of the plurality of displays comprises:

a first portion for displaying touch activated buttons;

a second portion separated from the first portion by a physical overlay, the second portion being configured to function as a cursor control touch pad.

61. The portable hand-held electronic device of claim 53 wherein the processor is operative to display a numeric keypad on at least one of the plurality of displays.

62. The portable hand-held electronic device of claim 53 wherein the processor is operative to display an alphanumeric keypad on at least one of the plurality of displays.

63. The portable hand-held electronic device of claim 53 wherein the processor is operative to provide Internet access functions.

64. The portable hand-held electronic device of claim 53 wherein at least one of the plurality of displays functions as an Internet viewing area.

65. The portable hand-held electronic device of claim 53 wherein at least one of the plurality of displays includes at least a portion which functions as an Internet access input means.

66. A hand-held portable electronic device capable of being used as a personal digital assistant, the hand-held device comprising:

a housing having a first display, a processor, and a memory, the processor being in communication with the first display and the memory;

a cover connected to the housing by a foldable coupling, the cover including a second display in communication with the processor, wherein the processor generates output signals to display information on at least one of the first and second displays;

input means in communication with the processor for selectively controlling functionality of the device;

means for establishing an electrical connection between the processor, the input means, and the first and second displays; and

wherein the processor is operative to provide Internet browsing functions.

67. The portable electronic device of claim 66 wherein at least one of the first and second displays is configured to provide an Internet viewing area.

68. The portable electronic device of claim 67 wherein at least one of the first and second displays includes at least a portion configured to provide an Internet access input means.

69. The portable electronic device of claim 68 wherein at least one of the first and second displays is selectively configurable by the processor to function as a touch-sensitive input device.

70. The portable electronic device of claim 68 wherein at least one of the first and second displays includes a first portion for displaying information to the user and a second portion for receiving input from the user.

71. The portable electronic device of claim 68 wherein the foldable coupling comprises at least one hinge connecting the cover to the housing.

72. The portable electronic device of claim 68 wherein at least one of the first and second displays comprises an LCD screen.

73. The portable electronic device of claim 68 wherein at least one of the first and second displays comprises an active matrix display.

74. The portable electronic device of claim 68 wherein the input means comprises a plurality of buttons positioned on the housing or the cover and in communication with the processor for controlling information displayed on at least one of the first and second displays.

75. The portable electronic device of claim 68 wherein the housing includes a transceiver in communication with the processor for wirelessly transmitting and receiving data.

76. The portable electronic device of claim 68 wherein the processor is operative to display images depicting a numeric keypad on at least one of the first and second displays.

77. The portable electronic device of claim 68 wherein the processor is operative to display images depicting an alphanumeric keypad on at least one of the first and second displays.

78. The portable electronic device of claim 68 wherein at least one of the first and second displays is configured to provide an Internet viewing area.

79. The portable electronic device of claim 68 wherein at least one of the first and second displays includes at least a portion configured to provide an Internet access input means.

80. The portable electronic device of claim 68 wherein one of the first and second displays includes a first portion for displaying information to the user while another of the first and second displays includes a second portion for generating signals based on user input.

81. The portable electronic device of claim 68 wherein the processor is operative to display text or images on the first and second displays such that the first and second displays function as a single display.

82. The portable electronic device of claim 68 wherein the processor is operative to scroll text between a bottom portion of the second display and a top portion of the first display.

83. The portable electronic device of claim 68 wherein the housing includes a port for receiving a computer readable storage medium containing data and/or instructions useable by the processor to selectively reconfigure at least one of the first and second displays.

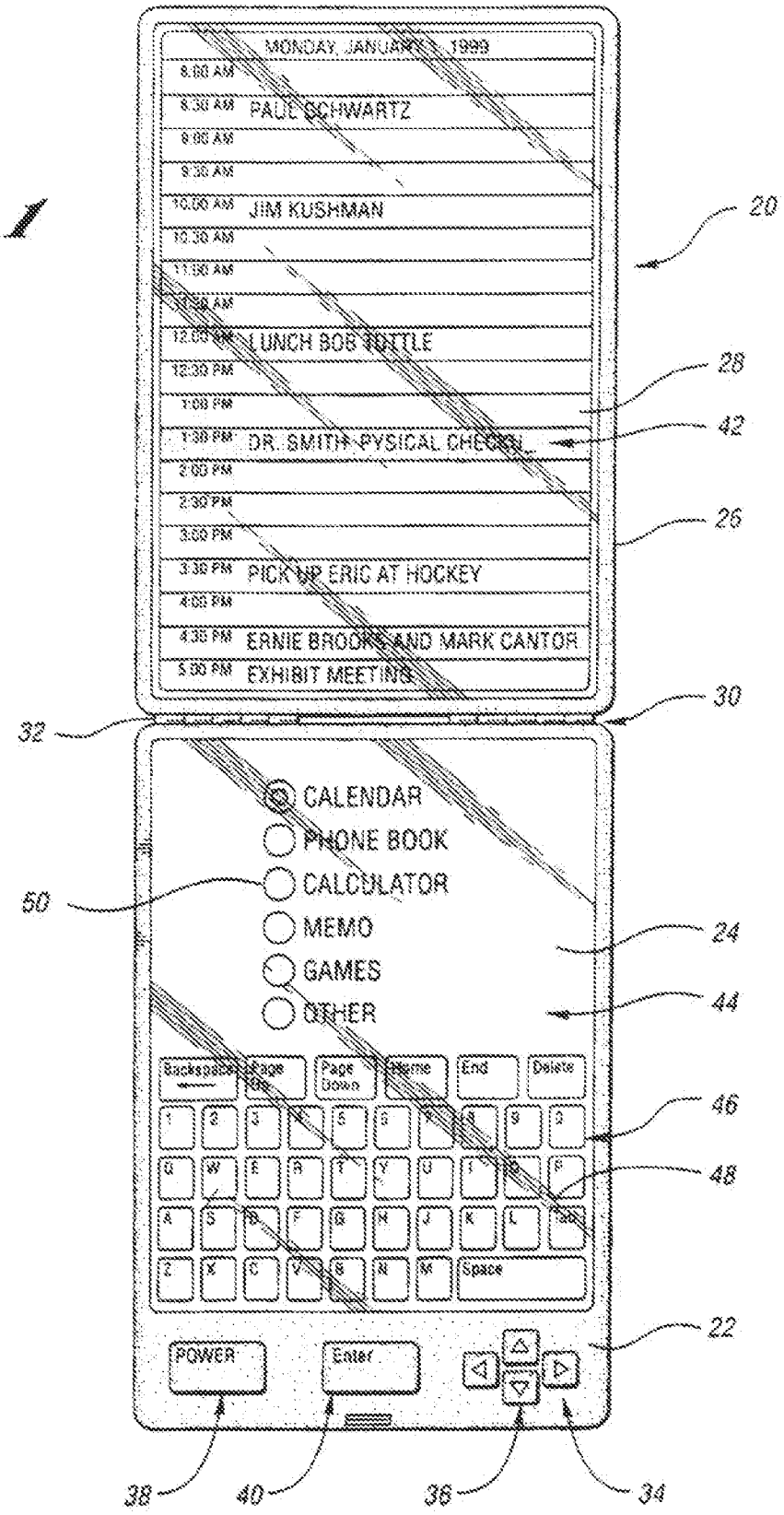
84. The portable electronic device of claim 68 further comprising a removable computer readable storage medium containing configuration data and/or instructions useable by the processor to selectively reconfigure at least one of the first and second displays.

85. The portable electronic device of claim 68 wherein the housing includes at least one connector for selectively receiving a cable to exchange data with a computer.

86. The portable electronic device of claim 68 wherein the housing or the cover includes a plurality of cursor control keys in communication with the processor for providing directional signals in response to a user's touch.

87. The portable electronic device of claim 68 wherein the processor is operative to selectively configure the first and second displays for horizontal or vertical viewing in response to a corresponding command received from the user.

Fig. 1


MONDAY, JANUARY 1, 1999
8:00 AM
8:30 AM PAUL SCHWARTZ
9:00 AM
9:30 AM
10:00 AM JIM KUSHMAN
10:30 AM
11:00 AM
11:30 AM
12:00 PM LUNCH BOB TOTTLE
12:30 PM
1:00 PM
1:30 PM DR. SMITH PYSICAL CHECKUP
2:00 PM
2:30 PM
3:00 PM
3:30 PM PICK UP ERIC AT HOCKEY
4:00 PM
4:30 PM ERNIE BROOKS AND MARK CANTOR
5:00 PM EXHIBIT MEETING
CALENDAR
PHONE BOOK
CALCULATOR
MEMO
GAMES
OTHER
Backspace
Page Up
Page Down
Home
End
Delete
Space
POWER
Enter
20
28
42
26
30
32
50
24
44
46
48
22
38
40
36
34

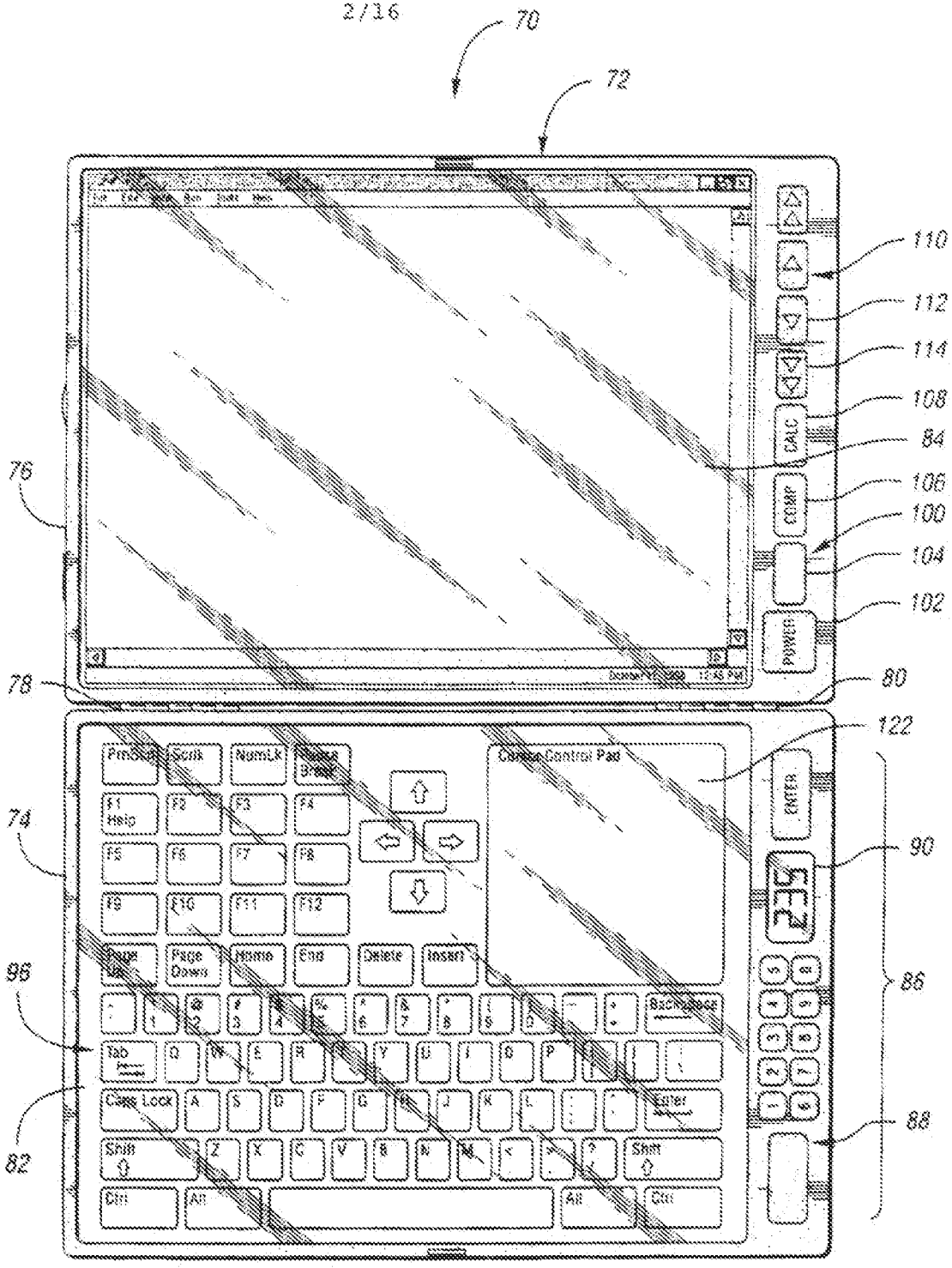

70
72
110
112
114
108
84
106
100
104
102
76
78
80
122
74
90
96
86
82
88
CALC
COMP
POWER
ENTER
Cursor Control Pad

Fig. 2

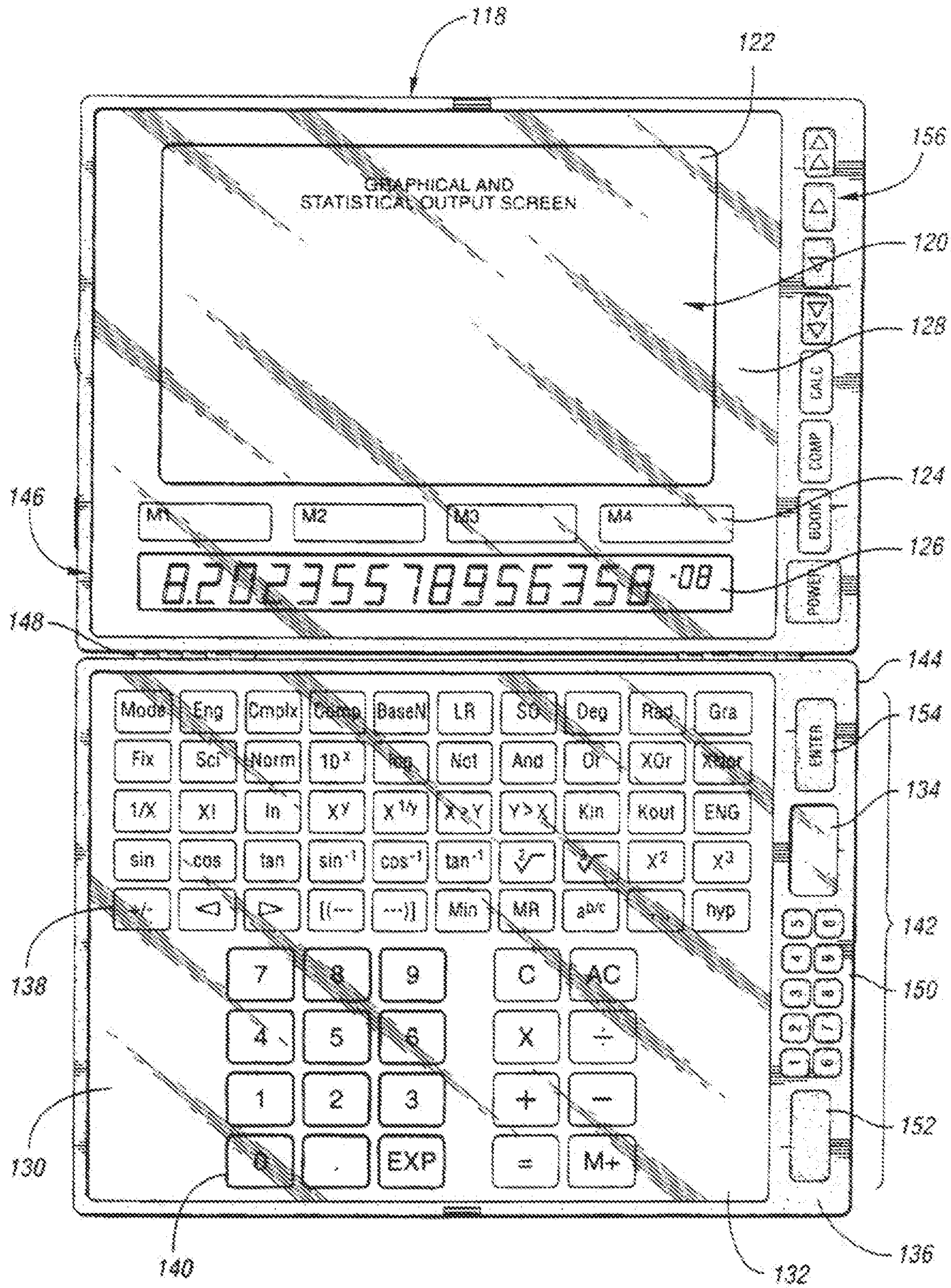

118
122
156
120
128
124
126
146
148
144
154
134
142
150
152
138
130
140
132
136
GRAPHICAL AND
STATISTICAL OUTPUT SCREEN
M1
M2
M3
M4
8.20235578956358 -08
CALC
COMP
POWER
ENTER
Mode
Eng
Cmplx
Fix
Sci
Norm
1/X
X!
ln
sin
cos
tan
Nct
And
Or
XOr
Kin
Kout
ENG
Min
MR
hyp
7
8
9
4
5
6
1
2
3
EXP
C
AC
M+

Fig. 3

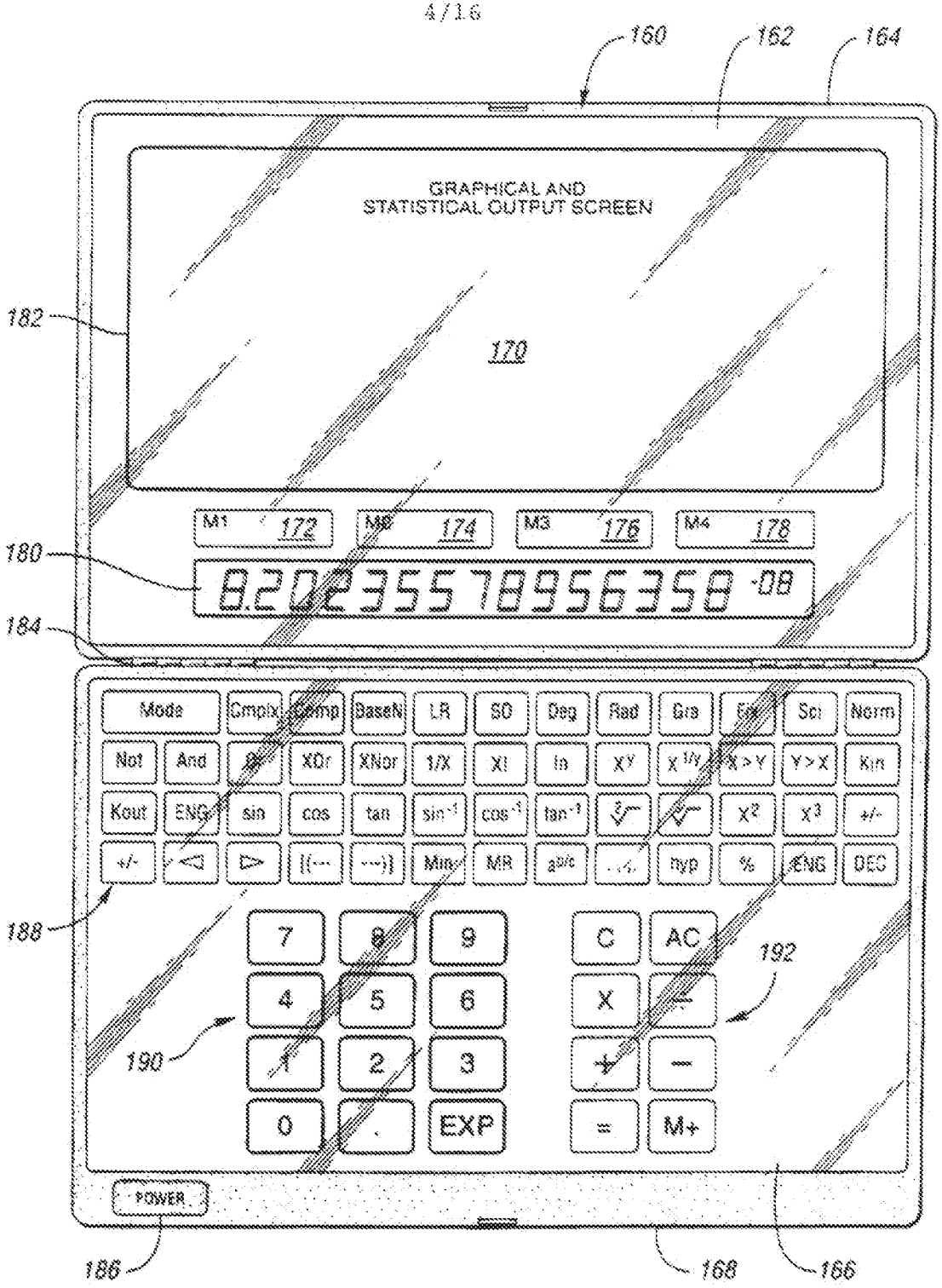

160
162
164
GRAPHICAL AND
STATISTICAL OUTPUT SCREEN
182
170
M1 172
M2 174
M3 176
M4 178
180
8.202355789563580 -08
184
Mode
Cmplx
Comp
BaseN
LR
SD
Deg
Rad
Gra
Fix
Sci
Norm
Not
And
Or
XOr
XNor
1/X
X!
ln
X^Y
X^1/Y
X>Y
Y>X
Rin
Rout
ENG
sin
cos
tan
sin-1
cos-1
tan-1
+/-
hyp
%
ENG
DEG
188
7
8
9
C
AC
4
5
6
X
190
1
2
3
+
−
0
.
EXP
=
M+
192
POWER
186
168
166

Fig. 4

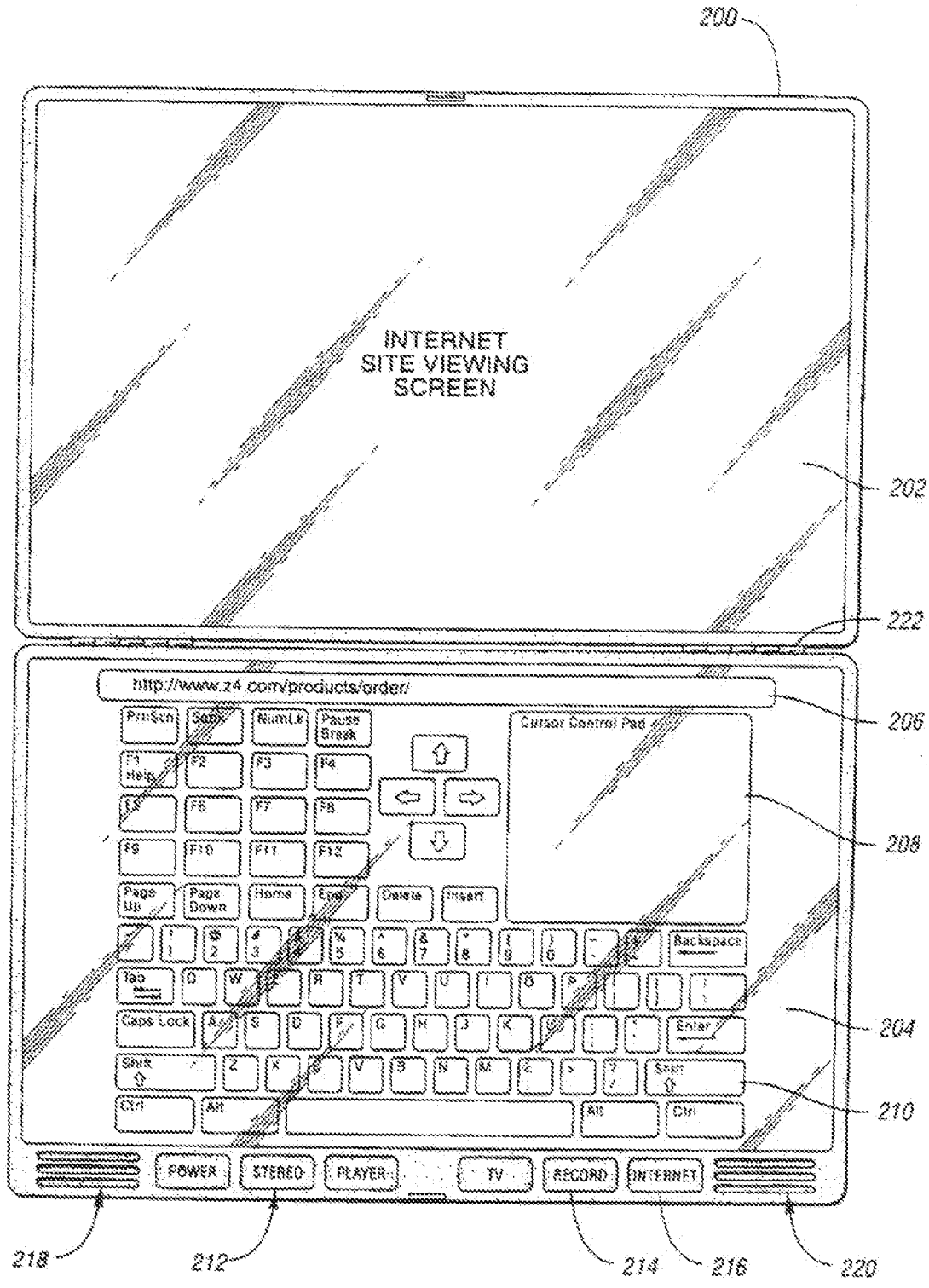

200
INTERNET
SITE VIEWING
SCREEN
202
222
http://www.24.com/products/order/
206
Cursor Control Pad
208
204
210
POWER
STEREO
PLAYER
TV
RECORD
INTERNET
218
212
214
216
220

Fig. 5

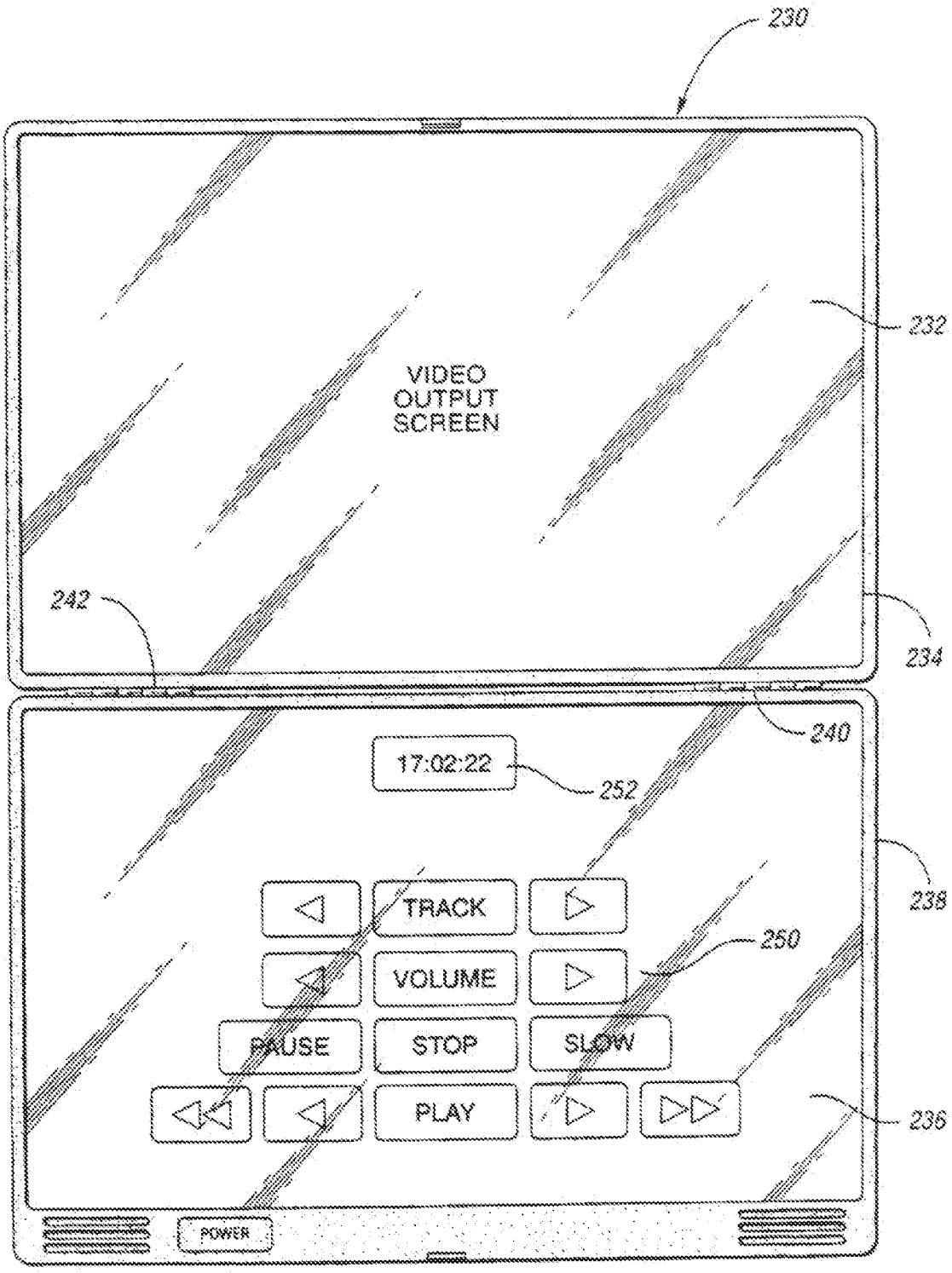

230
232
VIDEO
OUTPUT
SCREEN
242
234
240
17:02:22
252
238
TRACK
250
VOLUME
PAUSE
STOP
SLOW
PLAY
236
POWER

Fig. 6

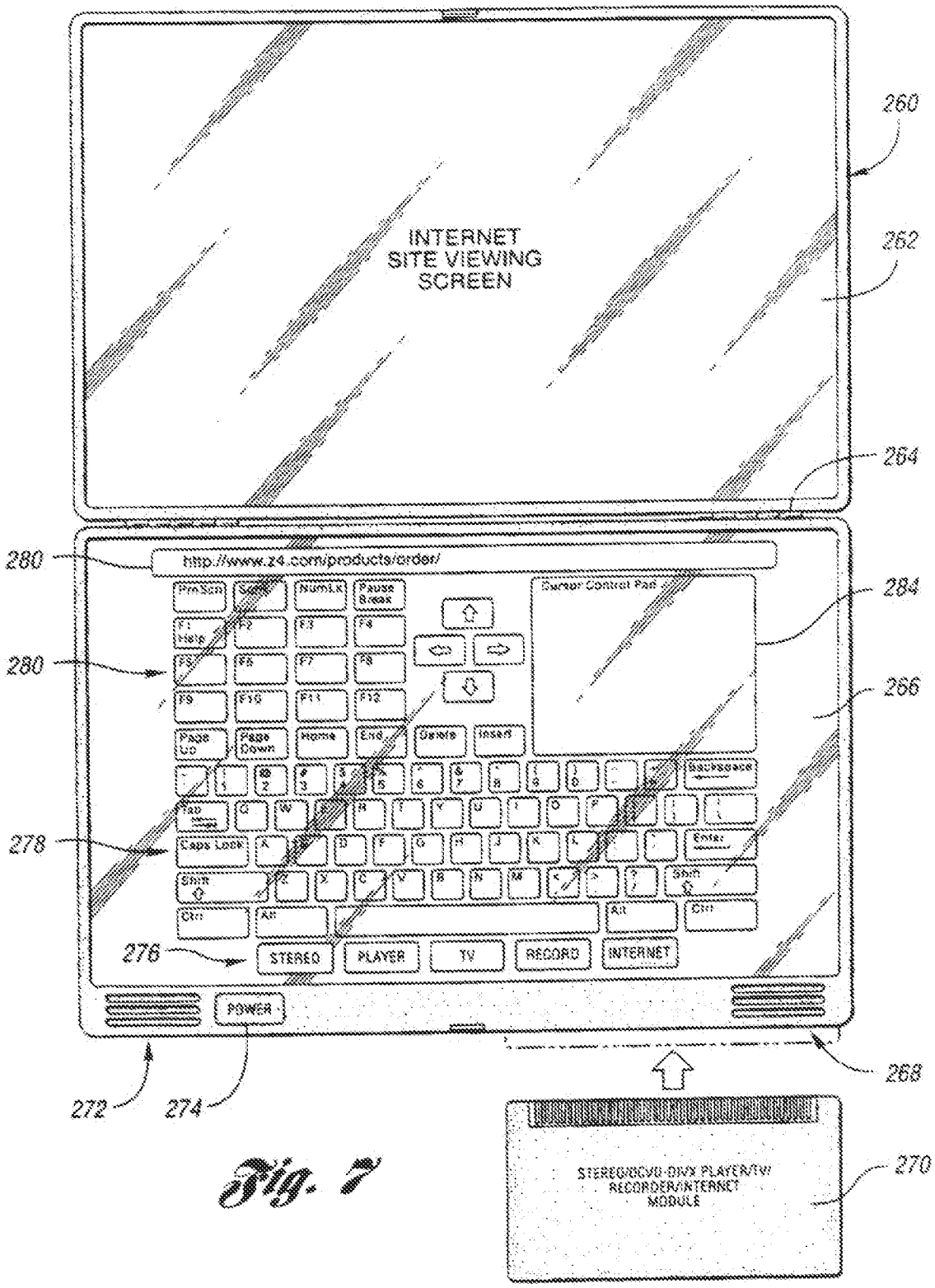
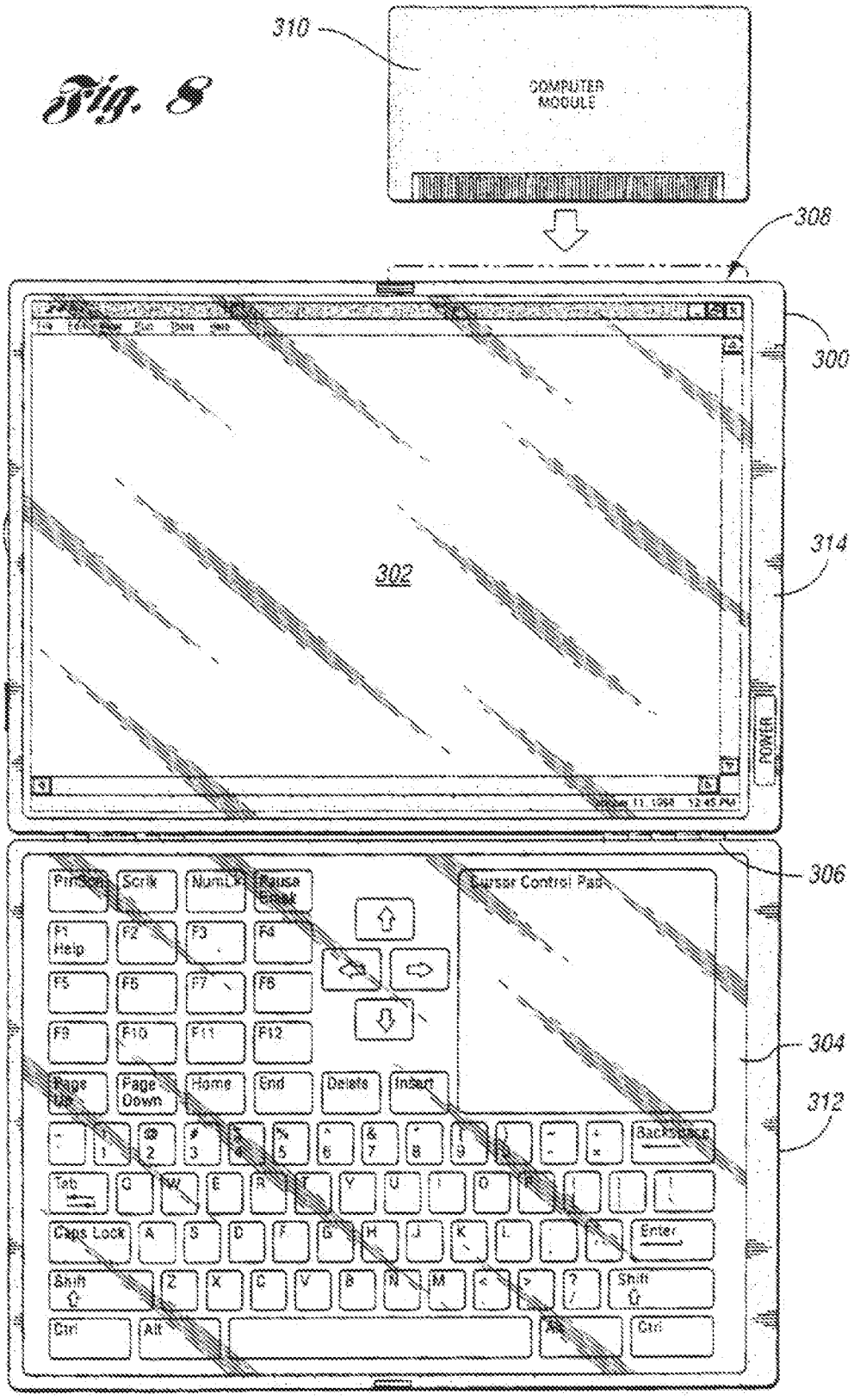

INTERNET
SITE VIEWING
SCREEN
260
262
264
280
http://www.z4.com/products/order/
280
284
266
278
276
STEREO
PLAYER
TV
RECORD
INTERNET
POWER
272
274
268
STEREO/DVD-DIVX PLAYER/TV/
RECORDER/INTERNET
MODULE
270

Fig. 7

Fig. 8


310
COMPUTER MODULE
308
300
302
314
POWER
306
Cursor Control Pad
304
312

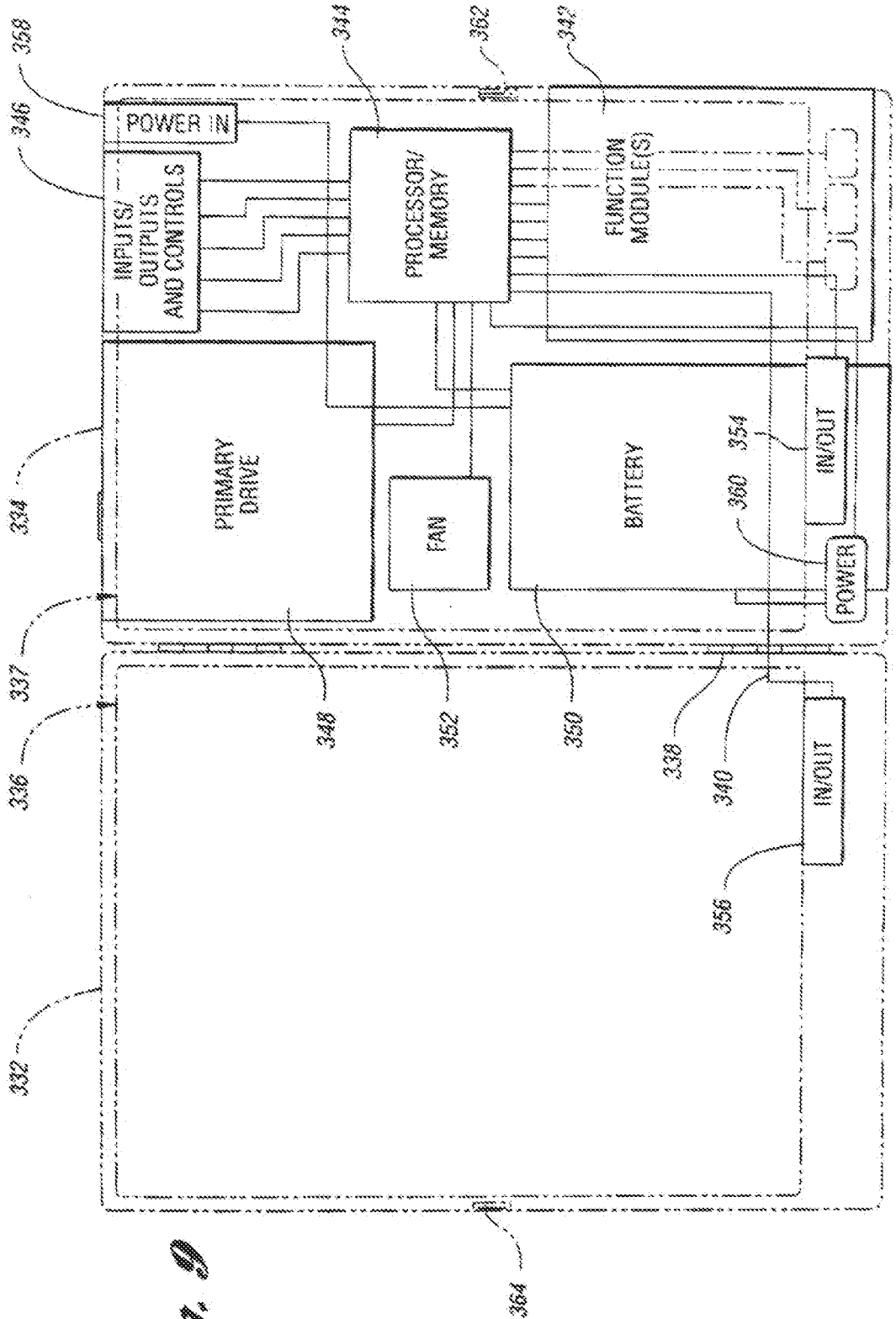

358
346
POWER IN
INPUTS/
OUTPUTS
AND CONTROLS
344
PROCESSOR/
MEMORY
342
FUNCTION
MODULE(S)
362
334
PRIMARY
DRIVE
FAN
BATTERY
354
IN/OUT
360
POWER
337
336
348
352
350
338
340
IN/OUT
356
332
364

Fig. 9

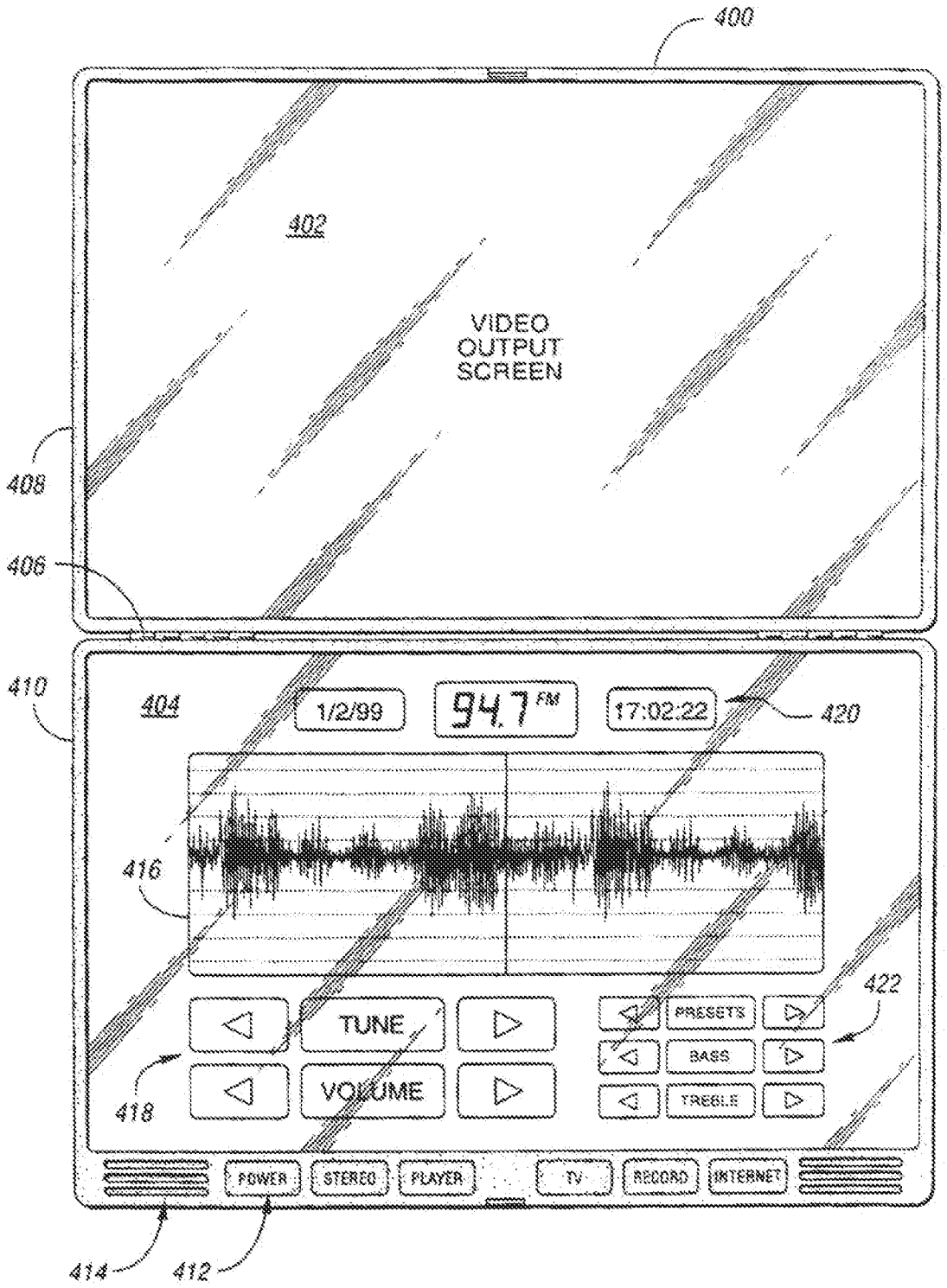

400
402
VIDEO
OUTPUT
SCREEN
408
406
410
404
1/2/99
94.7 FM
17:02:22
420
416
422
TUNE
VOLUME
PRESETS
BASS
TREBLE
418
POWER
STEREO
PLAYER
TV
RECORD
INTERNET
414
412

Fig. 10

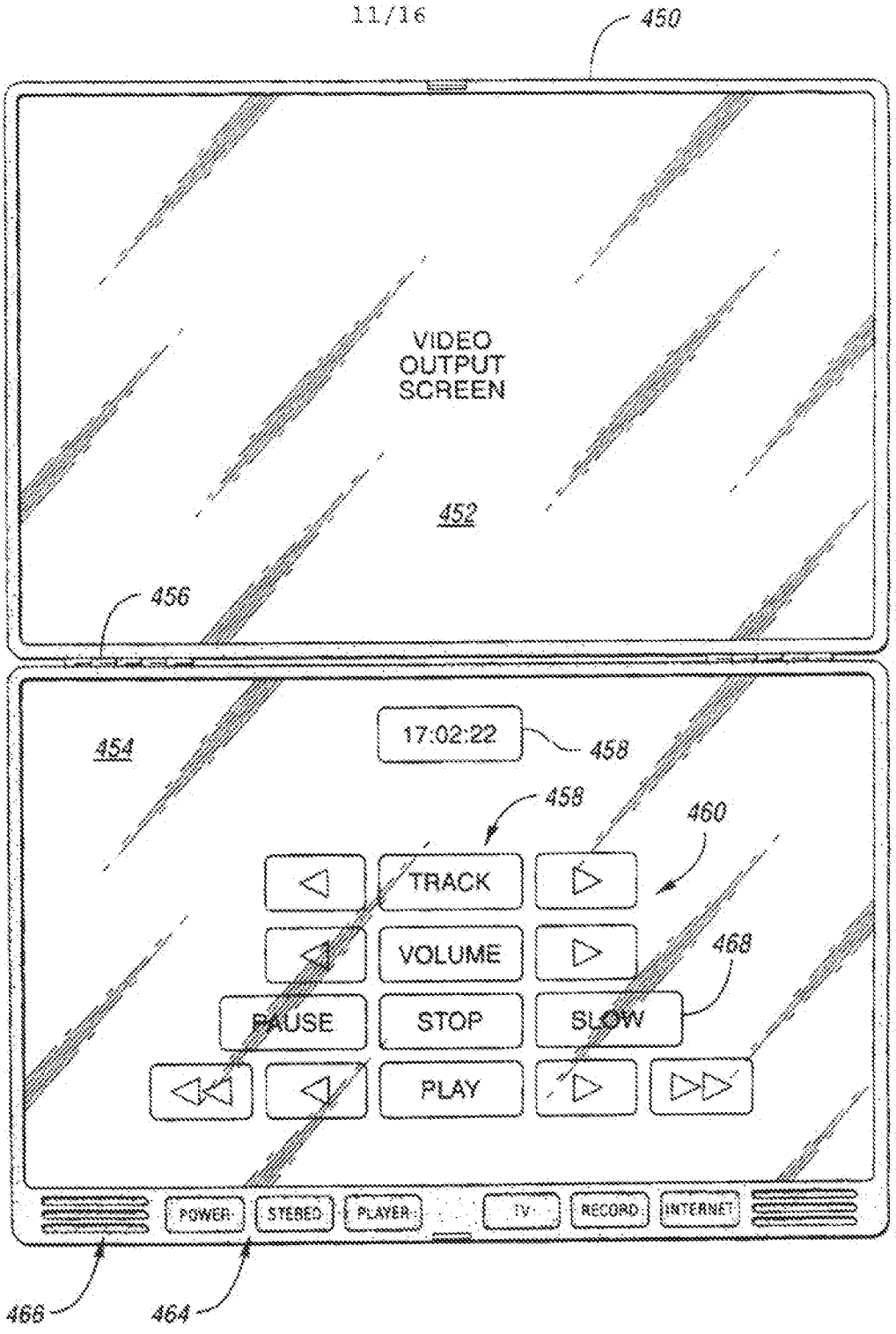

450
VIDEO
OUTPUT
SCREEN
452
456
454
17:02:22
458
458
460
TRACK
VOLUME
PAUSE
STOP
SLOW
468
PLAY
POWER
STEREO
PLAYER
TV
RECORD
INTERNET
466
464

Fig. 11

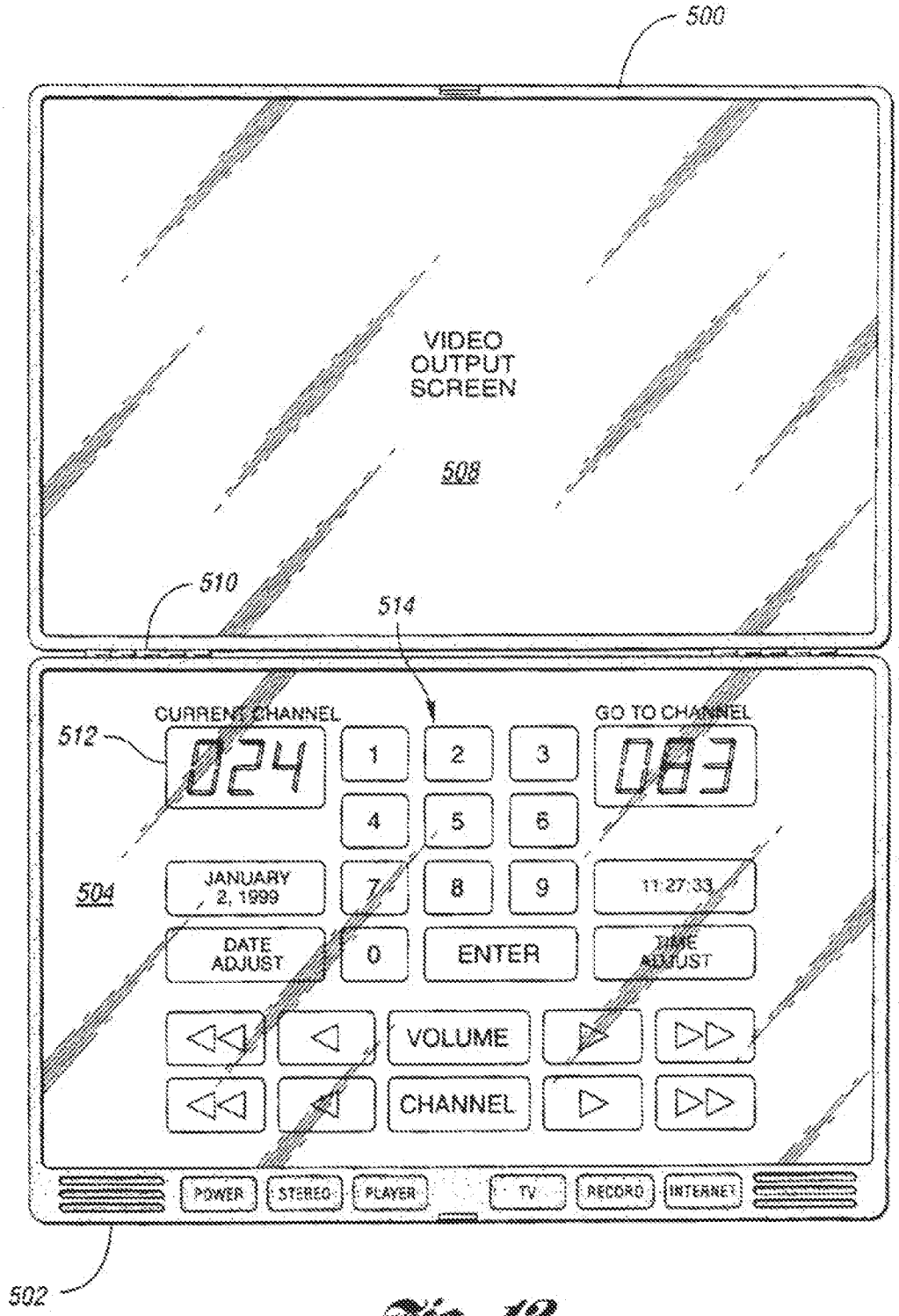

500
VIDEO
OUTPUT
SCREEN
508
510
514
CURRENT CHANNEL
512
024
GO TO CHANNEL
083
1
2
3
4
5
6
504
JANUARY
2, 1999
7
8
9
11:27:33
DATE
ADJUST
0
ENTER
TIME
ADJUST
VOLUME
CHANNEL
POWER
STEREO
PLAYER
TV
RECORD
INTERNET
502

Fig. 12

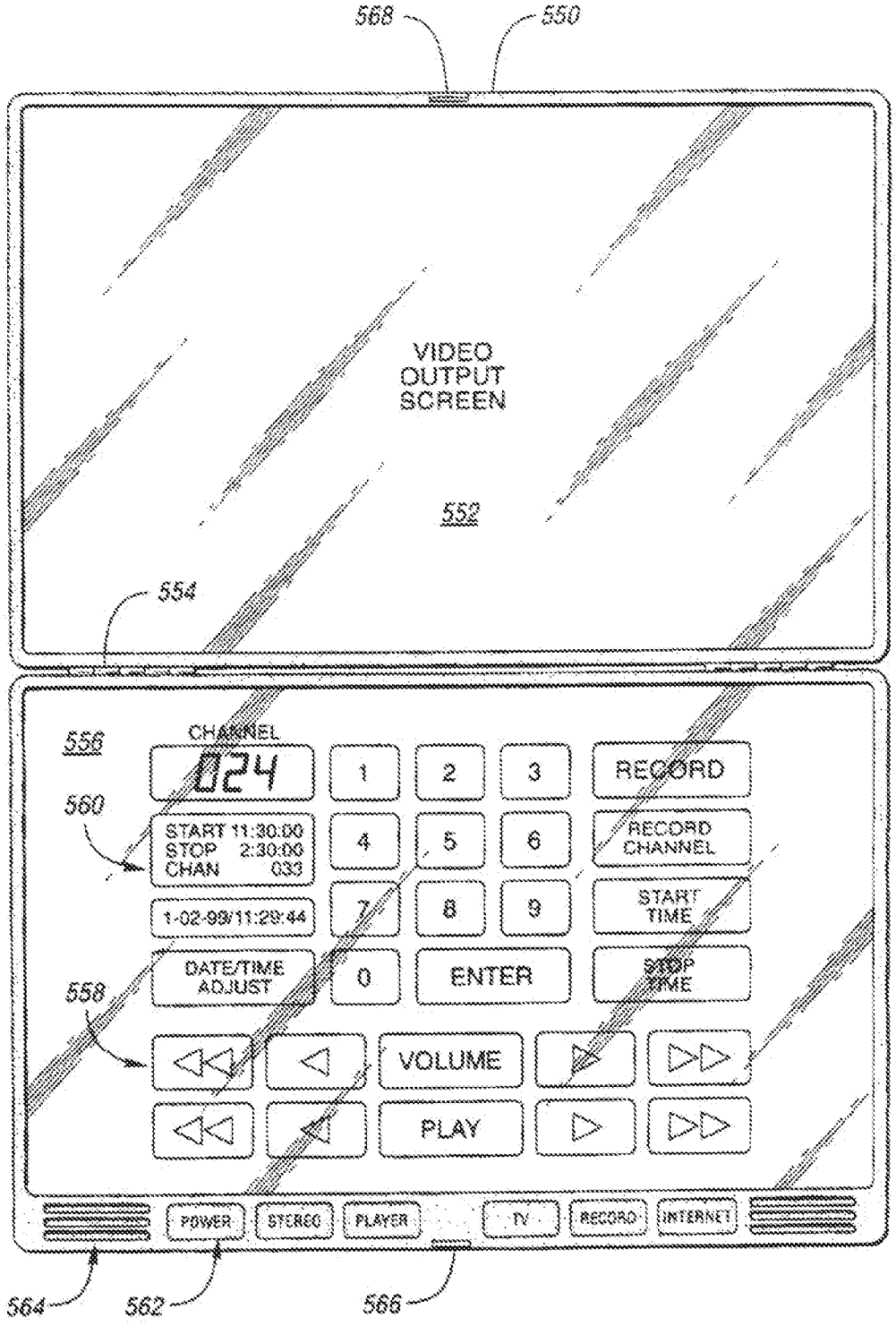
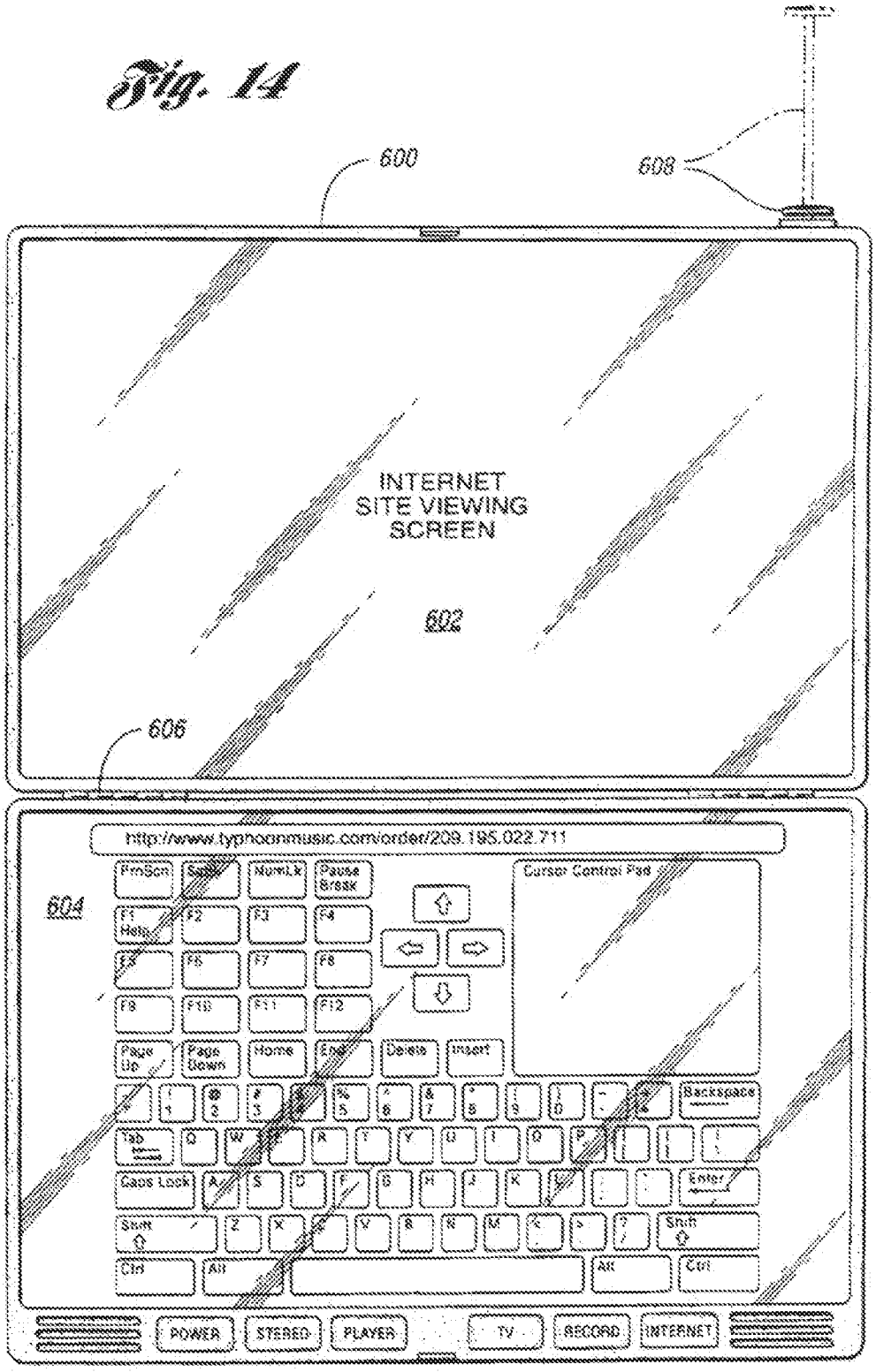

568
550
VIDEO
OUTPUT
SCREEN
552
554
556
CHANNEL
024
560
START 11:30:00
STOP 2:30:00
CHAN 033
1-02-99/11:29:44
DATE/TIME
ADJUST
558
1
2
3
RECORD
4
5
6
RECORD
CHANNEL
7
8
9
START
TIME
0
ENTER
STOP
TIME
VOLUME
PLAY
POWER
STEREO
PLAYER
TV
RECORD
INTERNET
564
562
566

Fig. 13

Fig. 14


600
608
INTERNET
SITE VIEWING
SCREEN
602
606
604
http://www.typhoonmusic.com/order/209.195.022.711
Cursor Control Pad
POWER
STEREO
PLAYER
TV
RECORD
INTERNET

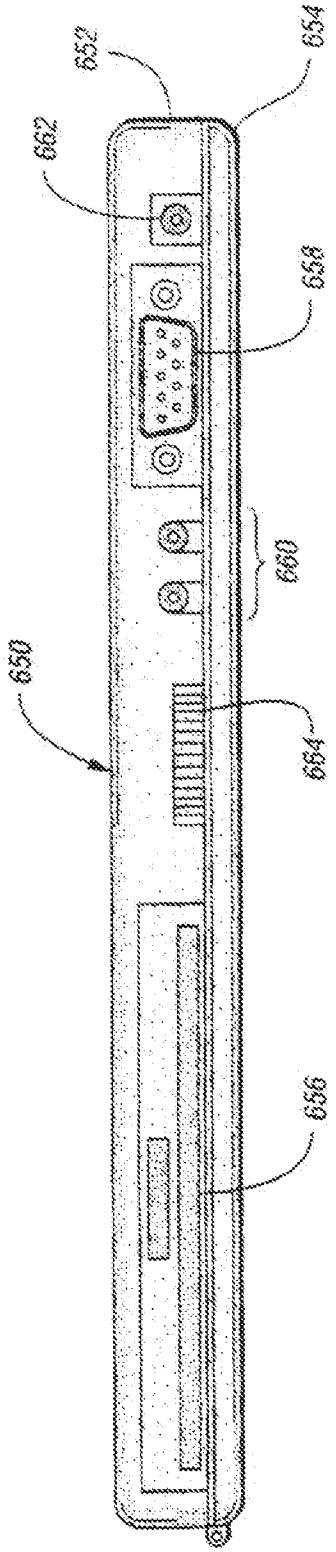


Fig. 15

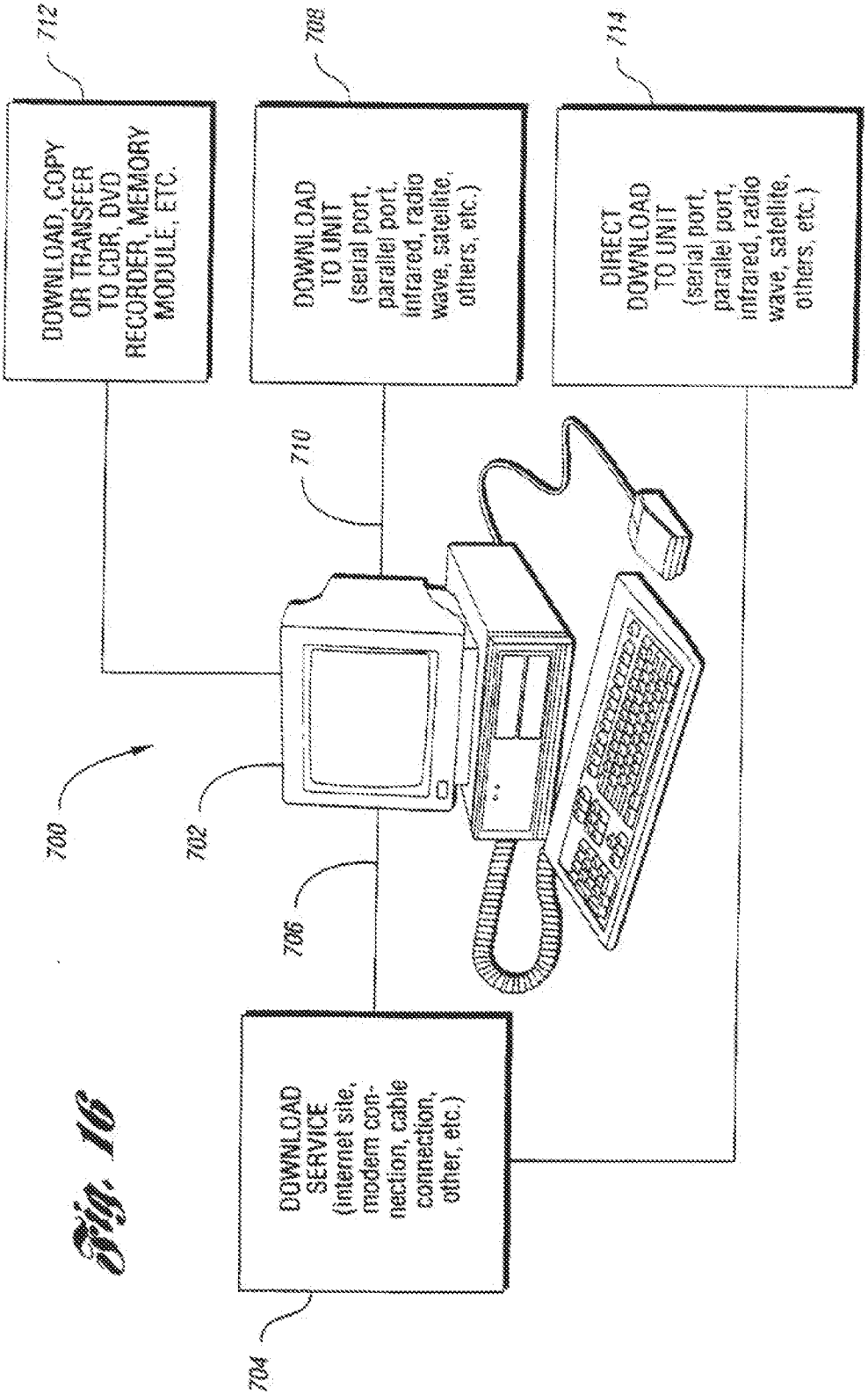

712
DOWNLOAD, COPY OR TRANSFER TO CDR, DVD RECORDER, MEMORY MODULE, ETC.
708
DOWNLOAD TO UNIT (serial port, parallel port, infrared, radio wave, satellite, others, etc.)
714
DIRECT DOWNLOAD TO UNIT (serial port, parallel port, infrared, radio wave, satellite, others, etc.)
710
700
702
706
DOWNLOAD SERVICE (internet site, modem connection, cable connection, other, etc.)
704

Fig. 16

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US00/40364

A. CLASSIFICATION OF SUBJECT MATTER
IPC(7) : G06F 3/00; G09G 5/00
US CL. : 345/156, 173, 340, 901, 905; 178/18, 19; 395/800; 364/708.1
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 345/156, 173, 340, 901, 905; 178/18, 19; 395/800; 364/708.1

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Microsoft Press-Computer Dictionary-Third Edition 1997

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Examiner Automatic Search Tools (EAST)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US 5,847,698 A (REAVEY et al) 08 December 1998 (08.12.1998), column 1, lines 5-15, line 41, column 2, lines 1-2, lines 5-6, lines 13-23, lines 45-48, lines 57-60, col. 3, lines 1-33, lines 48-57, col. 4, lines 4-8, col. 5, lines 17-19, lines 32-67, col. 6, lines 1-32, col. 7, lines 9-23, col. 8, lines 25-28, figures 2-7	1-18, 20-49, 51-52,66-84, 86-87 --- 19, 50, 53-65, 85
Y	US 5,467,102 A (KUNO et al) 14 November 1995 (14.11.1995), column 9, lines 7-10, lines 29-34, and Figure 11.	19, 50, 53-65, 85

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
13 September 2000 (13.09.2000)	17 OCT 2000
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703)305-3230	Authorized officer HENRY N. TRAN Telephone No. (703) 308-8410

Form PCT/ISA/210 (second sheet) (July 1998)

Electronic Acknowledgement Receipt

EFS ID:	5470766
Application Number:	12015320
International Application Number:	
Confirmation Number:	2156
Title of Invention:	Method for Managing Media
First Named Inventor/Applicant Name:	Russell W. White
Customer Number:	21906
Filer:	Mark J. Rozman/Stephanie Petreas
Filer Authorized By:	Mark J. Rozman
Attorney Docket Number:	AFF.0004C5US
Receipt Date:	08-JUN-2009
Filing Date:	16-JAN-2008
Time Stamp:	12:57:22
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Filed (SB/08)	AFF004C5IDS1449Form2.pdf	405157 6750040845808ef4436c969b8111e0fc3e3f422c	no	12

Warnings:	
Information:	

This is not an USPTO supplied IDS fillable form					
2	Information Disclosure Statement (IDS) Filed (SB/08)	AFF004C5IDS1449Form3.pdf	229983 f6c02e80ac71e5ffc3525c4e2f685b04f3af88e6	no	6
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
3	NPL Documents	DEF00015190.pdf	349301 ec714f660c558548617404daa4f7d849501c835c	no	3
Warnings:					
Information:					
4	Foreign Reference	DEF00015193.pdf	9206994 0a2dc0d889c0f517138c5cd784589d9ecf4211f7	no	58
Warnings:					
Information:					
5	Foreign Reference	DEF00015251.pdf	9881960 72fd934152e5a240908d47677768bffdae1da5e6	no	71
Warnings:					
Information:					
6	Foreign Reference	DEF00015322.pdf	2523383 d8541091de93a7c1c5f20db2fb29c28eb8d92564	no	16
Warnings:					
Information:					
7	Foreign Reference	DEF00015338.pdf	7657439 d282ffbc1359e9855551434fe0611078fb3ce0ac	no	52
Warnings:					
Information:					
			Total Files Size (in bytes):	30254217	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (04-09)
Approved for use through 05/31/2009. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	12015320
Filing Date	2008-01-16
First Named Inventor	Russell W. White, et al.
Art Unit	2617
Examiner Name	Erika A. Gary
Attorney Docket Number	AFF.004C5US

U.S.PATENTS

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

If you wish to add additional U.S. Patent citation information please click the Add button.

U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

If you wish to add additional U.S. Published Application citation information please click the Add button.

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	2000-66974	JP		2000-03-03			☐
	2	11-68685	JP		1999-03-09			☐
	3	CN 1218258A	CN		1999-06-02			☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12015320
	Filing Date	2008-01-16
	First Named Inventor	Russell W. White, et al.
	Art Unit	2617
	Examiner Name	Erika A. Gary
	Attorney Docket Number	AFF.004C5US

	4	H11-242686	JP		1999-09-07	Sony Corporation		☐
	5	DE 44 31 070 B4	DE		2004-07-22	DaimlerChrysler AG		☐
	6	0 569 343 A1	EP		1993-10-11	Pioneer Electronic Corporation		☐
	7	0 675 341 A1	EP		1995-04-10	Honda Giken Kogyo		☐
	8	0 771 686 A2	EP		1997-07-05	Toyota Jidosha Kabushiki Kaisha Toyota-shi, Aichi-		☐
	9	H4-261576	JP		1992-09-17	Mitsubishi Electric Corporation		☐
	10	2-301330	JP		1990-12-13			☐
	11	5-294250	JP		1993-11-09			☐
	12	6-187597	JP		1994-07-08			☐
	13	JP6289118	JP		1994-10-18	Sega Enterprises KK		☐
	14	JP6294659	JP		1994-10-21	Dainippon Printing Co. LTD.		☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12015320
	Filing Date	2008-01-16
	First Named Inventor	Russell W. White, et al.
	Art Unit	2617
	Examiner Name	Erika A. Gary
	Attorney Docket Number	AFF.004C5US

	15	07-129895	JP		1995-05-19	Honda Motor Co Ltd		☐
	16	07-146155	JP		1995-06-06	Honda Motor Co Ltd		☐
	17	7-262493	JP		1995-10-13	CSK Corporation		☐
	18	7-262493	JP		1995-10-13			☐
	19	JP7270171	JP		1995-10-20	Sumitomo Electronic Industries		☐
	20	JP7036382	JP		1995-02-07	Mitsubishi Electric Corp.		☐
	21	8-110231	JP		1996-04-30			☐
	22	9-61514	JP		1997-03-07			☐
	23	10-103966	JP		1998-04-24			☐
	24	10-143349	JP		1998-05-29	Compaq Computer Corporation		☐
	25	JP1018712	JP		1989-01-23	Mazda Motor		☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12015320
	Filing Date	2008-01-16
	First Named Inventor	Russell W. White, et al.
	Art Unit	2617
	Examiner Name	Erika A. Gary
	Attorney Docket Number	AFF.004C5US

	26	JP5077679	JP		1993-03-30	Nissan Motor		☐
	27	JP59085599	JP		1984-05-17	Nissan Motor		☐
	28	JP63136828	JP		1988-06-09	Pioneer Electronic Corp.		☐
	29	63-136828	JP		1988-06-09			☐
	30	WO 96/04724	WO		1996-02-15	Emerson, Harry		☐
	31	WO 96/07110	WO		1996-03-07	British Telecommunications Public Limited Company		☐
	32	WO 97/13657	WO		1997-04-17	United Technologies Automotive, Inc.		☐
	33	H11-317061	JP		1999-11-16	Victor Company of Japan, LTD.		☒
	34	2901445	JP		1999-03-19	Kenwood Corporation		☒
	35	WO 99/35009	WO		1999-07-15	Microsoft Corporation		☐
	36	11-219580	JP		1999-08-10			☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12015320
	Filing Date	2008-01-16
	First Named Inventor	Russell W. White, et al.
	Art Unit	2617
	Examiner Name	Erika A. Gary
	Attorney Docket Number	AFF.004C5US

	37	11219580 A	JP		1999-10-08	Sony Corp		☐
	38	1168685	JP		1999-03-09			☐
	39	11-068685	JP		1999-09-03	Sony Corp		☐
	40	1998-052033	JP		1998-09-25			☐
	41	1999-0042565	JP		1999-06-15			☐
	42	1999-0073234	KR		1999-10-05	Young-Man Lee		☐
	43	1999-0048723	KR		1999-07-05			☐
	44	KR2019990022030U	KR		1999-06-25	Young-Shik Cheon		☐
	45	2000-0001465	KR		2000-01-25	Samsung Motors		☐
	46	0142256	KR		1998-03-30			☐
	47	WO 98/21672	WO		1998-05-22	Inergy Online, Inc.		☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12015320
	Filing Date	2008-01-16
	First Named Inventor	Russell W. White, et al.
	Art Unit	2617
	Examiner Name	Erika A. Gary
	Attorney Docket Number	AFF.004C5US

	48	WO 98/47252	WO		1998-10-22	Stern, Geoffrey		☐
	49	WO 00/54187	WO		2000-09-14	Rock.Com, Inc.		☐
	50	WO 00/60450	WO		2000-10-12	Khyber Technologies Corporation		☐

If you wish to add additional Foreign Patent Document citation information please click the Add button

NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	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, pages(s), volume-issue number(s), publisher, city and/or country where published.	T5
	1	MARK MOELLER, Computing Unplugged Magazine, "Product Preview, A Survey of Auto PC 2.0 for software developers," 1999-2009, Zatz Publishing, pages 1-7.	☐
	2	MARK MOELLER, Computing Unplugged Magazine, "AutoPC Update, Auto PC/Windows CE for Automotive news bites," 1999-2009, Zatz Publishing, pages 1-4.	☐
	3	Claim Chart for KR19990033393, Claim 17 of U.S. Patent No. 7,324,833, pages 1-3.	☐
	4	RIO500, Getting Started Guide for Windows 98 and Macintosh OS 8.6, pages 1-2.	☐
	5	NORBERT A. STREITZ, et al., "DOLPHIN: Integrated Meeting Support Across Local And Remote Desktop Environments And LiveBoards," Integrated Publication and Information Systems Institute, 1994, pages 345-358.	☐
	6	LEO DEGEN, et al., "Working with Audio: Integrating Personal Tape Recorders and Desktop Computers," May 3-7, 1992, pages 413-418.	☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12015320
	Filing Date	2008-01-16
	First Named Inventor	Russell W. White, et al.
	Art Unit	2617
	Examiner Name	Erika A. Gary
	Attorney Docket Number	AFF.004C5US

	7	H.S. JUN GIBEE, "A Virtual Information Desk On The Internet," University of Ulsan, September 1999, pages 265-268.	☐
	8	STEVE WHITTAKER, et al., "TeleNotes: Managing Lightweight Interactions in the Desktop," Lotus Development Corporation, June 1997, pages 137-168.	☐
	9	R.M. CROWDER, et al., "Integration of Manufacturing Information Using Open Hypermedia," Computer in Industry, 1999, pages 31-42.	☐
	10	TOMAS BOSTROM, et al., "Mobile Audio Distribution," Royal Institute of Technology, 1999, pages 166-172.	☐
	11	ALEX POON, et al., Xerox Disclosure Journal, Vol. 19, No. 2, "Gestural User Interface Technique for Controlling the Playback of Sequential Media," March/April 1994, pages 187-190.	☐
	12	DEB KUMAR ROY, "NewsComm: A Hand-Held Device For Interactive Access to Structured Audio," Massachusetts Institute of Technology, June 1995, pages 1-12.	☐
	13	VICTORIA BELLOTTI, et al., "Walking Away from the Desktop Computer: Distributed Collaboration and Mobility in a Product Design Team," 1996, pages 209-218.	☐
	14	UPUL OBEYSEKARE, et al., "The Visual Interactive Desktop Laboratory," January-March 1997, pages 63-71.	☐
	15	ASIM SMAILAGIC, et al., "MoCCA: A Mobile Communication and Computing Architecture," Institute for Complex Engineered Systems, pages 1-8.	☐
	16	SUI-MENG POON, et al., "Integration of Value-Added Audio Playback Capacity Into Computer Network," Nanyang Technological University, 1995, pages 632-636.	☐
	17	ERDAL PAKSOY, et al., "A variable-rate celp coder for fast remote voicemail retrieval using a notebook computer," DSPS R&D Center, Texas Instruments, 1997, pages 119-124.	☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12015320
	Filing Date	2008-01-16
	First Named Inventor	Russell W. White, et al.
	Art Unit	2617
	Examiner Name	Erika A. Gary
	Attorney Docket Number	AFF.004C5US

	18	JEFFREY A. DAVIS, "Use of Personal Computers in Satellite Command and Control Systems," Raytheon Systems Company, October 24, 1999, pages 283-291.	☐
	19	NIKI DAVIS, "Remote Teaching Via ISDN2 And Desktop Conferencing,"Exeter University School of Education, pages 1-3.	☐
	20	A CHAN, et al., "The PEP-II Project-Wide Database," Stanford University, 1996, pages 840-842.	☐
	21	KRISHNA BHARAT, et al., "Migratory Applications," Springer Berlin, Vol. 1222, 1997, pages 1-21.	☐
	22	EMPEG CAR, "MP3 in your dash," Digital Audio Player User Guide, pages 1-50.	☐
	23	MICROSOFT, "Getting Started Microsoft. Windows. 98" Second Edition, 1998, pages 1-138.	☐
	24	SAUL GREENBERG, "PDAs and Shared Public Displays: Making Personal Information Public, and Public Information Personal," University of Calgary, March 1999, pages 1-11.	☐
	25	NAOHIKO KOHTAKE, et al., "InfoStick: an interaction device for Inter-Appliance Computing," Keio University, pages 1-15.	☐
	26	HEWLETT PACKARD, User's Guide, HP Jornada 420, Palm-Size PC, pages 1-75	☐
	27	MICROSOFT, "Introducing Microsoft Windows 95 - Certificate of Authenticity," 1995, pages 1-117.	☐
	28	SONY, "New Technical Theory For Servicing, MZ-R5ST Operation Manual," pages 1-44.	☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12015320
	Filing Date	2008-01-16
	First Named Inventor	Russell W. White, et al.
	Art Unit	2617
	Examiner Name	Erika A. Gary
	Attorney Docket Number	AFF.004C5US

	29	RICHARD C. DAVIS, et al., "A Framework for Sharing Handwritten Notes," 1998, pages 119-120.	☐
	30	KRISHNA A. BHARAT, et al., "Migratory Applications," UIST '95, November 14-17, 1995, pages 133-142.	☐
	31	BRAD A. MYERS, "Collaboration Using Multiple PDAs Connected To A PC," Carnegie Mellon University, 1998, pages 385-294.	☐
	32	RICHARD C. DAVIS, et al., "NotePals: Lightweight Note Sharing by the Group, for the Group," May 15-20, 1999, pages 338-345.	☐
	33	JUN REKIMOTO, et al., "Augmented Surfaces: A Spatially Continuous Work Space for Hybrid Computing Environments," May 15-20, 1999, pages 378-385.	☐
	34	DAN R. OLSEN, JR., "Interacting with Chaos," September and October 1999, pages 42-54.	☐
	35	SCOTT ROBERTSON, et al., "Dual Device User Interface Design: PDAs and Interactive Television," April 13-18, 1996, pages 79-86.	☐
	36	SYMANTEC CORPORATION, "pcANYWHERE32 User's Guide," 1993-1997, pages 1-216.	☐
	37	KRISHNA BHARAT, et al., Migratory Applications, "Mobile Object Systems Towards the Programmable Internet," Springer Berlin/Heidelberg, Volume 1222/11997, 1997, pages 1-134.	☐
	38	DIAMOND MULTIMEDIA SYSTEMS, INC., "Rio PMP300, User's Guide," 1998, pages 1-27.	☐
	39	SONY, "Portable MiniDisc Recorder, Operating Instructions, MZ-R55," 1998, pages 1-42.	☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12015320
	Filing Date	2008-01-16
	First Named Inventor	Russell W. White, et al.
	Art Unit	2617
	Examiner Name	Erika A. Gary
	Attorney Docket Number	AFF.004C5US

	40	NORBERT A. STREITZ, et al., "i-Land: An Interactive Landscape for Creativity and Innovation," Proceedings of the ACM Conference on Human Factors in Computing Systems, May 15-20, 1999, pages 120-127.	☐
	41	NORBERT A. STREITZ, et al., "Roomware for Cooperative Buildings: Integrated Design of Architectural Spaces and Information Spaces," pages 1-20	☐
	42	Direct Cable Connection screen shot, "B1U6U4," 10 pages total.	☐
	43	Direct Cable Connection screen shot, 10 pages total.	☐
	44	IBM, "WordPad z50 Cradle Option - User's Guide," 1990, pages 1-18.	☐
	45	IBM MOBILE SYSTEMS, "WorkPad z50 Mobile Companion (2608-1Ax), Hardware Maintenance Manual," March 1999, pages 1-77.	☐
	46	KEVIN JOST, Automotive Engineering International, "The car as a mobile-media platform," May 1998, pages 49-53.	☐
	47	MICROSOFT CORPORATION, "Windows CE 2.1 Technical Articles, Developing Applications for an Auto PC," June 1999, pages 1-13.	☐
	48	INFOGATION CORPORATION, "InfoGation Corp. Introduces Software Applications for Next-Generation Smart Car Systems," January 8, 1998, pages 1-2.	☐
	49	BUSINESS WIRE, "ORA Electronics Announces USB-Compatible TelCar Mark VII Begins Shipping First Quarter of 1999," January 6, 1999, pages 1-2.	☐
	50	ORA USA, "ORA Electronics Patents Telcar Cellular Telephone Interface," July 6, 1998, pages 1-2.	☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12015320
	Filing Date	2008-01-16
	First Named Inventor	Russell W. White, et al.
	Art Unit	2617
	Examiner Name	Erika A. Gary
	Attorney Docket Number	AFF.004C5US

If you wish to add additional non-patent literature document citation information please click the Add button			
EXAMINER SIGNATURE			
Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	12015320
Filing Date	2008-01-16
First Named Inventor	Russell W. White, et al.
Art Unit	2617
Examiner Name	Erika A. Gary
Attorney Docket Number	AFF.004C5US

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☒ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ None

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Mark J. Rozman/	Date (YYYY-MM-DD)	2009-06-04
Name/Print	Mark J. Rozman	Registration Number	42117

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 1 hour 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.**

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (04-09)
Approved for use through 05/31/2009. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	12015320
Filing Date	2008-01-16
First Named Inventor	Russell W. White, et al.
Art Unit	2617
Examiner Name	Erika A. Gary
Attorney Docket Number	AFF.004C5US

U.S.PATENTS

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

If you wish to add additional U.S. Patent citation information please click the Add button.

U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

If you wish to add additional U.S. Published Application citation information please click the Add button.

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	WO 00/79372 A1	WO		2000-12-28	Colvin, David S.		☐

If you wish to add additional Foreign Patent Document citation information please click the Add button

NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	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, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12015320
	Filing Date	2008-01-16
	First Named Inventor	Russell W. White, et al.
	Art Unit	2617
	Examiner Name	Erika A. Gary
	Attorney Docket Number	AFF.004C5US

	1	HEWLETT PACKARD, "HP Jornada 430/430se Palm-Size PC, User's Guide," Edition 1, 1999, pages 1-151.	☐
	2	NEC, "NEC MobilePro 750C, User's Guide," 1998, pages 1-83.	☐
	3	MICROSOFT, "Palm PC User's Guide," Microsoft Windows CE, pages 1-39.	☐
	4	PALM PC USER'S GUIDE, "Chapter 6, Information Backup and Exchange," pages 69-148	☐
	5	MPMan, "User's Guide, The Portable MP 3player using the flash memory and SmartMedia card," 1997, pages 1-35.	☐
	6	Cover Sheet, www.mpman.com, 1 page.	☐
	7	Smart Media Card Slot Diagram, 1 page.	☐
	8	MP Man F20 Logo, 1 page.	☐
	9	MPMan, "User's Guide, The portable MP3 player using the flash memory with variety features including the voice recording, phone/memo browsing, etc.," 1997, pages 1-47.	☐
	10	Smart Media card diagram and install instructions, pages 1-4.	☐
	11	ANAND LAL SHIMPI, Empeg, Ltd., "MP3 meets Car Audio: Empeg Mark II in-dash Car MP3 Player," September 18, 2000, pages 1-17.	☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12015320
	Filing Date	2008-01-16
	First Named Inventor	Russell W. White, et al.
	Art Unit	2617
	Examiner Name	Erika A. Gary
	Attorney Docket Number	AFF.004C5US

	12	PETER CLARKE, EE Times, "Engineers drive craze for MP3 audio players," February 5, 1999, pages 1-4.	☐
	13	RIO CAR DOT ORG GEEK GUIDE, "empeg car Mk. 1," February 21, pages 1-4.	☐
	14	HUGO FIENNES, RIO CAR DOT ORG GEEK GUIDE, "MP3 Mobile," February 21, pages 1-4.	☐
	15	RIO CAR DOT ORG, 'Frequently Asked Questions," pages 1-16.	☐
	16	DIAMOND MULTIMEDIA SYSTEMS, INC., "Rio PMP300 User's Guide," 1998, pages 1-27.	☐
	17	STEPHEN J. BUCKLEY, et al., "The Car as a Peripheral, Adapting a Portable Computer to a Vehicle Intranet," SAE Technical Paper Series, 98C030, October 19-21, 1998, pages 1-14.	☐
	18	"The MP3 Mobile," April 8, 1998, pages 1-13.	☐
	19	12-Volt Business & Technology Solutions, AutoMedia, "How the Intelligent Data Bus will impact the way you do business," November 1998, pages 1-2.	☐
	20	Press Release, "Creative Labs Launches Nomad Portable MP3 Players," April 15, 1999, pages 1-5.	☐
	21	BMW, "Betriebsanleitung Bordmonitor mit Navigation und TV," 1995, pages 1-82.	☐
	22	BMW, "Owner's Manual, On-board monitor with navigation system," 1996, pages 1-81.	☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12015320
	Filing Date	2008-01-16
	First Named Inventor	Russell W. White, et al.
	Art Unit	2617
	Examiner Name	Erika A. Gary
	Attorney Docket Number	AFF.004C5US

	23	TRANSPERFECT/TRANSLATIONS, "True and accurate translation of the 1995 BMW Manual, from German into English," August 16, 2005, pages 1-80.	☐
	24	HEINZ SODEIKAT, "EURO-SCOUT is facing the German 1994 Market," 1994, pages 551-556.	☐
	25	Pictures of car navigation systems in a car dashboard, pages 1-11.	☐
	26	BMW, "The BMW On-Board Navigation System - Technology Takes a Remarkable Turn," 2005, pages 1-9.	☐
	27	OLDSMOBILE, "1991 Toronado/Trofeo User's Guide," 1991, pages 1-41.	☐
	28	YEPP, "Digital Sounds - yepp - YP-E32/E64102-291," October 23, 1999, pages 1-.46	☐
	29		☐
	30	U.S. Provisional Application No. 60/167179, entitled "System, Method, And Device for Playing Recorded Music on a Wireless Communications Device," by Devon A. Rolf, filed November 23, 1999, pages 1-48.	☐
	31	MICROSOFT, "Getting Started, Microsoft Windows 98, For distribution with a new PC only," 1998, pages 1-145.	☐
	32	PR NEWSWIRE, "Alpine Announces Fall Release of Interface Adapter That Enables iPod Control and Playback from In-Vehicle Sound Systems," July 7, 2004, pages 1-2..	☐
	33	HA-YOUNG PARK, The Customer Times, "Portable Computer Music, MP3 File and MP3 Player rise as the Next Generation Audio Format," May 1999, pages 1-2.	☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12015320
	Filing Date	2008-01-16
	First Named Inventor	Russell W. White, et al.
	Art Unit	2617
	Examiner Name	Erika A. Gary
	Attorney Docket Number	AFF.004C5US

	34	"MP3 Players Introduced in the Korean IT Magazines," 1998-1999, pages 1-15.	☐
	35	MPMan, "MP-F20, User's Guide, Portable MP3 player using the flash memory and a Memory card," [ages 1-16.	☐
	36	PR NEWSWIRE ASSOCIATION, INC., "Delphi's Communiport(R) Technology for Tomorrow, Today Demonstrated at Frankfurt Auto Show," September 15, 1999, pages 1-8.	☐
	37	CRAIN COMMUNIATIONS, INC., "Products," Agilent Technologies Press Release, February 21, 2000, pages 1-6.	☐
	38	THE WASHINGTON TIMES, LLC, John Hanan, Dallas Morning News, "Cars add computer, audiovisual gear," January 14, 2000, pages 1-3.	☐

If you wish to add additional non-patent literature document citation information please click the Add button

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	12015320
Filing Date	2008-01-16
First Named Inventor	Russell W. White, et al.
Art Unit	2617
Examiner Name	Erika A. Gary
Attorney Docket Number	AFF.004C5US

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☒ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ None

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Mark J. Rozman/	Date (YYYY-MM-DD)	2009-06-04
Name/Print	Mark J. Rozman	Registration Number	42117

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 1 hour 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.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

(19)日本国特許庁（ＪＰ）　(12)公開特許公報（Ａ）　(11)特許出願公開番号
特開平11－68685
(43)公開日　平成11年(1999)３月９日

(51)Int.Cl.*	識別記号	Ｆ１		
Ｈ０４Ｈ　1/00		Ｈ０４Ｈ	1/00	Ｃ
Ｈ０４Ｂ　7/00		Ｈ０４Ｂ	7/00	
// Ｈ０４Ｂ　7/26			7/26	Ｍ

審査請求　未請求　請求項の数73　ＯＬ　（全 26 頁）

(21)出願番号　特願平9－225435

(22)出願日　平成９年(1997)８月21日

(71)出願人　000002185
ソニー株式会社
東京都品川区北品川６丁目７番35号
(72)発明者　伊藤　誠寿
東京都品川区北品川６丁目７番35号ソニー株式会社内
(74)代理人　弁理士：田辺　恵基

(54)【発明の名称】　無線情報通信方法及びその装置

(57)【要約】
【課題】本発明は無線音響受信装置に関し、利便性の良い音響提供サービスを実現する。
【解決手段】所望の音響信号を要求するサービス要求信号を送信する無線送信手段（５）と、サービス要求信号に対応して送信される音響信号が含まれる送信信号を受信する無線受信手段（５）と、無線受信手段から出力される受信信号に復調及び又は復号処理を施して音響信号を復元する復調復号手段（５及び６）と、復調復号手段によって復元された音響信号を音波に変換して出力する電気音響変換手段（６）とを設けるようにした。これにより音響信号が記録された記録媒体を持たずとも、所望の音響信号を容易に得ることができ、利便性が良い音響提供サービスを実現し得る。

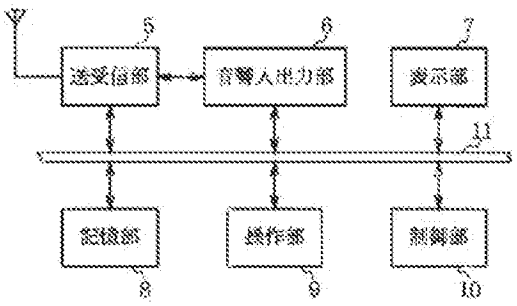


図２　音響受信装置の全体構成

【特許請求の範囲】
【請求項1】所望の音響信号を要求するサービス要求信号を送信する無線送信手段と、
上記サービス要求信号に対応して送信される上記音響信号が含まれる送信信号を受信する無線受信手段と、
上記無線受信手段から出力される受信信号に復調及び又は復号処理を施して上記音響信号を復元する復調復号手段と、
上記復調復号手段によって復元された上記音響信号を音波に変換して出力する電気音響変換手段とを具えることを特徴とする無線音響受信装置。
【請求項2】上記電気音響変換手段は少なくとも2つ以上の電気音響変換素子からなり、上記音響信号をステレオ音響で出力することを特徴とする請求項1に記載の無線音響受信装置。
【請求項3】上記復調復号手段は、
上記受信信号から主情報と副情報を分離する復号手段と、
上記副情報から特徴情報を復元する特徴情報復元手段と、
上記特徴情報復元手段によって復元した上記特徴情報を利用して上記主情報の復元処理を行う情報復元手段と、
上記情報復元手段の出力信号に復号化を行って上記音響信号を復元する情報源復号化手段とを具えることを特徴とする請求項1に記載の無線音響受信装置。
【請求項4】上記復調復号手段は、
さらに、上記主情報のデータ並び順を元に戻すデインターリーブ手段を具えることを特徴とする請求項3に記載の無線音響受信装置。
【請求項5】上記情報源復号化手段は、
上記出力信号に逆離散コサイン変換処理を行うことにより上記音響信号を復元することを特徴とする請求項3に記載の無線音響受信装置。
【請求項6】上記情報源復号化手段は、
上記出力信号に逆高速フーリエ変換処理を行うことにより上記音響信号を復元することを特徴とする請求項3に記載の無線音響受信装置。
【請求項7】所望の音響信号を要求するサービス要求信号を送信する無線送信手段と、
上記サービス要求信号に対応して送信される上記音響信号が含まれる送信信号を受信する無線受信手段と、
上記無線受信手段から出力される受信信号に復調及び又は復号処理を施して上記音響信号を復元する復調復号手段と、
少なくとも2つ以上の電気音響変換素子を有し、上記復調復号手段によって復元された上記音響信号を音波に変換してステレオ音響で出力する電気音響変換手段とを具えることを特徴とする車載音響装置。
【請求項8】さらに表示手段を具え、受信する上記音響信号に関連する情報を当該表示手段に表示することを特徴とする請求項7に記載の車載音響装置。
【請求項9】さらに遠隔操作手段を具え、当該遠隔操作手段を介して動作制御のための制御データが入力されることを特徴とする請求項8に記載の車載音響装置。
【請求項10】上記遠隔操作手段は、上記制御データを赤外光で送信することを特徴とする請求項9に記載の車載音響装置。
【請求項11】さらにテレビ放送受信手段を具え、上記受信する音響信号に関連する情報と、上記テレビ放送受信手段で受信したテレビ放送の画像とを同時又は切り換えて上記表示手段に表示することを特徴とする請求項8に記載の車載音響装置。
【請求項12】さらに現在位置測定手段を具え、上記受信する音響信号に関連する情報と、上記現在位置測定手段に関連する情報とを同時又は切り換えて上記表示手段に表示することを特徴とする請求項8に記載の車載音響装置。
【請求項13】上記無線送信手段、上記無線受信手段及び上記復調復号手段は取り外し可能な構成を有し、取り外した後でも通信機として使用可能であることを特徴とする請求項7に記載の車載音響装置。
【請求項14】所望の音響信号を要求するサービス要求信号を送信する無線送信手段と、
上記サービス要求信号に対応して送信される上記音響信号が含まれる送信信号を受信する無線受信手段と、
上記無線受信手段から出力される受信信号に復調及び又は復号処理を施して上記音響信号を復元する復調復号手段と、
少なくとも2つ以上の電気音響変換素子を有し、上記復調復号手段によって復元された上記音響信号を音波に変換してステレオ音響で出力する電気音響変換手段と、
駆動用の電池とを具えることを特徴とする携帯型音響出力装置。
【請求項15】上記電気音響変換手段が有する上記電気音響変換素子は、人体装着式の素子であることを特徴とする請求項14に記載の携帯型音響出力装置。
【請求項16】さらに、上記音響信号を受信する際の制御データを入力するための操作手段を具えることを特徴とする請求項15に記載の携帯型音響出力装置。
【請求項17】上記操作手段は、通話に関する制御データを入力するための操作キーであることを特徴とする請求項16に記載の携帯型音響出力装置。
【請求項18】上記操作手段は、回転押圧式の操作子からなることを特徴とする請求項16に記載の携帯型音響出力装置。
【請求項19】上記操作手段は、同動押圧式の操作子からなることを特徴とする請求項16に記載の携帯型音響出力装置。
【請求項20】上記操作手段は、複数の押圧スイッチからなることを特徴とする請求項16に記載の携帯型音響

出力装置。
【請求項２１】上記電気音響変換手段を、上記無線送信手段、上記無線受信手段及び上記復調復号手段を収納した本体ケースに対してケーブル接続し、当該ケーブル上に上記操作手段を配置することを特徴とする請求項１６に記載の携帯型音響出力装置。
【請求項２２】さらに表示手段を具え、受信する上記音響信号に関連する情報を当該表示手段に表示することを特徴とする請求項１６に記載の携帯型音響出力装置。
【請求項２３】上記表示手段は、通話に関する情報し表示することを特徴とする請求項２２に記載の携帯型音響出力装置。
【請求項２４】上記電気音響変換手段を、上記無線送信手段、上記無線受信手段及び上記復調復号手段を収納した本体ケースに対してケーブル接続し、当該ケーブル上に上記表示手段を配置することを特徴とする請求項２３に記載の携帯型音響出力装置。
【請求項２５】上記表示手段と上記操作手段は一体形成されることを特徴とする請求項２４に記載の携帯型音響出力装置。
【請求項２６】上記復調復号手段によって復元した上記音響信号を送信する微弱情報送信手段と、
上記微弱情報送信手段によって送信された上記音響信号を受信して上記電気音響変換手段に供給する微弱情報受信手段とを具え、上記音響信号を非ケーブル接続により上記電気音響変換手段に供給することを特徴とする請求項１４に記載の携帯型音響出力装置。
【請求項２７】上記微弱情報送信手段は、電磁波を使用して上記音響信号を送信することを特徴とする請求項２６に記載の携帯型音響出力装置。
【請求項２８】上記電磁波は、10（MHz）以上、かつ1（GHz）以下の周波数帯域であることを特徴とする請求項２７に記載の携帯型音響出力装置。
【請求項２９】上記微弱情報受信手段は所定の操作手段から入力された制御データを電磁波を使用して送信し、
上記微弱情報送信手段は当該微弱情報受信手段から送信された制御データを受信して所定の制御手段に出力することを特徴とする請求項２７に記載の携帯型音響出力装置。
【請求項３０】所望の音響信号を要求するサービス要求信号を送信する無線送信手段と、
上記サービス要求信号に対応して送信される上記音響信号が含まれる送信信号を受信する無線受信手段と、
上記無線受信手段から出力される受信信号に復調及び又は復号処理を施して上記音響信号を復元する復調復号手段と、
上記復調復号手段から出力される上記音響信号を再変調して出力する再変調手段と、
上記再変調手段の出力信号を再送信する再送信手段とを具えることを特徴とする無線情報再送信装置。
【請求項３１】上記再変調手段は、上記音響信号に対して周波数変調を行うことを特徴とする請求項３０に記載の無線情報再送信装置。
【請求項３２】上記再送信手段は、10（MHz）以上、かつ1（GHz）以下の周波数帯域の電磁波を使用して上記出力信号を送信することを特徴とする請求項３０に記載の無線情報再送信装置。
【請求項３３】所望の音響信号を要求するサービス要求信号を送信する無線送信手段と、
上記サービス要求信号に対応して送信される上記音響信号が含まれる送信信号を受信する無線受信手段と、
上記無線受信手段から出力される受信信号に復調及び又は復号処理を施して上記音響信号を復元する復調復号手段と、
少なくとも２つ以上の人体装着式の電気音響変換素子を有し、上記復調復号手段によって復元された上記音響信号を音波に変換してステレオ音響で出力する電気音響変換手段と、
駆動用の電池とを具え、通話時には上記電気音響変換手段の上記電気音響変換素子によって声帯の振動を検出して音声信号を生成し、当該音声信号を上記無線送信手段を介して送信すると共に、上記無線受信手段によって通信相手からの音声信号を受信して上記電気音響変換手段の上記電気音響変換素子から出力することにより、音響受信と通話の両方を成し得るようになされたことを特徴とする携帯用音響出力通信装置。
【請求項３４】通話時、上記電気音響変換素子に供給する上記音声信号と、上記電気音響変換素子から上記無線送信手段に供給する上記音声信号とを時分割伝送することを特徴とする請求項３３に記載の携帯用音響出力通信装置。
【請求項３５】所望の音響信号を要求するサービス要求信号を送信する無線送信手段と、
上記サービス要求信号に対応して送信される上記音響信号が含まれる送信信号を受信する無線受信手段と、
上記無線受信手段から出力される受信信号に復調及び又は復号処理を施して上記音響信号を復元する復調復号手段と、
少なくとも２つ以上の電気音響変換素子を有し、上記復調復号手段によって復元された上記音響信号を音波に変換してステレオ音響で出力する電気音響変換手段とを具えることを特徴とする自動車。
【請求項３６】さらに表示手段と現在位置測定手段とを具え、上記受信する音響信号に関連する情報と、上記現在位置測定手段に関連する情報とを同時又は切り換えて上記表示手段に表示することを特徴とする請求項３５に記載の自動車。
【請求項３７】入力信号を情報源符号化する情報源符号化手段と、
上記入力信号の特徴情報を抽出する特徴抽出手段と、

上記情報源符号化手段の出力データを上記特徴抽出手段によって抽出した上記特徴情報を利用してベクトル量子化する量子化手段と、
上記量子化手段の出力信号を変調する変調手段と、
上記変調手段の出力信号を端末装置に送信する無線送信手段と、
上記端末装置からの送信信号を受信する無線受信手段と、
上記無線受信手段から出力される受信信号に復調及び又は復号処理を施す復調復号手段とを具え、上記復調復号手段の出力信号の内容に基づいて上記入力信号の内容を変更することを特徴とする情報送信装置。
【請求項３８】上記情報源符号化手段から出力される上記出力データを並び換えるインターリーブ手段と、
上記特徴情報抽出手段によって抽出した特徴情報から重み関数を生成する重み関数生成手段とを具えることを特徴とする請求項３７に記載の情報送信装置。
【請求項３９】上記情報源符号化手段は、上記入力信号に離散コサイン変換処理を行うことを特徴とする請求項３７に記載の情報送信装置。
【請求項４０】上記情報源符号化手段は、上記入力信号に高速フーリエ変換処理を行うことを特徴とする請求項３７に記載の情報送信装置。
【請求項４１】所望の音響信号を要求するサービス要求信号を送信し、
上記サービス要求信号に対応して送信される上記所望の音響信号が含まれる送信信号を受信し、
受信した受信信号に復調及び又は復号処理を施して上記音響信号を復元し、
復元した上記音響信号を音波に変換して出力することを特徴とする無線音響受信方法。
【請求項４２】受信する上記音響信号に関連する情報を表示することを特徴とする請求項４１に記載の無線音響受信方法。
【請求項４３】上記受信信号から主情報と副情報を分離し、
上記副情報から特徴情報を復元し、
復元した上記特徴情報を利用して上記主情報を復元し、
当該復元結果を情報源復号化することにより、上記受信信号から上記音響信号を復元することを特徴とする無線音響受信方法。
【請求項４４】上記情報源復号化として離散コサイン逆変換処理を行うことを特徴とする請求項４３に記載の無線音響受信方法。
【請求項４５】上記情報源復号化として逆高速フーリエ変換処理を行うことを特徴とする請求項４３に記載の無線音響受信方法。
【請求項４６】所望の音響信号を要求するサービス要求信号を送信し、
上記サービス要求信号に対応して送信される上記音響信号が含まれる送信信号を受信し、
受信した受信信号に復調及び又は復号処理を施して上記音響信号を復元し、
復元した上記音響信号を再変調して再送信し、
再送信された上記音響信号を受信して復調し、当該音響信号を音波に変換して出力することを特徴とする無線音響受信方法。
【請求項４７】上記再変調として上記音響信号に周波数変調を行うことを特徴とする請求項４６に記載の無線音響受信方法。
【請求項４８】所望の音響信号を要求するサービス要求信号を送信し、
上記サービス要求信号に対応して送信される上記音響信号が含まれる送信信号を受信し、
受信した受信信号に復調及び又は復号処理を施して上記音響信号を復元し、
復元した上記音響信号を再変調して再送信することを特徴とする無線情報再送信方法。
【請求項４９】上記再変調として上記音響信号に周波数変調を行うことを特徴とする請求項４８に記載の無線情報再送信方法。
【請求項５０】所望の音響信号を要求するサービス要求信号を送信し、
上記サービス要求信号に対応して送信される上記音響信号が含まれる送信信号を受信し、
受信した受信信号に復調及び又は復号処理を施して上記音響信号を復元し、
復元された上記音響信号を所定の電気音響変換素子を使用して音波に変換して出力し、
通話時には声帯の振動を上記電気音響変換素子によって検出して音声信号を生成して送信すると共に、通信相手からの音声信号を受信して上記電気音響変換素子から出力することを特徴とする携帯式音響出力通信方法。
【請求項５１】上記電気音響素子による上記音声信号の出力と上記音声信号の生成とを時分割で行うことを特徴とする請求項５０に記載の携帯式音響出力通信方法。
【請求項５２】入力信号を情報源符号化すると共に、上記入力信号の特徴情報を抽出し、
上記情報源符号化による出力データを上記特徴情報を利用してベクトル量子化し、
上記ベクトル量子化による出力信号を変調して端末装置に送信し、
上記端末装置からの送信信号を受信し、
受信した受信信号に復調及び又は復号処理を施して上記端末装置から送信されたデータを復元し、当該データの内容に基づいて上記入力信号の内容を変更することを特徴とする情報送信方法。
【請求項５３】上記情報源符号化として上記入力信号に離散コサイン変換処理を行うことを特徴とする請求項５２に記載の情報送信方法。

【請求項５４】上記情報源符号化として上記入力信号に高速フーリエ変換処理を行うことを特徴とする請求項５２に記載の情報送信方法。
【請求項５５】端末装置からの要求信号を受信し、
上記要求信号が第１の種類の信号であったときには通信網で予め定められた所定の順番で楽曲を送信し、
上記要求信号が第２の種類の信号であったときには所定の曲群の中から任意の楽曲を選択して送信することを特徴とする楽曲送信方法。
【請求項５６】上記要求信号が第３の種類の信号であったときには端末装置側で定めた楽曲を送信することを特徴とする請求項５５に記載の楽曲送信方法。
【請求項５７】上記曲群は、過去に送信した楽曲を除いた楽曲群からなることを特徴とする請求項５５に記載の楽曲送信方法。
【請求項５８】上記曲群は、過去所定時間内に送信した楽曲を除いた楽曲群からなることを特徴とする請求項５５に記載の楽曲送信方法。
【請求項５９】端末装置からの要求信号を受信し、
上記要求信号が第１の種類の信号であったときには送信網で予め定められた所定の順番で楽曲を送信し、
上記要求信号が第２の種類の信号であったときには端末装置側で定めた楽曲を送信することを特徴とする楽曲送信方法。
【請求項６０】端末装置からの要求信号を受信する受信手段と、
上記要求信号が第１の種類の信号であったときには予め定められた所定の順番で楽曲を送信し、上記要求信号が第２の種類の信号であったときには所定の曲群の中から任意の楽曲を選択して送信する音楽情報送信手段とを具えることを特徴とする楽曲送信装置。
【請求項６１】上記曲群は、過去に送信した楽曲を除いた楽曲群からなることを特徴とする請求項６０に記載の楽曲送信装置。
【請求項６２】上記曲群は、過去所定時間内に送信した楽曲を除いた楽曲群からなることを特徴とする請求項６０に記載の楽曲送信装置。
【請求項６３】端末装置からの要求信号を受信する受信手段と、
上記要求信号が第１の種類の信号であったときには予め定められた所定の順番で楽曲を送信し、上記要求信号が第２の種類の信号であったときには端末装置側で定めた楽曲を送信する音楽情報送信手段とを具えることを特徴とする楽曲送信装置。
【請求項６４】楽曲を指定せずに楽曲送信を要求する第１の要求信号又は楽曲を指定して楽曲送信を要求する第２の要求信号を送信する送信手段と、
上記第１又は第２の要求信号に対応して送信された音楽信号を受信する受信手段とを具えることを特徴とする楽曲受信装置。
【請求項６５】楽曲送信を要求する要求信号を送信する送信手段と、
上記要求信号に対応した音楽信号を受信する受信手段と、
上記受信手段の出力信号から上記音楽信号と共に送信された付加情報を抽出する抽出手段と、
上記付加情報のうち第１の種類の付加情報と第２の種類の付加情報とを選択的に表示する表示手段とを具えることを特徴とする楽曲受信装置。
【請求項６６】上記第１の種類の付加情報は楽曲の題名であり、上記第２の種類の付加情報は楽曲の歌詞であることを特徴とする請求項６５に記載の楽曲受信装置。
【請求項６７】上記表示手段は、上記第１又は第２の種類の付加情報を表示する際、当該付加情報の種類に応じた異なる記号又は文字を表示することを特徴とする請求項６５に記載の楽曲受信装置。
【請求項６８】操作入力に応じて仮想カーソルが２次元の仮想情報テーブル上を移動することにより当該仮想カーソルが位置するところの情報を表示し、確定指示が入力されると、上記仮想カーソルが位置するところの情報を選択することを特徴とする情報選択方法。
【請求項６９】操作入力に応じて仮想カーソルが２次元の文字表上を移動することにより当該仮想カーソルが位置するところの文字を表示し、確定指示が入力されると、上記仮想カーソルが位置するところの文字を選択して入力することを特徴とする文字入力方法。
【請求項７０】上記文字は日本語の仮名文字であり、上記文字表は５０音表であることを特徴とする請求項６９に記載の文字入力方法。
【請求項７１】楽曲毎と、楽曲に付与された楽曲コードとを対とした単位データを少なくとも１つ以上有し、
上記単位データを所望の順番で並べて、当該順番によって上記楽曲の時系列的順番を規定することを特徴とする楽曲データ指定用データ構造。
【請求項７２】楽曲指定のための選情報を所定の通信回線を介して送信し、
上記選情報に該当する楽曲リストを上記通信回線を介して受信し、
上記楽曲リストの中から所望の楽曲を指定し、当該指定された楽曲を示す情報を上記通信回線を介して送信することを特徴とする通信回線を利用した楽曲指定方法。
【請求項７３】上記指定された楽曲を示す情報を所定の記憶手段に記憶しておき、所望の時刻になると、上記指定された楽曲を示す情報を送信することを特徴とする請求項７２に記載の通信回線を利用した楽曲指定方法。
【発明の詳細な説明】
【０００１】
【目次】以下の順序で本発明を説明する。
【０００２】発明の属する技術分野
従来の技術

発明が解決しようとする課題
課題を解決するための手段
発明の実施の形態
（１）第１の実施の形態
（１－１）音楽提供サービスシステムの構成（図１）
（１－２）音響受信装置の全体構成（図２及び図３）
（１－３）送受信部の構成（図４）
（１－４）音響入出力部の構成（図５）
（１－５）ＰＨＳ基地局の構成（図６）
（１－６）音響受信装置のデータ処理回路の構成（図７）
（１－７）音楽提供サービスを受ける際の操作及び表示（図８～図１３）
（１－８）音楽提供サービスに係わる制御部の制御手順（図１４及び図１５）
（１－９）音響受信装置の本体に設けられた操作部（図１６及び図１７）
（１－１０）動作及び効果
（２）第２の実施の形態（図１８及び図１９）
（３）第３の実施の形態（図２０～図２２）
（４）他の実施の形態（図２３）
発明の効果

【０００３】
【発明の属する技術分野】本発明は無線情報通信方法及びその装置に関し、例えば無線回線を介して音楽データを受信する音響受信装置に適用して好適なものである。

【０００４】
【従来の技術】近年、移動中において音楽やその他の情報を聞くといったことが頻繁に行われている。例えば小型ラジオ装置や、カセットテープ、ミニディスクまたはコンパクトディスク等の記録媒体を装着したヘッドホンステレオ装置等を携帯し、これらの装置を使用して通勤電車の中でラジオ放送や音楽等を聞くといったことが広く行われている。また自動車で移動している最中においても、カーラジオ装置を使用してラジオ放送を聞いたり、或いはカーオーディオ装置を使用してカセットテープ、ミニディスクまたはコンパクトディスク等の記録媒体に記録されている音楽を再生して聞くといったことが行われている。

【０００５】
【発明が解決しようとする課題】ところでかかる従来の移動しながらの情報入手方法においては、ユーザにとって使い勝手が未だ不十分のところがある。例えばラジオ放送の場合には、一般公衆向けの放送であるが故に、個人の情報や音楽の嗜好を反映させることができず、聞きたくも無い話や曲を聞かなければならないといった不都合がある。また記録媒体から音楽を再生する方法では、音楽等、収録内容については個人の嗜好を反映させることができるが、記録媒体を購入したり或いは編集したりする必要があり、時間や経費或いは労力や保管場所等が必要になるといった不都合があると共に、せっかく記録媒体を作成又は購入してもすぐに時代に取り残されてしまい、同じものを何度も聞いて聞き飽きてしまうといった不都合がある。

【０００６】このような問題を解決する方法として、本出願人は特願平8-207433号においてＰＨＳ（パーソナル・ハンディホン・システムいわゆる簡易型携帯電話システム）等の無線電話を用いて情報・音楽サービスを提供する方法を提案しており、この方法によれば上述した欠点を全て解消することができ、個人の嗜好を反映した情報提供サービスを記録媒体が無くても実現することができる。

【０００７】しかしながらＰＨＳ等の無線電話回線は、通常のコンパクトディスクやミニディスク等の記録媒体を使用した音楽再生方法に比較して再生周波数帯域が狭い上、さらに常に通信状態が良いとは限らないといった問題がある。このため無線電話回線を使用した音楽提供方法は、記録媒体からの再生による方法に比べて音質的に劣ると共に、フェージング等の種々の撹乱により高速な伝送レートを安定して得ることができない問題がある。上述した特願平8-207433号においては、この点について、回線状態に応じて周波数特性を切り換えたり或いは信号出力方式をステレオからモノラルに切り換えたりすることにより対処しているが、回線状態に応じて音質やサービス内容が変わることに他ならず、ユーザから見れば利便性の点において未だ不十分なところがある。

【０００８】本発明は以上の点を考慮してなされたもので、一段と利便性が向上した無線情報通信方法及びその装置を提案しようとするものである。

【０００９】
【課題を解決するための手段】かかる課題を解決するため本発明においては、所望の音響信号を要求するサービス要求信号を送信し、サービス要求信号に対応して送信される音響信号が含まれる送信信号を受信し、受信した受信信号に復調及び又は復号処理を施して音響信号を復元し、復元した音響信号を音声に変換して出力するようにした。

【００１０】このようにしてサービス要求信号を送信し、それに対応して送信された音響信号を受信して出力するようにしたことにより、音響信号が記録された記録媒体を持たなくても、ユーザが希望する音響信号を容易に得ることができる。また送信側で音響信号に所定の変調及び又は符号化処理を施しておいて、これを受信側で復調及び又は復号処理するようにしたことにより、回線状態が変化しても、高音質の音響信号を安定に得ることができる。

【００１１】また本発明においては、所望の音響信号を要求するサービス要求信号を送信し、サービス要求信号に対応して送信される音響信号が含まれる送信信号を受信し、受信した受信信号に復調及び又は復号処理を施し

で音響信号を復元し、復元した音響信号を再変調して再送信するようにした。

【００１２】このようにして受信した音響信号に再変調を施して再送信するようにしたことにより、音響信号を出力するための素子と音響信号を受信するための装置とをケーブルで接続しなくても良くなり、使い勝手を向上し得る。

【００１３】また本発明においては、所望の音響信号を要求するサービス要求信号を送信し、サービス要求信号に対応して送信される音響信号が含まれる送信信号を受信し、受信した受信信号に復調及び又は復号処理を施して音響信号を復元し、復元された音響信号を所定の電気音響変換素子を使用して音波に変換して出力し、通話時には声帯の振動を電気音響変換素子によって検出して音声信号を生成して送信すると共に、通信相手からの音声信号を受信して電気音響変換素子から出力するようにした。

【００１４】このように受信した音響信号を出力するための電気音響変換素子を、通話時には音声を集音するマイクロホンとして使用することにより、１つの素子を兼用し得、使い勝手を向上し得る。

【００１５】また本発明においては、入力信号を情報源符号化すると共に、入力信号の特徴情報を抽出し、情報源符号化による出力データを特徴情報を利用してベクトル量子化し、ベクトル量子化による出力信号を変調して端末装置に送信し、端末装置からの送信信号を受信し、受信した受信信号に復調及び又は復号処理を施して端末装置から送信されたデータを復元し、当該データの内容に基づいて入力信号の内容を変更するようにした。

【００１６】このように端末装置から送信されたデータの内容に基づいて、入力信号の内容を変更するようにしたことにより、端末装置が所望する入力信号を容易に送信することができる。

【００１７】また本発明においては、端末装置からの要求信号を受信し、要求信号が第１の種類の信号であったときには送信側で予め定められた所定の順番で楽曲を送信し、要求信号が第２の種類の信号であったときには所定の曲群の中から任意の楽曲を選択して送信するようにした。

【００１８】このように要求信号が第１の種類の信号であったときには送信側で予め定められた所定の順番で楽曲を送信し、要求信号が第２の種類の信号であったときには所定の曲群の中から任意の楽曲を選択して送信するようにしたことにより、要求信号の種類に応じて所望の楽曲を提供することができる。

【００１９】また本発明においては、端末装置からの要求信号を受信し、要求信号が第１の種類の信号であったときには送信側で予め定められた所定の順番で楽曲を送信し、要求信号が第２の種類の信号であったときには端末装置側で定めた楽曲を送信するようにした。

【００２０】このように要求信号が第１の種類の信号であったときには送信側で予め定められた所定の順番で楽曲を送信し、要求信号が第２の種類の信号であったときには端末装置側で定めた楽曲を送信するようにしたことにより、要求信号の種類に応じて所望の楽曲を提供することができる。

【００２１】また本発明においては、要求信号に対応した音楽信号を受信し、受信した受信信号から音楽信号と共に送信された付加情報を抽出し、付加情報のうち第１の種類の付加情報と第２の種類の付加情報とを選択的に表示するようにした。

【００２２】このように要求信号に対応した音楽信号を受信し、受信した受信信号から音楽信号と共に送信された付加情報を抽出し、付加情報のうち第１の種類の付加情報と第２の種類の付加情報とを選択的に表示するようにしたことにより、音楽信号と共に送信された付加情報を選択的に確認することができ、使い勝手を向上し得る。

【００２３】また本発明においては、操作入力に応じて仮想カーソルが２次元の仮想情報テーブル上を移動することにより当該仮想カーソルが位置するところの情報を表示し、確定指示が入力されると、仮想カーソルが位置するところの情報を選択するようにした。

【００２４】このように操作入力に応じて仮想カーソルが２次元の仮想情報テーブル上を移動することにより当該仮想カーソルが位置するところの情報を表示し、確定指示が入力されると、仮想カーソルが位置するところの情報を選択するようにしたことにより、容易に所望の情報を選択することができる。

【００２５】また本発明においては、操作入力に応じて仮想カーソルが２次元の文字表上を移動することにより当該仮想カーソルが位置するところの文字を表示し、確定指示が入力されると、仮想カーソルが位置するところの文字を選択して入力するようにした。

【００２６】このように操作入力に応じて仮想カーソルが２次元の文字表上を移動することにより当該仮想カーソルが位置するところの文字を表示し、確定指示が入力されると、仮想カーソルが位置するところの文字を選択して入力するようにしたことにより、容易に所望の文字を入力することができる。

【００２７】また本発明においては、楽曲データ指定用データ構造において、楽曲名と、楽曲に付与された楽曲コードとを対とした単位データを少なくとも１つ以上有し、その単位データを所望の順番で並べて、当該順番によって楽曲の時系列的順番を規定するようにした。

【００２８】このように楽曲名と、楽曲に付与された楽曲コードとを対とした単位データを所望の順番で並べ、その順番によって楽曲の時系列的順番を規定するようにしたことにより、楽曲名と楽曲コードとを容易に把握し得ると共に、楽曲順序までも容易に把握し得る。

【００２９】また本発明においては、通信回線を利用した楽曲指定方法において、楽曲指定のための種情報を所定の通信回線を介して送信し、種情報に該当する楽曲リストを通信回線を介して受信し、楽曲リストの中から所望の楽曲を指定し、当該指定された楽曲を示す情報を通信回線を介して送信するようにした。

【００３０】このように楽曲指定のための種情報を所定の通信回線を介して送信し、種情報に該当する楽曲リストを通信回線を介して受信し、楽曲リストの中から所望の楽曲を指定し、当該指定された楽曲を示す情報を通信回線を介して送信するようにしたことにより、通信相手機にある楽曲を通信回線を介して容易に指定することができる。

【００３１】

【発明の実施の形態】以下図面について、本発明の実施の形態を詳述する。

【００３２】（１）第１の実施の形態

（１－１）音楽提供サービスシステムの構成

図１において、１は全体として本発明を適用した音楽提供サービスシステムを示し、大きく分けてサービスセンタ２、ＰＨＳ基地局３及び音響受信装置４によって構成される。サービスセンタ２は提供する音楽信号の発信元であり、音響受信装置４を有したユーザが希望する楽曲の音楽信号をＰＨＳ基地局３に送信する。ＰＨＳ基地局３はＰＨＳ（パーソナル・ハンディホン・システムいわゆる簡易型携帯電話システム）の基地局装置であり、サービスセンタ２から供給される音楽信号をＰＨＳの無線回線を介して送信する。

【００３３】音響受信装置４はＰＨＳの電話端末装置に音楽提供サービスを受けるための構成を付加した装置であり、ＰＨＳ基地局３から送信される音楽信号を受信してこれを電気音響変換手段を介して出力する。これにより音響受信装置４を有するユーザは、サービスセンタ２が提供する音楽信号を受信して鑑賞することができ、ミニディスクやコンパクトディスク等といった記録媒体を持たずに所望の音楽を聞くことができる。

【００３４】因みに、音楽提供サービスを受ける際には、始めに音響受信装置４から楽曲の種類等を示すサービス要求信号をＰＨＳの無線回線を介してＰＨＳ基地局３に送信する。これを受けたＰＨＳ基地局３はそのサービス要求信号をサービスセンタ２に転送する。これによりサービスセンタ２では、そのサービス要求信号を基にユーザが希望する楽曲を把握し得、その楽曲の音楽信号を再生して発信することができる。

【００３５】（１－２）音響受信装置の全体構成

図２において、４は全体として本発明による音響受信装置を示し、大きく分けて送受信部５、音響入出力部６、表示部７、記憶部８、操作部９及び制御部１０によって構成される。

【００３６】送受信部５はＰＨＳの規格に準拠した無線送受信部であり、通話のための音声信号をＰＨＳの無線回線を介してＰＨＳ基地局３と送受信したり、或いは音楽提供サービスとしてＰＨＳの無線回線を介してＰＨＳ基地局３から送信される音楽信号を受信したりする回路ブロックである。

【００３７】音響入出力部６は送受信部５に対する音声信号及び音楽信号の入出力インタフェイスであり、マイクロホンによって通話のための音声信号を集音したり、スピーカによって通話相手からの音声信号を出力したりすると共に、音楽提供サービスとして受信した音楽信号をステレオ対応のスピーカやイヤホン等を介して出力するようになされている。

【００３８】表示部７は例えば液晶ディスプレイからなり、音響受信装置４を電話端末として使用しているときには通話相手や自局の電話番号、相手先名、或いは電波受信状態や電池状態等といった各種データを表示すると共に、音楽提供サービスを受けているときには楽曲の題名や歌詞等といったデータ（このデータは音楽信号と共にサービスセンタ２から送信される）を表示するようになされている。

【００３９】また記憶部８は例えばメモリからなり、短縮ダイヤルとして登録された電話番号や電話帳リストとして登録された相手先名及び電話番号、或いは自局の電話番号等といった電話端末として必要な各種データと、音楽提供サービスを受けるのに当たって必要な楽曲コードや曲順等の各種データを記憶するようになされている。また操作部９は例えばテンキーやその他の操作子によって構成され、当該テンキーやその他の操作子を介してこの音響受信装置４に対するユーザからの動作指令（具体的には、電話をかけたり受けたりするときの動作指令や音楽提供サービスを受けるときの動作指令）を入力し得るようになされている。

【００４０】制御部１０はこの音響受信装置４の全体動作を制御するための制御ブロックであり、データバス１１を介して各部に制御データを供給して各部の動作を制御するようになされている。また制御部１０はデータバス１１を介して記憶部８に各種データを記憶又は当該記憶部８から各種データを読み出したり、或いはデータバス１１を介して操作部９から入力された動作指令を示す制御データを受け、それに基づいた動作制御を行うようになされている。

【００４１】ここでこのような構成を有する音響受信装置４の実際の使用形態例を図３に示す。この図３に示す例では、音響受信装置４を電池によって駆動するようにしたことにより、音響受信装置４を携帯して使用することができるようになっている。この場合、ユーザ１２は音響受信装置４を携帯用ケース等を使用してベルト等に固定した上で、上述した音楽信号送出用の電気音響変換手段としてステレオ対応のイヤホン１３を使用することにより受信した音楽信号を鑑賞する。これによりユーザ

１２は、屋外を移動しながらでも、ほぼ手ぶら感覚で所望の音楽を聞くことができる。

【００４２】なお、この例では、上述した操作部９を音響受信装置４の本体だけに設けるのではなく、当該操作部９をリモート操作子１４としてイヤホン１３のケーブル上（すなわち電気音響変換手段と音響受信装置４を接続するケーブル上）にも配置しており、これによりユーザ１２は音楽提供サービスを受ける際の操作を手元で行うことができ、わざわざ音響受信装置４の本体に設けられた操作部９を操作しなくても音楽提供サービスを受けることができるようになされている。因みに、リモート操作子１４には、操作部９だけでなく、本体に設けられた表示部７と同様の表示部７が一体形成されており、これにより後述するような受信する音響信号に関連する情報を本体の表示部７を見なくても、リモート操作子１４を操作しながら見ることができるようになつている。

【００４３】（１－３）送受信部の構成

続いてこの項では上述した送受信部５について具体的に説明する。図４に示すように、送受信部５は無線送信部５Ａ及び無線受信部５Ｂを有しており、この無線送信部５Ａ及び無線受信部５ＢによつてＰＨＳの無線回線を介してデータの送受信を行うようになされている。

【００４４】この送受信部５においては、例えば通話時、音響入出力部６のマイクロホン２０によつて入力された音声信号Ｓ１を音声信号処理回路２１を介して受けるようになされている。この場合、マイクロホン２０は音響電気変換素子からなり、集音したユーザ１２の音声波を音響電気変換処理により電気的な音声信号Ｓ１に変換する。また音声信号処理回路２１は入力される音声信号Ｓ１に対してＡＤＰＣＭ（Adaptive Differential Pulse Code Modulation：適応差分型パルスコード変調）の符号化方式に基づいた所定の符号化処理を行い、その結果得られる符号化音声データＳ２を送受信部５に出力する。

【００４５】送受信部５ではこの符号化音声データＳ２を時分割多重回路２２に入力する。ＰＨＳの無線回線はＴＤＭＡ／ＴＤＤ方式（Time Division Multiple Access／Time Division Duplex：時分割多元接続／時分割二重通信方式）を採用しており、予め自局に割り当てられたタイムスロットのタイミングで送信と受信を交互に行うようになされている。このためこの送受信部５では、時分割多重回路２２が設けられており、この時分割多重回路２２によつて自局に割り当てられた送信スロットに送信データを格納すると共に、自局に割り当てられた受信スロットから受信データを取り出すようになされている。

【００４６】時分割多重回路２２は音声信号処理回路２１から供給される符号化音声データＳ２を自局に割り当てられた送信スロットに格納することにより送信バーストデータＳ３を生成し、これを変調回路２３に出力する。変調回路２３は入力される送信バーストデータＳ３に例えばＱＰＳＫ変調（Quadrature Phase Shift Keying：４相位相変調）による変調処理を施してベースバンド帯域の送信信号Ｓ４を生成し、これをミキサ回路２４に出力する。因みに、送信バーストデータＳ３がバースト的な信号であることからこの送信信号Ｓ４も同じくバースト的な信号である。

【００４７】ミキサ回路２４は周波数シンセサイザ２５から供給されるローカル信号Ｓ５を送信信号Ｓ４に乗算することにより当該送信信号Ｓ４を１.９〔ＧＨｚ〕帯の送信信号Ｓ６に周波数変換し、その送信信号Ｓ６をＲＦフィルタ２６に出力する。因みに、周波数シンセサイザ２５は温度補償型水晶発振器（ＴＣＸＯ）２７から出力される発振出力Ｓ７に基づいて所望周波数のローカル信号Ｓ５を生成するようになされている。これによりミキサ回路２４では、その所望周波数のローカル信号Ｓ５を使用して所望周波数の送信信号Ｓ６を生成することができる。

【００４８】ミキサ回路２４から出力される送信信号Ｓ６は、ＲＦフィルタ２６によつて当該送信信号Ｓ６に含まれる不要成分が除去された後、ＲＦ増幅器２８によつて所定電力に増幅され、アンテナ共用器２９を介してアンテナ３０に供給される。これによりアンテナ３０から音声信号Ｓ１に応じた送信信号Ｓ６が送信される。

【００４９】一方、アンテナ３０によつて受信された１.９〔ＧＨｚ〕帯の受信信号ＳＳはアンテナ共用器２９によつて送信信号Ｓ６から分離された後、ＲＦ増幅器３１によつて増幅され、ＲＦフィルタ３２に入力される。因みに、ここまでの説明から分かるように、アンテナ共用器３０は送信信号Ｓ６と受信信号Ｓ８とを分離する回路であり、このアンテナ共用器３０を設けることにより１つのアンテナ３０を送信と受信で共用して使用し得るようになされている。

【００５０】ＲＦフィルタ３２は受信信号ＳＳに含まれる不要成分を除去して後段のミキサ回路３３に出力する。ミキサ回路３３は周波数シンセサイザ２５から供給されるローカル信号Ｓ９を受信信号ＳＳに乗算することにより当該受信信号Ｓ８を例えば248.95又248.45〔MHz〕の第１中間周波信号Ｓ１０に周波数変換し、その第１中間周波信号Ｓ１０を第１ＩＦフィルタ３４に出力する。因みに、この場合、ＲＦフィルタ３２によつて受信信号Ｓ８に含まれる不要成分を除去していることによりミキサ回路３３で周波数変換処理を行つたときに擬変調歪みの発生を未然に防止し得る。

【００５１】第１ＩＦフィルタ３４は第１中間周波信号Ｓ１０に含まれる不要成分を除去して増幅器３５に出力する。増幅器３５は第１中間周波信号Ｓ１０を所定電力に増幅した後、これをミキサ回路３６に出力する。ミキサ回路３６はローカル発振器３７から供給される所定周波数のローカル信号Ｓ１１を第１中間周波信号Ｓ１０に

乗算することにより当該第１中間周波信号Ｓ１０を例えば10.7〔MHz〕の第２中間周波信号Ｓ１２に周波数変換し、これを第２ＩＦフイルタ３８に出力する。

【００５２】このようにして生成された第２中間周波信号Ｓ１２は第２ＩＦフイルタ３８によつて不要成分が除去された後、増幅器３９によつて所定電力に増幅され、復調回路４０に供給される。復調回路１０は第２中間周波信号Ｓ１２に対して送信側に対応する復調処理（例えばＱＰＳＫ復調処理）を施すことにより当該第２中間周波信号Ｓ１２から受信バーストデータＳ１３を復元し、これを時分割多重回路２２に出力する。

【００５３】時分割多重回路２２は受信スロットに対応してバースト状に形成された受信バーストデータＳ１３から符号化音声データＳ１４を取り出し、これを音声信号処理回路２１に出力する。音声信号処理回路２１は入力される符号化音声データＳ１４に対してＡＤＰＣＭの符号化方式に対応した復号化処理を施すことにより当該符号化音声データＳ１４から音声信号Ｓ１５を復元し、これをスピーカ４１に出力する。

【００５４】スピーカ４１は電気音響変換素子からなり、入力される音声信号Ｓ１５に電気音響変換処理を施すことにより当該音声信号Ｓ１５を音波に変換して出力する。これにより通話相手の音声をスピーカ４１を介して聞くことができる。

【００５５】これに対して音声以外のデータ（例えば新規データ等）を送信する場合には、音響入出力部６のデータ入力端子４２に入力されるデータをデータ処理回路４３に入力してここで所定の符号化処理を施し、その結果得られる符号化データＳ１７を送受信部５の時分割多重回路２２に入力する。時分割多重回路２２は、上述した符号化音声データＳ２と同様に、符号化データＳ１７を自局に割り当てられた送信スロットに格納することにより送信バーストデータＳ３を生成し、これを変調回路２３に出力する。これにより音声データ以外のデータも同様にして送信することができる。

【００５６】また音声以外のデータ（例えば音楽提供サービスによる音楽データ等）を受信した場合には、時分割多重回路２２は、上述の場合と同様に、受信バーストデータＳ１３から符号化データＳ１８を取り出し、その符号化データＳ１８をデータ処理回路４３に出力する。データ処理回路４３はこの符号化データＳ１８に送信側に対応した所定の復号化処理を施すことにより受信データを復元し、これをデータ出力端子４４を介して出力する。これにより音声以外のデータも受信して出力することができる。

【００５７】（１－４）音響入出力部の構成

続いてこの項では音響入出力部６の具体的構成を説明する。図５に示すように、音響入出力部６においては、制御部１０から出力されるサービス要求信号Ｓ２０をデータ入力端子４３を介してデータ処理回路４３に入力し得るようになされている。このサービス要求信号Ｓ２０は上述したように符号化処理された後、送受信部５を介してＰＨＳ基地局３に送信される。これにより音楽関係サービスを受けたいことをＰＨＳ基地局３を介して音楽発信元であるサービスセンタ２に送ることができる。

【００５８】このサービス要求信号Ｓ２０に応じてサービスセンタ２が送出した音楽信号（この音楽信号は当該音楽信号に付随する付加情報も含む）は、上述した送受信部５を介して受信され、符号化データＳ１８としてデータ処理回路４３に入力される。データ処理回路４３はこの符号化データＳ１８に所定の復号化処理を施すことにより音楽データ等によつて構成される受信パケットデータＳ２１を復元し、これをデータ出力端子４４を介して受信パケット処理部４５に出力する。

【００５９】受信パケット処理部４５は受信パケットデータＳ２１から楽曲の題名や歌詞等の付加情報を分離し、これを画像データＳ２２として上述したデータバス１１を介して表示部７に送出する。これによりこの音響受信装置４では、音楽信号に付随する付加情報を表示部７に表示することができる。また受信パケット処理部４５は、受信パケットデータＳ２１から音楽データＳ２３を分離してこれを音響出力部４６に出力する。

【００６０】音響出力部４６は音声データＳ２３からステレオ方式の右側音楽信号Ｓ２４Ｒ及び左側音楽信号Ｓ２４Ｌを取り出し、これをそれぞれ出力端子４８に接続されたイヤホン１３の右側電気音響変換素子４７Ｒ及び左側電気音響変換素子４７Ｌに出力する。これによりユーザ１２は、イヤホン１３を介してステレオ音響の音楽を鑑賞することができる。因みに、出力端子４８に接続されるイヤホン１３としては、いわゆるハイファイ仕様のものであつて周波数特性の良いものが使用されており、これにより音質の良い音楽を鑑賞し得、音楽の鑑賞価値を高めることができるようになされている。

【００６１】（１－５）ＰＨＳ基地局の構成

ここで音楽信号を送信するＰＨＳ基地局３の構成を説明する。但し、ここでは音楽信号を送信するための回路ブロックについてのみ説明する。ＰＨＳ基地局３は、図６に示すように、送信データ処理部５０、送受信部５１、アンテナ５２及び受信データ処理部５３を有している。因みに、送信データ処理部５０及び受信データ処理部５３は必ずしもＰＨＳ基地局３に搭載される必要はなく、場合によつては音楽信号の発信元であるサービスセンタ２に接続されることもある。なお、サービスセンタ２に接続される場合には、送信データ処理部５０及び受信データ処理部５３は有線回線を介してＰＨＳ基地局３に接続される。

【００６２】サービスセンタ２から出力される音楽信号は所定のアナログディジタル変換回路（図示せず）を介してディジタル化された後、音楽データＳ３０としてデータ入力端子５４を介して送信データ処理部５０に入力

される。因みに、この音楽データＳ３０は音楽そのものだけでなく、その音楽に付随する付加情報（例えば楽曲の題名や歌詞等）も含んでいる。送信データ処理部５０においては、この音楽データＳ３０を離散コサイン変換回路（ＤＣＴ）５５及び特徴情報抽出回路５６に入力するようになされている。

【００６３】離散コサイン変換回路５５は情報源符号化のための回路であり、入力される音声データＳ３０に離散コサイン変換を施し、その結果得られる変換音声データＳ３１をインターリーブ回路５７及び特徴情報抽出回路５６に出力する。因みに、離散コサイン変換とは、入力データを予め用意された周波数成分の異なる複数の基底ベクトルと係数（一般にはＤＣＴ係数と呼ばれる）との乗算によつて表し、その係数を変換データとして出力する処理であり、これにより入力データのデータ量を減らすような処理である。

【００６４】特徴情報抽出回路５６は、音声データＳ３０及び変換音声データＳ３１の両方、或いは音声データＳ３０又は変換音声データＳ３１のいずれか一方から信号が有する特徴を抽出し、その特徴情報Ｓ３２を重み関数生成回路５８に出力する。因みに、ここで言う特徴とは、周波数成分や信号波形パターン等、その信号が独自に持つ特徴である。

【００６５】重み関数生成回路５８は入力される特徴情報Ｓ３２を基に重み関数Ｓ３３を生成し、これを後述するベクトル量子化回路５９に出力する。因みに、重み関数Ｓ３３は送信対象のデータそのものではなく、そのデータの特徴を表すデータであるので副情報と呼ばれる。

【００６６】一方、インターリーブ回路５７は入力される変換音声データＳ３１のデータ順序を所定の順序で並び換え、その結果得られる変換音声データＳ３４をベクトル量子化回路５９に出力する。因みに、このようにデータ順序を並び換えることにより、伝送路の劣化によつてバーストエラーが発生したとき、これを分散してエラー訂正し得、伝送路が劣化した場合でも良好にデータ伝送を行うことができる。またインターリーブ回路５７から出力される変換音声データＳ３４は、送信対象のデータそのものであるので、副情報としての重み関数Ｓ３３に対して主情報と呼ばれる。

【００６７】ベクトル量子化回路５９は、内部に予め用意されたコードブックを使つて、入力される重み関数Ｓ３３及び変換音声データＳ３４にベクトル量子化を施し、その結果得られる量子化データＳ３５を符号化回路６０に出力する。因みに、ベクトル量子化とは、コードブックとして用意された代表ベクトルの中から入力データを表す最適な代表ベクトルを検出し、その代表ベクトルを表すコードを量子化するものであり、入力データのデータ量を大幅に低減し得るものである。

【００６８】符号化回路６０は入力される量子化データＳ３５に対して誤り訂正のための符号化処理を施し、その結果得られる送信データＳ３６を送受信部５１に出力する。なお、ベクトル量子化回路５９においては、変換音声データＳ３４を量子化する際に重み関数Ｓ３３が示す特徴情報を利用して量子化処理を行うので、変換音声データＳ３４を良好に量子化する上では重み関数Ｓ３３が重要な役割を果たすことになる。このため重み関数Ｓ３３は忠実に入力データの特徴を表していなければならないし、また重み関数Ｓ３３は確実に伝送されなければならない。そのため符号化回路６０では、重み関数Ｓ３３（副情報）のデータ部分に対しては変換音声データＳ３４（主情報）のデータ部分よりも強力な誤り訂正処理を施すようになされている。

【００６９】送受信部５１は上述した音響受信装置４の送受信部５とほぼ同様の構成を有しており、入力される送信データＳ３６に例えばＱＰＳＫ変調による所定の変調処理を施した後、周波数変換処理を施して送信信号Ｓ３７を生成し、これをアンテナ５２を介して送信する。これによりサービスセンタ２から出力された音楽信号がＰＨＳの無線回線を介して送信されることになる。

【００７０】一方、音響受信装置４から送信されたサービス要求信号Ｓ２０が重畳された送信信号Ｓ６はアンテナ５２によつて受信され、受信信号Ｓ３８として送受信部５１に入力される。送受信部５１はこの受信信号Ｓ３８に周波数変換を施して中間周波信号を取り出した後、その中間周波信号に復調処理を施して受信データＳ３９を復元し、これを受信データ処理部５３に出力する。

【００７１】受信データ処理部５３は、受信データＳ３９に所定の復号化処理を施すことにより上述したサービス要求信号Ｓ２０を復元し、これを制御信号Ｓ４０としてサービスセンタ２に送出する。これにより音響受信装置４が音楽提供サービスを要求していることをサービスセンタ２に通達することができる。なお、受信データ処理部５３で行う復号化処理としては、音響受信装置４のデータ処理回路１３で行つた符号化処理に対応した復号化処理である。

【００７２】（１－６）音響受信装置のデータ処理回路の構成

続いてこの項では上述した音響受信装置４のデータ処理回路４３について説明する。上述したデータ処理回路４３は、図７に示すようなデータ復号ブロック６２を有しており、このデータ復号ブロック６２によつてＰＨＳ基地局３から送られる音楽データを復号化処理するようになされている。

【００７３】このデータ復号ブロック６２においては、送受信部５の時分割多重回路２２から出力される符号化データＳ１８をまず復号化回路６３に入力する。この復号化回路６３は入力される符号化データＳ１８に誤り訂正処理を施して当該データに含まれる誤りを訂正した後、主情報のデータＳ５０と副情報のデータＳ５１とをそれぞれ分離抽出し、抽出した主情報のデータＳ５０、

副情報のデータＳ５１をそれぞれデインターリーブ回路６４、特徴情報復元回路６５に出力する。

【００７４】デインターリーブ回路６４は送信側のインターリーブ回路５７で行ったデータ順序の並び換えを元に戻し、その結果得られる主情報のデータＳ５２を情報復元回路６６に出力する。一方、特徴情報復元回路６５は入力される副情報のデータＳ５１から特徴情報Ｓ５３を復元してこれを情報復元回路６６に出力する。

【００７５】情報復元回路６６は入力される特徴情報Ｓ５３を利用して主情報のデータＳ５２の復元処理を行うことにより当該主情報のデータＳ５２から送信側の変換データＳ３１（すなわちＤＣＴ変換されたデータ）に対応する復元データＳ５４を復元し、これを離散コサイン逆変換回路（ＩＤＣＴ）６７に出力する。離散コサイン逆変換回路６７は情報源復号化のための回路であり、入力される復元データＳ５４に対して離散コサイン逆変換処理を施すことにより送信側の音楽データＳ３０に対応する音楽データＳ２１を復元し、これを上述したように受信パケット処理部１５に出力する。

【００７６】このようにしてこの音響提供サービスシステム１においては、送信側で音楽データＳ３０に離散コサイン変換処理やベクトル量子化処理を施し、受信側ではその逆処理を行って送信された音楽データＳ２１を復元するようにしたことにより、伝送状態が変化した場合でも、送信された音楽データＳ２１を良好かつ確実に復元し得る。また送信時、音楽データＳ３０に対して離散コサイン変換処理やベクトル量子化処理を施すようにしたことにより、送信するデータ量を減らして効率良くデータ伝送することができる。

【００７７】（１－７）音楽提供サービスを受ける際の操作及び表示

続いてこの項では音響受信装置４を使用して音楽提供サービスを受ける際の操作及びそのときの表示部７の表示例について説明する。まず音響受信装置４の操作部９を使用して所定の操作を行うと、図８に示すように、音楽提供サービスのメニュー画面が表示部７に表示される。なお、このメニュー画面のデータは予め記憶部８に記憶されており、そのデータを読出して表示部７に供給することにより図８に示すようなメニュー画面が表示される。

【００７８】このメニュー画面においては、全部で１０種のモードが用意されており、それらのモードを示す項目名と項目番号がそれぞれ表示される。１番目から３番目のモード、すなわち「最新ベストテン（Ｊ－ＰＯＰ）」、「最新ベストテン（ロック）」、「最新ベストテン（演歌）」は各ジャンルのうち最新のヒット曲として定められた１０曲を下位又は上位から順に聞くことができるモードである。

【００７９】また４番目から６番目のモード、すなわち「ランダムヒットアップ（９０年代）」、「ランダムヒットアップ（８０年代）」、「ランダムヒットアップ（６０～７０年代）」は各年代の曲の中からランダムに選ばれた曲を聞くことができるモードである。また７番目から９番目のモード、すなわち「ジャズランダム」、「クラシックランダム」、「レゲエランダム」は各ジャンルの曲の中からランダムに選ばれた曲を聞くことができるモードである。

【００８０】因みに、４～６番目及び７～９番目のモードにおいては、ユーザ側が曲を選定するのではなく、サービスセンタ２が曲を選定するようになされている。具体的には、サービスセンタ２は各分野毎に分類された楽曲群の中から乱数等を用いて任意の曲を選定し、その曲を提供する。その際、サービスセンタ２は過去所定時間（例えばその当日の朝から現在まで或いは前日の朝から現在まで）の間にユーザが聞いた曲を記憶しておき、その曲を除いた楽曲群の中から任意の曲を選ぶようになされている。これにより一度聞いた楽曲と同じ曲がすぐさま選択されることを防止し得ると共に、所定時間経過すればその楽曲を再び選択することができる。このようにした理由は、同じ曲を立て続けに聞きたくないというユーザ心理に合わせたサービスを提供するためである。

【００８１】最後に、１０番目のモードすなわち「プログラムモード」はユーザが選定した楽曲をサービスセンタ２に通知してその楽曲を聞くことができるモードである。このモードの場合には、１曲だけを指定して聞くこともできるし、また複数曲を順番を指定して聞くこともできる。

【００８２】このようなメニュー画面の中から所望のモードを指定して音楽提供サービスを開始するときには、ユーザは希望するモードの項目番号を操作部９のテンキーを使用して入力する。この操作により、その希望したモードに対応したサービス要求信号Ｓ２０がサービスセンタ２に向けて送信される。これによりサービスセンタ２ではユーザが希望するモードを把握し得、ユーザが希望するモードの音楽提供サービスを開始し得る。なお、「プログラムモード」の場合には、楽曲の選定が必要になるので項目番号を入力しただけではサービス要求信号Ｓ２０は送信されず、後述する曲選定処理が終了した後に当該サービス要求信号Ｓ２０が送信される。

【００８３】また上述したように音楽提供サービスのモードとしては、大きく分けて予めサービスセンタ側で決められている楽曲を順に送出するモード（第１から第３番目のモード）と、サービスセンタ側で予め用意されている楽曲群の中からランダムに選んで送出するモード（第４から第９のモード）と、ユーザ側から指定された楽曲をサービスセンタ側が送出するモード（第１０番目のモード）とに分けられることから、サービス要求信号Ｓ２０としても大きく分けて３種類に分けられる。

【００８４】ここで実際に音楽提供サービスが開始されると、音響受信装置４の表示部７には図９に示すような

表示画面が表示される。すなわち図９に示すように、通常モードとして曲名表示画面が表示される。この場合、表示部７の上段に表示されている「ハイウエイ○×△」は現在選択している楽曲の題名を示しており、その下段に表示されている「デイープ△×□」はその楽曲の歌手名又は演奏者名を示している。なお、楽曲がクラシック音楽の場合には、演奏者名と共に作曲者名が表示される。これは、クラシック音楽の場合には、演奏者が知りたいというよりもその作曲者が知りたいという要望が強いためである。

【００８５】また楽曲名の前後に表示される音符記号「♪」は、現在表示されている画面が曲名表示画面であることを示すマークである。このような音符記号を表示するようにしたことにより、ユーザは現在表示されている画面が曲名表示画面であることを容易に知り得る。

【００８６】表示部７の中央にある「next」の下段に表示されている「１７＜＞」は次に演奏される予定の楽曲の題名を示し、その隣の「表高○○」は次の楽曲の歌手名又は演奏者名を示している。因みに、この次曲名表示は設定により表示を解除し得るようになされている。これは、特にランダムモード（上述した第１から第９番目のモード）の場合には、次に何が演奏されるか分からないことが楽しみの１つでもあるので、このようなユーザ心理を反映させた運用形態を実現するためである。

【００８７】また表示部７の最下段にはサブメニューが表示される。このサブメニュー内において表示される「０→メニュー」は、テンキーから「０」を入力すると図８に示したようなモード設定のためのメニュー画面に表示が切り換わることを示している。また「１→次曲」は、テンキーから「１」を入力すると現在演奏している楽曲を停止して次の楽曲の演奏を開始することを示している。また「２→歌詞」は、テンキーから「２」を入力すると曲名表示画面から次に説明するような歌詞表示画面に切り換わることを示している。

【００８８】因みに、この曲名表示画面において表示される楽曲の題名や歌手名、或いは次の楽曲の題名や歌手名のデータは、サービスセンタ２から音楽データと共に送信された付加情報から抽出したものである。またサブメニューに示すように「１」を入力した場合には、次曲演奏の開始を要求するサービス要求信号Ｓ２０が送信される。これによりサービスセンタ２では現在流している音楽データの送出を停止して次曲の音楽データの送出を開始する。なお、サブメニューには表示されていないが、音楽提供サービスを受けている最中に通話終了キーを押すと、ＰＨＳの無線回線が切られるので、音楽提供サービスが自動的に停止する。

【００８９】ここでサブメニューに示されるように、テンキーから「２」を入力すると、表示部７には、図１０に示すような歌詞表示画面が表示される。この場合、画面の上段に表示される本マーク記号は現在表示されている画面が歌詞表示画面であることを示している。このような本マーク記号を表示するようにしたことにより、ユーザは現在表示されている画面が歌詞表示画面であることを容易に知り得る。

【００９０】またこの本マーク記号の様又は下段には、現在演奏されている楽曲の歌詞が表示される。この歌詞表示は、曲進行に合わせて表示形態（例えば色、ハツチング又は点滅等）が変わるようになされており、これにより現在どの部分まで曲が進んでいるかを容易に知り得るようになされている。

【００９１】さらにこの歌詞表示の下段には、曲名表示画面と同様に、サブメニューが表示される。サブメニューにおける「０→曲名表示」はテンキーから「０」を入力すると図９に示した曲名表示画面に戻ることを示しており、「１→次曲」はテンキーから「１」を入力すると現在演奏中の曲を停止して次の曲を開始することを示している。

【００９２】一方、図８に示したメニュー画面において「プログラムモード」を示す項目番号「０」を入力すると、図１１（Ａ）に示すようなプログラムモードの画面が表示部７に表示される。この画面の右側に表示されている矢印記号及び数字は、テンキーから「５」を入力すると、仮想文字テーブル上において仮想カーソルが上方向に移動することを示しており、同様に「０」を入力すると仮想カーソルが下方に、「７」を入力すると仮想カーソルが左方向に、「９」を入力すると仮想カーソルが右方向に移動することを示している。

【００９３】具体的には、図１１（Ｂ）に示すように、仮想文字テーブルＴＢは５０音の仮名文字をあいうえお順に２次元的に並べた、いわゆる５０音表によって構成されており、「５」を入力すると「お」段から「あ」段の方向に向かって仮想カーソルＫが移動し、「０」を入力すると逆に「あ」段から「お」段の方向に向かって仮想カーソルＫが移動し、「７」を入力すると「あ」行から「ん」行の方向に向かって仮想カーソルＫが移動し、「９」を入力すると逆に「ん」行から「あ」行の方向に向かって仮想カーソルＫが移動するようになされている。

【００９４】その際、仮想カーソルＫが位置するところの仮名文字が表示画面の下段に表示されるようになっている。例えば仮想カーソルＫが仮名文字「か」のところに位置していれば、当該仮名文字「か」が選択され、図１１（Ａ）に示すように、表示画面の下段に仮名文字「か」が表示される。このようにして「５」、「０」、「７」又は「９」のテンキーを操作すれば、音響受信装置４に所望の仮名文字を表示させることができるようになされている。

【００９５】またこのプログラムモードの表示画面においては、画面下方に「press ←ぎ」が表示されている。この表示は、テンキーから「ぎ」を入力すれば確定指示

が入力され、現在表示されている仮名文字を確定して入力することができることを意味している。

【００９６】このようなプログラムモードの表示画面において、ユーザが希望する楽曲を指定する場合には、まずこのようなテンキーを操作して希望する楽曲の題名頭文字を入力する。例えば図１１に示すように、「か」で始まる楽曲を希望するのであれば、仮名文字「か」を入力する。頭文字が入力できたら続いて「＃」を入力すると、その仮名文字が確定され、題名の頭文字が「か」で始まる曲名リストを要求するサービス要求信号Ｓ２０が音響受信装置４から送信される。これによりサービスセンタ２はこのサービス要求信号Ｓ２０に応じて題名の頭文字が「か」である曲名リストを音響受信装置４に向けて送信する。

【００９７】この曲名リストを受信すると、表示部７には、図１２に示すような曲名リストが表示される。この図１２に示すように、曲名リストを受信すると、その曲名リストとして受信した各楽曲名が上から順に表示される。この場合、画面の右側には先程と変わって矢印記号と「５」及び「０」の数字だけが表示されている。これは、題名の前に表示されるカーソル「＊」を「５」又は「０」のテンキーを使用して上下方向に移動し得ることを意味している。なお、「０」キーを使用してカーソル「＊」を画面の一番下に移動したとき、曲名リストがまだ下に続く場合には、曲名リストが速に上にシフトしてスクロール表示し、またこれと逆に「５」キーを使用してカーソル「＊」を画面の一番上に移動したとき、曲名リストがまだ上に続く場合には、曲名リストが速に下にシフトしてスクロール表示するようになされており、これにより表示画面に対してリスト数が多い場合でも全てのリストを表示することができるようになされている。因みに、この状態では、受信した曲名リストを表示しているだけなので、カーソル「＊」は点滅状態にあり、曲指定が未だなされていないことを示している。

【００９８】ここでユーザが希望する楽曲を指定する場合には、上述したような「５」又は「０」のテンキーを操作してユーザが希望する楽曲の題名のところにカーソル「＊」を表示させる。続いて「＃」キーを押圧操作して当該「＃」を入力してカーソル「＊」が位置している楽曲を確定する。これによりカーソル「＊」が点滅表示から連続表示に変更され、その楽曲が確定されたことが示される。

【００９９】楽曲が確定されると、その楽曲が確定されたことを示すサービス要求信号Ｓ２０がＰＨＳ無線回線を介してサービスセンタ２に送信される。サービスセンタ２はこのサービス要求信号Ｓ２０によりユーザが希望している楽曲を把握し、その楽曲を特定する楽曲コードをＰＨＳ無線回線を介して音響受信装置４に送信する。因みに、この楽曲コードは、予めサービスセンタ２が保有している全曲に対して楽曲毎に異なるように付されているコードである。

【０１００】プログラムモードの場合には、このような操作を順に繰り返して行くことにより、ユーザが聞きたい楽曲を１曲ずつ指定し、その楽曲を特定する楽曲コードを１つずつ入手する。そしてその入手した楽曲コードを、図１３に示すように、１つのファイルとして記憶部８に記憶する。この場合、１行目の「Fav 1 」はファイルネームであり、ユーザが任意に指定するか又は音響受信装置４において以前に作成されたファイルネームと異なるように自動的に付与される。また２行目の「Title of 1＝”ハイウエイ○×△”」は１曲目として指定した楽曲の題名が「ハイウエイ○×△」であることを示し、３行目の「Code of 1 ＝22920」は１曲目の楽曲コードが「22920」であることを示している。このように楽曲名と楽曲コードを対にし、これを指定された演奏順番に合わせて並べて記憶する。これによりこの曲名ファイルを参照すれば、ユーザにより指定された楽曲名及び楽曲コードを把握し得ると共に、演奏順番も把握することができる。

【０１０１】なお、このようにして楽曲コードを入手することにより生成された曲名ファイルは、操作部９より所定の操作を行うと、実際に表示部７に表示されるようになされており、これにより指定した楽曲が合っているかどうかユーザ自身が目で見て確認することができる。

【０１０２】かくしてプログラムモードで音楽提供を受ける場合には、このようにして曲名ファイルを作成した後、所定操作を行って、その曲名ファイルから順に沿って楽曲コードを順に読み出し、その楽曲コードを付加したサービス要求信号Ｓ２０を送信する。これによりユーザが指定した音楽信号がサービスセンタ２から送信され、プログラムモードの音楽提供サービスが開始される。

【０１０３】（１－Ｓ）音楽提供サービスに係わる制御部の制御手順

ここで以上説明した音楽提供サービスの制御は全て制御部１０の動作制御によって行われるが、この項では、その動作制御をフローチャートを使用して順に説明する。

【０１０４】まず曲指定を行う際には、図１４に示す動作手順によって曲指定がなされる。すなわちステップＳＰ１から入ったステップＳＰ２において、制御部１０はメニュー画面表示中にプログラムモードを選ぶ操作がなされたか否か判断する。その結果、プログラムモード以外の操作がなされた場合には、制御部１０はそのモードを示すサービス要求信号Ｓ２０を送信した後、ステップＳＰ３に移って処理を終了する。

【０１０５】一方、プログラムモードが指定された場合には、制御部１０はステップＳＰ４に移って曲指定のための頭文字入力を受付け付ける。ステップＳＰ４において、曲指定のための頭文字入力がなされると、制御部１０は、題名の頭文字が入力された文字からなる楽曲の曲

名リストをサービスセンタ２に要求することにより、当該サービスセンタ２から曲名リストを入手し、その曲名リストを表示部７に表示する。

【０１０６】そしてステップＳＰ５において、制御部１０はその曲名リスト内の任意の楽曲に対して確定操作がなされたか否か判断し、曲確定の操作がなされた場合には、ステップＳＰ６に移ってここで曲確定を示すサービス要求信号Ｓ２０をサービスセンタ２に送信し、続くステップＳＰ７においてサービスセンタ２から送られてくる楽曲コードを受信する。一方、曲確定の操作がなされなかった場合には、制御部１０はステップＳＰ４に戻って曲指定の頭文字入力を再度受け付ける。

【０１０７】制御部１０は、楽曲コードを入手すると、ステップＳＰ８に移り、ここで引き続き曲指定の操作がなされるか否か判断することによりユーザが希望する楽曲が全て指定し終わったか否か判断する。その結果、引き続き曲指定の操作がなされた場合には、制御部１０は、ステップＳＰ４に戻って処理を繰り返し、曲指定が終わった場合にはステップＳＰ９に移る。

【０１０８】ステップＳＰ９において、制御部１０は今までの処理により指定された全曲の楽曲名及び楽曲コードを曲名ファイルに指定された順番で格納し、当該曲名ファイルを記憶部８に記憶する。この処理を終えると、制御部１０はステップＳＰ３に移って曲指定のための処理を終了する。

【０１０９】これに対して音楽提供サービスを受ける際の手順としては、図１５に示すようになる。すなわちステップＳＰ１０から入ったステップＳＰ１１において、制御部１０は、メニュー画面表示中にモード選択のためのテンキー入力を受け付ける。そして次のステップＳＰ１２において、制御部１０は入力されたテンキーの種類を判断することによりプログラムモードが指定されたかランダムモードが指定されたか判断する。その結果、プログラムモードが指定された場合には、制御部１０はステップＳＰ１３に進み、ランダムモードが指定された場合にはステップＳＰ１８に進む。

【０１１０】ステップＳＰ１３において、制御部１０は先の曲指定により記憶部８に格納した曲名ファイルから楽曲の題名を読み出し、これを表示部７に表示する。次にステップＳＰ１４において、制御部１０は、表示した楽曲の楽曲コードを曲名ファイルから読み出し、これをサービスセンタ２に向けて送信する。次のステップＳＰ１５では、その楽曲コード送信に応じてサービスセンタ２から送られてくる音楽データを受信し、これをイヤホン１３を介して出力する。これによりユーザは指定した音楽を当該イヤホン１３を介して聴取することができる。

【０１１１】１曲分の音楽データが受信し終えると、制御部１０は次のステップＳＰ１６にて移り、ここで曲名ファイル内に次の曲があるか否か判断し、次の曲があればステップＳＰ１３に戻って処理を繰り返し、次の曲がなければステップＳＰ１７に移って処理を終了する。

【０１１２】一方、ランダムモードが指定されたためステップＳＰ１８に移った場合には、制御部１０は指定されたランダムモード（ランダムモードとしては図８に示した第１から第９番目のモードがある）に対応するサービス要求信号Ｓ２０をサービスセンタ２に向けて送信する。次のステップＳＰ１９では、そのサービス要求信号Ｓ２０に応じてサービスセンタ２から送られてくる音楽データを受信し、これをイヤホン１３を介して出力する。これによりユーザは指定した音楽提供モードに対応する音楽を当該イヤホン１３を介して聴取することができる。

【０１１３】次のステップＳＰ２０では、制御部１０は通話終了キーが押されたか否か判断することにより音楽提供サービスの停止が指示されか否か判断する。その結果、音楽提供サービスの停止が指示されなかった場合には、制御部１０はステップＳＰ１９に戻って処理を繰り返し、停止が指示された場合にはステップＳＰ２１に進んで音楽提供サービスの受信を停止して処理を終える。

【０１１４】（１－９）音響受信装置の本体に設けられた操作部

最後にこの項では、音響受信装置４の本体に設けられた操作部９について説明する。音響受信装置４の各電気回路を収納した本体ケース４Ａの上面にはＰＨＳ基地局３と無線通信するためのアンテナ３０が配置されている。また本体ケース４Ａの正面には表示部７と音響入出力部６のスピーカ４１とが設けられている。さらに表示部７の下方には操作部９を構成する通話キー９Ａ、通話終了キー９Ｂ及びテンキー９Ｃが配置されている。因みに、テンキー９Ｃは、図から明らかなように、実際には「０」～「９」の１０個の数字キーと「＊」キー及び「＃」キーの２つの特殊キーからなっている。

【０１１５】また本体ケース４Ａの下部には当該本体ケース４Ａに対して回動自在にフリップ４Ｂが取り付けられている。このフリップ４Ｂは閉じたときに丁度通話キー９Ａ、通話終了キー９Ｂ及びテンキー９Ｃを覆うようになされており、これにより音響受信装置４を鞄やポケット等に入れているときに誤ってこれらの操作キーが押されることを未然に防止し得るようになされている。またこのフリップ４Ｂの先端には音響入出力部６のマイクロホン２０が設けられており、このフリップ４Ｂを開くことにより当該マイクロホン２０が通話時に丁度ユーザの口元にきてユーザの音声を拾い易くなっている。

【０１１６】また本体ケース４Ａの側面には操作部９を構成する回転押圧式の操作子いわゆるジョグダイアル９Ｄが設けられている。このジョグダイアル９Ｄは、図１７に示すように、矢印ａ又はｂに示す方向に回転し得るように本体４Ａに取り付けられている。このジョグダイアル９Ｄを回転させたときには「カチカチ」といった

リック感が得られるようになっており、これによりユーザはいずれの方向にどれだけ回転させたかを容易に把握し得るようになされている。

【0117】このジョグダイアル9Dを回転操作すると、当該ジョグダイアル9Dはその回転角に応じたパルスを発生する（このパルスは回転角に応じていることにより回転方向及び回転量を示している）。制御部10はこのジョグダイアル9Dが発生するパルスを検出することにより当該ジョグダイアル9Dがいずれの方向にどれだけ回転操作されたかを検出し得るようになされている。そして制御部10はその検出した回転方向及び回転量に応じた量だけ表示部7に表示されるカーソルを上方向又は下方向に移動するようになされている。これによりこの音響受信装置4では、上述したように「5」又は「0」キーを押さなくても、カーソルを容易に移動し得るようになされている。

【0118】またこのジョグダイアル9Dは矢印cに示す方向（すなわち本体4Aにほぼ垂直な方向）に押圧操作し得るようになされている。このジョグダイアル9Dは押圧操作がなされると、押圧操作がなされたことを示すスイッチ信号を発生する。制御部10はこのスイッチ信号を検出することによりジョグダイアル9Dの押圧操作を検出し得るようになされており、当該押圧操作を検出したときにはカーソルが表示されている項目を確定するようになされている。これによりこの音響受信装置4では、上述したように「＃」キーを押さなくても、カーソルが位置している項目を確定することができる。かくしてこのようなジョグダイアル9Dを設けることにより、部品点数は増えるものの、音響受信装置4の操作性及び商品性を向上することができる。

【0119】因みに、イヤホン13のケーブル上に設けられたリモート操作子14にも、ここで示した表示部7、通話キー9A、通話終了キー9B、テンキー9C及びジョグダイアル9Dが設けられており、当該リモート操作子14を使用しても同様の操作を行うことができる。

【0120】（1－10）動作及び効果

以上の構成において、この音楽提供サービスシステム1で音楽提供サービスを受ける場合には、まず音響受信装置4からサービスセンタ2に対してPHSの無線回線を介してサービス要求信号S20を送信する。この場合、提供される音楽サービスとしては大きく分けてサービスセンタ2側で楽曲を決めるランダムモードとユーザ側で楽曲を決めるプログラムモードとに分けられる。ユーザがランダムモードを希望した場合には、その旨を示すサービス要求信号S20がサービスセンタ2に送信される。サービスセンタ2はこのサービス要求信号S20に応じて所定の曲群の中からランダムに楽曲を選んでその音楽データを送信するか、もしくは最新ベストテンとして登録されている曲群の中から順番に楽曲を選んでその音楽データを送信する。音響受信装置4はこのようにしてPHSの無線回線を介して送信される音楽データを受信し、これをイヤホン13に出力する。これによりユーザは当該イヤホン13を介して希望した音楽を聞くことができる。

【0121】一方、ユーザがプログラムモードを希望した場合には、まず希望する楽曲名の頭文字を入力して曲名リストをサービスセンタ2に要求する。サービスセンタ2はその指定された文字が頭文字の頭に付く曲名リストを音響受信装置4に送信する。音響受信装置4では、その曲名リストを表示部7に表示してユーザにその中から希望する楽曲を選択させる。そしてユーザが希望する楽曲を確定すると、曲確定を示すサービス要求信号S30を送信してサービスセンタ2から楽曲コードを入手する。以降のこの動作を繰り返して、ユーザが希望している楽曲名及び楽曲コードからなる曲名ファイルを作成する。そして音響受信装置4では、この曲名ファイルから順に楽曲コードを読み出してサービスセンタ2に送信することによりユーザが希望している音楽データをサービスセンタ2に順に送信させる。かくしてこの音楽データを受信して、イヤホン13から出力することにより、ユーザは希望する音楽を聞くことができる。

【0122】このようにしてこの音楽提供サービスシステム1では、ユーザが希望する音楽データをPHSの無線回線を介して送信し、これを音響受信装置4で受けて出力することにより、カセットテープやコンパクトディスク等の記録媒体を待たなくともユーザが希望する音楽を移動しながら聞くことができ、いわゆるミュージック・オン・デマンド・サービスを移動体通信で実現することができ、ユーザに大いなる利便性を提供することができる。

【0123】またこの音楽提供サービスシステム1においては、音楽データを送信する際、当該音楽データに離散コサイン変換処理やベクトル量子化処理を施して送信する。このようにして離散コサイン変換処理やベクトル量子化処理を施して音楽データを送信すると、回線状態が変化した場合でも、受信側で当該音楽データを正確に受信し得る。従って回線状態に応じて周波数特性を切り換えたり或いは信号出力方式をステレオからモノラルに切り換えたりする必要がなくなり、安定に音楽提供サービスを提供することができる。

【0124】以上の構成によれば、サービス要求信号S20に応じてユーザが希望する音楽データに所定の変調符号化処理を施して送信し、受信側ではその音楽データを受信して所定の復調復号化処理を施した後、所定の出力手段を介して出力するようにしたことにより、記録媒体を待たずにユーザが希望する音楽を移動しながらでも聞くことができ、一段と利便性が向上した音楽提供サービスを実現することができる。

【0125】（2）第2の実施の形態

上述の第1の実施の形態においては、ユーザが音響受信

装置４を携帯して音楽提供サービスを受けた場合について述べたが、この第２の実施の形態においては、音響受信装置と自動車の車載音響機器と組み合わせて音楽提供サービスを受ける場合について説明する。

【０１２６】図１８において、７０は全体として第２の実施の形態による音響受信装置を示し、この実施の形態の場合も、ＰＨＳ基地局３から送信される音楽データを当該音響受信装置７０で受信するようになされている。但し、この音響受信装置７０は受信した音楽データを第１の実施の形態のようにイヤホン１３から送出するのではなく、自動車の車内に配置された車載音響機器を介して送出するようになされている。

【０１２７】近年の車載音響機器としては、昔のように単にラジオ放送だけを受信するのではなく、ナビゲーション装置やテレビ受像機等と組み合わせたものが提案されている。このような車載音響機器は、図１８に示すように、大きく分けて、ナビゲーションのための地図や経路、或いは受信したテレビ放送の画像や各種メニュー等を表示する表示部７１と、現在位置測定手段及び地図データベース手段を有するナビゲーション装置やテレビ受像機の受信部、或いはミニディスクやコンパクトディスク等の記録媒体から音楽を再生する音楽再生部やＡＭ／ＦＭラジオ放送のラジオ受信機等が収納された音響機器本体７２と、受信したラジオ放送の音声や再生した音楽を送出するステレオ対応のスピーカ７３Ｒ、７３Ｌとによって構成される。

【０１２８】この第２の実施の形態による音響受信装置７０は、ＰＨＳの無線回線を介して受信した音楽データにＦＭ変調（Frequency Modulation：いわゆる周波数変調）を施し、これをＦＭラジオ放送の周波数帯域（通常７５～９０〔ＭＨｚ〕）の微弱電波（以下、単に微弱電波と呼ぶ）で送信する。車載音響機器のラジオ受信機はこの微弱電波で送信されるＦＭ信号を受信し、受信したＦＭ信号から音楽データを復元してこれをスピーカ７３Ｒ、７３Ｌを介して出力する。これによりユーザは、自動車に既に搭載されている車載音響機器のスピーカ７３Ｒ、７３Ｌを介して希望する音楽をステレオ音響で聞くことができる。

【０１２９】このようにしてこの第２の実施の形態による音響受信装置７０では、ＰＨＳの無線回線を介して受信した音楽データを微弱電波のＦＭ信号に変換し直して送信し、これを車載音響機器のラジオ受信機に受信させて音楽を出力させる。これにより既存の車載音響機器を利用して高音質及び高出力で音楽を出力することができる。

【０１３０】因みに、この第２の実施の形態においては、リモートコントローラ７４から赤外光で送信される制御データを音響受信装置７０で受信し得るようになされており、これによりリモートコントローラ７４を使って音響受信装置７０や車載音響機器の動作を制御し得るようになされている。

【０１３１】またこの第２の実施の形態においては、受信したテレビ放送の画像を表示しているときに、当該テレビ放送の画像と、第１の実施の形態で説明したような楽曲名や音楽提供サービスを受ける際のメニュー画面等、受信する音楽データに関連する情報とを表示部７１に同時又は切り換えて表示し得るようになされている。同様に、ナビゲーションのための経路画面を表示しているときに、当該経路画面と、受信する音楽データに関連する情報とを表示部７１に同時又は切り換えて表示し得るようになされている。これによりこの第２の実施の形態においては、車載音響機器として既に設置されている表示部７１を音楽提供サービスでも使用し得るようになされている。

【０１３２】なお、この第２の実施の形態による音響受信装置７４も、第１の実施の形態と同様に、送受信部等の各種電気回路を電池で駆動し得るようになされており、ダッシュボードから取り外せば通常のＰＨＳの通信端末装置として使用し得るようになされている。

【０１３３】ここでこの第２の実施の形態による音響受信装置７０の構成を図１９に示す。図２との対応部分に同一符号を付して示す図１９において、７０は全体として第２の実施の形態による音響受信装置を示し、第１の実施の形態による音響受信装置４に対して新たに微弱電波発生・変調部７５、微弱電波用のアンテナ７６、赤外線受光部７７及び赤外線受信処理部７８が設けられている。

【０１３４】赤外線受光部７７はリモートコントローラ７４から送信される赤外光を受信し、当該赤外光の光量に応じた電気信号Ｓ６０を発生する。赤外線受信処理部７８はこの電気信号Ｓ６０を解析することによりリモートコントローラ７４から送信された制御データＳ６１を検出し、これをデータバス１１を介して制御部１０に送出する。

【０１３５】制御部１０はこの制御データＳ６１に応じて音響受信装置７０の各部の動作を制御するようになされており、これによりリモートコントローラ７４を使用して音響受信装置７４の動作を制御し得るようになされている。例えばリモートコントローラ７４から所定のモードで音楽提供サービスを開始するような制御データが送信された場合には、制御部１０はその制御データに応じて送受信部５の動作を制御し、当該送受信部５を介してサービス要求信号Ｓ２０を送信する。これによりサービスセンタ２はこのサービス要求信号Ｓ２０に応じてユーザが希望するモードで音楽データを送信する。音響受信装置７４においては、ＰＨＳの無線回線を介して送信される信号を送受信部５によって受信し、その受信した音楽データを音響入出力部６で復号化処理することにより、サービスセンタ３から送信された音楽データ（Ｓ２４Ｒ、Ｓ２４Ｌ）を復元し、これを微弱電波発生・変調

部７５に出力する。

【０１３６】微弱電波発生・変調部７５は、供給される音楽データ（Ｓ２４Ｒ、Ｓ２４Ｌ）にＦＭ変調を施して送信信号を生成した後、当該送信信号をＦＭラジオ放送の周波数帯域に周波数変換し、これを微弱電波でアンテナ７６から送信する。これにより車載音響機器のラジオ受信機でこの微弱電波を受信すれば、音響受信装置７０で受信した音楽データを車載音響機器を介して出力することができる。

【０１３７】なお、制御部１０は、音楽データと共に送信された楽曲名や歌手名等といった付加情報Ｓ６２や、表示部７に表示するメニュー画面のデータＳ６３も微弱電波発生・変調部７５を介して送信するようになされており、これにより車載音響機器でこれを受信すれば、当該車載音響機器の表示部７１に楽曲名や歌詞思いとメニュー画面等、音楽提供サービスに関するデータを表示することができる。

【０１３８】また、制御部１０は、赤外線受光部７７及び赤外線受信処理部７８を介して受けた車載音響機器に関する制御データＳ６４も、微弱電波発生・変調部７５を介して送信するようになされており、これによりリモートコントローラ７４を使用して車載音響機器の動作をも制御することができる。

【０１３９】以上の構成によれば、受信した音楽データに再度ＦＭ変調を施してこれを微弱電波で送信するようにしたことにより、音響受信装置７０で受信した音楽データを既存の車載音響機器を介して高音質及び高出力で送出し得、音楽提供サービスを受ける際の利便性をさらに向上することができる。

【０１４０】（３）第３の実施の形態

上述の第１の実施の形態においては、音響受信装置４で受信した音楽データを有線接続されたイヤホン１３を介して送出した場合について述べたが、この第３の実施の形態においては、ワイヤレスタイプのイヤホンを使用して音楽データを聴取し得るようにした場合について説明する。

【０１４１】図２０に示すように、この第３の実施の形態においては、音響受信装置８０で受信した音楽データを再変調して微弱電波で送信し、これをワイヤレスタイプのイヤホン８１の通信部８１Ａで受信することにより当該音楽データをイヤホン８１の電気音響変換素子を介して出力するようになされている。これによりこの第３の実施の形態では、音響受信装置８０とイヤホン８１とを分離して使用することができ、第１の実施の形態のように音響受信装置４を身につけずとも鞄の中等に入れておけば容易に音楽データを聞くことができる。

【０１４２】なお、第１の実施の形態であっても、音響受信装置４を鞄の中等に入れることは可能であるが、ケーブル接続されている関係上、少なくともイヤホン１３のケーブル長分しか引き離すことができない。また第１の実施の形態の場合には、音響受信装置４を身につけて歩くと、イヤホン１３のケーブルが手などに引っ掛かって邪魔になるおそれがある。しかしながらこの第３の実施の形態のように音響受信装置８０とイヤホン８１とを無線接続すれば、電波の届く範囲内であれば自由に引き離すことができると共に、第１の実施の形態のようにイヤホン１３のケーブルが邪魔になることもないので、一段と大きな自由度が得られる。

【０１４３】またこの第３の実施の形態においても、イヤホン８１のケーブル途中にはリモート操作子８１Ｂが設けられており、このリモート操作子８１Ｂから入力された制御データを通信部８１Ａを介して送信し得るようになされている。これにより音響受信装置８０の本体に設けられた操作部９をわざわざ操作しなくても、音楽提供サービスを受ける際の制御データをユーザの手元で入力することができる。因みに、このリモート操作子８１Ｂは、第１の実施の形態で説明したリモート操作子１４とほぼ同様のものであり、表示機能と操作入力機能を有している。

【０１４４】ここでこの第３の実施の形態による音響受信装置８０の構成を図２１に示す。図２との対応部分に同一符号を付して示す図２１において、８０は全体として第３の実施の形態による音響受信装置を示し、第１の実施の形態による音響受信装置４に対して新たに微弱電波送受信部８２及び微弱電波用のアンテナ８３が設けられている。

【０１４５】この音響受信装置８０においては、ワイヤレスタイプのイヤホン８１の通信部８１Ａから送信された送信信号をアンテナ８３によって受信し、その結果得られる受信信号Ｓ７０を微弱電波送受信部８２に入力するようになされている。微弱電波送受信部８２はこの受信信号Ｓ７０に所定の復調処理を施すことにより当該受信信号Ｓ７０からリモート操作子８１Ｂが発した制御データＳ７１を復元し、これをデータバス１１を介して制御部１０に出力する。

【０１４６】制御部１０は、この制御データＳ７１が音楽提供サービスを受けるための制御データであれば、当該制御データＳ７１に応じて音楽提供サービスを受けるためのサービス要求信号Ｓ２０を送受信部５を使ってＰＨＳの無線回線を介してサービスセンタ２に送信する。これを受けたサービスセンタ２は、サービス要求信号Ｓ２０に応じた所望の音楽データをＰＨＳの無線回線を介して送信する。

【０１４７】音響受信装置８０においては、ＰＨＳの無線回線を介して送信される信号を送受信部５によって受信し、その受信した音楽データを音響入出力部６で復号化処理することにより、サービスセンタ２から送信された音楽データ（Ｓ２４Ｒ、Ｓ２４Ｌ）を復元し、これを微弱電波送受信部８２に出力する。

【０１４８】微弱電波送受信部８２は、供給される音楽

データ（Ｓ２４Ｒ、Ｓ２４Ｌ）に所定の変調処理を施して送信信号を生成した後、当該送信信号を例えば数100（ＭＨｚ）程度の信号に変換し、これを微弱電波でアンテナ８３から送信する。かくしてこの微弱電波をイヤホン８１の通信部８１Ａで受信して音楽データを復調し、当該音楽データをイヤホン８１の電気音響変換素子を介して出力すれば、音響受信装置８０で受信した音楽データをワイヤレスタイプのイヤホン８１で容易に聞くことができる。

【０１４９】なお、微弱電波送受信部８２は、楽曲名や歌詞或いはメニュー画面のデータ等、受信する音楽データに関連するデータも、微弱電波を使用して送信する。これによりワイヤレスタイプのイヤホン８１でこれを受信してリモート操作子８１Ｂに表示すれば、楽曲名や歌詞等を音響受信装置８０の本体に設けられた表示部７を見ずとも容易に確認し得る。

【０１５０】ここでワイヤレスタイプのイヤホン８１の構成を図２２に示す。この図２２に示すように、ワイヤレスタイプのイヤホン８１は大きく分けて通信部８１Ａ、リモート操作子８１Ｂ、アンテナ８１Ｃ及び電気音響変換素子８１Ｒ、８１Ｌによって構成される。このワイヤレスタイプのイヤホン８１においては、音響受信装置８０の微弱電波送受信部８２から送信された微弱電波をアンテナ８１Ｃによって受信し、その結果得られる受信信号Ｓ７２を通信部８１Ａに入力するようになされている。通信部８１Ａは受信信号Ｓ７２に所定の復調処理を施すことにより当該受信信号Ｓ７２からステレオ方式の左右の音楽信号Ｓ７３Ｒ及びＳ７３Ｌを復元し、これを電気音響変換素子８１Ｒ、８１Ｌに出力する。これによりユーザは電気音響変換素子８１Ｒ、８１Ｌを耳に当てれば、当該電気音響変換素子８１Ｒ、８１Ｌを介して音楽を聞くことができる。

【０１５１】一方、ユーザがリモート操作子８１Ｂを操作することにより入力された制御データＳ７４は通信部８１Ａに入力される。通信部８１Ａはこの制御データＳ７４に所定の変調処理を施して送信信号を生成した後、当該送信信号を例えば数100（ＭＨｚ）程度の信号に変換し、これを微弱電波でアンテナ８１Ｃから送信する。これにより音響受信装置８０では、この微弱電波を受信して制御データＳ７１を復元すれば、その制御データＳ７１に基づいてユーザの指示に応じた動作を行うことができる。

【０１５２】以上の構成によれば、受信した音楽データを再変調して微弱電波で送信するようにしたことにより、音響受信装置８０で受信した音楽データをワイヤレスタイプのイヤホン８１で聞くことができ、音楽提供サービスを受ける際の利便性を一段と向上することができる。

【０１５３】（４）他の実施の形態

なお上述の第１及び第３の実施の形態においては、受信した音楽データを出力する音響出力手段としてイヤホンを用いた場合について述べたが、本発明はこれに限らず、耳を覆うようにして音響出力手段を装着する、いわゆるヘッドホンを用いるようにしても上述の場合と同様の効果を得ることができる。

【０１５４】また上述の第２の実施の形態においては、音楽データが重畳された微弱電波の周波数を70～90（ＭＨｚ）程度に設定した場合について述べたが、本発明はこれに限らず、車載音響機器として搭載されているラジオ受信機で受信し得る範囲の周波数であればその他の周波数であっても良い。

【０１５５】また上述の第３の実施の形態においては、音楽データが重畳された微弱電波の周波数を数100（ＭＨｚ）程度に設定した場合について述べたが、本発明はこれに限らず、数10（ＭＨｚ）以上、かつ１（ＧＨｚ）以下の範囲であればその周波数はいずれであっても良い。少なくともこの範囲に設定しさえすれば、微弱電波による通信を容易に行うことができる。

【０１５６】また上述の第１及び第３の実施の形態においては、受信した音声データを単にイヤホン１３又は８１で送出するようにした場合について述べたが、本発明はこれに限らず、電気音響変換素子であるイヤホンをマイクロホンとして使用し、通話のための音声信号を当該イヤホンを介して入力するようにしても良い。一般にイヤホンを構成する電気音響変換素子は、音声波の振動を逆に拾って電気信号に変換することができる。すなわち人間の声帯で発生した音声波は、通常、骨等を伝わって耳の中まで到達するが、この音声波の振動をイヤホンによって受ければ、当該イヤホンによって音声信号を生成することができる。この音声信号を第１又は第３の実施の形態のようにケーブル又は無線回線を介して音響受信装置４又は８０の音響入出力部６に入力すれば、イヤホンをマイクとして使用することができるので、音響受信装置４又は８０を電話端末として使用するとき、両手に何も持たずに手ぶら状態で通話を行うことができ、大きな自由度が得られる。この場合、イヤホンに出力する音声信号とイヤホンから入力された音声信号の伝送を半二重通信によって行っても良いが、時分割伝送による全二重通信によって伝送する方が通話の応答性が良くなるのでより効果的である。

【０１５７】また上述の第１の実施の形態においては、音楽データをＰＨＳ基地局３から送信するとき、送信データ処理部５０において当該音楽データに離散コサイン変換を施した場合について述べたが、本発明はこれに限らず、高速フーリエ変換（ＦＦＴ）等、その他の処理を施すようにしても良い。因みに、送信側で高速フーリエ変換処理を行った場合には、受信側のデータ復号ブロック６２で離散コサイン逆変換の代わりに逆高速フーリエ変換（ＩＦＦＴ）を行うようにすれば良い。

【０１５８】また上述の第１の実施の形態においては、

メニュー画面のデータを記憶部８に記憶しておく場合について述べたが、本発明はこれに限らず、ＰＨＳの無線回線を介してサービスセンタ２側からこのメニュー画面のデータを送るようにしても上述の場合と同様の効果を得ることができる。

【０１５９】また上述の第１の実施の形態においては、ランダムモードで提供する音楽の分類を、図１０に示すように、「最新ベストテン（Ｊ－ＰＯＰ）」、「最新ベストテン（ロック）」、「最新ベストテン（演歌）」、「ランダムヒットアソア（９０年代）」、「ランダムヒットアソア（８０年代）」、「ランダムヒットアソア（６０～７０年代）」、「ジャズランダム」、「クラッシックランダム」及び「レゲエランダム」の９個に分けた場合について述べたが、本発明はこれに限らず、年代及びジャンルを更に細かく分けても良い。要は、楽曲群の分類としては、図１０に示した分類以外のものであっても良い。

【０１６０】また上述の第１の実施の形態においては、仮想文字テーブルＴＢを日本語の５０音表によって形成することにより日本語の仮名文字を入力し得るようにした場合について述べたが、本発明はこれに限らず、その他の文字からなる仮想文字テーブルを形成してその他の文字を入力し得るようにしても良い。

【０１６１】また上述の第１の実施の形態においては、２次元方向に広がる仮想文字テーブルＴＢを使用したため、「５」、「０」、「７」及び「９」キーを使用して上下左右方向に仮想カーソルＫを移動し得るようにした場合について述べたが、本発明はこれに限らず、アルファベットのように１次元方向に文字が並ぶ仮想文字テーブルを使用した場合には、「５」及び「０」キー又は「７」及び「９」キーを使用して上下又は左右方向のみに仮想カーソルを移動し得るようにして、「Ａ」から「Ｚ」方向又は「Ｚ」から「Ａ」方向のみに仮想カーソルを移動するようにしても良い。

【０１６２】また上述の第１の実施の形態においては、プログラムモードで楽曲を指定するとき、ユーザが曲名リストから所望の楽曲を選んで楽曲を確定した後、その曲確定を示すサービス要求信号Ｓ２０を送出して楽曲コードを入手した場合について述べたが、本発明はこれに限らず、曲名リストをサービスセンタ２から送信するとき、楽曲名と共に楽曲コードも送信するようにしても良い。このようにすれば、図１４に示したフローチャートのステップＳＰ６及びＳＰ７の処理を省略することができ、一段と処理を簡易にすることができる。

【０１６３】また上述の第１の実施の形態においては、音符記号を表示することにより曲名表示画面であることを示すと共に、本マーク記号を表示することにより歌詞表示画面であることを示すようにした場合について述べたが、本発明はこれに限らず、「曲名」といった文字や「歌詞」といった文字を表示することにより曲名表示画面であることや歌詞表示画面であることを示すようにしても良い。

【０１６４】また上述の第１の実施の形態においては、プログラムモードで指定した楽曲を示す曲名ファイルを記憶部８に記憶し、音楽提供サービスを受ける際にはこの曲名ファイルからユーザが指定した楽曲を示す楽曲コードを読み出してサービスセンタ２に通達することによりユーザが指定した楽曲の音楽信号を得るようにした場合について述べたが、本発明はこれに限らず、予め記憶しておいた曲名ファイルから楽曲コードを読み出す時刻を指定するタイマを設け、このタイマに登録された時刻になったら楽曲コードを読み出してサービスセンタ２に通達するようにしても良い。このようにすれば、予めユーザがタイマに所望の時刻を登録しておけば、その時刻になったときに自動的に音楽信号を受信して所望の音楽を聞くことができる。

【０１６５】また上述の第１の実施の形態においては、ランダムモードで音楽提供サービスを受けているとき、通話終了キーを使用して音楽提供サービスの停止を指示した場合について述べたが、本発明はこれに限らず、音楽提供サービスの停止をテンキー等に割り当てるようにしても良い。

【０１６６】また上述の第１の実施の形態においては、回転押圧式の操作子すなわちジョグダイアル９Ｄを設けてカーソル移動を行った場合について述べたが、本発明はこれに限らず、その他の操作子を設けてカーソル移動を行うようにしても良い。例えば図２３（Ａ）に示すように、所定の角度だけ回動すると共に、本体４Ａにほぼ垂直な方向に押圧操作が可能な回動押圧式の操作子９０を設け、当該操作子９０によってカーソル移動を行うようにしても良い。この場合、操作子９０は、上下方向に±αの角度だけ回動し得るようになされていると共に、回動した状態から手を離せばバネ等の付勢力によって元の位置に戻るようになされている。この操作子９０はユーザにより＋α又は－αの角度だけ回動させられると、２つのスイッチのうち回動方向に対応するスイッチをオン状態にするようになされている。制御部１０はこのスイッチの状態を検出することにより操作子９０の回動方向を検出すると共に、スイッチがオン状態になっている時間を計測するようになされており、その検出した回動方向及び時間に応じた量だけ表示部７に表示されるカーソルを上方向又は下方向に移動するようになされている。これにより上述した実施の形態のように所定のテンキーを押さなくても、カーソルを容易に移動することができる。またこの操作子９０は矢印ｃに示す方向に押圧操作し得るようになされている。この操作子９０は押圧操作がなされると、押圧操作がなされたことを示すスイッチ信号を発生する。制御部１０はこのスイッチ信号を検出することにより操作子９０の押圧操作を検出し得るようになされており、当該押圧操作を検出したときにはカーソルＫが表示されている項目を確定するようになされ

ている。これにより上述した実施の形態のように「＊」キーを押さなくても、カーソルが位置している項目を容易に確定することができる。

【0167】またこれに限らず、図23（B）に示すように、3点スイッチ式の操作子91を設けてカーソル移動を行うようにしても良い。この場合、操作子91は縦に並んだ3つのスイッチ91A～91Cによって構成される。制御部10はこの3つのスイッチ91A～91Cのスイッチ状態を検出し得るようになされており、検出結果に応じてカーソルを移動すると共に、カーソルの位置している項目の確定を行うようになされている。具体的には、第1のスイッチ91Aが押圧操作された場合には、制御部10は当該第1のスイッチ91Aが押されている時間を計測し、その時間に応じた量だけカーソルを上方向に移動する。また第3のスイッチ91Cが押圧操作された場合には、制御部10は第3のスイッチ91Cが押されている時間を計測し、その時間に応じた量だけカーソルを下方向に移動する。これにより上述した実施の形態のように所定のテンキーを押さなくても、カーソルを容易に移動することができる。また第2のスイッチ91Bが押圧操作された場合には、制御部10は当該第2のスイッチ91Bの押圧状態を検出してカーソルが位置している項目を確定する。これにより上述した実施の形態のように「＊」キーを押さなくても、カーソルが位置している項目を容易に確定することができる。かくしてこのような回動押圧式の操作子90又は3点スイッチ式の操作子91を設けるようにしても、同様に音響受信装置の操作性及び商品性を向上することができる。

【0168】また上述の実施の形態においては、サービスセンタ2から音楽信号を送信することによりユーザに音楽提供サービスを行った場合について述べたが、本発明はこれに限らず、サービスセンタ2からニュースや株式情報、或いは天気予報等、その他の情報を送信するようにしても良い。要は、音楽や音声等、情報提供のための音響信号をサービスセンタから送信するようにすれば、上述の場合と同様の効果を得ることができる。

【0169】また上述の実施の形態においては、PHSの無線回線を介して音楽信号を伝送した場合について述べたが、本発明はこれに限らず、携帯電話システムや自動車電話システム等、その他の無線通信システムの無線回線を介して音楽信号を伝送するようにしても上述の場合と同様の効果を得ることができる。

【0170】また上述の実施の形態においては、受信した音響信号を出力する電気音響変換素子を2つ設け、ステレオ音響を出力するようにした場合について述べたが、本発明はこれに限らず、少なくとも2つ以上の電気音響変換素子を設けて、受信した音響信号をステレオ音響で出力するようにすれば上述の場合と同様の効果を得ることができる。

【0171】また上述の実施の形態においては、無線送信部9Aを介してサービス要求信号を送信し、これに応答して送られてくる音楽信号を無線受信部9Bで受信し、その受信信号を復調回路40で復調処理した後、データ処理回路43で復号化処理を行って音楽信号を復元し、これをイヤホン13を介して出力した場合について述べたが、本発明はこれに限らず、少なくとも、所望の音響信号を要求するサービス要求信号を送信する無線送信手段と、サービス要求信号に対応して送信される音響信号が含まれる送信信号を受信する無線受信手段と、無線受信手段から出力される受信信号に復調及び又は復号処理を施して音響信号を復元する復調復号手段と、復調復号手段によって復元された音響信号を音波に変換して出力する電気音響変換手段とを設けるようにすれば、上述の実施の形態と同様に、音響信号が記録された記録媒体を持たずに、ユーザが希望する音響信号を容易に得ることができる。

【0172】

【発明の効果】上述のように本発明によれば、サービス要求信号を送信し、それに対応して送信された音響信号を受信して出力するようにしたことにより、音響信号が記録された記録媒体を持たなくても、ユーザが希望する音響信号を容易に得ることができる。また送信側で音響信号に所定の変調及び又は符号化処理を施しておいて、これを受信側で復調及び又は復号処理するようにしたことにより、回線状態が変化しても、高音質の音響信号を安定に得ることができる。かくして一段と利便性を向上した上で音響信号を提供することができる。

【0173】また受信した音響信号に再変調を施して再送信するようにしたことにより、音響信号を出力するための素子と音響信号を受信するための装置とをケーブルで接続しなくても良くなり、使い勝手を向上し得る。

【0174】また受信した音響信号を出力するための電気音響変換素子を、通話時には音声信号を生成する素子として使用することにより、1つの素子を兼用し得、使い勝手を向上し得る。

【0175】また端末装置から送信されたデータの内容に基づいて、送信する入力信号の内容を変更するようにしたことにより、端末装置が所望する入力信号を容易に送信することができる。

【0176】また要求信号が第1の種類の信号であったときには送信側で予め定められた所定の順番で楽曲を送信し、要求信号が第2の種類の信号であったときには所定の曲群の中から任意の楽曲を選択して送信するようにしたことにより、要求信号の種類に応じて所望の楽曲を提供することができる。

【0177】また要求信号が第1の種類の信号であったときには送信側で予め定められた所定の順番で楽曲を送信し、要求信号が第2の種類の信号であったときには端末装置側で定めた楽曲を送信するようにしたことにより、要求信号の種類に応じて所望の楽曲を提供すること

ができる。

【０１７８】また要求信号に対応した音楽信号を受信し、受信した受信信号から音楽信号と共に送信された付加情報を抽出し、付加情報のうち第１の種類の付加情報と第２の種類の付加情報とを選択的に表示するようにしたことにより、音楽信号と共に送信された付加情報を選択的に確認することができ、使い勝手を向上し得る。

【０１７９】また操作入力に応じて仮想カーソルが２次元の仮想情報テーブル上を移動することにより当該仮想カーソルが位置するところの情報を表示し、確定指示が入力されると、仮想カーソルが位置するところの情報を選択するようにしたことにより、容易に所望の情報を選択することができる。

【０１８０】また操作入力に応じて仮想カーソルが２次元の文字表上を移動することにより当該仮想カーソルが位置するところの文字を表示し、確定指示が入力されると、仮想カーソルが位置するところの文字を選択して入力するようにしたことにより、容易に所望の文字を入力することができる。

【０１８１】また楽曲名と、楽曲に付与された楽曲コードとを対とした単位データを所望の順番で並べ、その順番によって楽曲の時系列的順番を規定するようにしたことにより、楽曲名と楽曲コードとを容易に把握し得ると共に、楽曲順序までも容易に把握し得る。

【０１８２】また楽曲指定のための情報を所定の通信回線を介して送信し、該情報に該当する楽曲リストを通信回線を介して受信し、楽曲リストの中から所望の楽曲を指定し、当該指定された楽曲を示す情報を通信回線を介して送信するようにしたことにより、通信相手側にある楽曲を通信回線を介して容易に指定することができる。

【図面の簡単な説明】

【図１】本発明による音楽提供サービスシステムの構成を示すブロック図である。

【図２】音響受信装置の構成を示すブロック図である。

【図３】音響受信装置の使用形態の説明に供する略線図である。

【図４】音響受信装置の送受信部の構成を示すブロック図である。

【図５】音響受信装置の音響入出力部の構成を示すブロック図である。

【図６】ＰＨＳ基地局の構成を示すブロック図である。

【図７】データ処理回路のデータ復号ブロックの構成を示すブロック図である。

【図８】音楽提供サービスのためのメニュー画面を示す略線図である。

【図９】音楽提供サービスを受けているときの曲名表示画面を示す略線図である。

【図１０】音楽提供サービスを受けているときの歌詞表示画面を示す略線図である。

【図１１】プログラムモードのときの表示画面及び仮想文字テーブルを示す略線図である。

【図１２】プログラムモードにおいて曲名リストを表示したときの表示画面を示す略線図である。

【図１３】プログラムモードで指定した曲の曲名ファイルを示す略線図である。

【図１４】プログラムモードで曲を指定するときの手順を示すフローチャートである。

【図１５】音楽提供サービスを受ける際の手順を示すフローチャートである。

【図１６】音響受信装置の外観構成を示す斜視図である。

【図１７】回転押圧式の操作子の動作の説明に供する略線図である。

【図１８】第２の実施の形態による受信側のシステム構成を示す略線図である。

【図１９】第２の実施の形態による音響受信装置の構成を示すブロック図である。

【図２０】第３の実施の形態による音響受信装置の使用形態を示す略線図である。

【図２１】第３の実施の形態による音響受信装置の構成を示すブロック図である。

【図２２】第３の実施の形態におけるワイヤレスタイプのイヤホンの構成を示すブロック図である。

【図２３】他の実施の形態による操作子を示す略線図である。

【符号の説明】

１……音楽提供サービスシステム、２……サービスセンタ、３……ＰＨＳ基地局、４、７０、８０……音響受信装置、４Ａ……本体ケース、５、３１……送受信部、５Ａ……無線送信部、５Ｂ……無線受信部、６……音響入出力部、７、７１……表示部、８……記憶部、９……操作部、９Ａ……通話キー、９Ｂ……通話終了キー、９Ｃ……テンキー、９Ｄ……ジョグダイアル、１０……制御部、１１……データバス、１２……ユーザ、１３、８１……イヤホン、１４、８１Ｂ……リモート操作子、２１……音声信号処理回路、２２……時分割多重回路、２３……変調回路、３０、５２、７６、８１Ｃ、８３……アンテナ、４０……復調回路、４３……データ処理回路、４５……受信パケット処理部、４６……音響出力部、５０……送信データ処理部、５３……受信データ処理部、５５……離散コサイン変換回路、５６……特徴情報抽出回路、５７……インターリーブ回路、５８……重み係数生成回路、５９……ベクトル量子化回路、６０……符号化回路、６２……データ復号ブロック、６３……復号化回路、６４……デインターリーブ回路、６５……特徴情報復元回路、６６……情報復元回路、６７……離散コサイン逆変換回路、７２……音響機器本体、７４……リモートコントローラ、７５……脳磁電波発生・変調部、７７……赤外線受光部、７８……赤外線受信処理部、８１

A…通信部、82…微弱電波送受信部、90、91　…操作子。

【図1】

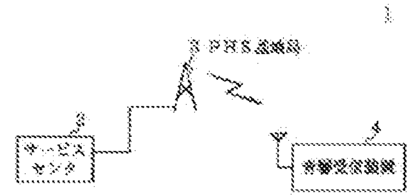


図1　音楽提供サービスシステムの全体構成

【図2】

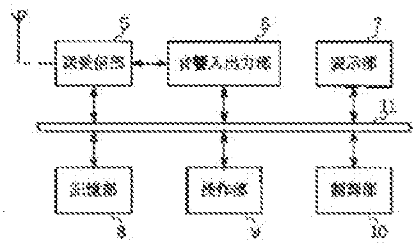


図2　音響受信装置の全体構成

【図9】

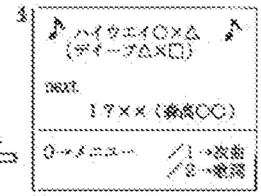


図9　曲名表示画面

【図3】

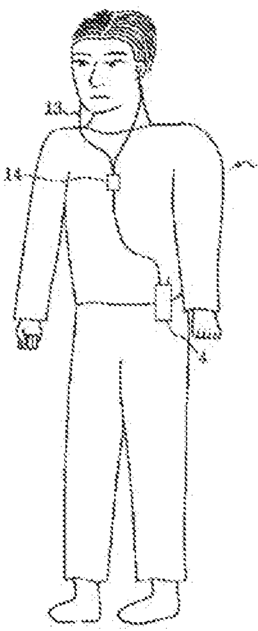


図3　音響受信装置の使用形態

【図4】

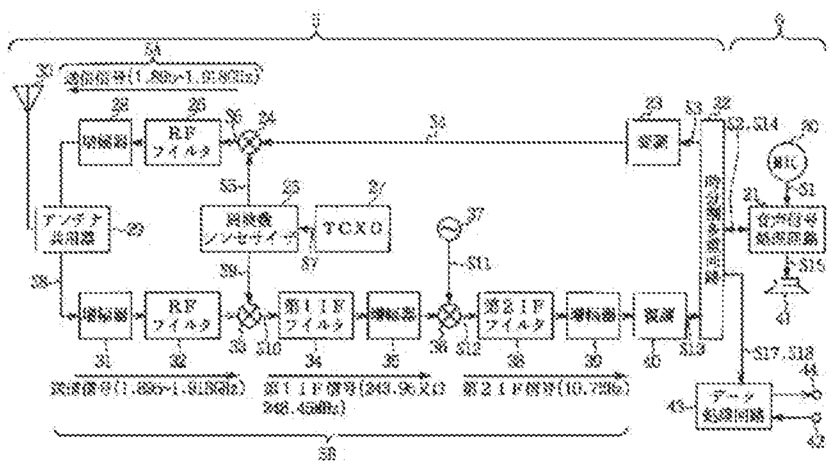


図4　送受信部の構成

【図5】

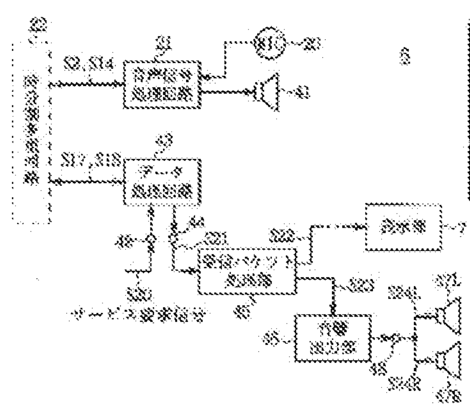


図5　音響入出力部の構成

【図10】

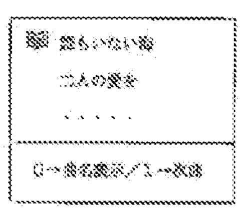


図10　歌詞表示画面

【図17】

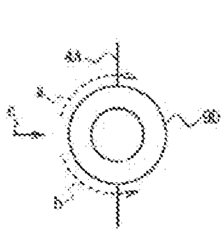


図17　回転操作子の構成

【図6】

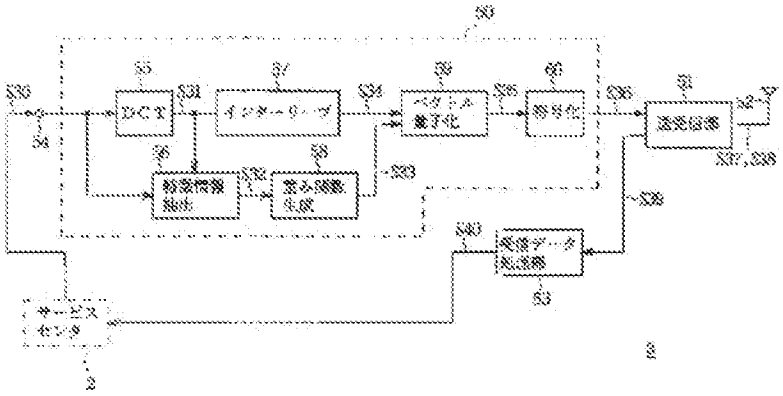


図6　PHS基地局の構成

【図7】

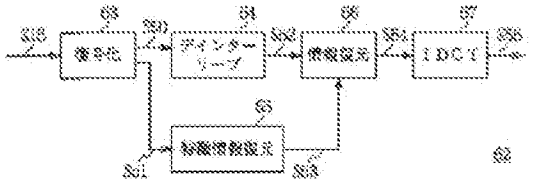


図7　データ処理装置のデータ復号ブロック

【図8】

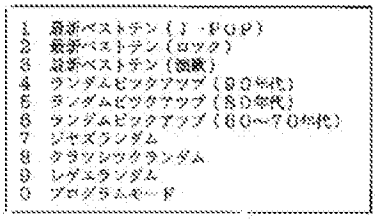
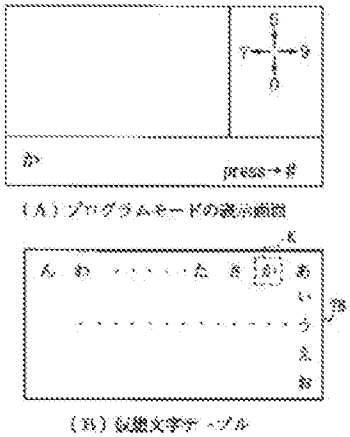


図8　メニュー画面

【図11】



（A）プログラムモードの表示画面

（B）仮想文字テーブル

図11　プログラムモードの表示画面及び仮想文字テーブル

【図12】

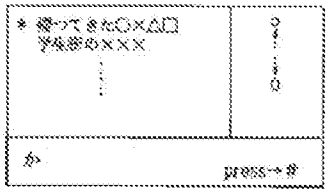


図12　プログラムモードにおける曲名リストの表示

【図13】

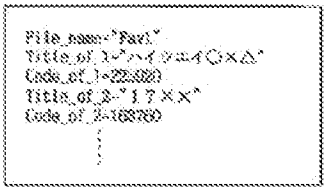


図13　プログラムモードで指定した曲名ファイル

【図１４】

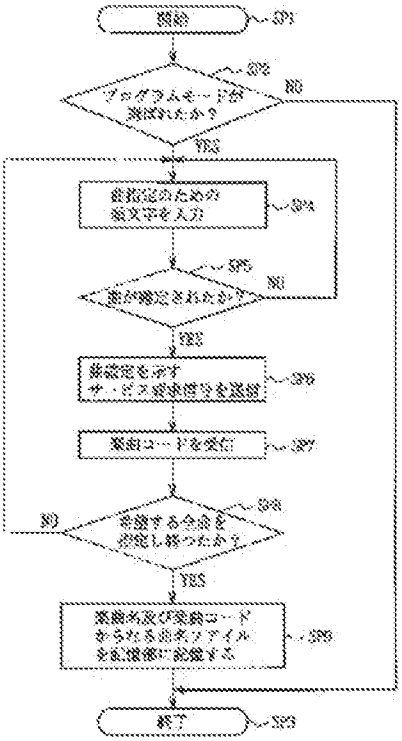


図１４　曲指定手順

【図１５】

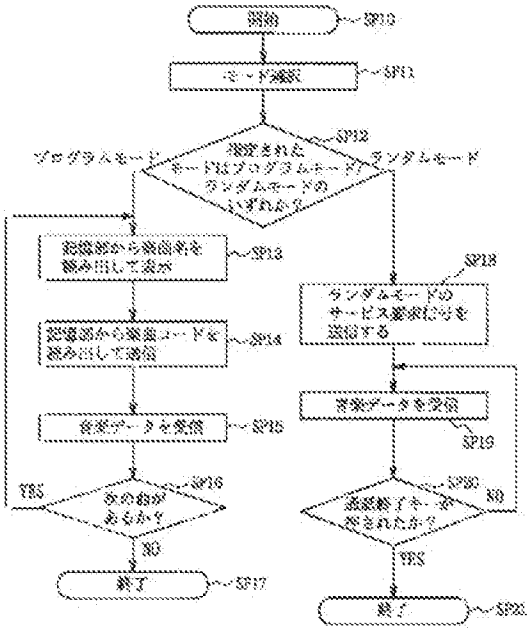


図１５　音楽提供サービスを受ける際の手順

【図１６】

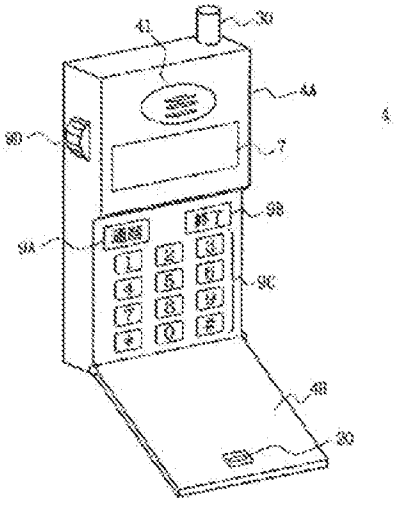


図１６　音響受信装置の外観構成

【図１９】

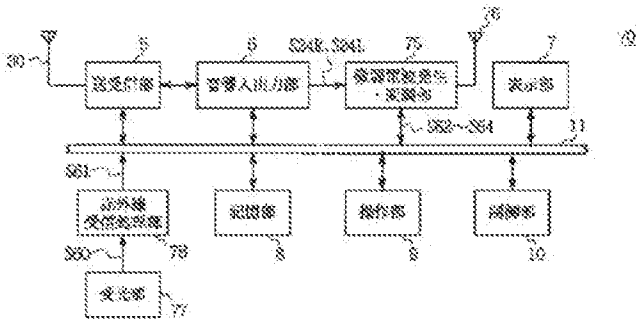


図１９　第２の実施の形態による音響受信装置の構成

【図18】

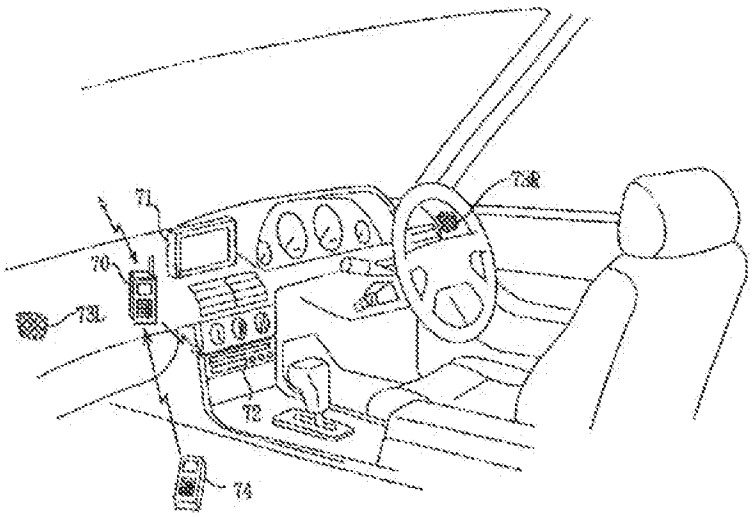


図18　第2の実施の形態による受信機のシステム概観

【図20】

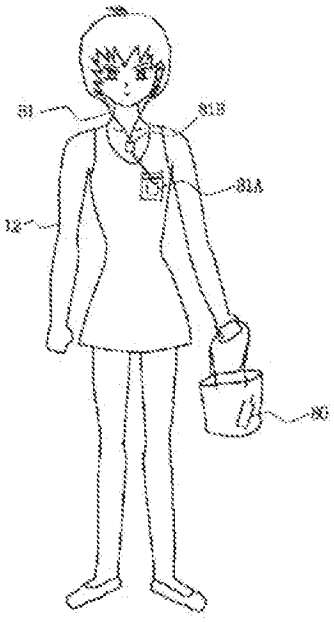


図20　第3の実施の形態による使用形態

【図21】

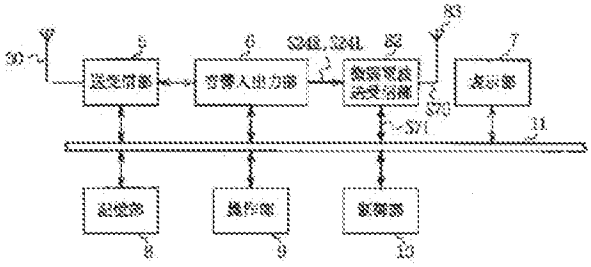


図21　第3の実施の形態による音響受信装置の構成

【図22】

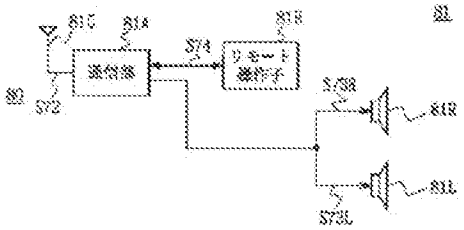


図22　ワイヤレスタイプのイヤホン

【図23】

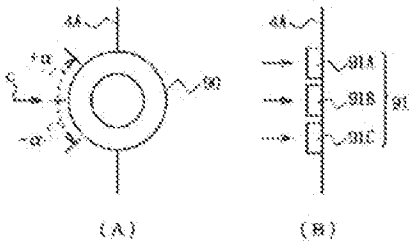


図23　他の実施の形態による操作子

(19) Japanese Patent Office (JP) (12) **Unexamined Patent Publication Bulletin** (A) (11) patent application laid-open disclosure number

H11-242686 (1999)

(43) Date of Publication: September 7, Heisei 11 (1999)

(51) Int. Cl.[6]	Domestic classification symbol	FI		
G06F 17/30	351	G06F	15/40	310F
13/00			13/00	351E
			15/40	310Q
				370E
			15/401	310D

Request of examination: Not requested yet Number of claims 20 OL (total 27 pages)

continuing to the last page

(21) Patent application H10-45116

(22) Filing date February 26, 1998 (Heisei 10)

(71) Patent Applicant 000002185
SONY Corporation
6-7-35 Kitashinagawa, Shinagawa-ku, Tokyo

(72) Inventor Takashi Kumagai
C/O SONY Corporation
6-7-35 Kitashinagawa, Shinagawa-ku, Tokyo

(72) Inventor Toshiyuki Arai
C/O SONY Corporation
6-7-35 Kitashinagawa, Shinagawa-ku, Tokyo

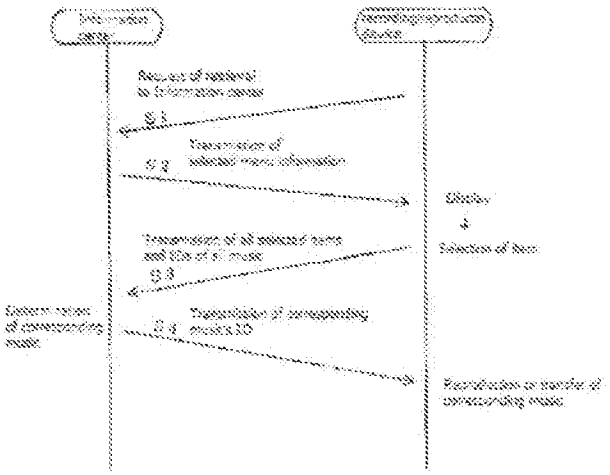
(74) Agent Atsuo Waki, Patent attorney
and one other

(54) [Title of the invention] INFORMATION DELIVERY SYSTEM, TERMINAL APPARATUS AND FILE PROCESSING METHOD

(57) Abstract

[PROBLEM TO BE SOLVED] To provide a user with an easy and diversified selection method of a stored file from a database incorporated in a terminal apparatus.

[SOLUTION] A classification database means, wherein a large number of data files (for example, musical compositions) are classified according to diversified categories, is provided to an information center so that information retrievals can be executed using retrieval object information transmitted from a terminal side and the classification database means in the information center. Also, in exchange of transmitting the retrieval object information from a user-side terminal to the information center, it is enabled that the user can obtain the result of retrieval, which matches the user's retrieval object information within the user's data files. For example, the data files in the classification database means are classified according to a variety of phenomena such as a season, time, event, mood, conditions and the like so that the user can process the data files (reproduction, transfer etc.,) selected in accordance with the user's mood or condition by only designating the item of classification corresponding the user's mood or condition.



[Claims]

[Claim 1] An information delivery system comprising an information center and a terminal apparatus capable of communicating with the information center, wherein the information center comprises:

a classification database means storing classification information according to classification items on a plurality of data files;

a receiving means at the center side capable of receiving retrieval object information from the terminal apparatus;

an information retrieving means capable of executing data file retrieval by using the retrieval object information received at the center and the classification database means; and a transmitting means at the center side capable of transmitting the result of retrieval from the information retrieval means, and

the terminal apparatus comprises:

a storing means to store a plurality of data files;

a transmitting means at the terminal side capable of transmitting the retrieval object information to the information center;

a receiving means at the terminal side capable of receiving the result of retrieval from the information center; and

a file processing means capable of executing predetermined processing of data files corresponding to the result of retrieval received by the receiving means at the terminal side.

[Claim 2] The information delivery system according to Claim 1, wherein the terminal apparatus is provided with a selecting means capable of selecting classification item to be the target of the retrieval within the classification items stored in the classification database means; the retrieval object information transmitted by the transmitting means at the terminal side comprises the selected classification item selected by the selecting means and identification information of each data file stored in the storing means; the information retrieving means retrieves the classification database means to find classified data files corresponding to the data files identified from the identification information transmitted from the transmitting means at the terminal apparatus side within the classification items matching those transmitted from the transmitting means at the terminal side and;

the transmitting means at the center side transmits the identification information of data files retrieved by the information retrieving means as the result of information retrieval.

[Claim 3] The information delivery system according to Claim 1, wherein the file processing means reads out data files corresponding to the result of retrieval received by the receiving means at the terminal side to reproduce and output them.

[Claim 4] The information delivery system according to Claim 1 comprising: a connecting means capable of connecting the terminal apparatus to enable the terminal apparatus to communicate information; and a data-file-storage device capable of storing data files, wherein the file processing means reads out data files corresponding to the result of retrieval received by the receiving means at the terminal side to supply to the data-file-storage device so that the data files are stored in the storing means in the data-file-storage device.

[Claim 5] The information delivery system according to Claim 4, wherein a reproducing means capable of executing reproduction and outputting of data files stored in the storing means in the data-file-storage device is provided to the data-file-storage device

[Claim 6] An information delivery system comprising an information center and a terminal apparatus capable of communicating with the information center, wherein the information center comprises:

a classification database means storing classification information according to classification items on a plurality of data files;

a receiving means at the center side capable of receiving retrieval object information from the terminal apparatus;

an information retrieving means capable of executing data file retrieval by using the retrieval object information received at the center and the classification database means; and a transmitting means at the center side capable of transmitting the result of retrieval from the information retrieval means, and

the terminal apparatus comprises:

a storing means to store a plurality of data files;

a transmitting means at the terminal side capable of transmitting the retrieval object information to the information center;

a receiving means at the terminal side capable of receiving the result of retrieval from the information center;

a classified-item-storing/processing means to store classification items received by the receiving means at the terminal side so as to correspond to respective data files stored in the storing means; and

a file processing means capable of executing predetermined processing of data files by using stored classification items corresponding to the respective data files.

[Claim 7] The information delivery system according to Claim 6, wherein the retrieval object information transmitted by the transmitting means at the terminal side is identification information of the respective data files stored in the storing means; the information retrieving means retrieves respective classification items corresponding to the respective data files identified from the identification information transmitted from the transmitting means at the terminal side; and

the transmitting means at the center side transmits the respective classification items for the respective data files retrieved by the information retrieving means.

[Claim 8] The information delivery system according to Claim 6, wherein a selecting means is provided to the terminal apparatus; and

the file processing means reads out data files corresponding to the result of retrieval received by the receiving means at the terminal side to reproduce and output them.

[Claim 9] The information delivery system according to Claim 8, wherein a selecting means is provided to the terminal apparatus; a connecting means capable of connecting the terminal apparatus to enable the terminal apparatus to communicate information is provided;

a data-file-storage device comprises a storing means capable of storing data files is provided; and the file processing means reads out data files stored so as to correspond to classification items selected by the selecting means from the storing means in the data-file-storage device.

[Claim 10] The information delivery system according to Claim 9, wherein a reproducing means capable of executing reproducing and outputting processing of data files stored in the storing means in the data-file-storage device is provided to the data-file-storage device.

[Claim 11] A terminal apparatus comprising:

a storing means capable of storing a plurality of data files;

a transmitting means capable of transmitting retrieval object information to the outside information center;

a receiving means capable of receiving a result of retrieval transmitted from the information center; and

a file processing means capable of executing predetermined processing of data files corresponding to the result of retrieval received by the receiving means at the terminal side.

[Claim 12] The terminal apparatus according to Claim 11, wherein a selecting means capable of selecting classification items to be the retrieval object information is provided; and

the retrieval object information transmitted by the transmitting means at the terminal side comprises the classification items selected by the selecting means and identification information of the respective data files stored in the storing means.

[Claim 13] The terminal apparatus according to Claim 11, wherein the file processing means reads out data files corresponding to the result of retrieval received by the receiving means from data files stored in the storing means to reproduce and output them.

[Claim 14] The terminal apparatus according to Claim 11 wherein the file processing means reads out data files corresponding to the result of retrieval received by the receiving means from data files stored in the storing means and supplies them to outside data-file-storage device for the storage thereof.

[Claim 15] A terminal apparatus comprising:

a storing means capable of storing a plurality of data files;

a transmitting means capable of transmitting retrieval object information to the outside information center;

a receiving means capable of receiving a result of retrieval transmitted from the information center;

a file processing means capable of executing predetermined processing of data files corresponding to the result of retrieval received by the receiving means at the terminal side; and

a file processing means capable of executing predetermined processing by using classification items stored so as to correspond to the respective data files.

[Claim 16] The terminal apparatus according to Claim 15, wherein the retrieval object information transmitted by the transmitting means is identification information of the respective data files stored in the storing means.

[Claim 17] The terminal apparatus according to Claim 15, wherein a selecting means to select classification items is provided; and the file processing means reads out data files stored in the storing means so as to correspond to the respective classification items selected by the selecting means to reproduce and output them.

[Claim 18] The terminal apparatus according to Claim 15 wherein a selecting means to select classification items is provided; and the file processing means reads out data files stored in the storing means so as to correspond to the respective classification items selected by the selecting means and supplies them to outside data-file-storage device for the storage thereof.

[Claim 19] A file processing method for a system, in which a mutual information communication between a terminal apparatus storing a plurality of data files and an information center comprising a classification database storing classification information according to classification items of a plurality of data files is enabled, wherein the following operation procedures are performed: a selecting operation procedure at the terminal apparatus side to select classification items to be the retrieval object information in the classification database means;

a first transmitting operation procedure to transmit the classification items selected by the selecting operation procedure and identification information of stored respective data files from the terminal apparatus side;

a first receiving means at the information center side to receive the classification items and the identification information transmitted by the first transmitting operation procedure;

a retrieving operation procedure at the information center side to execute the retrieval of data files by using the classification items and identification information received by the first receiving operation procedure and the classification database means;

a second transmitting operation procedure to transmit the identification information of data files as the result of retrieval by the retrieval operation procedure from the information center;

a second receiving operation procedure at the terminal side equipment to receive the identification information transmitted by the second transmitting operation procedure; and

a file processing operation procedure at the terminal apparatus side to execute predetermined processing of data files corresponding to the identification information received by the second receiving operation procedure.

[Claim 20] A file processing method for a system, in which a mutual information communication between a terminal apparatus storing a plurality of data files and an information center comprising a classification database storing classification information according to classification items of a plurality of data files is enabled, wherein the following operation procedures are performed: a first transmitting operation procedure to transmit the classification items selected by the selecting operation procedure and identification information of stored respective data files from the terminal apparatus side;
a first receiving means at the information center side to receive the classification items and the identification information transmitted by the first transmitting operation procedure;
a retrieving operation procedure at the information center side to execute the retrieval of classification items of data files by using the identification information received by the first receiving operation procedure and the classification database means;
a second transmitting operation procedure to transmit the classification items of data files as the result of retrieval by the retrieval operation procedure from the information center;
a second receiving operation procedure at the terminal apparatus side to receive the classification items transmitted by the second transmitting operation procedure;
a classified-item-storing operation procedure at the terminal apparatus side to store the classification items received by the second receiving operation procedure so as to correspond to stored respective data files;
a selecting operation procedure at the terminal apparatus side to select classification items;
and
a file processing operation procedure at the terminal apparatus side to execute predetermined processing of data files stored so as to correspond to classification items selected by the selecting operation procedure.
[Detailed description of the invention]
[0001]
[Field of the invention] The present invention relates to an information center, an information delivery system comprising the information center and a terminal apparatus capable of communicating with the information center, the terminal apparatus, and a file processing method using the information delivery system.
[0002]
[Description of the related art] A variety of devices are spreading as audiovisual apparatuses owned by users and it has becoming popular to individually enjoy music software or visual software. For example, users can own audio systems using disk recording media such as CDs (compact discs) or MD (minidiscs) to reproduce their favorite CDs or MDs after purchasing them or they can produce original disks by copying favorite music compositions on MDs which are recordable media.
[0003]
[Problems to be solved by the invention] Development of a recording/reproducing apparatus as a novel audiovisual device capable of accumulating audio data files or video data files, for example using high-capacity media such as a hard disk, has been advanced. For example, a user can dub musical compositions recorded on his package media such as CDs on a hard disk in the novel audiovisual device to be developed. By using high-capacity recording media such as hard disks, for example, all musical compositions recorded on a large number of CDs owned by the user can be stored in the recording/reproducing apparatus.
[0004] Thus, the user does not need to find a CD recording the music, which he wants to reproduce and load it in the recording/reproducing apparatus for the reproduction but he can simply designate the music so that the music can be read out from a hard disk for the reproduction. Therefore, this system would be particularly convenient for a user having a large number of CDs. Furthermore, since changing of CDs would not be necessary, it can be easily achieved that a user can enjoy musical compositions by simply selecting them for example in accordance with his mood and condition of the day.
[0005] Additionally, if a portable recording/reproducing device capable of transferring or copying musical components from the hard disc of the recording/reproducing apparatus is provided, it is enabled to select and copy only desired musical components from a large number of musical components onto the portable device for their reproduction. Particularly, if a hard disk or flash memory is used as the recording medium for the portable recording/reproducing device, the transfer or copying of musical components can be achieved instantaneously; therefore for example such a usage style that a user can select musical components in accordance with his mood and condition and transfer them to or copy them onto the portable recording/reproducing device to enjoy the reproduction thereof by the portable recording/reproducing device on a daily basis. For example, in cases in which desired musical components for a user are recorded on a plurality of CDs or MDs, the user has to carry all CDs or MDs with him for the reproduction of desired musical components using a conventional portable reproducing device (CD player or MD player); however the realization of above-described portable recording/reproducing device would eliminate the trouble.
[0006] Thus, users may be able to easily enjoy musical components by using above-described recording/reproducing apparatus and portable recording/reproducing device; however, following problems may occur with the usage thereof. For example, in cases in which considerably large number of musical components is stored in a hard disk of the above-described recording/reproducing apparatus, the selection of desired musical components or selecting operation of musical components which the user wants to transfer or copy may become troublesome. Meanwhile, in order to eliminate the troublesome selecting operation, it may be effective to classify each musical component according to the genre or artist; however, actually such classifications may not be necessarily effective for the user to select musical components in accordance with his personal fancy, mood, schedule, condition and the like. Furthermore, the addition of the advanced retrieval function for the selecting operation of musical components to the recording/reproducing apparatus may result in the higher production cost and enlargement thereof; therefore such apparatus may not be relevant as the apparatus used by an average user.
[0007] In consideration of above-described problems, the objective of the present invention is to provide a method which enables a user to appropriately and easily select musical components from a large number of data files such as music data stored in a hard disk and the like in accordance with his mood, condition, etc.

[0008] To achieve the objective, an information delivery system comprising an information center and a terminal apparatus capable of communicating with the information center is constructed in the present invention. The information center is provided with a classification database means storing classification information according to classification items on a plurality of data files, a receiving means at the center side capable of receiving retrieval object information from the terminal apparatus, an information retrieving means capable of executing data file retrieval by using the classification database means and a transmitting means at the center side capable of transmitting the result of retrieval from the information retrieval means. Additionally, the terminal apparatus is provided with a storing means to store a plurality of data files, a transmitting means at the terminal side capable of transmitting the retrieval object information to the information center, a receiving means at the terminal side capable of receiving the result of retrieval from the information center and a file processing means capable of executing predetermined processing of data files corresponding to the result of retrieval received by the receiving means at the terminal side.

[0009] That is, the information center is provided with the classification database in which respective data files of music components recorded on commercially available CDs are classified according to diversified classification items so that the user side can select and designate certain classification items in the classification database by using the terminal apparatus. Then the information center retrieves data files which are included in the selected classification items and also owned by the user in his terminal apparatus (i.e., data files stored in the storing means) and transmits the result to the terminal apparatus. Thus, by providing the information center with the classification database for retrieval, a very advanced retrieval is realized and the terminal apparatus can simply request retrieval by transmitting classification items and identification information on stored data files to the information center. And once receiving the result of retrieval from the information center, the processing of data files such as reproduction or transfer to other device according to a desired condition for the user is enabled based on the result. Therefore, the necessary selection operation for the user is to simply select the classification items in accordance with his mood or condition.

[0010] Additionally, an information delivery system comprising an information center and a terminal apparatus capable of communicating with the information center is constructed in the present invention. The information center is provided with a classification database means storing classification information according to classification items on a plurality of data files, a receiving means at the center side capable of receiving retrieval object information from the terminal apparatus, an information retrieving means capable of executing data file retrieval by using the classification database means and a transmitting means at the center side capable of transmitting the result of retrieval from the information retrieval means. Additionally, the terminal apparatus is provided with a storing means to store a plurality of data files, a transmitting means at the terminal side capable of transmitting the retrieval object information to the information center, a receiving means at the terminal side capable of receiving the result of retrieval from the information center, a classified-item-storing means capable of storing classification items received by the receiving means at the terminal apparatus side so as to correspond to respective data files stored in the storing means and a file processing means capable of executing predetermined processing of data files corresponding to the result of retrieval received by the receiving means at the terminal side.

[0011] That is, the information center is provided with the classification database in which respective data files of music components recorded on commercially available CDs are classified according to diversified classification items so that the information center can retrieve data files owned by the user in his terminal apparatus (i.e., data files stored in the storing means) for their classification items and transmit the respective classification items of data files to the terminal apparatus. Then, classification items corresponding to respective data files transmitted from the information center in the terminal apparatus side. Therefore, at the time the user uses the terminal apparatus, by only selecting certain classification items, the terminal apparatus can extract data files corresponding to the selected classification items from all data files stored in the storing means so the predetermined processing of files can be executed. In this case, by providing the classification database for retrieval to the information center, information retrieval according to diversified classification items can be achieved (i.e., it is enabled to provide the terminal apparatus with diversified classification items for retrieval.) Therefore, the necessary selection operation for the user is to simply select the classification items in accordance with his mood or condition and thereby the processing of data files such as reproduction or transfer to other device according to a desired condition for the user is enabled.

[0012]

[Embodiments of the invention] Hereafter, the information delivery system, the information center 1 and recording/reproducing apparatus 10 which are configuring the information delivery system and furthermore a portable device 50 which is connectable with the recording/reproducing apparatus 10 shall be explained. The explanation shall be performed according to the following sequence.

1. Summary of the information delivery system
2. Example of appearances of the recording/reproducing device and the portable device
3. Internal constitution of the recording/reproducing device
4. Internal constitution of the portable device
5. Processing of the file migration
6. Storing mode of files in the recording/reproducing device
7. First example of the operation for file selection
8. Second example of the operation for file selection

[0013] Summary of the information delivery system

Figure 1 shows the summary of the information delivery system according to the embodiment of the present invention. The information delivery system is constituted by the recording/reproducing apparatus 10 used at a house 2 of an average user and the information center as an information service organization concerning the usage of recording/reproducing device 10. It is enabled that the information center 1 and recording/reproducing apparatus 10 can mutually communicate various information through a communication line 3. The communication line may be a public network such as an ISDN network or a leased line network for the system and the mode of network is not particularly limited. Additionally, the information delivery system may be configured by a satellite communication line comprising a communication satellite 4 and parabola antennas 5 installed to each house 2 so as to enable information communication between the information center 1 and each recording/reproducing apparatus 10.

[0014] The recording/reproducing apparatus 10 used by an average user shall be explained in detail below, but is provided with a large capacity data storing unit (e.g., a hard disk drive 15 shown in Figure 3) therein as well as with a drive function of package media such as CDs or MDs, inputting function of data from other devices, inputting function of data through a communication line and the like. Therefore, it can store audio data, visual data and other various data reproduced from CDs, CD-ROM, MDs purchased by the user and other various data inputted from other devices or through the communication line as files.

[0015] Thereby, the user can freely reproduce any stored file (e.g., for music component, one song is stored as one file.) Therefore, if the user once stores all music components recorded in a large number of CDs that he owns as files, he can reproduce any desired music component without selecting and loading the CD wherein the desired music component is recorded.

[0016] The information center can provide various information to the recording/reproducing apparatus 10 as described above with or without charging fee. For example, the information center can provide information on files of musical components stored in the recording/reproducing apparatus 10 including text data such as song titles, artist names, lyrics and the like, image data such as images accompanied with songs, images of artists and the like and data on copyrights such as names of concerned parties such as lyric writers, composers, creators and the like. For example, the recording/reproducing apparatus 10 can store the information provided from the information center so as to correspond to files of musical components in order to utilize the information for various operations such as display. Additionally, it is also possible for the information center 1 to transmit audio data itself, i.e., musical components to the recording/reproducing apparatus 10 to make the recording/reproducing apparatus 10 store them as files; thus it is enabled to establish another sales system for musical components which is different from a conventional sales of CDs as package media.

[0017] The details shall be described below, but in this embodiment, the information center 1 comprises a database wherein musical components recorded on commercially available CDs are classified according to predetermined classification items so that the user of the recording/reproducing apparatus 10 can utilize the retrieval service using the classification database at the information center 1 for example through a communication line 3. That is, the retrieval of own musical components (files stored in the recording/reproducing apparatus 10) can be implemented by using the information center 1.

[0018] Additionally, in this embodiment, a portable recording/reproducing device (hereafter, portable device) 50, which is connectable to the recording/reproducing apparatus 10 is provided to a user. The details on the portable device 50 shall be described below, but it comprises data file storing unit (for example, a hard disk drive (or a flush memory) in Figure 4) 54 capable of storing files such as audio data therein. When connected to the recording/reproducing apparatus 10, files (musical components and the like) stored in the recording/reproducing apparatus 10 can be transferred to or copied onto the data file storing unit in the portable device 50. Needless to say but files stored in the data file storing unit in the portable device 50 can also be transferred to or copied onto the data file storing unit in the recording/reproducing apparatus 10.

[0019] Any files stored in the recording/reproducing apparatus 10 can be transferred to or copied onto the portable device 50 by the user to utilize them in the portable device 50. For example, user can listen to musical components outside of home after transferring the files of the musical components to the portable device 50.

[0020] Example of appearances of the recording/reproducing device and the portable device

Figure 2 shows one example of the appearances of the recording/reproducing apparatus 10 and the portable device 50. Meanwhile, what is explained here is only one example, and other modifications may be possible for the appearance of each device, configurations of the user interface (configurations for operations and displays), connecting mode between the recording/reproducing apparatus 10 and the portable device 50 and the like.

[0021] As shown in Figure 2, in this embodiment the recording/reproducing apparatus 10 is so-called a radio-cassette recorder so as to suit to the use at home. Of course, a component type is also usable. Operational keys, operational knobs, rotating keys referred to as jog dials are provided as a variety of operators Ka to the front panel and the like of the recording/reproducing apparatus. Speakers 35 to output reproduced sounds and a display part 24 to display various information are provided as outputting parts for a user. For example, the display part is formed by a liquid crystal panel.

[0022] A CD inserting part 17 is provided to insert CD system disks for the reproduction of CD system disks (audio CD, CD-ROMs, CD texts etc.) by the recording/reproducing apparatus 10 or dubbing of data onto the internal hard disk which shall be described below.

In a similar manner, an MD inserting part 18 is provided to insert MD system disks for the reproduction/reproduction [note by the translator: as per original] of MD system disks (audio MD, MD data etc.) by the recording/reproducing apparatus 10 or dubbing of data onto the internal hard disk.

[0023] Additionally, a variety of terminals ta to be connected to other devices are provided. These terminals can serve as portions to be used for the connection with a microphone or headphone, as connecting terminals, optical digital terminals or interface connecters with other audiovisual device, personal computer and the like.

[0024] As means of inputting operations, a keyboard 90 or a remote commander 91 are provided in addition to the operators Ka. The keyboard 90 can be connected to the recording/reproducing apparatus 10 through a keyboard connector as a terminal ta, or in cases in which an infrared ray transmitting part is installed in the keyboard 90, the operational information from the keyboard 90 can be outputted as infrared rays to be inputted in the recording/reproducing apparatus 10 through a light-receiving portion 21. The remote commander 91 can output the operational information for example in an infrared ray system. The operational information in terms of infrared rays can be inputted in the recording/reproducing apparatus 10 through the light-receiving portion 21. Meanwhile, when a wireless system is applied to the keyboard 90 or for the output of operational information from the remote commander 91, radio waves can be used instead of infrared rays.

[0025] Additionally, a PCMCIA slot 39 is formed on the recording/reproducing apparatus 10 so that data transactions by using the installed PCMCIA card are enabled.

[0026] The portable device is made small and light to suit to the portable use by the user. Operational keys and the like are provided to the portable device 50 as operators Kb for various operations by the user. Even though they are not illustrated, jog dials and the like may be also provided. Speakers 58 to output reproduced sounds and a display part 57 to display various information are provided as outputting parts for the user. For example, the display part 57 is formed by a liquid crystal panel.

[0027] Additionally, a variety of terminals tb to be connected to other devices are provided. These terminals can serve as portions to be used for the connection with a microphone or headphone, as connecting terminals, optical digital terminals or interface connecters with other audiovisual device, personal computer and the like. For example, when the user carries the portable device, the user can listen to the reproduced music from the speaker 58 as well as from a headphone 92 connected to a headphone terminal among terminals tb.

[0028] By connecting the recording/reproducing apparatus 10 with the portable device 50, it is enabled to perform a variety of data communications (real file data such as audio data etc. and control data for the processing thereof at the time of communication) between the recording/reproducing apparatus 10 and the portable device 50. In this embodiment, the recording/reproducing apparatus 10 is provided with an attaching part MT having a connecter so that the portable device 50 is connected to the recording/reproducing apparatus 10 by loading it in the attachment part MT. When the portable device 50 is loaded in the recording/reproducing device 10, a connector 60 arranged on the bottom of the portable device 50 and the connector 27 in the attaching part MT can be mutually connected and the data communications between two devices are performed through the connectors 60, 27. Meanwhile, the connection between recording/reproducing apparatus 10 and the portable device 50 may be achieved by a line connection system using a communication cable or a wireless system.

[0029] Internal constitution of the recording/reproducing apparatus 10

Subsequently, the internal constitution of the recording/reproducing apparatus 10 shall be explained by referring to Figure 3. Touch-tone or rotating operators are provided to the recording/reproducing apparatus 10 as a panel operating part 20. The operators herein are equivalent to various operators Ka in Figure 2. That is, they are various operators disposed on the device chassis. Meanwhile, it was not explained in Figure 2, but in addition to the display of operational keys on the display part 24, a touch-panel operators may be formed by providing a touch detecting mechanism on the display part 24, and these touch-panel operators are also included in the panel operating part 20 in Figure 3. By the operation of the panel operating part 20, operation signals to execute various operations of the recording/reproducing apparatus 10 are transmitted and the recording/reproducing apparatus 10 is operated according to the operation signals.

[0030] For example, to make the input operation of names of musical components corresponding to the recorded audio information or name of artists easy, the keyboard 90 or the remote commander 91 can be used; also by connecting the keyboard 90 to a USB (universal serial bus) terminal ta6, the inputting by the keyboard 90 is enabled. That is, by supplying the input signal (operation signal) from the keyboard 90 through the USB terminal ta6 to the USB driver, the signals can be inputted in the recording/reproducing device 10. Meanwhile, each of various terminals ta1 to ta7 corresponds to one of terminals ta shown in Figure 2, respectively.

[0031] Additionally, it is configured that the operation signals in terms of infrared rays transmitted from the remote commander 91 (and operation signal transmitted from the keyboard 90 when set to output infrared rays) are converted from light to electricity at the light-receiving part 21 to be supplied to an infrared ray interface driver 22 so that they can be taken in the recording/reproducing device 10.

[0032] Meanwhile, it also may be configured so that the data output and transfer is performed through the infrared ray interface driver 22 or a USB driver 23.

[0033] The recording/reproducing apparatus 10 is provided with a RAM 13, ROM 12 and a flush memory 14 which configure a regular personal computer, and the entire operation control is performed by a CPU 11. The communication of file data or control data between each block is performed through a bus B1.

[0034] The ROM 1 stores a program and the like to control the operations of the recording/reproducing apparatus 10 according to input signals inputted by the operation of the panel operating part 20 (or input signals from the keyboard 90 or the remote commander 91.) Data area and task area for the execution of the program can be temporarily set on the RAM 13 and flush memory 14. Or, the ROM 12 stores a program loader and thereby the program itself can be loaded in the flush memory 14.

[0035] Once an optical disk of CD system (audio CD, CD-ROM, CD text etc.) is loaded in the CD-ROM drive 17 through the above-mentioned CD inserting part 17, the information recorded on the optical disc is read out by an optical pickup with a single speed or higher than a single speed for example such as 16X or 32X speed. Additionally, once an optical disk of MD system (audio MD, MD data etc.) is loaded in the MD drive 17 through the above-mentioned MD inserting part 18, the information recorded on the optical disc is read out by an optical pickup. Or, information can be recorded on the disk loaded therein. Meanwhile, in this embodiment, the CD-ROM drive 17 and MD drive 18 are provided; however it is also allowed to provide either one of them or to provide other drive corresponding to other information storing media (e.g. magnet-optical disks referred to as MOs, optical disks of other systems, magnetic disks, memory cards etc.)

[0036] As a high-capacity storing means in the recording/reproducing apparatus 10, a hard disk drive (hereafter, HDD) 15 to record and reproduce information on a hard disk is provided. For example, audio information and the like read out from the CD-ROM drive 17 or MD drive 18 can be stored in HDD 15 as files (e.g. one music component is stored as one file.)

[0037] Additionally, an encoder 28 to perform the encoding of audio data according to ATRAC2 (Adaptive Transform Acoustic Coding 2) and a decoder 29 to decode the encoded audio data according to ATRAC2 (Adaptive Transform Acoustic Coding 2) are provided. The encoder 28 and decoder 29 perform the encoding and decoding of supplied audio data corresponding to the control by the CPU 11. Additionally, a buffer memory 16 is provided to temporarily store the audio data which is the subject of processing. The buffer memory 16 performs the writing/reading-out of data based on the control by the CPU.

[0038] For example, in cases in which the data read out from the disk by the CD-ROM drive 17 is stored in the HDD 15, as the preprocessing for the storage of the audio data in the HDD 15, the audio data read out from the disk is temporarily stored in the buffer memory 16 as well as the same audio data is supplied to the encoder 28 for the encoding thereof according to the ATRAC2. Furthermore, the data encoded by the encoder 28 is again stored in the buffer memory 16 temporarily, and finally the encoded audio data is accumulated in the HDD 15.

[0039] In this embodiment, it is configured that the audio data encoded according to the ATRAC2 by the encoder 28 is accumulated in the HDD 15; however, for example, it is allowed that the data read out from the CD-ROM drive 17 is directly accumulated in the HDD 15.

[0040] The encoder 28 not only encodes data read out from a medium loaded in the CD-ROM drive 17, but also it is configured so that audio signals inputted from a microphone terminal ta3 connected to a microphone or other audio signals inputted from a line input terminal ta2 connected to other device such as a CD player can be inputted therein through an A/D converter 31; these inputted audio data can be encoded by the encoder 28. Furthermore, it is configured that the data inputted from an external device (e.g. a CD player) can be inputted in the encoder 28 through an IEC958 (International Electrotechnical Commission 958) encoder; thus data inputted according to an optical digital system can be also encoded by the encoder 28.

[0041] Then, after encoding the data inputted from an external device, the encoded data can be stored in the HDD 15 in files.

[0042] Meanwhile in the above description, the ATRAC2 (trademark) is used as an encoding algorithm of the encoder 28; however, the algorithm may be any one which can compress the information and it also may be the ATRAC (trademark), MPEG (moving picture coding experts group), PASC (precision adaptive sub-band coding), TwinVQ (trademark), RealAudio (trademark), LiquidAudio or the like.

[0043] Additionally, the recording/reproducing apparatus 10 is provided with a modem 19 which is an interface connectable with an external network including the internet, TEL network, cable TV, wireless network and the like. Request signals, information stored in medium loaded in the CD-ROM drive 17, user ID, user information, user billing information and the like are transmitted to a remote server through the modem 19.

[0044] At the server (a server which is communicable through the communication line 3) side of the external network, operations including a verification by a user ID, processing of billing, retrieval of additional information on musical components from disk information such as titles, name of artists, composers, lyric writers, image of jackets, etc. are performed. All operations are controlled so that predetermined information, which the user requested can be returned to the recording/reproducing apparatus 10 side.

In this embodiment, the example wherein the additive information on musical components is returned; however, it is also possible to configure the system so that musical components requested by the user can be directly downloaded from the external network. Additionally, it is further possible to configure the system so that the information on musical components corresponding to the media information is returned and bonus tracks of predetermined media can be obtained by delivery.

[0045] The audio information accumulated in the HDD 15 is decoded by the decoder 29, and the decoded data can be reproduced and outputted by the speaker 35 through the D/A converter 33 and the amplifier 34. Or it can be reproduced and outputted by a headphone connected to the headphone terminal ta1. In this embodiment, the decoder 29 decodes data according to the ATRAC2; however the decoding algorithm may be any one which can match the encoding algorithm of the encoder 26. Additionally, it is possible that the encoding and decoding are performed by the CPU instead of being performed by the hardware.

[0046] The display unit 24 shown in Figure 2 is provided as an interface for the user to administrate and control files such as audio data accumulated in the HDD 15. The display part 24 is displayed and driven by a display driver 25. Required characters, symbols, icons and the like are displayed on the display part 24 based on the control by the CPU 11. Additionally, folders or jacket images corresponding to audio files (hereafter, for the convenience of explanation, files, wherein audio data on musical components are recorded, are referred to as "audio files") and operations by a pointing device such as a mouse, pen, fingers and the like are enabled. The pointing device is included in the panel operating part 26. For example, such an operation that an audio file designated by the user on the display is reproduced is enabled.

[0047] Additionally, it is possible that selected files are deleted, transferred to or copied onto an external device (e.g. portable device 50) by using the display on the display part 24. Or, it is also possible to configure the display part 24 so as to graphically display an html (hyper text mark up language) document searched and downloaded from the WWW (World Wide Web) site on the internet as the related information based on a TOC (table of contents) information in a medium loaded in the CD-ROM drive 17. Furthermore, the display part 24 can also serve as a usual internet browser.

[0048] The recording/reproducing apparatus 10 is configured so as to take in audio information from a variety of devices or systems, connected to the terminal ta7, such as an IRD for satellite communication, MD player, DVD player, DV player and the like through an IEEE1394 interface 37 and IEEE1394 driver 36. As a further additive function, a PCMCIA (Personal Computer Memory Card International Association) slot 39 is provided through a PCMCIA driver so as to enable the attachment of PCMCIA card thereto; therefore, peripheral devices such as an external memory unit, other media drive, modem, terminal adapter, capture board etc. can be easily connected thereto.

[0049] As described in Figure 2, the recording/reproducing apparatus 10 is provided with the connecter 27 for the connection with the portable device 50. By connecting the connector 27 with the connector 60 of the portable device 50, the CPU 11 is enabled to exchange various information communications with the portable device 50 through the interface driver 28. For example, audio files accumulated in the HDD 15 can be transferred.

[0050] 4. Internal constitution of the portable device

An example of the internal constitution of the portable device is shown in Figure 4. The recording/reproducing apparatus 10 with the portable device 50 can be electrically connected by connecting the connecter 27 and the connector 60. In this state, the interface driver 25 of the recording/reproducing apparatus 10 and the interface driver 59 of the portable device 50 are mutually connected so that the data communication between both devices is enabled.

[0051] The portable device 50 is provided with touch-tone and rotating keys and the like as a panel operating unit 56. That is, a variety of operators Kb shown in Figure 2 correspond to the panel operating part 56. By operating operators Kb as the panel operating part 56, operation signals to command the operations of the portable device 50 are transmitted to a control bus B2 so that the portable device 50 is operated according to the operation signals.

[0052] Additionally, similarly to the case of recording/producing apparatus 10, the portable device 50 is also provided with a RAM 53 and ROM 52 which configure a regular personal computer, and the entire operation control is performed by a CPU 51. The communication of file data or control data between each block is performed through a bus B2.

[0053] The ROM 52 stores a program and the like to control the operations of the portable device 50 according to the operation signals inputted by the operation of the panel operating part 56. Data area and task area for the execution of the program can be temporarily set on the RAM 13 and flush memory 14. Meanwhile, a flush memory may also be installed therein similarly to the case of recording/producing apparatus 10 and the configuration of bus shall not be limited.

[0054] As a storing means in the portable device 50, a hard disk drive (HDD) 54 to record and reproduce information on a hard disk is provided. For example, audio information and the like transferred from the recording/reproducing apparatus 10 can be stored in HDD 54 as files (e.g. one music component is stored as one file.) Meanwhile, a flush memory and the like may be used instead of a HDD as a storing means.

[0055] Additionally, similarly to the case of recording/reproducing apparatus 10, an encoder 61 to perform the encoding of audio data according to ATRAC2 and a decoder 62 to decode the encoded audio data according to ATRAC2 are provided. The encoder 61 and decoder 62 perform the encoding and decoding of supplied audio data corresponding to the control by the CPU 51. Additionally, a buffer memory 55 is provided to temporarily store the audio data, which is the subject of processing. The buffer memory 55 performs the writing/reading-out of data based on the control by the CPU 51.

[0056] For example, in cases in which the audio data not encoded according to ATRAC2 is supplied from the recording/reproducing apparatus 10 through the interface driver 59 to be stored in the HDD 54, as the preprocessing for the storage of the audio data in the HDD 54, the audio data is temporarily stored in the buffer memory 55 as well as the same audio data is supplied to the encoder 61 for the encoding thereof according to the ATRAC2. Furthermore, the data encoded by the encoder 61 is again stored in the buffer memory 55 temporarily, and finally the encoded audio data is accumulated in the HDD 54.

[0057] In this embodiment, it is configured that the audio data encoded according to the ATRAC2 is accumulated in the HDD 54; therefore in cases in which the audio files stored in the HDD 15 are supplied through the interface driver 59 to be stored in the HDD 54 (i.e. transfer or copy of musical components) the processing by the encoder 61 is not necessary. However, it is allowed that the audio data (uncompressed data) read out from a medium loaded in the CD-ROM drive 17 and the like in the recording/reproducing apparatus 10 is directly inputted through the interface driver 59, and in these cases, as processing to record the audio data on the HDD 54, it is necessary to encode the data by the encoder 61 as described above.

[0058] In this embodiment, it is configured so that the audio data encoded according to the ATRAC2 by the encoder 61 is accumulated in the HDD 54; however, for example, it is allowed to directly accumulate the uncompressed data in the HDD 54.

[0059] As the parts to supply the audio data to be compressed to the encoder 61, in addition to the above-described interface driver 59, a microphone terminal tb3, line input terminal tb2, optical digital terminal tb4 and the like are provided. Meanwhile, a variety of terminals tb1 to tb4 in Figure 4 respectively correspond to one of terminals tb in Figure 2.

[0060] The encoder 61 is configured so that audio signals inputted from a microphone terminal tb3 through an amplifier 65 or other audio signals inputted from a line input terminal tb2 connected to other device such as a CD player can be inputted therein through an A/D converter 64; these inputted audio data can also be encoded by the encoder 28 [note by the translator: as per original]. Furthermore, it is configured that the data inputted from an external device (e.g. a CD player) can be inputted in the encoder 61 through an IEC958 (International Electrotechnical Commission 958) encoder 63; thus data inputted according to an optical digital system can be also encoded by the encoder 61.

[0061] Then, after encoding the data inputted from an external device, the encoded data can be stored in the HDD 54 in files.

[0062] Meanwhile in the above description, the ATRAC2 is used as an encoding algorithm of the encoder 61; however, the algorithm may be any one which can compress the information and it also may be the ATRAC, MPEG, PASC, TwinVQ, RealAudio, LiquidAudio or the like.

[0063] The audio information accumulated in the HDD 54 can be decoded by the decoder 62 and can be reproduced by a speaker 67 through a D/A converter 66 and an amplifier 67. Or it can be reproduced and outputted by a headphone connected to the headphone terminal tb1. In this embodiment, the decoder 62 decodes data according to the ATRAC2; however the decoding algorithm may be any one, which can match the encoding algorithm of the encoder 61. Additionally, it is possible that the encoding and decoding are performed by the software in the CPU 51 instead of being performed by the hardware.

[0064] The display unit 57 shown in Figure 2 is provided as an interface for the user to administrate and control files such as audio data accumulated in the HDD 54. The display part 57 is displayed and driven by a display driver 58. Required characters, symbols, icons and the like are displayed on the display part 57 based on the control by the CPU 51. Additionally, folders or jacket images corresponding to audio files and operations by a pointing device such as a mouse, pen, fingers and the like are enabled. The pointing device is included in the panel operating part 20. For example, such an operation that an audio file designated by the user on the display is read out from the HDD 54 and reproduced by the speaker 35 and the like is enabled. Additionally, it is possible that selected files are deleted, transferred to or copied onto an external device (e.g. recording/reproducing apparatus 10) by using the display on the display part 57.

[0065] Meanwhile, as explained in Figure 2, the portable device 50 is enabled to exchange data between the recording/reproducing apparatus 10 when loaded in the attaching part MT of recording/reproducing apparatus 10; however the interface may also be contactless, for example, an IrDA and the like may be used. Additionally, even though it is not illustrated but a charging current supplying part is provided to the recording/reproducing apparatus 10, so it may be configured in such a manner that electricity is charged in a chargeable battery of the portable device 50, which is the power supply unit for the operation, when the portable device 50 is attached to the recording/reproducing apparatus 10.

[0066] 5. Processing of the file migration

In the recording/reproducing apparatus 10 and portable device configured as mentioned above, respectively stored files (audio data on musical components) can be copied or transferred (moved) between each other. That is, files stored in the HDD 15 of the recording/reproducing apparatus 10 can be transferred to or copied onto the HDD 54 of the portable device 50, or adversely, files stored in the HDD 54 of the portable device 50 can be transferred to or copied onto the HDD 15 of the recording/reproducing apparatus 10.

[0067] Meanwhile, herein, the word "copy" means the processing which results in a condition in which a certain file exists in both of the HDD to be copied and the HDD to copy after completing the operation, i.e., the same certain file can be reproduced in both the recording/reproducing apparatus 10 and portable device 50. By contrast, the word "transfer" (move) means the processing which results in a condition in which the reproduction of a certain file is disabled in the HDD to be copied after completing the operation. In this embodiment, it is enabled to transfer (move) any audio files between the HDD 15 and HDD 54.

[0068] The processing to transfer a designated file among files stored in the HDD 15 of the recording/reproducing apparatus 10 to the HDD 54 of the portable device 50 shall be explained by referring to Figure 5. This processing is executed by the CPU 11.

[0069] In Step F101, the CPU 11 detects whether the portable device 50 is loaded in the attaching part MT of the recording/reproducing apparatus 10 or not. The detecting methods at this time include a detection of loading condition be a mechanical switch system, a detection of connection by transacting signals through connectors 27, 60 and the like.

[0070] If it is judged that the recording/reproducing apparatus 10 and portable device 50 are connected each other, the processing proceeds to Step F102 and whether a request to transfer musical components, i.e., audio files to portable device 50 is requested by a user (or as an execution request by operation program) or not is judged. For example, more particularly, the audio file selected among folders indicating audio files displayed in the display part 24 by the user by using the predetermined pointing device will be transferred to the portable device 50 upon further receipt of the direction to transfer to the portable device 50 by the user.

[0071] If it is judged that there is a request of transfer of musical components based on above-mentioned operations, the volume of selected audio file is detected in the following Step F 103. Next, in Step F104, the free area in the HDD 54 of the portable device 50 is detected and the result is compared with the volume of audio file requested to transfer to the portable device 50. The free area in the HDD 54 can be found by a communication with the CPU 51. For example, it is possible to configure the system so that the CPU 11 can directly access the HDD 54; in that case, by enabling the operation control of the HDD 54 or file control by the CPU 11, it is enabled that the CPU 11 directly checks the free area in HDD 54 and the like.

[0072] In cases in which it is judged that the free are in HDD 54 is insufficient compared to the volume of the audio file to be transferred, processing to delete audio files stored in HDD 54 will be executed. This processing may be executed by the CPU 11 through the CPU 51 or the directly executed by the CPU 11. As methods to delete audio files from HDD 54 (how to select files to be deleted), a method to delete files according to the ascending order of number of reproduction, a method to delete files according to the ascending order of date, and the like may be adopted. Additionally, since there is a fear that important files may be deleted automatically without the user's permission, it is preferred to provide a warning display on the display parts 24, 57 to obtain a confirmation by the user.

[0073] If it is judged that the transfer is possible in Step F104, and in cases in which the transfer is judged to be impossible and following processing of Step F105 is executed, the processing proceeds to Step F106 and the file migration is executed. That is, predetermined audio files are transferred from the HDD 15 to HDD 54 through the interface drivers 28, 59 and the transfer is recorded.

[0074] Since the above-mentioned operation is file transfer processing, a flag to prohibit a reproduction is set for the audio file which is transferred in the HDD 15 so that the audio file is treated as a file which is recorded but can not be reproduced. Meanwhile, it is also possible to delete the audio file which is transferred from the HDD 15 in Step F107.

[0075] Since the audio file is virtually transferred to the portable device 50 from the recording/reproducing apparatus 10 by setting a flag to prohibit a reproduction in Step F107, it is controlled that only one certain audio file can exist; therefore the flag can also serve to prevent an illegal copy of files. Additionally, since the transfer is performed between the HDD 15 and HDD 54 both of which are high-speed accessing media and an encoding/decoding processing such as ATRAC3 is not necessary, the transfer is completed instantaneously and even a plurality of files can be transferred in a short time.

[0076] Thus, the file transfer is achieved by the execution of processing described in Figure 5.

These processing enables, the user for example, to select desired musical components from those owned by the user (i.e. files stored in the HDD 15) and to transfer them to the portable device to enjoy them out of home.

[0077] Meanwhile, in cases in which a copy of files is performed, only the processing in Step F107 is not executed. Additionally, in cases in which a file is transferred to (or copied onto) HDD 15 from HDD 54, the similar processing as described above needs to be executed by the CPU 51; however, the processing can also be mainly executed by the CPU 11.

[0078] 6. Storing mode of files in the recording/reproducing apparatus

Figure 6 shows an example of storing mode of files in the HDD 15 of the recording/reproducing apparatus 10. By way of example, the user can load his CD in the CD-ROM drive 17 and record (i.e. copy) musical components stored in the CD as respective files in the HDD 15. If the storage is implemented on a basis of a medium such as a CD, an administrative file corresponding to each medium in the CD, which is copied is formed, and each musical component is stored as one audio file.

[0079] Figure 6 shows a condition in which "n" pieces of CDs are copied on the HDD 15; an administrative file AL (AL1 to AL(n)) corresponding to each CD is formed. Each musical component recorded on each CD is stored as an audio file so as to correspond to each administrative file. In Figure 6, files in each row mean files copied from one CD; for example, copied data from a certain CD (respective musical components) are stored as AL1-M1, AL1-M2, AL1-M3, and so on, in such a manner that respective files correspond to the administrative file, AL1. Copied data from other CD (respective musical components) are stored as AL2-M1, AL2-M2, AL2-M3, and so on, in such a manner that respective files correspond to the administrative file, AL2. That is, these are actual music data. Thus, when one CD is copied, one administrative file and audio files of same number as that of musical components in the CD are formed.

[0080] Additionally, at the time of copying a certain CD, the user may be able to input data, or the user may be able to receive related information to the CD from the information center 1 with or without charge, and those information is stored as related information files. By way of example, a related information file AL1ad is formed corresponding to the administrative file AL1. The data stored as the related information file AL (*) ad are, as described above, titles, name of artists, text data such as lyrics, images on musical components and image of artists, address of artist's internet homepage (URL), information on copyrights, name of related persons (composers, lyric writers, creator and the like) etc.

[0081] The administrative file comprises a variety of information on corresponding one or more than two audio files and related information files and is used at the time of reproduction, transfer, copy or edition of each audio file of related information file. For example, the administrative file AL1 stores entire administrative information, administrative information on each audio file, AL1-M1, AL1-M2, AL1-M3, and so on, of a group of files which are copied and stored from a medium such as a CD and furthermore administrative information on the related information file AL1ad.

[0082] Figure 7 shows an example of data of administrative information recorded on an administrative file. For example, as the album information, which is entire administrative information, copied and stored from a medium such as CD, file types, number of files, title of the album, data sizes, date and time of copy, name of related persons (composers, lyric writers, player and the like), information on copyrights, album ID and other information are recorded. The album ID is an identification code unique to the album recorded on a medium such as CD.

[0083] As the administrative information individually corresponding to each audio file, file information (#1) to file information (#m) are recorded on the administrative file, and the file information includes a file type of the corresponding file, address pointer indicating recording position of the corresponding file on the HDD 15, data size of the file, title (name of the music component etc), time and date op copy, name of related persons (composers, lyric writers, player and the like), information on copyright, musical component ID, flag to prohibit the reproduction, classification item code, and other various administrative information. The musical component code is an identification code unique to the musical component in case of musical component file. The flag to prohibit the reproduction is the flag to prohibit the reproduction explained for the transfer operation in Figure 5. The classification item code is information on classification items recorded so as to correspond to a musical component in the second example of operation for file selection to be described below.

[0084] Furthermore, related file information is recorded in the administrative file as the administrative information to administrate the related file. The related file information includes a file type and number of files of corresponding related information files, address pointer indicating recording position of related information file on the HDD 15, data size of the related information file, time and date op recording, name of related persons, information on copyright, related information file ID, and other various administrative information.

[0085] By recording above-mentioned administrative information in the administrative file, the recording/reproducing apparatus 10 is enabled to execute processing of reproduction, transfer, copy, edition of certain musical component and output images or texts as related information while the music component is reproduced and the like.

[0086] Meanwhile, the contents of administrative information numerated in the explanation of Figure 7 is only one example and the file storing mode shown in Figure 6 is also only an example. In practice, preferred file storing mode and administrative mode for a variety of processing of the audio data, which is the actual data, may be adopted. Additionally, in this embodiment, the file is explained as being the audio data on musical component; however, it is also considered to store the moving image data, still image data, text data, program as a game software as actual files (i.e., not as related files but as independent files.)

[0087] First example of the operation for file selection

Subsequently, the first example of the operation for the file selection, which is a unique operation in this embodiment shall be explained. As described above, the user is able to reproduce or transfer audio files stored in the HDD 15 of the recording/reproducing apparatus 10. That is, by storing audio files copied from own CD and the like in the HDD 15 of the recording/reproducing apparatus 10, the user can select and reproduce desired musical components among a large number of musical components he owns, or transfer the same to the portable device for the reproduction thereof outside the house. Additionally, in cases in which audio files are transferred to the portable device 50, since the data transfer between HDDs (or between the HDD and flush memory) can be completed instantaneously, for example, the user can easily select musical components in accordance with his mood or condition every day without having any temporal burden.

[0088] However, in cases in which a considerably large number of musical components are stored in the HDD 15, the operation to select desired musical components or musical components to be transferred to the portable device 50 becomes troublesome. Especially in cases in which the user wants to select musical components in accordance with his mood or condition (time, schedule or place to visit etc), the user has to think about musical components suitable for his mood and condition and perform an operation to designate them among a large number of musical components. Therefore, this embodiment achieves the simplification of file selecting operation and an operation, which does not put a burden on the user as described below.

[0089] In the first example of operation, for the file selection, first the information center provides a selection menu to the user, i.e., the recording/reproducing apparatus 10 through the communication line 3. Then, the user can simply perform a selecting operation toward the selection menu displayed on the display part 24 of the recording/reproducing apparatus 10, and thereby one or more than two musical components he desires are selected and the reproduction or transfer to the portable device 50 thereof can be automatically performed without specifically designating name of musical components etc.

[0090] Herein, the classification items in the selection menu provided by the information center 1 are not items according to music genres or artists (of course, these classification items may be included therein), for example, they are classification items by which the user can select musical components in accordance with his mood, condition, date, schedule etc at the time. For example, classification items according to the seasons such as "spring music", "summer music", "autumn music" and "winter music" or classification items according to the time such as "morning music", "daytime music" and "nighttime music" or as classification items according to conditions or schedules such as "music for driving", "music for party" and "music for date" and the like may be provided. More diversified examples for classification items such as "recent recommended music", "hit numbers", "love songs", "farewell songs", "vernal songs", "journey songs", "mountain songs", "ocean songs" and the like may also be provided.

[0091] The information center 1 comprises a classification database in which numerous commercially available music components are classified according to diversified classification items as described above. By way of example, Figure 8 exemplifies part of contents stored in the classification database. That is, as shown in Figure 8, the database comprises lists of musical components in such a manner that they correspond to each classification item which matches them. Needless to say, but depending on how to set the classification items, there may be cases in which a certain musical component is included in a plurality of classification items.

[0092] Meanwhile, the user using the recording/reproducing apparatus 10 has a large number of musical components stored in the HDD of the recording/reproducing apparatus 10. For example, herein it is assumed that a variety of musical components as shown in Figure 9 (a) are stored in the HDD 15 as files. The user select one or more than two musical components among those owned by the user and reproduce or transfer them to the portable device 50; at that time the user can utilize the classification database of the information center 1 as shown in Figure 8. For example in the case in which the user selects the "spring music" from a variety of classification items provided by the information center 1; the information center 1 retrieves musical components included in the classification item of "spring music" among the musical components owned by the user as shown in Figure 9(a) from the database; and transmits the corresponding musical components to the user as the result. Then, the recording/reproducing apparatus 10 reproduces or transfers the corresponding musical components. For example, in this example, there are two musical components, which match the classification item, "spring music among musical components shown in Figure 9(a); therefore these two musical components shown in Figure 9(b) are reproduced or transferred.

[0093] Communication operations between the information center 1 and the recording/reproducing apparatus 10 at the time of execution of the first example of operation shall be explained by referring to Figures 10 and 11. Figure 10 shows basic communication operations. When the user wants to use the file selection as the first example of operation provided by the information center 1, the user operates the recording/reproducing apparatus 10 to transmit the request of retrieval. Then, the recording/reproducing apparatus 10 transmit a request for retrieval as Communication S1 to the information center 1. When the request is received by the information center 1, the information center 1 transmits information of selection menu as Communication S2 in return.

That is, the information center 1 transmits information on selection items stored in the classification database so that the classification items on the database can be displayed as selection menus in the recording/reproducing apparatus 10.

[0094] After receiving the selection menu information, the recording/reproducing apparatus 10 makes the display part 24 display selection items supplied as one of selection menu information so as to present it to the user. For example, the selection menu as shown in Figure 14 (a) is displayed. The user selects desired classification items in accordance with his mood or condition from classification items such as "spring music", "summer music", "autumn music", and so on, displayed in the selection menu.

[0095] Once certain classification items are selected by the user, the recording/reproducing apparatus 10 transmits the information on selected classification items as Communication S3, and concurrently, transmits all IDs of musical components owned by the user (i.e., stored in the HDD 15). As described above, the administrative information on each audio file in the HDD 15 is stored in the corresponding administrative file, and also musical component ID as an identification code of the musical component is added (of course, other file structure such as the musical component ID is added in the header area of each audio file is possible.) Figure 9 (a) shows musical component IDs (id1 to id (x)) to identify the stored musical component; thus, musical components for all musical components owned by the user is transmitted from the recording/reproducing apparatus 10 to the information center.

[0096] After receiving the selected items and all musical component IDs as Communication S3, the information center 1 executes a retrieval by using the classification database as shown in Figure 8. That is, musical components contained in the selected classification items registered in the database are compared with musical components owned by the user by using each ID of musical component to retrieve musical components owned by the user which match those in the database (hereafter, referred to as "corresponding musical components"). For example, when ID of each musical component as shown in Figure 9 (a) and the classification item, "spring music" are transmitted, the retrieval is performed in such a manner that a list of musical components which is classified as "spring music in the database shown in Figure 8" is compared with musical components owned by the user to retrieve corresponding musical components. In this example, as easily understood by comparing Figure 8 and Figure 9 (a), 2 musical components in Figure 9 (a) are corresponding musical components.

[0097] After completing the retrieval of corresponding musical components, the information center 1 transmits IDs of corresponding musical components to the recording/reproducing apparatus 10 as the result in Communication S4. By receiving IDs of corresponding musical components, the recording/reproducing apparatus 10 is enabled to determine files (musical components) corresponding to the classification item selected by the user among files stored in the HDD 15 so that the recording/reproducing apparatus 10 can reproduce or transfer them to the portable device 50. For example, musical components in Figure 9 (b) are reproduced or transferred.

[0098] Meanwhile, corresponding musical components are selected from corresponding musical components owned by the user; therefore, there may be a case in which no musical components corresponding to the selected classification item are found (the user does not own them.) The communication operations for such a case are shown in Figure 11. Meanwhile, Communications S1, S2 and S3 are similar to those shown Figure 10, so the explanation shall be omitted.

[0099] After receiving the selected items and all musical component IDs as Communication S3, the information center 1 executes retrieval by using the classification database as described above; in cases in which no corresponding musical components are found, information for selectable menu is transmitted as Communication S5. The selectable menu is the information in which classification items, which can be selected by the user within the extent of musical components owned by the user are listed. That is, the selection menu information as Communication S2 is a list of classification items provided in the classification database of the information center; however, the selectable menu information as Communication S5 is the information as the result of retrieving all classification items on the classification database in accordance with all musical components owned by the user and at the recording/reproducing apparatus 10 side, for example, the selectable menu is displayed as shown in Figure 14 (b).

[0100] The user selects desired classification items from those listed up in the selectable menu, and once certain classification items are selected, the recording/reproducing apparatus 10 transmits information on selected classification items as Communication S6. Meanwhile, IDs of all musical components are already transmitted so it is not necessary to send them again.

[0101] After receiving the information on selected classification items as Communication S6, the information center 1 executes the retrieval by using the classification database again and determines the corresponding musical components among those owned by the user. By definition, some corresponding musical components are determined at this time. Then, after completing the retrieval of corresponding musical components, the information center 1 transmits IDs of corresponding musical components to the recording/reproducing apparatus 10 as the result in Communication S7. By receiving IDs of corresponding musical components, the recording/reproducing apparatus 10 is enabled to determine files (musical components) corresponding to the classification item selected by the user among files stored in the HDD 15 so that the recording/reproducing apparatus 10 can reproduce or transfer them to the portable device 50.

[0102] Meanwhile, as a modification of this example of operation, it is possible to transmit IDs of all musical components owned by the user with the request for retrieval at the stage of Communication S1. Thereby, the information center is enabled to transmit the selectable menu information at the stage of Communication S2; therefore at the first display of menu for the user, only selectable menu is presented to the user and the condition, which no corresponding musical components for selected classification items are found, is prevented from occurring.

[0103] The processing in the recording/reproducing apparatus 10 (processing by the CPU 11) to achieve the above-mentioned first example of operation is shown in Figure 12 and the processing in the information center 1 is shown in Figure 13. First, the processing at the recording/reproducing apparatus 10 side shall be explained by referring to Figure 11. After the execution of the operation for the request for retrieval by the user, the processing by the CPU proceeds from Step F201 to Step F202 to transmit the request for retrieval to the information center 1. That is, above-mentioned Communication S2 is executed. Then, in Step 203, the CPU 11 waits for the selection menu information (Communication S2) from the information center 1. After receiving the selection menu information, the processing proceeds to Step F203 wherein a selection menu corresponding to the selection menu information as shown in Figure 14 (a) is displayed in the display part 24. Then, the CPU 11 waits for the operation by the user. After confirming the selection menu, the user selects desired classification items or cancels the processing. Meanwhile, it is omitted in a flowchart in Figure 12, the user may have to operate the page flipping or cursor movement on the display of menu to select classification items; therefore, the CPU 11 has to control of display corresponding to those operations.

[0104] If the user cancels the operation, the processing is terminated at Step F206. If the user executes the operation to select certain classification items, the processing proceeds from Step F205 to Step F207 wherein selected classification items and IDs of all musical components (all audio files) stored in the HDD 15 are transmitted. That is, the above-mentioned Communication S3 is executed. Then the processing waits for the transmission of IDs of corresponding musical components (Communication S4) or selectable menu information (Communication S5) from the information center 1.

[0105] If the IDs of corresponding musical components are transmitted; that is such a case as shown in Figure 10, therefore the processing proceeds from Step F208 to Step F210. Then, it is determined that the operation requested by the user is either reproduction or transfer to the portable device 50. In case of reproduction, the processing proceeds to Step F212 wherein one or more than two corresponding musical components indicated by received IDs of corresponding musical components are read out from the HDD 15 and processing to reproduce and output them from the speaker 35 and the like is executed. By contrast, when the operation requested by the user is transfer, the processing proceeds to Step F211 wherein one or more than two corresponding musical components indicated by received IDs of corresponding musical components are read out from the HDD 15 and processing to transfer them to the HDD 54 of the portable device 50 is executed. That is, the file transfer explained in Figure 5 is executed (the files to be transferred in Figure 5 are one or more than two files indicated by IDs of corresponding musical components.)

[0106] Meanwhile, the determination of user's direction in Step F210 may be executed to prompt the user to execute the operation to direct when the processing proceeds to this stage, or it may be possible to prompt the user to direct the processing in Steps F201 or F205.

[0107] After transmitting the selected classification items and IDs of all musical components in Step F207, there may be a case that the selectable menu is transmitted from the information center 1. That is, this is such a case as explained in Figure 11; in this case the processing proceeds from Step F209 to Step F213. Then according to the received selectable menu information, a selectable menu as shown in Figure 14 (b) is displayed in the display part 24. Thereafter, the processing waits for the operation by the user. After confirming the selection menu, the user selects desired classification items or cancels the processing. Meanwhile, in this Step the user may also have to operate the page flipping or cursor movement on the display of menu to select classification items; therefore, the CPU 11 has to control of display corresponding to those operations.

[0108] If the user cancels the operation, the processing is terminated at Step F215. If the user executes the operation to select certain classification items, the processing proceeds from Step F214 to Step F216 wherein selected classification items are transmitted. That is, the above-mentioned Communication S6 is executed. Then the processing waits for the transmission of IDs of corresponding musical components in Step F208. After receiving IDs of corresponding musical components from the information center 1 as Communication S7, the processing proceeds to Step F 210 wherein the user's direction is determined. Then, if user directs the reproduction, the processing proceeds to Step F212 wherein one or more than two corresponding musical components indicated by received IDs of corresponding musical components are read out from the HDD 15 and processing to reproduce and output them from the speaker 35 and the like is executed. By contrast, when the operation requested by the user is transfer, the processing proceeds to Step F211 wherein one or more than two corresponding musical components indicated by received IDs of corresponding musical components are read out from the HDD 15 and processing to transfer them to the HDD 54 of the portable device 50 is executed.

[0109] Next, the processing at the information center 1 side shall be explained by referring to Figure 13. In the information center, when receiving a request for retrieval from a certain recording/reproducing apparatus 10 as Communication S1, the processing proceeds from Step F301 to Step F302 wherein selection menu information is created. That is, the selection menu information is created by listing up classification items prepared as the classification database. In this case, it may be possible to select classification items by taking the date, season, current events and the like at that time into consideration. Meanwhile, the selection menu can be previously created and updated whenever new classification items are added to the database and the like.

[0110] Next, in Step F303, the selection menu information is transmitted to recording/reproducing apparatus 30 [note by the translator: as per original] which transmits the request for retrieval as the aforementioned Communication S2. Then, in Step F304 the processing waits for the Communication S3, i.e., the transmission of selected classification items and IDs of all musical components from the recording/reproducing apparatus 10. After receiving the selected classification items and IDs of all musical components, the retrieval is executed in Step F305. That is, as described above, musical components contained in the selected classification items registered in the database are compared with musical components owned by the user by using each ID of musical component to retrieve corresponding musical components. Herein, if corresponding musical components are found, the processing proceeds to Step F307 wherein IDs of corresponding musical components are transmitted to the recording/reproducing apparatus 10 (aforementioned Communication S4) and the processing is completed.

[0111] However, in cases in which no corresponding musical components are found as the result of retrieval in Step F305, the processing proceeds from Step F306 to Step F308 wherein a selectable menu is created by listing up selectable items for the user of the recording/reproducing apparatus 10 from classification items in the classification database. Then, the selectable menu information is transmitted to the recording/reproducing apparatus 10 in Step F309. That is, the aforementioned Communication S5 is executed. After transmitting the selectable menu information, the process waits for the Communication S6 from the recording/reproducing apparatus 10, i.e., the receipt of selected classification items, and after receiving thereof, the processing proceeds from Step F310 to Step F311 wherein the retrieval is executed. That is, musical components contained in the selected classification items registered in the database are compared with musical components owned by the user by using each ID of musical component to retrieve musical components owned by the user which match those in the database. In this case the corresponding musical components must definitely exist; therefore after the completion of the retrieval, the processing proceeds to Step F307 wherein IDs of corresponding musical components are transmitted to the recording/reproducing apparatus 10 (aforementioned Communication S7) and the processing is completed.

[0112] By executing above-mentioned processing as shown in Figures 12 and 13, the operations as the first example of the operation in this embodiment is actualized and thereby the user only needs to select arbitrary classification items in accordance with his mood or condition on that day; accordingly musical components which meet his mood or condition are selected and their reproduction or transfer to the portable device can be performed. Thus, the selecting operation for the user can be significantly simplified. For example, by selecting "driving music" from the selection menu before going to drive a car, the user can obtain a condition in which musical components suitable for driving are transferred to the portable device side. Additionally, since the contents of the data in communications executed in this example of operation as shown in Figures 10 and 11 are request commands, IDs of musical components, classification items and the like and are smaller, with respect to the data volume, than audio data or video data, the communications can be swiftly completed without constructing a high-speed communication line. Therefore, there will not be cases in which the user has to wait long.

[0113] As described above, according to this embodiment of the present invention, the user's daily operation to select desired musical components can be simplified, the operation can be completed in a shorter time and the usability of the recording/reproducing apparatus 10 and portable device 50 can be significantly improved.

[0114] 8. Second example of the operation for file selection

Next, the second example of the operation for file selection different from the above-mentioned first example of the operation shall be explained as the example of operation for file selection in this embodiment. The second example is also to significantly simplify the selecting operation by the user and to achieve the operation, which will not put a burden on the user.

[0115] In the first example of the operation as described above, the retrieval for file selection is executed in the information center 1; however, in this second example of the operation, the retrieval of files is executed by the recording/reproducing apparatus 10 side. That is, in this example of operation, the information center 1 is provided with the classification database as shown in Figure 9, and retrieves classification items in the classification database based on the each musical component owned by the user and transmit thereof to the recording/reproducing apparatus 10. The recording/reproducing apparatus 10 stores the transmitted classification items from the information center 1 so that they can correspond to respective musical components (audio files) stored in the HDD 15. Then, in the processing process of the retrieval after the actual retrieval is executed, the communication with the information center is not particularly performed, that is, a selection menu is created from the stored classification items so that the user can select musical components.

[0116] The user using the recording/reproducing apparatus 10 is storing a large number of files as musical components copied from own CDs and the like in the HDD. For example, now it is assumed that a variety of musical components as shown in Figure 15 (a) are stored in the HDD 15 as files. The classification items for respective files stored as described above are submitted to the information center 1 for the determination thereby, and then the recording/reproducing apparatus 10 receives the information on classification items determined for respective musical components. The recording/reproducing apparatus 10 stores the classification items for musical components so that they can correspond to respective musical components. Herein, the classification items are expressed as "Kwa", "Ksp" and so on; these correspond to classification items set in the database as shown in Figure 8. These classification items may be stored in the administrative files to administrate respective audio files (refer to Figures 6 and 7.) Or, they may be stored in the respective header regions of audio files. Meanwhile, of course there may be cases wherein a plurality of classification items correspond to a single musical component (audio file.)

[0117] A selection of actual musical components for the reproduction or transfer to the portable device 50 thereof is performed by the user from own musical components; at the time of the selection, the recording/reproducing apparatus 10 (CPU 11) checks classification items of respective musical components stored in the HDD 15 to create a selection menu to make user perform the selection. After the selection, audio files (corresponding musical components) corresponding to the selected classification items are retrieved and the reproduction or transfer thereof is executed according to the selection operation. For example, when "spring music" is selected from a variety of classification items presented in the selection menu by the user, musical components corresponding to the classification item "Ksp" of "spring music" are retrieved in the HDD 15; as the result, for example, 2 musical components are extracted as shown in Figure 15 (c); 2 musical components as shown in Figure 15 (c) are reproduced or transferred.

[0118] Communication operations between the information center 1 and the recording/reproducing apparatus 10 at the time of execution of the second example of operation shall be explained by referring to Figure 16. This communication operation is executed in one stage previous to that the user actually executes the file selection operation. First, at a predetermined time point based on the user's selection or judgment by the CPU 11, the recording/reproducing apparatus 10 transmit a request for classification and IDs of all musical components stored in the HDD 15 as Communication S10 to the information center 1.

[0119] After receiving the request for classification and all musical component IDs as Communication S10, the information center 1 executes a retrieval by using the classification database as shown in Figure 8. That is, each musical component owned by the user which is identified by the received musical component ID is subjected to the retrieval in the classification database to determine one or more than two classification items including the each musical component.

[0120] After determining all classification items for all musical components owned by the user, the information center 1 transmits information on classification items for respective musical components to the recording/reproducing apparatus 10 as the result of retrieval. After receiving the classification items for respective musical components, the recording/reproducing apparatus 10 stores them on the HDD so that they can correspond to stored respective musical components (audio files).

[0121] Additionally, when new audio files are added on the HDD 15 by further copy of CD and the like by the user afterward, the recording/reproducing apparatus 10 executes an operation to transmit a request for classification and musical components IDs corresponding to newly added audio files to the information center as Communicaiion S12.

[0122] After receiving the request for classification and musical component IDs corresponding to newly added audio files as Communication S12, the information center 1 executes a retrieval by using the classification database as shown in Figure 8 to determine classification items corresponding to added musical components. After determining all classification items, the information center 1 transmits information on classification items for respective musical components to the recording/reproducing apparatus 10 as the result of retrieval in Communication S13. After receiving the classification items, the recording/reproducing apparatus 10 stores them on the HDD so that they can correspond to stored newly added musical components (audio files).

[0123] The processing by the CPU 11 in the recording/reproducing apparatus 10 and the processing in the information center 1 to achieve the above-mentioned communications are shown in Figure 17. When the request for classification is executed by the user or judgment of the CPU 11, first, the processing proceeds from Step F401 to Step F402 wherein whether audio files to which classification items are added exist among audio files stored in the HDD 15 or not is judged. If it is judged that there are no classified audio files, the processing proceeds to Step F403 wherein the operation to transmit IDs of all musical components stored in the HDD 15 with a request for classification, i.e., the above-mentioned Communication S10 is executed. By contrast, if it is judged that there are classified audio files, the processing proceeds to Step F404 wherein audio files to which classification items are not added yet are listed up, and the operation to transmit musical component IDs corresponding to unclassified musical components with a request for classification, i.e., Communication S12 is executed.

[0124] After receiving the request for classification transmitted from the recording/reproducing apparatus 10 by processing in Step F403 or Step F404, in the information center 1, the processing proceeds from Step F501 to Step F502 wherein a retrieval of classification items corresponding to IDs of transmitted respective musical components is executed by using the classification database. Then in Step F503, the classification items corresponding to respective musical components are transmitted as the result of retrieval. That is, the above-mentioned Communication S11 or S13 is executed.

[0125] In the recording/reproducing apparatus 10, after executing the processing of Step F403 or Step F404, the processing is waiting for the receipt of classification items as the result of retrieval in Step F405. After receiving the result, the processing proceeds to Step F406 wherein the classification items are stored in the HDD 15 so as to correspond to respective musical components (audio files) which are targets of classification.

[0126] By executing the addition of classification items to musical components owned by the user through above mentioned communication operations, a condition as shown in Figure 15(b) can be obtained; hereafter, selecting operation of musical components according to the user's mood or condition is enabled at the recording/reproducing apparatus 10 side. The processing executed by the CPU 11 at the time of file selection for the reproduction or transfer thereof shall be explained by referring to Figure 18.

[0127] After the operation to direct the execution of retrieval is performed by the user, the processing by the CPU 11 proceeds from Step F601 to Step F602 wherein for example a selection menu as shown in Figure 14 (a) is displayed in the display part 24. The classification items presented in the selection menu may be all kinds of classification items as classification items stored in the HDD 15. That is, selectable classification items in all musical components owned by the user are listed. After displaying the selection menu, the processing waits for the user's operation.

[0128] After confirming the selection menu, the user selects desired classification items or cancels the processing. Meanwhile, it is omitted in Figure 18, but in this Step the user may also have to operate the page flipping or cursor movement on the display of menu to select classification items; therefore, the CPU 11 has to control of display corresponding to those operations.

[0129] If the user cancels the operation, the processing is terminated at Step F604. If the user executes the operation to select certain classification items, the processing proceeds from Step F603 to Step F604 wherein audio files to which selected classification items are added are retrieved and extracted. Then, the processing proceeds to Step F 605 wherein the user's direction is either reproduction or transfer to the portable device 50 is determined. Then, if user directs the reproduction, the processing proceeds to Step F606 wherein one or more than two corresponding musical components are read out from the HDD 15 and processing to reproduce and output them from the speaker 35 and the like is executed. By contrast, when the operation requested by the user is transfer, the processing proceeds to Step F607 wherein one or more than two corresponding musical components are read out from the HDD 15 and processing to transfer them to the HDD 54 of the portable device 50 is executed. That is, the file transfer processing explained in Figure 5 is executed (Files to be transferred in Figure 5 correspond to one or more than two files extracted as corresponding musical components.)

[0130] Meanwhile, the determination operation of user's direction in Step F606 may be performed at the time the processing proceeds to this stage to prompt the user to execute the operation.

[0131] By executing above-mentioned processing as shown in Figures 18, the operations as the second example of the operation in this embodiment is actualized and thereby the user only needs to select arbitrary classification items in accordance with his mood or condition on that day; accordingly musical components which meet his mood or condition are selected and their reproduction or transfer to the portable device can be performed. Thus, the selecting operation for the user can be significantly simplified. Therefore, similarly to the first example, according to this embodiment of the present invention, the user's daily operation to select desired musical components can be simplified, the operation can be completed in a shorter time and the usability of the recording/reproducing apparatus 10 and portable device 50 can be significantly improved.

[0132] Thus, the system configurations and example of operations are explained as embodiments of the present invention; however, the present invention shall not be limited by above embodiments and a large number of modifications for the configuration of devices and procedure of processing and the like may be possible.

[0133]

[Effect of the invention] As comprehended by the explanation described above, the following effects can be achieved by the present invention. In the present invention, the information center is provided with the classification database means in which a large number of data files (musical components etc.) are classified according to diversified classification items so that the retrieval operation by using the retrieval object information transmitted from the terminal apparatus side and classification database means can be executed. From the user's point of view, by transmitting the retrieval object information from the terminal apparatus to the information center, the user can obtain the information on files matching the retrieval object information among data files owned by the user, i.e., data files stored in the storing means of the terminal apparatus as the result of retrieval. That is, the user can obtain diversified results of retrieval by using the advanced retrieval system at the information center side. Therefore the user can execute a diversified and simple retrieval regarding the selection of data files owned by the user (i.e., the user can use the advanced retrieval system at the information center side); therefore the user can obtain a condition, in which desired data files are selected, without executing an operation to specifically designate data files.

[0134] Particularly, the user side is enabled to select certain classification items in the classification database from the terminal apparatus; once selected classification items and each identification information on each file stored in the storing means are transmitted as retrieval object information, the information center side can retrieve data files contained in the selected classification items from data files owned by the user in the terminal apparatus (i.e., data files stored in the storing means) and transmit the result of retrieval to the terminal apparatus. For example, if data files are classified not only according to the genre of musical component or artist but also according to diversified events such as the season, time, events, mood, various situations and the like in the classification database, the user only needs to designate classified items in accordance with his mood or condition on that day and the processing of selected files in accordance with his mood or condition on that day can be executed; thus this system can provide a great convenience to the user.

[0135] Additionally, since the information communicated between the information center and the user are aforementioned classification items, ID of musical components, result of retrieval and the like and their data volumes are smaller than those of audio data or video data, there is no necessity to construct a specific line (high-speed transmission line) as a communication line. Additionally, since the volume of the data communicated has a small volume, the communications can be completed quite swiftly. As described above, in the present invention, a round-trip communication is needed from the stage that the terminal apparatus side selects the classification items and transmits the retrieval request to the stage that the terminal apparatus side receives the result; however, the time for round-trip communication is quite short and therefore the time interval from the user executes the operation to select classification items to the execution of processing of retrieved data files can be quite short. That is, a system, which does not put a burden with respect to time (particularly, latency) on the user can be achieved.

[0136] Additionally, provided that the terminal apparatus side is configured so that the data files corresponding to received retrieval result are read out from the storing means to be reproduced and outputted, from the user's point of view, the reproduction of appropriate data files (musical components etc.) can be achieved by only designating and inputting retrieval object information such as classification items. Thus, a preferred reproducing operation for the user can be achieved in return of quite simple operation by the user. For example, the user can enjoy musical components in accordance with his mood or condition of the day.

[0137] Additionally by executing operations to read out data files corresponding to received retrieval result from the data file storing means and transferring or copying them to the data file storing device connected with the terminal apparatus at the terminal apparatus side, the user can obtain a condition, in which appropriate data files (musical components etc.) are stored in the data file storing means by only designating and inputting retrieval object information such as classification items. Therefore, the user can enjoy musical components in accordance with his mood or condition by using the data file-storing device. If the data file storing means is a portable device, the user can enjoy musical components in accordance with his mood or condition outside the home.

[0138] Additionally, in the present invention, the information center is provided with the classification database in which a large number of data files are classified according to diversified classification items so that the information center can retrieve data files owned by the user for their classification items by using the retrieval object information transmitted from the terminal apparatus side and the classification database means. From the user's point of view, by only transmitting retrieval object information to the information center, the user can obtain classification items of data files owned by the user, i.e., data files stored in the storing means of the terminal apparatus. That is, the user can obtain classification items according to diversified classification systems by using the advanced retrieval system at the information center side and they can be stored so that they can correspond to data files. Therefore, the user is enabled to make the terminal apparatus execute a diversified and simple retrieval for the selection of data files owned by the user. For example, provided that the data files are classified according to classification items corresponding to diversified events such as the season, time, event, mood, a variety of situations and the like; the terminal apparatus side is enabled to store classification items according to the diversified events obtained by using the advanced retrieval system at the information center side so that they can correspond to each data file. Accordingly, the terminal apparatus can execute retrieval by using the stored classification items; therefore the user can select desired data files and execute the predetermined operations thereof by only designating classification items in accordance with the user's mood or condition without specifically selecting data files.

[0139] Additionally, provided that the retrieval object information is the identification information of respective data files stored in the storing means; the retrieval means in the information center is enabled to appropriately retrieve classification items of the database means for the respective files owned by the user; therefore, preferred retrieval result (classification items) for the user can be transmitted.

[0140] Additionally, since also in this case, the information communicated between the information center and the terminal apparatus are aforementioned identification information and classification items as the result of retrieval and their data volumes are smaller than those of audio data or video data, there is no necessity to construct a specific line (high-speed transmission line) as a communication line or to fix a new infrastructure. Additionally, since the volume of the data being communicated has a small volume, the communications can be completed quite swiftly and the time interval from the user executes the operation to select classification items to the execution of processing of retrieved data files can be quite short.

[0141] Additionally, in cases in which classification items corresponding to data files stored in the storing means are already stored at the terminal apparatus side, it is enabled to read out data files stored so as to correspond to classification items selected by the user from the storing means and execute processing for the reproduction and output; therefore, from the user's point of view, reproduction of appropriate data files (musical components etc.) is achieved by only selecting the classification items. Thus, the preferred reproducing operation for the user can be achieved by a quite simple operation. For example, the user can enjoy musical components and the like in accordance with his mood or condition of the day.

[0142] Additionally, in cases in which classification items corresponding to data files stored in the storing means are already stored at the terminal apparatus side, it is enabled to read out data files stored so as to correspond to classification items selected by the user from the storing means and execute processing for the copy or transfer thereof to the data file storing device connected with the terminal apparatus; therefore, the user can obtain a condition, in which appropriate data files (musical components etc.) are stored at the data file storing device side by only selecting classification items from the terminal apparatus. Consequently, the user can enjoy musical components in accordance with his mood or condition by using the data file-storing device. If the data file storing device is the portable device, the user can enjoy musical components in accordance with his mood or condition outside the home.

[Brief description of drawings]

[Figure 1] This is an explanatory drawing of the information delivery system in the embodiment in accordance with the present invention.

[Figure 2] This is a block diagram of the recording/reproducing apparatus as a terminal apparatus in the embodiment in accordance with the present invention.

[Figure 3] This is a block diagram of the recording/reproducing apparatus in the embodiment in accordance with the present invention.

[Figure 4] This is a block diagram of the portable device in the embodiment in accordance with the present invention.

[Figure 5] This is a flowchart of file transfer from the recording/reproducing apparatus to portable device in the embodiment in accordance with the present invention.

[Figure 6] This is an explanatory drawing of the file storing system in the hard disk of the recording/reproducing apparatus in the embodiment in accordance with the present invention.

[Figure 7] This is an explanatory drawing of the contents of the administrative file in the hard disk of the recording/reproducing apparatus in the embodiment in accordance with the present invention.

[Figure 8] This is an explanatory drawing of the classification database provided to the information center in the embodiment in accordance with the present invention.

[Figure 9] This is an explanatory drawing of the file selected in the first example of the operation in the embodiment in accordance with the present invention.

[Figure 10] This is an explanatory drawing of the communication operation in the first example of the operation in the embodiment in accordance with the present invention.

[Figure 11] This is an explanatory drawing of the communication operation in the first example of the operation in the embodiment in accordance with the present invention.

[Figure 12] This is a flowchart of the processing executed in the recording/reproducing apparatus in the first example of the operation in the embodiment in accordance with the present invention.

[Figure 13] This is a flowchart of the processing executed in the information center in the first example of the operation in the embodiment in accordance with the present invention.

[Figure 14] This is an explanatory drawing of the selection menu display in the first example of the operation in the embodiment in accordance with the present invention.

[Figure 15] This is an explanatory drawing of the file selected in the second example of the operation in the embodiment in accordance with the present invention.

[Figure 16] This is an explanatory drawing of the communication operation in the second example of the operation in the embodiment in accordance with the present invention.

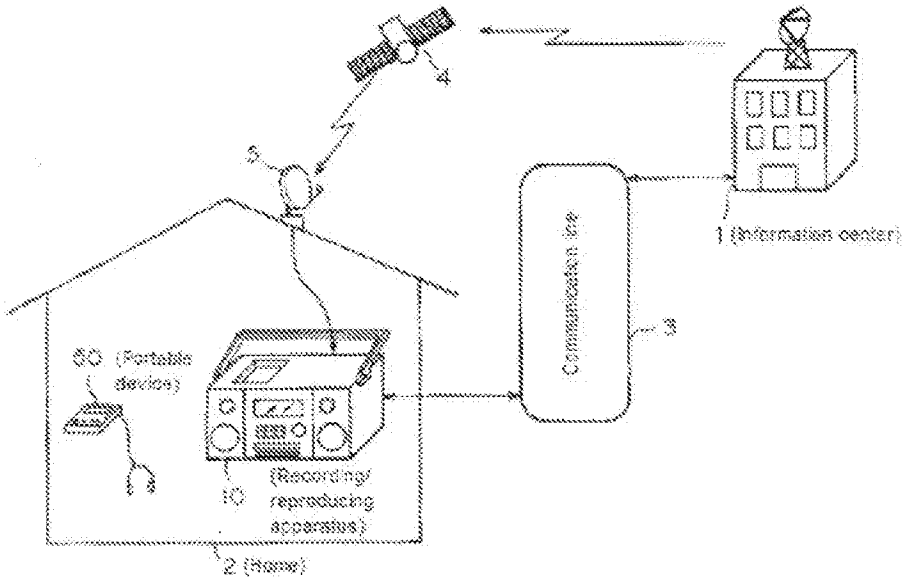
[Figure 17] This is a flowchart of processing executed in the recording/reproducing apparatus and the information center at the time of communication operation in the second example of the operation in the embodiment in accordance with the present invention.

[Figure 18] This is a flowchart of processing of the data file reproduction/transfer in recording/reproducing apparatus in the second example of the operation in the embodiment in accordance with the present invention.

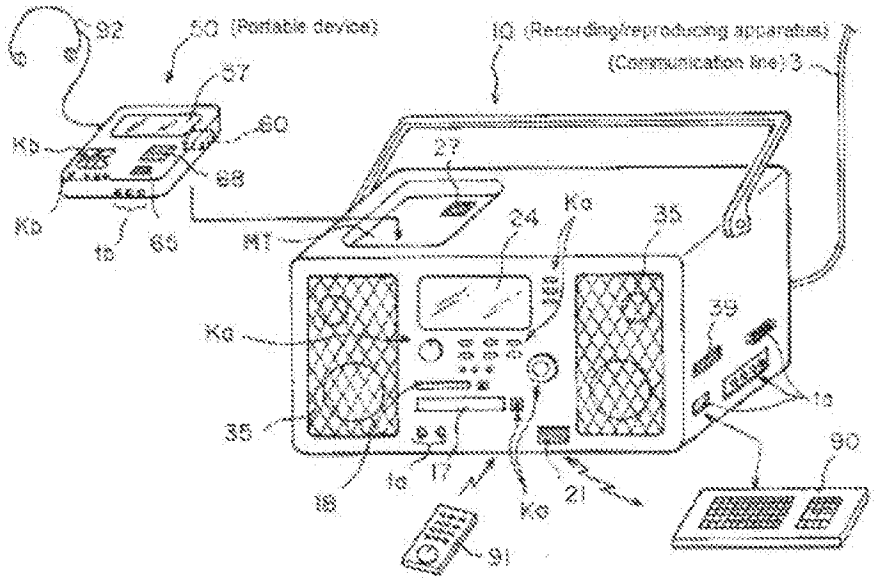
[Description of symbols]

1 information center, 3 communication line, 10 recording/reproducing apparatus, 11 CPU, 12 ROM, 13 RAM, 14 flush memory, 15 HDD, 16 buffer memory, 17 CD-ROM drive, 18 MD drive, 19 modem, 20 panel operating part, 22 infrared ray interface driver, 23 USB driver, 24 display part, 25 display driver, 26 interface driver, 27 connector, 28 encoder, 29 decoder, 30 IEC958 encoder, 31 A/D converter, 32 microphone amplifier, 33 D/A converter, 34 amplifier, 35 speaker, 36 IEEE1394 driver, 37 IEEE1394 interface, 38 PCMCIA driver, 39 PCMCIA slot, 51 CPU, 52 ROM, 53 RAM, 54 HDD, 55 buffer memory, 56 panel operating part, 57 display part, 58 display driver, 59 interface driver, 60 connector, 61 encoder, 62 decoder, 63 IEC958 encoder, 64 A/D converter, 65 microphone amplifier, 66 D/A converter, 67 amplifier, 68 speaker

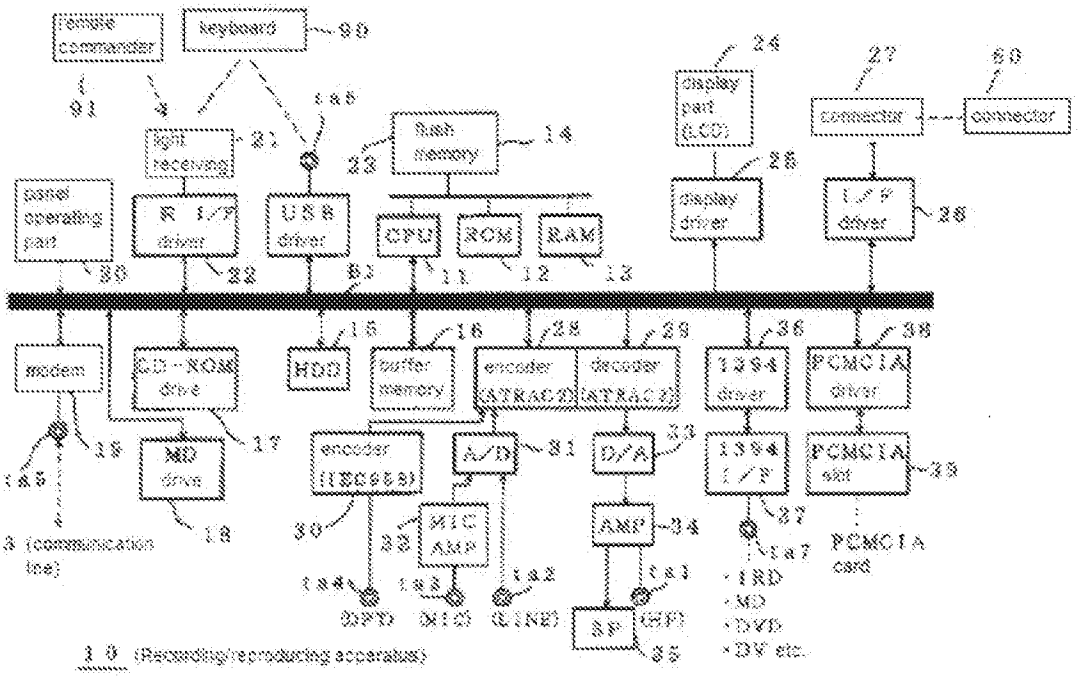
[Figure 1]



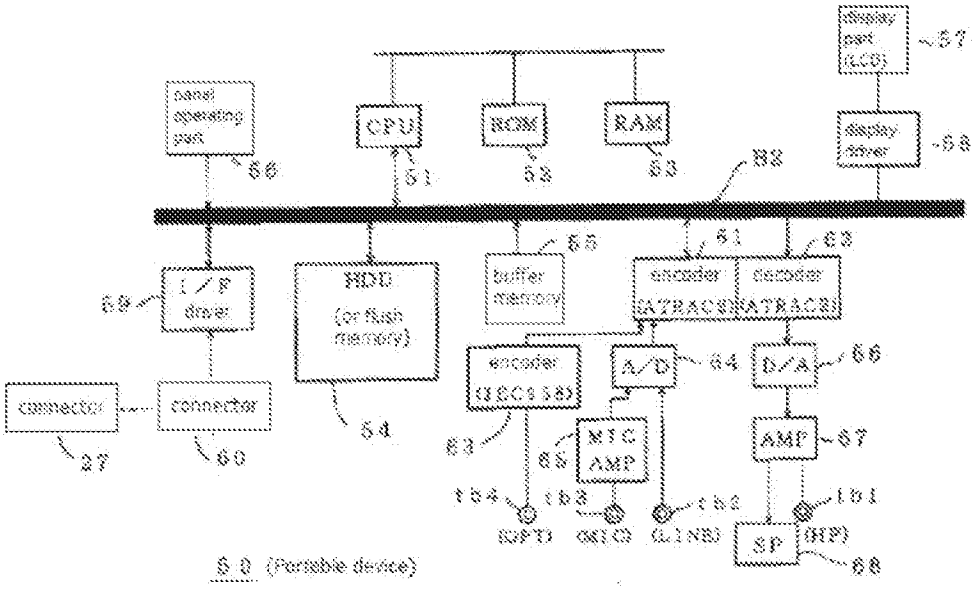
[Figure 2]



[Figure 3]

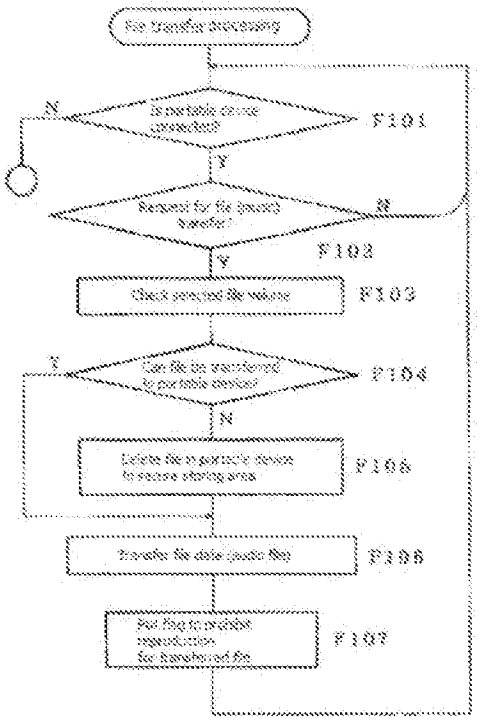


[Figure 4]

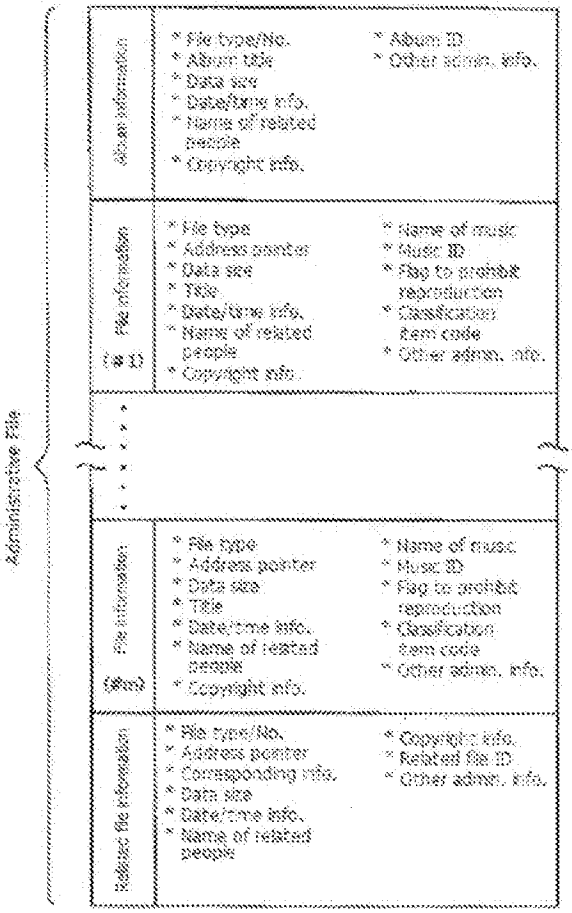


50 (Portable device)

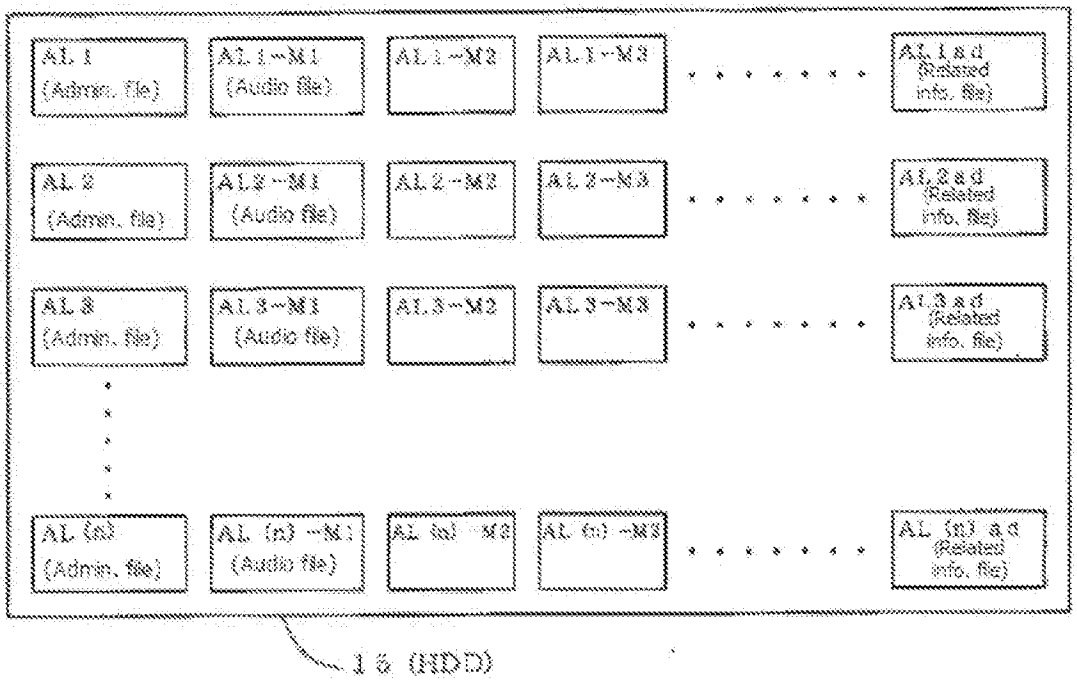
[Figure 5]



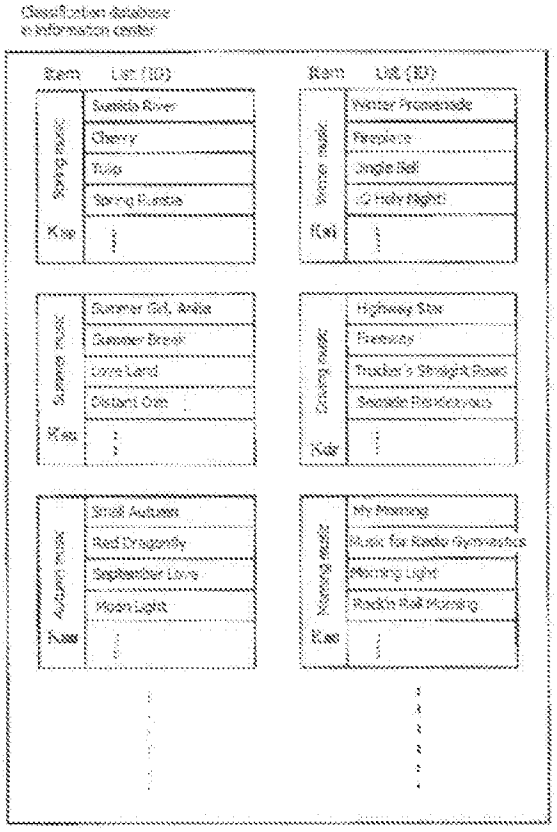
[Figure 7]



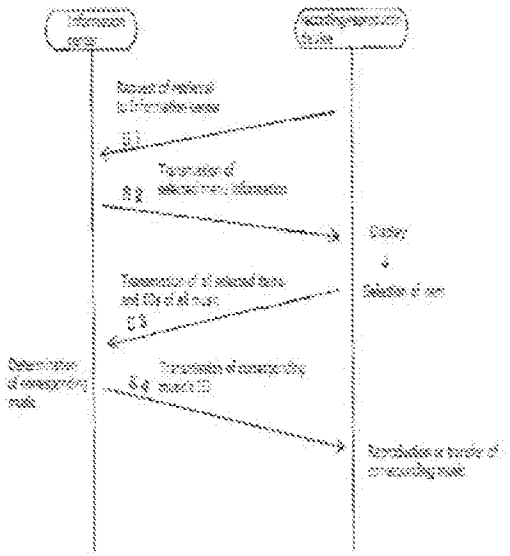
[Figure 6]



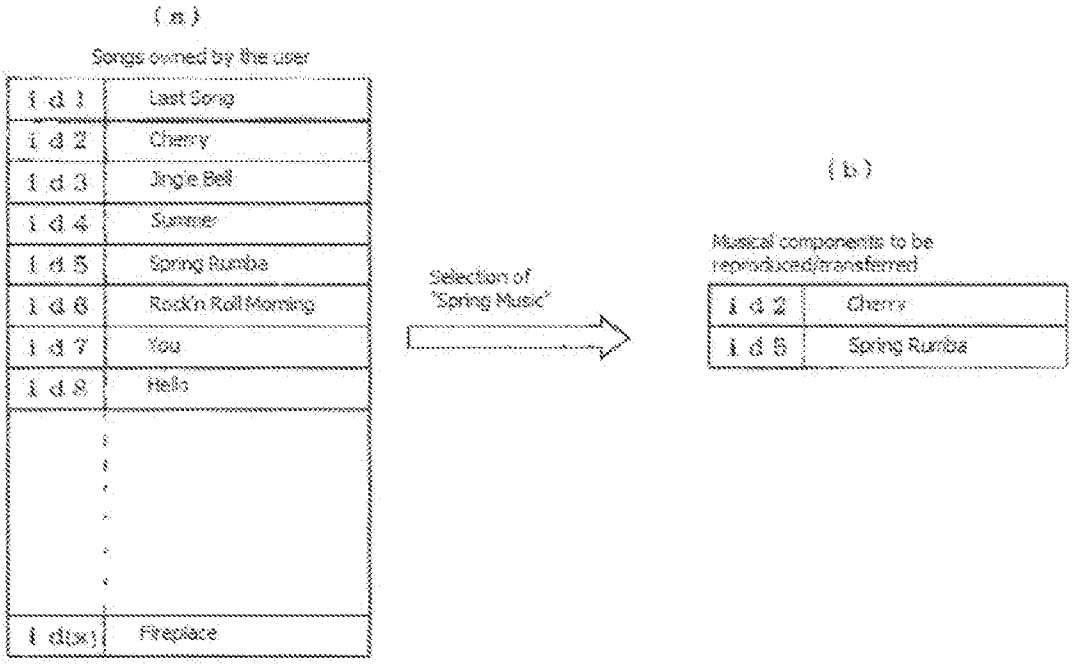
[Figure 8]



[Figure 10]

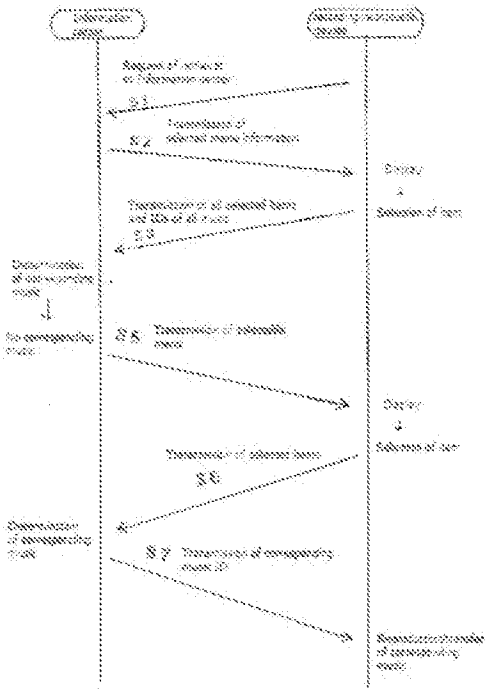


[Figure 9]

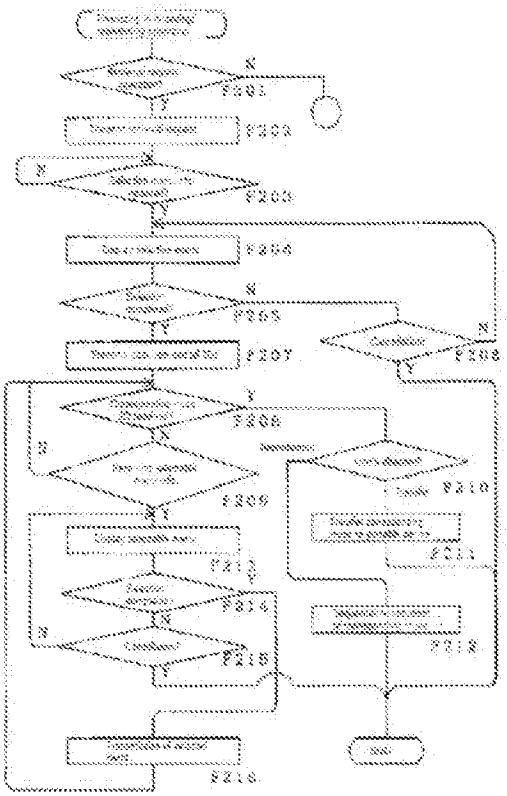


[Figure 11]

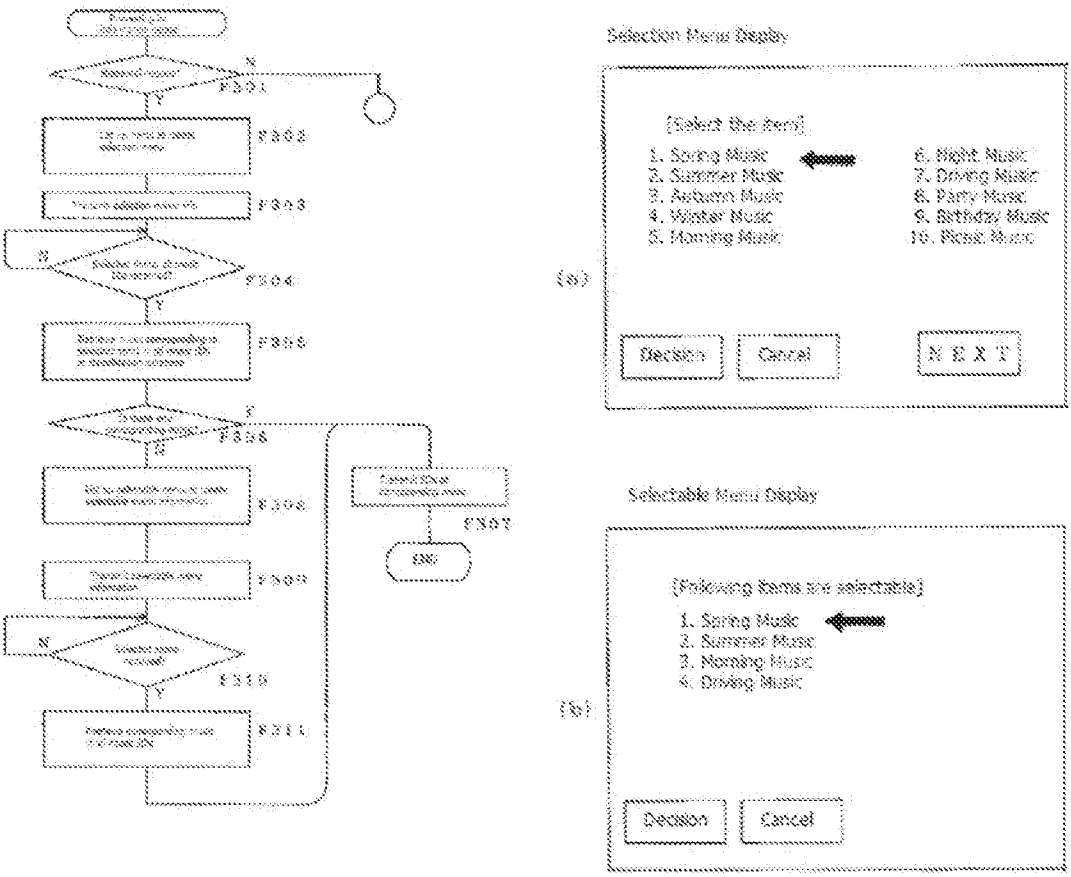
[Figure 12]



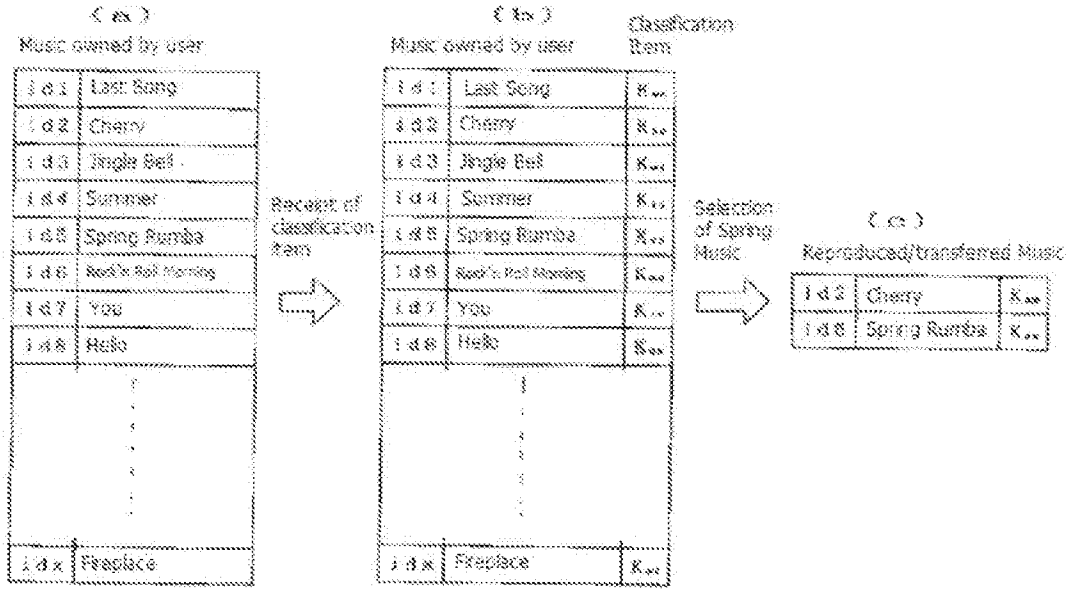
[Figure 13]



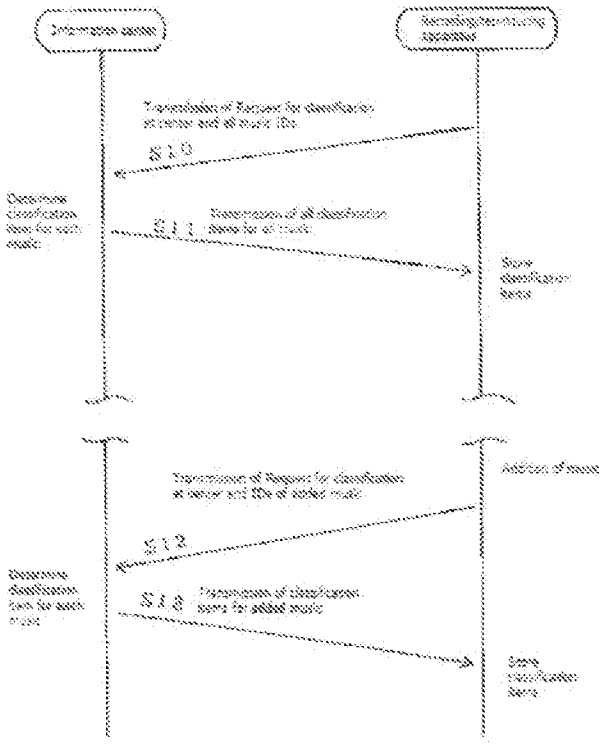
[Figure 14]


Selection Menu Display
[Select the item]
1. Spring Music
2. Summer Music
3. Autumn Music
4. Winter Music
5. Morning Music
6. Night Music
7. Driving Music
8. Party Music
9. Birthday Music
10. Rose Music
(a)
Decision
Cancel
NEXT
Selectable Menu Display
[Following items are selectable]
1. Spring Music
2. Summer Music
3. Morning Music
4. Driving Music
(b)
Decision
Cancel

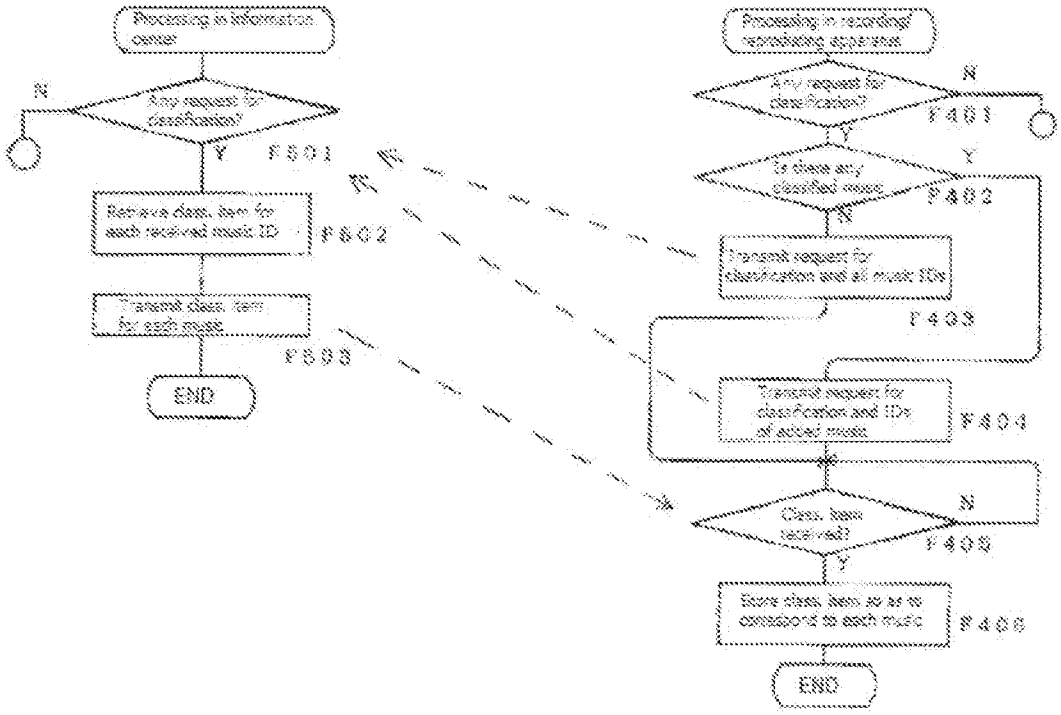
[Figure 15]


(ex)
Music owned by user
Id 1 Last Song
Id 2 Cherry
Id 3 Jingle Bell
Id 4 Summer
Id 5 Spring Rumba
Id 6 Rock'n Roll Morning
Id 7 You
Id 8 Hello
Id x Fireplace
Recount of classification item
(ex)
Music owned by user
Classification Item
Id 1 Last Song K11
Id 2 Cherry K12
Id 3 Jingle Bell K13
Id 4 Summer K14
Id 5 Spring Rumba K15
Id 6 Rock'n Roll Morning K16
Id 7 You K17
Id 8 Hello K18
Id x Fireplace K1x
Selection of Spring Music
(ex)
Reproduced/transferred Music
Id 2 Cherry K12
Id 5 Spring Rumba K15

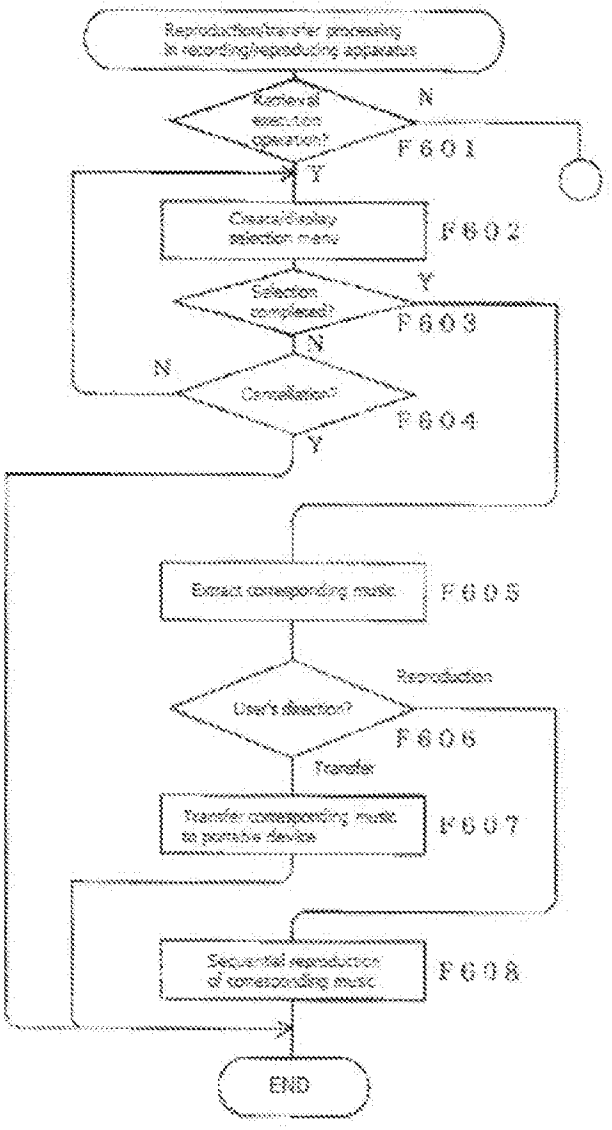
[Figure 16]



[Figure 17]



[Figure 18]



Continuing from the front page

(51) Int. Cl.[5] Domestic classification symbol FI

G06F 15/403 310B

[EOF]

EXPERT TRANSLATION BUREAU, INC.

Telephone: (312) 759-9999 Facsimile: (800) 803-0676
1450 Sandpebble Drive, Suite 112, Wheeling, IL 60090
www.Expert-Translation.com

CERTIFICATE OF TRANSLATION

March 9, 2009

I, Kagari Fujita, hereby certify that I am competent in both English and Japanese languages.

I further certify under penalty of perjury that translation of the aforementioned patent document:

[JP1999242686(A)_English.pdf]

from the Japanese language into the English language is accurate and correct to the best of my knowledge and proficiency.

Kagari Fujita
Professional Translator

OFFICIAL SEAL
ALEXANDER GOFMAN
NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPIRES 6-6-2009

03.09.2009

[19]中华人民共和国国家知识产权局

[51]Int.Cl⁶
G11B 20/10
G11B 27/10

[12]发明专利申请公开说明书

[21]申请号 98114958.8

[43]公开日 1999年6月2日

[11]公开号 CN 1218258A

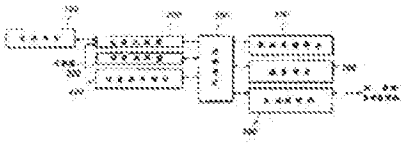
[22]申请日 98.4.20 [21]申请号 98114958.8
[30]优先权
[32]97.11.24 [33]KR [31]62315/97
[71]申请人 世韩情报系统株式会社
地址 韩国汉城
共同申请人 数字网株式会社
[72]发明人 文光洙 黄鼎夏
[74]专利代理机构 柳沈知识产权律师事务所
代理人 马莹

权利要求书4页 说明书9页 附图页数6页

[54]发明名称 运动图像专家组便携式放音系统及其再现方法

[57]摘要

一种MPEG便携式放音系统及其再现方法。该系统包括:电源装置,提供工作电源;电源处理装置,对电源整流以稳定电压和电流;信息显示装置,显示与系统相关的数和字母组合;控制装置,控制声音数据的转换和再现;数据存储装置,把压缩的声音数据存储在指定的地址;信息选择装置,再现、下载和提供存储的选择的声音数据;放音装置,把声音数据转换成用户可听格式;和发送/接收装置,发送和接收来自外部装置的声音和节目数据。



ISSN1008-4274

权 利 要 求 书

1. 一种 MPEG 便携式放音系统，包括：

电源装置，用于给该系统提供工作电源，该电源装置由蓄电池来构成；

电源处理装置，用于对由电源装置提供的电源进行整流以便稳定电压和电流；

信息显示装置，用于显示与该系统的操作状态相关的数和字母组合；

控制装置，用于控制利用 MPEG 方法压缩的声音数据的转换和再现的所有操作；

数据存储装置，用于根据由控制装置输出的信号把利用 MPEG 方法压缩的声音数据存储在指定的地址；

信息选择装置，用于选择一般的操作以便再现、下载和提供在数据存储装置中存储的选择的声音数据；

放音装置，用于根据由控制装置输出的信号将在数据存储装置中存储的声音数据转换成对用户可听的格式；和

发送/接收装置，用于发送和接收由外部装置来的声音数据和节目数据。

2. 根据权利要求 1 所述的放音系统，其中当电源处理装置通过适配器接收外部电源时，该电源处理装置给电源装置的蓄电池提供充电电流。

3. 根据权利要求 1 所述的放音系统，其中该信息选择装置包括：

正向开关，用于当按下该开关小于一秒时进入到下一个选择，并且当连续按下该开关大于一秒时它快速播放当前的选择；

反向开关，用于当按下该开关小于一秒时，如果选择是在中间播放位置，那么它返回到目前选择的开始位置，或如果选择是在两个选择之间，那么它返回到前一个选择，并且当连续按下该开关大于一秒的预定时间时它快速地反向播放数据；

播放/停止开关，用于当按下该开关一次时再现数据，并且在播放模式中，当按下时停止播放模式，然后关断电源；

重复开关，用于当按下该开关一次时重新播放目前选择的节目，当按下两次时重复所有的选择，并当连续按下该开关时它取消所有的重复命令；和

随机开关，用于当按下该开关时以随机顺序随机地再现节目选择。

4. 根据权利要求 1 所述的放音系统，其中该控制装置包括：

CPU，用于控制有关把利用 MPEG 方法存储的数字数据变换成可听格式的操作；

中断控制器，用于当输入/输出操作结束或在其中产生故障时输出控制信号以便控制 CPU；

电源控制器，用于输出控制信号，以使稳定由电源处理装置提供的电源以作为 CPU 的工作电源，并且当存在故障时关断电源；

键盘接口，用于连接由信息选择装置提供的键选择信号；

LCD 控制器，用于控制提供给信息显示装置的矩阵电路的电流，以便在本发明的放音系统的操作期间控制显示；

扩展 ROM 接口，用于与扩展 ROM 连接，该扩展 ROM 被附加以扩展节目或存储器的容量；

计时器，用于对为数据下载和再现下载的数据所需要的时间信息和操作该系统所需要的数据中断所需要的时间信息进行计数；

总线桥接控制器，用于输出控制总线的控制信号，该总线传送数据；

控制器，用于控制数据发送和接收的输入/输出；

闪速 ROM 控制器，用于根据由 CPU 提供的中断器控制信号来驱动闪速 ROM；

DSP 接口，用于输出控制信号，该控制信号控制利用 MPEG 方法压缩的数字声音数据的输入/输出；和

时钟驱动器，用于把发生器的发生器时钟处理到预定的状态并且驱动该时钟作为 CPU 的时钟信号。

5. 根据权利要求 1 所述的放音系统，其中该数据存储装置包括：

RAM，该 RAM 是当切断电源时丢失数据的易失性存储元件，用于在给该系统提供电源之后正在进行再现操作的同时装入应用软件和瞬时存储该软件；和

闪速 ROM，该闪速 ROM 是当切断电源时不丢失数据的非易失性存储元件，用于存储和删除声音数据和与应用软件相关的数据以及其它数字数据。

6. 根据权利要求 1 所述的放音系统，其中该放音装置包括：

DSP 部分，用于把利用 MPEG 方法压缩的数字声音数据处理到预定状态；和

音频部分，用于把由 DSP 部分输入的声音信号转换成可听的格式。

7. 一种用于 MPEG 便携式放音系统的再现方法，包括下列步骤：

在把电源提供给信息选择装置时启动该系统；

装入主程序和完成所需软件的引导；和

根据由信息选择装置输出的信号、工作电源的状态、是否与外部电源连接和与外部电信系统连接等，如果操作环境的设置被完成，那么下载和再现存储的声音数据。

8. 根据权利要求 7 的再现方法，其中该方法还包括下列步骤：

在 CPU 和所有电路已经被启动之后，检测在主程序中是否存在误差；和

如果检测到主程序处于正常状态，那么运行主程序和完成所需软件的引导，如果在主程序中检测到误差，那么输出误差信号并且停止进一步的运行。

9. 根据权利要求 7 所述的再现方法，其中该方法还包括下列步骤：

当检测到键信号是由信息选择装置输入时，确定键信号是否是电源关断信号；

如果键信号不是电源关断信号，那么确定该键信号是否是声音数据再现信号；

如果键信号不是声音数据再现信号，那么确定该键信号是否是正向信号；

如果键信号不是正向信号，那么确定该键信号是否是反向信号；

如果该键信号不是反向信号，那么确定该键信号是否是停止信号；

如果该键信号不是停止信号，那么确定该键信号是否是重复信号；

如果该键信号不是重复信号，那么确定该键信号是否是随机信号；和

进行与检测信号对应的操作。

10. 根据权利要求 7 所述的再现方法，其中该方法还包括下列步骤：

如果确定电源装置的工作电源是在低电源状态，那么把检测到的电源与预定标准值相比较；

如果确定检测的电源太低以致不能进行该系统的操作，那么显示警告消息、存储当前数据、并且关断电源；和

如果确定检测到的电源足以使该系统继续操作，那么显示指示该系统充电的消息。

11. 根据权利要求 7 所述的再现方法，该方法还包括下列步骤：

当确定正在由外部电源提供电源时，利用由该外部电源提供的电源进行声音数据的再现操作；和

确定电源装置的电源状态并且进行充电操作。

12. 根据权利要求 7 所述的再现方法，该方法还包括下列步骤：

当检测到再现信号是来自信息选择装置时，显示已选择的声音数据选择的信息和当前正在播放的节目选择的信息。

13. 根据权利要求 7 所述的再现方法，该方法还包括下列步骤：

检索从外部电信系统接收的数据并且确定在该数据中是否存在误差；

如果检测到在该数据中存在误差，那么请求重新发送数据；和

如果检测到在该数据中没有误差，那么在该数据的接收被完成之后在指定的地址中存储接收的数据。

98.06.01

说 明 书

运动图像专家组便携式放音系统及其再现方法

本发明涉及一种便携式放音系统和方法，尤其涉及一种便携式放音系统及其再现方法，其中利用运动图像专家组(MPEG)方法压缩的并且在存储装置中存储的声音数据被转换成一种可听格式并且通过耳机、扬声器等输出。

通常，处理成待听和待看的数据被存储在存储介质中，然后通过再现装置输出。最普通的例子包括在磁带上存储的模拟数据，该磁带通过盒式播放机来播放，和在光盘上存储的数字数据，该光盘通过光盘播放机来播放。

近来在数字技术领域的发展已经使在个人计算机中使用的存储介质得到了很大改进。也就是说，用在 PC 中的存储介质明显地变轻和变小，为用户提供了更大的存储容量。

然而，随着为了运行操作系统和应用软件所需要的存储容量的增加，怎样能够更有效地利用存储介质受到了限制。为了补救这个问题，设计了各种方法以使能够有效地利用数字数据。 MPEG 标准是这些方法中的一个方法，它通过压缩存储在存储介质中的数据来增加存储介质的存储容量。

也就是说，利用压缩数据的 MPEG 方法把数据大约压缩到其原始规模的十二分之一而不损害声音或图像质量。在为了该目的利用软件或硬件压缩数据之后，把该数据存储到存储介质中，然后利用 MPEG 方法把该数据转换到它的原始状态，以致于该数据以由用户能够听到或看到的格式被再现。因此，MPEG 方法大大地增加了数据存储容量。

虽然所有传统的再现系统，例如磁带播放机、光盘播放机和 PC 等，具有再现 MPEG 压缩的数据的能力，但是用户遇到了许多麻烦。

具体地讲，在利用能够再现存储在磁带上的数据的盒式播放机时，由于存储(记录)数据所需要的时间与再现该数据的时间是相同的，所以存储过程是费时间的，并且在存储过程期间产生的热起损害记录质量的作用，以致于放音质量被降低。此外，由于磁带容易被损坏，所以在盒式带上存储的数据的重复播放也起着降低声音质量的作用。

光盘播放机和其中使用的光盘也具有许多问题，即，在光盘上不能记

录。此外，由于CD机的机械易坏性，所以当CD机即使受到轻微的外部振动时也能够产生再现故障。最后，由于在该装置中的机械部件经常超过一定的时间就损坏，所以CD机具有有限的使用寿命。

在盒式带中和CD机使用的存储介质也具有占据很大空间的缺陷。同样，用户必须特别小心地把存储介质放置在不受热，不受阳光直照等的区域内。

在现有技术的装置方面，例如用于再现利用MEPG方法存储的数据的PC，由于这些装置不是便携式的，所以用户能够接收声音和图像所在的位置被限制到该装置所在的位置。此外，当利用PC来再现利用MPEG方法压缩的数据时，使PC配置能够进行这种功能的软件或硬件的费用较高。同样，由于各种类型的声音数据被存储在许多存储介质中，所以用户必须购买许多类型的存储介质并且经过复杂的处理来再现在其中存储的数据。

最后，在上述所有的情况下，用户必须亲自去零售店来购买存储介质，这对用户产生了不方便。

本发明已经做了努力来解决上述的问题。本发明的一个目的是提供一种MPEG便携式放音系统及其再现方法，其把利用MPEG方法压缩和存储在存储芯上的声音数据再现成可听的格式。

本发明的另一个目的是提供一种MPEG便携式放音系统，通过把数据存储在半导体存储介质中，在记录期间该系统能够防止像在现有的盒式带播放机中那样产生的热，并且能够避免象传统的盒式带、光盘和其它存储介质那样由于暴露在热中而被损坏。

本发明的又一个目的是提供一种MPEG便携式放音系统，该系统能够与电信网和数据自动售货机连接，以致于各种数据能够被下载，由此，能够使用户享受到这些系统的快速、方便，多样等好处。

本发明的又一个目的是提供一种MPEG便携式放音系统，在该系统中借助于如上所述的电信网和数据自动售货机下载的数据能够由个人计算机来访问和保留。

本发明的又一个目的是提供一种MPEG便携式放音系统，该系统不需要像磁带播放机和光盘播放机那样的单独的存储介质，以致于能够使该装置变轻和变薄，并且不需要存储介质的物理存储空间。

为了实现上述目的，本发明提供一种用于再现利用MPEG方法压缩的声

音数据的 MPEG 便携式放音系统和方法。本发明的系统包括：电源装置，用于给该系统提供工作电源，该电源装置由蓄电池来构成；电源处理装置，用于对由电源装置提供的电源进行整流以便稳定电压和电流；信息显示装置，用于显示与该系统相关的数和字母组合；控制装置，用于控制利用 MPEG 方法压缩的声音数据的转换和再现的所有操作；数据存储装置，用于根据由控制装置输出的信号把利用 MPEG 方法压缩的声音数据存储在指定的址；信息选择装置，用于选择一般的操作以便再现、下载和提供在数据存储装置中存储的选择声音数据；放音装置，用于根据由控制装置输出的信号把在数据存储装置中存储的声音数据转换成用户可听的格式；和发送/接收装置，用于发送和接收由外部装置来的声音数据和节目数据。

本发明的再现方法包括下列步骤：在把电源提供给信息选择装置时启动该系统和检测闪速 ROM 的状态；如果检测到闪速 ROM 的状态是正常的，由闪速 ROM 装入主程序和完成所需软件的引导；和如果操作环境的安装被完成，那么根据由信息选择装置输出的信号、工作电源的状态、是否与外部电源连接和与外部电信系统连接，下载和再现存储的声音数据。

作为说明书一部分的附图解释了本发明的实施例，并且与说明书一起来解释本发明的原理，附图中：

图 1 是根据本发明的优选实施例的 MPEG 便携式放音系统的方框图。

图 2 是图 1 的 MPEG 便携式放音系统的详细方框图；和

图 3a － 3f 是用于根据本发明的优选实施例的 MPEG 便携式放音系统的再现方法的流程图。

下面参照附图来描述本发明的优选实施例。

首先参照图 1，本发明的 MPEG 便携式放音系统包括：电源部分 100，电源处理器 200，信息选择器 300、信息显示部分 400、控制部分 500、数据存储部分 600，放音部分 700 和发送/接收机 800。

利用镍－镉(Ni － CD)、镍－金属氢化物(Ni － MH)、锂离子，或锂聚合物蓄电池来实现电源部分 100，并且该电源部分 100 把化学能量变换成电能并把该电能提供给便携式放音系统。此外，利用通过适配器接收的电能对电源部分 100 进行再次充电。

电源处理器 200 从电源部分 100 或直接地通过适配器接收电力，并且把该电力整流成稳压电流，然后把该稳压电流作为驱动电源提供给控制部分

500，当电源处理器 200 通过适配器接收电力时，电源处理器 200 把接收到的电力提供给电源部分 100，用于对电源部分 100 进行充电。

利用由用户操作的各种预定键来执行信息选择器 300，并且信息选择器 300 根据用户的选择来输出电信号以便控制电源，分离用于再现的数据、控制与数据再现相关的各种功能、并且发送和接收数据。

具体的说，信息选择器 300 包括：正向开关，用于当按下该开关最好小于一秒的预定时间时它进入到下一个节目选择，并且当连续按下最好大于一秒的预定时间时它快速播放数据；反向开关，用于当按下该开关最好小于一秒的预定时间时，如果选择是在中间播放位置，那么它返回到目前节目选择的开始位置，或如果选择是在两个选择之间，那么它返回到前一个节目选择位置，并且当连续按下该开关最好大于一秒的预定时间时它快速地反向播放数据；播放/停止开关，用于当按下该开关一次时再现数据，并且在再现数据的情况下，当再按下一次时停止目前的播放模式，然后关断电源；重复开关，用于当按下该开关一次时它重新播放目前选择的节目，当按下两次时它重复所有的选择，当按下最好大于三秒的预定时间时它取消所有的重复命令；随机开关，用于当按下该开关时以随机顺序随机地再现节目选择。

利用 LCD(液晶显示器)来实现信息显示部分 400，并且该信息显示部分 400 显示与通过上述开关实现的各种模式相关的各种数字和字母。

控制部分 500 控制用于存储和再现利用 MPEG 方法压缩的声音信号的所有各种操作。如在图 2 中所示的，控制部分 500 包括：CPU(中心处理单元)501，用于控制与把利用 MPEG 方法存储的数字数据变换成可听格式相关的操作；中断控制器 503，用于输出控制信号，以便当输入/输出操作结束或在其中产生故障时控制 CPU 501；电源控制器 505，用于输出控制信号，以便稳定由电源处理器 200 提供的电源来作为 CPU 501 的工作电源，并且当故障存在时关断电源；键盘接口 507，用于连接由信息选择器 300 提供的键选择信号；LCD 控制器 509，用于控制提供给信息显示部分 400 的矩阵电路的电流，以便在本发明的放音系统的操作期间控制显示；扩展 ROM 接口 511，用于与扩展 ROM 连接，增加该扩展 ROM 是用于扩展节目或存储器，并且与闪速 ROM 连接；计时器 513，用于对为数据下载和再现下载的数据所需要的信息和操作该系统所需要的数据中断所需要的时间信息进行计数；总线桥接控制器 519，用于输出控制总线的控制信号，该总线传送数据；控制器

523，用于控制发送和接收的数据的输入/输出；闪速 ROM 控制器 527，用于根据由 CPU 501 提供的中断器控制信号来驱动闪速 ROM 603； DSP(数字信号处理器)接口 529，用于输出控制信号，该控制信号控制利用 MPEG 方法压缩的数字声音数据的输入/输出；和时钟驱动器 531，用于把发生器 1000 的发生器时钟处理到预定的状态并且驱动该时钟作为 CPU 501 的时钟信号。

利用中断线与 I/O 总线的结合，把上述控制部分 500 的所有元件连接起来。

数据存储部分 600 根据从控制部分 500 来的信号存储通过发送/接收机 800 下装的并且利用 MPEG 方法压缩的声音数据。此外，如在图 2 中所示的，利用闪速 ROM 603 来实现数据存储部分 600，用于存储和删除声音数据和与应用软件相关的数据以及其它的数字数据，该闪速 ROM 603 是非易失性存储元件，即当切断电源时它不丢失数据。

放音部分 700 根据由控制部分 500 提供的信号把存储在数据存储部分 600 中的声音数据转换成一种可听的格式。如在图 2 中所示的，放音部分 700 包括： DSP 部分 701，用于把利用 MPEG 方法压缩的数字声音数据还原成它的原始状态；音频部分 703，用于把由 DSP 部分 701 输入的声音信号转换成一种可听的格式；和耳机/扬声器 705，用于把由音频部分 703 输入的电声音信号转换成能够由用户可听的声音。

发送/接收机 800 与 PC，数据自动售货机，或其它这样的外部装置连接，并且它既可以给这些外部装置发送声音或节目数据，也可以从这些装置接收声音或节目数据。

下面参照图 3a － 3f 来描述一种利用 MPEG 方法压缩数据的优选再现方法，该方法用于上述结构的便携式放音系统。

首先，如果用户按下信息选择器 300 的 ON(接通)开关以便再现和听在利用 MPEG 方法压缩的并且存储在数据存储部分 600 中的所有数字数据之中特殊的声音数据，那么控制部分 500 的 CPU 501 通过借助于电源处理器 200 接收从电源部分 100 或适配器来的电源而进入到操作模式(S1000)。

接着， CPU 501 运行主程序和完成所需软件的引导(S1300)，然后确定通过键盘接口 507 和 MEM/IO 总线输入的信息选择器 300 的键信号是否被检测(S1400)。

如果在步骤 S1400 中检测到键信号，那么在步骤 S1410 中它确定是否具

有电源关断选择信号，该选择信号是由用户选择以切断由电源处理器 200 提供的电源来选择的。如果检测到电源关断信号，那么在步骤 S1415 中关断由电源处理器 200 提供的工作电源并且该系统进入到预备模式。

如果在步骤 S1410 中没有检测到电源关断信号，那么在步骤 S1420 中检测是否输入放音信号，该放音信号用于恢复和再现利用 MPEG 方法压缩的和在数据存储部分 600 的闪速 ROM 603 中存储的数据选择。

如果在步骤 S1420 中确定键信号是用于再现在数据存储部分 600 中存储的声音数据的再现键信号，那么在步骤 S1425 中 CPU 501 把选择的声音信号借助于控制部分 500 的 DSP 接口 529 加载到放音部分 700 的 DSP 部分 701 上，然后利用操作系统软件把利用 MPEG 方法压缩的数字声音数据恢复到它的原始状态，通过放音部分 700 的音频部分 703 把该数据转换成电声音信号，和通过耳机/扬声器 705 把该电信号转换成用户可听的声音信号并且输出该信号。

在步骤 S1420 中，如果检测到的键信号不是用于再现声音信号的信号或如果该系统目前正在再现数据，那么在步骤 S1430 中检测是否已经输入正向信号。如果在步骤 S1430 中检测到正向键信号，那么 CPU 501 确定是否该正向选择信号是在小于一秒的预定时间之内被发送，如果这个判据被满足，那么进入到下一个选择并且执行再现操作，同时还确定是否该正向选择信号是在大于一秒的预定时间之内被发送，如果是，那么目前的选择被快速地再现(S1435)。

在步骤 S1430 中，如果没有检测到正向键信号，那么在步骤 S1440 上确定反向键信号是否已被输入，如果该反向键信号已被输入，那么正在再现的目前节目选择被返回到开始，或如果是在两个选择之间，那么如果反向信号是最好在小于一秒的预定时间之内被发送，那么进入到前一首歌的选择，如果反向信号是在最好大于一秒的预定时间之内被发送，那么当前播放的节目选择被快速地反向(S1445)。

如果在步骤 S1440 中没有检测到反向信号，那么在步骤 S1450 中检测停止信号是否已经被输入，在步骤 S1450 中，如果检测到停止信号，那么利用安装程序进一步确定预定次数最好为一次的信号是否已经被输入并且当前的模式是否是播放模式，在这种情况下当前的再现操作被中断，以及在停止模式中是否再现被起动。此外，在播放模式已经被中断的情况下，如果检测到

在最好大于三秒的预定时间内发送了停止信号，那么预备电源被控制到关断(S1455).

在步骤 S1450 中，如果没有检测到停止信号，或如果检测到该系统是在播放模式，那么在步骤 S1460 中确定重复信号是否已经被输入。如果检测到重复信号，那么利用安装程序来确定输入的次数，从而当检测到信号已经被输入最好为一次的预定次数时重复当前的选择，当检测到两个信号被输入时，重复在闪速 ROM 603 的存储器中存储的所有声音信号，和当在重复操作期间检测到信号被输入时，取消任何重复的命令(S1465).

此外，如果在步骤 S1460 中没有检测到重复信号，那么在步骤 S1470 中确定随机信号是否已经被输入。如果在这个步骤中检测到随机信号，那么在步骤 S1475 中以随机的顺序再现选择的节目，如果没有检测到随机信号，那么重复进行再现利用 MPEG 方法压缩的声音数据的操作.

在上述根据由信息选择器 300 输入的键信号正在再现由用户选择的声音信号的情况下，工作电源在电源处理器 200 中被分析，以便确定在电源部分 100 中是否存在低电源状态，该低电源状态不能使再现操作被进行(S1500). 如果在步骤 S1500 中检测到电源部分 100 是在低电源状态中，那么在步骤 S1510 中确定检测的当前电压是否低于预定的基准值，该基准值将阻止声音信号的正常再现.

如上所述，如果确定电源部分 100 的电压小于预定的标准值，那么控制部分 500 借助于 MEM/IO 总线输出预定的控制信号给 LCD 控制器 509 以使显示警告.在此，LCD 控制器 509 调节提供给信息显示部分 400 的矩阵电路的电源，从而在信息显示部分 400 上显示“电源关断”的消息(S1520).

在显示“电源关断”消息的同时，控制部分 500 的 CPU 501 给数据存储部分 600 的闪速 ROM 603 输入数据存储信号，以致于当前的状态被保留(S1530)，并且借助于 MEM/IO 总线来控制电源控制器 505 以使切断提供给电源处理器 200 的电源(S1540).

在步骤 S1510 中，如果确定电源部分 100 的电压大于预定的标准值，该电压能够使该系统正常操作，那么控制部分 500 借助于 LCD 控制器 509 来控制信息显示部分 400，以致于“低电源”信息被显示(S1550).

在步骤 S1500 中检查电源状态之后，控制部分 500 的 CPU 501 确定电源处理器 200 是否通过适配器与外部电源连接(S1600). 如果在步骤 S1600 中检

测到电源处理器200与外部电源连接，那么在步骤S1610中确定电源部分100是否被充满电。

如上所述，如果检测到电源部分100已被充满电，那么中断充电操作，以便防止电源部分100由过充电而被损坏，如果检测到电源部分100没有被充满电，那么确定由外部电源来的电力是否通过适配器正在供电(S1620)。此时，如果在电源部分100没有被充满电的状态下外部电源正在供电，那么由外部电源给电源部分100提供电源以便对电源部分100进行充电(S1630)。

在步骤S1600之后，即在确定是否与外部电源连接之后，在步骤S1700中确定声音数据是否根据用户的选择正在被再现。在这个步骤中，如果声音数据正在被再现，那么控制部分500的CPU 501分析声音数据，检查例如：数据再现时间、选择的题目、音乐的类型、用于该选择的保留播放时间等等，并且通过控制LCD控制器509由信息显示部分400来显示该信息(S1710)。

此外，控制部分500的CPU 501在数据存储部分600的闪速ROM 603中存取利用MPEG方法压缩的声音数据，并且通过DSP接口529把这个声音数据发送给放音部分700的DSP部分701，从而，DSP部分701把利用MPEG方法压缩的数字声音数据处理到预定的状态，并且借助于音频部分703把它转换成声音信号，然后通过耳机/扬声器705再现该声音数据，从而用户能够听到该声音(S1720)。

接着，在步骤S1730中确定选择的声音数据是否已经被完全再现了，如果已经被再现完了，那么在步骤S1740中从闪速ROM 603中检索下一个选择的声音数据，然后，在步骤S1750中从闪速ROM 603装入待再现的声音数据和做好再现该声音数据的准备。

在步骤S1700之后，即确定声音数据是否正在被再现之后，控制部分500的CPU 501分析由控制器523来的信号，以便确定发送/接收机800是否与外部电信系统连接，该外部电信装置是指例如计算机，该计算机具有调制解调器或安装在其中的其它电信装置，或数据自动售货机，该自动售货机出售各种数据和各种音乐节目，电视游戏等(S1800)。

如果在步骤S1810中确定发送/接收机800与外部电信系统连接，那么本发明的系统被变成下载的负载，在步骤S1810中该数据被下载，并且在步骤S1820中确定在下载的数据中是否存在误差。

如上所述，如果确定在下载的数据中存在误差，那么控制部分500的

CPU 501 控制重新发送数据，如果在该数据中不存在误差，那么存储该数据(S1830)。此外，如果在步骤 S1820 中确定在发送的数据中不存在误差，那么在步骤 S1840 中 CPU 501 确定该数据的发送是否被完成，指明在数据存储部分 600 中的地址区域，然后在步骤 S1850 中下载和存储该数据。

在如上所述构成和再现压缩数据的 MPEG 便携式放音系统，由于利用 MPEG 方法压缩声音数据并且把该数据存储到半导体芯片中或其它存储元件中，然后以一种用户可听的格式被再现，因此，通过消除了对唱片、磁带、CD 和其它类似的存储介质的需要而提供了方便，并且能够克服在现有再现装置中利用存储介质的许多缺陷：即在记录或重复播放之后音质的下降、存储介质的易碎性迫使在存储数据时需要特别小心等缺陷。

此外，因为能够把本发明的系统与电信系统和数据自动售货机连接起来以便下载各种数据，所以能够提供给用户快速、方便和低费用的好处。

考虑到在此公开的对本发明的描述和特殊的实施例，本发明的其它实施例对于本领域里的技术人员来说是显而易见的。这些说明和实施例仅作为例子来考虑，它们都属于由所附权利要求所指示的本发明的保护范围和精神之内。

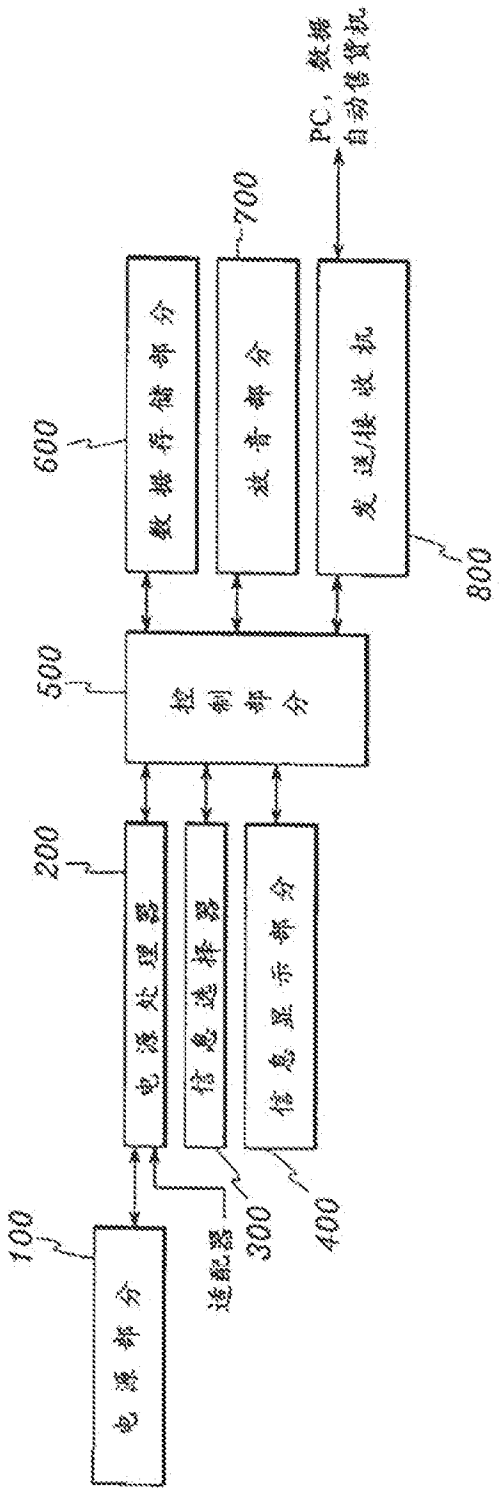

PC，数据
自动修复机
700
600
数据存储部分
故障部分
发送/接收机
800
500
控制部分
200
电源处理器
信息选择器
信息显示部分
100
电源部分
通信器
300
400

图 1

图 2

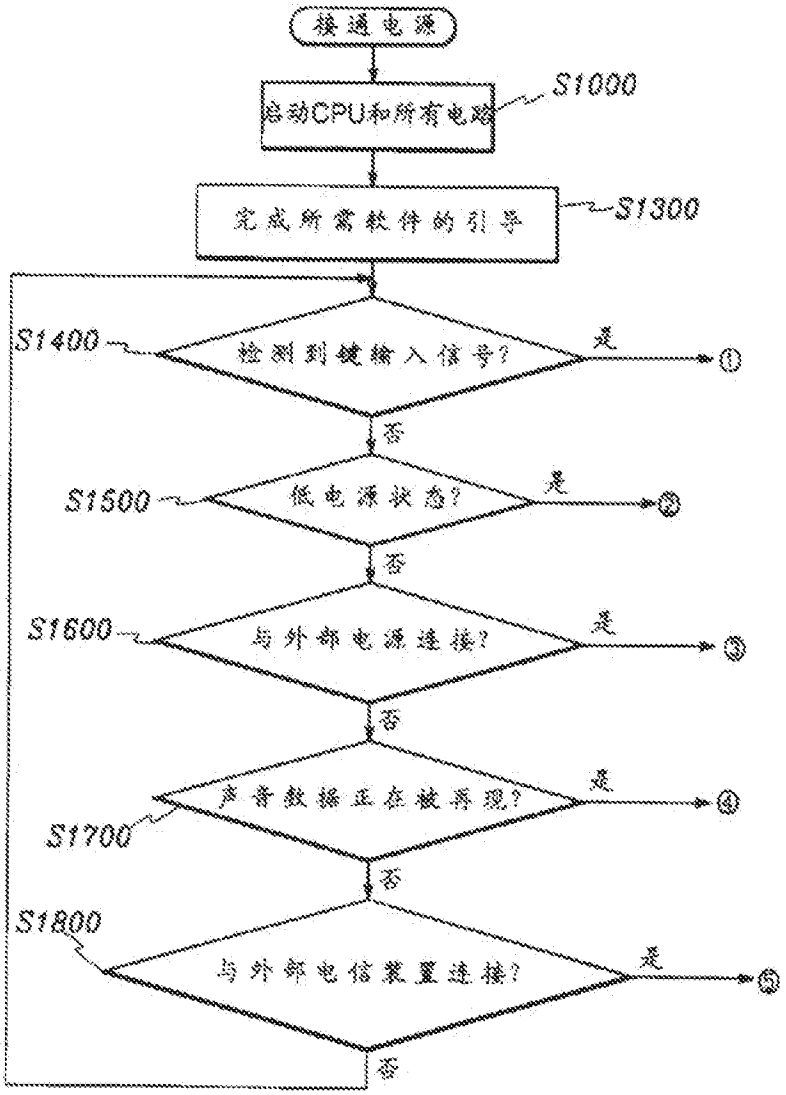


图 3a

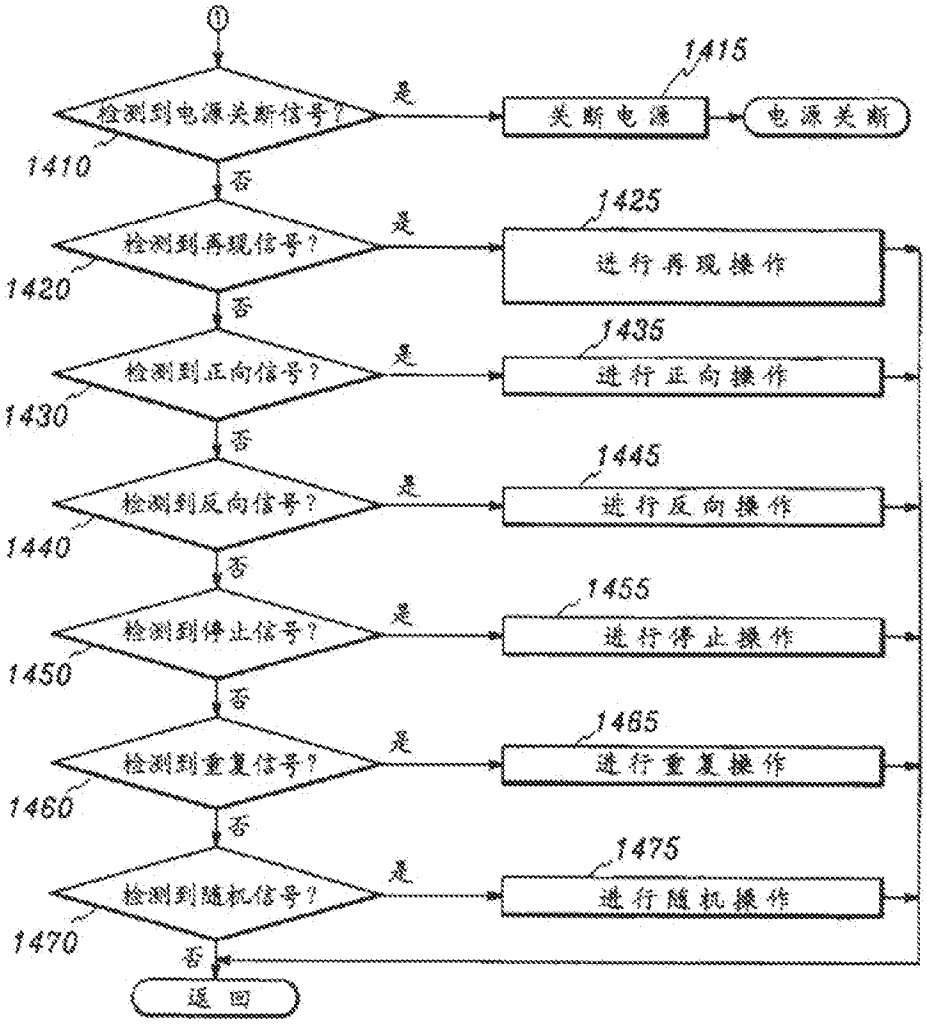


图 3b

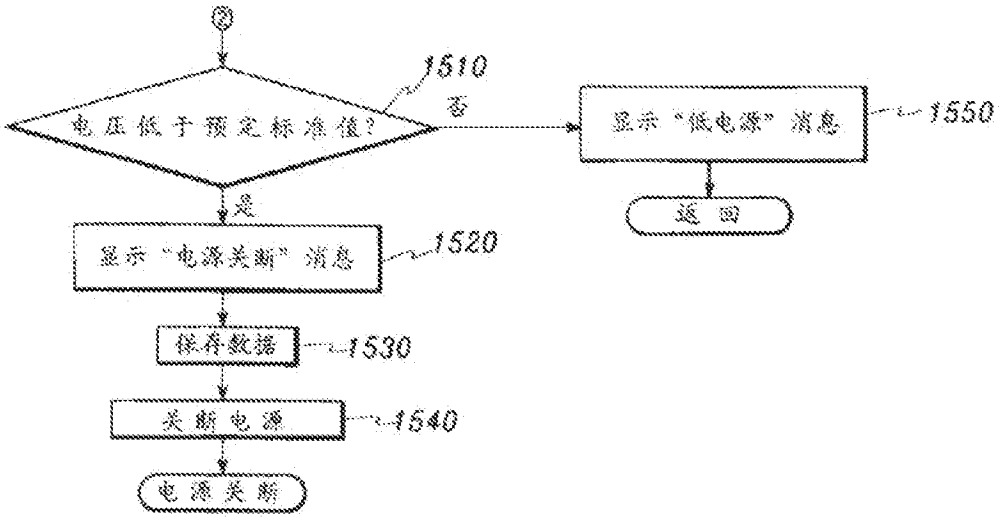

1510
电压低于预定标准值?
否
显示"低电源"消息
1550
返回
是
显示"电源关断"消息
1520
保存数据
1530
关断电源
1540
电源关断

图 3c

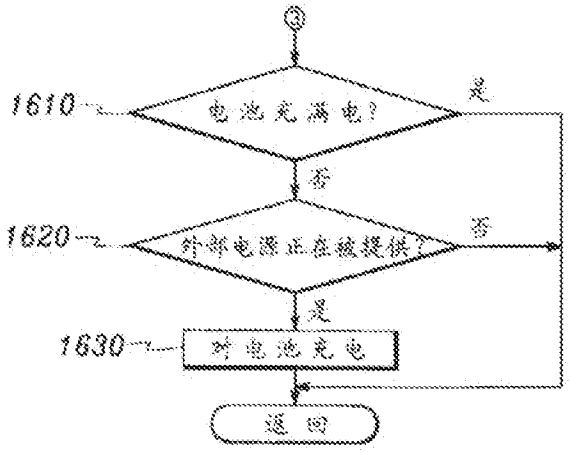

1610
电池无满电?
是
否
1620
外部电源正在被提供?
否
是
1630
对电池充电
返回

图 3d

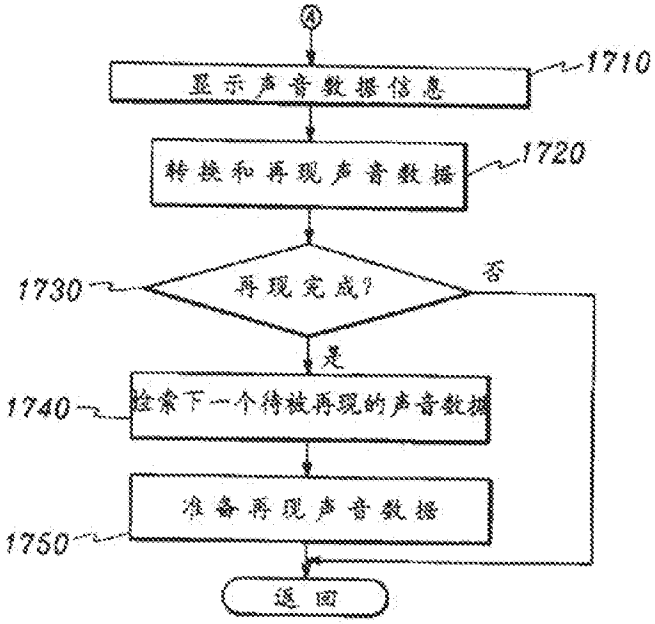


图 3e

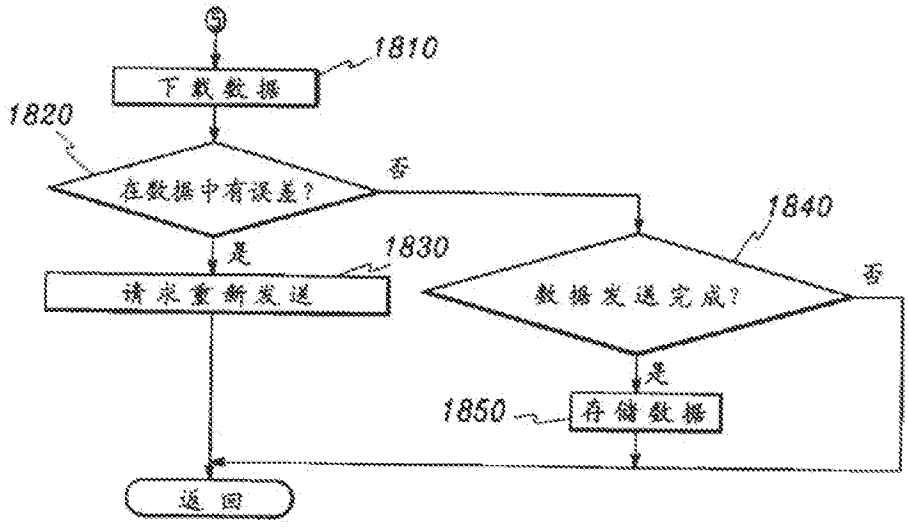


图 3f

(19) Bundesrepublik Deutschland
Deutsches Patent- und Markenamt

(10) DE 44 31 070 B4 2004.07.22

(12) # Patentschrift

(21) Aktenzeichen: P 44 31 070.6
(22) Anmeldetag: 01.09.1994
(43) Offenlegungstag: 07.03.1996
(45) Veröffentlichungstag
der Patenterteilung: 22.07.2004

(51) Int Cl.[7]: B60R 25/00
B60K 31/00

Innerhalb von 3 Monaten nach Veröffentlichung der Erteilung kann Einspruch erhoben werden.

(71) Patentinhaber:
DaimlerChrysler AG, 70567 Stuttgart, DE

(74) Vertreter:
Amersbach, W., Dipl.-Ing., 89250 Senden

(72) Erfinder:
Regel-Brietzmann, Peter, Dr., 89073 Ulm, DE;
Class, Fritz, Dr., 72587 Römerstein, DE;
Heisterkamp, Paul, 89610 Oberdischingen, DE

(56) Für die Beurteilung der Patentfähigkeit in Betracht gezogene Druckschriften:
DE 42 32 435 C1
DE 42 27 968 C2
DE 34 38 385 C2
DE 42 39 271 A1
DE 42 24 536 A1
DE 42 01 142 A1
DE 38 05 810 A1
DE 32 20 083 A1
DE 92 16 352 U1
US 38 78 915
EP 06 24 488 A1
N.N.: Die elektronischen Beifahrer. In: Funkschau 5/1988, S.46-48;
HANKEL,Rainer; URBANSKI,Wilfried: OKE - ein autar-
kes Ortungssystem für Einsatzfahrzeuge. In: Bosch
Techn. Berichte 8, 1988, 1/2, S.57-66;

(54) Bezeichnung: Anordnung zur zugangscodegesteuerten Benutzungseinschränkung eines Kraftfahrzeugs

(57) Hauptanspruch: Anordnung zur zugangscodegesteuerten Benutzungseinschränkung eines Kraftfahrzeuges mit elektronisch steuerbaren Komponenten, bei welcher in einem Zuordnungsspeicher eine benutzungseinschränkende Zuordnungsvorschrift von Steuerungsparametern der elektronisch steuerbaren Komponenten zu jedem zulässigen Zugangscode gespeichert ist und eine Steuereinheit die Komponenten nach Maßgabe der gespeicherten Zuordnungsvorschrift und des eingegebenen Zugangscodes steuert, dadurch gekennzeichnet, dass die Steuereinheit geeignet ist, die benutzungseinschränkende Zuordnungsvorschrift für den aktuellen Benutzer des Kraftfahrzeuges anhand mindestens eines zusätzlichen Passwortes dahingehend zu ändern, dass in Abhängigkeit des Passwortes vorab gespeicherte Steuerparameter aktiviert werden.

Beschreibung

[0001] Die Erfindung betrifft eine Anordnung zur zugangscodegesteuerten Benutzungseinschränkung eines Kraftfahrzeugs.

[0002] Zur Verringerung der Mißbrauchs- oder Diebstahlsgefahr ist insbesondere die mechanische Sicherung in Form des Lenkradschlosses bekannt. Darüberhinaus gibt es bereits codebetätigte elektronische Wegfahrsperren. Beide Sicherungsmaßnahmen sind aber erfahrungsgemäß zu überwinden. Insbesondere existiert aber auch kein wirksamer Schutz gegen die mißbräuchliche Benutzung eines eingeschränkt befugten Benutzers oder den kriminellen Zugriff auf ein von einem Berechtigten gestartetes Fahrzeug.

Stand der Technik

[0003] Im deutschen Gebrauchsmuster DE 92 16 352 U1 ist eine Kilometerkarte für Fahranfänger offenbart, die eine PIN-Nummer und ein Kilometerguthaben enthält. Die Karte wird dazu verwendet, bei der Benutzung eines Fahrzeuges durch einen Fahranfänger zu gewährleisten, dass der Fahrer eine vorab eingestellte Höchstgeschwindigkeit nicht überschreitet und das Fahrzeug nur für eine fest eingestellte Anzahl von Kilometern von dem Fahranfänger verwendet werden kann. Darüber hinausgehende Modifikationen von Fahrzeugfunktionen sind in der genannten Schrift nicht offenbart. In der deutschen Offenlegungsschrift DE 42 39 271 A1 ist ein Diebstahlschutz für Fahrzeuge offenbart, bei dem ein Fahrzeug durch die Fernabfrage eines eingebauten Senderempfängers beispielsweise im Fall eines Diebstahls lokalisiert werden kann. Die dort beschriebene Funktionalität wird lediglich zur Ortung eines abhanden gekommenen Fahrzeuges verwendet.

[0004] In der deutschen Offenlegungsschrift DE 42 24 536 A1 ist eine Anlage beschrieben, anhand der Bewegungsraum von Fahrzeugen geografisch definiert begrenzt werden kann. Hierbei werden, sobald das entsprechend ausgestattete Fahrzeug ein vorab definiertes geografisches Gebiet verläßt, wesentliche Fahrzeugfunktionen wie beispielsweise die Motorsteuerung vollständig deaktiviert. Die deutsche Offenlegungsschrift DE 42 01 142 A1 beschreibt ein System, mit dem die Geschwindigkeit eines Fahrzeuges anhand eines Fahrzeugnavigationssystems und Sensoren insbesondere zum Fahrbahnzustand ortsabhängig geregelt werden kann. In dem US-Patent US 3,878,915 B1 wird eine programmierbare Geschwindigkeitskontrolleinrichtung beschrieben, die die Vorabauswahl einer Maximalgeschwindigkeit eines Fahrzeuges anhand von einem Benutzer angegebener Codes ermöglicht. Die europäische Patentanmeldung EP 0 624 489 A1 sowie die deutsche Patentschrift DE 34 38 385 C2 offenbaren ähnliche Einrichtungen zur Begrenzung bzw. Kontrolle einer maximalen Fahrzeuggeschwindigkeit oder anderer Parameter für Fahrzeugfunktionen anhand vom Fahrer direkt eingegebenen oder anderweitig zur Verfügung gestellten Daten.

Aufgabenstellung

[0005] Der vorliegenden Erfindung liegt daher die Aufgabe zugrunde eine Anordnung zur zugangscodegesteuerten Benutzungseinschränkung eines Kraftfahrzeugs anzugeben, welche eine solche mißbräuchliche Benutzung verhindert oder zumindest erschwert.

[0006] Die Erfindung ist im Patentanspruch 1 beschrieben. Die Unteransprüche enthalten vorteilhafte Ausgestaltungen und Weiterbildungen der Erfindung.

[0007] Die Erfindung ermöglicht es, daß ein eingeschränkt berechtigter Benutzer ein Fahrzeug unter Einhaltung von Beschränkungen z.B. räumlicher, zeitlicher oder funktioneller Art ein Kraftfahrzeug wie gewöhnlich nutzen kann und erst bei Überschreiten der Beschränkungen oder bei dem Versuch dazu Sicherungsmaßnahmen ausgelöst werden.

[0008] Der Umfang der Beschränkungen ist vorzugsweise veränderlich programmierbar und als Zuordnungsvorschrift in einem programmierbaren Speicher spezifisch für einen oder mehrere Zugangscodes gespeichert.

[0009] Die Sicherungsmaßnahmen werden durch Einfluß einer Steuereinheit auf elektronische Komponenten des Fahrzeugs bewerkstelligt. Dabei können bevorzugt ohnehin vorhandene elektronische Komponenten wie z.B. die elektronisch gesteuerte Zündung oder die elektronisch gesteuerte Kraftstoffzufuhr oder evtl. vorhandene Zusatzsysteme genutzt werden.

[0010] Die Eingabe eines Zugangscodes kann auf verschiedene an sich bekannte Arten erfolgen, beispielsweise über eine Tastatur, durch Spracheingabe, mittels einer Karte usw.. Vorzugsweise werden zur Codeeingabe Einrichtungen mitbenutzt, die auch für andere Funktionen vorgesehen sind, z.B. Mikrofon und Spracherkenner einer Freisprecheinrichtung mitbenutzt zur Spracheingabe eines Zugangscodes.

[0011] Die technische Ausführung kann mit gebräuchlichen Mitteln und damit kostengünstig und aufwandsarm erfolgen. Die elektronische Steuerung des Kraftfahrzeugs wird mit einem programmierbaren Speicher verbunden, in welchem als Zuordnungsvorschrift zu einem oder mehreren zulässigen Zugangscodes Steuerparameter für elektronisch steuerbare Komponenten des Kraftfahrzeugs gespeichert sind. Nach Maßgabe dieser gespeicherten Parameter steuert eine Steuereinrichtung in Verbindung mit der Fahrzeugelektronik einzelne oder mehrere Funktionen des Kraftfahrzeugs, wie etwa Freigabe der Benzinpumpe, der Zündung, die mögliche Höchstgeschwindigkeit, das Öffnen des Kofferraums und ähnliches. Die Parameter können in Gruppen zusammengefaßt sein. Der eingegebene Zugangscode legt nach der codespezifisch gespeicherten Zuord-

nungsvorschrift anhand der gespeicherten Parameter fest, welche elektronisch steuerbaren Funktionen im Fahrzeug aktiviert oder gesperrt sind und bestimmt somit den Umfang der Benutzungseinschränkung.

[0012] Die Aufhebung einer Benutzungseinschränkung ist an die vorherige Eingabe eines freigebenden Zugangscodes gebunden, z. B. vor Antritt einer Fahrt, während einer bestimmten Zeitpause zu Beginn der Fahrt, in einem bestimmten Zeitintervall vor der gewünschten Benutzungsart oder auf Aufforderung des Systems.

[0013] Die Steuerungsparameter können als bedingte Parameter oder Funktionen programmiert sein, welche erst in Verbindung mit über spezielle oder für andere Funktionen bereits vorhandene Sensoren bestimmte Zustandswerte, z.B. nach Vergleich in einer Vergleichseinrichtung zu konkreten Steuerungsparametern führen.

[0014] So kann z.B. ein Wert für die Höchstgeschwindigkeit programmiert sein, der fortlaufend mit dem aktuellen Geschwindigkeitswert verglichen wird. Bei Unterschreiten der programmierten Höchstgeschwindigkeit erfolgt keine Beeinflussung des elektronischen Systems. Erst beim Überschreiten dieser Höchstgeschwindigkeit steuert die Steuereinrichtung das Fahrzeugsystem nach einem hierfür vorgesehenen Ablauf, z.B. Drosselung der Kraftstoffzufuhr, Auslösen eines Warnhinweises und/oder einer Aufforderung zur Eingabe eines die Beschränkung aufhebenden Zugangscodes usw.,

[0015] Nach einem anderen Beispiel kann eine Gebietsbeschränkung einprogrammiert sein, die unter Benutzung eines Ortssensors in einem Navigationssystem (Global Positioning System o.ä.) fortlaufend mit dem aktuellen Ort des Fahrzeugs vergleichen wird und z.B. bei Annäherung an die Gebietsgrenze einen Warnhinweis an den Fahrer, nach Überschreiten der programmierten Gebietsgrenze einen Funk-Alarmruf auslöst und/oder eine allmähliche Stillegung des Fahrzeugs bewirkt.

[0016] Die Programmierung des Systems kann z.B. über eine numerische oder alphanumerische Tastatur erfolgen. Dazu läßt sich das System mittels eines zusätzlichen besonderen mechanischen oder elektronischen Schlüssels in einen Programmierzustand versetzen. In diesem Zustand ist die Eingabe oder Freigabe von neuen Zugangscodes möglich, die Löschung von alten Zugangscodes, sowie die Setzungen, Änderung und Löschung von mit bestimmten Zugangscodes gekoppelten Nutzungseinschränkungen. Ebenfalls läßt sich die Beschränkung der Gültigkeitsdauer von Zugangscodes setzen, ändern oder Löschen. Ferner können die von der Steuereinheit ausgelösten Abläufe neu vergegeben werden.

[0017] Zugangscodes können in Gruppen zusammengefaßt sein und so jeweils die gleiche Nutzungsbeschränkung in Kraft setzen. Zugangscodes oder Codegruppen können bestimmten Personen zugeordnet werden. Dadurch erfolgt bei der Eingabe des Codes eine Identifizierung des Eingebenden.

Ausführungsbeispiel

[0018] Nachfolgend sind zur Veranschaulichung der Erfindung noch einige spezielle bevorzugte Funktionen und vorteilhaft mit der erfindungsgemäßen Anordnung verbindbare Zusatzfunktionen beschrieben, ohne daß die Erfindung auf diese beschränkt sein soll.

A. Diebstahlsicherung

[0019] Das System wird eingestellt auf eine allgemeine Benutzungseinschränkung. Alle Untersysteme des Fahrzeugs werden abgeschaltet, wenn keine korrekte Fahreridentifizierung erfolgt. Die Anzahl der möglichen Fehlversuche zur Eingabe ist im Programmiermodus bestimmbar. Wird diese erreicht oder überschritten, blockiert die Systemsteuerung sämtliche Systeme und Eingaben bis zur Wiederherstellung des Programmiermodus.

[0020] Bei Benutzung eines tastaturbasierten Zugangscodesystems muß sich der Fahrer vor Antritt der Fahrt identifizieren. Bei Benutzung eines Spracherkennungssystem muß sich der Fahrer innerhalb eines im Programmiermodus eingestellten Zeitraums oder einer zurückgelegten Strecke identifizieren. Geschieht diese Identifizierung nicht, oder wird die Anzahl der erlaubten Fehlversuche überschritten, blockiert die Fahrzeugelektronik wie bei herkömmlichen Systemen, bzw. sorgt nach einer oder mehreren Warnungen an den Fahrer für ein allmähliches Anhalten des Fahrzeugs. Das Fahrzeugsystem blockiert anschließend. Die Blockade ist nur in einem besonders geschützten Modus (etwa dem Programmiermodus) aufhebbar.

B.Nutzungseinschränkungen für spezielle Fälle bzw. Personen und Personengruppen

- Eingabe eines oder mehrerer gleichwertiger Paßwörter (für den Fall, daß einmal eines vergessen wird) für einen oder mehrere berechtigte Benutzer mit der vollen Nutzungsberechtigung. Diese Paßwörter werden sprecherabhängig gehalten.
- Eingabe eines oder mehrerer Paßwörter für Benutzer mit eingeschränkter Nutzungsberechtigung und die zugehörige Nutzungseinschränkung. Diese Nutzungseinschränkung kann zeit- oder streckenabhängig (etwa für den Parkservice, die Werkstatt, die Tankstelle etc.) gestaltet werden, aber auch andere Fahrzeugfunktionen (etwa Höchstgeschwindigkeit, Öffnung des Kofferraums etc.) können eingeschränkt werden. Bei diesen Paßwörtern kann auch Sprecherunabhängigkeit eingestellt werden.
- Eingabe eines oder mehrerer sprecherunabhängiger Notruf-Paßwörter. Diese Paßwörter bewir-

ken Notrufmaßnahmen seitens der Fahrzeugelektronik (s.u. "Zusätzliche Funktionalität"), schränken aber zunächst die Benutzung des Fahrzeugs nicht ein.

– Eingabe von sprecherabhängigen Stornierungs-Paßwörtern, die innerhalb des Sicherheitsintervalls der Notrufpaßwörter die Aufhebung der Notruf-Funktionalität bewirken.

C. Zusätzliche Funktionen

[0021] Notruf Verschiedene Notrufwörter bewirken verschiedene Notrufe und Notrufarten. Es gibt allgemeine Notrufe, die sofort einen entsprechenden Notruf offen absetzen, und Notrufe, die nach einem Intervall einen verdeckten Notruf absetzen. Die verdeckte Notrufart dient als Schutzmaßnahme bei Fahrzeugentführungen (car-jacking).

[0022] Die offenen Notrufwörtern erledigen automatisch etwa die Anforderung eines Polizei-Einsatzwagens oder eines Rettungswagens. Wenn das Fahrzeug mit einem Navigationssystem ausgestattet ist, wird gleichzeitig die Position übermittelt, ansonsten wird der Notruf dem Fahrer über das Telefon weitergegeben, damit dieser die Position angeben kann.

[0023] Die verdeckten Notrufwörter bewirken, daß sich das Fahrzeug als gestohlen bzw. entführt meldet. Ist ein Navigationssystem vorhanden, wird auch die Position angegeben,

[0024] Dies geschieht verdeckt und nach einem Intervall, um eine Gefährdung einer eventuelle mitentführten Person zu vermeiden.

[0025] Für beide Arten von Notrufwörtern gibt es Stornierungswörter, die die Absetzung des Notrufs verhindern bzw. abbrechen oder eine Stornierungsmeldung absetzen. Für die verdeckten Notrufwörter gibt es Pseudo-Stornierungswörter, die nur die Quittierungsmeldung des Systems auslösen, den Notruf aber aufrechterhalten.

Fahrtenbuch bzw. Fahrtprotokoll

[0026] Da durch den Paßwortmechanismus der jeweilige Fahrer identifiziert ist, kann das Fahrzeugsystem für jede Fahrt und jeden Fahrer ein Nutzungsprotokoll erstellen, das über die Ansprüche an ein Fahrtenbuch hinaus auch einen Fahrtenschreiber-Mechanismus sowie in Verbindung mit einem Navigationssystem ein vollständiges Fahrtenprotokoll beinhalten kann.

Nutzung durch Verleihfirmen

[0027] Bei der Übergabe des Fahrzeugs gibt der Mieter ein Hauptnutzungspaßwort ein. Damit verbunden kann die Verleihfirma eventuelle vertragliche Nutzungseinschränkungen wie etwa maximale Nutzungsdauer, maximale Entfernungsleistung sowie in Verbindung mit einem Navigationssystem geographische Nutzungseinschränkungen in die Fahrzeugelektronik eingeben. Das Fahrzeug meldet es, wenn diese Nutzungseinschränkungen nicht eingehalten werden bzw. sorgt für ein allmähliches Anhalten des Fahrzeugs. Die Sicherung der Eingabemöglichkeit erfolgt in diesem Falle elektronisch, damit ein Point-to Point-Verleih möglich wird.

Patentansprüche

1. Anordnung zur zugangscodegesteuerten Benutzungseinschränkung eines Kraftfahrzeuges mit elektronisch steuerbaren Komponenten, bei welcher in einem Zuordnungsspeicher eine benutzungseinschränkende Zuordnungsvorschrift von Steuerungsparametern der elektronisch steuerbaren Komponenten zu jedem zulässigen Zugangscode gespeichert ist und eine Steuereinheit die Komponenten nach Maßgabe der gespeicherten Zuordnungsvorschrift und des eingegebenen Zugangscodes steuert, **dadurch gekennzeichnet**, dass die Steuereinheit geeignet ist, die benutzungseinschränkende Zuordnungsvorschrift für den aktuellen Benutzer des Kraftfahrzeuges anhand mindestens eines zusätzlichen Passwortes dahingehend zu ändern, dass in Abhängigkeit des Passwortes vorab gespeicherte Steuerparameter aktiviert werden.

2. Anordnung nach Anspruch 1, dadurch gekennzeichnet, dass das zusätzliche Passwort eindeutig einem Benutzer zugeordnet ist.

3. Anordnung nach Anspruch 1, dadurch gekennzeichnet, dass das zusätzliche Passwort benutzerunabhängig ist.

4. Anordnung nach einem der vorangehenden Ansprüche, dadurch gekennzeichnet, dass die Zuordnungsvorschrift zusätzlich veränderlich programmierbar ist.

5. Anordnung nach einem der vorangehenden Ansprüche, dadurch gekennzeichnet, dass die Steuerparameter als Funktion von variablen Zustandswerten gespeichert sind, dass Sensoren diese Zustandswerte ermitteln und eine Vergleichseinrichtung aus der gespeicherten Funktion und anhand der ermittelten Zustandswerte konkrete Steuerparameter ableitet.

6. Anordnung nach Anspruch 4, dadurch gekennzeichnet, dass ein Ortssensor mittels eines Ortungssystems den momentanen Ort des Fahrzeugs bestimmt, dass die Zuordnungsvorschrift eine Gebietsbeschränkung enthält und die Vergleichseinrichtung den bestimmten Ort mit der Gebietsbeschränkung vergleicht.

7. Anordnung nach Anspruch 4, dadurch gekennzeichnet, dass ein Geschwindigkeitssensor die Momentangeschwindigkeit ermittelt.

8. Anordnung nach Anspruch 7, dadurch gekennzeichnet, dass die Zuordnungsvorschrift eine Beschränkung der Geschwindigkeit enthält.

9. Anordnung nach einem der vorangehenden Ansprüche, dadurch gekennzeichnet, dass die Steuereinheit die Betätigung elektronischer Komponenten sperrt oder freigibt.

10. Anordnung nach einem der vorangehenden Ansprüche, dadurch gekennzeichnet, dass die Steuereinheit einen vorprogrammierten Ablauf auslöst.

11. Anordnung nach einem der vorangehenden Ansprüche, dadurch gekennzeichnet, dass die Steuereinheit beim Versuch der Betätigung einer gesperrten Komponente die Ausgabe eines Hinweises auf die Sperrung und/oder die Aufforderung zur Eingabe eines freigebenden Zugangscodes auslöst.

12. Anordnung nach einem der vorangehenden Ansprüche, dadurch gekennzeichnet, dass sie eine zusätzliche Komponente aufweist, die geeignet ist, einen Notruf zu generieren, und die durch die Eingabe eines bestimmten Passwortes aktivierbar ist.

Es folgt kein Blatt Zeichnungen

(19) Europäisches Patentamt
European Patent Office
Office européen des brevets.

(11) Publication number : 0 569 243 A1

(12) EUROPEAN PATENT APPLICATION

(21) Application number : 93303536.2

(22) Date of filing : 07.05.93

(51) Int. Cl.[5] : G06F 3/033, B60R 16/02

(30) Priority : 08.05.92 JP 116447/92

(43) Date of publication of application :
10.11.93 Bulletin 93/45

(84) Designated Contracting States :
DE FR GB

(71) Applicant : PIONEER ELECTRONIC CORPORATION
No. 4-1, Meguro 1-chome
Meguro-ku Tokyo-to (JP)

(72) Inventor : Nishida, Junichi, c/o Pioneer Electronic Corp.
Kawagoe Works, No, 25-1 Aza-Nishicho
Oaza-Yamada, Kawagoe-shi, Saitama-ken (JP)
Inventor : Ishida, Tessho, c/o Pioneer Electronic Corp.
Kawagoe Works, No, 25-1 Aza-Nishicho
Oaza-Yamada, Kawagoe-shi, Saitama-ken (JP)
Inventor : Sakaguchi, Masahiko, c/o Pioneer Electronic Corp.
Kawagoe Works, No, 25-1 Aza-Nishicho
Oaza-Yamada, Kawagoe-shi, Saitama-ken (JP)
Inventor : Shinohara, Jun, c/o Pioneer Electronic Corp.
Kawagoe Works, No, 25-1 Aza-Nishicho
Oaza-Yamada, Kawagoe-shi, Saitama-ken (JP)
Inventor : Araki, Mario, c/o Pioneer Electronic Corp.
Kawagoe Works, No, 25-1 Aza-Nishicho
Oaza-Yamada, Kawagoe-shi, Saitama-ken (JP)
Inventor : Ayukai, Yasushiro, c/o Pioneer Electronic Corp.
Kawagoe Works, No, 25-1 Aza-Nishicho
Oaza-Yamada, Kawagoe-shi, Saitama-ken (JP)
Inventor : Nabe, Kenichi, c/o Pioneer Electronic Corp.
Kawagoe Works, No, 25-1 Aza-Nishicho
Oaza-Yamada, Kawagoe-shi, Saitama-ken (JP)
Inventor : Arakawa, Takeharu, c/o Pioneer Electronic Corp.
Kawagoe Works, No, 25-1 Aza-Nishicho
Oaza-Yamada, Kawagoe-shi, Saitama-ken (JP)
Inventor : Baba, Toshiharu, c/o Pioneer Electronic Corp.
Kawagoe Works, No, 25-1 Aza-Nishicho
Oaza-Yamada, Kawagoe-shi, Saitama-ken (JP)
Inventor : Kaneko, Michihiro, c/o Pioneer Electronic Corp.
Kawagoe Works, No, 25-1 Aza-Nishicho
Oaza-Yamada, Kawagoe-shi, Saitama-ken (JP)

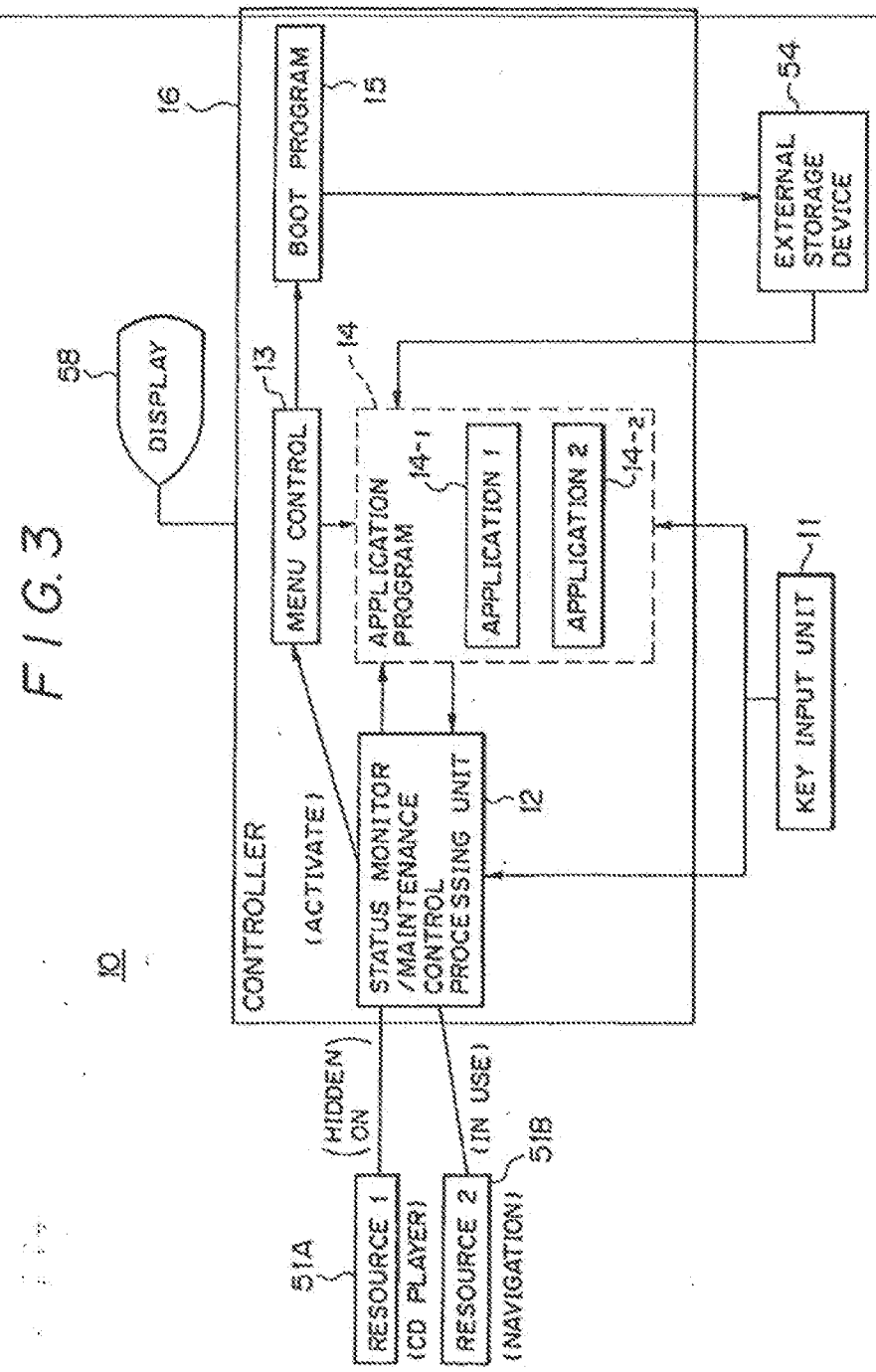
(74) Representative : Brunner, Michael John et al
GILL JENNINGS & EVERY Broadgate House 7 Eldon Street
London EC2M 7LH (GB)

(54) Control system for devices mounted on vehicle.

(57) A control system (10) for devices mounted on vehicle includes a plurality of controlled devices (51), storage unit (54) for storing a plurality of control programs for controlling each of the plurality of the controlled devices, input unit (11) for selecting controlled devices to be operated from the plurality of controlled devices, and operation control unit (16) for reading application programs respectively associated with controlled devices selected by the input unit from the storage unit and monitoring status of operations of the controlled devices selected by the input unit on the basis of the application programs read from the storage unit so as to simultaneously operate the controlled devices.

EP 0 569 243 A1

FIG. 3


10
CONTROLLER
16
BOOT PROGRAM
15
54
EXTERNAL STORAGE DEVICE
68
DISPLAY
13
MENU CONTROL
14
APPLICATION PROGRAM
14-1
APPLICATION 1
14-2
APPLICATION 2
11
KEY INPUT UNIT
(ACTIVATE)
STATUS MONITOR /MAINTENANCE CONTROL PROCESSING UNIT
12
(HIDDEN ON)
(IN USE)
51A
RESOURCE 1 (CD PLAYER)
51B
RESOURCE 2 (NAVIGATION)

Field of the Invention:

The present invention relates to a control system for devices mounted on vehicle (hereinafter referred to as "on-vehicle device"), and more particularly to a control system for on-vehicle devices which integrally controls, by means of a single control unit, a plurality of devices, such as a navigation device, a compact disk (CD) player, a tuner and a cassette player.

Description of the Prior Art:

Recently, various electronic devices have been used as on-vehicle devices. Examples of these on-vehicle devices are audio devices such as CD (Compact Disk) players, DAT (Digital Audio Tape) players and FM/AM tuners, visual devices such as television sets, navigation devices using a GPS (Global Positioning System) or the like. It is possible to operate these devices independently. However, it is desirable to integrally control the devices by means of a single control unit in order to systematically operate the overall system. Further, it is required that on-vehicle devices can be provided in a limited space and can be operated by the driver who is driving the car. From the above point of view, it is desirable to employ a centralized control system using a single control device.

FIG. 1 is a block diagram illustrating an overview of a control system for on-vehicle devices. Referring to FIG. 1, a control system 50 includes devices 51A and 51B to be controlled, a key input unit 52, a controller 53, an external storage device 54 and a display unit 58. The controlled devices 51A and 51B are, for example, audio devices such as CD players, DAT players and FM/AM tuners, visual devices such as television sets, navigation devices using a GPS or the like. Hereinafter, the controlled devices 51A and 51B are referred to as "resources". The key input unit 52 is used to input various kinds of data to the system. The controller 53 selects one of the resources on the basis of input data from the input key unit 52, and performs various controls on the basis of an application program (application software) used to control the selected resource. The external storage device 54 stores application programs associated with the respective resources. The display unit 58 displays various kinds of data and the operation status.

The controller 53 includes a menu controller 55, an application operation controller 56, and a boot controller 57. The menu controller 55 activates the system and the operation of the overall system. The application operation controller 56 operates the application program. The boot controller 57 transfers the application program read from the external storage device 54 in an initial state to the application operation controller 56, and activates the application program.

A description will now be given of the operation of the control system. In the following description, the resources 51A and 51B are a CD player (resource 1) and a navigation device (resource 2), respectively.

First of all, a power supply to the on-vehicle control system 50 is turned ON. The menu controller 55 of the controller 53 activates the overall controller 53, and makes the display 58 represent a menu screen MENU for selecting one of the resources. It will now be assumed that the user looks at the menu screen MENU and selects the CD player 51A by the key input unit 52. The menu controller 55 sends the boot controller 57 an instruction to activate the application program associated with the CD player 51A.

In response to receipt of the instruction, the boot controller 57 transfers the application program associated with the CD player 51A to the application operation controller 56, and activates the application program. The display unit 58 displays an application screen APP associated with the selected application program (see FIG. 2). The application screen APP for use in the CD player represents the number of programs, information indicating how to operate the key input unit 52 for the CD player (for example, information indicating the functions of key switches), and so on. Hence, the system operates as if the controller 53 is used exclusively for the CD player, and the CD player 51A performs a play specified by the user.

When the user wishes to operate the navigation device 51B while the CD player 51A is playing, a menu screen display key (menu key; not shown) mounted on the key input unit 52 is pushed down, and then the menu screen MENU is displayed again. Hence, the display on the display unit 58 is switched from the application screen APP to the menu screen MENU. At the same time as the above switching, the application operation controller 56 terminates the operation of the application program associated with the CD player 51A. As a result, the play of the CD player 51A is interrupted.

Thereafter, the user looks at the menu screen MENU and selects the navigation device 51B by the key input unit 52. The menu controller 55 makes the boot controller 57 activate the application program associated with the navigation device 51B.

The boot controller 7 transfers the application program associated with the navigation device 51B to the application operation controller 56, and activates the selected application program. Hence, the display unit 58 represents an application screen APP related to the application program (see FIG. 2). The application screen APP for use in the navigation device indicates a map, information indicating how to operate the key input unit 52 for the navigation device (for example, information indicating the functions of key switches), and so on. Hence, the system operates as if the controller 53 is used exclusively for the navigation device, and the navigation device 51B performs an operation specified by the user, for example, displays a map desired by the user.

As described above, the display operation on the menu screen MENU corresponds to switching of resources performed when the desired resource is specified. In order to terminate displaying of the application screen APP and display the menu screen MENU, it is necessary to terminate execution of the application program currently selected. In other words, it is impossible to simultaneously use the resources usable independently, such as the CD player and the navigation device. Hence, the resources cannot be efficiently utilized.

It is an object of the present invention to provide a control system for on-vehicle devices, which is capable of simultaneously using resources usable independently.

According to one aspect of the present invention, there is provided a control system for devices mounted on vehicle includes a plurality of controlled devices, storage unit for storing a plurality of control programs for controlling each of the plurality of the controlled devices, input unit for selecting controlled devices to be operated from the plurality of controlled devices, and operation control unit for reading application programs respectively associated with controlled devices selected by the input unit from the storage unit and monitoring status of operations of the controlled devices selected by the input unit on the basis of the application programs read from the storage unit so as to simultaneously operate the controlled devices.

The nature, utility, and further features of this invention will be more clearly apparent from the following detailed description with respect to a preferred embodiment of the invention when read in conjunction with the accompanying drawings briefly described below.

FIG. 1 is a block diagram illustrating an overview of a control system for on-vehicle devices;

FIG. 2 is a diagram showing switching between screens in the control system shown in FIG. 1;

FIG. 3 is a block diagram of an overview of the structure of an embodiment of the present invention;

FIG. 4 is a diagram illustrating a state transition of a menu screen in the embodiment of the present invention;

FIG. 5 is a diagram illustrating an example of display of the menu screen;

FIG. 6 is a block diagram illustrating an overview of the structure of a state monitor/maintenance control processing unit;

FIG. 7 is a flowchart of the operation of a first-resource status maintenance processing unit; and

FIG. 8 is a flowchart of the operation of a second-resource status maintenance processing unit.

A description will now be given, with reference to FIGS. 3 through 8, of an embodiment of the present invention. In these figures, parts that are the same as those shown in FIG. 1 are given the same reference numbers.

A control system 10 for on-vehicle devices according to the embodiment of the present invention includes a plurality of resources 51A and 51B, a key input unit 11, a controller 16, the external storage device 54 and the display unit 56. The resources 51A and 51B are, for example, audio devices such as CD players, DAT players and FM/AM tuners, visual devices such as television sets, navigation devices using a GPS or the like. The key input unit 11 is used to input various kinds of data to the system. The controller 16 selects two or more resources from among the plurality of resources on the basis of the input data from the input key unit 11, and performs various controls on the basis of an application program or programs (application software) used to control the selected resource or resources. The external storage device 54 stores application programs associated with the respective resources. The display unit 56 displays various pieces of data and the operation status.

The controller 16 includes a status monitor/maintenance control processing unit 12, a menu controller 13, an application operation controller 14, and a boot controller 15. The status monitor/maintenance control processing unit 12 activates the system, and monitors the status of the operation of the plurality of resources. Further, the processing unit 12 simultaneously operates one or more resources. The menu controller 13 performs an operation on the menu screen MENU (see FIG. 2) under the control of the status monitor/maintenance control processing unit 12. The application operation controller 14 operates a plurality of application programs 14_1 and 14_2. The boot controller 15 transfers one or more application programs read from the external storage device 54 to the application operation controller 14 in an initial mode, and activates the application programs.

A description will now be given, with reference to FIGS. 6 through 8, of the structure and operation of the status monitor/maintenance control processing unit 12. For the sake of simplicity, the following description relates to a case where two resources are simultaneously operated.

FIG. 6 is a block diagram of the structure of the status monitor/maintenance control processing unit 12. The status monitor/maintenance control processing unit 12 includes a first-resource status maintenance processing unit 20, a second-resource status maintenance processing unit 21 and an application interface 22. The first-resource status maintenance processing unit 20 controls the operation of the first resource 51A. The second-resource status maintenance processing unit 21 controls the operation of the second resource 51B. The application interface 22 performs an interfacing operation between the first-

resource status maintenance processing unit 20 or the second-resource status maintenance processing unit 21 and the application operation controller 14.

The operation of the status monitor/maintenance control processing unit 12 will now be described with reference to FIGS. 7 and 8. It will be assumed that the status monitor/maintenance control processing unit 12 simultaneously operates the two application programs by executing an interruption process.

FIG. 7 is a flowchart of the operation of the first-resource status maintenance processing unit 20, and FIG. 8 is a flowchart of the operation of the second-resource status maintenance processing unit 21.

The first-resource status maintenance processing unit 20 determines whether or not a command from the application operation controller 14 to the first resource 51A has been inputted via the application interface 22 by the interruption process in step S10.

When it is determined that the command to the first resource 51A has not been inputted, the first-resource status maintenance processing unit 20 sends the first resource 51A an operation confirmation command for confirming the status of the operation of the first resource 51A in step S11. In response to receipt of the operation confirmation command, the first resource 51A sends the first-resource status maintenance processing unit 20 information concerning the operation of the first resource 51A requested by the received command.

Then, the first-resource status maintenance processing unit 20 determines whether or not an error has occurred on the basis of the received information concerning the operation of the first resource 51A in step S13, and performs an error process when an error has occurred in step S14. Then, the process returns to step S10. When it is determined that an error has not occurred in the first resource 51A, the first-resource status maintenance processing unit 20 performs nothing and returns to step S10.

When it is determined, in step S10, that the command to the first resource 51A has been inputted, the first-resource status maintenance processing unit 20 sends the above command to the first resource 51A in step S15. In response to receipt of the above command, the first resource 51A performs the operation related to the command, and sends the first-resource status maintenance processing unit 20 information concerning the result of the operation in step S12.

The first-resource status maintenance processing unit 20 determines, on the basis of the received information concerning the operation, whether or not an error with respect to the command has occurred in step S13. When it is determined that an error has occurred, the first-resource status maintenance processing unit 20 performs an error process in step S14, and returns to step S10 again. When it is determined, in step S13, that no error has occurred, the first-resource status maintenance processing unit 20 does not perform anything, and returns to step S10.

In parallel with the above operation of the first-resource status maintenance processing unit 20, the second status maintenance processing unit 21 determines whether or not a command from the application operation controller 14 to the second resource 51B has been inputted via the application interface 22 by the interruption process in step S20.

When it is determined, in step S20, that no command to the second resource 51B has been inputted, the second-resource status maintenance processing unit 21 sends the second resource 51B an operation confirmation command for confirming the status of the operation of the second resource 51B in step S21. In response to receipt of the operation confirmation command, the second resource 51B sends the second-resource status maintenance processing unit 21 information concerning the operation of the second resource 51B requested by the received command.

The second-resource status maintenance processing unit 21 determines whether or not an error has occurred on the basis of the received information concerning the operation of the second resource 51B in step S23, and performs an error process when an error has occurred in step S24. Then, the process returns to step S20. When it is determined that an error has not occurred in the second resource 51B, the second-resource status maintenance processing unit 21 performs nothing and returns to step S20.

When it is determined, in step S20, that the command input to the second resource 51B has been inputted, the second-resource status maintenance processing unit 21 sends the above command to the second resource 51B in step S25. In response to receipt of the above command, the second resource 51B performs the operation related to the command, and sends the second-resource status maintenance processing unit 21 information concerning the result of the operation in step S22.

Then, the second resource status maintenance processing unit 21 determines, on the basis of the received information concerning the operation, whether or not an error with respect to the command has occurred in step S23. When it is determined that an error has occurred, the second-resource status maintenance processing unit 21 performs an error process in step S24, and executes step S20 again. When it is determined, in step S23, that no error has occurred, the second-resource status maintenance processing unit 21 does not perform anything, and returns to step S20.

As described above, according to the embodiment of the present invention, it is possible to simultaneously operate the two resources in parallel with each other by the interruption process and to efficiently utilize the resources.

A description will now be given of the concrete operation of the on-vehicle control system. In the follow-

ing description, the first resource 51A is a CD player (serving as "resource 1"), and the second resource 51B is a navigation device (serving as "resource 2").

First, a power supply to the on-vehicle control system 50 is turned ON. The status monitor/maintenance control processing unit 12 of the controller 16 activates the overall controller 53, and makes the display unit 58 represent a menu screen $MENU_{CMS}$ for selecting one or more resources. It will now be assumed that the user looks at the menu screen $MENU_{CMS}$ and selects the CD player 51A by the key input unit 52. The menu controller 55 sends the boot controller 15 an instruction to activate the application program corresponding to the CD player 51A.

In response to receipt of the instruction, the boot controller 15 transfers the application program 14_{-1} associated with the CD player 51A to a predetermined area of a memory (not shown) in the application operation controller 14, and activates the application program 14_{-1}. The display unit 58 displays an application screen APP_1 associated with the selected application program 14_{-1} (see FIG. 2). The application screen APP for use in the CD player indicates the number of programs, information indicating how to operate the key input unit 52 for the CD player (for example, information indicating the functions of key switches), and so on. Hence, the system operates as if the controller 53 is used exclusively for the CD player, and the CD player 51A performs a play specified by the user.

When the user wishes to operate the navigation device 51B while the CD player 51A is playing, a menu screen display key (menu key; not shown) mounted on the key input unit 52. Hence, the status monitor/maintenance control processing unit 12 sends the menu controller 13 the command for displaying the menu screen on the display unit 58. Hence, the display on the display unit 58 is switched from the application screen APP_1 to a menu screen $MENU_{NOW}$. As shown in FIG. 5, the menu screen $MENU_{NOW}$ indicates the resources so that the resources which are operating are visually distinguishable from the resources which are not operating. For example, the resources (the CD player: CD AUDIO) which are operating are indicated with a display color different from a display color with which the resources which are not operating are indicated. In the example shown in FIG. 5, the indication of the CD player which is operating is shown so that it is surrounded by a block. A state in which one or more resources previously selected are simultaneously operating is referred to as a "hidden ON state".

The user refers to the menu screen $MENU_{NOW}$ and operates a cursor key (not shown) of the key input unit 11 so that the cursor moves to the indication of the navigation device 51B (a reverse indication in FIG. 5). Hence, the menu controller 55 sends the boot controller 15 a command to activate an application program 14_{-2} associated with the navigation device 51B. In response to receipt of the command, the boot controller 15 transfers the application program 14_{-2} associated with the navigation device 51B to a memory area in the application operation controller 14 different from that for the application program 14_{-1}, and activates the application program 14_{-2}. Hence, an application screen APP_2 for the application program 14_{-2} for the navigation device 51B is displayed on the display unit 58 (see FIG. 2). The application screen APP_2 for use in the navigation device indicates a map, information indicating how to operate the key input unit 11 for the navigation device (for example, information indicating the functions of key switches), and so on. Hence, the system operates as if the controller 16 is used exclusively for the navigation device, and the navigation device 51B performs an operation specified by the user, for example, displays a map desired by the user.

The status monitor/maintenance control processing unit 12 controls the application operation controller 14 so that the application program 14_{-1} for the CD player 51A is simultaneously running. Hence, reproduced sounds are being output via a speaker (not shown) in the hidden ON state.

According to the embodiment of the present invention, the status monitor/maintenance control processing unit is provided between the application softwares and the resources, and is capable of maintaining the operating status of the previously selected one or more resource. As a result, a plurality of resources operable independently can be simultaneously operated and can be efficiently utilized. In this case, it is possible to directly switch the display from the application screen APP_2 to the application screen APP_1 and directly switch the display from the menu screen $MENU_{NOW}$ to the menu screen $MENU_{CMS}$.

In the above-mentioned embodiment, two resources are simultaneously operated. Further, more than two resources can be simultaneously operated in the same manner as described above.

According to the present invention, it is possible to independently operate a plurality of controlled devices (resources) by means of an operation control means and hence to efficiently utilize the resources in the on-vehicle control system.

The invention may be embodied in other specific forms without departing from the spirit of essential characteristics thereof. The present embodiments are therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

Claims

1. A control system (10) for devices mounted on vehicle comprising:

   a plurality of controlled devices (51),

   storage means (54) for storing a plurality of control programs for controlling each of the plurality of the controlled devices;

   input means (11) for selecting controlled devices to be operated from the plurality of controlled devices; and

   operation control means (16) for reading application programs respectively associated with controlled devices selected by said input means from the storage means and monitoring status of operations of the controlled devices selected by said input means on the basis of the application programs read from said storage means so as to simultaneously operate the controlled devices.

2. A control system according to claim 1, wherein said operation control means monitors a selection of controlled device by interruption process when at least one controlled device is being operated.

3. A control system according to claim 1, wherein said operation control means comprising a plurality of sub-control means (14, 20, 21) for respectively monitoring and operating each one of said controlled devices and interface means (22) for interfacing said sub-control means with each other.

4. A control system according to claim 1, further comprising display means (56) for indicating the controlled devices currently operated.

5. A control system according to claim 4, wherein said display means indicates the newly selected controlled device in a manner being distinguished from the controlled device which has been operated prior to the selection of the new controlled device.

FIG.1

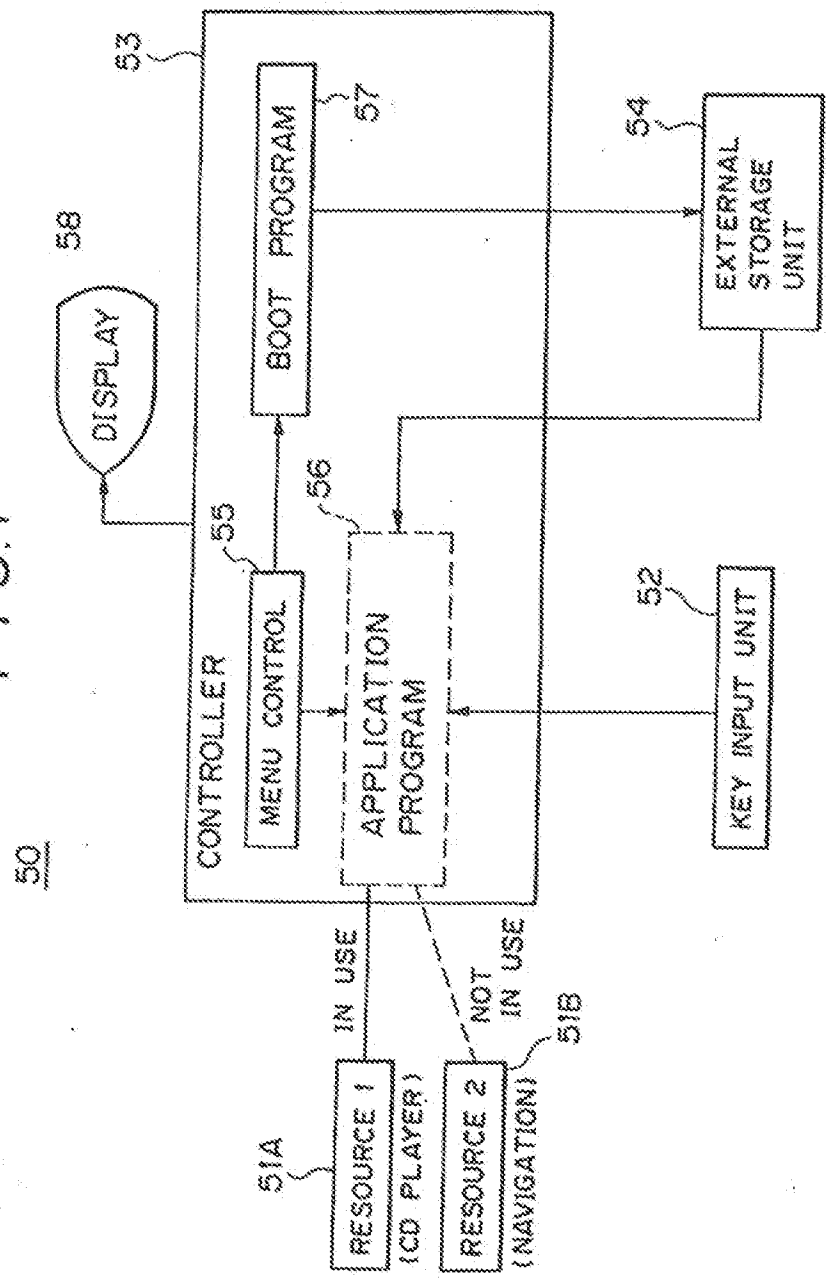

50
53
58
DISPLAY
CONTROLLER
55
MENU CONTROL
56
APPLICATION PROGRAM
57
BOOT PROGRAM
54
EXTERNAL STORAGE UNIT
52
KEY INPUT UNIT
IN USE
NOT IN USE
51A
RESOURCE 1 (CD PLAYER)
51B
RESOURCE 2 (NAVIGATION)

FIG. 2

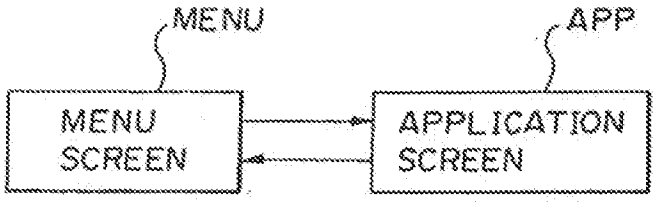


FIG. 3

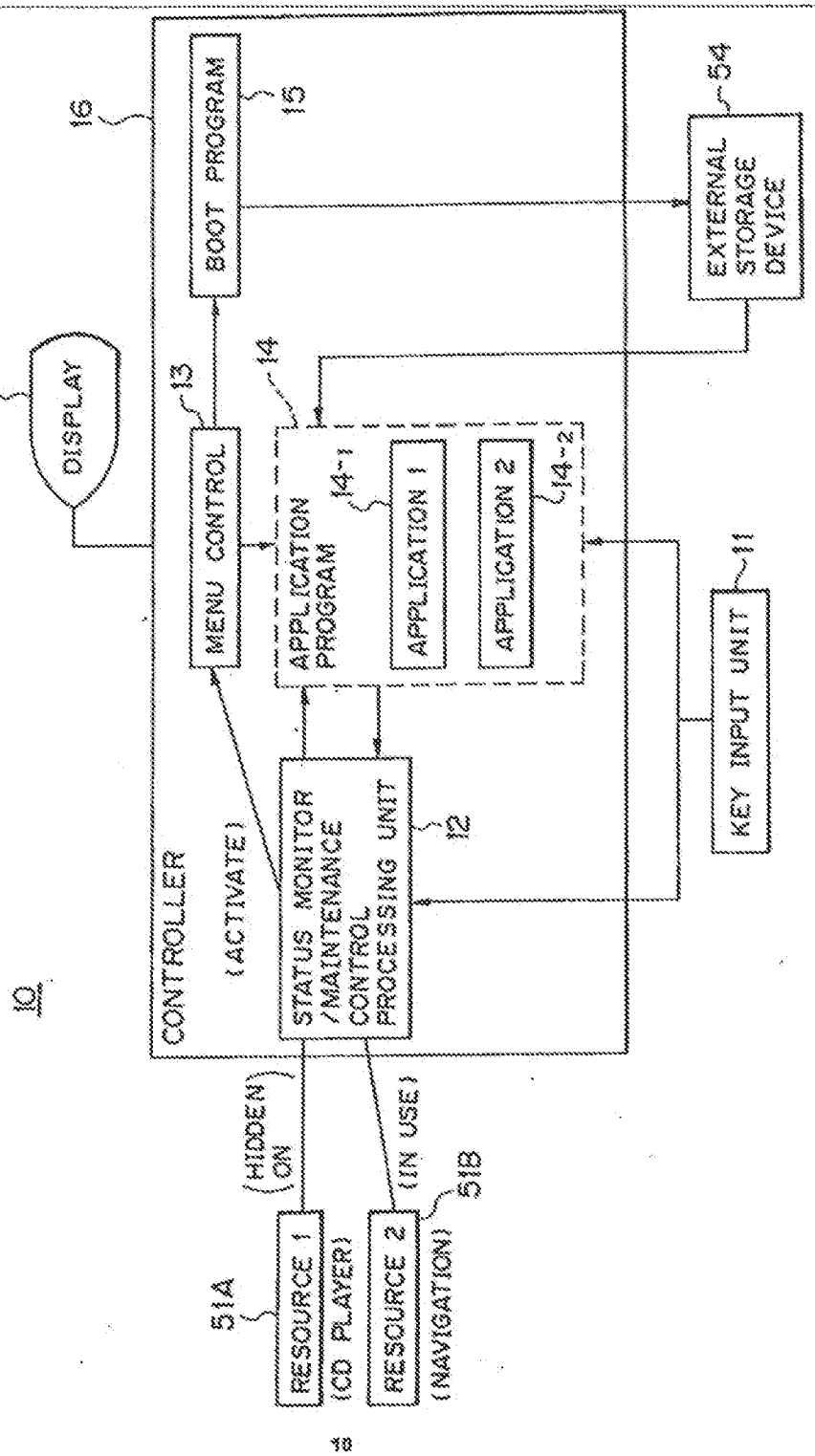

10
CONTROLLER
16
BOOT PROGRAM
15
DISPLAY
58
13
MENU CONTROL
14
APPLICATION PROGRAM
14-1
APPLICATION 1
APPLICATION 2
14-2
EXTERNAL STORAGE DEVICE
54
KEY INPUT UNIT
11
(ACTIVATE)
STATUS MONITOR /MAINTENANCE CONTROL PROCESSING UNIT
12
(HIDDEN ON)
(IN USE)
51A
RESOURCE 1 (CD PLAYER)
RESOURCE 2 (NAVIGATION)
51B

FIG. 4

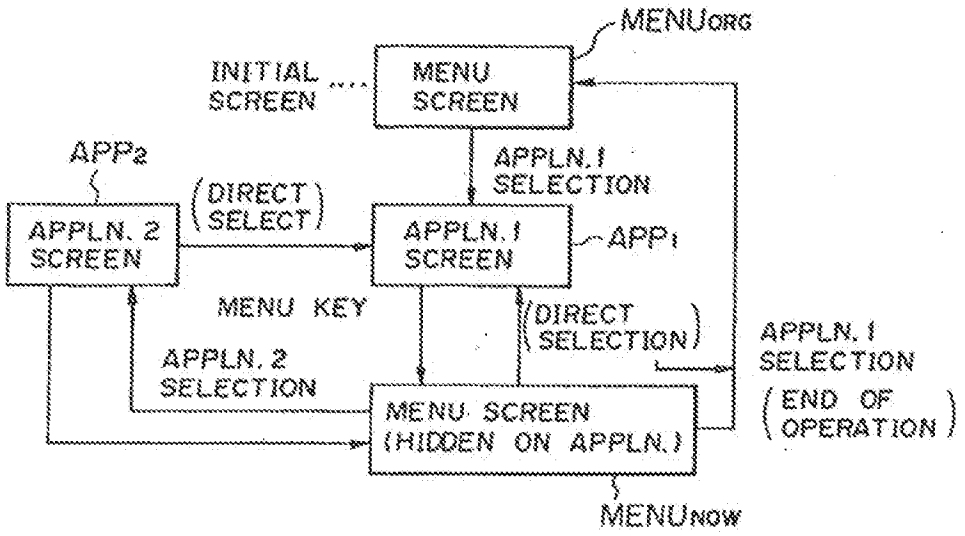


FIG. 5

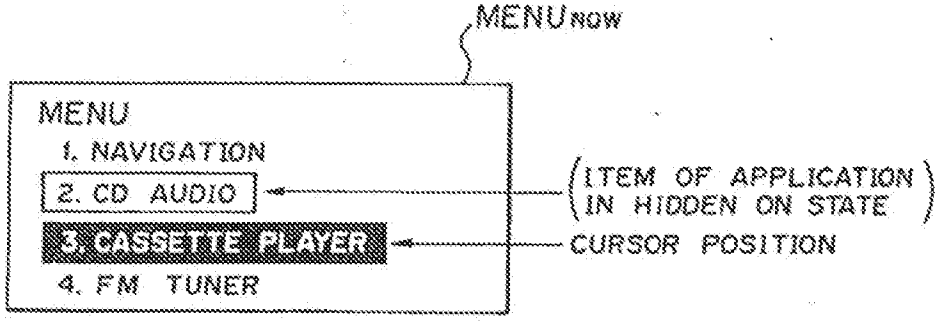


FIG.6

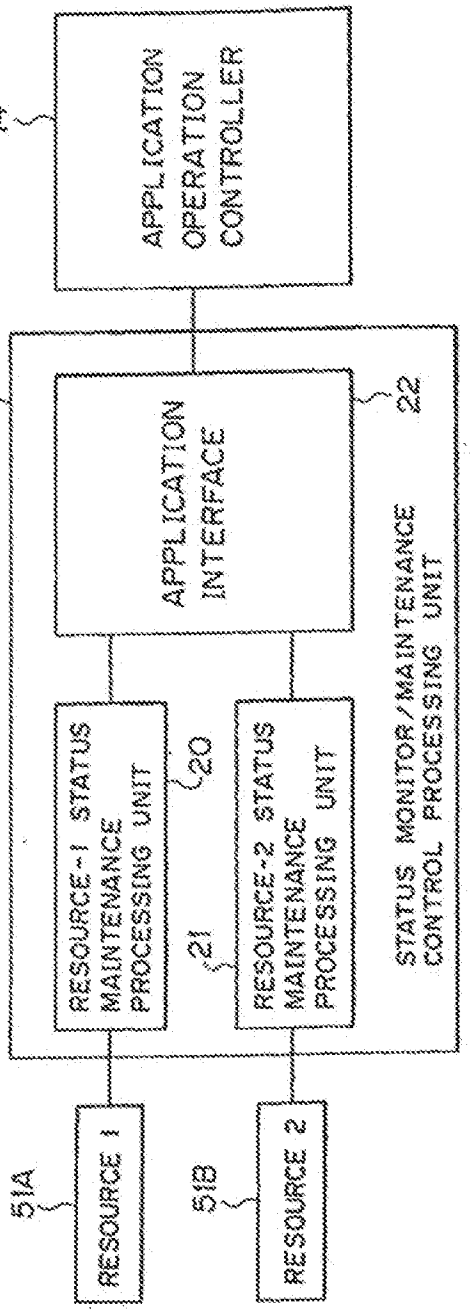

14
APPLICATION OPERATION CONTROLLER
12
APPLICATION INTERFACE
22
RESOURCE-1 STATUS MAINTENANCE PROCESSING UNIT
20
21
RESOURCE-2 STATUS MAINTENANCE PROCESSING UNIT
STATUS MONITOR/MAINTENANCE CONTROL PROCESSING UNIT
51A
RESOURCE 1
51B
RESOURCE 2

FIG. 7

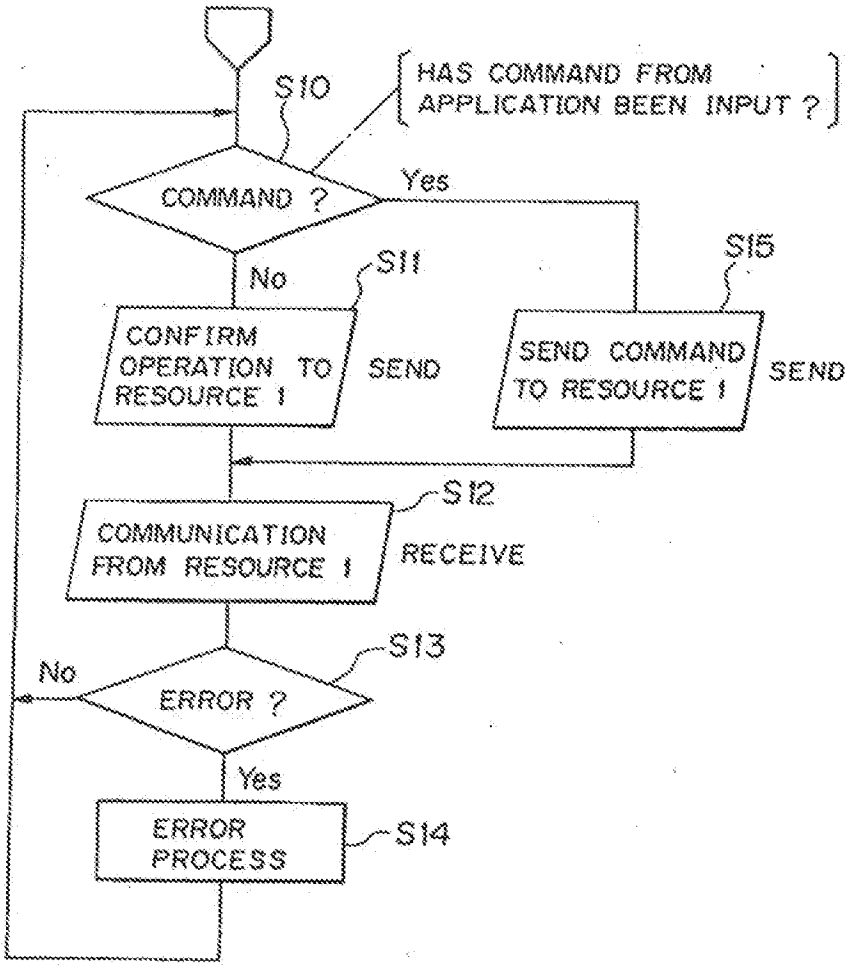
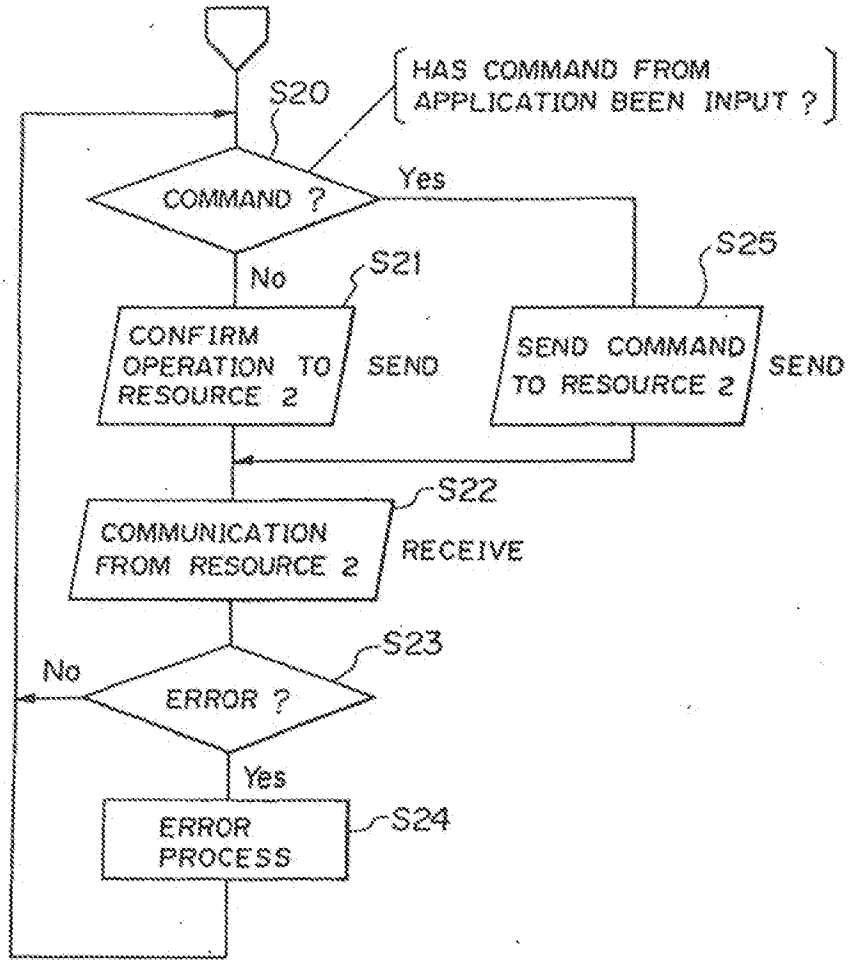


FIG. 8



European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 93 30 3536

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	EP-A-0 383 094 (ROBERT BOSCH GMBH) * the whole document *	1-4	G06F3/033 B60R16/02
X	US-A-4 809 177 (WINDLE W. E.) * column 2, line 64 - column 3, line 19 * * column 4, line 61 - column 5, line 10 * * column 8, line 50 - column 15, line 38 *	1,3-5	
X	PATENT ABSTRACTS OF JAPAN vol. 15, no. 116 (P-1182)20 March 1991 & JP-A-30 06 773 (ALPINE ELECTRON INC) 14 January 1991 * abstract *	1,4	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

G06F
G09B
B60R

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	23 AUGUST 1993	BAILAS A.

EPO FORM 1503 03.82 (P0401)

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

Electronic Acknowledgement Receipt

EFS ID:	5461036
Application Number:	12015320
International Application Number:	
Confirmation Number:	2156
Title of Invention:	Method for Managing Media
First Named Inventor/Applicant Name:	Russell W. White
Customer Number:	21906
Filer:	Edwin E. Richards/Stephanie Petreas
Filer Authorized By:	Edwin E. Richards
Attorney Docket Number:	AFF.0004C5US
Receipt Date:	05-JUN-2009
Filing Date:	16-JAN-2008
Time Stamp:	12:05:13
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Filed (SB/08)	AFF004C5IDS1449Form2.pdf	406324 42b19ed921c386a3b7ea5778579d47d548f3cb41	no	12

Warnings:	
Information:	

This is not an USPTO supplied IDS fillable form					
2	Information Disclosure Statement (IDS) Filed (SB/08)	AFF004C5IDS1449Form3.pdf	307057 fc8193f8a09b8a5b2a8443a3454e81c5ee4bc5ca	no	7
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
3	NPL Documents	DEF00005957.pdf	453100 f9007f9687c9fdca2b8ce3d8543ec2327d0cdfd6	no	4
Warnings:					
Information:					
4	NPL Documents	DEF00005961.pdf	4649387 ddf5648c014335cc5f4de6e9bf2b53005195abad	no	17
Warnings:					
Information:					
5	NPL Documents	DEF00005978.pdf	923214 f56cb5acd88dd348bc44a58200a824e76c9096b0	no	4
Warnings:					
Information:					
6	NPL Documents	DEF00005982.pdf	798012 392fa385ba5c2f6f20da98b87a266c8b78e11de7	no	4
Warnings:					
Information:					
7	NPL Documents	DEF00006036.pdf	645752 5383ec8066ad2abb3748e7b9b3e814885cbeec56	no	4
Warnings:					
Information:					
8	NPL Documents	DEF00006040.pdf	3337025 e8eec982a73f7b18fa47030166d8b3d606dbff12	no	16
Warnings:					
Information:					
9	NPL Documents	DEF00006578.pdf	2563814 f33b8877805f96fb229e1958eb78f7a536700225	no	27
Warnings:					
Information:					

10	Foreign Reference	DEF00006552.pdf	6623494 eb00653f3e77c3f2b74fec7f6ddab8bbdd644c12	no	26
Warnings:					
Information:					
11	NPL Documents	DEF00006686.pdf	2690712 7e4241cad60f6b7b25fe9fdd6c512d1c488457e1	no	13
Warnings:					
Information:					
12	NPL Documents	DEF00006699.pdf	452958 c22f5ff8941c8fb7e117d1f6c299652584605442	no	2
Warnings:					
Information:					
13	NPL Documents	DEF00006709.pdf	1287236 eec11e90599c164ea5e2ea28dbc2bc5c74e9feac	no	5
Warnings:					
Information:					
14	Foreign Reference	DEF00008095.pdf	7211061 76dd4a27f10ca371f9d0ee3d26b7107aa4a05ebb	no	28
Warnings:					
Information:					
15	Foreign Reference	DEF00007989.pdf	3091952 32f5e57543903806c3dfc7d5c0eec8b6c653c22a	no	20
Warnings:					
Information:					
16	NPL Documents	DEF00011275.pdf	13986791 773afe63cab9b3e05f114b703cb0031a7ab9dd58	no	82
Warnings:					
Information:					
17	NPL Documents	DEF00011395.pdf	11050910 5ac22443bae3f7449669636fe71b68d4ed967cde	no	81
Warnings:					
Information:					
18	NPL Documents	DEF00011557.pdf	9372135 f4199dc9074ec990b181ffccc452d24eef83e937	no	80
Warnings:					
Information:					

19	Foreign Reference	DEF00011637.pdf	1128345 2d8584ded06ce14dedba7e7c9593645a0a7d3e50	no	5
Warnings:					
Information:					
20	Foreign Reference	DEF00011642.pdf	2114782 f327d0b6dbf54d841f4bc099472ea30feaed761b	no	15
Warnings:					
Information:					
			Total Files Size (in bytes):	73094061	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (04-09)
Approved for use through 05/31/2009. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	12015320
Filing Date	2008-01-16
First Named Inventor	Russell W. White, et al.
Art Unit	2617
Examiner Name	Erika A. Gary
Attorney Docket Number	AFF.004C5US

U.S.PATENTS

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

If you wish to add additional U.S. Patent citation information please click the Add button.

U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

If you wish to add additional U.S. Published Application citation information please click the Add button.

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	2000-66974	JP		2000-03-03			☐
	2	11-68685	JP		1999-03-09			☐
	3	CN 1218258A	CN		1999-06-02			☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12015320
	Filing Date	2008-01-16
	First Named Inventor	Russell W. White, et al.
	Art Unit	2617
	Examiner Name	Erika A. Gary
	Attorney Docket Number	AFF.004C5US

	4	H11-242686	JP		1999-09-07	Sony Corporation		☐
	5	DE 44 31 070 B4	DE		2004-07-22	DaimlerChrysler AG		☐
	6	0 569 343 A1	EP		1993-10-11	Pioneer Electronic Corporation		☐
	7	0 675 341 A1	EP		1995-04-10	Honda Giken Kogyo		☐
	8	0 771 686 A2	EP		1997-07-05	Toyota Jidosha Kabushiki Kaisha Toyota-shi, Aichi-		☐
	9	H4-261576	JP		1992-09-17	Mitsubishi Electric Corporation		☐
	10	2-301330	JP		1990-12-13			☐
	11	5-294250	JP		1993-11-09			☐
	12	6-187597	JP		1994-07-08			☐
	13	JP6289118	JP		1994-10-18	Sega Enterprises KK		☐
	14	JP6294659	JP		1994-10-21	Dainippon Printing Co. LTD.		☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12015320
	Filing Date	2008-01-16
	First Named Inventor	Russell W. White, et al.
	Art Unit	2617
	Examiner Name	Erika A. Gary
	Attorney Docket Number	AFF.004C5US

	15	07-129895	JP		1995-05-19	Honda Motor Co Ltd		☐
	16	07-146155	JP		1995-06-06	Honda Motor Co Ltd		☐
	17	7-262493	JP		1995-10-13	CSK Corporation		☐
	18	7-262493	JP		1995-10-13			☐
	19	JP7270171	JP		1995-10-20	Sumitomo Electronic Industries		☐
	20	JP7036382	JP		1995-02-07	Mitsubishi Electric Corp.		☐
	21	8-110231	JP		1996-04-30			☐
	22	9-61514	JP		1997-03-07			☐
	23	10-103966	JP		1998-04-24			☐
	24	10-143349	JP		1998-05-29	Compaq Computer Corporation		☐
	25	JP1018712	JP		1989-01-23	Mazda Motor		☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12015320
	Filing Date	2008-01-16
	First Named Inventor	Russell W. White, et al.
	Art Unit	2617
	Examiner Name	Erika A. Gary
	Attorney Docket Number	AFF.004C5US

	26	JP5077679	JP		1993-03-30	Nissan Motor		☐
	27	JP59085599	JP		1984-05-17	Nissan Motor		☐
	28	JP63136828	JP		1988-06-09	Pioneer Electronic Corp.		☐
	29	63-136828	JP		1988-06-09			☐
	30	WO 96/04724	WO		1996-02-15	Emerson, Harry		☐
	31	WO 96/07110	WO		1996-03-07	British Telecommunications Public Limited Company		☐
	32	WO 97/13657	WO		1997-04-17	United Technologies Automotive, Inc.		☐
	33	H11-317061	JP		1999-11-16	Victor Company of Japan, LTD.		☒
	34	2901445	JP		1999-03-19	Kenwood Corporation		☒
	35	WO 99/35009	WO		1999-07-15	Microsoft Corporation		☐
	36	11-219580	JP		1999-08-10			☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12015320
	Filing Date	2008-01-16
	First Named Inventor	Russell W. White, et al.
	Art Unit	2617
	Examiner Name	Erika A. Gary
	Attorney Docket Number	AFF.004C5US

	37	11219580 A	JP		1999-10-08	Sony Corp		☐
	38	1168685	JP		1999-03-09			☐
	39	11-068685	JP		1999-09-03	Sony Corp		☐
	40	1998-052033	JP		1998-09-25			☐
	41	1999-0042565	JP		1999-06-15			☐
	42	1999-0073234	KR		1999-10-05	Young-Man Lee		☐
	43	1999-0048723	KR		1999-07-05			☐
	44	KR20199900220 30U	KR		1999-06-25	Young-Shik Cheon		☐
	45	2000-0001465	KR		2000-01-25	Samsung Motors		☐
	46	0142256	KR		1998-03-30			☐
	47	WO 98/21672	WO		1998-05-22	Inergy Online, Inc.		☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12015320
	Filing Date	2008-01-16
	First Named Inventor	Russell W. White, et al.
	Art Unit	2617
	Examiner Name	Erika A. Gary
	Attorney Docket Number	AFF.004C5US

	48	WO 98/47252	WO		1998-10-22	Stern, Geoffrey		☐
	49	WO 00/54187	WO		2000-09-14	Rock.Com, Inc.		☐
	50	WO 00/60450	WO		2000-10-12	Khyber Technologies Corporation		☐

If you wish to add additional Foreign Patent Document citation information please click the Add button

NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	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, pages(s), volume-issue number(s), publisher, city and/or country where published.	T5
	1	MARK MOELLER, Computing Unplugged Magazine, "Product Preview, A Survey of Auto PC 2.0 for software developers," 1999-2009, Zatz Publishing, pages 1-7.	☐
	2	MARK MOELLER, Computing Unplugged Magazine, "AutoPC Update, Auto PC/Windows CE for Automotive news bites," 1999-2009, Zatz Publishing, pages 1-4.	☐
	3	Claim Chart for KR19990033393, Claim 17 of U.S. Patent No. 7,324,833, pages 1-3.	☐
	4	RIO500, Getting Started Guide for Windows 98 and Macintosh OS 8.6, pages 1-2.	☐
	5	NORBERT A. STREITZ, et al., "DOLPHIN: Integrated Meeting Support Across Local And Remote Desktop Environments And LiveBoards," Integrated Publication and Information Systems Institute, 1994, pages 345-358.	☐
	6	LEO DEGEN, et al., "Working with Audio: Integrating Personal Tape Recorders and Desktop Computers," May 3-7, 1992, pages 413-418.	☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12015320
	Filing Date	2008-01-16
	First Named Inventor	Russell W. White, et al.
	Art Unit	2617
	Examiner Name	Erika A. Gary
	Attorney Docket Number	AFF.004C5US

	7	H.S. JUN GIBEE, "A Virtual Information Desk On The Internet," University of Ulsan, September 1999, pages 265-268.	☐
	8	STEVE WHITTAKER, et al., "TeleNotes: Managing Lightweight Interactions in the Desktop," Lotus Development Corporation, June 1997, pages 137-168.	☐
	9	R.M. CROWDER, et al., "Integration of Manufacturing Information Using Open Hypermedia," Computer in Industry, 1999, pages 31-42.	☐
	10	TOMAS BOSTROM, et al., "Mobile Audio Distribution," Royal Institute of Technology, 1999, pages 166-172.	☐
	11	ALEX POON, et al., Xerox Disclosure Journal, Vol. 19, No. 2, "Gestural User Interface Technique for Controlling the Playback of Sequential Media," March/April 1994, pages 187-190.	☐
	12	DEB KUMAR ROY, "NewsComm: A Hand-Held Device For Interactive Access to Structured Audio," Massachusetts Institute of Technology, June 1995, pages 1-12.	☐
	13	VICTORIA BELLOTTI, et al., "Walking Away from the Desktop Computer: Distributed Collaboration and Mobility in a Product Design Team," 1996, pages 209-218.	☐
	14	UPUL OBEYSEKARE, et al., "The Visual Interactive Desktop Laboratory," January-March 1997, pages 63-71.	☐
	15	ASIM SMAILAGIC, et al., "MoCCA: A Mobile Communication and Computing Architecture," Institute for Complex Engineered Systems, pages 1-8.	☐
	16	SUI-MENG POON, et al., "Integration of Value-Added Audio Playback Capacity Into Computer Network," Nanyang Technological University, 1995, pages 632-636.	☐
	17	ERDAL PAKSOY, et al., "A variable-rate celp coder for fast remote voicemail retrieval using a notebook computer," DSPS R&D Center, Texas Instruments, 1997, pages 119-124.	☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12015320
	Filing Date	2008-01-16
	First Named Inventor	Russell W. White, et al.
	Art Unit	2617
	Examiner Name	Erika A. Gary
	Attorney Docket Number	AFF.004C5US

	18	JEFFREY A. DAVIS, "Use of Personal Computers in Satellite Command and Control Systems," Raytheon Systems Company, October 24, 1999, pages 283-291.	☐
	19	NIKI DAVIS, "Remote Teaching Via ISDN2 And Desktop Conferencing,"Exeter University School of Education, pages 1-3.	☐
	20	A CHAN, et al., "The PEP-II Project-Wide Database," Stanford University, 1996, pages 840-842.	☐
	21	KRISHNA BHARAT, et al., "Migratory Applications," Springer Berlin, Vol. 1222, 1997, pages 1-21.	☐
	22	EMPEG CAR, "MP3 in your dash," Digital Audio Player User Guide, pages 1-50.	☐
	23	MICROSOFT, "Getting Started Microsoft. Windows. 98" Second Edition, 1998, pages 1-138.	☐
	24	SAUL GREENBERG, "PDAs and Shared Public Displays: Making Personal Information Public, and Public Information Personal," University of Calgary, March 1999, pages 1-11.	☐
	25	NAOHIKO KOHTAKE, et al., "InfoStick: an interaction device for Inter-Appliance Computing," Keio University, pages 1-15.	☐
	26	HEWLETT PACKARD, User's Guide, HP Jornada 420, Palm-Size PC, pages 1-75	☐
	27	MICROSOFT, "Introducing Microsoft Windows 95 - Certificate of Authenticity," 1995, pages 1-117.	☐
	28	SONY, "New Technical Theory For Servicing, MZ-R5ST Operation Manual," pages 1-44.	☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12015320
	Filing Date	2008-01-16
	First Named Inventor	Russell W. White, et al.
	Art Unit	2617
	Examiner Name	Erika A. Gary
	Attorney Docket Number	AFF.004C5US

	29	RICHARD C. DAVIS, et al., "A Framework for Sharing Handwritten Notes," 1998, pages 119-120.	☐
	30	KRISHNA A. BHARAT, et al., "Migratory Applications," UIST '95, November 14-17, 1995, pages 133-142.	☐
	31	BRAD A. MYERS, "Collaboration Using Multiple PDAs Connected To A PC," Carnegie Mellon University, 1998, pages 385-294.	☐
	32	RICHARD C. DAVIS, et al., "NotePals: Lightweight Note Sharing by the Group, for the Group," May 15-20, 1999, pages 338-345.	☐
	33	JUN REKIMOTO, et al., "Augmented Surfaces: A Spatially Continuous Work Space for Hybrid Computing Environments," May 15-20, 1999, pages 378-385.	☐
	34	DAN R. OLSEN, JR., "Interacting with Chaos," September and October 1999, pages 42-54.	☐
	35	SCOTT ROBERTSON, et al., "Dual Device User Interface Design: PDAs and Interactive Television," April 13-18, 1996, pages 79-86.	☐
	36	SYMANTEC CORPORATION, "pcANYWHERE32 User's Guide," 1993-1997, pages 1-216.	☐
	37	KRISHNA BHARAT, et al., Migratory Applications, "Mobile Object Systems Towards the Programmable Internet," Springer Berlin/Heidelberg, Volume 1222/11997, 1997, pages 1-134.	☐
	38	DIAMOND MULTIMEDIA SYSTEMS, INC., "Rio PMP300, User's Guide," 1998, pages 1-27.	☐
	39	SONY, "Portable MiniDisc Recorder, Operating Instructions, MZ-R55," 1998, pages 1-42.	☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12015320
	Filing Date	2008-01-16
	First Named Inventor	Russell W. White, et al.
	Art Unit	2617
	Examiner Name	Erika A. Gary
	Attorney Docket Number	AFF.004C5US

	40	NORBERT A. STREITZ, et al., "i-Land: An Interactive Landscape for Creativity and Innovation," Proceedings of the ACM Conference on Human Factors in Computing Systems, May 15-20, 1999, pages 120-127.	☐
	41	NORBERT A. STREITZ, et al., "Roomware for Cooperative Buildings: Integrated Design of Architectural Spaces and Information Spaces," pages 1-20	☐
	42	Direct Cable Connection screen shot, "B1U6U4," 10 pages total.	☐
	43	Direct Cable Connection screen shot, 10 pages total.	☐
	44	IBM, "WordPad z50 Cradle Option - User's Guide," 1990, pages 1-18.	☐
	45	IBM MOBILE SYSTEMS, "WorkPad z50 Mobile Companion (2608-1Ax), Hardware Maintenance Manual," March 1999, pages 1-77.	☐
	46	KEVIN JOST, Automotive Engineering International, "The car as a mobile-media platform," May 1998, pages 49-53.	☐
	47	MICROSOFT CORPORATION, "Windows CE 2.1 Technical Articles, Developing Applications for an Auto PC," June 1999, pages 1-13.	☐
	48	INFOGATION CORPORATION, "InfoGation Corp. Introduces Software Applications for Next-Generation Smart Car Systems," January 8, 1998, pages 1-2.	☐
	49	BUSINESS WIRE, "ORA Electronics Announces USB-Compatible TelCar Mark VII Begins Shipping First Quarter of 1999," January 6, 1999, pages 1-2.	☐
	50	ORA USA, "ORA Electronics Patents Telcar Cellular Telephone Interface," July 6, 1998, pages 1-2.	☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12015320
	Filing Date	2008-01-16
	First Named Inventor	Russell W. White, et al.
	Art Unit	2617
	Examiner Name	Erika A. Gary
	Attorney Docket Number	AFF.004C5US

If you wish to add additional non-patent literature document citation information please click the Add button			
EXAMINER SIGNATURE			
Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12015320
	Filing Date	2008-01-16
	First Named Inventor	Russell W. White, et al.
	Art Unit	2617
	Examiner Name	Erika A. Gary
	Attorney Docket Number	AFF.004C5US

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☒ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ None

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Mark J. Rozman/	Date (YYYY-MM-DD)	2009-06-05
Name/Print	Mark J. Rozman	Registration Number	42117

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 1 hour 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.**

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (04-09)
Approved for use through 05/31/2009. OMB 0651-0031
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 contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	12015320
Filing Date	2008-01-16
First Named Inventor	Russell W. White, et al.
Art Unit	2617
Examiner Name	Erika A. Gary
Attorney Docket Number	AFF.004C5US

U.S.PATENTS

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

If you wish to add additional U.S. Patent citation information please click the Add button.

U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

If you wish to add additional U.S. Published Application citation information please click the Add button.

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	WO 00/79372 A1	WO		2000-12-28	Colvin, David S.		☐

If you wish to add additional Foreign Patent Document citation information please click the Add button

NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	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, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12015320
	Filing Date	2008-01-16
	First Named Inventor	Russell W. White, et al.
	Art Unit	2617
	Examiner Name	Erika A. Gary
	Attorney Docket Number	AFF.004C5US

	1	HEWLETT PACKARD, "HP Jornada 430/430se Palm-Size PC, User's Guide," Edition 1, 1999, pages 1-151.	☐
	2	NEC, "NEC MobilePro 750C, User's Guide," 1998, pages 1-83.	☐
	3	MICROSOFT, "Palm PC User's Guide," Microsoft Windows CE, pages 1-39.	☐
	4	PALM PC USER'S GUIDE, "Chapter 6, Information Backup and Exchange," pages 69-148	☐
	5	MPMan, "User's Guide, The Portable MP 3player using the flash memory and SmartMedia card," 1997, pages 1-35.	☐
	6	Cover Sheet, www.mpman.com, 1 page.	☐
	7	Smart Media Card Slot Diagram, 1 page.	☐
	8	MP Man F20 Logo, 1 page.	☐
	9	MPMan, "User's Guide, The portable MP3 player using the flash memory with variety features including the voice recording, phone/memo browsing, etc.," 1997, pages 1-47.	☐
	10	Smart Media card diagram and install instructions, pages 1-4.	☐
	11	ANAND LAL SHIMPI, Empeg, Ltd., "MP3 meets Car Audio: Empeg Mark II in-dash Car MP3 Player," September 18, 2000, pages 1-17.	☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12015320
	Filing Date	2008-01-16
	First Named Inventor	Russell W. White, et al.
	Art Unit	2617
	Examiner Name	Erika A. Gary
	Attorney Docket Number	AFF.004C5US

	12	PETER CLARKE, EE Times, "Engineers drive craze for MP3 audio players," February 5, 1999, pages 1-4.	☐
	13	RIO CAR DOT ORG GEEK GUIDE, "empeg car Mk. 1," February 21, pages 1-4.	☐
	14	HUGO FIENNES, RIO CAR DOT ORG GEEK GUIDE, "MP3 Mobile," February 21, pages 1-4.	☐
	15	RIO CAR DOT ORG, 'Frequently Asked Questions," pages 1-16.	☐
	16	DIAMOND MULTIMEDIA SYSTEMS, INC., "Rio PMP300 User's Guide," 1998, pages 1-27.	☐
	17	STEPHEN J. BUCKLEY, et al., "The Car as a Peripheral, Adapting a Portable Computer to a Vehicle Intranet," SAE Technical Paper Series, 98C030, October 19-21, 1998, pages 1-14.	☐
	18	"The MP3 Mobile," April 8, 1998, pages 1-13.	☐
	19	12-Volt Business & Technology Solutions, AutoMedia, "How the Intelligent Data Bus will impact the way you do business," November 1998, pages 1-2.	☐
	20	Press Release, "Creative Labs Launches Nomad Portable MP3 Players," April 15, 1999, pages 1-5.	☐
	21	BMW, "Betriebsanleitung Bordmonitor mit Navigation und TV," 1995, pages 1-82.	☐
	22	BMW, "Owner's Manual, On-board monitor with navigation system," 1996, pages 1-81.	☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12015320
	Filing Date	2008-01-16
	First Named Inventor	Russell W. White, et al.
	Art Unit	2617
	Examiner Name	Erika A. Gary
	Attorney Docket Number	AFF.004C5US

	23	TRANSPERFECT/TRANSLATIONS, "True and accurate translation of the 1995 BMW Manual, from German into English," August 16, 2005, pages 1-80.	☐
	24	HEINZ SODEIKAT, "EURO-SCOUT is facing the German 1994 Market," 1994, pages 551-556.	☐
	25	Pictures of car navigation systems in a car dashboard, pages 1-11.	☐
	26	BMW, "The BMW On-Board Navigation System - Technology Takes a Remarkable Turn," 2005, pages 1-9.	☐
	27	OLDSMOBILE, "1991 Toronado/Trofeo User's Guide," 1991, pages 1-41.	☐
	28	YEPP, "Digital Sounds - yepp - YP-E32/E64102-291," October 23, 1999, pages 1-.46	☐
	29		☐
	30	U.S. Provisional Application No. 60/167179, entitled "System, Method, And Device for Playing Recorded Music on a Wireless Communications Device," by Devon A. Rolf, filed November 23, 1999, pages 1-48.	☐
	31	MICROSOFT, "Getting Started, Microsoft Windows 98, For distribution with a new PC only," 1998, pages 1-145.	☐
	32	PR NEWSWIRE, "Alpine Announces Fall Release of Interface Adapter That Enables iPod Control and Playback from In-Vehicle Sound Systems," July 7, 2004, pages 1-2..	☐
	33	HA-YOUNG PARK, The Customer Times, "Portable Computer Music, MP3 File and MP3 Player rise as the Next Generation Audio Format," May 1999, pages 1-2.	☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12015320
	Filing Date	2008-01-16
	First Named Inventor	Russell W. White, et al.
	Art Unit	2617
	Examiner Name	Erika A. Gary
	Attorney Docket Number	AFF.004C5US

	34	"MP3 Players Introduced in the Korean IT Magazines," 1998-1999, pages 1-15.	☐
	35	MPMan, "MP-F20, User's Guide, Portable MP3 player using the flash memory and a Memory card," [ages 1-16.	☐
	36	PR NEWSWIRE ASSOCIATION, INC., "Delphi's Communiport(R) Technology for Tomorrow, Today Demonstrated at Frankfurt Auto Show," September 15, 1999, pages 1-8.	☐
	37	CRAIN COMMUNIATIONS, INC., "Products," Agilent Technologies Press Release, February 21, 2000, pages 1-6.	☐
	38	THE WASHINGTON TIMES, LLC, John Hanan, Dallas Morning News, "Cars add computer, audiovisual gear," January 14, 2000, pages 1-3.	☐

If you wish to add additional non-patent literature document citation information please click the Add button

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12015320
	Filing Date	2008-01-16
	First Named Inventor	Russell W. White, et al.
	Art Unit	2617
	Examiner Name	Erika A. Gary
	Attorney Docket Number	AFF.004C5US

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☒ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ None

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Mark J. Rozman/	Date (YYYY-MM-DD)	2009-06-04
Name/Print	Mark J. Rozman	Registration Number	42117

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 1 hour 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.**

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12015320
	Filing Date	2008-01-16
	First Named Inventor	Russell W. White, et al.
	Art Unit	2617
	Examiner Name	Erika A. Gary
	Attorney Docket Number	AFF.004C5US

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☒ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ None

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Mark J. Rozman/	Date (YYYY-MM-DD)	2009-06-05
Name/Print	Mark J. Rozman	Registration Number	42117

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 1 hour 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.**

(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number : 0 675 341 A1

(12) EUROPEAN PATENT APPLICATION

(21) Application number : 95302088.6

(22) Date of filing : 29.03.95

(51) Int. Cl.[6] : G01C 21/20, B60R 16/02, G06F 3/16, G09B 29/10

(30) Priority : 29.03.94 JP 59250/94

(43) Date of publication of application : 04.10.95 Bulletin 95/40

(84) Designated Contracting States : DE FR GB

(71) Applicant : HONDA GIKEN KOGYO KABUSHIKI KAISHA
1-1, Minami-Aoyama 2-chome
Minato-ku Tokyo 107 (JP)

(72) Inventor : Sawada, Yasuhiro
c/o Honda R&D Co., Ltd.,
4-1, Chuo 1-chome
Wako-shi, Saitama-ken, 351-01 (JP)

(74) Representative : Tomlinson, Kerry John et al
Frank B. Dehn & Co.
European Patent Attorneys
Imperial House
15-19 Kingsway
London WC2B 6UZ (GB)

(54) Car navigation system.

(57) A car navigation system (1) includes a route judgement means (6) for judging whether the driver should head for an input place name (5a) in order to reach a destination (4a), and judgement result means (8) for outputting a judgement result, so that a car can be guided and navigated along a suitable route to the destination by inputting place names written on road signs or the like. The judgement result is output with a voice message or image display (9). When plural place names are input, the judgement is made on each of the place names, and the most suitable place name is selected and output.

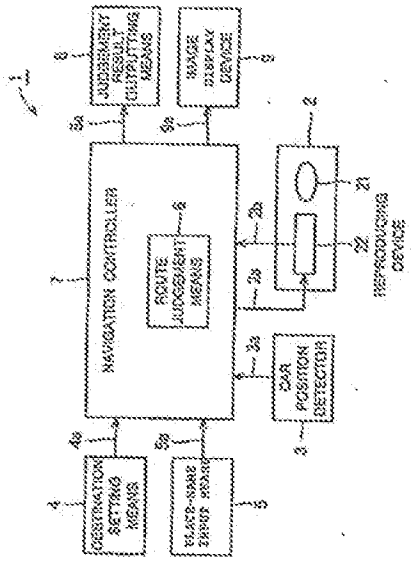


FIG.1

EP 0 675 341 A1

This invention relates to a car navigation system for obtaining information on a route which is suitable to guide or navigate a car (vehicle) to a destination by beforehand registering the destination.

There has been known a car navigation system in which a route extending to a destination is preset, and a course to be selected, such as "turning to the left or right", "keeping straight on" or the like, is guided using voice synthesis or the like when a car arrives at the front side of a crossing or the like. In such a system, the course guide is made with synthesized voice or the like at all times irrespective of driver's need every time the car arrives at this side of a crossing or the like, and thus the voice may sound offensive to the driver's ear. In order to overcome such a disadvantage, a car navigation system for outputting road guide information with voice immediately when a request (navigation request) is made from a driver is proposed in Japanese Laid-open Patent Application No. Hei-5-99678.

In addition, a map display device for a car in which a destination and a current position can be set by inputting the names of places, etc., displayed on a map with voice is also proposed in Japanese Laid-open Patent Application No. Hei-3-257485.

Furthermore, for a solid road as shown in Fig. 12 which has been recently developed in cities, the car position is indicated at the same position on a map which is displayed on a display unit or the like of a car navigation system when a car runs on any road of a high level road 121, a ground road 122 and an underground road (tunnel) 123. In order to avoid such a problem, Japanese Laid-open Patent Application No. Hei-4-219872 proposes a voice guide device in which a road environment is specified in accordance with a view from a car window, for example, (1) only a distance view can be taken because of high level road, (2) only a close-range view can be taken because of a general road, or (3) no view can be taken because of a covered road, and a guide sentence (message) is prepared in accordance with the specified road environment to perform the road guide with synthesized voice.

In the car having the navigation system, a driver drives his car while checking the position of the car or the course (direction) of the car by seeing a road sign as shown in Fig. 13. When the same place name as the final destination is indicated on a road sign, the driver identifies the course without losing his way. However, the same place name as the destination is not necessarily indicated on a road sign. In this case, the driver must decide a suitable course on the basis of one or plural place names which are indicated on a road sign. Here, if the driver knows his way around an area in which he drives currently, he can decide the course on the basis of the names of places which will be passed until the car reaches the final destination (hereinafter these places are referred to as "via-places"). However, if he does not know well his way around the area, he cannot decide the suitable course. Therefore, there has been required a device in which by inputting the names of via-places displayed on road signs or the like, the car can be guided and navigated along a course which is suitable to lead the car to the final destination, on the basis of judgment as to whether it is suitable to lead the car to a course extending to the name of a via-place. In the car navigation system as disclosed in Japanese Laid-open Patent Application No. Hei-5-99678, a travel route must be preset, and this is a cumbersome work. A navigation system having an advance indication function as disclosed in Japanese Laid-open Patent Application No. Sho-60-202307 is designed to indicate a course to a car at every crossing by inputting a travel start point and a destination point. However, in the navigation systems of the Japanese Laid-open Patent Application Nos. Hei-5-99678 and Sho-60-202307 as described above, the judgment on "turning to the left or right", "keeping straight on", etc., is made on the basis of a road map to indicate a suitable course to a driver.

Therefore, for example, in a case where a crossing at which the car is to change its course is a solid crossing as shown in Fig. 14, a voice guide indicating "turn to the right 00meters ahead" would be merely made insofar as a map data base is provided with no information indicating a solid crossing structure when the car is instructed at the solid crossing to change its course from a course in the north direction on a road A to another course in the east direction on a road B. However, various structures may be designed for solid crossings, and thus even when the course change (turning to the right) is beforehand indicated, it is unclear whether it is suitable to keep a right lane in accordance with the indication.

Accordingly, in order to enable making a guide indicating "pass from a left lane through a bypass and enter a road B" in accordance with the structure of the solid crossing a map data base is required having road environment data containing the detailed structures of solid crossings as disclosed in the Japanese Laid-open Patent Application No. 4-219872. However, such a map data base needs a large amount of data, and thus a larger capacity storing medium (for example, plural CD-ROMs) and a storing medium reading device for accessing the storing medium at high speed (for example, CD-ROM automatic changer or the like) are required, so that the system becomes complicated and high in price. In addition, a larger number of steps for renewal and maintenance of road environment data are required.

The present invention has been implemented to overcome the above problem, and has a first object to provide a car navigation system for guiding and navigating a car along a suitable route extending to a destination on the basis of place names which are in-

dicated on road signs even when a general data base having no road environment data on the structures of solid crossings, etc., is used, and, in other words, a car navigation system for assisting a driver to surely judge his route on the basis of the road signs even in a geographically unfamiliar area around which the driver does not know his way.

Furthermore, the present invention has a second object to provide a car navigation system which can surely guide and navigate the car to a suitable course even in such a case where the driver does not know an accurate place name (Japanese rendering or pronunciation) because in some cases the driver does not accurately know the pronunciations (the Japanese rendering) of some place names written in Kanji on road signs in a geographically unfamiliar area, and in which place names can be hand-written with characters such as Hiragana, Katakana or the like which are relatively easily input and easily recognizable even under a vibrational running condition.

In order to attain the above objects, a car navigation system according to claim 1 includes route judgment means for judging whether an input place name is suitable for a route extending to a destination, and judgment result outputting means for outputting a judgment result of the route judgment means. Accordingly, by inputting a place name written on a road sign or the like, it can be suitably indicated which course should be selected. Therefore, even when the driver or the like does not recognize the geographical relationship between a destination and a place name written on a road sign or the like in a geographically unfamiliar area, he can take the suitable course on the basis of the place name written in the road sign or the like.

In a car navigation system according to claim 2, place names indicated on a map which is reproduced and displayed on a screen by an image display device and data on pronunciations of the place names (written in Kanji) are provided to a road map data base. Therefore, place names such as via-places, etc., can be specified by inputting the place names with voice using a voice recognition device (in the following description, a via-place is defined as a place through which the car passes to the destination). Furthermore, when a hand-writing input device is used, the place names such as via-places can be also specified by inputting the place names in Hiragana or Katakana with a pen or the like. Accordingly, a hand-write character recognizing unit of this system can be more facilitated in construction than a hand-write input device which needs recognition of Kanji. In addition, it is difficult to accurately input complicated Kanji characters during running because of car vibration. On the other hand, the Hiragana or Katakana character input of the place names makes the hand-writing input operation more easy.

In a car navigation system according to claim 3, in addition to an accurate (formal) pronunciation for each place name, data on other ways of pronunciation (hereinafter referred to merely as "pronunciations") for each place name are also provided. Accordingly, even when the driver or the like does not known the formal place names because of a geographically unfamiliar area, the place names written on road signs, etc., can be input by voicing or hand-writing an adequate (informal) pronunciation for each place name.

For example, in the car navigation system having the place name input means using a voice recognition device and the judgment result output means using a voice synthesizer, when the driver or the like voices one or plural place names which are written on a road sign, the place name input means analyzes the voice and supplies the input one or plural place names to the route judgment means.

On the basis of the datum on the current position of the car which is supplied from a car position detection device, the route judgment means recognizes the position at which the car is currently located, and judges whether a route containing a place whose name is input from the place name input means as a via-place name is suitable, thereby allowing the car to arrive at a destination (final destination) which is preset by destination setting means. If plural place names are input, the above judgment may be made on each place name, and the most suitable one (place name, route) selected and output.

Through the judgement as described above, the route may be judged to be suitable when an angle at which a line connecting the car current position and the destination intersects to a line connecting the car current position and an input place-name point is below a predetermined threshold value. If there are plural input place-name points which satisfy the above angle condition (below the predetermined threshold angle value), a route containing a place name providing the smallest angle in these plural place names may be selected.

Furthermore, the suitability judgment may be made on the basis of the distance of a common portion between a route extending from the current position to the destination and a route extending from the current position to an input place name. Besides, the suitability judgment may be made on the basis of the distance of a route extending from the current position through an input place name (via-place) to the destination. In a case where a route extending to an input place name contains a route (road) such as a superhighway on which the car can run at a higher speed than on a general road, the distance of the road (superhighway) may be converted (reduced) to a shorter value than its actual distance (conversion of the distance on the basis of a preset reduction rate) to calculate the distance to the destination, and a route through which the car arrives at the destination

most early may be selected/identified on the basis of the converted distance (calculated in consideration of an arrival time).

When a judgment result on the suitable route is given, the judgment result output means may allow the suitable route to be audibly supplied by voice synthesis, whereby the driver can take the suitable route.

In the above system, the place name input means may be constructed by the hand-write character input device and the hand-write character recognition device, and the judgment result output means may be designed to display a route which is judged to be suitable on a map which is reproduced and displayed on a screen of a display unit, and a line connecting the car current position and a via-place which is judged to be suitable.

Embodiments of the present invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

Fig. 1 is a block diagram showing a car navigation system according to a first embodiment of the present invention;

Fig. 2 is a block diagram showing a car position detector;

Fig. 3 is a block diagram showing a voice recognition device;

Fig. 4 is a block diagram showing a destination setting means and a place name input means;

Fig. 5 is a block diagram showing a navigation controller;

Fig. 6 is a block diagram showing a judgment result output means;

Fig. 7 is a schematic diagram showing a first embodiment of a suitability judgment on a route extending to a destination (judgment based on a course direction);

Fig. 8 is a schematic diagram showing a second embodiment of the suitability judgment on the route extending to the destination (judgment based on route);

Fig. 9 is a schematic diagram showing a third embodiment of the suitability judgment on the route extending to the destination (judgment based on set area);

Fig. 10 is a block diagram showing another embodiment of the navigation controller;

Fig. 11 is a schematic diagram showing an example of a course guide image;

Fig. 12 is a schematic diagram showing an example of a solid road;

Fig. 13 is a schematic diagram showing an example of a road sign; and

Fig. 14 is a schematic diagram showing an example of the structure of a solid crossing.

Fig. 1 is a block diagram showing the overall construction of a car navigation system 1 of an embodiment of the present invention. The car navigation system 1 includes a road map data base 2, a car position detector 3, a destination setting means 4, a place-name input means 5, a navigation controller 7 having a route judgment means 6, a judgment result output means 8 and an image display device 9.

Reference numeral 2a represents an access request signal for accessing the road map data base 2, reference numeral 2b represents a data output signal to be output in response to the access request signal 2a, reference numeral 3a represents car position data, reference numeral 4a represents input information on the destination setting, reference numeral 5a represents input information on a place name which is a target for a route judgment, reference numeral 6a represents information on the judgment result, and reference numeral 9a represents a display unit driving signal such as a video signal or the like.

The road map data base 2 comprises a CD-ROM (compact disc ROM) 21 on which road map information is recorded, and a reproducing device 22 for the CD-ROM 21. In the road map data base 2 are beforehand stored map data for generating maps on various reduced scales such as a broad area map, a middle area map, a detailed area map, etc., various kinds of display matters to be indicated on a map which is displayed on the image display device 9, such as names of superhighways, national roads, local roads, etc., attributes and display data (character data containing Kanji, etc.) of main buildings, railways, rivers, lakes, etc., and at least pronunciation data (character data of Hiragana or Katakana) for place names in accordance with a predetermined data base format (structure).

With respect to the pronunciation data, the data base format is designed so that plural ways of pronunciation (hereinafter referred to merely as "pronunciations") (i.e., not only one pronunciation) may be registered for each place name. Accordingly, with respect to place names which are hard to pronounce or liable to be mispronounced because these names are written in Kanji, plural pronunciations are beforehand registered for these place names so that the place name concerned can be specified with any one of the registered pronunciations for the place name. For example, plural pronunciations "Tokorozawa", "Tokorosawa", "Shozawa", "Shosawa", etc., are registered for the place name of Kanji character " ". These plural pronunciations are managed so that the formal pronunciation and the informal pronunciations for the place name are discriminable from each other. Accordingly, when the current position of the car is requested to be audibly output to the driver or the like using the voice synthesis (i.e., so that the driver or the like can hear a synthesized voice representing the current position), the car navigation system 1 of this embodiment can voice to the driver the place name of the car current position with the formal pronunciation.

The road map data base 2 may comprise a re-

cording medium such as a magnetic recording medium, a magneto-optical recording medium or a semiconductor memory in place of the CD-ROM, and a read-out device therefor.

Fig. 2 is a block diagram showing an embodiment of the car position detector shown in Fig. 1. The car position detector 3 is designed so as to use jointly a dead reckoning navigation device 33 which successively calculates the position of the car on the basis of a direction signal 31a from a direction sensor 31 such as a gyro, a geomagnetic sensor or the like and a distance signal such as a pulse signal or the like which is output every predetermined unit travel distance from a travel distance sensor 32 such as a wheel rotation sensor or the like, and a GPS position measuring device 35 for detecting the position of the car on the basis of signals which are received from plural GPS satellites using a GPS reception antenna 34. Accordingly, even when it is impossible to receive waves from the GPS satellites, the current position of the car can be guessed by the dead reckoning navigation device 33.

The car position detector 3 is further provided with a travel locus calculation means 36 for obtaining a travel locus on the basis of car position data 33a which are successively output from the dead reckoning navigation device 33, and a map matching means 37 for comparing travel locus data 36a output from the travel locus calculation means 36 with road data 2a read out from the road map data base 2 to correct the current position of the car so that the car is located on a road in consideration of features of the travel locus such as crossings, bending points, etc.

When no setting operation is carried out for the current position of the car (initial position), the car position detection control means 38 in the car position detector 3 supplies the dead reckoning navigation device 33 with position data 35a output from the GPS position measuring device 35 as an initial position or temporary position data 38a, and also outputs it as car position data 3a. The car position detection control means 38 supplies the dead reckoning navigation device 33 with position correction data 37a which are output from the map matching means 37 to correct the current position data of the car, and supplies the navigation control unit 7 with the newest car position data 33a which are successively output from the dead reckoning navigation device 33 as the car position data 3a.

Fig. 3 is a block diagram showing a destination setting means and a place name input means.

The destination setting means 4 and the place name input means 5 are designed to input a destination and a place name serving as a target for the course judgment with a voice using a voice recognition device 40. The voice recognition device 40 can recognize the voice of any speaker, and its recognition rate can be improved by beforehand registering the voice of a specific speaker (for example, a driver).

Therefore, the voice recognition device 40 includes a level adjustment circuit 42 having an AGC function for adjusting the output signal 41a of a microphone 41 to a predetermined signal level, a noise removing circuit 43 for removing noise components and emphasizing a specific frequency band component and removing undesired frequency components so that a voice signal is suitable for voice analysis, a voice analyzing circuit 44 for analyzing the features of a voice signal 43a for analysis from which the noise components are removed and which has frequency components suitable for the voice analysis to code the voice signal 43a, a collate circuit 46 for comparing and collating the analysis data (voice input) 44a output from the voice analysis circuit 44 and the analysis data (comparison reference) 45a supplied from an analysis data storing circuit 45 to output analysis result data 46a representing coincidence or similarity degree for these analysis data, a recognition result output means 47 for outputting a destination input command 47a and place-name input data 4b on the basis of the analysis result data 46a, monosyllable data and vocabulary data 45b, a register control means 48 for registering the voice of a specific speaker, a key input interface (I/F) circuit 49 and an operation unit 50 having various operation keys.

The analysis data storing circuit 45 is designed so that analysis data for the voice of an unspecific speaker and analysis data for the voice of a specific speaker are stored in discrete storage areas. The register control means 48 is designed so that when the destination key 51 is pushed down in a state where a voice register switch 48a is set to a register mode and then "Destination" is voiced, the vocabulary analysis data for "Destination" is stored in the analysis data storing circuit 45 while making a correspondence between the pushed key and data representing the function of the key.

The operation unit 50 includes the destination key 51 for registering a command voice (command words) when the destination is input with voice, a road guide key 52 for registering a command voice (command words) for starting a road guide operation, cursor shift keys 53a to 53d for scrolling a map displayed on the screen of the image display device 9 and registering a command voice (command words) to shift a position indicating cursor displayed on the map, an enter (set) key 54 for registering a command voice (command words) to determine and input the position of the shifted cursor, and a voice register key 55 which has plural keys and serves to register the voiceless sounds of the Japanese syllabary, the voiced sounds, the syllabic nasal in Japanese, numerals, words such as alphabetic letters, etc., in accordance with the pushing frequency of each key and the combination of pushed keys (multi-pushing).

The unspecific speaker can start the destination

set mode and a mode for inputting a place name for course guide by voicing a predetermined key word. For example, the voice of "destination" starts the destination set mode and the voice of "course guide" starts the course guide mode, and then the next voice of "Tokorozawa" (place name) allows input of a place name corresponding to the destination, a via-place name or the like.

On the other hand, the specific speaker such as a driver or the like can register his favorite words in accordance with the operation of the keys 51 to 55. Any words such as "the end of travel" and "which course" may be used and registered for the destination setting and the start of the course guide, respectively. The words of "ue", "shita", "hidari", "migi", "up", "down", "left", "right", etc., may be used and registered as command words (key words) for the shift of the cursor and the scroll of the map, and further the word of "OK" may be used and registered as a command word (key word) to determine the curs position and the map.

The destination setting means 4 and the place-name input means 5 are designed so that the input operation can be performed by using the various keys 51 to 55 of the operation unit 50 and by jointly using the operation of the keys 51 to 55 and the voice. For example, the following actions may be performed. That is, the destination key 51 is pushed to shift the mode to the destination register mode, and then a destination name is input with voice. Furthermore, the road guide key 52 is pushed to shift the mode to the course guide mode, and then the via-place name is input with voice. Accordingly, the recognition result output means 47 monitors the key input information 49a output from the key input interface circuit 49 at all times, and it is designed to generate and output not only the commands corresponding to the voice input, but also the commands corresponding to the key input and data 47a to 47c. Reference numeral 47c represents a cursor shift command for scrolling the cursor position and the map or determining them, and reference numeral 47d represents a voice unrecognizableness output signal representing that the voice recognition cannot be performed.

The operation unit 50 is provided with map type selection keys 56a to 56c for selecting the map type such as a broad area map, a middle area map, a detailed area map or the like. When the map type selection keys 56a to 56c are operated, the corresponding map selection command 47e is output from the recognition result output means 47. The selection of the map type may be performed by voicing a key word such as "broad area map", "middle area map", "detailed area map" or the like.

The voice analysis circuit 44 is provided with a continuous word judgment circuit for judging a series of voice periods (phrases) on the basis of an envelope waveform of an analysis voice signal and time variation of a power spectrum, and supplies the judgment result 44b to the collate circuit 46, the recognition result output means 47, the register control means 48, etc., to identify the punctuation of the voice input command. Accordingly, even when plural place names of "Tokorozawa", "Kawagoe" and "Omiya" are input for the course guide, these voices are identified as three kinds of place names, and the place-name input data 47b of the three place names are supplied to the navigation control unit 7.

Fig. 4 is a block diagram showing another embodiment of the destination setting means and the place-name input means.

The destination setting means 4 and the place-name input means 5 shown in Fig. 4 are designed so that the destination and the place names serving as targets for the route judgment can be input with a pen using a hand-write character recognition device 56.

A pen input operation which is conducted on a hand-write input tablet 56a of pressure-sensitive type or electromagnetic induction type is detected by a pen input detector 56b, and the hand-write character recognition means 56d makes an analysis of writer's handwriting, an analysis of the order of making strokes in writing a character, etc., on the basis of the detection output 56c of the pen input detector 56b. The character code data 56e corresponding to the identified characters are supplied to the recognition result output control means 57a in the recognition result check/output control unit 57.

The recognition result output control means 57a temporarily stores into a temporary storage means such as a RAM or the like (not shown) the character code data 56e which are successively supplied from the hand-write character recognition means 56d while considering the supply order (the handwriting order).

The display control means 57b obtains through a character generator (not shown) character font data corresponding to the temporarily stored character code data of a character or a character array, and displays a recognized character or character array on an input character check display area 57d of an operation unit display 57c comprising a liquid crystal display or the like.

An operation input unit 58 comprising a transparent touch panel switch or the like is provided on the display screen of the operation unit display 57c, whereby the operation input areas 58a to 58e corresponding to functional displays such as destination setting, course guide (via-place input), input mode switching, cancel (one-character delete for hand-written characters), OK (input character check), etc., are operated with a pen tip or a finger to perform the input of various kinds of functions. The input operation of the operation input unit 58 is detected by the operation input detector 57e, and when the input operation of the destination setting is carried out, the

destination input command 47a is supplied to the navigation controller 7.

An input mode switching means 57g switches alternately the character input mode and the cursor shift mode with each other every time the detection output 57f corresponding to the input mode switching operation is supplied from the operation input detector 57e, and outputs an input mode indication signal 57h indicating the corresponding input mode. On the basis of the input mode indication signal 57h, the display control means 57b visibly displays the current input mode by turning on or turning on and off any one of "character input" mode and "cursor shift" mode on the operation unit display 57c. Upon reception of the detection output indicating the execution of the input operation of the destination setting or course guide (via-place input) from the operation input detector 57e, the display control means 57b turns on the character display of "destination setting" or "course guide (via-place input) " of the operation unit display 57c to visibly display the setting of the current mode.

When supplied with the input mode indication signal 57h representing the cursor shift mode, the handwrite character recognition means 56d outputs a cursor shift command 47c corresponding to the pen input direction (the shift direction of the pen) and the shift distance (or shift speed and shift distance) thereof. Through this operation, the scroll of the map and the shift of the cursor displayed on the map can be performed with the same operation performance as a pointing device (image position indicating device) such as a mouse or the like.

When the detection output of the cancel operation is output from the operation input detector 57d, the recognition result output control means 57a cancels the character code data which are supplied just before the supply of the detection output. Accordingly, the characters which are displayed on the input character check display area 57d are deleted from the rear side one by one every time the cancel operation is carried out. Through this operation, correction can be performed for an erroneous handwriting input or an erroneous recognition of a character. On the other hand, when supplied with the detection output of the OK (input character check) operation, the recognition result output control means 57a successively outputs the character code data corresponding to the character array, etc., which are temporarily stored in the temporary storage means as the place-name input data 47b. Through this operation, the place name of the destination or the place name which is a target for the course guide is supplied to the navigation controller 7.

The hand-write input operation unit 59 having the handwrite input tablet 56a is provided with a pen receiver 59b on which a pen 59a is mounted and fixed for an emergent use, and is also provided with a palm rest portion 59c (a hatched area) for mounting hands or wrists thereon below and at the side of handwrite input table 56a. Therefore, the handwriting input operation can be more stably performed even when running vibration occurs.

The handwrite character recognition unit 56d is designed to recognize only characters of Hiragana or Katakana, numerals and some symbols so that the data amount required for the analysis of the writer's handwriting and the order of making strokes in writing a character is reduced to reduce the storage area of these data, and a time required for recognition is shortened.

The handwriting input tablet 56a may be formed of transparent or excellently light-permeable material and disposed on the display screen of the operation unit display 57c.

Fig. 5 is a block diagram showing an embodiment of the navigation controller.

The navigation controller 7 includes a data base access means 71 for controlling a read-out (access) operation of data from the road map data base 2, a signal processor 72 for processing the read-out data 2b, a pronunciation-position managing means 73 for managing the relationship between the pronunciations of place names and the positions thereof on a map, a map image generator 74 for generating map image data 74a, a character symbol generator 75 for generating display image data 75a such as characters, symbols, etc., to be displayed on the map, a route judgment means 76, a guide information generating means 77 for generating guide image data 77a displayed on the display screen of the image display device 9, an image synthesizer 78 for combining the respective image data 74a, 75a and 77a to output the synthesized image data 78a, and a display device interface (I/F) unit 79. The navigation controller 7 may be formed of a microcomputer system.

The data base access means 71 has a function of indicating the map type such as the broad area map, the middle area map, the detailed area map or the like on the basis of the map selection command 47a, and a function of generating and outputting an access request signal 2a for accessing the corresponding data on the basis of the car position data 3a successively output from the car position detection means 3, the position data 73a output from the pronunciation-position management means 73, and a search request 73b.

The signal processor 72 analyzes the read-out data 2b on the basis of the preset data base format to decompose these data into the map data 72a, the character symbol data 72b, the pronunciation-position data 72c on the relationship between the pronunciation of a place name and its position on the map and then outputs these decomposed data. When the road map data base 2 comprises a CD-ROM and a reproducing device therefor, the signal processor 72 carries out various signal processing such as an error

check, signal format conversion and serial-to-parallel signal conversion for the data 2b on the basis of reproduced signals.

The pronunciation-position management means 73 corresponds to a so-called dictionary for place names in which the position data 73a are output on the basis of the place-name input data 47b. On the basis of the presence or absence of the destination input command 47a, it judges whether the place-name input data 47b supplied from the voice recognition device 40 or the handwrite character recognition device 56 corresponds to the place name of the destination or the place name of a via-place or the like, and outputs the position data 73a containing information on the destination/via-place, etc.

When the pronunciation-position managing means 73 is designed to manage the place names of the map displayed currently on the image display device 9 and the pronunciation data thereof (containing plural pronunciation data other than the format pronunciation data) and there is no input place name on the map, a map which is nearest to the currently-displayed map in the direction extending to the destination is first indicated and the search request 73b is output. If the corresponding pronunciation is not detected in the data output signal 2b of the map which is preferentially indicated, those maps (excluding the preferentially-indicated map) which are nearest to the currently-displayed map are successively searched. However, if no corresponding pronunciation is still detected, those maps which are at the outside of and adjacent to the nearest maps are successively searched while preferentially searching a map in the direction extending to the destination. The preferential search of the map in the direction extending to the destination enables the search time to be effectively shortened.

Therefore, for generation of the search request 73b, the pronunciation-position managing means 73 supplies a search preferential direction guide request 73c to the route judgment means 76 which temporarily stores the position data of the beforehand-registered destination, and obtains preferential search map information 73d on the map to be preferentially searched from the route judgement means 76 to successively generate and output the search request 73b on the basis of the preferential search map information 73d.

This construction brings such an advantage that the storage capacity of the storage device for the pronunciation-position data, which is provided in the pronunciation-position managing means 73, can be reduced.

In order to set the destination itself, the adjacent maps are successively searched on the basis of the car current position as a reference position to shorten the search time. However, even by this manner, the search time may be long when the destination is far away from the current position.

Accordingly, all the pronunciation-position data which are stored in the CD-ROM 21 mounted on the reproducing device 22 of the road map data base 2 may be beforehand read into the pronunciation-position managing means 73, and stored in a storage device (for example, non-volatile memory or the like) provided in the pronunciation-position management means 73.

With this construction, the position data corresponding to any input place name in Japan can be obtained for a short time.

Furthermore, the pronunciation-position data may be provided in the pronunciation-position managing means 73 in place of the storage of the pronunciation-position data in the road map data base 2. With this construction, an existing road map data base having no pronunciation data, etc., is directly usable.

Still furthermore, the pronunciation-position data may be stored in a detachably-mounted storage medium such as an IC card type non-volatile memory or the like, whereby the destination setting and the course suitability judgment based on the via-place names through the place-name inputting operation are allowed by mounting the storage medium on the mount portion. In this case, the pronunciation-position data which are provided with only the pronunciations of place names displayed on a reproducing screen to meet the type of a CD-ROM 21 (map data storage medium) mounted on the reproducing device 22 may be supplied by the mountable storage medium. In this case, the pronunciation-position data for place names which are not displayed on the reproducing screen may be provided to perform a finer position setting. Furthermore, various pronunciation-position storage media for various purposes such as a leisure storage medium having pronunciation-position data on the names of golf places, hotels, sight-seeing places, etc., a business storage medium having the pronunciation-position data on the names of public offices, companies, etc., may be prepared to enable the destination setting and the course suitability judgment in accordance with the use purpose.

The map image generator 74 is designed to generate and output the map image data on the basis of the map data 72a supplied from the signal processor 72.

On the basis of the character symbol data 72b supplied from the signal processor 72, the character/symbol generator 75 generates and outputs display image data 75a for character information such as place names, road names, names of means of transportation, station names, the names of main buildings, etc., and symbols such as public offices, police offices, fire stations, post offices, hospitals, schools, shrines, temples, etc.,so that these characters and symbols are displayed at prescribed positions on the

map, and it is provided with a character generator (character/symbol generator) for generating fonts of characters, symbols, etc.

The route judgment means 76 includes a temporary storage device (for example, RAM) for temporarily storing the position data of the destination (MD), the car position data (JD) 3a and judgment target position data (KD1, KD2, KD3, ...) corresponding to the via-places input for the course suitability judgment. The route judgment means 76 judges, on the basis of each position data (MD, JD, KDn), the map data 72a and a route judgment method as described later, whether a route extending to the destination is suitable, and outputs the judgment result 8a.

When the position data 73a supplied from the pronunciation-position management means 73 contains information representing that it is the destination, the route judgment means 76 judges the position data 73a to be the position data (MD) of the destination, and stores it into a prescribed storage address. When the position data 73a is judged to be the judgment target position data (KD1, KD2, KD3,...) corresponding to the via-place or the like, the route judgment means 76 stores it into a prescribed address, and counts the even number of the supplied position data to recognize the number of routes to be estimated.

When supplied with the search preferential direction guide request 73c from the pronunciation-position management means 73, the route judgment means 76 outputs data on a direction extending from the car position (J) to the destination (M) as preferential search map information 73d. When the route judgment means 76 can recognize the numbers or the like for the road maps, the number data or the like for a sectional map which is adjacent to the currently-displayed map in the direction extending to the destination may be output as the preferential search map information 73d. Furthermore, a relative direction of a map to be preferentially searched with respect to the currently-displayed map, such as a north side, an east side or the like, may be merely output.

When the route judgment means 76 receives a signal 47d representing that a place name or the like input by voice or handwrite cannot be recognized, from the destination setting means 4 and the place name input means 5 constructed by the voice recognition device 40 or the handwrite character recognition device 56, or receives a signal 73e representing that there is no place name concerned, from the pronunciation-position management means 73, the route judgment means 76 supplies the judgment result output means 8 with a judgment result 8a representing that the input is requested to be carried out again, or that the judgment cannot be performed. In this case, through the voice output means 80 in the judgment result output means 8, a voice guide message such as "please input once more", "the name of ΔΔ is not registered" or the like is output, and through the image output means 90 in the judgment result output means 8, message image data 90a such as "please input again", "the place name is unrecognizable" or the like is generated to display the guide image message on the screen of the image display device 9 through the image synthesizer 78 and a display device interface unit 79.

On the basis of the car position data 3a, the position data 73a for the place names containing classification information of destination/via-place, etc., and the map 72a, the guide information generator 77 generates and outputs a mark indicating an advance direction, a mark indicating the destination position, a mark indicating the position of a place name input for route judgment, and guide image data 77a on various guide information such as a line connecting the car position and the destination, a line connecting the car position and the position of a place name input for the route judgment (the respective lines are different in line type or display color), etc.

The guide information generating means 77 controls the shift of the position of the cursor displayed on the screen of the display device 9 on the basis of the cursor shift command 47c, and supplies the destination position register data 77b to the route judgment means 76 when the destination is registered by the determination input of the cursor position while it supplies the current position register data 77c to the car position detector 3 when the current position is registered.

The image synthesizer 78 combines the map image data 74a supplied from the map image generator 74, the display image data 75a such as the symbols/characters supplied from the character symbol generator 75, the guide image data 77a supplied from the guide information generating means 77 and the message image data 90a (when the judgment result is imaged and displayed) with one another to output synthesized image data 78a.

The display device interface (I/F) unit 79 converts the synthesized image data 78a to a display device driving signal 9a which is suitable for an input specification of the image display device 9, and outputs it. For example, it is equipped with a CRT interface circuit for generating and outputting an analog video signal when a CRT monitor display is used as the image display device 9, or with an LCD driving circuit or the like for converting the synthesized image data to a signal for driving each dot when an LCD (liquid crystal) display is used.

Fig. 6 is a block diagram showing the judgment result output means.

The judgment result output means serves to audibly output the judgment result with voice and also to display a message sentence corresponding to the judgment result on the screen of the image display device 9, and thus it is equipped with the voice output

means 80 and the image output means 90.

A guide message generating means 81 analyzes the judgment result 8a which is output on the basis of a preset rule to select a suitable one from plural messages which are beforehand stored in a message storage unit 82, and inserts a place name or the like into the message if necessary, whereby guide message data 81a are generated and output.

A voice editor 83 successively takes out desired voice information data from a voice information storage unit 84 on the basis of the guide message data 81a, and successively outputs the voice information data to a voice synthesizer 85. A voice signal 85a output from the voice synthesizer 85 is amplified by an amplifier 86 to drive an electro-acoustic transducer 87 of a speaker or the like. Through this operation, a voice message such as "ΔΔ direction" or "please go to OO direction" is output. When one place name is input and it is suitable to go toward the place name, a voice message of "OK" (if it is not preferably, a voice message of "NO") or the like is merely output.

A guide message image synthesizer 91 successively takes out character font data from a character generator 92 on the basis of the guide message data 81a to generate and output message image data 90a.

In place of independently providing the image output means 90, the message image data corresponding to the judgment result may be generated using the guide information generating means 77 in the navigation controller 7 shown in Fig. 5. Furthermore, the judgment result may be output with only voice or only an image.

Fig. 7 is a diagram showing a suitability judgement method for a route extending to a destination.

In the suitability judgment method shown in (a) of Fig. 7, a route is judged to be suitable if an intersectional angle θ between a line J-M connecting the current position (car position) J and a destination M and a line J-M connecting the current position (car position) J and the position K of an input place name is smaller than a predetermined threshold angle θth (for example, 60 degrees). If an angle between the destination direction and the direction of a place name serving as a judgment target is above 120 degrees, for example, a judgment result 8a representing that the direction should be inverted is output, and a message "the advance direction is opposite" or the like is given to the driver or the like.

When plural place names are input as judgment targets, intersectional angles θ1 between a line J-K1 connecting the current position (car position) J and the position K1 of a judgment target and a line J-M connecting the current position J and the destination M, θ2 between a line J-K2 connecting the current position J and the position K2 of another judgment target and the line J-M, and θ3 between a line J-K3 connecting the current position J and the position K3 of the other judgment target and the line J-M, are calculated as shown in (b) of Fig. 7, and the place name which provides the smallest intersectional angle below the threshold value θth is judged to be the most suitable place name for the route.

As described above, the course suitability method based on the positional relationship of the via-place Kn with the current position J and the destination M requires no road data 72a. The route judgment means 76 can judges the course suitability on the basis of only the position data 73a supplied from the pronunciation-position management means 73, so that the judgment can be performed for a short time. In addition, the route judgment means 76 is merely provided with the position relationship judgment means for judging the positions of plural places and the relationship thereamong, so that the hard structure can be made compact or the number of the program processing steps can be reduced.

When two or more via-places are input and the angles θ1 and θ2 shown in (b) of Fig. 7 are substantially equal to each other, the route judgment means 76 may output a judgment result 8a representing "any one of "OO" and "ΔΔ" is OK".

A more detailed route judgement can be performed by designing the route judgment means 76 so that a course suitability judgment is made in consideration of the map data 72a.

For example, when two or more via-places are input and the angles θ1 and θ2 show in (b) of Fig. 7 are substantially equal to each other, the route judgment means 76 calculates the road distance of each route extending from the current position (car position) J through each input via-place name to the destination M on the basis of the map data 72a, and one of the via-place names which provides the shorter travel distance is judged as being suitable.

In this case, the road distance of the route extending through the input via-place name to the destination M is calculated when it is satisfied that the input place name is located at the car position side with respect to the destination M (nearer to the car position than the destination M). On the other hand, the road distance from the current position (car position) to the destination M is calculated when the input place name is farther away from the current position than the destination M.

The route judgment means 76 supplies the judgment result output means 8 with the pronunciation data of the place name and the judgment result 8a representing that the route containing the place name is the optimum route, whereby a voice message "OO is optimum" or the like is voiced from the judgment result output means 8, and a guide sentence having the same means is displayed on the screen of the image display device 9.

When the map data 72a contains information to discriminate superhighways, etc. and general roads from one another, the route judgment means 76 may

calculate the value corresponding to an estimation time which is estimated to be taken until the car arrives at the destination, thereby performing a more detailed judgement containing the route information.

In a case where a route passing through a superhighway or the like to the destination can be set by selecting a route containing an input via-place or the like (the direction of the place name for which the course guide is requested), the route judgment means 76 calculates the road distance of the route containing the superhighway or the like so that the distance of an area in which a superhighway is usable is converted to a half of the actual distance, for example, and the course suitability judgment is made on the basis of the calculated road distance. Thereafter, it outputs the judgment result 8a containing the type information of used roads and outputs from the judgment result output means 8 a guide message of "A superhighway is usable if you go to XX direction. If you use a general road, please go to OO direction" or the like.

Fig. 8 shows another embodiment of a suitability judgment method for the route extending to the destination.

The course suitability judgment method shown in Fig. 8 is effective for the case where a route extending to the destination M is set manually or for the case where a function of automatically setting a route extending to the destination is provided. Furthermore, the accurate course guide can be performed even when the position of an input place name for the course guide is farther away from the current position than the destination.

As shown in (a) of Fig. 8, the route judgment means 76 compares a route (PJM) extending from the car position (current position) J to the destination M with a route (PJK) extending from the car position (current position) J to the position K of an input place name to judge whether there is a common portion between the routes (PJM) and (PJK). If there is a common portion PJC, the route judgment means 76 outputs the judgment result 8a representing that selection of the route extending to the input place name is suitable, and supplies audibly or visibly a message of "OO", "Please go to O• direction" or the like through the judgment result output means 8.

When plural place names are input and respective routes extending to the respective input place names have a common portion with a route extending to the destination as shown in (b) of Fig. 8, the route judgment means 76 calculates the distance of the common portion (PJC1, PJC2) for every route, or calculates the ratio of the common portion to the route extending to the destination (PJC1/PJCM), (PJC-2/PJCM) every route, and judges the route (the input place name) having the common portion of larger distance or larger ratio as a more suitable route.

Furthermore, the route judgment means 76 may calculate the distance of the common portion and output the judgment result 8a containing the calculation result to output a guide message of "Please go to ΔΔ direction. It is necessary to change the course about XX kilometers ahead" or the like through the judgment result output means 8. With this message, it is understood by or suggested to the driver or the like that it is suitable at this time to go to the direction of the place name ΔΔ although it is not coincident with the direction to the destination.

Fig. 9 shows a third embodiment of a suitability judgment method for the route extending to the destination.

In this method, a rhombic ((a) of Fig. 9) or egg-shaped ((b) of Fig. 9) area A which has a width (distance) W corresponding to the length (distance) LJM of a line L connecting the current position J and the destination M is set at both sides of the line L. If a place name input for the course guide exists in the area A, a route extending to the input place name is judged as "suitable". A portion having the largest width in the area A is set so as to be nearer to the destination M, so that a course guide (navigation) in a direction which is deviated from a direction toward the destination can be prevented. In the case of (a) of Fig. 9, the widest portion in the area A is set away from the destination at a distance of one-third of the length (distance) LJM of the line L.

In this manner, the course suitability judgment is performed with no map data 72a, and thus the judgment and response can be performed for a short time. In addition, a permissible range of via-places, etc., is limited in accordance with the distance to the destination M, so that it is avoided to take a long roundabout way.

In (c) of Fig. 9, it is assumed that the place names of big cities or important positions of transportation exist around (far away from or in the neighborhood of) the destination, and a place name which is located within an area B having a radius of R from the destination M is judged as "suitable". In the methods of (a) and (b) of Fig. 9, as the car approaches to the destination, the area permitting the "suitable" judgment is narrower. Therefore, there occurs a case where "NO" message is more frequently output even when a place name is input. However, by setting the area B having the destination M at the center thereof, the car can be navigated into the area having the predetermined radius R from the destination M.

In (d) of Fig. 9, an area B having the destination M at the center thereof and an egg-shaped area A whose wider portion is set at the car position J side (near to the car position J) are combined with each other to set a gourd-shaped area as a whole. Accordingly, even when the car is located at the current position and approaches to the destination M, the frequency of the message "NO" is reduced.

Fig. 10 is a block diagram showing another embodiment of the navigation controller.

When a place name is input for the course guide, the navigation controller 107 of this embodiment displays the position of the input place name on the screen of the image display device 9 so that the relationship between the position of the place name and the destination can be recognized, whereby the driver and passengers such as a passenger at the assistant driver's seat or the like can check the route by seeing the displayed map.

When the position data 73a of a place name such as a via-place or the like is supplied from the pronunciation-position managing means 73, the route judgment means 101 supplies a course guide map automatic selection means 102 with the position data 101a (JD,MD,KD) of the car position J, the destination M and the via-place or the like K.

The road guide map automatic selection means 102 has range data of each sectional map every reduced scale such as a detailed area, a middle area, a broad area, etc., and it first searches such a map as contains all of the car position J, one or plural via-places, etc., K and the destination M. If there is the map concerned, it supplies the map indication data 102a indicating the map to the data base access means 71 to read out the data of the corresponding sectional map from the road map data base 2.

If there is no sectional map containing all the car position J, the destination M and the via-places, etc.,K, the road guide map automatic selection means 102 searches a sectional map containing the current position J and at least one via-place K, or a sectional map containing the current position J and the destination M. If the selected map does not contain the destination M, the road guide map automatic selection means 102 outputs information representing the fact to the route judgment means 101, and if there is a via-place which is not contained in the selected map, the road guide map automatic selection means 102 outputs information 102b on the via-place to the route judgment means 101.

If there is a sectional map containing the car position J, the destination M and all the input via-places, etc., K, the route judgment means 101 supplies the position data 101b thereof (MD,KD) to the guide information generating means 103. On the basis of each position data 101b (MD,KD), the guide information generating means 103 generates image data for displaying a mark MM indicating the destination position and a mark MK indicating the position of each of the input via-places, etc., at the corresponding positions, and generates image data of lines LM and LK which connect the car position mark MJ based on the car position data 3a and the respective marks MM, MD. Thereafter, it supplies the generated image data 103a for the road guide to the image synthesizer 78. Through this operation, the road guide information is displayed on the screen of the image display device 9 while superposed on the road map.

Fig. 11 shows an example of a road guide image.

A case where the destination and all the input via-places are displayed at the same time is shown in (a) of Fig. 11. MM represents a mark indicating the position of the destination M, MK1 to MK3 (MKn) represent marks indicating the positions of the respective input via-places K1 to K3 (kn). MJ represents a mark indicating the vehicle position. LM represents a line connecting the vehicle position and the destination, and LK1 to LK3 (LKn) represent lines connecting the respective via-places, etc., to the vehicle position, respectively.

The route judgment means 101 judges a suitable route on the basis of the judgment methods shown in Figs. 7 to 9 and outputs the judgment result 6a to the judgment result output means 108 to output the judgment result in the form of a voice message while also outputting to the guide information generating means the position data 101b of the via-place or the like which is judged to be suitable.

Thereafter, the guide information generating means 103 displays the line LM extending from the vehicle position to the destination, the line extending from the vehicle position to the via-place or the like which is judged to be suitable (in this embodiment, line LK2), and the lines extending from the vehicle position to the other via-places (in this embodiment, lines LK1, LK3) with different line types (thickness of line, the kind of line such as a solid line, a chain line, etc.) or different display colors so that these lines are discriminable from one another.

Therefore, when the driver or the passenger inputs one or plural place names written on a road sign or the like into the car navigation system 1, a suitable route is indicated with a voice message, and a road map containing the destination and the input place name(s) is reproduced and displayed on the screen 9a of the image display device 9. In this case, the positions of the destination and the input via-place names, the vehicle position and the lines connecting the vehicle position to these positions are displayed on a map in such a way as to be easily visible, so that the route can be checked using the map display in combination.

When any map which contains the positions of all place names serving as targets for the route judgment cannot be selected, the route judgment means 101 supplies the guide information generating means 103 with place-name data on the positions of the place names which cannot be displayed on a selected map, and data 101b on the direction extending from the vehicle position to each of the positions of these place names and the distance in a straight line extending from the vehicle position to each of the positions.

Upon reception of these data 101b, the guide information generating means 103 displays an arrow extending from the vehicle position to the destination

end an arrow extending from the vehicle position to a via-place or the like, and generates image data for guide information JM on the destination which indicates the place name of the destination and the distance to the destination at the arrow side, and for guide information FJK on the place names of the via-places and the distance of the straight line.

When the route judgment means 101 judges the course suitability on the basis of the route to the destination as shown in Fig. 8, the guide information generating means 103 may generate image data on a route extending from the destination and the input via-place or the like to display the route on the map.

Furthermore, in Fig. 10, the judgment result output means for imaging and displaying the route judgment result is constructed by the guide information generating means 103, the image synthesizer 78, the display device I/F unit 79 and the image display device 9 in the navigation controller 100. However, the image for the navigation guide may be generated by the image output means 90 shown in Fig. 5.

In the above embodiment, the judgment result 8a is output in the form of a voice message and an image display. However, it may be output in the form of either the voice or the image display. Besides, a selection switch may be provided for the judgment result so that the judgment result can be switched between the voice and the image display by an user's operation.

A car navigation system according to claim 1 includes route judgment means for judging whether an input place name is suitable for a route extending to a destination, and judgment result outputting means for outputting a judgment result of the route judgment means. Accordingly, by inputting a place name written on a road sign or the like, it can be suitably guided which course should be selected. Therefore, even when a driver or the like does not recognize the geographical relationship between a destination and a place name written on a road sign or the like in a geographically unfamiliar area, he can take the suitable course on the basis of the place name written in the road sign or the like.

In a car navigation system according to claim 2, place names indicated on a map which is reproduced and displayed on a screen by an image display device and data on pronunciations of the place names (written in Kanji) are provided to a road map data base. Therefore, place names such as via-places, etc., can be specified by inputting the place names with voice using a voice recognition device. Furthermore, when a hand-writing input device is used, the place names such as via-places can be also specified by inputting the place names in Hiragana or Katakana with a pen or the like. Accordingly, a hand-writing character recognizing unit of this system can be more facilitated in construction than a hand-writing input device which needs recognition of Kanji. In addition, it is difficult to accurately input complicated Kanji characters during running because of car vibration. On the other hand, the Hiragana or Katakana input of the place names makes the hand-writing input operation more easy.

In a car navigation system according to claim 3, in addition to accurate (formal) pronunciations for place names, data on other pronunciations for the place names are provided. Accordingly, even when the driver or the like does not known the formal place names because of a geographically unfamiliar area, the place names written on road signs, etc., can be input by voicing or hand-writing an adequate pronunciation for each place name.

Furthermore, the destination setting means and the place-name input means are constructed by using the voice recognition device or the handwrite character recognition device, the destination and the via-places can be easily input.

Whether the input place name is suitable as a via-place is output with voice using the voice synthesizer. On the screen of the image display device are displayed a map containing the current position of the car, and the lines connecting the current position to the destination and to the input place name (via-place).

Claims

1. A car navigation system comprising:
   a road map data base;
   a car position detecting device for detecting the current position of a car;
   place-name input means for inputting a place name;
   route judgement means for judging whether the input name is suitable for a route extending to a destination; and
   judgement result output means for outputting a judgement result.

2. The car navigation system as claimed in claim 1, wherein said road map data base is provided with place-name display data for place names to be displayed on a map which is reproduced on a screen of an image display device, and pronunciation data for the place means.

3. The car navigation system as claimed in claim 1 or 2, wherein said road map data base is provided with place-name display data of the place names to be displayed on the map, data on formal pronunciations for the place names and data on the other pronunciations for the place names.

4. The car navigation system as claimed in claim 1, 2 or 3, wherein said destination setting means and said place-name input means are constructed by a voice recognition device.