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(54) APPARATUS AND METHOD FOR MANAGING CONTENTS IN A COMPUTER

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(30) Foreign Application Priority Data

Jan. 26, 2000 (JP) 2000-017218

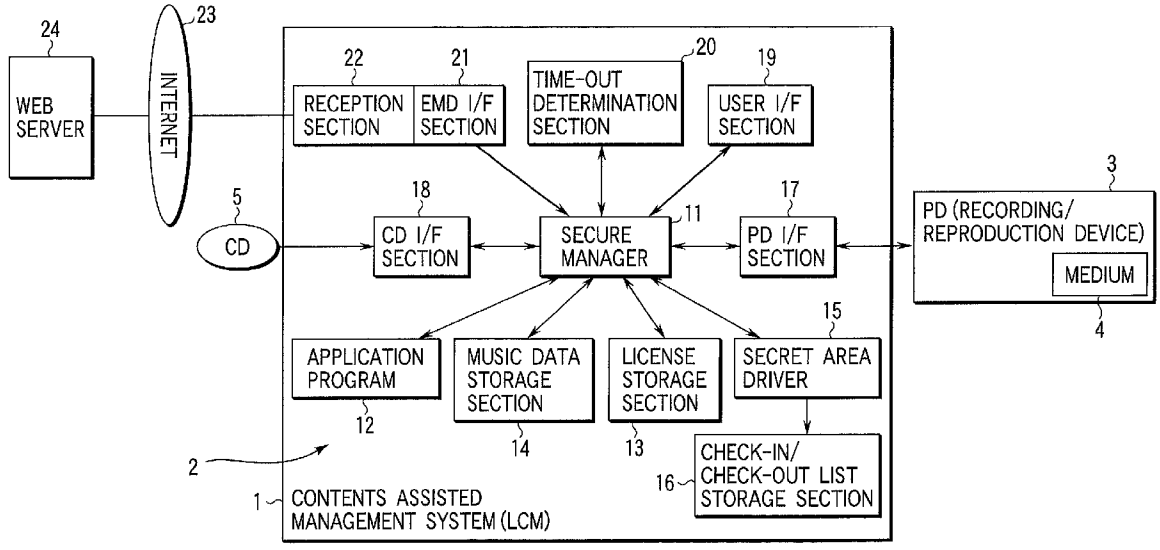
Publication Classification

(51) Int. Cl.[7] G06F 3/00

(52) U.S. Cl. 345/764; 345/810

(57) ABSTRACT

A library display section and a PD display section are displayed in a management window on a PD edit screen. By selecting conditions to be retrieved by a retrieval condition setting section and clicking a retrieval key in a retrieval key setting section, a music data storage section is retrieved and relevant contents are displayed on a library list display section. By selecting contents displayed on the library list display section and operating an add button, the selected contents are transmitted to the PD and displayed in a PD contents list display section. At this time, the contents-transferable number of times that is displayed in the list of the library list display section is decreased by one. If the contents-transferable number of times is managed, the number of duplicated contents can be limited.



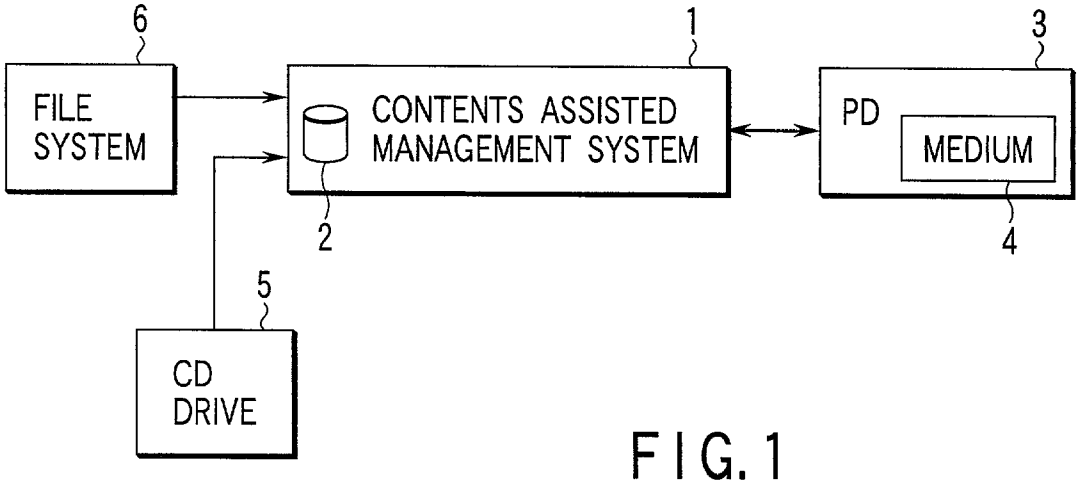

6
FILE SYSTEM
1
CONTENTS ASSISTED MANAGEMENT SYSTEM
2
3
PD
MEDIUM
4
5
CD DRIVE

FIG. 1

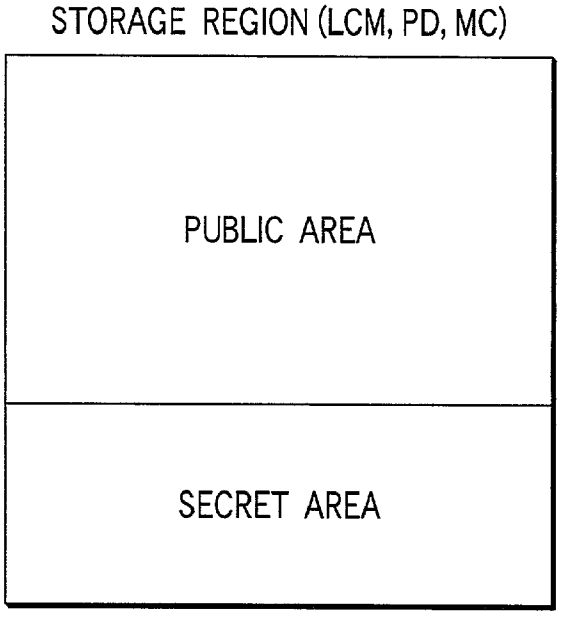

STORAGE REGION (LCM, PD, MC)
PUBLIC AREA
SECRET AREA

FIG. 3

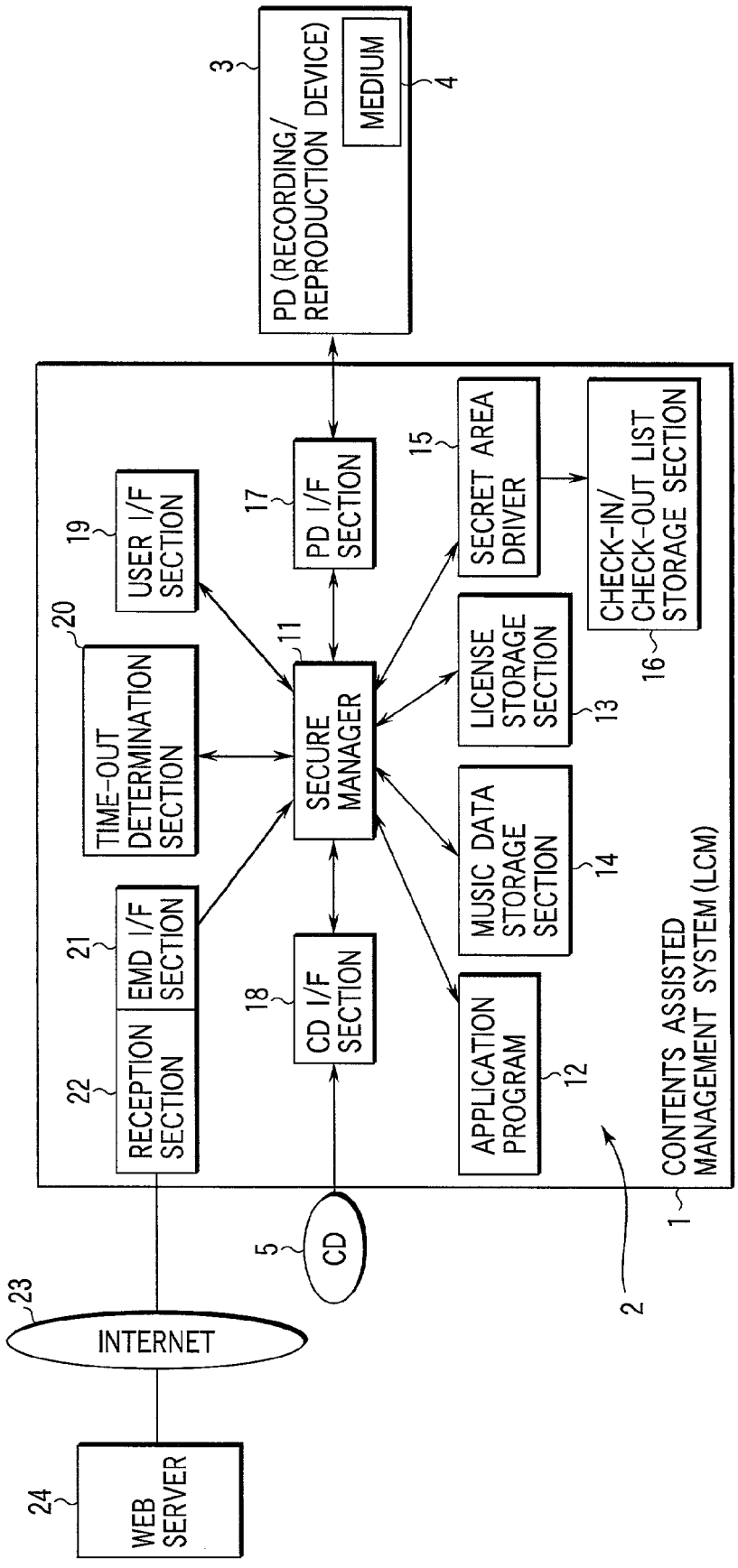

PD (RECORDING/ REPRODUCTION DEVICE)
MEDIUM
3
4
CONTENTS ASSISTED MANAGEMENT SYSTEM (LCM)
1
SECURE MANAGER
11
USER I/F SECTION
19
PD I/F SECTION
17
SECRET AREA DRIVER
15
CHECK-IN/ CHECK-OUT LIST STORAGE SECTION
16
TIME-OUT DETERMINATION SECTION
20
LICENSE STORAGE SECTION
13
EMD I/F SECTION
21
MUSIC DATA STORAGE SECTION
14
RECEPTION SECTION
22
CD I/F SECTION
18
APPLICATION PROGRAM
12
CD
5
INTERNET
23
WEB SERVER
24
2

FIG. 2

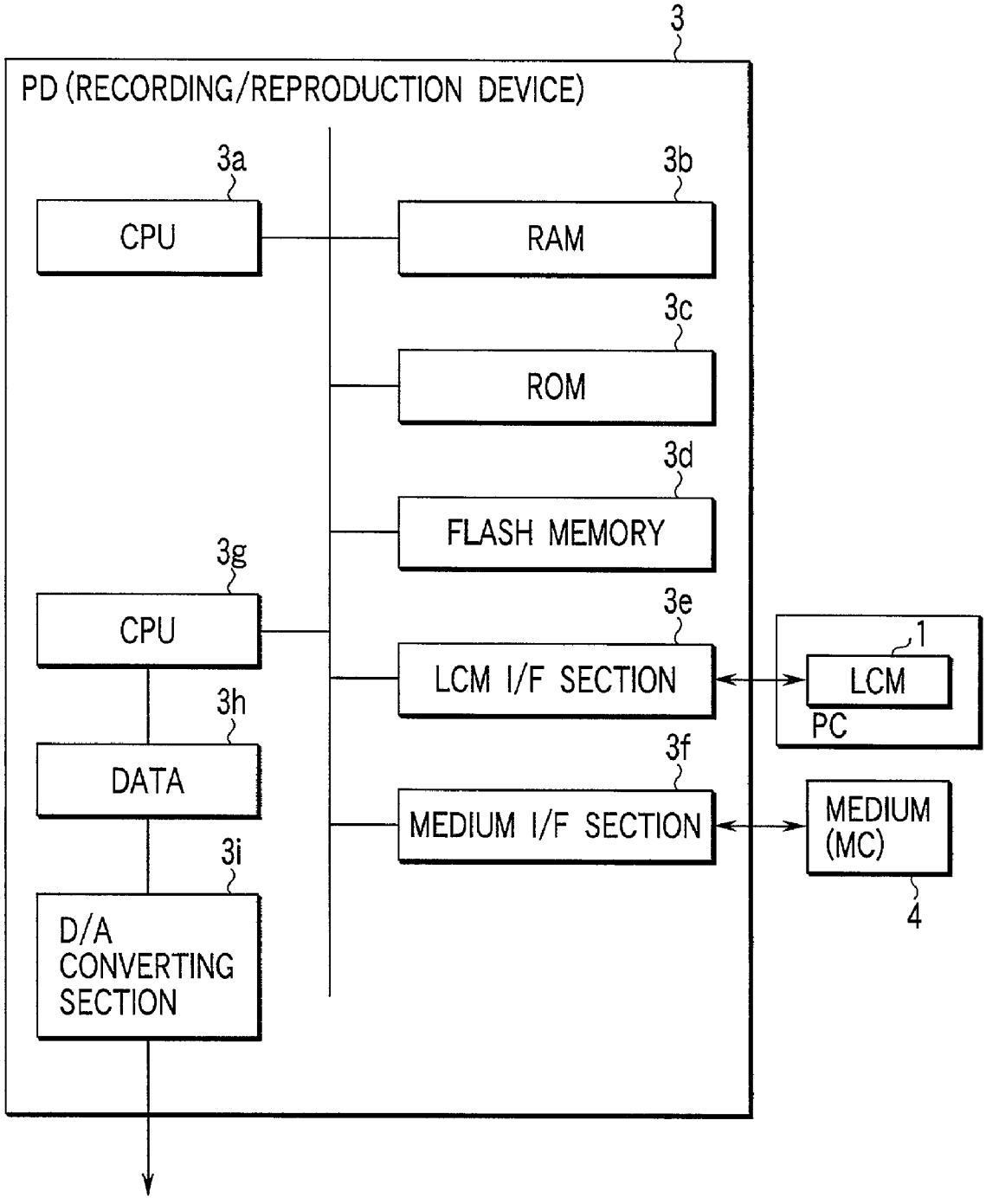

3
PD (RECORDING/REPRODUCTION DEVICE)
3a
CPU
3b
RAM
3c
ROM
3d
FLASH MEMORY
3g
CPU
3e
LCM I/F SECTION
1
LCM
PC
3h
DATA
3f
MEDIUM I/F SECTION
MEDIUM (MC)
4
3i
D/A CONVERTING SECTION

FIG. 4

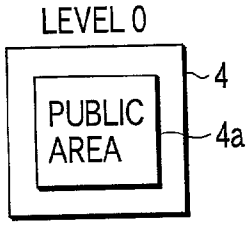


FIG. 5A

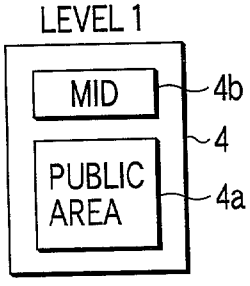


FIG. 5B

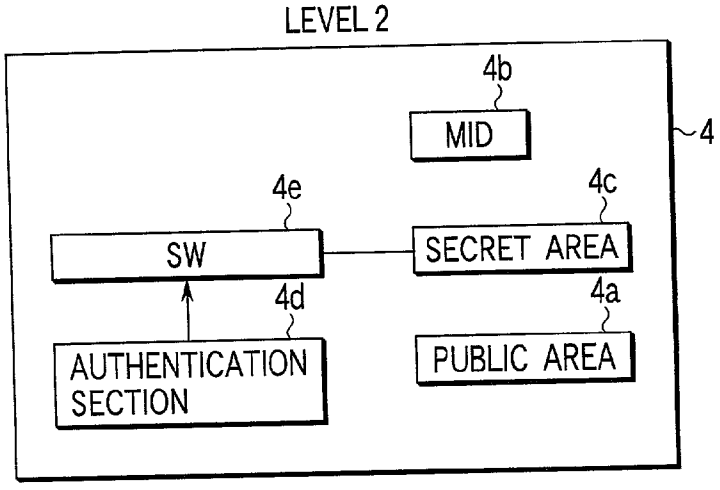


FIG. 5C

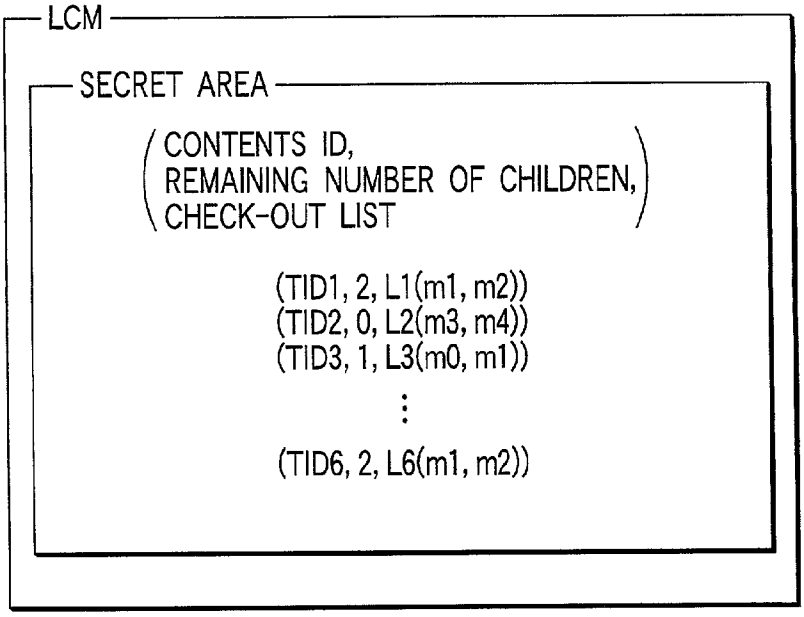


FIG. 6A

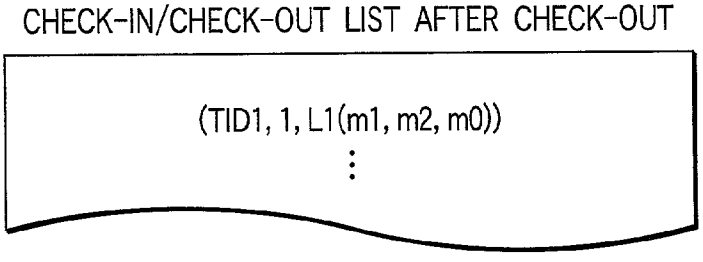


FIG. 6B

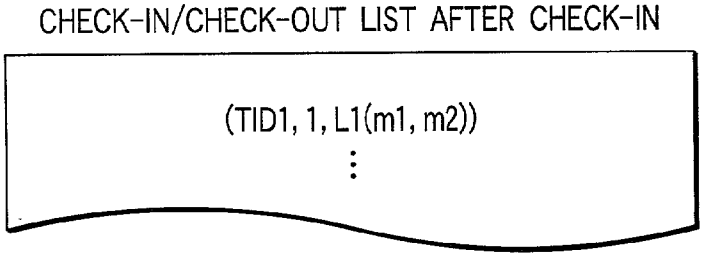


FIG. 6C

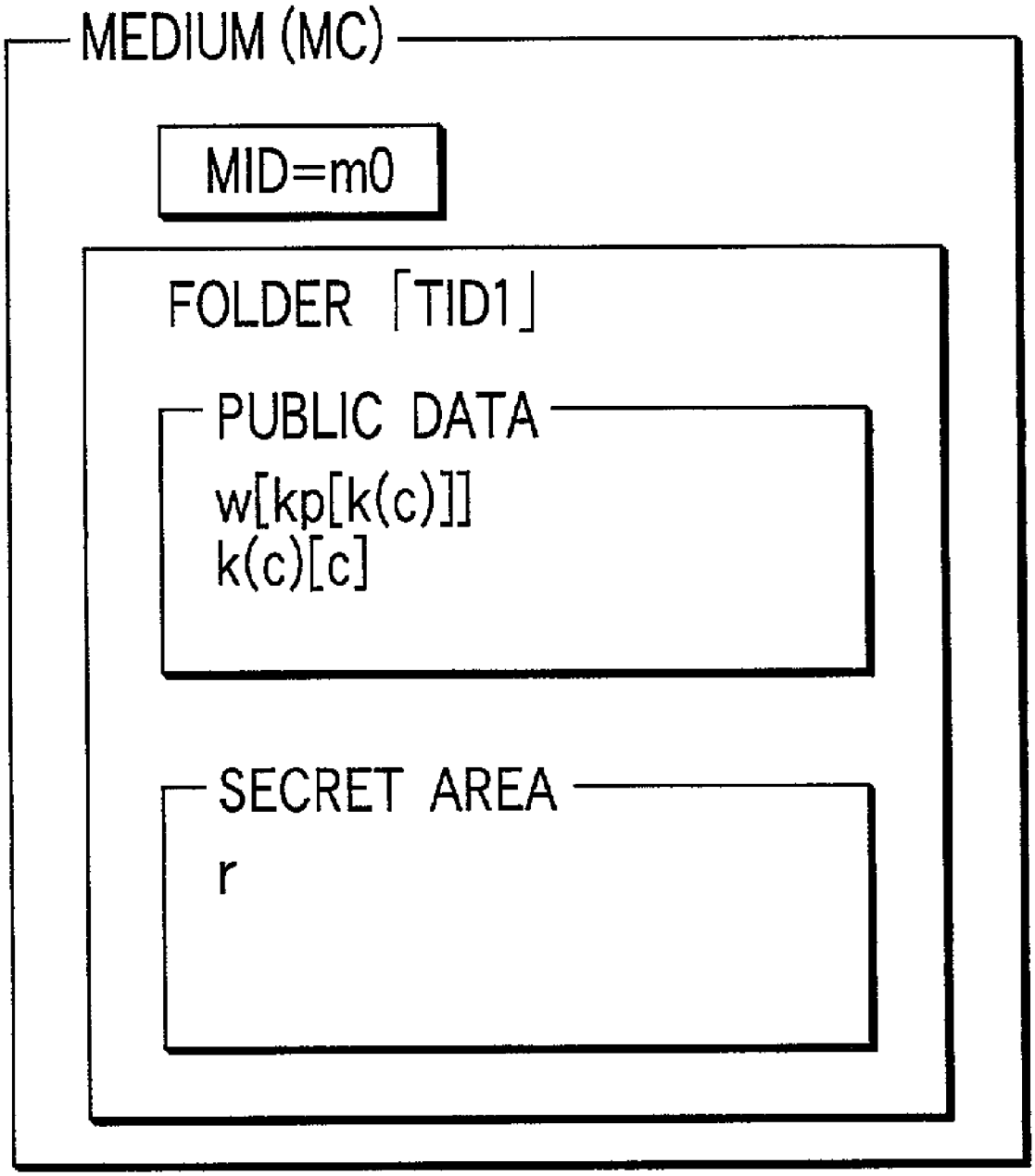

MEDIUM (MC)
MID=m0
FOLDER 「TID1」
PUBLIC DATA
w[kp[k(c)]]
k(c)[c]
SECRET AREA
r

FIG. 7

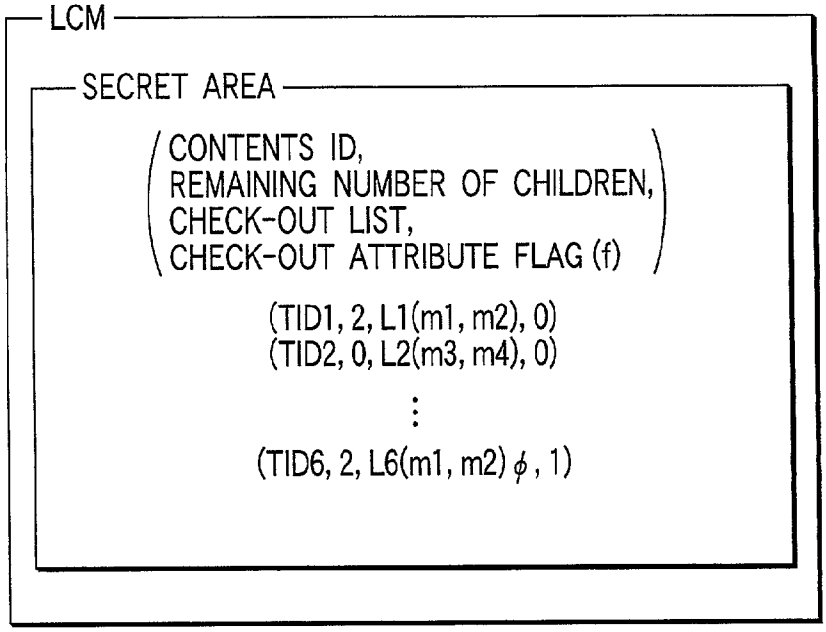


FIG. 8A

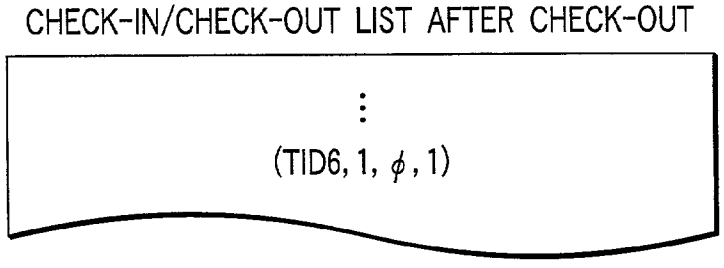


FIG. 8B

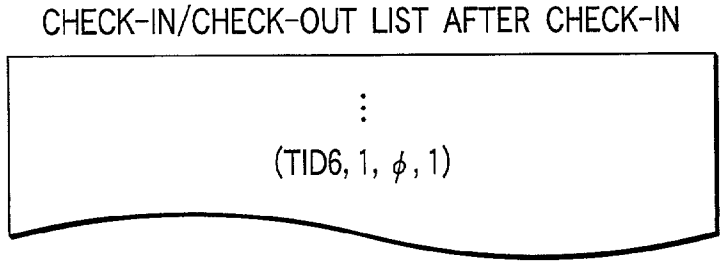


FIG. 8C

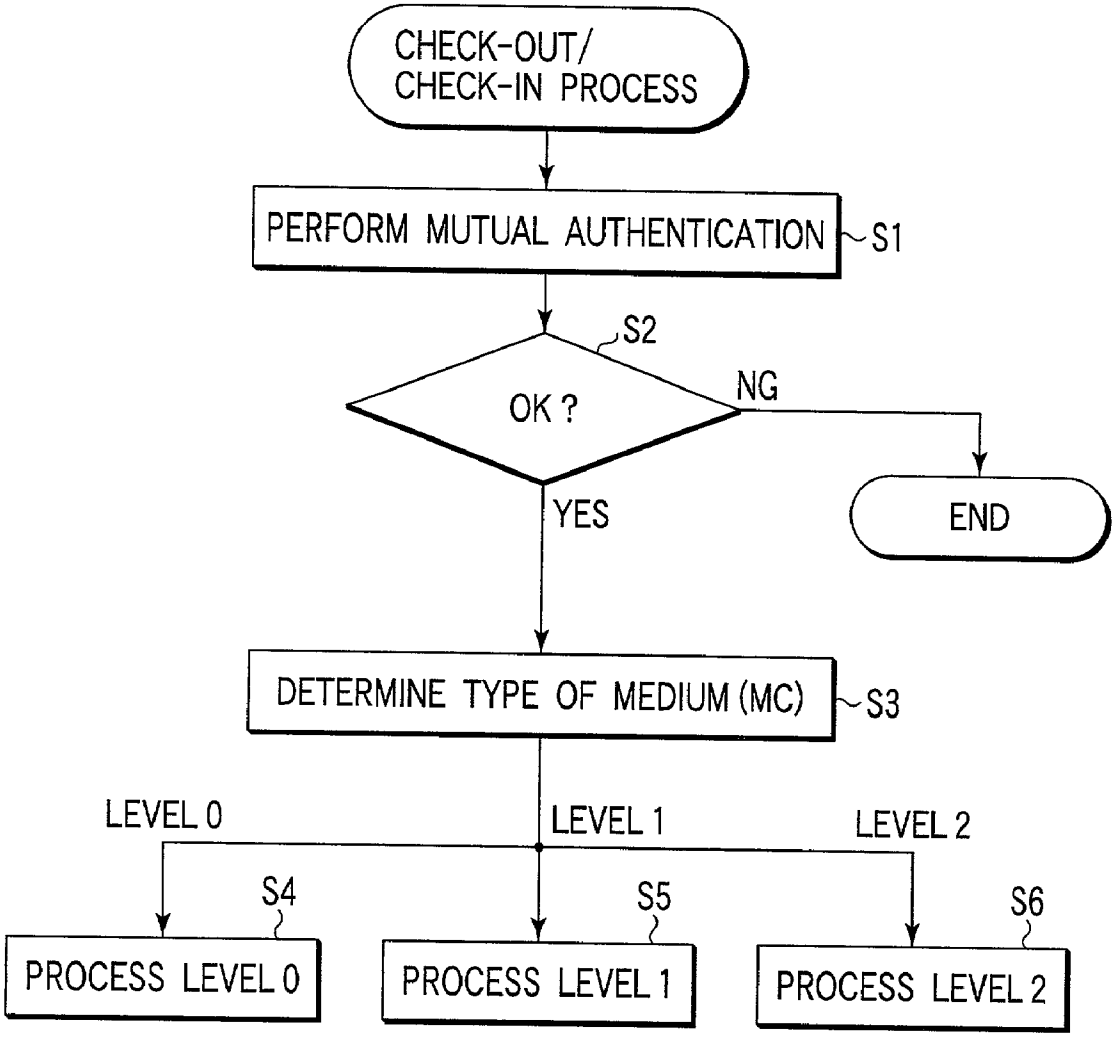

CHECK-OUT/
CHECK-IN PROCESS
PERFORM MUTUAL AUTHENTICATION
S1
S2
OK ?
NG
END
YES
DETERMINE TYPE OF MEDIUM (MC)
S3
LEVEL 0
LEVEL 1
LEVEL 2
S4
S5
S6
PROCESS LEVEL 0
PROCESS LEVEL 1
PROCESS LEVEL 2

FIG. 9

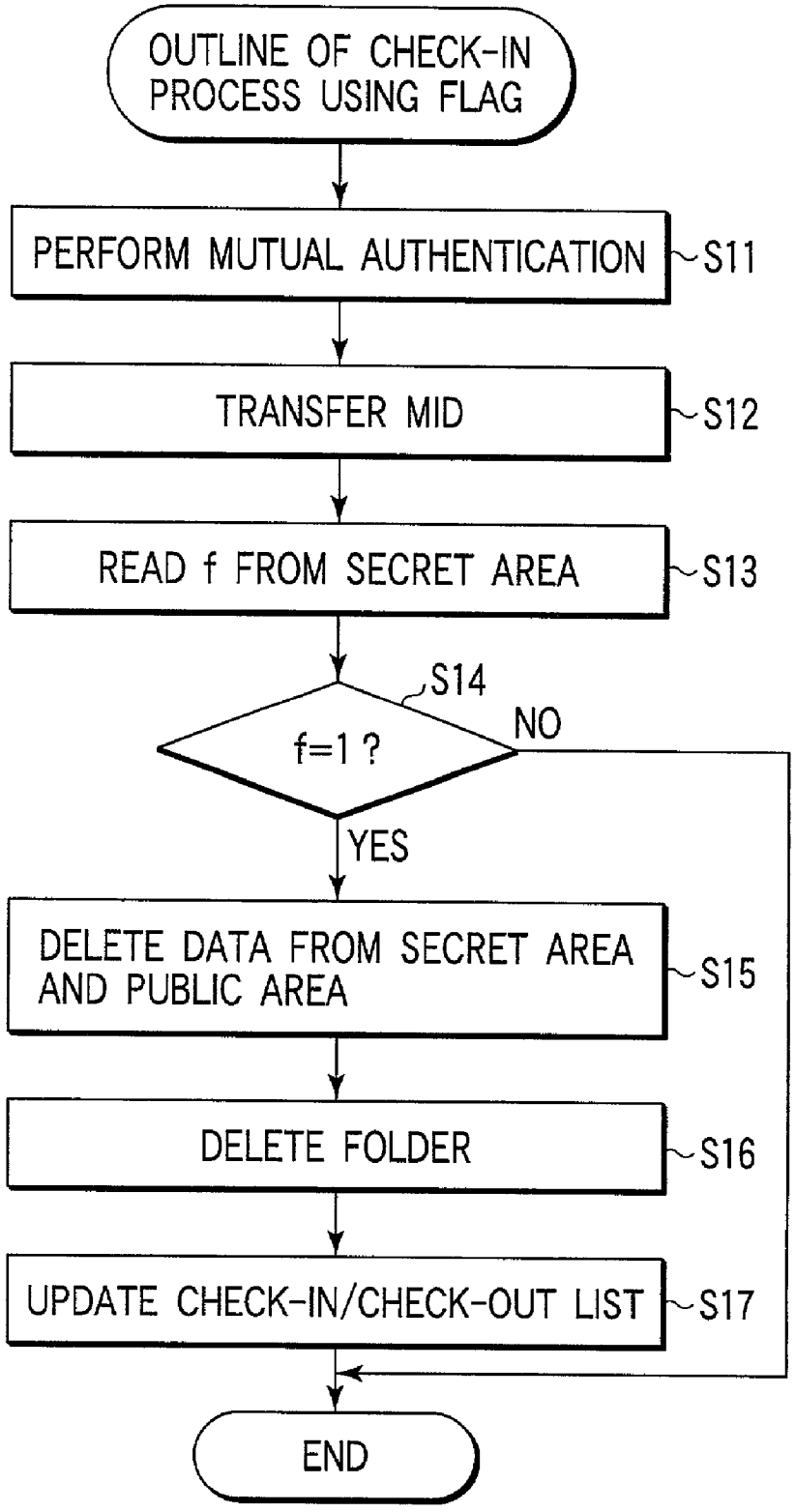

OUTLINE OF CHECK-IN PROCESS USING FLAG
PERFORM MUTUAL AUTHENTICATION
S11
TRANSFER MID
S12
READ f FROM SECRET AREA
S13
S14
f=1 ?
NO
YES
DELETE DATA FROM SECRET AREA AND PUBLIC AREA
S15
DELETE FOLDER
S16
UPDATE CHECK-IN/CHECK-OUT LIST
S17
END

FIG. 10

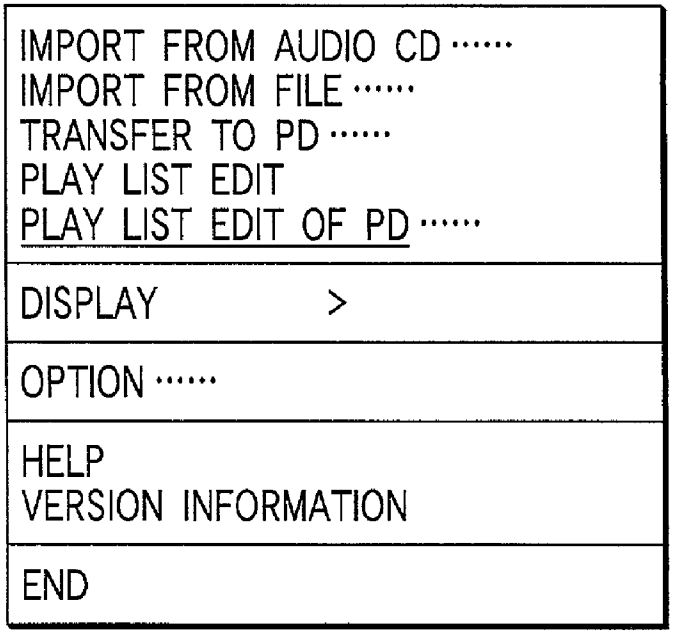


FIG. 11A

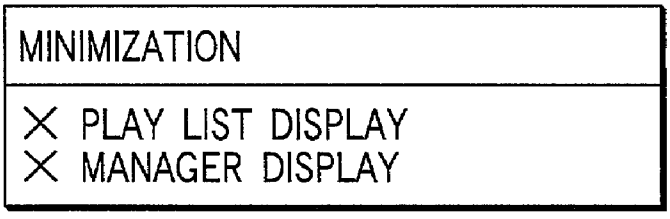


FIG. 11B

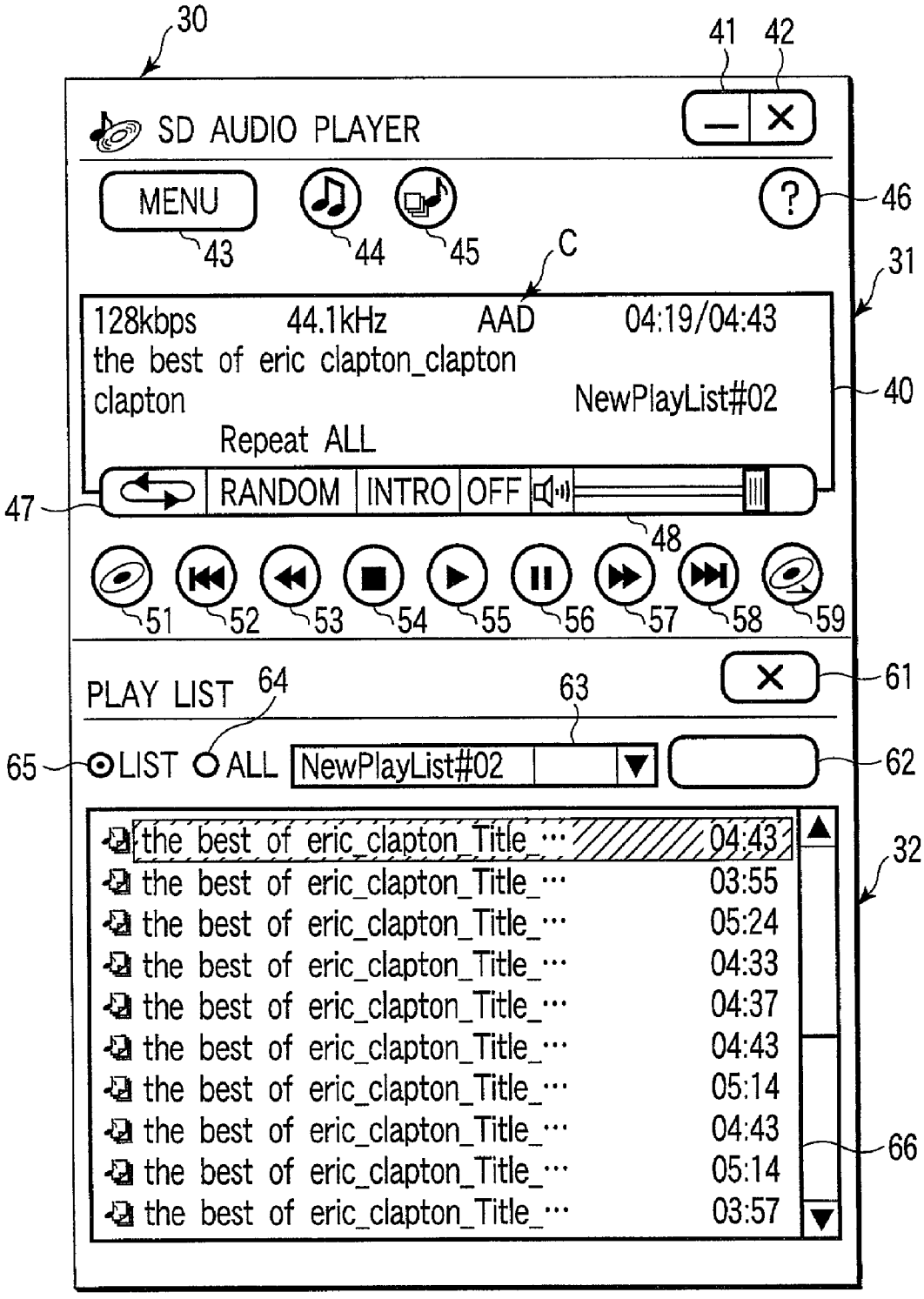

30
41
42
SD AUDIO PLAYER
MENU
43
44
45
46
C
31
128kbps 44.1kHz AAD 04:19/04:43
the best of eric clapton_clapton
clapton
NewPlayList#02
40
Repeat ALL
47
RANDOM
INTRO
OFF
48
51
52
53
54
55
56
57
58
59
PLAY LIST
64
63
61
65
LIST
ALL
NewPlayList#02
62
the best of eric_clapton_Title_··· 04:43
the best of eric_clapton_Title_··· 03:55
the best of eric_clapton_Title_··· 05:24
the best of eric_clapton_Title_··· 04:33
the best of eric_clapton_Title_··· 04:37
the best of eric_clapton_Title_··· 04:43
the best of eric_clapton_Title_··· 05:14
the best of eric_clapton_Title_··· 04:43
the best of eric_clapton_Title_··· 05:14
the best of eric_clapton_Title_··· 03:57
32
66

FIG. 12

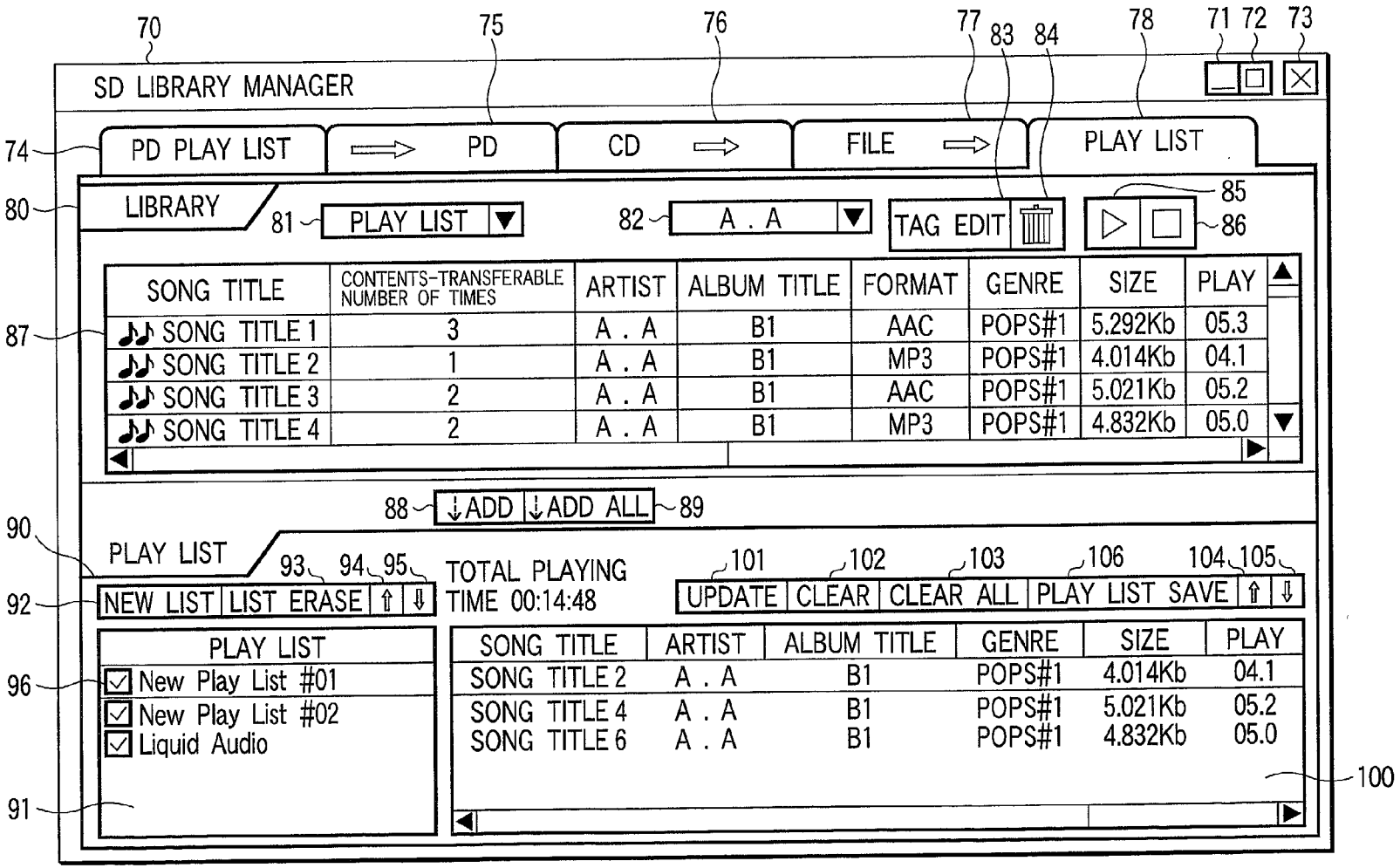

70
75
76
77
83
84
78
71
72
73
SD LIBRARY MANAGER
74
PD PLAY LIST
PD
CD
FILE
PLAY LIST
80
LIBRARY
81
PLAY LIST
82
A . A
TAG EDIT
85
86
87
SONG TITLE
CONTENTS-TRANSFERABLE NUMBER OF TIMES
ARTIST
ALBUM TITLE
FORMAT
GENRE
SIZE
PLAY
SONG TITLE 1 3 A . A B1 AAC POPS#1 5.292Kb 05.3
SONG TITLE 2 1 A . A B1 MP3 POPS#1 4.014Kb 04.1
SONG TITLE 3 2 A . A B1 AAC POPS#1 5.021Kb 05.2
SONG TITLE 4 2 A . A B1 MP3 POPS#1 4.832Kb 05.0
88
ADD
ADD ALL
89
90
PLAY LIST
93
94
95
TOTAL PLAYING TIME 00:14:48
101
102
103
106
104
105
92
NEW LIST
LIST ERASE
UPDATE
CLEAR
CLEAR ALL
PLAY LIST SAVE
PLAY LIST
96
New Play List #01
New Play List #02
Liquid Audio
SONG TITLE
ARTIST
ALBUM TITLE
GENRE
SIZE
PLAY
SONG TITLE 2 A . A B1 POPS#1 4.014Kb 04.1
SONG TITLE 4 A . A B1 POPS#1 5.021Kb 05.2
SONG TITLE 6 A . A B1 POPS#1 4.832Kb 05.0
91
100

FIG. 13

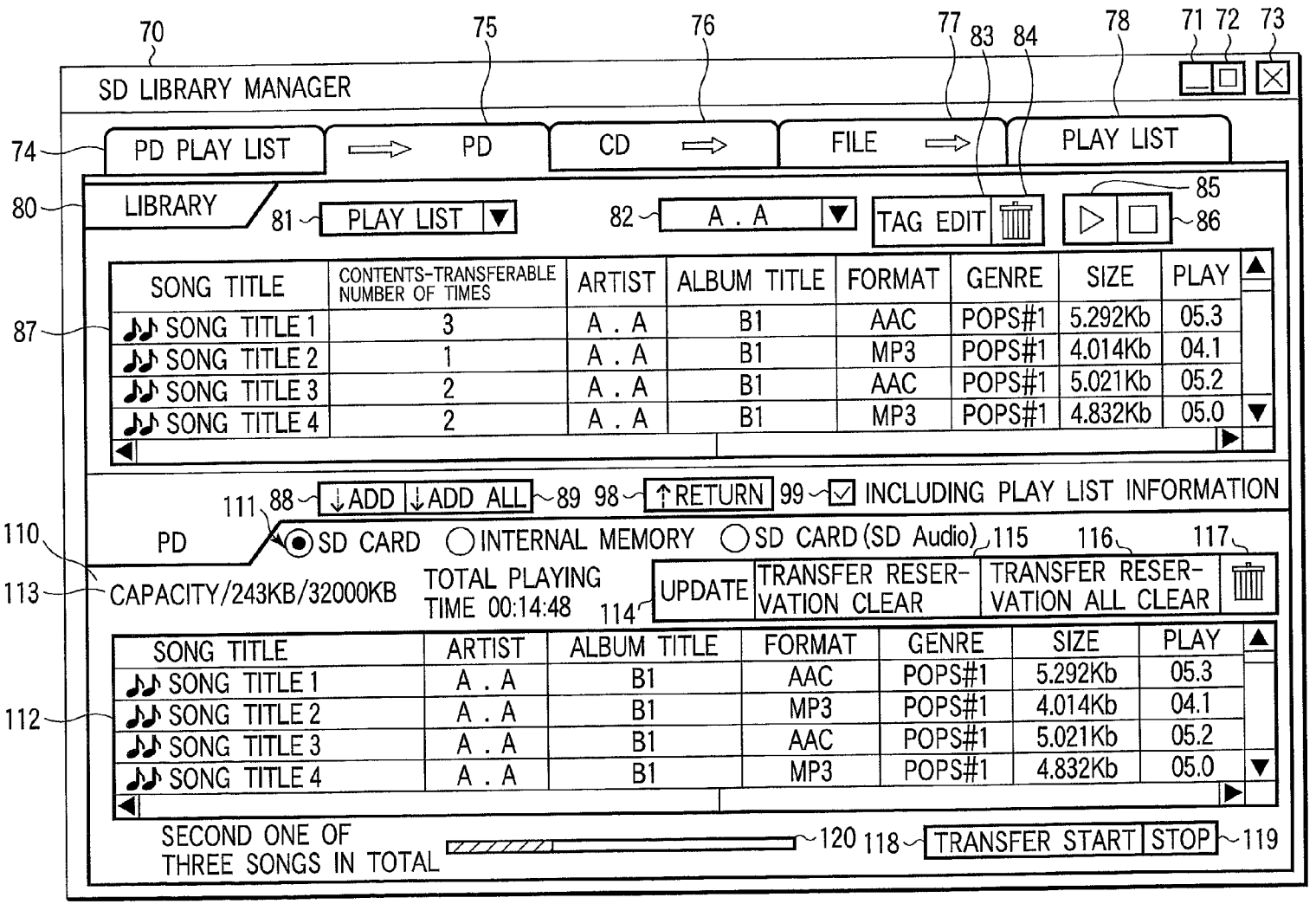

70
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71 72 73
SD LIBRARY MANAGER
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PD PLAY LIST
PD
CD
FILE
PLAY LIST
80
LIBRARY
81
PLAY LIST
82
A . A
TAG EDIT
85
86
SONG TITLE
CONTENTS-TRANSFERABLE NUMBER OF TIMES
ARTIST
ALBUM TITLE
FORMAT
GENRE
SIZE
PLAY
87
SONG TITLE 1 3 A . A B1 AAC POPS#1 5.292Kb 05.3
SONG TITLE 2 1 A . A B1 MP3 POPS#1 4.014Kb 04.1
SONG TITLE 3 2 A . A B1 AAC POPS#1 5.021Kb 05.2
SONG TITLE 4 2 A . A B1 MP3 POPS#1 4.832Kb 05.0
111
88
↓ADD
↓ADD ALL
89
98
↑RETURN
99
INCLUDING PLAY LIST INFORMATION
PD
SD CARD
INTERNAL MEMORY
SD CARD (SD Audio)
115
116
117
110
113
CAPACITY/243KB/32000KB
TOTAL PLAYING TIME 00:14:48
114
UPDATE
TRANSFER RESERVATION CLEAR
TRANSFER RESERVATION ALL CLEAR
SONG TITLE
ARTIST
ALBUM TITLE
FORMAT
GENRE
SIZE
PLAY
112
SONG TITLE 1 A . A B1 AAC POPS#1 5.292Kb 05.3
SONG TITLE 2 A . A B1 MP3 POPS#1 4.014Kb 04.1
SONG TITLE 3 A . A B1 AAC POPS#1 5.021Kb 05.2
SONG TITLE 4 A . A B1 MP3 POPS#1 4.832Kb 05.0
SECOND ONE OF THREE SONGS IN TOTAL
120
118
TRANSFER START
STOP
119

FIG. 14

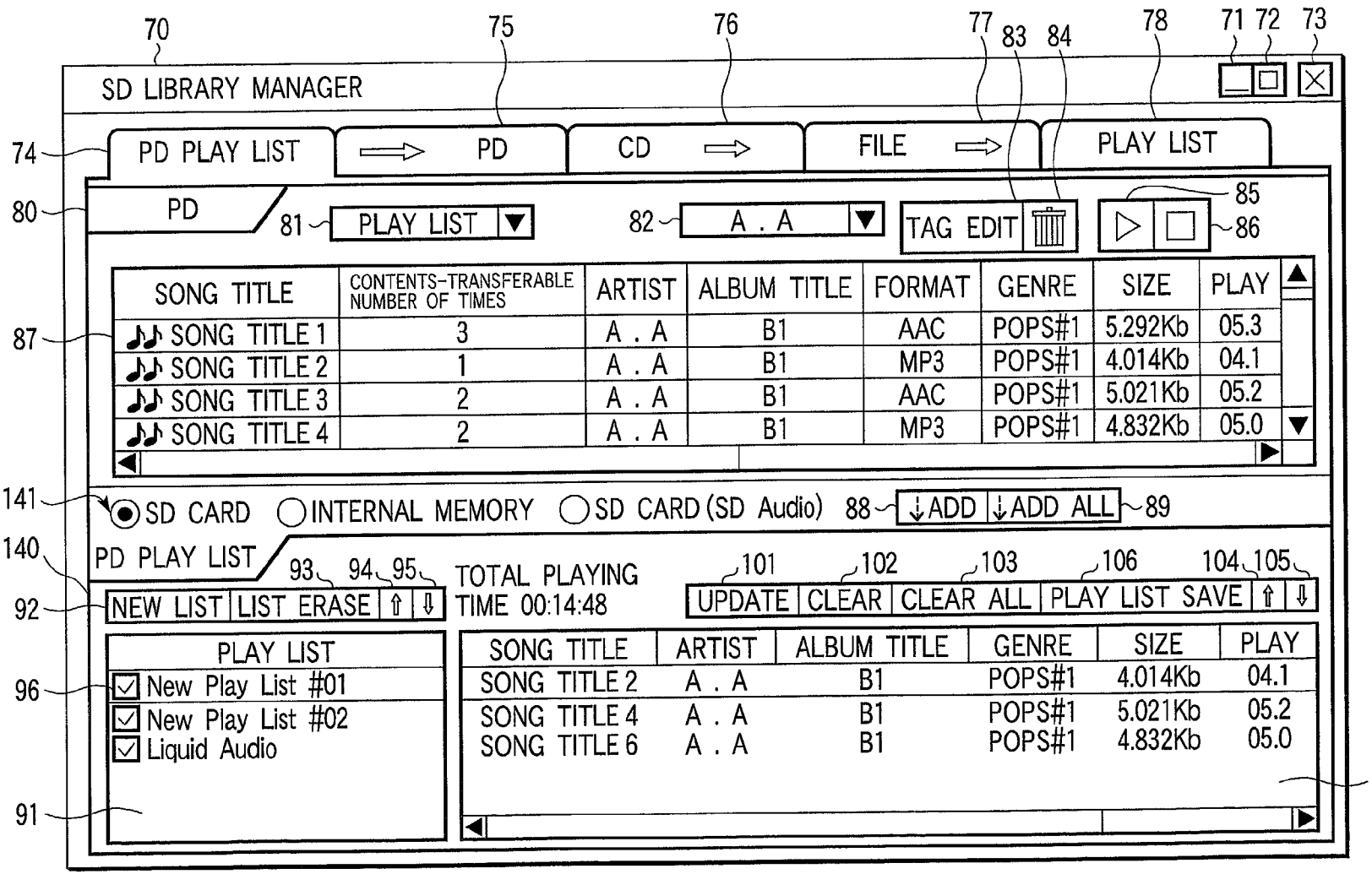

70
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84
78
71
72
73
SD LIBRARY MANAGER
74
PD PLAY LIST
PD
CD
FILE
PLAY LIST
80
PD
81
PLAY LIST
82
A . A
TAG EDIT
85
86
SONG TITLE
CONTENTS-TRANSFERABLE NUMBER OF TIMES
ARTIST
ALBUM TITLE
FORMAT
GENRE
SIZE
PLAY
87
SONG TITLE 1 3 A . A B1 AAC POPS#1 5.292Kb 05.3
SONG TITLE 2 1 A . A B1 MP3 POPS#1 4.014Kb 04.1
SONG TITLE 3 2 A . A B1 AAC POPS#1 5.021Kb 05.2
SONG TITLE 4 2 A . A B1 MP3 POPS#1 4.832Kb 05.0
141
SD CARD
INTERNAL MEMORY
SD CARD (SD Audio)
88
ADD
ADD ALL
89
140
PD PLAY LIST
93
94
95
92
NEW LIST
LIST ERASE
TOTAL PLAYING TIME 00:14:48
101
102
103
106
104
105
UPDATE
CLEAR
CLEAR ALL
PLAY LIST SAVE
PLAY LIST
96
New Play List #01
New Play List #02
Liquid Audio
SONG TITLE
ARTIST
ALBUM TITLE
GENRE
SIZE
PLAY
SONG TITLE 2 A . A B1 POPS#1 4.014Kb 04.1
SONG TITLE 4 A . A B1 POPS#1 5.021Kb 05.2
SONG TITLE 6 A . A B1 POPS#1 4.832Kb 05.0
100
91

FIG. 15

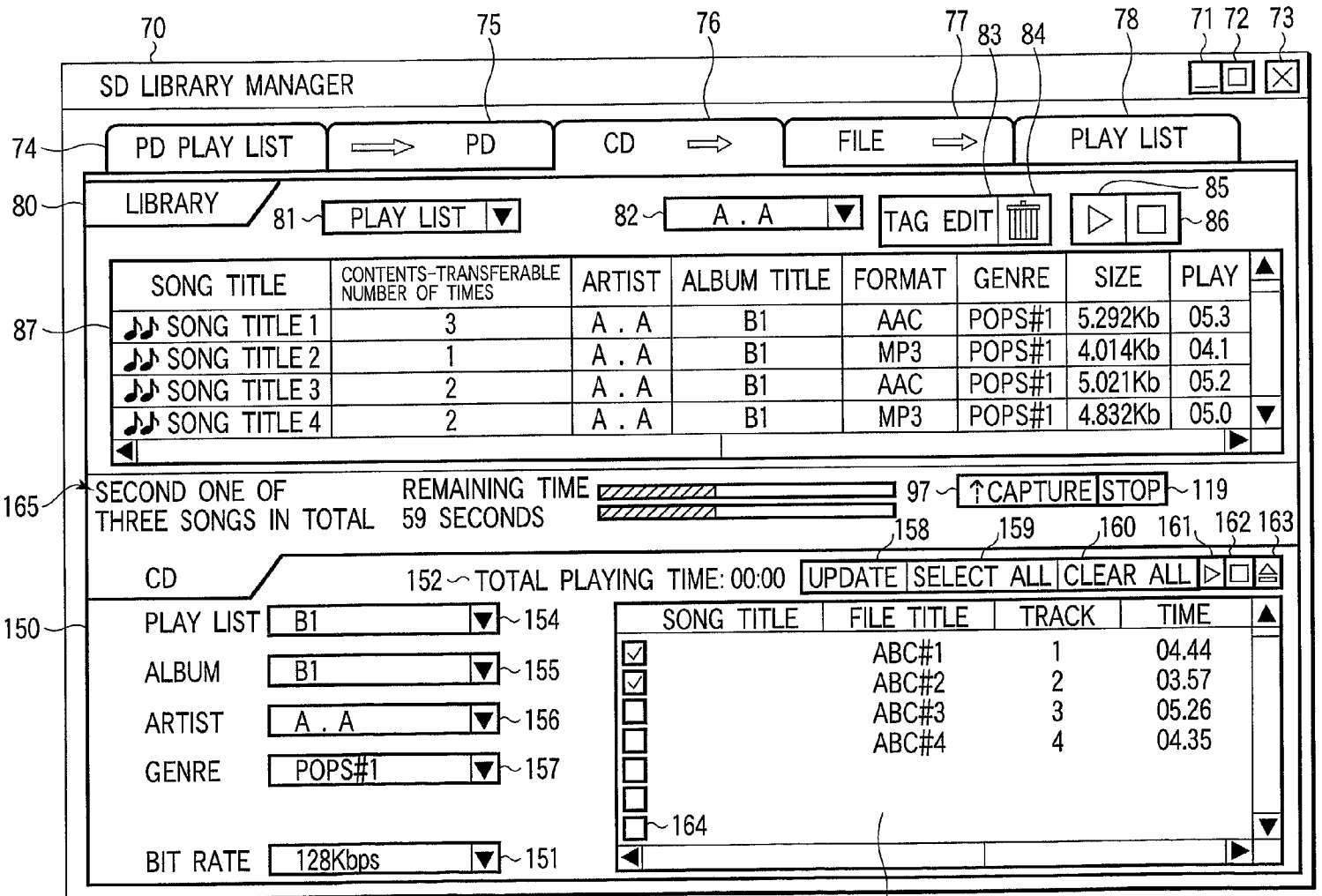

70
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72
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SD LIBRARY MANAGER
74
PD PLAY LIST
PD
CD
FILE
PLAY LIST
80
LIBRARY
81
PLAY LIST
82
A . A
TAG EDIT
85
86
87
SONG TITLE
CONTENTS-TRANSFERABLE NUMBER OF TIMES
ARTIST
ALBUM TITLE
FORMAT
GENRE
SIZE
PLAY
SONG TITLE 1 3 A . A B1 AAC POPS#1 5.292Kb 05.3
SONG TITLE 2 1 A . A B1 MP3 POPS#1 4.014Kb 04.1
SONG TITLE 3 2 A . A B1 AAC POPS#1 5.021Kb 05.2
SONG TITLE 4 2 A . A B1 MP3 POPS#1 4.832Kb 05.0
165
SECOND ONE OF THREE SONGS IN TOTAL
REMAINING TIME 59 SECONDS
97
↑CAPTURE
STOP
119
158
159
160
161
162
163
CD
152
TOTAL PLAYING TIME: 00:00
UPDATE
SELECT ALL
CLEAR ALL
150
PLAY LIST B1 154
ALBUM B1 155
ARTIST A . A 156
GENRE POPS#1 157
BIT RATE 128Kbps 151
SONG TITLE
FILE TITLE
TRACK
TIME
ABC#1 1 04.44
ABC#2 2 03.57
ABC#3 3 05.26
ABC#4 4 04.35
164
153

FIG. 16

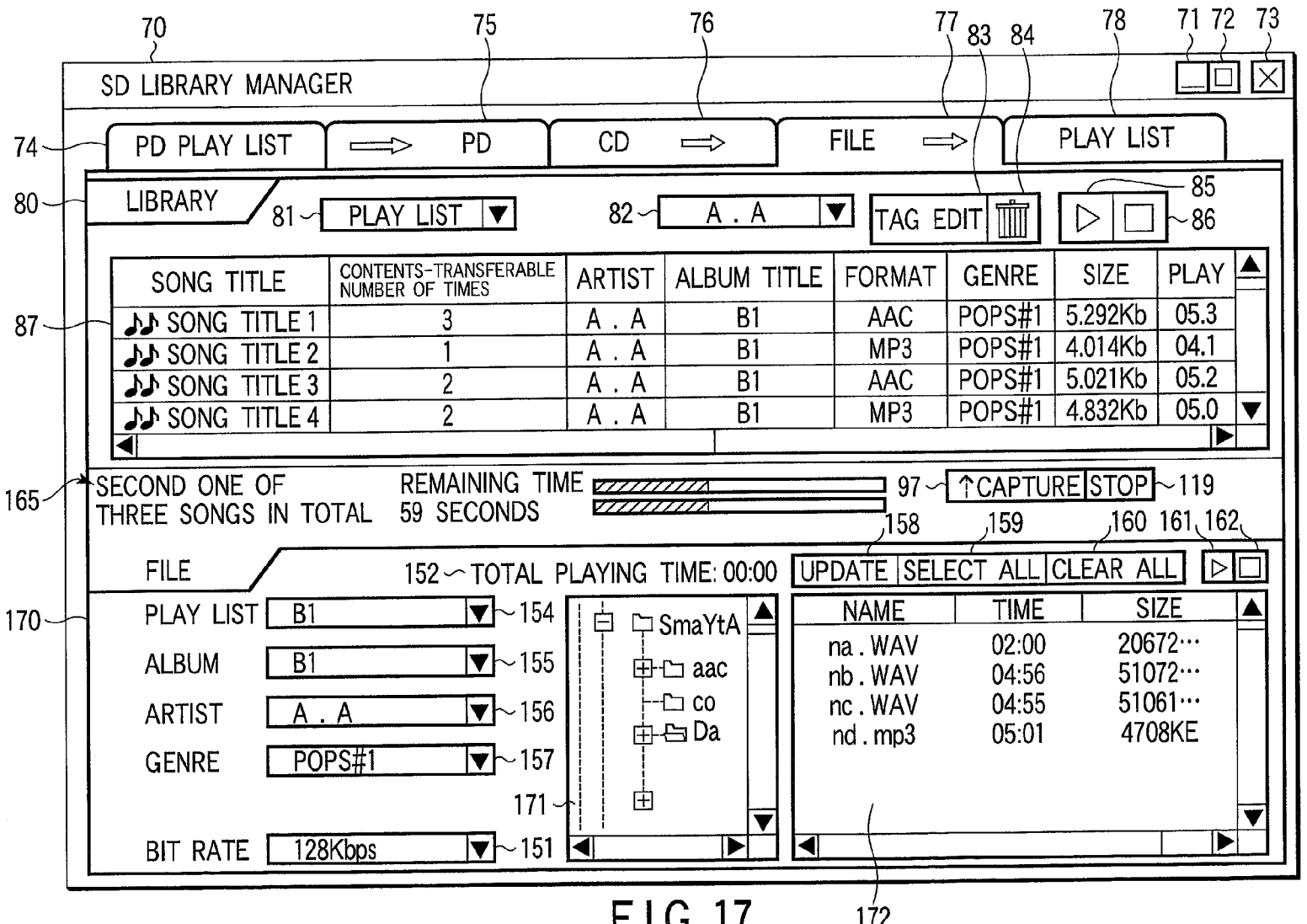

70
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72
73
SD LIBRARY MANAGER
74
PD PLAY LIST
PD
CD
FILE
PLAY LIST
80
LIBRARY
81
PLAY LIST
82
A . A
TAG EDIT
85
86
SONG TITLE
CONTENTS-TRANSFERABLE NUMBER OF TIMES
ARTIST
ALBUM TITLE
FORMAT
GENRE
SIZE
PLAY
87
SONG TITLE 1 3 A . A B1 AAC POPS#1 5.292Kb 05.3
SONG TITLE 2 1 A . A B1 MP3 POPS#1 4.014Kb 04.1
SONG TITLE 3 2 A . A B1 AAC POPS#1 5.021Kb 05.2
SONG TITLE 4 2 A . A B1 MP3 POPS#1 4.832Kb 05.0
165
SECOND ONE OF THREE SONGS IN TOTAL
REMAINING TIME 59 SECONDS
97
CAPTURE
STOP
119
158
159
160
161
162
FILE
152
TOTAL PLAYING TIME: 00:00
UPDATE
SELECT ALL
CLEAR ALL
170
PLAY LIST
B1
154
ALBUM
B1
155
ARTIST
A . A
156
GENRE
POPS#1
157
171
BIT RATE
128Kbps
151
SmaYtA
aac
co
Da
NAME
TIME
SIZE
na . WAV 02:00 20672…
nb . WAV 04:56 51072…
nc . WAV 04:55 51061…
nd . mp3 05:01 4708KE
172

FIG. 17

APPARATUS AND METHOD FOR MANAGING CONTENTS IN A COMPUTER

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is based upon and claims the benefit of priority from the prior Japanese Patent Application No. 2000-017218, filed Jan. 26, 2000, the entire contents of which are incorporated herein by reference.

BACKGROUND OF THE INVENTION

[0002] The present invention relates to a contents management apparatus and contents management method in a computer having a function of managing the number of duplicated contents of music, movies or the like, which can be stored in a storage medium.

[0003] Conventionally, the copy of contents (copyrighted materials) of music, movies and the like, which can be stored in a storage medium, has been managed. A balance has been considered between the protection of copyright and the convenience of use by managing the generation of copy and the number of copies.

[0004] Recently, the concept of "move" has emerged instead of copy management. While no original data is erased in the copy management, data is transferred to a different location (medium) and the original data is erased in the "move." The digitization of contents and the spread of networks form the background to the emergence of "move" for protection against copy.

[0005] Since a copy has recently been made faithfully to the original through a network or the like, the copyright of the original becomes difficult to protect only by the copy management. Furthermore, no copyright can be managed by an unlimited move from medium to medium, e.g., the for-profit distribution of data (by move).

[0006] It is thus difficult to reliably management the duplication of the original data, especially the contents to be protected by copyright.

BRIEF SUMMARY OF THE INVENTION

[0007] The present invention has been developed in order to resolve the above problems. It is accordingly an object of the present invention to provide a contents management apparatus and contents management method in a computer, which allows contents to be easily written to a storage medium and read therefrom and managements the number of duplicate contents to be recorded on the storage medium to limit the duplication of contents and thus protect the contents by copyright.

[0008] In order to attain the above object, a first aspect of the present invention provides a contents management apparatus in a computer for managing the number of times contents are transferred between the computer and a recording and reproduction device, the contents management apparatus comprising:

[0009] management screen display means for displaying on a display section of the computer a library management screen of contents and a device management screen for managing contents of a device; and

[0010] contents management means for displaying the contents-transferable number of times, which is predetermined for each content, on the library management screen, and for displaying a number obtained by subtracting a predetermined number from the contents-transferable number of times every check-out when contents are transferred from the library management screen to the device management screen, and displaying a number obtained by adding a predetermined number to the contents-transferable number of times every check-in when the contents transferred to the device management screen are returned to the library management screen.

[0011] As described above, the contents library management screen and the device management screen are displayed on the display section of the computer, and the contents-transferable number of times, which is predetermined for each content, is displayed on the library management screen. A number, which is obtained by subtracting a predetermined number from the contents-transferable number of times every check-out, is displayed, while a number, which is obtained by adding a predetermined number thereto every check-in, is displayed. The contents can thus be easily written to a device storage medium and read therefrom. Moreover, the number of duplicate contents that can be recorded on the storage medium can be managed with reliability.

[0012] A second aspect of the present invention provides a contents management apparatus in a computer for managing the number of times contents are transferred between the computer and a plurality of recording and reproduction devices, the contents management apparatus comprising:

[0013] management screen display means for displaying on a display section of the computer a library management screen for managing transfer of contents between the computer and each of the devices; and

[0014] contents screen selection means for selecting a tag corresponding to each of the devices on the library management screen and displaying a device management screen for managing the device of the selected tag to the forefront.

[0015] As described above, tags are displayed on the library management screen. If one of the tags is selected, its corresponding device management screen is displayed to the forefront. Thus, a management screen corresponding to each device can be selected easily and a process for each device can be performed rapidly.

[0016] A third aspect of the present invention provides a contents management apparatus in a computer for managing the number of times contents are transferred between the computer and a recording and reproduction device, the contents management apparatus comprising display means for displaying on a display section of the computer a library management screen of contents and a device management screen for managing contents of a device,

[0017] wherein the library management screen serves to display the number of times contents are transferable.

[0018] As described above, a library management screen having a security function and a device management screen are displayed on the display section of the computer correspondingly to each other. Therefore, even when an operator processes contents the security of which is not managed, he or she can management the security by reading those contents from the device management screen and writing them to the library management screen, with the result that the number of duplicate contents that can be recorded on a storage medium can be regulated with reliability.

[0019] A fourth aspect of the present invention provides a contents management method in a computer for managing the number of times contents are transferred between the computer and a recording and reproduction device, the contents management method comprising the steps of:

[0020] displaying on a display section of the computer a library management screen of contents and a device management screen for managing contents of a device, and displaying the contents-transferable number of times, which is predetermined for each content, on the library management screen; and

[0021] displaying a number obtained by subtracting a predetermined number from the contents-transferable number of times every check-out when contents are transferred from the library management screen to the device management screen, and displaying a number obtained by adding a predetermined number to the contents-transferable number of times every check-in when the contents transferred to the device management screen are returned to the library management screen.

[0022] According to the above contents management method, contents can easily be written to a device and read therefrom and duplicate contents, which can be recorded on a device, can reliably be managed.

[0023] Additional objects and advantages of the invention will be set forth in the description which follows, and in part will be obvious from the description, or may be learned by practice of the invention. The objects and advantages of the invention may be realized and obtained by means of the instrumentalities and combinations particularly pointed out hereinafter.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

[0024] The accompanying drawings, which are incorporated in and constitute a part of the specification, illustrate presently preferred embodiments of the invention, and together with the general description given above and the detailed description of the preferred embodiments given below, serve to explain the principles of the invention.

[0025] **FIG. 1** is a block diagram schematically showing a configuration of the overall contents management apparatus in a computer according to an embodiment of the present invention;

[0026] **FIG. 2** is a block diagram showing details of a contents assisted management system of the contents management apparatus shown in **FIG. 1**;

[0027] **FIG. 3** is a diagram showing an example of the structure of a storage region of each medium;

[0028] **FIG. 4** is a block diagram showing an example of the internal structure of a PD (recording and reproduction device);

[0029] **FIGS. 5A** to **5**C are diagrams explaining the features of three different storage mediums;

[0030] **FIGS. 6A** to **6**C are diagrams each showing a recording form of a check-in/check-out list to be stored in a secret area of the contents assisted management system;

[0031] **FIG. 7** is a diagram explaining the recording contents of a storage medium after check-in;

[0032] **FIGS. 8A** to **8**C are diagrams each showing another storage example of the check-in/check-out list to be stored in the secret area of the contents assisted management system;

[0033] **FIG. 9** is a flowchart of check-in/check-out, which shows a procedure from determination of a type of a recording medium to selection of a process corresponding to the type of the recording medium;

[0034] **FIG. 10** is a flowchart schematically showing a check-in process using a flag;

[0035] **FIGS. 11A and 11B** are diagrams each showing an example of display of a menu in an SD audio player;

[0036] **FIG. 12** is a view showing an example of display of a screen of the SD audio player in the contents assisted management system;

[0037] **FIG. 13** is a view showing a play list edit display of an SD library manager;

[0038] **FIG. 14** is a view showing a PD edit display of the SD library manager;

[0039] **FIG. 15** is a view showing a PD play list edit display of the SD library manager;

[0040] **FIG. 16** is a view showing a CD edit display of the SD library manger; and

[0041] **FIG. 17** is a view showing a file edit display of the SD library manger.

DETAILED DESCRIPTION OF THE INVENTION

[0042] Embodiments of the present invention will now be described with reference to the accompanying drawings.

[0043] **FIG. 1** is a schematic block diagram showing a configuration of the overall contents management apparatus in a computer according to one embodiment of the present invention.

[0044] In **FIG. 1**, reference numeral **1** indicates a contents assisted management system (LCM) that is constituted of a computer such as a personal computer (PC). The system **1** comprises a hard disk (HDD) **2**. Various types of application and data are stored in the disk **2**. A PD (portable device) **3** serving as a portable recording and reproduction device is connected to the system **1**. A medium (MC: memory card) **4**, such as an SD (secure digital) card, is provided detachably from the PD 3 as a memory medium. The PD 3 has a function of recording and reproducing contents on and from the medium **4**. The medium **4** contains identification information (MID) that is proper to the medium and cannot be

rewritten. A contents decryption key that depends upon the medium **4** encrypts the contents stored in the medium **4**.

[**0045**] A CD drive **5** and a file system **6** are connected to the contents assisted management system **1**. Audio data is stored in a CD (compact disc) set in the CD drive **5**. The file system **6** imports file-format audio data from outside through the WEB.

[**0046**] **FIG. 2** illustrates details of the contents assisted management system shown in **FIG. 1**. In this embodiment, music is taken as one example of contents; however, movies or game software can be taken. Further, the memory card (MC) such as an SD card is used as a medium; however, it can be replaced with other storage mediums such as a floppy disk and a DVD.

[**0047**] The contents assisted management system **1** is able to process various digital contents such as music data and image data. In this system, contents are protected and managed on the premise that the encryption and decryption of contents are managed for each of recording mediums on which the contents are to be recorded, using a medium ID of the recording medium. This aims at allowing the contents to be reproduced even when the same recording medium is used in different personal computers and electronic equipment. The contents are encrypted and recorded using a dedicated medium ID prepared for each recording medium. The management of encryption/decryption of contents using a medium ID is executed by a secure manager **11** as software dedicated thereto. The secure manager **11** is achieved as tamper-resistant software. The tamper-resistant software has a function of protecting contents against unauthorized internal analysis and tampering.

[**0048**] The secure manager **11** works with application programs **12** provided in the hard disk **2** to execute various types of process such as "recording,""reproduction,""copy" and "move" with respect to contents to be protected and managed. The secure manager **11** serves as an SD (secure digital) audio player.

[**0049**] The hard disk **2** includes a license storage section **13**, a music data storage section **14**, a secret area driver **15**, and a check-in/check-out list storage section **16**. The PD 3 is connected to the secure manager **11** through a PD I/F (interface) section **17**, as is the CD drive **5** through a CD I/F section **18**. Moreover, a user I/F section **19** and a time-out determination section **20** are connected to the secure manager **11**, as is a reception section **22** through an EMD (electronic music distribution) I/F section **21**. The reception section **22** receives encrypted contents or their licenses (a condition of use and a decryption key of the encrypted contents) from a WEB server **24** via the Internet **23**. The reception section **22** may have a reproducing function or an accounting function. The reproducing function is used for a test-listen to distributed music contents, while the accounting function is used to purchase favorite contents.

[**0050**] The music contents that a user has purchased are sent to the secure manager **11** via the EMD I/F section **21**. If necessary, the music contents are decrypted by the EMD I/F section **21** and subjected to format conversion and re-encryption. Upon receiving encrypted contents, the secure manager **11** stores them in the music data storage section **14** and stores a music data decryption key in the license storage section **13**. The secure manager **11** may have a reproducing function. The reproducing function allows the music contents managed by the secure manager **11** to be reproduced on a PC.

[**0051**] The secure manager **11** has a function of supplying contents data to the PD 3. The PD 3 can reproduce contents from the medium **4**.

[**0052**] The medium **4** has identification information (MID) that is proper to the medium and cannot be rewritten. A contents decryption key that depends upon the medium **4** encrypts the contents stored in the medium **4**. This key is encrypted by an encryption key Kp stored in the PD 3 and then recorded on the medium **4**.

[**0053**] The contents and contents decryption key in the medium **4** can be copied onto another storage medium (referred to as MCb hereinafter).

[**0054**] 1. Contents are not reproduced from the MCb correctly without using a legitimate PD 3 since only the legitimate PD 3 includes the encryption key Kp; however,

[**0055**] 2. Since the identification information MID of the medium **4** cannot be copied, the identification information MID of the MCb differs from that of the medium **4** which is the source of copy, with the result that the contents copied onto the MCb cannot be reproduced correctly. In other words, the duplicate contents recorded on the medium **4** by the secure manager **11** are inhibited from being copied to other MCs one after another and then utilized.

[**0056**] Check-in/check-out will now be described in accordance with the contents assisted management system **1** shown in **FIG. 2**.

[**0057**] The term "check-out" means that the system **1** stores contents as "parent" and copies their duplicates onto the medium **4** as "child" contents. While the "child" contents can freely be reproduced by the PD 3, no "grandchild" contents can be reproduced from the "child" contents. The number of "children" generated from the "parent" is defined as an attribute of "parent." The term "check-in" means that the system **1** writes the "child" contents of the medium **4** back to the "parent" contents or erases them (or prevents them from being used), with the result that the "parent" contents in the system **1** recover the right to make one "child." This is also called check-in at "parent."

[**0058**] Next, the check-in/check-out and the means for managing recording of contents on the medium **4** through a network will be described in the order of items presented below.

[**0059**] 1. Check-in/check-out

[**0060**] (1-1) Check-in/check-out

[**0061**] (1-2) Check-in/check-out of duplicate contents using an MC of level 2

[**0062**] (1-3) Another method of managing duplicate contents using a check-in/check-out list

[**0063**] (1-4) Reproduction of duplicate contents stored in the MC of level 2

[**0064**] (1-5) Check-in/check-out and reproduction of duplicate contents using an MC of level 1

[0065] (1-6) Check-in/check-out and reproduction of duplicate contents using an MC of level 0

[0066] 2. Means for managing recording of duplicate contents on an MC through a network

[0067] 3. Secret area (check-in/check-out)

[0068] In order to achieve check-in/check-out, the storage region of the medium **4** includes an area where neither reading nor writing is permitted by a disclosed procedure (secret area), and information necessary for decryption of contents is recorded in the secret area (see **FIG. 3**). The storage region of the contents assisted management system **1** (e.g., a secret area on the hard disk **2** that can be accessed only by an undisclosed procedure when the system **1** is constituted of a PC) includes a check-in/check-out list storage section **16**, and a check-in/check-out list, as will be described later, is stored in the section **16** (see **FIG. 3**). Furthermore, the storage region of the PD 3 includes an area that can be accessed only by an undisclosed procedure (secret area), and information necessary for decryption of contents can be recorded in the secret area (see **FIG. 3**). The area of the storage region other than the secret area, which can be accessed by a normal procedure, is called a public area.

[0069] The secret area of the contents assisted management system **1** shown in **FIG. 2** includes the secret area driver **15** and check-in/check-out list storage section **16**. The secret area driver **15** is designed to read data from the secret area after the secure manager **11** executes a secret specific procedure for accessing the check-in/check-out list storage section **16**.

[0070] As **FIG. 5C** shows, the medium **4** includes a public area **4***a*, an identification information storage section **4***b*, a secret area **4***c*, an authentication section **4***d* and a switch (SW) **4***e*. The identification information storage section **4***b* stores identification information MID that cannot be rewritten or copied from outside. The authentication section **4***d* authenticates a user whenever the user accesses the secret area **4***c*. If the user is identified as an authorized person, the switch **4***e* opens a gate such that the user can access the secret area **4***c*. There are three types of medium **4** that can be applied to the embodiment of the present invention. The type of medium **4** including both the identification information MID and secret area, as shown in **FIG. 5**C, is referred to as level 2. The type of medium **4** having not a secret area but identification information MID, as shown in **5**B, is referred to as level 1. The type of medium **4** having neither a secret area nor identification information, as shown in **5**A, is called level 0. For example, the level 0 can be distinguished from the other levels by the presence and absence of identification information MID, and the levels 1 and 2 can be distinguished from each other by the structure of identification information MID. When identification information is consecutive numeric values, if it is not smaller than a given value, the type of medium **4** is level 2.

[0071] The medium **4** will now be described taking level 2 as an example.

[0072] The medium **4** can be set in the PD3 connected to the contents assisted management system **1** or set in the system **1** directly.

[0073] **FIG. 4** illustrates an example of the structure of the PD 3. The PD 3 comprises a CPU **3***a*, a RAM **3***b*, a ROM **3***c*, a flash memory **3***d*, an LCM I/F (interface) section **3***e*, a medium I/F (interface) section **3***f*, a decoding section **3***g*, a decoder **3***h*, and a D/A converting section **3***i*. The medium **4** is set in the medium I/F section **3***f*. When the contents assisted management system **1** reads/writes information from/to the medium **4** through the PD 3, it accesses a secret area of the medium **4** via a secret area access section of the PD 3. The medium I/F section **3***f* includes a secret area access section for accessing the secret area of the medium **4**. The secret area of the PD 3 can be formed in the flash memory **3***d*. The ROM **3***c* stores programs for authentication between the ROM **3***c* and the medium **4** and for distinguishing the types of medium **4**. In accordance with these programs, the authentication and distinction are executed under the management of the CPU **3***a*.

[0074] Next, the check-in/check-out list stored in the secret area of the contents assisted management system **1** will be described.

[0075] All music contents held in the secure manager **11** have a contents ID (TID), which is identification information for identifying the respective contents, a predetermined number of contents to be duplicated or the remaining number of "children," and a check-out list as attribute information. This attribute information is called a check-in/check-out list. The check-in/check-out list is recorded in the check-in/check-out list storage section **16** in the secret area as shown in **FIG. 6A**.

[0076] In **FIG. 6**A, the remaining number of "children" for contents ID "TID1" is 2 and the check-out list thereof is L1.

[0077] The check-out list is a list of identification information of the medium **4** on which duplicate contents (children) are recorded. As is seen from **FIG. 6**A, "child" contents of contents ID "TID1" are check out at two mediums **4** having identification information of m1 and m2 in the check-out list L1.

[0078] As shown in the flowchart in **FIG. 9**, when the medium **4** is set in the PD 3, mutual authentication is performed between them (step **S1**). When each of two parties determines that the other is legitimate (step **S2**), the PD 3 determines the type of medium **4** based on identification information MID read by the medium **4** (step **S3**).

[0079] When the type of medium **4** is level 0, a process of level 0 is performed (step **S4**). When the type is level 1, a process of level 1 is done (step **S5**).

[0080] Since the type of medium **4** is level 2, the PD 3 executes a check-in/check-out process according to the type (step **S6**).

[0081] As **FIG. 6B** shows, the secure manager **11** subtracts "1" from the remaining number n of children of contents of contents ID "TID1" to which a check-out request was made, and adds identification information "m0" of the medium **4** to the check-out list L1.

[0082] The storage contents of the medium **4**, which is obtained when the above process is completed, are illustrated in **FIG. 7**.

[0083] **FIG. 6C** illustrates the status of the check-in/check-out list when a check-in process is executed. In the check-in process, the secure manager **11** adds "1" to the

remaining number n of children of contents of contents ID "TID1" to which a check-in request was made, and deletes identification information "m0" of the medium **4** from the check-out list L1.

[**0084**] A case where each of contents has a check-out attribute flag f such that a copyright holder can management a check-in at another contents assisted management system **1**, will now be described.

[**0085**] **FIG. 8A** shows a format of the check-in/check-out list included in the contents assisted management system **1** in the above case.

[**0086**] As shown in **FIG. 8A, a** contents ID, the remaining number of children, a check-out list, and a check-out attribute flag f are registered in the check-in/checkout list of each content.

[**0087**] When the flag f is "1," the contents can check out and check in at another contents assisted management system **1**. When the flag f is "0," the contents cannot at least check in at another contents assisted management system **1**.

[**0088**] Let us consider that the contents of contents ID "TID6" check out. First, the secure manager **11** checks the check-in/check-out list to confirm that the checkout attribute flag of the contents is "1." When the flag is "0," the contents do not check out at this contents assisted management system **1**. When the flag is "1," the secure manager **11** subtracts "1" from the remaining number of children in the check-in/check-out list of contents ID "TID6" so that the number of remaining children is now "1" (see **FIG. 8B**). The check-out list L**6** is empty (indicated by symbol ϕ) and the flag f is "1." The contents can check in at the contents assisted management system **1** provided on another PC. No check-out list is therefore required. The flag f is recorded in the secret area of the medium **4** together with random numbers r.

[**0089**] A case of check-in at a contents assisted management system which is the same as or different from the contents assisted management system **1** at which the contents of contents ID "TID6" checks out, will now be described with reference to the flowchart shown in **FIG. 10**.

[**0090**] Authentication is performed between the medium **4** and the contents assisted management system **1** (step S**11**). Identification information MID is acquired from the medium **4** (step S**12**).

[**0091**] The secure manager **11** executes the foregoing procedure for the secret area **4***c* of the medium **4** (the legitimacy of both is confirmed by the mutual authentication and the switch **4***e* opens a gate to the secret area **4***c*) irrespective of whether the contents to which a check-in request was made are listed on the check-in/check-out list, and reads a flag f out of the secret area **4***c* (step S**13**). When the flag f is 1 (step S**14**), data is deleted from the secret area and the public area (step S**15**), a folder is deleted (step S**16**), and the check-in/check-out list is updated (step S**17**). When the flag f is 0, the process ends. Finally, when the contents are not registered on the check-in/checkout list, a new check-in/check-out list (TID6, 1, ϕ, 1) in which the remaining number of children of the contents is "1" is registered. When the contents are registered on the check-in/check-out list, "1" is added to the remaining number of children of the contents (step S**17**).

[**0092**] A process operation of the contents assisted management system **1** will now be described specifically. When the secure manager **11** of the system **1** starts, an SD audio player **30** is displayed on the screen of a display device (not shown) of the system **1**, as illustrated in **FIG. 12**. The display screen of the SD audio player **30** includes a player window **31** and a play list window **32**.

[**0093**] The player window **31** has a playback state display window **40** in its central part. The window displays a song title, a play list, an artist, a playback position (time), a sampling frequency, a bit rate, a format type, a special playback mode, and the like. Above the playback state display window **40**, there are a minimization button **41** for holding a program in a task bar, an exit button **42** for exiting a program, a menu button **43** for displaying a menu, a manager window display button **44** for turning on/off a management window, a play list display button **45** for turning on/off the play list window **32**, and a help button **46**.

[**0094**] When the menu button **43** is pressed or clicked by a mouse, a main menu is displayed as shown in **FIG. 11A**. The main menu contains "Import from Audio CD . . . ,""Import from File . . . ,""Transfer to PD . . . ,""Play List Edit . . . ,""Play List Edit of PD . . . ,""Display >,""Option . . . ,""Help,""Version Information,""Exit" and the like. When a cursor moves to the position of "Display >" in the above menu, a display menu containing "minimization,""Play List Display" and "Manager Display" is displayed. In this case, a check area is added to the head of each of "Play List Display" and "Manager Display."

[**0095**] The "minimization" aims at holding the current state in a task bar as it is. The "Play List Display" aims at displaying the play list window **32** when a check mark is present and closing it when a check mark is absent. The "Manager Display" aims at displaying the management window when a check mark is present and closing it when a check mark is absent.

[**0096**] A playback mode designation button group **47** is provided under the playback state display window **40**. The group **47** contains buttons for selecting a special playback mode from among REPEAT, RANDOM and INTRO, an OFF button for clearing the selected special playback mode, and a volume slider bar **48** for adjusting the volume of sound when music data is reproduced.

[**0097**] Whenever a user clicks the REPEAT button of the group **47**, he or she selects one from among the modes of REPEAT, REPEAT ALL and REPEAT PLAY LIST. The REPEAT means playing back a designated tune over and over again. The REPEAT ALL means playing back from the current tune to the last tune through a play list, returning to the first tune of a first play list, and continuing the playback again. This playback continues until a user gives an instruction. The REPEAT PLAY LIST means continuing a playback of all tunes in a play list until an instruction to stop the playback is provided.

[**0098**] When a user clicks the RANDOM button, he or she can switch between RANDOM PLAY LIST and RANDOM ALL. The RANDOM PLAY LIST is a mode for randomly playing back tunes in a play list. The RANDOM ALL is a mode for randomly playing back tunes of all play lists. Clicking the INTRO button, the user can select an intro playback and, in this case, the beginning of each of tunes of

all play lists is reproduced for five seconds. The volume slider bar **48** is used to adjust the volume of sound when music data is reproduced.

[**0099**] Under the playback mode designation button group **47** and the volume slider bar **48**, there are a play list move (forward) button **51**, a backward skip button **52**, a fast-rewind button **53**, a stop button **54**, a play button **55**, a pause button **56**, a fast-forward button **57**, a forward skip button **58**, and a play list move (backward) button **59**.

[**0100**] The play button **55** is used to reproduce contents. When the player stops, the button **55** allows the currently-selected contents to be reproduced from the beginning. When the player pauses, the button **55** continues a playback of contents. In a fast-forward/fast-rewind mode, the button **55** restores it to a normal play mode. When a user selects one of tunes in a play list, the button **55** reproduces the selected tune. If there is another tune in the play list, then it is reproduced. When a playback of the last tune in the play list is completed, a first tune in the next play list is reproduced.

[**0101**] When any one of the REPEAT, PLAY LIST REPEAT, REPEAT ALL, RANDOM PLAY LIST, RANDOM ALL and INTRO is selected, a playback is performed in accordance with the selected mode.

[**0102**] The play list move (backward) button **59** aims at moving between play lists. During the playback, the button **59** produces a first tune in the next play list. During the halt of the player, the button **59** only displays information of a first tune in the next play list and does not reproduce it. The button **59** does not operate during the reproduction or selection of the last play list.

[**0103**] The play list move (forward) button **51** aims at moving between play lists. During the playback, the button **51** produces a first tune in the preceding play list. During the halt of the player, the button **51** only displays information of a first tune in the preceding play list and does not reproduce it. The button **51** does not operate during the reproduction or selection of the last play list.

[**0104**] The stop button **54** stops each of playback, fast-forward/fast-rewind, and pause operations to stop the SD audio player.

[**0105**] The pause button **56** stops each of playback and fast-forward/fast-rewind operations to stop the SD audio player.

[**0106**] The fast-forward button **57** shifts an operation from each of playback and pause operations to a fast-forward operation. This button cannot be used when the player stops.

[**0107**] The fast-rewind button **53** shifts an operation from each of playback and pause operations to a fast-rewind operation. This button cannot be used when the player stops, either.

[**0108**] The forward skip button **58** reproduces the next tune from the beginning in play mode.

[**0109**] The backward skip button **52** reproduces the preceding tune from the beginning in play mode.

[**0110**] The play list window **32** is designed to display a play list and select and reproduce a tune from the play list. The window **32** has an exit button **61** in its upper right end portion. In the row under the exit button **61**, the window **32** includes an ALL music/play list radio button **62**, a playback state display window **63**, an ALL display light **64**, and a LIST display light **65**. The window **32** also has a play list component box **66** thereunder.

[**0111**] The ALL music/play list radio button **62** allows "ALL" or "PLAY LIST" to be selected as a method of displaying contents. After the player starts, the LIST display light **65** corresponding to the "PLAY LIST" is selected. When the "ALL" is selected, the play list component box **66** is impossible to operate.

[**0112**] The play list component box **66** is effective only when "PLAY LIST" is selected by the radio button **62**. If "ALL" is selected, the box **66** displays the titles of all songs registered in a library in alphabetical order as a contents list. When "PLAY LIST" is selected, the box **66** displays songs of the selected play list in playback order. In either case, if a user double-clicks a song by a mouse or the like, the song is considered to be the current one and displayed on the reproduction state display window **63**. The subsequent reproduction is performed in the same manner as the normal reproduction of the play list. After all songs of the same play list are reproduced, the reproduction moves to the next play list. However, when "ALL" is selected, only one song is reproduced and the player stops. In random reproduction, the song is considered to be a first one and then the other songs are reproduced randomly.

[**0113**] The currently-reproduced song is displayed on the play list component box **66**. A user can thus know the reproduction position visually.

[**0114**] The management window, which is displayed by the menu button **43** or the manager window display button **44** in the player window **31**, will now be described.

[**0115**] [Play List Edit]

[**0116**] **FIG. 13** shows an example of a display screen of an SD library manager in the play list edit mode of the management window **70**. The management window **70** includes a minimization button **71**, a maximization button **72** and an exit button **73** for exiting a program in its upper right end portion. The window **70** also includes a library display section **80** in its central part. The section **80** is designed to display a library for each library storing song data, and a tag is stuck to the device. As the tag, there can be provided a PD play list tag **74** for displaying a play list edit screen of the PD 3, a PD tag **75** for displaying an edit screen of the PD 3, a CD tag **76** for displaying an edit screen of a CD, a file tag **77** for displaying an edit screen of a song in file format, and a play list tag **78** for displaying an edit screen of a play list. By clicking these tags **74** to **78**, their corresponding edit screens are displayed.

[**0117**] When a user clicks the play list tag **78**, data is read out of the music data storage section **14** of the hard disk **2** and the edit screen of the play list is displayed as shown in **FIG. 13**.

[**0118**] The management window **70** includes a play list display section **90** in addition to the library display section **80** on the play list edit screen. The section **80** has a retrieval condition setting section **81**, a retrieval key setting section **82**, a tag edit button **83**, an erase button **84**, a play button **85**, a stop button **86**, and a library list display section **87**. An add button **88** and an add-all button **89** are provided under the section **87**.

[0119] The above retrieval condition setting section **81** is capable of retrieval from an artist, an album and a play list. If a user chooses a condition for retrieval by the section **81** and chooses a retrieval key by the section **82**, the music data storage section **14** is searched for desired contents, and only the contents are listed on the library list display section **87**. The display section **87** displays music data read from the music data storage section **14** or an icon, the contents-transferable number of times (the number of times the contents can be copied), a song title, an artist, an album title, a format, a genre, a file size, performance time, etc.

[0120] The uppermost song of the currently-selected contents can be managed by the play button **85** and stop button **86**. During the play of the song, the player window **31**, shown in **FIG. 12**, displays information of the song.

[0121] The erase button **84** allows contents to be erased in the display except the play list display, but it cannot be used in the play list display. When a user clicks the erase button **84**, a warning dialog such as "Are you sure? The erased song cannot be restored." is displayed. If the user certainly wishes to erase the currently-selected contents, they are erased. The tag edit button **83** reads a tug edit screen (not shown) to edit tug information such as an audio type, a bit rate, a copyright, a song title, an artist name, an album title, a composer, a lyric writer, lyrics, and a genre.

[0122] The play list display section **90** includes a play list box **91** and a contents list display section **100**. The display section **90** also includes a new list button **92**, a list delete button **93**, a play list up button **94**, and a play list down button **95**, which correspond to the play list box **91**. The new list button **92** prepares a new play list called "New Play List #01" (the number increases) and displays and edits a confirmation dialog of a play list name. The list delete button **93** erases the currently-displayed play list after the confirmation dialog is displayed. The play list up button **94** and play list down button **95** moves the play order of a selected play list up and down. The order can also be moved by a mouse in the list.

[0123] In the play list box **91**, a play list can be chosen from a retrieval directory. A check box **96** is displayed at the head of the play list in order to confirm whether the play list is to be played or not. Only the checked play list is played on the player window **31**. If a user edits a chosen play list and chooses another play list without storing the former, the play list box **92** displays a play list close dialog and asks the user whether he or she wishes to store it. The same operation is performed while a new play list is being edited. The name of a play list can be edited by clicking a mouse.

[0124] The play list display section **90** includes an update button **101**, a clear button **102**, an all-clear button **103**, a play list save button **106**, a contents up button **104**, and a contents down button **105**, which correspond to the contents list display section **100**. The update button **101** inquires the current status of the music data storage section **14** again to display the current status. The clear button **102** clears the selected contents, while the all-clear button **103** clears all contents displayed on the contents list display section **100**. No dialogue is displayed to confirm whether the contents are cleared or not. The contents up button **104** and contents down button **105** moves the play order of selected contents up and down. The order can also be moved by a mouse in the list. The play list save button **106** catalogues an edit content in the currently-edited play list.

[0125] On the play list edit screen shown in **FIG. 13, a** user selects contents from the library list display section **87** and clicks the add button **88**. Thus, the selected contents are added to the play list selected in the play list box **91** and displayed on the contents list display section **100**. If the user edits the play list as described above and then clicks the play list save button **106**, the play list displayed on the play list display section **90** is saved in the music data storage section **14**. On the above play list edit screen, a play list can be prepared to arrange song data stored in the music data storage section **14** and the song data can be moved to the play list.

[0126] [PD Edit]

[0127] When a user clicks the PD tug **75** on the management window **70** illustrated in **FIG. 13**, the window switches to the PD edit screen shown in **FIG. 14**. The PD edit screen includes a library display section **80** and a PD display section **110**, and designates a song to be moved to the medium **4** such as an SD card set in the PD 3 and gives an instruction to transfer the song.

[0128] The library display section **80** has substantially the same structure as that of the library display section of the play list edit. However, the section **80** of the PD edit has in its lower part a return button **98** and a check box **99** containing play list information in addition to the add button **88** and the add-all button **89**.

[0129] The add button **88** registers the current library or the contents selected by the library list display section **87** in the list as a candidate to be transferred to the PD 3. The add-all button **89** registers all contents, which are currently displayed on the display section **87**, in the list as a candidate to be transferred to the PD 3. The return button **98** is used to return the contents selected by a PD contents list display section **112** to the library. The check box **99** containing play list information is operable when the library retrieval conditions are effective in the play list, and becomes gray and inoperable at the other times. If a transfer candidate is added when a play list is checked, the currently-displayed play list can also be transferred to the PD3.

[0130] The PD display section **110** includes a medium select section **111** and a PD contents list display section **112**. The medium select section **111** allows a destination medium to be selected from among an SD card, an internal memory and an SD audio card. When the SD audio card is selected, only the file in AAC format can be transferred thereto. The PD display section **110** also includes a capacity display section **113**, an update button **114**, a transfer reservation clear button **115**, a transfer reservation all-clear button **116**, and an erase button **117** above the PD contents list display section **112**. The capacity display section **113** displays a file capacity/a total medium capacity of selected contents.

[0131] The update button **114** inquires the current status from the PD 3 again and displays it. The transfer reservation clear button **115** clears contents, which are selected as a candidate to be transferred, from the list, but the contents themselves are left. The transfer reservation all-clear button **116** clears all contents, which are selected as candidates to be transferred, from the list, but the contents themselves are left. The erase button **117** is used to erase the selected contents after it confirms that a user wishes to erase them.

[0132] The PD display section **110** includes a progress status display section **120** as well as a transfer start button

118 and a stop button **119** under the PD contents list display section **112**. The transfer start button **118** is used to actually transfer the contents, which are selected and displayed in gray on the PD contents list display section **112**, to the PD 3. The transfer of the contents is stopped when a play list is transferred. The stop button **119** is effective only during the transfer of contents and used to stop the transfer. When the transfer is stopped, the contents that have been already transferred are registered as they are, but no files are created for the contents suspended during the transfer thereof. The progress status display section **120** displays the progress status of transfer on a progress bar that indicates how many songs have been transferred.

[**0133**] When a user clicks the add button **88** or add-all button **89** to add the contents displayed on the library list display section **87** to the PD contents list display section **112** on the PD display screen described above, the contents-transferable number of times displayed on the list of the section **87** is decreased by one through the foregoing check-out process. When the largest contents-transferable number of times is four, "3" is displayed first as the number and then "2", "1" and "0" are displayed in that order because the number is decreased by one every time contents are transferred.

[**0134**] Conversely, when a user clicks the return button **98** to return the contents displayed on the PD contents list display section **112** to the library list display section **87**, the contents-transferable number of times is increased by one through the check-in process described above.

[**0135**] [PD play list edit]

[**0136**] When a user clicks the PD play list tag **74** on the display screen of the library manger described above, the display screen is switched to the PD play list display screen shown in **FIG. 15**. The PD play list display screen includes a PD library display section **130** and a PD play list display section **140**. Like the library display section **80**, the PD library display section **130** has a retrieval condition setting section **81**, a retrieval key setting section **82**, a tag edit button **83**, an erase button **84**, a play button **85**, a stop button **86**, and a library list display section **87**. An add button **88** and an add-all button **89** are provided under a component box **137**.

[**0137**] The PD play list display section **140** includes a medium select section **141** and, like the play list display section **90** shown in **FIG. 13**, it also includes a play list box **91** and a contents list display section **100**. The medium select section **141** allows a user to select a medium to be edited from among an SD card, an internal memory, and an SD audio card. However, a play list cannot be created bridging all of these mediums. Only the contents of the selected medium are displayed on the PD library display section **130** and PD play list display section **140**.

[**0138**] The PD play list display section **140** also includes a new list button **92**, a list delete button **93**, a play list up button **94**, and a play list down button **95**, which correspond to the play list box **91**.

[**0139**] The display section **140** also includes an update button **101**, a clear button **102**, an all-clear button **103**, a play list save button **106**, a contents up button **104**, and a contents down button **105**, which correspond to the contents list display section **100**.

[**0140**] When a user selects any one of the SD card, internal memory and SD audio card by the medium select section **141** on the display screen of the above PD play list, the recording contents of the selected medium are read out and displayed on the PD library display section **130** and PD play list display section **140**. The user can create a new play list (#1 . . .) by clicking the new list button **92** of the section **140** on the above display screen and add an arbitrary song, which is selected from the library list display section **87**, to the new play list. The user can also click the list delete button **93** to delete the selected play list.

[**0141**] If, moreover, the user clicks the clear button **102** and all-clear button **103**, he or she can clear the selected song or all songs at once.

[**0142**] After the user edits the play list, he or she clicks the play list save button **106** to register the edited contents in the currently-edited play list.

[**0143**] [CD edit]

[**0144**] When a user clicks the CD tag **76** on the display screen of the management window **70** described above, the screen is switched to the display screen displaying song data of a CD as shown in **FIG. 16**. The CD display screen includes a library display section **80** and a CD-ROM drive display section **150**. The section **80** is the same as that of the play list edit screen illustrated in **FIG. 13**. The library display section **80** has a library list display section **87**, and both a import button **97** and a stop button **119** are provided under the section **87**. The CD display screen allows a user to only add contents to the library display section **80** from the CD by clicking the import button **97** on the CD display screen. The import button **97** thus starts to import contents of a check box **164** that is checked. The stop button **119** is effective only during the import of contents and used to stop the import operation. The contents that have been already transferred when the import is stopped, are registered as they are. No files are created for the contents suspended during the import thereof.

[**0145**] The CD-ROM drive display section **150** includes a bit rate select section **151**, a total playing time display section **152**, a progress status display section **165**, a track list display section **153**, a play list component box **154**, an album title component box **155**, an artist name component box **156**, a genre component box **157**, an update button **158**, an all-select button **159**, an all-clear button **160**, a play button **161**, a stop button **162**, and an eject button **163**.

[**0146**] The bit rate select section **151** is capable of selecting and designating one for encoding from among a plurality of bit rates. The total playing time display section **152** displays the total playing time of a selected track.

[**0147**] The track list display section **153** displays a selecting check box **164** for each track, together with a song title, a track number, playing time, and a file name. A user can fill a blank with song titles and edit them by clicking a mouse. If the user checks the check box **164**, its corresponding contents are selected as an object to be imported and the total playing time is updated.

[**0148**] The play list component box **154** allows a user to select a play list of the imported contents that the user wishes to register. The selected information is effective but inhibited from being converted during the import. A user can choose

a new play list or an existent play list from the list displayed on the play list component box **154**. If the user chooses the new one, he or she can edit a name of the play list. The play list is thus created when the import process starts.

[**0149**] A user can input an album title to be registered as tag information in the album name component box **155**. The input information is effective but inhibited from being converted during the import. Neither edit nor selection can be performed in the box **155** when the apparatus starts for the first time.

[**0150**] A user can input an artist name to be registered as tag information in the artist name component box **156**. The input information is effective but inhibited from being converted during the import.

[**0151**] A user can input a genre to be registered as tag information in the genre component box **157**. The input information is effective but inhibited from being converted during the import. In order to help user's input, a genre such as pops, rock, hard rock, classical music, jazz, fusion, new music, hip-hop, blues, and traditional-style Japanese popular songs, is registered in advance.

[**0152**] The update button **158** is used to confirm the contents of a medium since there is a case where the displayed track information and the actual audio CD information are caused to differ from each other by inserting the medium again.

[**0153**] The all-select button **159** is used to put check marks in the check boxes **164** of all tracks displayed on the track list display section **153**. The all-clear button **160** is used to remove the check marks from all tracks displayed on the track list display section **153**.

[**0154**] The play button **161** reproduces a specified track, and its reproduction information is displayed on the player window **31**. The stop button **162** stops the reproduction.

[**0155**] The eject button **163** opens/closes a tray of the currently-selected drive.

[**0156**] The CD-ROM drive display section **150** of the above CD display screen displays songs stored in a CD-ROM (CD disc) set in the CD drive **5** shown in **FIG. 2**. A user can thus select an arbitrary song and click the play button **161** to play the selected song. The user can also select a track list displayed on the track list display section **153** and click the import button **97** to import it into a library. The imported track list can be displayed on the library display section **80** and its corresponding song can be moved to an arbitrary medium (a file) through the above operation.

[**0157**] [File edit]

[**0158**] When a user clicks the file tag **77** on the display screen of the management window **70**, the display screen is switched to a file edit display screen as shown in **FIG. 17**. This file edit display screen displays songs in file format and is used to arrange song data, which is imported from outside via the WEB by the file system **6** shown in **FIG. 1**, and store it in a library or the music data storage section **14** of the hard disk **2**.

[**0159**] The file edit display screen includes a library display section **80** and a file select section **170**. The library display section **80** is the same as that of the CD edit shown in **FIG. 16**.

[**0160**] Like the CD-ROM drive display section **150** shown in **FIG. 16**, the file select section **170** includes a bit rate select section **151**, a total playing time display section **152**, a progress status display section **165**, a play list component box **154**, an album title component box **155**, an artist name component box **156**, a genre component box **157**, an update button **158**, an all-select button **159**, an all-clear button **160**, a play button **161**, and a stop button **162**. The functions of these elements are the same as those in the CD edit described above and thus their descriptions are omitted.

[**0161**] The file select section **170** also includes a folder display section **171** and a file list display section **172**.

[**0162**] The folder display section **171** displays folders stored in the hard disk **2**. When a user selects a folder displayed on the section **171**, the file list display section **172** displays files of the selected folder. The section **172** displays a selecting check box, a file name, a file type, playing time, and a file size for each file. When a user checks the check box, its corresponding contents are selected as an object to be imported and the total playing time is updated. In this case, it is only the files with extensions like mp3 and WAV that are listed. If these files are imported into the library, the names of the imported files are changed in the extensions.

[**0163**] In the file edit display screen, the folders stored in the music data storage section **14** of the hard disk **2** are displayed on the folder display section **171**. If a user selects one of the folders, the files in the selected one are displayed on the file list display section **172**. Checking the check box of a file displayed on the section **172** and clicking the play button **161**, the user is able to reproduce a song recorded in the file.

[**0164**] If the user also checks the check box of a file displayed on the section **172** and clicks the import button **97**, the import of the selected file starts. Since, in this case, the type of the file is displayed in the file list only by the extension, it is likely that a problem will occur in the contents of the file. If that is the case, a dialogue box is displayed to allow the user to choose "continue" or "stop" importing the file. To stop the import of the file, the user clicks the stop button **119**. Files that have been already imported when the import of the file is stopped, are registered in their current format.

[**0165**] The progress status of import of the file is displayed on the progress status display section **165**. For example, "XX songs of XXX songs completed" or "XX %" is displayed in the progress bar. Alternatively, the order of a song that is currently imported, the estimated import time, and the percentage (%) of the imported songs is displayed.

[**0166**] A file that is imported to a library in the manner described above can also be reproduced if a user selects the file and clicks the play button **85**.

[**0167**] Note that, in the above embodiment, audio data is recorded and reproduced; however, image data of movies or the like (moving images) can be recorded and reproduced.

[**0168**] As described above in detail, the present invention provides a contents management apparatus for managing the number of times contents are transferred between a computer and a recording and reproduction device. In this apparatus, the contents library management screen and the

device management screen are displayed on the display section of the computer, and the contents-transferable number of times, which is predetermined for each content, is displayed on the library management screen. A number, which is obtained by subtracting a predetermined number from the contents-transferable number of times every check-out, is displayed, while a number, which is obtained by adding a predetermined number thereto every check-in, is displayed. The contents can thus be easily written to a device storage medium and read therefrom. Moreover, the number of duplicate contents, which can be recorded on the storage medium, can reliably be managed.

[0169] In the present invention, furthermore, tags are displayed on the respective management screens of each of a plurality of devices. If one of the tags is selected, its corresponding management screen is displayed to the forefront. Therefore, a management screen corresponding to each device can be selected easily and a process for each device can be performed rapidly.

[0170] In the present invention, furthermore, a library management screen having a security function and a device management screen are displayed on the display section of the computer correspondingly to each other. Therefore, even when an operator processes contents the security of which is not managed, he or she can management the security by reading those contents from the device management screen and writing them to the library management screen, with the result that the number of duplicate contents that can be recorded on a storage medium can be regulated with reliability.

[0171] Additional advantages and modifications will readily occur to those skilled in the art. Therefore, the invention in its broader aspects is not limited to the specific details and representative embodiments shown and described herein. Accordingly, various modifications may be made without departing from the spirit or scope of the general inventive concept as defined by the appended claims and their equivalents.

What is claimed is:

1. A contents management apparatus in a computer for managing the number of times contents are transferred between the computer and a recording and reproduction device, the contents management apparatus comprising:

management screen display means for displaying on a display section of the computer a library management screen of contents and a device management screen for managing contents of a device; and

contents management means for displaying the contents-transferable number of times, which is predetermined for each content, on the library management screen, and for displaying a number obtained by subtracting a predetermined number from the contents-transferable number of times every check-out when contents are transferred from the library management screen to the device management screen, and displaying a number obtained by adding a predetermined number to the contents-transferable number of times every check-in when the contents transferred to the device management screen are returned to the library management screen.

2. The contents management apparatus according to claim 1, wherein the contents management means includes a check-out list for managing a device whose contents are checked out.

3. The contents management apparatus according to claim 2, wherein the contents management means adds a contents-transferred device to the check-out list every check-out of each content, and deletes a contents-transferring device from the check-out list every check-in of each content.

4. The contents management apparatus according to claim 2, wherein the check-out list includes a flag indicating whether a check-out is allowed for each content, and the apparatus further comprises inhibit means for inhibiting a check-out of contents when the flag indicates that the check-out is not allowed.

5. A contents management apparatus in a computer for managing the number of times contents are transferred between the computer and a plurality of recording and reproduction devices, the contents management apparatus comprising:

management screen display means for displaying on a display section of the computer a library management screen for managing transfer of contents between the computer and each of the devices; and

contents screen selection means for selecting a tag corresponding to each of the devices on the library management screen and displaying a device management screen for managing the device of the selected tag to the forefront.

6. The contents management apparatus according to claim 5, further comprising contents management means for displaying the contents-transferable number of times, which is predetermined for each content, on the library management screen, and for displaying a number obtained by subtracting a predetermined number from the contents-transferable number of times every check-out when contents are transferred from the library management screen to the device management screen, and displaying a number obtained by adding a predetermined number to the contents-transferable number of times every check-in when the contents transferred to the device management screen are returned to the library management screen.

7. The contents management apparatus according to claim 6, wherein the contents management means includes a check-out list for managing a device whose contents are checked out.

8. The contents management apparatus according to claim 7, wherein the contents management means adds a contents-transferred device to the check-out list every check-out of each content, and deletes a contents-transferring device from the check-out list every check-in of each content.

9. The contents management apparatus according to claim 7, wherein the check-out list includes a flag indicating whether a check-out is allowed for each content, and the apparatus further comprises inhibit means for inhibiting a check-out of contents when the flag indicates that the check-out is not allowed.

10. A contents management apparatus in a computer for managing the number of times contents are transferred between the computer and a recording and reproduction device, the contents management apparatus comprising display means for displaying on a display section of the

computer a library management screen of contents and a device management screen for managing contents of a device,

wherein the library management screen serves to display the number of times contents are transferable.

11. A contents management method in a computer for managing the number of times contents are transferred between the computer and a recording and reproduction device, the contents management method comprising the steps of:

displaying on a display section of the computer a library management screen of contents and a device management screen for managing contents of a device, and displaying the contents-transferable number of times, which is predetermined for each content, on the library management screen; and

displaying a number obtained by subtracting a predetermined number from the contents-transferable number of times every check-out when contents are transferred from the library management screen to the device management screen, and displaying a number obtained by adding a predetermined number to the contents-transferable number of times every check-in when the contents transferred to the device management screen are returned to the library management screen.

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