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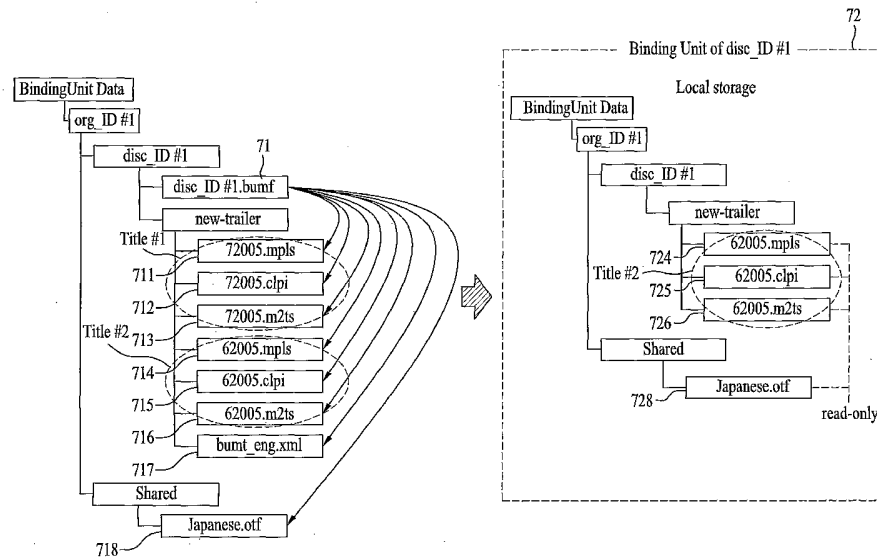
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(54) Title: METHOD AND APPARATUS FOR REPRODUCING DATA FROM RECORDING MEDIUM USING LOCAL STORAGE



(57) Abstract: An apparatus for reproducing data recorded on a recording medium includes a pickup unit, a local storage, and a controller. The pickup unit reads a disc package from the recording medium, and the local storage stores a local storage package associated with the disc package. The controller generates control signals to display metadata information of the local storage package, and to generate a binding unit from the local storage package. The binding process is performed according to binding information which is modified by a user with reference to the displayed metadata information. The controller finally generates a virtual package by binding the binding unit with the disc package according to the modified binding information.

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[DESCRIPTION]**METHOD AND APPARATUS FOR REPRODUCING DATA FROM RECORDING
MEDIUM USING LOCAL STORAGE**5 **Technical Field**

The present invention relates to a method and apparatus for reproducing data from a recording medium, and more particularly to a method and apparatus for reproducing data from a recording medium using a local storage contained in an optical recording/reproducing device.

10**Background Art**

Generally, there has been widely used an optical disc acting as a recording medium capable of recording a large amount of data therein. Particularly, there has recently been developed a high-density optical recording medium capable of recording/storing high-quality video data and high-quality audio data for a long period of time, for example, a Blu-ray Disc (BD).

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The BD based on the next-generation recording medium technique has been considered to be the next-generation optical recording solution capable of storing much more data than a conventional DVD. In recent times, many developers have conducted intensive research into the international

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standard technical specification associated with the BD along with those of other digital devices.

In association with the above-mentioned situation, there has recently been developed an optical recording/reproducing device based on the BD international standard, but the BD international standard has not yet been completed, such that many limitations and problems occur in developing the optical recording/reproducing device.

Particularly, the above-mentioned optical recording/reproducing device must consider not only a basic function for recording/reproducing data of the BD, but also an additional function for enabling the optical recording/reproducing device to interact with peripheral digital devices. In other words, the optical recording/reproducing device must receive an external input signal, must display the received signal, and must reproduce desired data using the external input signal and the BD.

However, an apparatus for reproducing data from the recording medium to simultaneously reproduce the external input signal and data of the BD has not yet been established, such that many limitations and problems occur in developing a BD-based optical recording/reproducing device.

Disclosure of Invention

Accordingly, the present invention is directed to a method and apparatus for reproducing data from a recording medium using a local storage that substantially obviate one or more
5 problems due to limitations and disadvantages of the related art.

An object of the present invention is to provide a method and apparatus for downloading data from an external part, storing the downloaded data in a plurality of local storages, and
10 effectively reproducing data recorded in the local storages and data recorded in a recording medium such as a BD.

Additional advantages, objects, and features of the invention will be set forth in part in the description which follows and in part will become apparent to those having ordinary
15 skill in the art upon examination of the following or may be learned from practice of the invention. The objectives and other advantages of the invention may be realized and attained by the structure particularly pointed out in the written description and claims hereof as well as the appended
20 drawings.

To achieve these objects and other advantages and in accordance with the purpose of the invention, as embodied and broadly described herein, a method for reproducing data recorded on a recording medium using a local storage, the
25 method comprises reading a disc package from the recording

medium; reading a local storage package associated with the disc package from a local storage; displaying metadata information of the local storage package; generating a first binding unit from the local storage package according to
5 binding information modified by a user with reference to the displayed metadata information; and generating a first virtual package by binding the first binding unit with the disc package according to the modified binding information.

In another aspect of the present invention, there is
10 provided a method for generating a virtual package, the method comprises reading a first package from an optical disc; reading a second package associated with the first package from a local storage; displaying metadata information of the second package stored through a BD-J application;
15 generating a binding unit from the second package, the binding unit including binding unit manifest information which is modified by a user with reference to the displayed metadata information; and generating a virtual package by binding the binding unit with the disc package according to
20 the binding unit manifest information included in the binding unit.

In yet another aspect of the present invention, there is provided an apparatus for reproducing data recorded on a recording medium, the apparatus comprises a pickup unit for
25 reading a disc package from the recording medium; a local

storage for storing a local storage package associated with the disc package; and a controller for generating control signals to display metadata information of the local storage package, and to generates a binding unit from the local storage package according to binding information modified by a user with reference to the displayed metadata information, wherein the controller generates a virtual package by binding the binding unit with the disc package according to the modified binding information.

10 It is to be understood that both the foregoing general description and the following detailed description of the present invention are exemplary and explanatory and are intended to provide further explanation of the invention as claimed.

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Brief Description of Drawings

The accompanying drawings, which are included to provide a further understanding of the invention and are incorporated in and constitute a part of this application, illustrate embodiment(s) of the invention and together with the description serve to explain the principle of the invention.

In the drawings:

FIG. 1 is a conceptual diagram illustrating a method and apparatus for reproducing data from a recording medium according to the present invention;

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FIG. 2 is a conceptual diagram illustrating a file structure recorded in an optical disc acting as a recording medium and a method for reproducing a specific title using the file structure;

5 FIG. 3 is a structural diagram illustrating a data record structure of an optical disc acting as a recording medium according to the present invention;

FIG. 4A is a block diagram illustrating an optical recording/reproducing device according to the present
10 invention;

FIG. 4B is a block diagram illustrating an apparatus for reproducing data using a local storage from among overall components contained in the optical recording/reproducing device according to the present invention;

15 FIG. 5 is a conceptual diagram illustrating a method for generating a virtual package capable of simultaneously reproducing data recorded in a recording medium and data recorded in a local storage according to the present invention;

20 FIG. 6 is a structural diagram illustrating a local storage binding unit for generating a virtual package in accordance with a preferred embodiment of the present invention;

FIG. 7 is a structural diagram illustrating a local storage binding unit for generating a virtual package in accordance
25 with another preferred embodiment of the present invention;

FIG. 8 is an application image illustrating descriptor information for a binding unit according to the present invention;

FIG. 9 is a flow chart illustrating a method for reproducing
5 data from a recording medium using a local storage in accordance with a first preferred embodiment of the present invention;

FIG. 10 is a conceptual diagram illustrating a method for generating the virtual package using a virtual file system
10 (VFS), and modifying the virtual package according to the present invention; and

FIG. 11 is a flow chart illustrating a method for reproducing data from a recording medium using a local storage in accordance with a first preferred embodiment of the present
15 invention.

Best Mode for Carrying Out the Invention

Reference will now be made in detail to the preferred embodiments of the present invention, examples of which are
20 illustrated in the accompanying drawings. Wherever possible, the same reference numbers will be used throughout the drawings to refer to the same or like parts.

A method and apparatus for reproducing data from a recording medium using a local storage will hereinafter be described
25 with reference to the annexed drawings.

Prior to describing the present invention, it should be noted that most terms disclosed in the present invention correspond to general terms well known in the art, but some terms have been selected by the applicant as necessary and will hereinafter be disclosed in the following description of the present invention. Therefore, it is preferable that the terms defined by the applicant be understood on the basis of their meanings in the present invention.

A recording medium for use in the present invention is indicative of all recordable mediums, for example, an optical disc, and a magnetic tape, etc., according to various recording schemes. It should be noted that the term "Disc" is considered to be the same as the recording medium according to the present invention.

For the convenience of description and better understanding of the present invention, the optical disc, such as a BD, will hereinafter be exemplarily used as the above-mentioned recording medium in the present invention. It should be noted that technical ideas of the present invention can be applied to other recording mediums without departing from the scope and spirit of the invention.

The term "local storage" is indicative of a storage unit contained in an optical recording/reproducing device 10 shown in FIG. 1. In more detail, the term "local storage" is indicative of a component capable of receiving necessary

information or data from a user, and storing the received information or data. For example, a general local storage may be indicative of a Hard Disc Drive (HDD), but it should be noted that the term "local storage" of the present invention is not limited to the HDD, and is applicable to other examples as necessary. It is obvious to those skilled in the art that the local storage may be connected/disconnected to/from the optical recording/reproducing device, and may be implemented with a portable recording medium (e.g., a portable HDD, and a portable flash memory, etc.)

Particularly, the term "local storage" is indicative of a storage unit for storing data associated with a recording medium such as a BD. The data associated with the recording medium is generally downloaded from an external device.

The term "Local Storage File Structure" for use in the present invention is indicative of a file structure of data stored in the local storage.

In association with the above-mentioned description, it is obvious to those skilled in the art that the local storage may directly read some permission data from the recording medium, may generate system data (e.g., metadata) associated with record/reproduction operations of the recording medium, and may download the system data from an external Content Provider (CP), such that the system data may be stored in the local storage.

In this case, it is preferable that the metadata is indicative of data recorded in a metadata file, for example, Metadata for Binding Unit. Specifically, although a Descriptor for Binding Unit information indicative of information for modifying the binding unit or the virtual package will be described as the Metadata for Binding Unit in the present invention, it should be noted that the present invention is not limited to the aforementioned Descriptor for Binding Unit information.

10 The term "binding unit" is indicative of a set of files stored in the local storage. Particularly, the binding unit is indicative of a set of information (i.e., information set) associated with a specific recording medium. In this case, the information set is replaced with, is added (or appended) to, or is merged with data contained in the recording medium by information of the binding unit manifest files, such that it can simultaneously reproduce data of the recording medium and data of the local storage. Specifically, the binding unit can be deleted or modified even by the metadata file information, and a detailed description thereof will be described later.

For the convenience of description, data recorded in the recording medium is referred to as "original data", and data associated with the recording medium from among a plurality

of data units stored in the local storage is referred to as "additional data".

In association with the above-mentioned description, a program for reproducing data of the recording medium or driving the optical recording/reproducing device is referred to as an "Application" in the present invention. For example, if the recording medium is determined to be a BD, a BDJ application is used as a drive application, and a Disc Library Application is used for a disc library. However, it should be noted that the present invention is not limited to the aforementioned specific application names, and is applicable to other examples.

FIG. 1 is a conceptual diagram illustrating a method and apparatus for reproducing data according to the present invention. Unified usages of the optical recording/reproducing 10 and peripheral devices are shown in FIG. 1.

The optical recording/reproducing device 10 can record/reproduce data in/from various optical discs having different formats. If necessary, the optical recording/reproducing device 10 can record/reproduce specific data in/from only a specific optical disc such as a BD, or can reproduce the data from the optical disc without recording the data in the same. It should be noted that the present invention exemplarily uses a BD-player capable of

reproducing data from the BD or a BD-recorder capable of recording data in the BD in consideration of correlation between the BD and peripheral devices for the convenience of description.

5 It is well known in the art that the optical recording/reproduction device 10 is also applicable to a drive embedded in a specific device such as a computer.

The optical recording/reproducing device 10 records or reproduces data in/from the optical disc 30, receives an
10 external input signal, performs a signal process on the received signal, and transmits the signal processed result to the external display 20, such that a user can view the signal processed result on the display 20. In this case, there is
no limitation in a receivable external signal. For example,
15 representative external input signals may be determined to be a DTV-associated signal and an Internet-associated signal, etc. Specifically, the Internet is indicative of a communication network to which a user easily gains access, such that the user can download specific Internet data using
20 the optical recording/reproducing device 10, and can use the downloaded data.

In association with the above-mentioned description, a person for providing content data used as an external source is generally referred to as a content provider (CP).

When original data is recorded in the optical disc 30 seated in the optical recording/reproducing device 10, and additional data associated with the original data is present in other storage places (e.g., Internet), the present invention aims to reproduce the original data and the additional data at the same time.

Specifically, in order to reproduce user-desired data from among the additional data and the original data when the additional data and the original data are reproduced, a function capable of modifying the additional data according to a user command or operation is used, such that the present invention proposes a method for more effectively reproducing data.

For example, it is assumed that multiplexed AV (Audio/Video) streams are recorded as the original data recorded in the optical disc, and additional data for use in the Internet is an audio stream different from an audio stream (e.g., Korean) of the original data. In this case, some users may download a specific audio stream (e.g., English) acting as additional data from the Internet, may desire to reproduce the downloaded audio stream along with the AV stream acting as original data, or may desire to reproduce only the additional data. In order to implement the above-mentioned desires of the users, correlation between the original data and the additional data must be established, and there is needed a

systemized method for managing/reproducing the above-mentioned data according to a user request.

For the convenience of description, although a signal recorded in the disc is referred to as the original data, and
5 other signals existing in the outside of the disc are referred to as the additional data, it should be noted that the original data and the additional data classified according to their data acquisition methods are not limited to only specific data.

10 Generally, additional data may be indicative of audio data, presentation graphic (PG) data, interactive graphic (IG) data, or text subtitle, etc., but the additional data may also be indicative of a multiplexed AV stream including the above-mentioned data and video data. In other words, data
15 associated with the original data simultaneously existing in the outside of the optical disc may act as additional data.

In order to satisfy the above-mentioned user requests, a predetermined file structure must be established between the original data and the additional data. Accordingly, a file
20 structure and data record structure for use in the BD will hereinafter be described with reference to FIGS. 2~3.

FIG. 2 is a conceptual diagram illustrating a file structure for reproducing/managing the original data recorded in an optical disc, and a method for reproducing a specific title

according to the file structure. Specifically, the present invention assumes that the disc is a BD-ROM.

Referring to FIG. 2, the file structure according to the present invention includes one or more BD directories (BDMV) under a single root directory. The BD directory (BDMV) includes not only an index file "index" acting as a general file (i.e., an upper file) capable of guaranteeing user interactivity, but also the above-mentioned object. The file structure includes a variety of directories for storing information of actual data recorded in a disc and other information associated with a method for reproducing the data, for example, a playlist directory (PLAYLIST), a clip information directory (CLIPINF), a stream directory (STREAM), an auxiliary data directory (AUXDATA), a metadata directory (META), and a backup directory (BACKUP). The above-mentioned directories and a variety of files included in the directory will hereinafter be described.

The auxiliary data directory (AUXDATA) includes an additional data file for reproducing data of the disc. For example, the AUXDATA directory includes a "Sound.bdmv" file for providing a user with sound data when an interactive graphic function is executed, and an "l11111.otf" file for providing the user with font information when data of the disc is reproduced.

The stream directory (STREAM) includes a plurality of AV stream files recorded in a disc according to a specific

format. Generally, individual streams are recorded using an MPEG-2 based transport packet, and the stream directory (STREAM) uses extension names of stream files (01000.m2ts and 02000.m2ts) as a specific extension name "*.m2ts".

5 Particularly, if video/audio/graphic information from among the above-mentioned streams is multiplexed, the multiplexed information is called an AV stream, and a single title is composed of at least one AV stream file.

The clip information (Clip-info) directory (CLIPINF) is

10 composed of a plurality of clip-info files (01000.clpi and 02000.clpi) connected to the above-mentioned stream files on a one-to-one basis. Particularly, the clip-info files (*.clpi) record attribute information and timing information of the stream files (*.m2ts) therein. The clip-info files

15 (*.clpi) connected to the stream files (*.m2ts) on a one-to-one basis are generically named a "Clip". In other words, this means that a single clip is indicative of data composed of a stream file (*.m2ts) and a clip-info file (*.clpi).

The playlist directory (PLAYLIST) includes a plurality of

20 playlist files (*.mpls). Each playlist file (*.mpls) includes one or more playitems (PlayItem) and one or more sub-playitems (SubPlayItem). Each playitem (PlayItem) and each sub-playitem (SubPlayItem) are adapted to designate a playing interval during which a specific clip is reproduced.

25 The playitem (PlayItem) and the sub-playitem (SubPlayItem)

include information associated with a specific clip to be reproduced, i.e., information associated with a reproduction start time (IN-Time) and other information associated with a reproduction termination time (OUT-Time) of the specific clip.

5 In association with the above-mentioned description, a process for reproducing data using at least one playitem (PlayItem) in the playlist file is referred to as a main path, and a process for reproducing data using individual sub-play items (SubPlayItem) is referred to as a sub-path. The
10 playlist file must contain a single main path. The playlist file may contain at least one sub-path according to the presence or absence of the sub-playitem (SubPlayItem) as necessary.

In conclusion, the playlist file acts as a basic
15 reproduction/management file unit contained in overall reproduction/management file structures for reproducing a desired clip by combination of one or more playitems (PlayItem).

The metadata directory (META) is indicative of a directory
20 including metadata files. The metadata files include metadata information for the binding unit. It is preferable that the metadata information for the binding unit includes descriptor information capable of allowing a user to recognize contents of data stored in the local storage.

Preferably, the descriptor information may include "Descriptors for Disc Information" for modifying individual directories associated with a specific disc (e.g, disc_ID #1) and "Descriptors for Title Information" for modifying
5 individual titles.

Specifically, a single metadata file is used for a Disc Specific Directory and a Shared Directory, respectively. For example, the metadata file associated with the present invention is recorded as a file name such as "bumt_000.xml".

10 In association with the above-mentioned description, head information "bumt_" contained in the aforementioned file name is used as a File Descriptor Code distinguished from other data. For example, a file beginning with the "bumt_" information is indicative of "Descriptor File for Binding
15 Unit", the "Descriptor File for Binding Unit" of the present invention may be used as a descriptor file, and it should be noted that the "Descriptor File for Binding Unit" is considered to be the same as the descriptor file.

Specific information "_000_" contained in the aforementioned
20 file name is used as a language code for identifying supported language information. For example, the Descriptor File for Binding Unit" composed of the English language may be denoted by "_eng_", the Descriptor File for Binding Unit" composed of the Korean language may be denoted by "_kor_",
25 the Descriptor File for Binding Unit" composed of the

Japanese language may be denoted by "_jpn_", and the
Descriptor File for Binding Unit" composed of a plurality of
languages may be denoted by "_mul_".

Specific information "_xml" contained in the file name is
5 indicative of description language, and it should be noted
that other limitations (e.g., a file size) may be applied to
the metadata file structure as necessary.

For example, the "Descriptor File for Binding Unit" acting as
a metadata file for modifying (deleting or modifying) the
10 local storage binding unit may be denoted by "bumt_eng_xml".

The "Descriptor file for Binding Unit" is stored in the same
directory as other metadata files. For example, the
"Descriptor file for Binding Unit" is located under the
metadata directory (META) of a specific directory (disc_ID
15 #1) of a specific disc, or is located under the metadata
directory (META) of the shared directory (Shared).

The backup directory (BACKUP) stores a plurality of duplicate
files, i.e., a duplicate file (also called "copied files") of
the index file "index" storing information associated with
20 disc reproduction, a duplicate file of the object file
"MovieObject", duplicate files of all playlist files (*.mpls)
contained in the playlist directory (PLAYLIST), and duplicate
files of all clip-info files (*.clpi) contained in the clip-
info directory (CLIPINF). If the above-mentioned files
25 ("index", "MovieObject", "*.mpls", and "*.clpi") are damaged,

a disc reproduction process is also fatally damaged, such that the backup directory (BACKUP) is designed to pre-store duplicate files of the above-mentioned files as backup files.

In association with the above-mentioned description, a method
5 for reproducing a specific title using the above-mentioned disc file structure is shown in FIG. 2.

If a user enters a title reproduction command in association with a title used as an index file (also called "index table"), reproduction of the title begins. A detailed
10 description thereof will hereinafter be described.

The index file (index.bdmv) includes first playback information "First Playback" indicative of information associated with a first reproduction image when data of a corresponding disc is loaded, top menu information "Top Menu"
15 for providing a menu image, and at least one title information "Title #1 ~Title #n".

If the optical disc 30 is loaded in the optical recording/reproducing device 10, title menu information associated with the index table is provided to the user via
20 the display 20. If the user selects a specific title or a specific menu contained in a menu image, data reproduction begins according to a scenario pre-defined by a disc manufacturer. In other words, if the user enters a command for reproducing a specific title (e.g., title #1), a specific
25 playlist file is executed according to a command contained in

the object file (MovieObject) of the reproduction/management file structure. Thereafter, one or more clips (e.g., Clip #1 ~ Clip #3) constructing the title #1 are reproduced by a specific playitem and/or sub-playitem contained in the
5 playlist file according to the playlist file information.

FIG. 3 is a structural diagram illustrating a data record structure recorded in a recording medium according to the present invention. In more detail, FIG. 3 shows a disc record format of information associated with the file
10 structure.

As shown in FIG. 3, from the viewpoint of an inner area of the disc, the above-mentioned disc structure sequentially includes a file system information area serving as system information for managing overall files, a database area for recording a playlist file and a clip-info file to reproduce a
15 recorded AV stream (*.m2ts), and an AV stream area for recording a plurality of streams composed of audio data, video data, and graphic data, etc. Particularly, it should be noted that data recorded in the AV stream area may be
20 determined to be original data as previously stated above.

The present invention provides a method and apparatus for simultaneously reproducing original data (e.g., a file structure shown in FIG. 2) recorded in the disc and additional data recorded in the local storage, and a variety

of preferred embodiments according to the present invention will hereinafter be described.

FIG. 4A is a block diagram illustrating the optical recording/reproducing device 10 according to the present invention.

Referring to FIG. 4A, the optical recording/reproducing device 10 includes a pickup unit 11, a servo unit 14, a signal processor 13, a local storage 15, and a microprocessor 16. The pickup unit 11 reproduces original data recorded in the optical disc and management information including reproduction/management file information. The servo unit 14 controls operations of the pickup unit 11. The signal processor 13 receives a reproduction signal from the pickup unit 11, restores the received reproduction signal to a desired signal value, or modulates a signal to be recorded into another signal recorded in the optical disc, such that it transmits the restored or modulated result. The local storage stores data therein. The microprocessor 16 controls overall operations of the above-mentioned components.

Preferably, when the local storage 15 constructs a file structure for storing additional data downloaded from an external part, the additional data may include a metadata file including metadata information capable of deleting or modifying the binding unit or the virtual package.

The present invention is applicable to an example in which a plurality of local storages 15 are used or another example in which a plurality of binding units are contained in a single local storage 15.

5 A controller 12 downloads additional data from outside of the optical disc upon receiving a command from a user, stores the downloaded additional data in the local storage 15, and configures a binding unit using Binding Unit Manifest Information recorded in Binding unit manifest files of the
10 local storage. In addition, the controller 12 configures a virtual file structure (hereinafter referred to as a virtual package) using the binding unit manifest information recorded in the binding unit manifest files, such that it can reproduce data contained in the recording medium and data
15 contained in the local storage. The controller reproduces the original data and/or the additional data using the virtual package upon receiving a request from a user.

The virtual package generated by the controller 12 includes at least one virtual playlist including a playitem capable of
20 reproducing a plurality of clips.

The controller 12 controls the modifying of the binding unit using "Descriptor Information for Binding Unit" from among metadata information, such that it generates an modified binding unit. The controller 12 performs a binding unit for
25 binding or combining the modified binding unit with a disc

package, such that it generates a method for generating the virtual package. The controller 12 can modify the virtual package using the binding unit manifest information.

Therefore, if a user performs the modification operation by referring to an application image using the "Descriptor Information for Binding Unit" from among the metadata information, the controller 12 can modify the binding unit or the virtual package according to a user command.

In association with the above-mentioned description, a detailed description of the Binding Unit Manifest Files, the Binding Unit Manifest Information, and the virtual package will hereinafter be described with reference to the annexed drawings.

The AV decoder 17 finally decodes output data (i.e., original data and/or additional data) upon receiving a control signal from the controller 12, and provides the user with the decoded result.

The AV encoder 18 converts an input signal into a specific format signal (e.g., an MPEG2 transport stream) upon receiving a control signal from the controller 12, and transmits the converted result to the signal processor 13.

The new virtual package may be stored in the local storage 15 such that it can be re-used in future. Also, the new virtual package may be temporarily stored in an additional dynamic memory, and may then be used.

FIG. 4B is a block diagram illustrating an apparatus for reproducing data of an optical disc using a local storage from among overall components contained in the optical recording/reproducing device 10 according to the present invention.

Information stored in the local storage 15 will hereinafter be described. The local storage 15 according to the present invention stores file information (Directory-File for disc_ID #n dependent) including directories and files for every individual disc identification (ID) information, and a plurality of additional clips downloaded from an external part.

A binding unit of the local storage 15 is generated, and the local storage 15 may include binding unit manifest information for a binding operation associated with a disc package, and may also include "Descriptor Information for Binding Unit" information for allowing a user to view an application image so as to modify the binding unit or the virtual package.

Specifically, the local storage 15 may include a plurality of file information units (Directory-File for disc_ID #n dependent) to cope with different discs. Therefore, the local storage 15 additionally requires a file system for managing the above-mentioned file information units.

Specifically, the file system is also referred to as a local

storage file system 41, and the local storage file system 41 is indicative of a system for managing all files stored in the local storage 15.

Therefore, if an optical disc (e.g., disc_ID #1) of a
5 specific disc ID (disc_ID) is loaded in the optical recording/reproducing device 10, the controller 12 contained in the optical recording/reproducing device 10 recognizes ID information of the disc using the pickup unit 11 and the signal processor 13. If the local storage 15 stores file
10 information, the controller reads binding unit file information equal to the loaded disc ID information from among all file information units stored in the local storage 15, generates a virtual package by binding (or combining) the read information and the disc package, and reproduces both
15 the original data of the disc and the additional data of the local storage using the generated virtual package.

However, although a single local storage 15 and a local storage file system 41 are depicted in FIG. 4B, the present invention relates to an example of a plurality of local
20 storages, and it is obvious to those skilled in the art that the number of local storages 15 may be determined to be a plural number and the number of local storage file systems 41 may also be determined to be a plural number.

A method for combining (or binding) the local storage data with a disc package to form the virtual package will hereinafter be described with reference to FIG. 5.

FIG. 5 is a conceptual diagram illustrating a method for generating the above-mentioned virtual package to simultaneously reproduce data of a recording medium and data of a local storage according to the present invention.

If a specific disc is loaded in the optical recording/reproducing device 10 on the condition that the information and contents shown in FIG. 4b are stored in the local storage 15, the optical recording/reproducing device 10 reads the file system information 41 contained in the local storage 15, and at the same time reads disc file system information 42 including the file structure recorded in the disc, resulting in the creation of the VFS. In more detail, the virtual file system (VFS) is indicative of a file system virtually generated to manage both the file system contained in the local storage 15 and the other file system of the loaded disc.

The optical recording/reproducing device generates a new virtual package to simultaneously reproduce original data recorded in the disc and additional data recorded in the local storage using the above-mentioned virtual file system (VFS). For this purpose, the optical recording/reproducing device 10 reads file information (Directory-File for disc_ID

#1 dependent) associated with the disc (e.g., disc_ID #1) from the file system, generates a binding unit according the read binding unit manifest information, reads the generated binding unit, and performs a binding operation for replacing
5 the read file information with a disc package of the loaded disc (disc_ID #1) or appending the read file information to the disc package.

Specifically, the present invention is characterized in that the binding unit is modified by a metadata file before the
10 binding operation associated with the binding unit manifest information is performed, or the virtual package is modified after being generated by the binding operation.

In association with the above-mentioned description, the binding unit manifest file according to the present invention
15 includes a list (i.e., Files and Titles relation List) indicative of a relationship between files and titles; Name Mapping information for performing mapping of all files contained in the binding unit to form the virtual package; Progressive Playlist information for progressive playlists;
20 and Credential information.

Specifically, the above-mentioned name mapping information is used when file structure data of the local storage generates the binding unit or when the binding unit is combined with the disc package.

The virtual package generated by the above-mentioned binding operation is indicative of a file structure for reproducing/managing an original clip 422 and an additional clip 412. The original clip 422 is composed of original data recorded in the disc. The additional clip 412 is composed of additional data recorded in the local storage.

A preferred embodiment for generating the local storage binding unit will hereinafter be described with reference to FIG. 6. The preferred embodiment shown in FIG. 6 is characterized in that the binding unit generates a file structure including a directory in title units, and it should be noted that the present invention is applicable to other examples.

The aforementioned binding unit configured in title units may have the same file structure as that of the recording medium. If necessary, the binding unit may have a file structure different from that of the recording medium.

FIG. 6 is a structural diagram illustrating a local storage binding unit for generating a virtual package according to the present invention. Specifically, FIG. 6 shows a preferred embodiment in which the "org_ID #1" and the "disc_ID #1" are used.

Referring to FIG. 6, the binding unit manifest file (disc_ID #1.bumf) 61 contained in the local storage file structure includes mapping information for mapping lower files

(42005.mpls, 42005.clpi, and 42005.m2ts) of a new trailer to an auxiliary data file (Japanese.otf) contained in the Shared directory of the disc.

If the disc binding unit (Binding Unit of disc_ID #1) 62 is
5 generated by the aforementioned mapping information, a new-trailer directory is located under the specific disc directory (disc_ID #1). The aforementioned new-trailer directory includes a playlist file (42005.mpls), a clip-info file (42005.clpi), and a stream file (42005.m2ts). An
10 auxiliary data file (Japanese.otf) is located under the Shared directory.

In association with the above-mentioned description, all files of the generated binding unit act as Read-only files, and the aforementioned binding unit combined with the disc
15 package generates a new virtual package to reproduce data of the recording medium and/or data of the local storage.

FIG. 7 is a structural diagram illustrating a local storage binding unit for generating a virtual package in accordance with another preferred embodiment of the present invention.
20 Specifically, FIG. 7 shows a preferred embodiment in which the local storage file structure including the "Descriptor File for Binding Unit" is modified and then the binding unit is generated according to the binding unit manifest file.

Referring to FIG. 7, the binding unit manifest file (disc_ID
25 #1.bumf) 71 contained in the local storage file structure

includes mapping information for mapping files (72005.mpls: 711, 72005.clpi: 712, and 72005.m2ts: 713) of a specific title (e.g., Title #1) of a new trailer directory (New-trailer), files (62005.mpls: 714, 62005.clpi: 715, and
5 62005.m2ts: 716) of another title (e.g., Title #2), a "Descriptor File for Binding Unit" (bumt_eng.xml) 717, and an auxiliary data file (Chinese.otf) located under the shared directory (Shared).

In the case where a user views an application image for the
10 binding unit descriptor by the "Descriptor File for Binding Unit" before the disc binding unit associated with the mapping information is generated, and deletes a specific title (Title #1), the binding unit manifest file (disc_ID #1.bumf) 71 is modified, such that the binding unit manifest
15 file information is changed to a file including mapping information for mapping files (62005.mpls: 714, 62005.clpi: 715, and 62005.m2ts: 716) of a specific title (e.g., Title #1) located under the new-trailer directory (New-trailer) to an auxiliary data file (Japanese.otf: 718) located under the
20 shared directory (Shared), resulting in the creation of a new modified binding unit manifest file.

Therefore, if the disc binding unit (Binding Unit of disc_ID #1) 72 is generated according to the mapping information of the new binding unit manifest file, the new-trailer directory
25 (New-trailer) is located under the Disc Specific Directory

(disc_ID #1). The new-trailer directory (New-trailer) includes a playlist file (62005.mpls) 724, a clip-info file (62005.clpi) 725, and a stream file (62005.m2ts) 726 for a specific title (Title #2). An auxiliary data file
5 (Japanese.otf) 728 is located under the shared directory (Shared).

In association with the above-mentioned description, all files of the generated binding unit act as Read-only files, and the aforementioned binding unit combined with the disc
10 package generates a new virtual package to reproduce data of the recording medium and/or data of the local storage, as previously shown in FIG. 6.

FIG. 8 is an application image illustrating descriptor information for a binding unit according to the present
15 invention. The modifying of the binding unit will be described with reference to FIG. 8.

For example, if the descriptor information for the binding unit (Descriptor for Binding Unit) is depicted by an application image displayable on a display, a directory name
20 indicative of selected directory information 800 is a movie title "Die Hard", a specific title (Title #1) indicative of a content list is a specific image "Movie #1", a specific title (Title #2) is indicative of another specific image "Movie #2", a download site indicative of a CP's site includes
25 information of an Internet Web-site "WWW.FOX.com" and

download time information "Jan-10-2005" as download information. Besides, the download site may further include Directory Property information, Latest Downloaded Time information, or Updated Time information, etc. It should be
5 noted that the present invention is not limited to the aforementioned examples, and is applicable to other examples. If a user views a specific command "Do you want to delete data associated with this disc ?" to modify the binding unit or the virtual package in the application image showing the
10 aforementioned selected directory information 800, the user can delete data of a desired disc by a descriptor application acting as an modifying program.

However, if the user desires to modify information of a specific title (e.g., Title #1) without deleting specific
15 disc information, and selects the specific title (Title #1), the application image shows the selected title information 810 on a display. In the case of the selected title information 810, a title name is a specific movie "Die Hard", a title type is a movie title, and downloaded lists are
20 Japanese Audio information and Korean Text Subtitle Information, etc. Besides, the selected title information 810 may include a downloaded site, etc., but it should be noted that the present invention is not limited to the aforementioned examples, and is applicable to other examples.

If a user views a specific command "Do you want to delete data associated with this title ?" to modify the binding unit or the virtual package in the application image showing the aforementioned selected directory information 810, the user
5 can delete data of a desired title (e.g., Title #1) disc by a descriptor application acting as an modifying program.

FIG. 9 is a flow chart illustrating a method for reproducing data from a recording medium using a local storage in accordance with a first preferred embodiment of the present
10 invention. Specifically, FIG. 9 shows an example in which the binding unit is modified by the descriptor information for the binding unit.

Referring to FIG. 9, if the disc is loaded in the optical recording/reproducing device, the optical
15 recording/reproducing device recognizes disc ID (disc_ID) information in local storage data at step S901.

The optical recording/reproducing device reads file information including local storage file structure information of the same disc ID (disc_ID) as the loaded disc
20 from the local storage at step S902.

The file information includes a metadata file for the binding unit. When content data is downloaded from an external CP, a metadata file is also downloaded from the external CP.

The metadata file is modified by the application. For
25 example, if a user command enters the optical

recording/reproducing device via a user interface because the user desires to delete or modify specific content data contained in a specific directory, specific content data to be modified by the user is deleted by a BD-J application, and
5 a metadata file is updated by the deleted information.

It is determined whether the modifying operation caused by the metadata information from among file information of the same disc ID (disc_ID) is performed at step S903.

The metadata information is indicative of descriptor
10 information for the binding unit (Descriptors for Binding Unit), and is required to recognize each binding unit as information when the user desires to modify the binding unit. The user desires to recognize a variety of information, i.e., CP content information downloaded/stored in the local storage,
15 content information of a disc, and content information of a title, such that descriptor information is required to recognize the aforementioned information. The user can perform the deleting operation from among directory-, disc-, and title- modifying operations using the aforementioned
20 descriptor information. In other words, the descriptor information can support a user operation for the aforementioned modifying operation.

In association with the above-mentioned description, the modifying application from among a binding unit group
25 composed of a single binding unit or a plurality of binding

units uses "Descriptor for Disc Information" to modify individual directories associated with a specific disc in the Disc Library Application. Preferably, the modifying operation of individual files associated with a specific
5 title may be performed by "Descriptor for Title Information". If the modifying operation caused by the metadata information is not performed at step S903, a first binding unit indicative of a binding unit based on the Binding Unit Manifest Files is generated at step S904.

10 If the modifying operation caused by the metadata information is performed at step S903, the local storage file structure is modified according to the metadata file, and a second binding unit indicative of the binding unit associated with the modified binding unit manifest files is generated at step
15 S905.

It is determined whether the binding operation for binding (or combining) the generated binding unit with the disc package at steps S904~S905 is performed at step S906.

If the binding operation is not performed at step S906, a
20 disc package is reproduced at step S907.

If the binding operation is performed at step S906, the binding operation associated with the name mapping information contained in the binding unit manifest files is performed so that the virtual package is generated. Original
25 data of a disc acting as a recording medium and additional

data of a local storage are reproduced according to the virtual package at step S908.

In association with the above-mentioned description, the binding priority can be established during the aforementioned
5 binding operation. It is preferable that the controller 12 may establish the binding priority. When binding operation is performed between files in the local storage and files in the recording medium disc, the binding priority is as follows. The file of the Disc Specific Area Binding Unit has priority
10 over the file of the Shared Area Binding Unit. Furthermore, the file of the Shared Area Binding Unit has priority over the file of the Disc Package.

In association with the above-mentioned description, the binding unit is basically similar to the disc package. If
15 necessary, the binding unit configured in title units may have the same file structure as that of the recording medium, or may have a file structure different from that of the recording medium.

It should be noted that the binding unit cannot be operated
20 as a reproduction/management file by itself, differently from the disc package.

If it is assumed that the binding unit is designed to perform data reproduction by itself, this data reproduction is similar to data reproduction of the local storage, such that
25 the above-mentioned operations of the binding unit are

contrary to the purpose of the present invention for simultaneously reproducing both original data recorded in the disc and additional data recorded in the local storage.

Therefore, the virtual file system (VFS) specifically uses
5 name mapping information from among the above-mentioned binding unit manifest files, and performs a binding operation by binding (or combining) the binding unit updated to the local storage file structure with the disc package contained in the loaded disc, such that it generates a new virtual
10 package.

Preferably, the generated virtual package may have the same structure as that of the disc package.

FIG. 10 is a conceptual diagram illustrating a method for generating the virtual package using a virtual file system
15 (VFS), and modifying the virtual package according to the present invention.

For example, the disc package (org_ID #1, disc_ID #1: 102) contained in a specific disc includes an index file (index.bdmv), an object file (MovieObject.bdmv), a playlist
20 file (00000.mpls) 1021, a clip-info file (01000.clpi) 1022, a stream file (01000.m2ts), and an auxiliary data file (sound.bdmv) 1024 in the BD directory (BDMV) indicative of a lower directory of the root directory.

The newly-downloaded-updated binding unit associated with the
25 loaded disc (e.g., disc_ID #1) or the local storage binding

unit 101, which is pre-downloaded and stored in the local storage, includes a disc specific directory (disc_ID #1) and a disc Shared directory (Shared) under the specific CP directory (e.g., an org_ID #1).

5 The new-trailer directory indicative of a lower directory of the disc specific directory (disc_ID #1) includes a specific playlist file (42005.mpls) 1011, a clip-info file (42005.clpi) 1012 managed by the playlist file (42005.mpls) 1011, and a stream file (42005.m2ts) 1013. The disc shared
10 directory (Shared) includes an auxiliary data file (Japanese.otf) 1015, such that the binding unit of the local storage is generated.

According to the preferred embodiment of the present invention, the name mapping information of the binding unit
15 manifest files of the local storage according to the present invention includes specific information indicative of names and locations of the binding unit files in the virtual package. For example, according to the name mapping information of the binding unit manifest files, the playlist
20 file (42005.mpls) 1011 contained in the binding unit is replaced with the playlist file (00000.mpls) 1031 contained in the playlist directory (PLAYLIST) of the virtual package, the clip-info file (42005.clpi) 1012 is replaced with the clip-info file (02000.clpi) 1033 of the clip-info directory
25 (CLIPINF) of the virtual package, the stream file

(42005.m2ts) 1013 is replaced with the stream file (02000.m2ts) 1035 of the stream directory (STREAM) of the virtual package, the "Descriptor File for Binding Unit" (bumt_eng.xml) 1014 is replaced with the "Descriptor File for Binding Unit" (bumt_eng.xml) 1036 of the metadata directory (META) of the virtual package, and the auxiliary data file (Japanese.otf) 1015 is replaced with the auxiliary data file (11111.otf) 1038 of the AUXDATA directory of the virtual package. The aforementioned name mapping information includes list information of files associated with file locations.

Therefore, when the virtual file system (VFS) performs the binding operation, the binding operation is executed according to the aforementioned name mapping information recorded in the Binding Unit Manifest Files contained in the local storage, such that the virtual package is generated.

Therefore, the virtual package 103 generated by the name mapping information includes a BD directory acting as a lower directory of a root directory. The BD directory includes an index file (index.bdmv) and an object file (MovieObject.bdmv) according to the virtual package. The BD directory includes a playlist directory (PLAYLIST), a clip-info directory (CLIPINF), a stream directory (STREAM), a metadata directory (META), and an AUXDATA directory (AUXDATA). The playlist directory (PLAYLIST) includes a playlist file (00000.mpls)

1031 acting as a substitute for the playlist file
(42005.mpls) 1011 of the local storage binding unit 101. The
clip-info directory (CLIPINF) appends a clip-info file
(02000.clpi) 1033 acting as a substitute for the clip-info
5 file (42005.clpi) 1012 of the local storage binding unit 101
to the clip-info file (01000.clpi) 1022 of the disc package.
The stream directory (STREAM) appends a stream file
(02000.m2ts) 1035 acting as a substitute for the stream file
(42005.m2ts) 1013 of the local storage binding unit 101 to
10 the stream file (01000.m2ts) 1023 of the disc package. The
metadata directory (META) includes a "Descriptor File for
Binding Unit" (bunt_eng.xml) 1036 acting as a metadata file
of the local storage binding unit 101. The AUXDATA directory
(AUXDATA) appends an auxiliary data file (11111.otf) 1038
15 acting as a substitute for the auxiliary data file
(Japanese.otf) 1015 of the local storage binding unit 101 to
the auxiliary data file (sound.bdmv) 1024 of the disc package.
In association with the above-mentioned description, the
index file (Index.bdmv) and the object file
20 (MovieObject.bdmv), which act as upper files of the virtual
package, may be updated in conventional index and object
files (Index.bdmv and MovieObject.bdmv) contained in the disc
on the basis of the newly-generated virtual playlist file
(00000.mpls) 1031.

For example, if a title is changed to another title by the playlist file (00000.mpls) 1031 contained in the virtual package (e.g., if a new title is added, a conventional title is deleted, or a title reproduction scenario is changed to
5 another scenario), the aforementioned index and object files may be updated on the basis of the newly-generated virtual package.

In association with the above-mentioned description, the generated virtual package 103 is referred to as a first
10 virtual package. If a user modifies the first virtual package according to the "Descriptor File for Binding Unit" (bumt_eng.xml) 1036 contained in the first virtual package, and generates a new virtual package, the new virtual package is referred to as a second virtual package.

15 For example, if the user deletes data of a specific title according to the "Descriptor File for Binding Unit" (bumt_eng.xml) 1036 from the first virtual package, the index and object files (index.bdmv and MovieObject.bdmv) acting as upper files contained in the second virtual package generated
20 by the aforementioned deletion result are updated on the basis of the newly-generated virtual playlist file (00000.mpls), files of a specific title are deleted, such that the second virtual package is generated.

A method for reproducing original data indicative of the
25 recording medium data and additional data indicative of the

local storage data according to the aforementioned first and second virtual packages (i.e., the first virtual package and the second virtual package) will hereinafter be described with reference to FIG. 11.

5 FIG. 11 is a flow chart illustrating a method for reproducing data from a recording medium using a local storage in accordance with a first preferred embodiment of the present invention. Specifically, FIG. 11 is a flow chart illustrating a method for reproducing data of a recording
10 medium and data of a local storage in a new virtual package generated by modifying a virtual package including the "Descriptor File for Binding Unit".

Referring to FIG. 11, if a disc is loaded in an optical recording/reproducing device, the optical
15 recording/reproducing device recognizes disc ID information (disc_ID) from the local storage data at step S1101.

The optical recording/reproducing device determines whether the binding unit of the same disc ID (disc_ID) exists in the aforementioned local storage at step S1102. In this case, if
20 there are a plurality of local storages, a single binding unit of the same disc ID (disc_ID) may be contained in the local storages, or no binding unit of the same disc ID (disc_ID) exists in the local storages.

The binding unit includes the "Descriptor File for Binding
25 Unit" (e.g., bumt_eng.xml) acting as a metadata file.

If it is determined that there is no binding unit of the same disc ID (disc_ID) in the local storage at step S1102, the optical recording/reproducing device reproduces data of a disc package contained in a disc acting as the recording
5 medium at step S1103.

If it is determined the binding unit of the same disc ID (disc_ID) exists in the local storages, the optical recording/reproducing device determines whether the same file exists in the binding units having the same disc ID (disc_ID)
10 at step S804.

If it is determined that the binding unit of the same disc ID (disc_ID) exists in the local storage at step S1102, it is determined whether a binding operation for binding (or combining) the binding unit with the disc package is
15 performed at step S1104.

If it is determined that the binding operation is not performed at step S1104, the optical recording/reproducing device reproduces data of the disc package contained in a disc acting as the recording medium at step S1105.

20 If the binding operation is performed at step S1104, the optical recording/reproducing device generates the virtual package according to the name mapping information of the binding unit manifest files. The first virtual package includes the "Descriptor File for Binding Unit" (e.g.,

bumt_eng.xml) acting as a metadata file for the binding unit in the metadata directory (META) at step S1106.

Preferably, the binding operation may be performed on the condition that the optical recording/reproducing device is
5 not connected to a network such as the Internet.

In association with the above-mentioned description, the binding priority may be established between a plurality of local storages. Preferably, the controller may establish the binding priority. In association with the binding priority
10 contained in the local storage, the file of the Disc Specific Area Binding Unit has a binding priority higher than that that of the Shared Area Binding Unit.

Preferably, the binding priority between the file of the local storage binding unit and the file of the recording
15 medium binding unit (i.e., the disc package) may be determined in the order of the local storage binding unit file → the disc package file. In other words, the local storage binding unit file has a binding priority higher than that of the disc package file.

20 It is determined whether the first virtual package generated at the above step S1106 is modified by a user command using the "Descriptor File for Binding Unit" (e.g., bumt_eng.xml) at step S1107.

If it is determined that the virtual package is not modified
25 at step S1107, the optical recording/reproducing device

reproduces recording medium data and local storage data according to the first virtual package generated at the above step S1106 at step S1108.

If it is determined that the virtual package is modified at step S1107, the optical recording/reproducing device generates the second virtual package by executing the user command. If there is a reproduction command, the optical recording/reproducing device reproduces recording medium data and local storage data according to the second virtual package at step S1109.

As apparent from the above description, a method and apparatus for reproducing data from a recording medium using a local storage according to the present invention can effectively reproduce original data recorded in a recording medium and additional data downloaded/recorded in a plurality of local storages. Also, the user can modify the additional data if required according to the present invention, such that the user can more conveniently use a variety of functions according to the present invention.

20

Industrial Applicability

It will be apparent to those skilled in the art that various modifications and variations can be made in the present invention without departing from the spirit or scope of the inventions. Thus, it is intended that the present invention

25

covers the modifications and variations of this invention provided they come within the scope of the appended claims and their equivalents.

[CLAIMS]

1. A method for reproducing data recorded on a recording medium using a local storage, the method comprising:
5 reading a disc package from the recording medium;
reading a local storage package associated with the disc package from a local storage;
displaying metadata information of the local storage package;
generating a first binding unit from the local storage package according to binding information modified by a user
10 with reference to the displayed metadata information; and
generating a first virtual package by binding the first binding unit with the disc package according to the modified binding information.
15
2. The method according to claim 1, further comprising:
generating a second binding unit from the local storage package according to original binding information included in the local storage package; and
20 generating a second virtual package by binding the second binding unit with the disc package according to the original binding information.
3. The method according to claim 1, further comprising
25 reproducing the disc package only.

4. The method according to claim 1, wherein the metadata information includes descriptor information indicating contents of data stored in the local storage.

5

5. The method according to claim 1, wherein the metadata information is included in a metadata file, and wherein the metadata file is included in a metadata directory which is included in the local storage package.

10

6. The method according to claim 5, wherein a file name of the metadata file indicates that the metadata file includes descriptor information and indicates language information of the metadata file.

15

7. The method according to claim 4, wherein the descriptor information indicates at least one of first contents provided by a content provider, second contents of the recording medium, and third contents of titles.

20

8. The method according to claim 1, wherein the user modifies the binding information through a BD-J application.

9. The method according to claim 1, wherein the user modifies the binding information using descriptors for disc information.

5 10. The method according to claim 9, wherein the binding information is automatically modified when the user deletes data associated with a specific disc from the local storage.

11. The method according to claim 1, wherein the user
10 modified the binding information using descriptors for title information.

12. The method according to claim 11, wherein the binding
information is automatically modified when the user deletes
15 data associated with a specific title from the local storage.

13. The method according to claim 1, wherein the binding information comprises binding unit manifest information.

20 14. The method according to claim 13, wherein the binding unit manifest information is included in a binding unit manifest file, and wherein the binding unit manifest information comprises name mapping information associated with files contained in the binding unit.

15. The method according to claim 1, wherein the local storage package stored in the local storage includes a directory containing entire data associated with a particular disc.

5

16. The method according to claim 1, wherein the disc package includes a first object file and a first index file and the local storage package includes a second object file and a second index file, and wherein the virtual package includes
10 the second object file and the second index file.

17. The method according to claim 1, wherein a virtual file system is used for generating the virtual package.

15 18. The method according to claim 1, wherein a file structure of the virtual package is identical to a file structure of the disc package.

19. A method for generating a virtual package, the method
20 comprising:

reading a first package from an optical disc;

reading a second package associated with the first package from a local storage;

displaying metadata information of the second package stored
25 through a BD-J application;

generating a binding unit from the second package, the binding unit including binding unit manifest information which is modified by a user with reference to the displayed metadata information; and

5 generating a virtual package by binding the binding unit with the disc package according to the binding unit manifest information included in the binding unit.

20. An apparatus for reproducing data recorded on a recording
10 medium, the apparatus comprising:

a pickup unit for reading a disc package from the recording medium;

a local storage for storing a local storage package associated with the disc package; and

15 a controller for generating control signals to display metadata information of the local storage package, and to generates a binding unit from the local storage package according to binding information modified by a user with reference to the displayed metadata information, wherein the
20 controller generates a virtual package by binding the binding unit with the disc package according to the modified binding information.

21. The apparatus of claim 20, wherein the metadata information includes descriptor information indicating
25 contents of data stored in the local storage.

22. The apparatus of claim 20, wherein the metadata information includes descriptor information indicating at least one of first contents provided by a content provider, second contents of the recording medium, and third contents
5 of titles.

FIG. 1

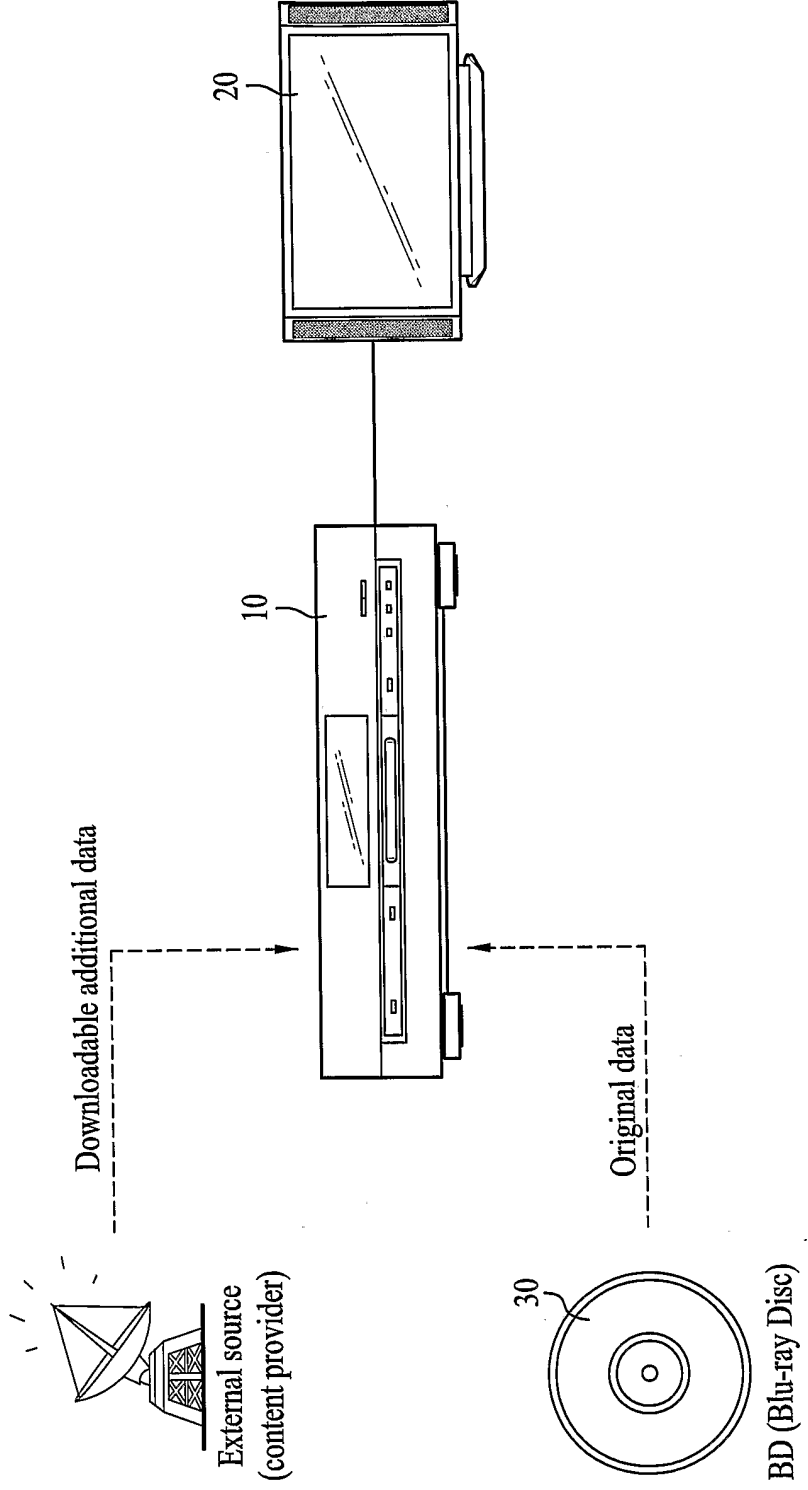


FIG. 2

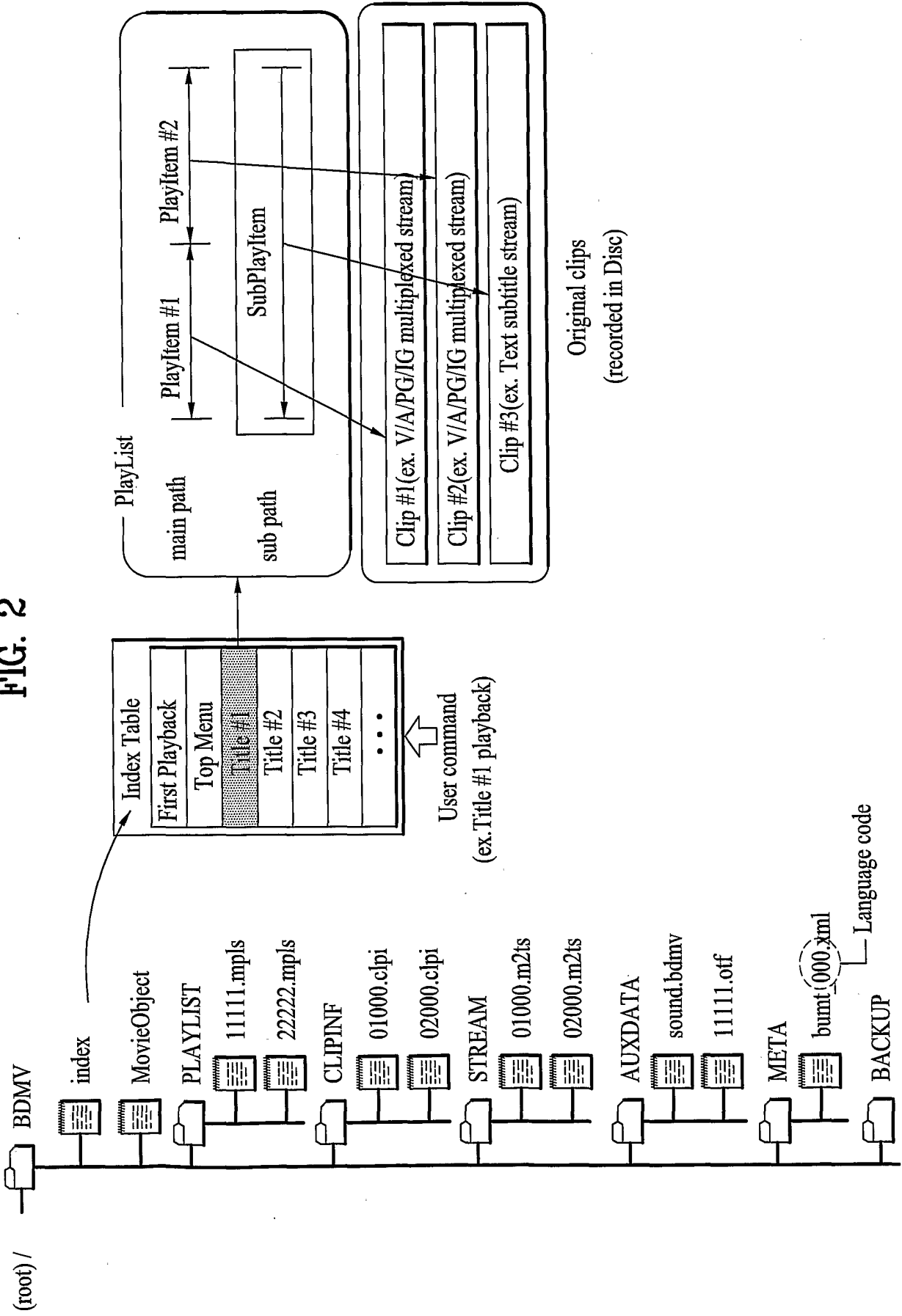


FIG. 3

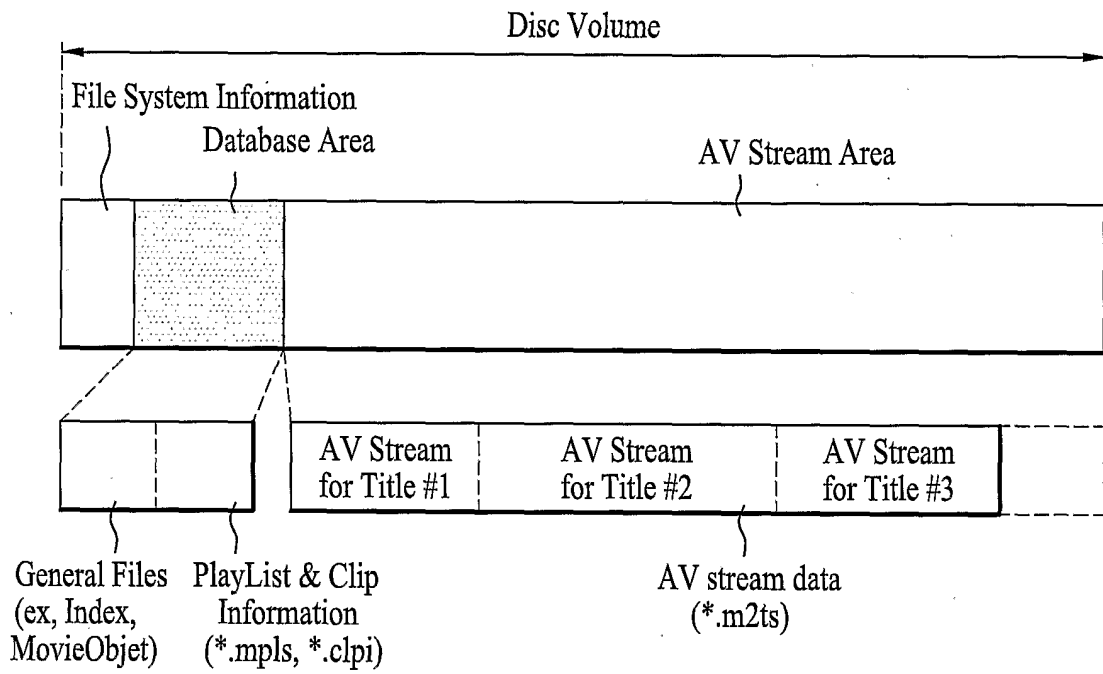


FIG. 4A

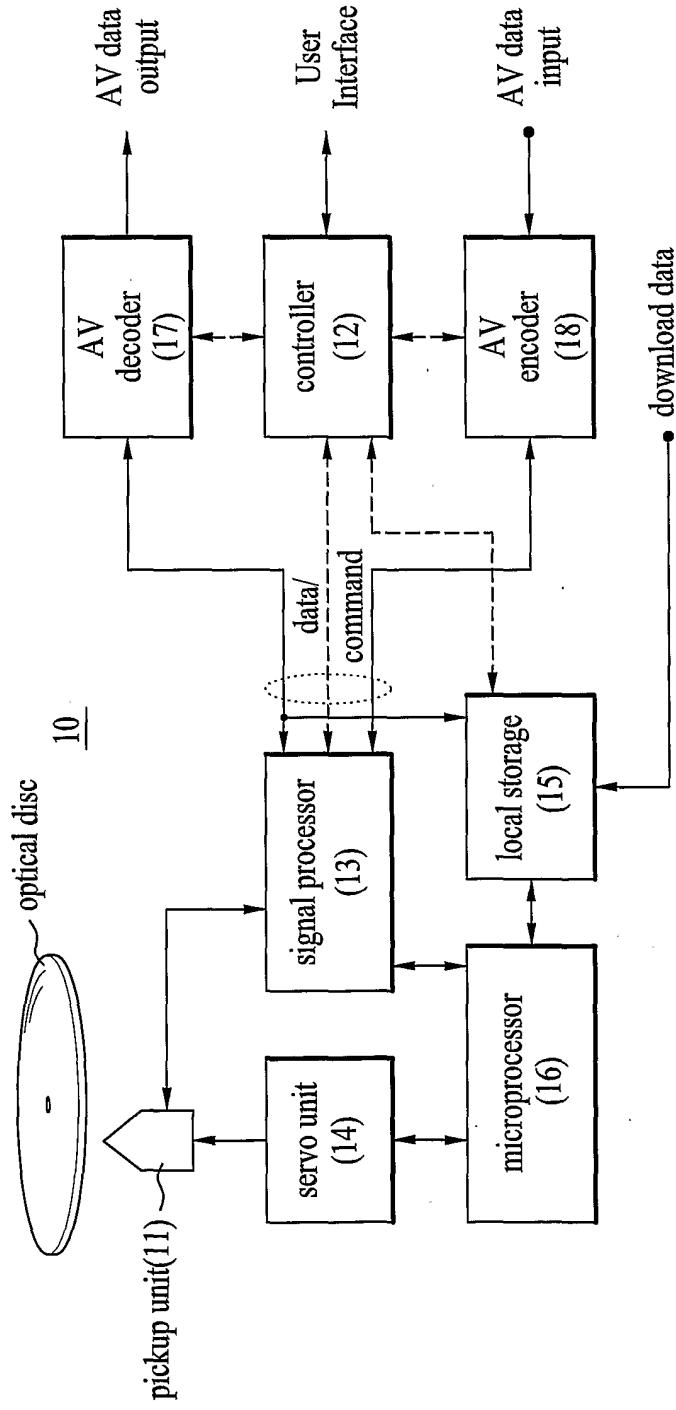


FIG. 4B

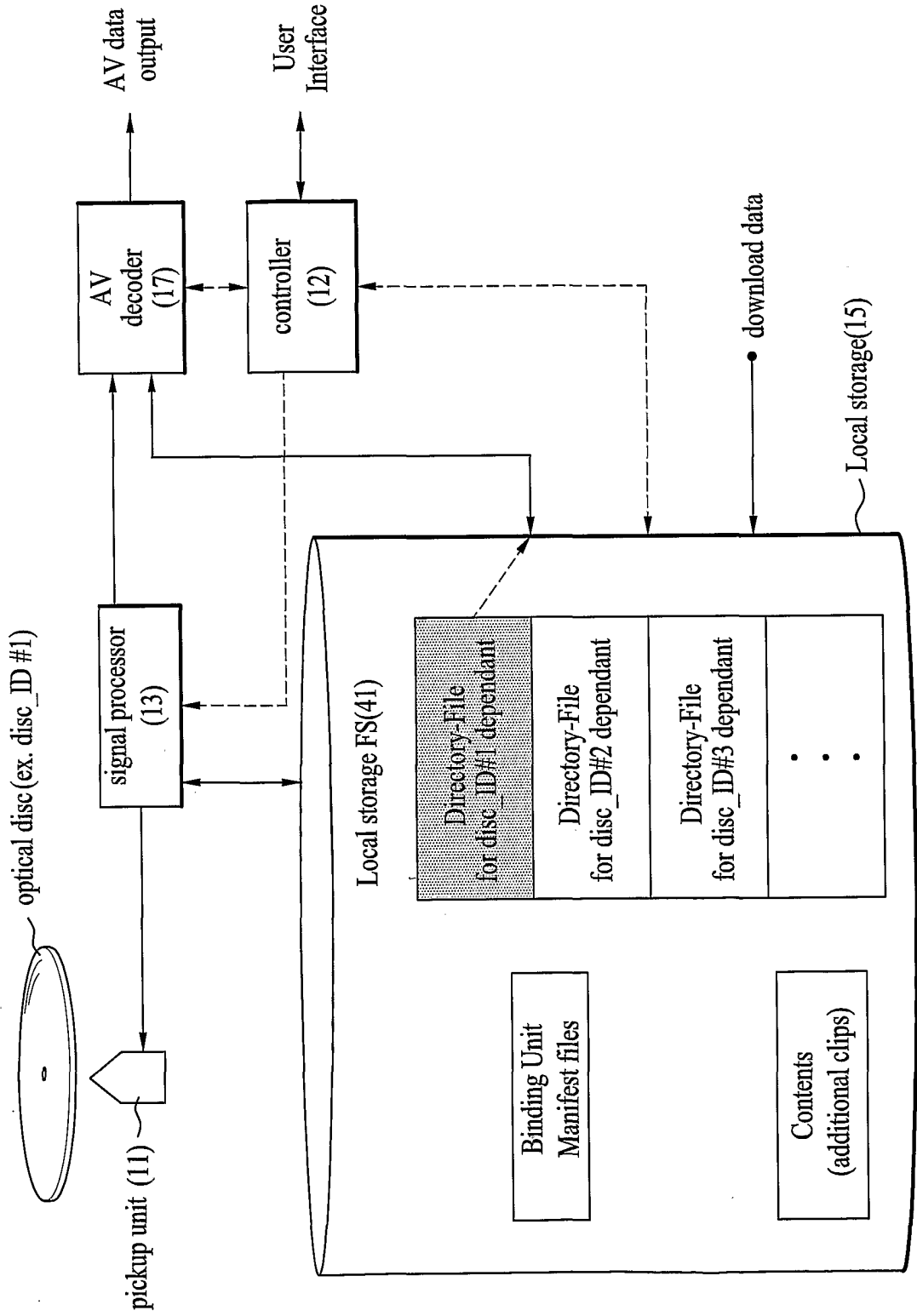


FIG. 5

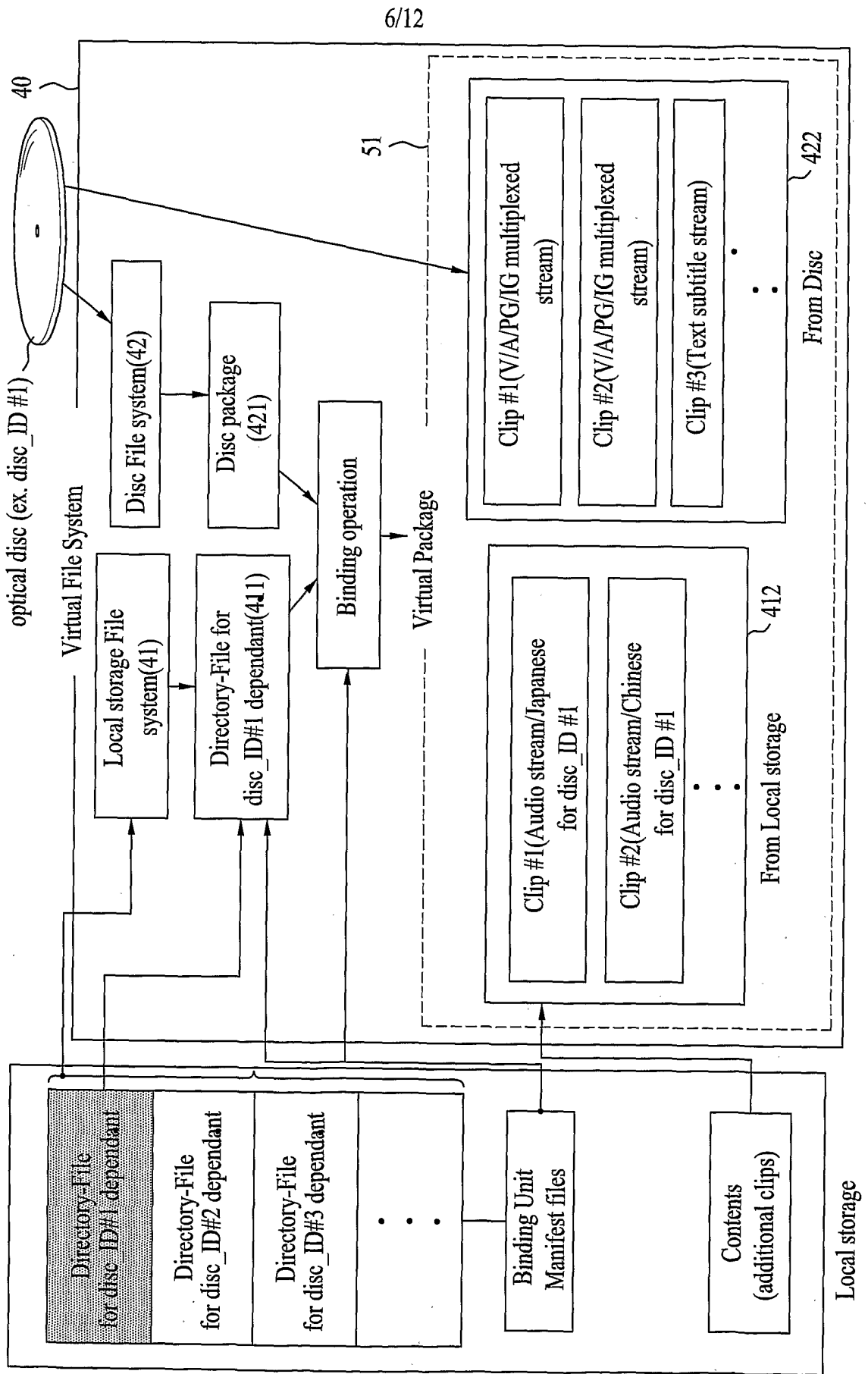


FIG. 6

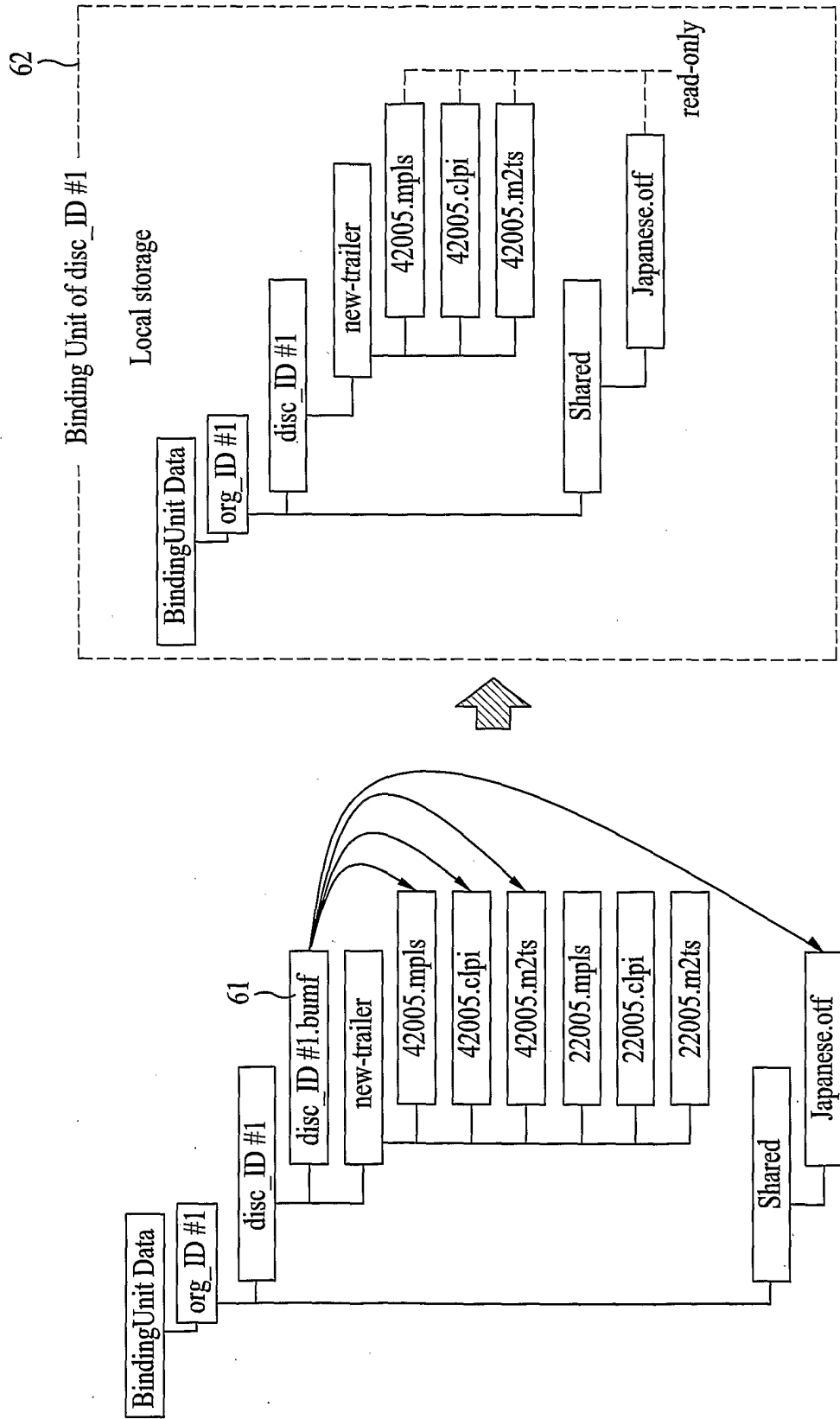


FIG. 7

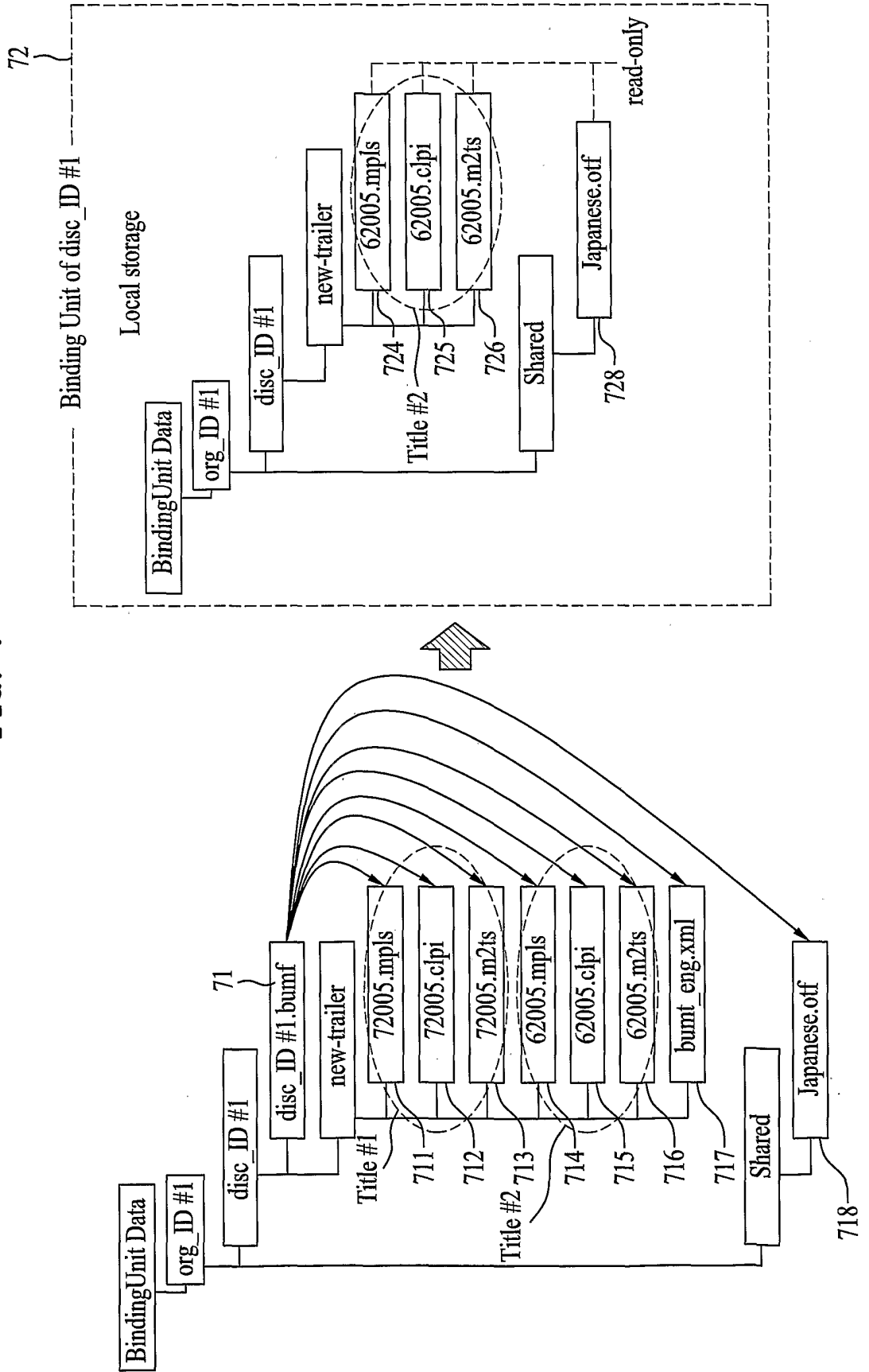
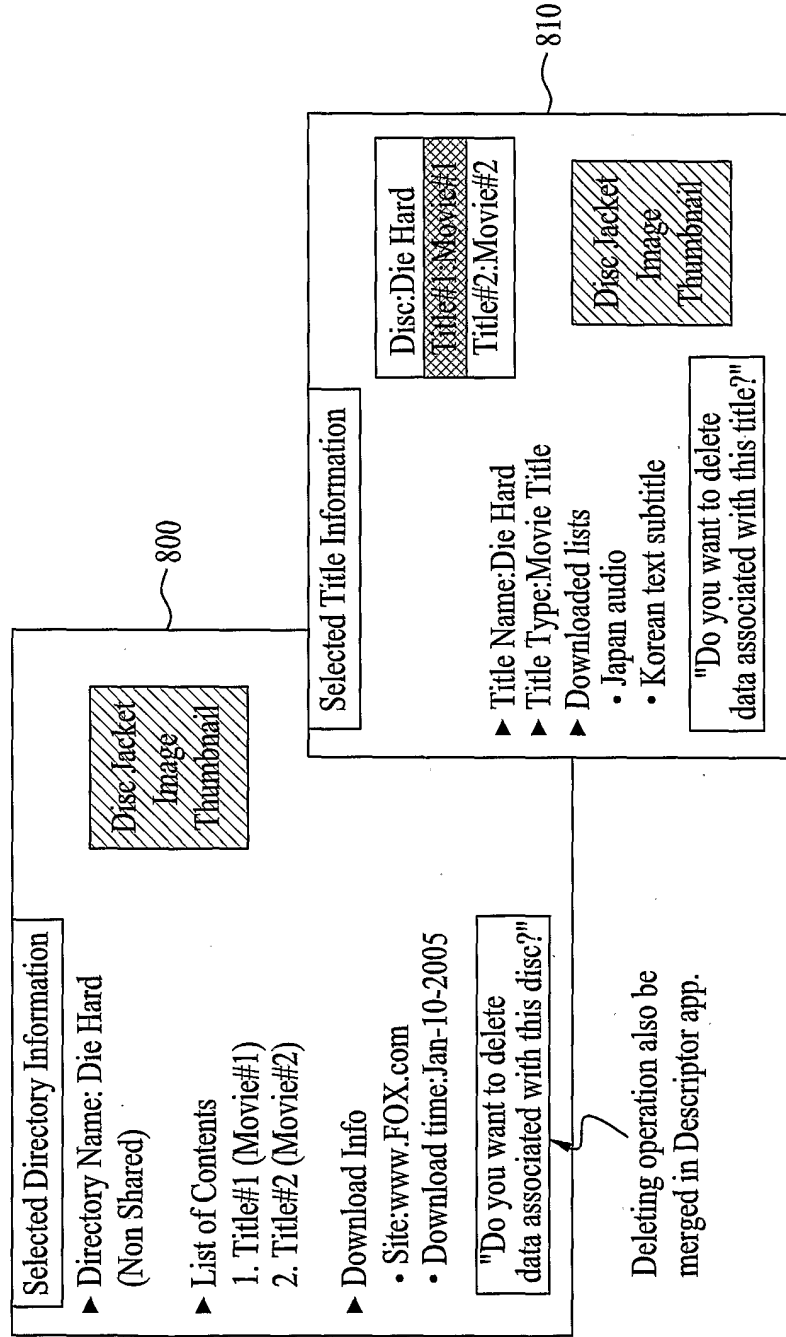


FIG. 8



810

800

FIG. 9

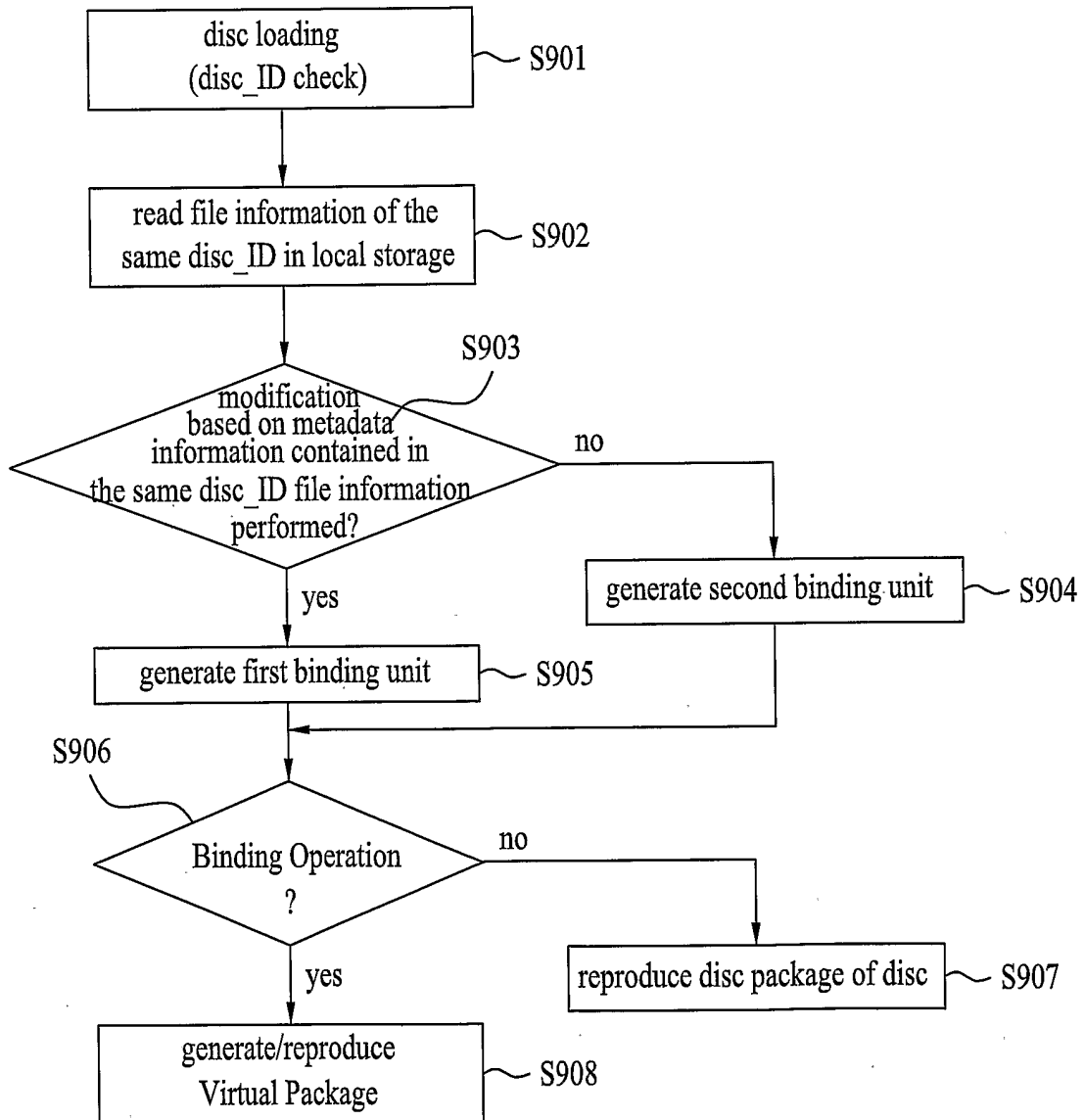


FIG. 10

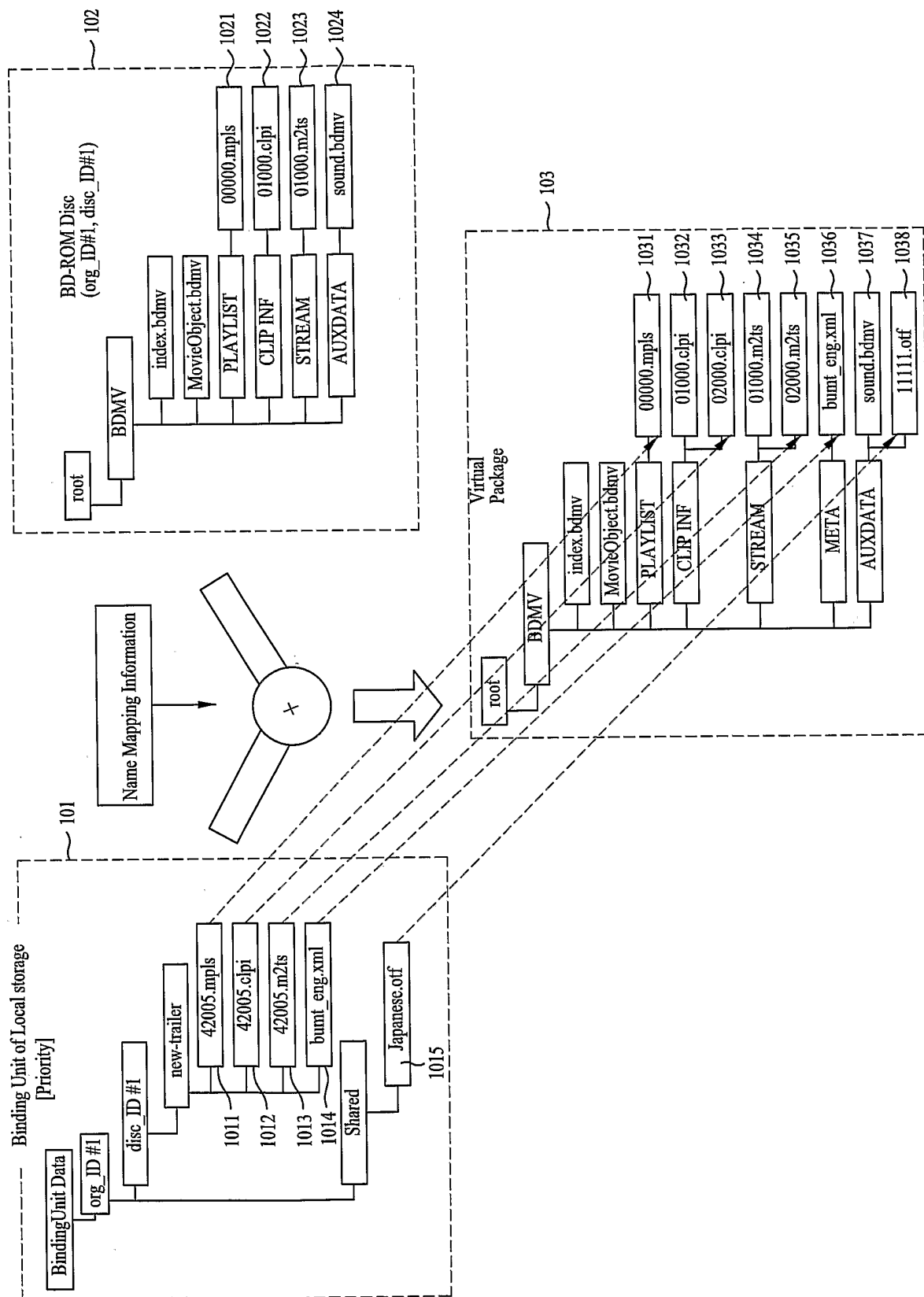
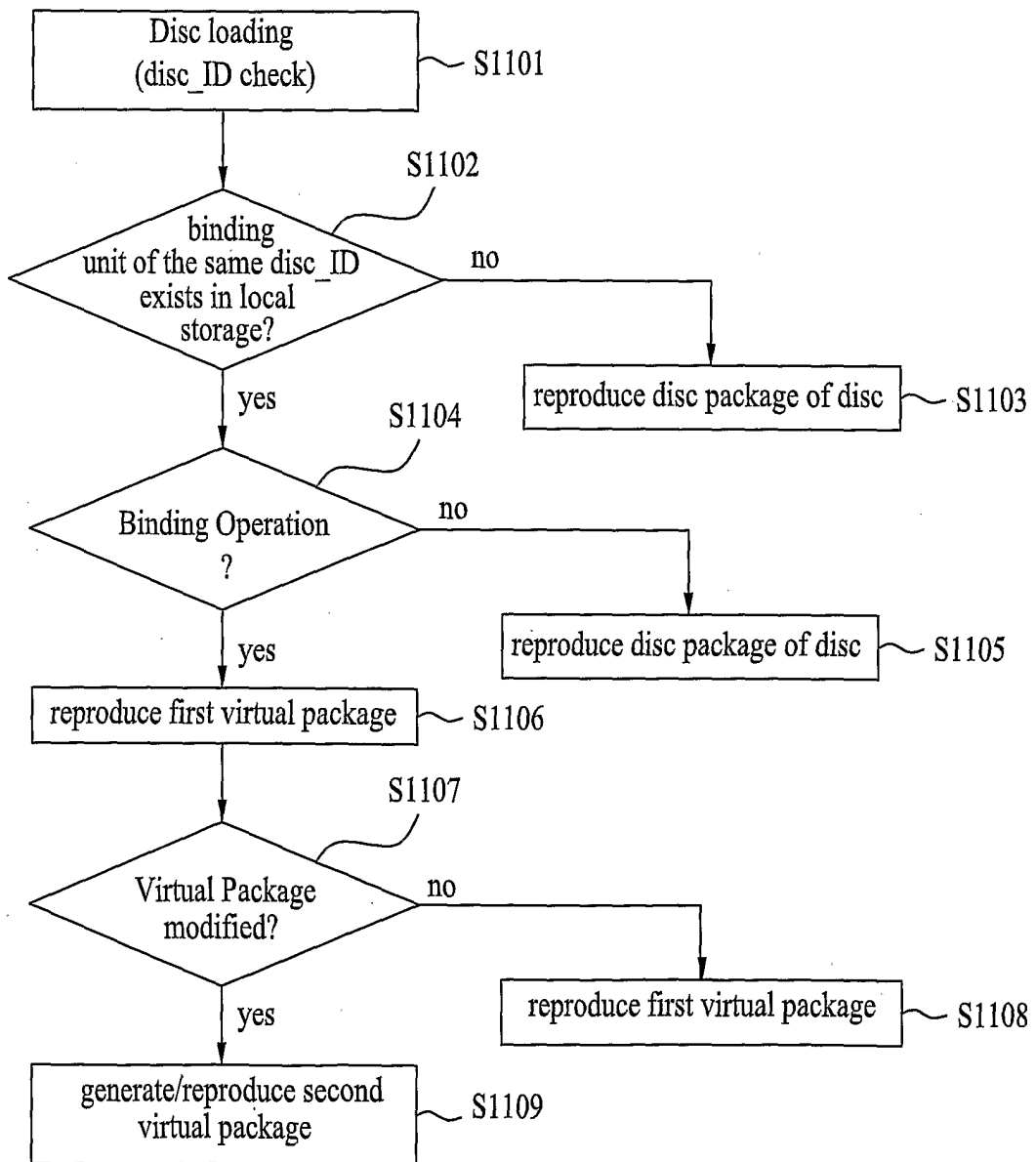


FIG. 11



INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR 2005/004648

A. CLASSIFICATION OF SUBJECT MATTER IPC ^B : G11B 20/10 (2006.01); G11B 27/00 (2006.01) 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) IPC ^B : G11B 20/10, G11B 20/12, G11B 27/00		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched G11B, G06F		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) WPI, INPADOC		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2005/052941 A1 (SONY) 9 June 2005 (09.06.2005) <i>the whole document</i> --	1, 19, 20
A	TW 583538 B (WU) 11 April 2004 (11.04.2004) <i>the whole document</i> --	1, 19, 20
A	WO 2001/067668 A1 (MATSUSHITA) 13 September 2001 (13.09.2001) <i>the whole document</i> ----	1, 19, 20
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> 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 but 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 31 May 2006 (31.05.2006)		Date of mailing of the international search report 16 June 2006 (16.06.2006)
Name and mailing address of the ISA/ AT Austrian Patent Office Dresdner Straße 87, A-1200 Vienna Facsimile No. +43 / 1 / 534 24 / 535		Authorized officer GRÖSSING G. Telephone No. +43 / 1 / 534 24 / 386

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/KR 2005/004648

Patent document cited in search report			Publication date	Patent family member(s)			Publication date
TW	A	583538		none			
WO	A	200167668		none			
WO	A1	2005052941	2005-06-09	JP	A	2005159589	2005-06-16