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(54) **INFORMATION PROCESSING APPARATUS, INFORMATION PROCESSING METHOD AND PROGRAM**

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(57) **ABSTRACT**

An information processing apparatus includes an acquiring unit adapted to acquire preference information representing a user's preference based on an operation given by the user regarding content; a selecting unit adapted to select content and to designate the selected content as an object for copying; and a copying unit adapted to copy the selected content to another information processing apparatus. Further, if the object for copying is copied by the copying unit, the acquiring unit updates the preference information associated with the content of the copied object for copying.

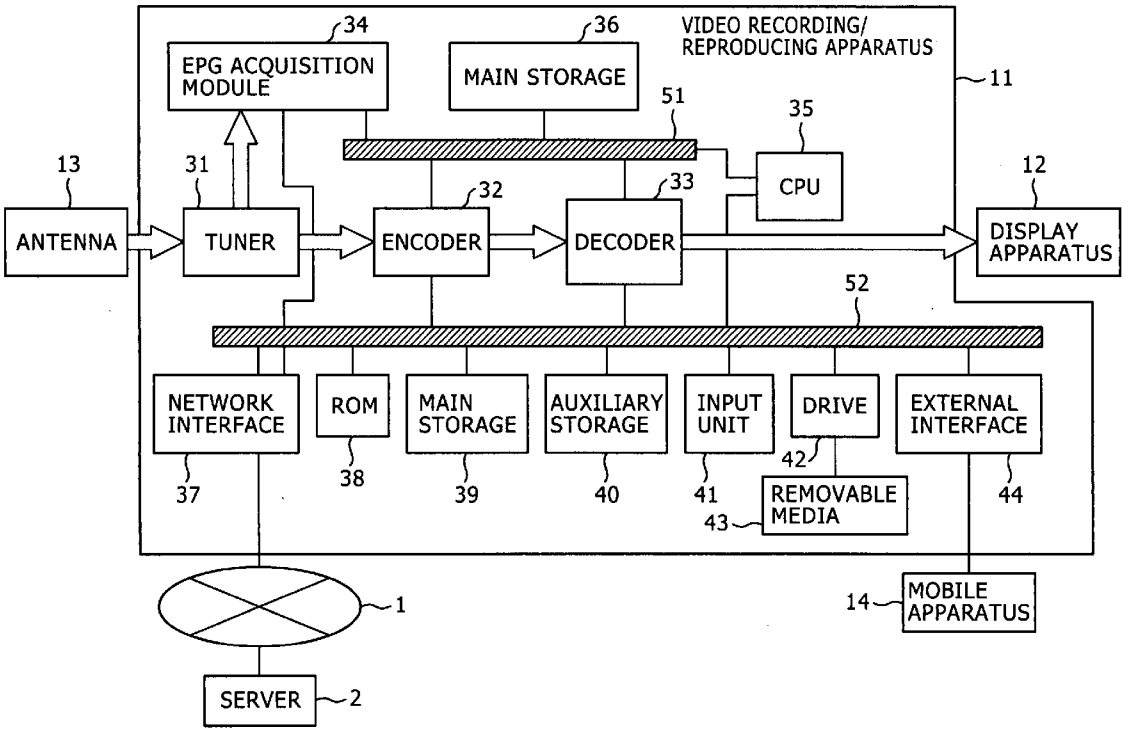


FIG. 1

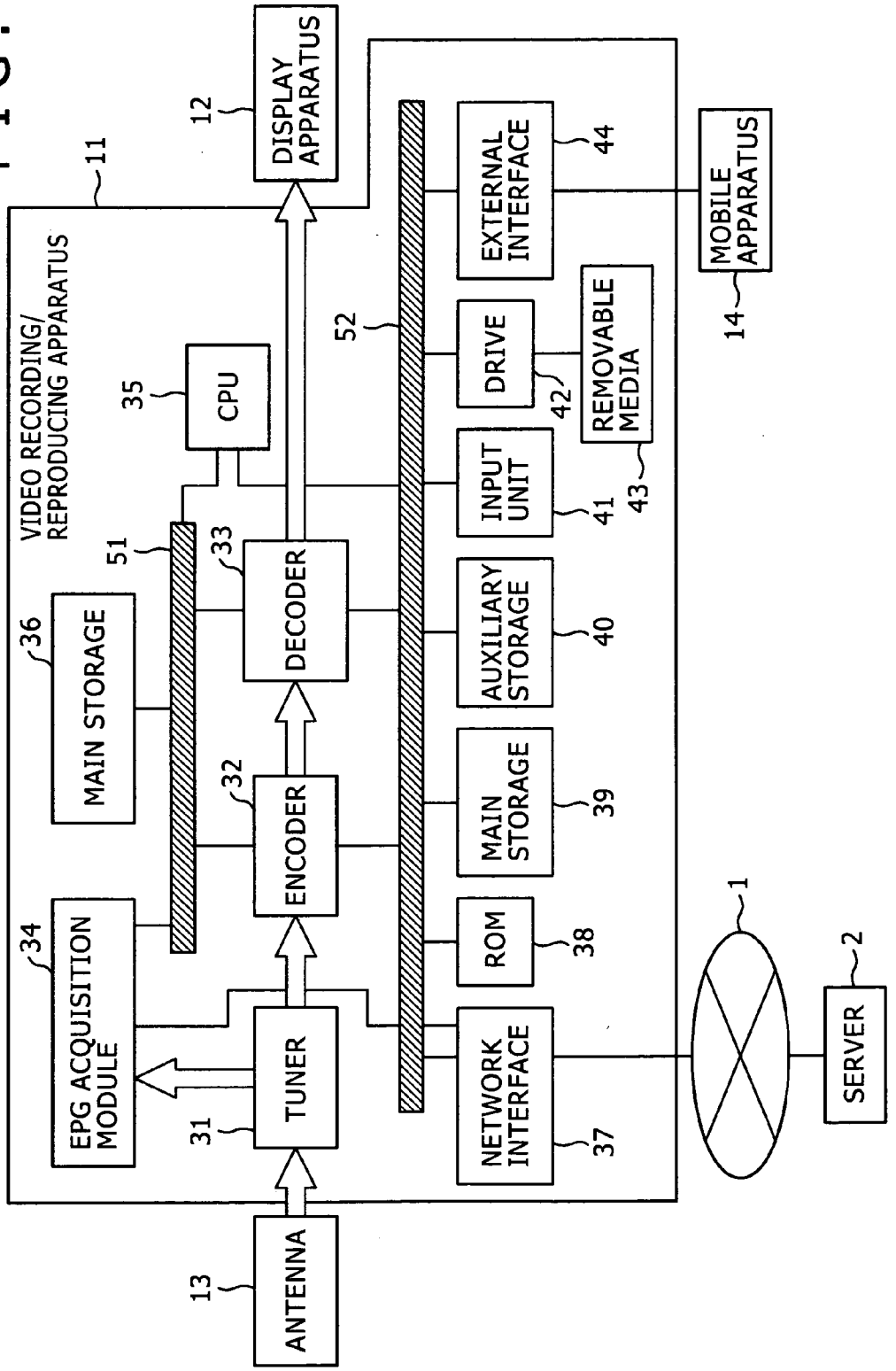

VIDEO RECORDING/
REPRODUCING APPARATUS
11
DISPLAY APPARATUS
12
ANTENNA
13
MOBILE APPARATUS
14
SERVER
2
1
CPU
35
MAIN STORAGE
36
EPG ACQUISITION MODULE
34
TUNER
31
ENCODER
32
DECODER
33
51
52
EXTERNAL INTERFACE
44
DRIVE
42
REMOVABLE MEDIA
43
INPUT UNIT
41
AUXILIARY STORAGE
40
MAIN STORAGE
39
ROM
38
NETWORK INTERFACE
37

FIG. 2

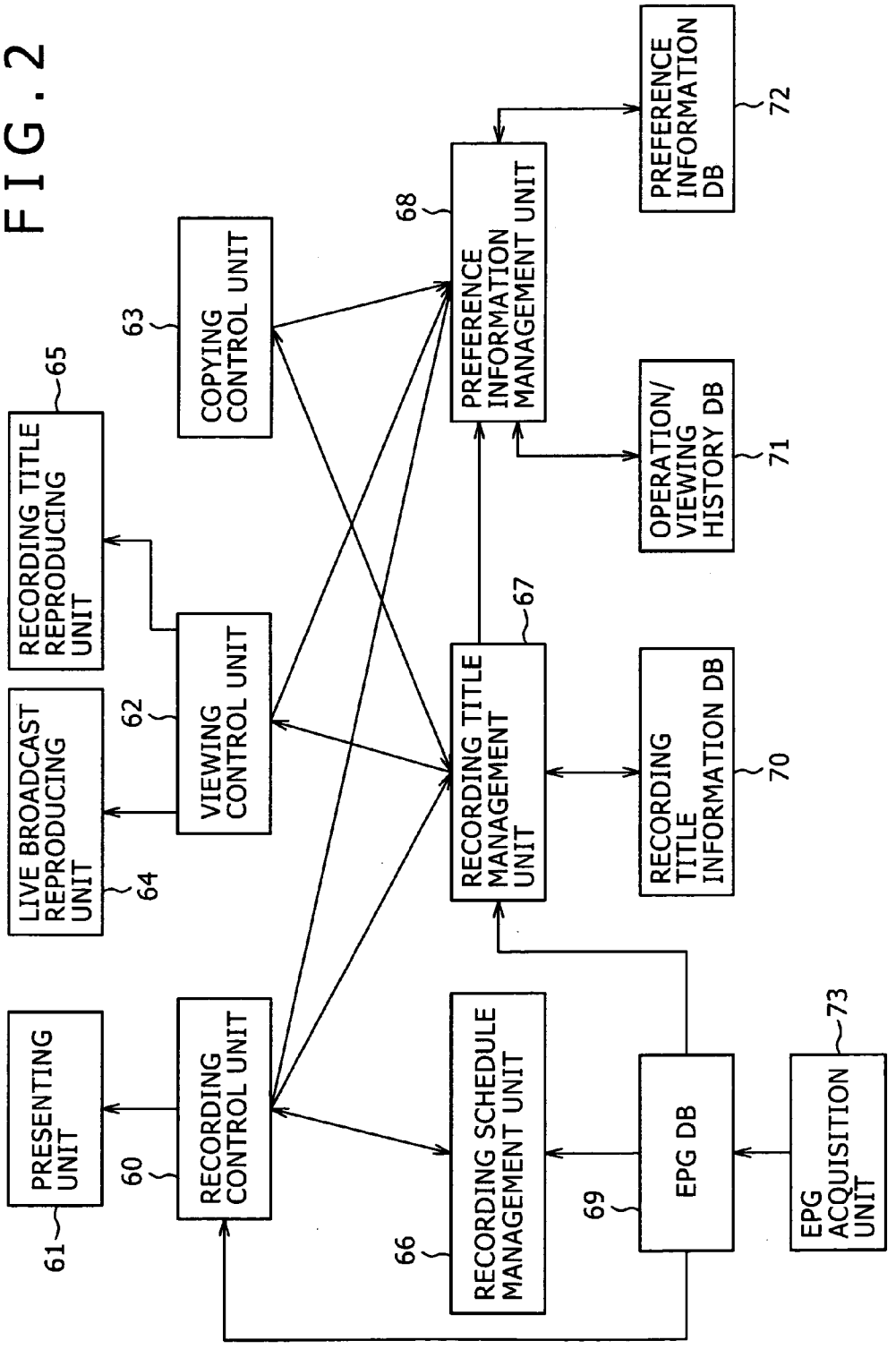

PRESENTING UNIT
61
RECORDING CONTROL UNIT
60
LIVE BROADCAST REPRODUCING UNIT
64
RECORDING TITLE REPRODUCING UNIT
65
VIEWING CONTROL UNIT
62
COPYING CONTROL UNIT
63
RECORDING SCHEDULE MANAGEMENT UNIT
66
EPG DB
69
EPG ACQUISITION UNIT
73
RECORDING TITLE MANAGEMENT UNIT
67
RECORDING TITLE INFORMATION DB
70
PREFERENCE INFORMATION MANAGEMENT UNIT
68
OPERATION/ VIEWING HISTORY DB
71
PREFERENCE INFORMATION DB
72

FIG. 3

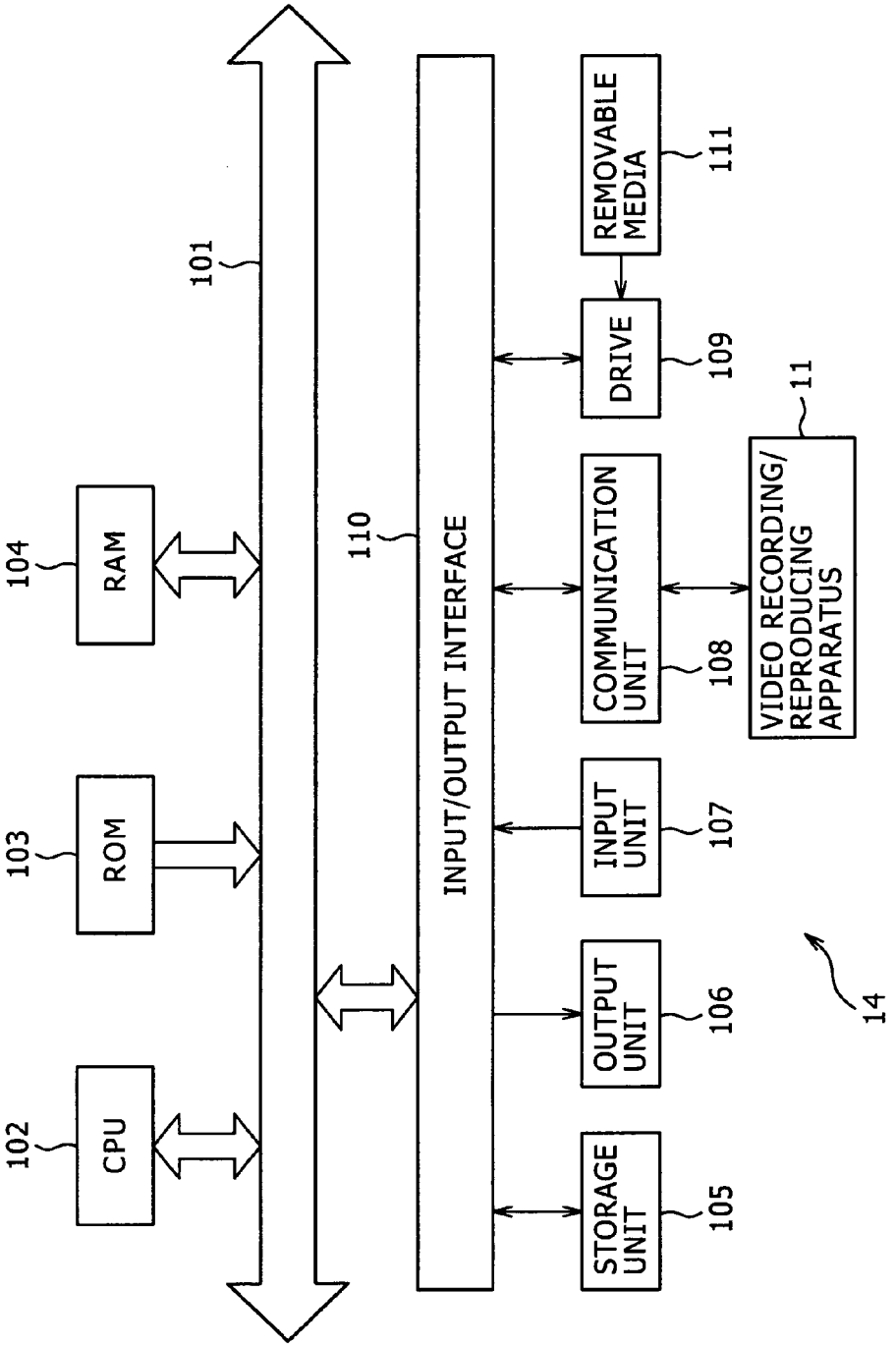

101
CPU
102
ROM
103
RAM
104
110
INPUT/OUTPUT INTERFACE
STORAGE UNIT
105
OUTPUT UNIT
106
INPUT UNIT
107
COMMUNICATION UNIT
108
DRIVE
109
REMOVABLE MEDIA
111
VIDEO RECORDING/ REPRODUCING APPARATUS
11
14

FIG. 4

301

	ATTRIBUTE	CONTENT
311	PROGRAM ID	00000001
312	BROADCAST START TIME	2000/01/01/ 01:00:00
313	BROADCAST END TIME	2000/01/01/ 01:30:00
314	DISTRIBUTION SOURCE	GROUND WAVE BROADCASTING, XX−CH,YYY STATION
315	GENRE	NEWS
316	NAME	ZZZ NEWS
317	CONTENT	AAA
318	CONTENT	BBB

FIG. 5

351

	ATTRIBUTE	CONTENT
361	TITLE ID	00000001
362	CUMULATIVE VIEWING TIME	00:12:00
363	NUMBER OF VIEWING	2
364	NUMBER OF OPERATION	6

FIG. 6

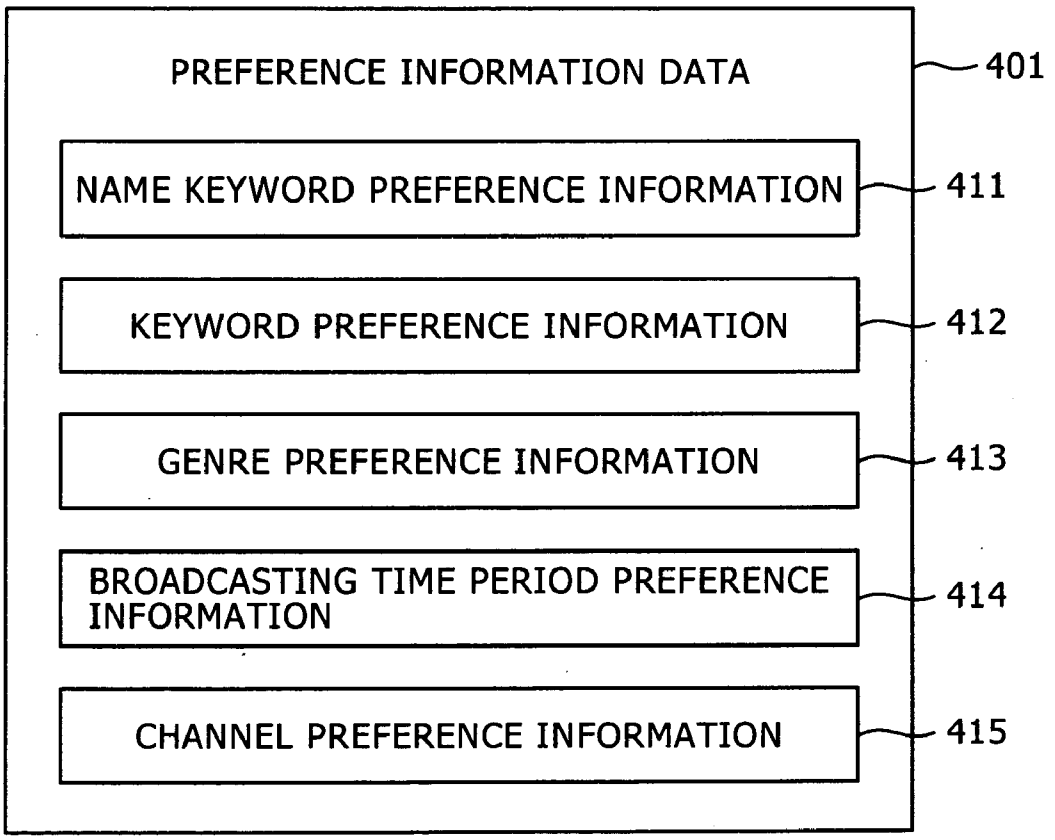

PREFERENCE INFORMATION DATA
401
NAME KEYWORD PREFERENCE INFORMATION
411
KEYWORD PREFERENCE INFORMATION
412
GENRE PREFERENCE INFORMATION
413
BROADCASTING TIME PERIOD PREFERENCE INFORMATION
414
CHANNEL PREFERENCE INFORMATION
415

FIG. 7

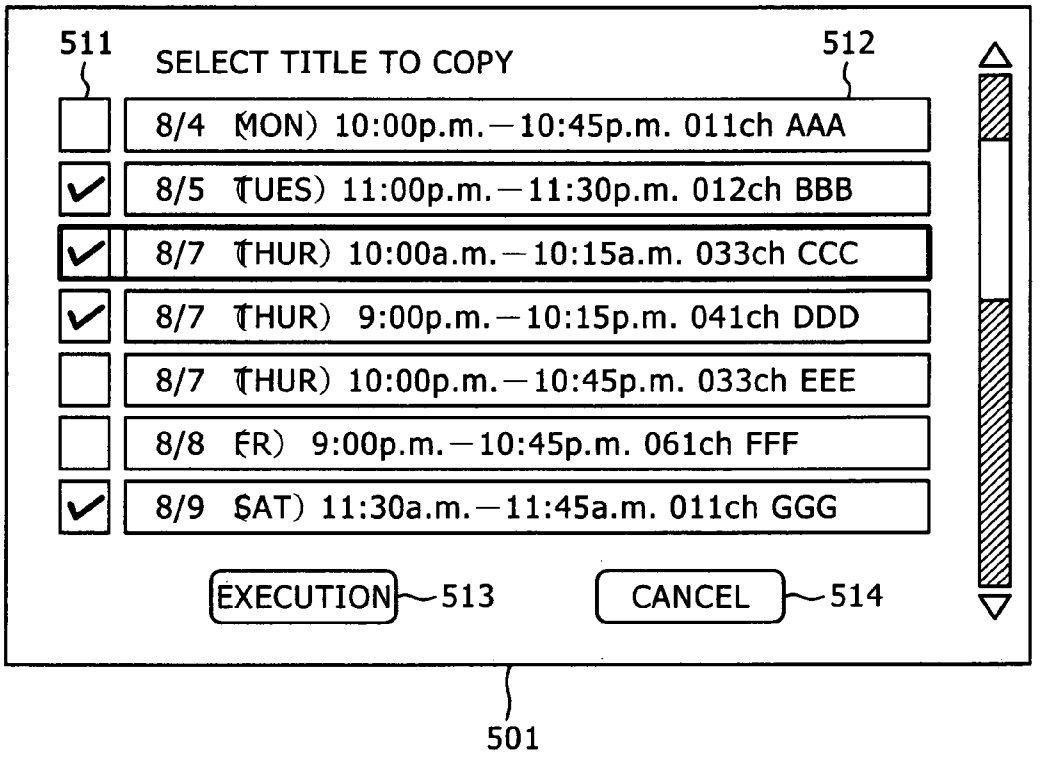

511
SELECT TITLE TO COPY
512
8/4 (MON) 10:00p.m.—10:45p.m. 011ch AAA
8/5 (TUES) 11:00p.m.—11:30p.m. 012ch BBB
8/7 (THUR) 10:00a.m.—10:15a.m. 033ch CCC
8/7 (THUR) 9:00p.m.—10:15p.m. 041ch DDD
8/7 (THUR) 10:00p.m.—10:45p.m. 033ch EEE
8/8 (FR) 9:00p.m.—10:45p.m. 061ch FFF
8/9 (SAT) 11:30a.m.—11:45a.m. 011ch GGG
EXECUTION
513
CANCEL
514
501

FIG. 8

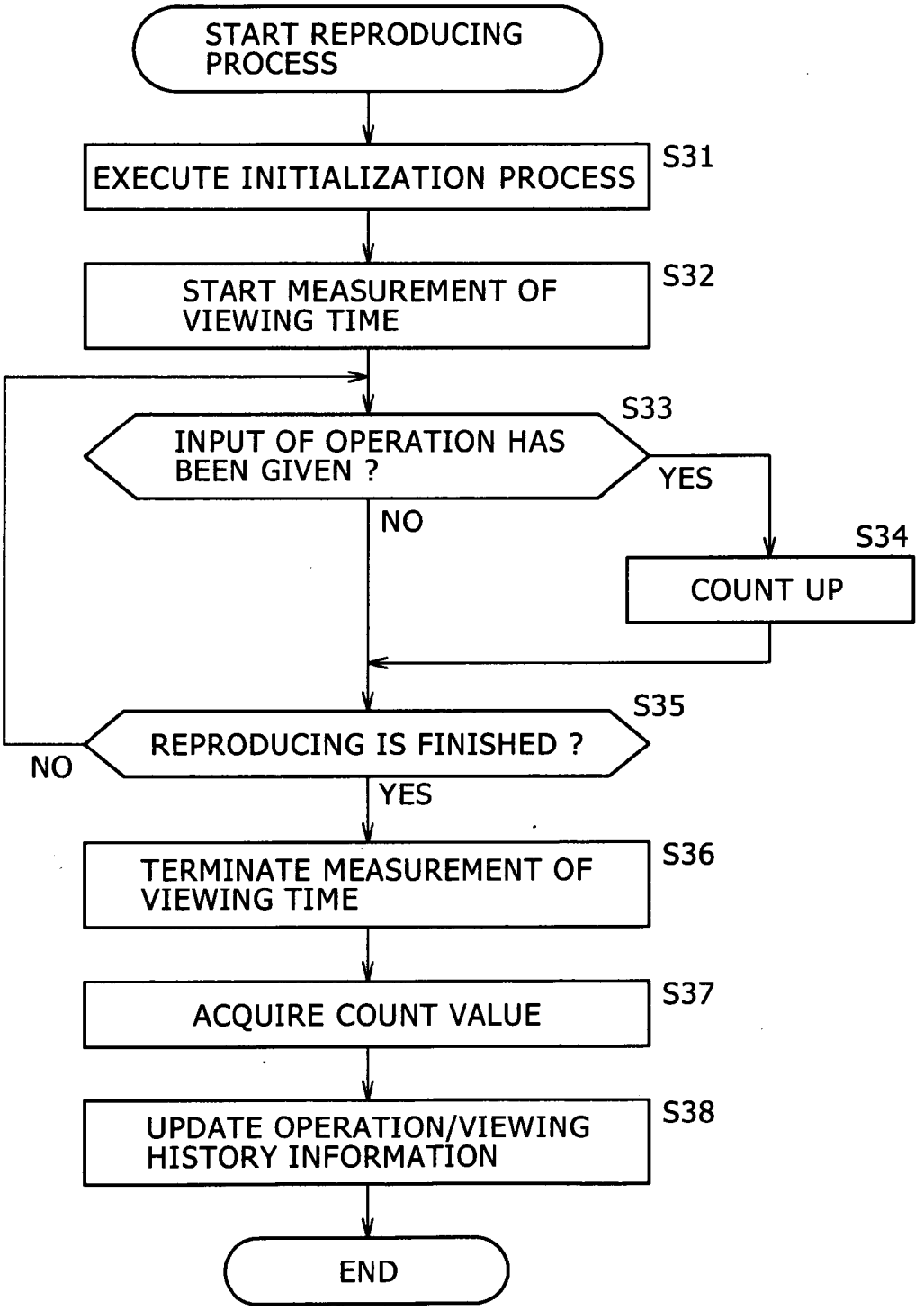

START REPRODUCING PROCESS
EXECUTE INITIALIZATION PROCESS
S31
START MEASUREMENT OF VIEWING TIME
S32
S33
INPUT OF OPERATION HAS BEEN GIVEN ?
YES
NO
S34
COUNT UP
S35
REPRODUCING IS FINISHED ?
NO
YES
TERMINATE MEASUREMENT OF VIEWING TIME
S36
ACQUIRE COUNT VALUE
S37
UPDATE OPERATION/VIEWING HISTORY INFORMATION
S38
END

FIG. 9

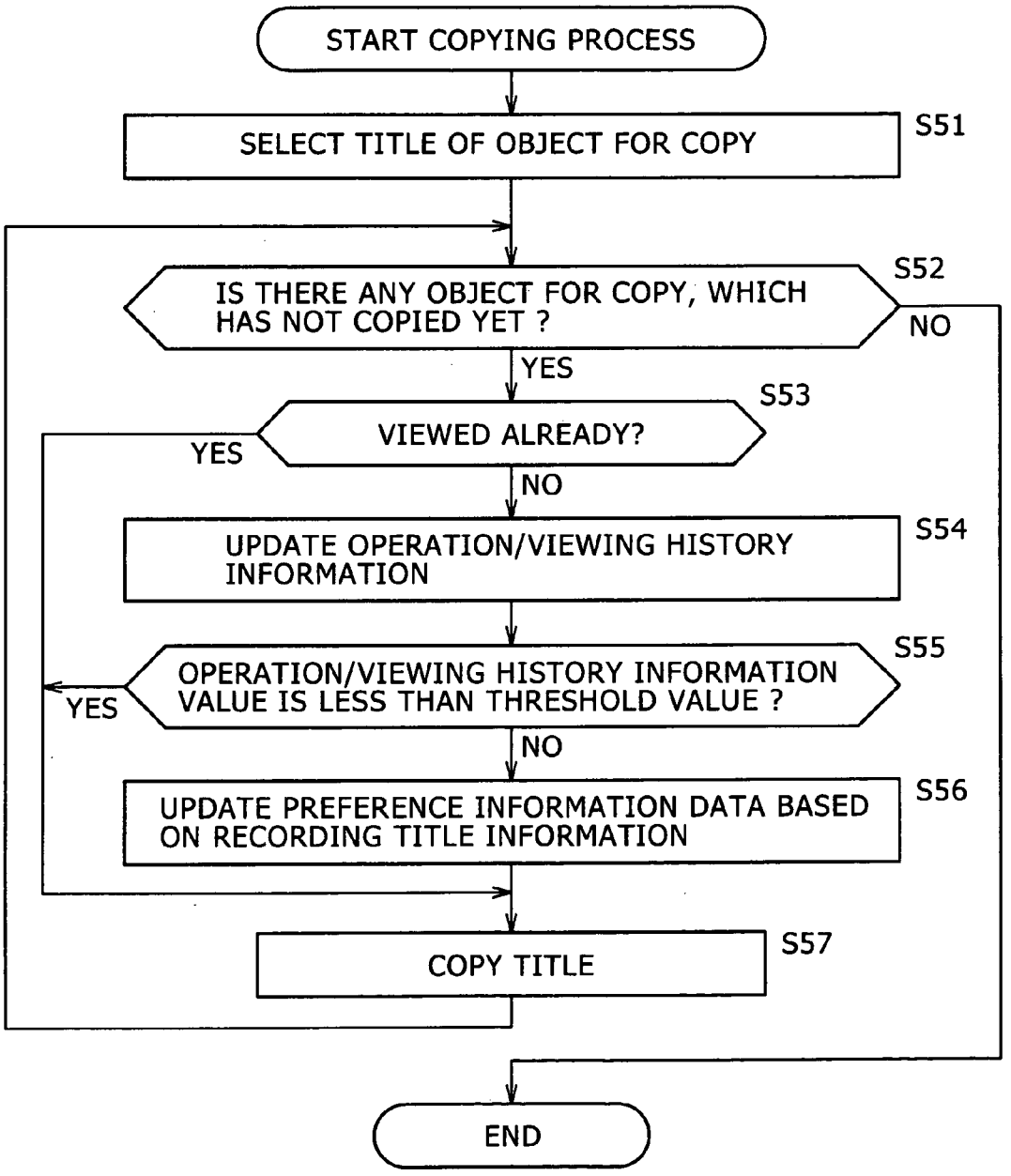

START COPYING PROCESS
SELECT TITLE OF OBJECT FOR COPY
S51
IS THERE ANY OBJECT FOR COPY, WHICH HAS NOT COPIED YET ?
S52
NO
YES
VIEWED ALREADY?
S53
YES
NO
UPDATE OPERATION/VIEWING HISTORY INFORMATION
S54
OPERATION/VIEWING HISTORY INFORMATION VALUE IS LESS THAN THRESHOLD VALUE ?
S55
YES
NO
UPDATE PREFERENCE INFORMATION DATA BASED ON RECORDING TITLE INFORMATION
S56
COPY TITLE
S57
END

FIG. 10

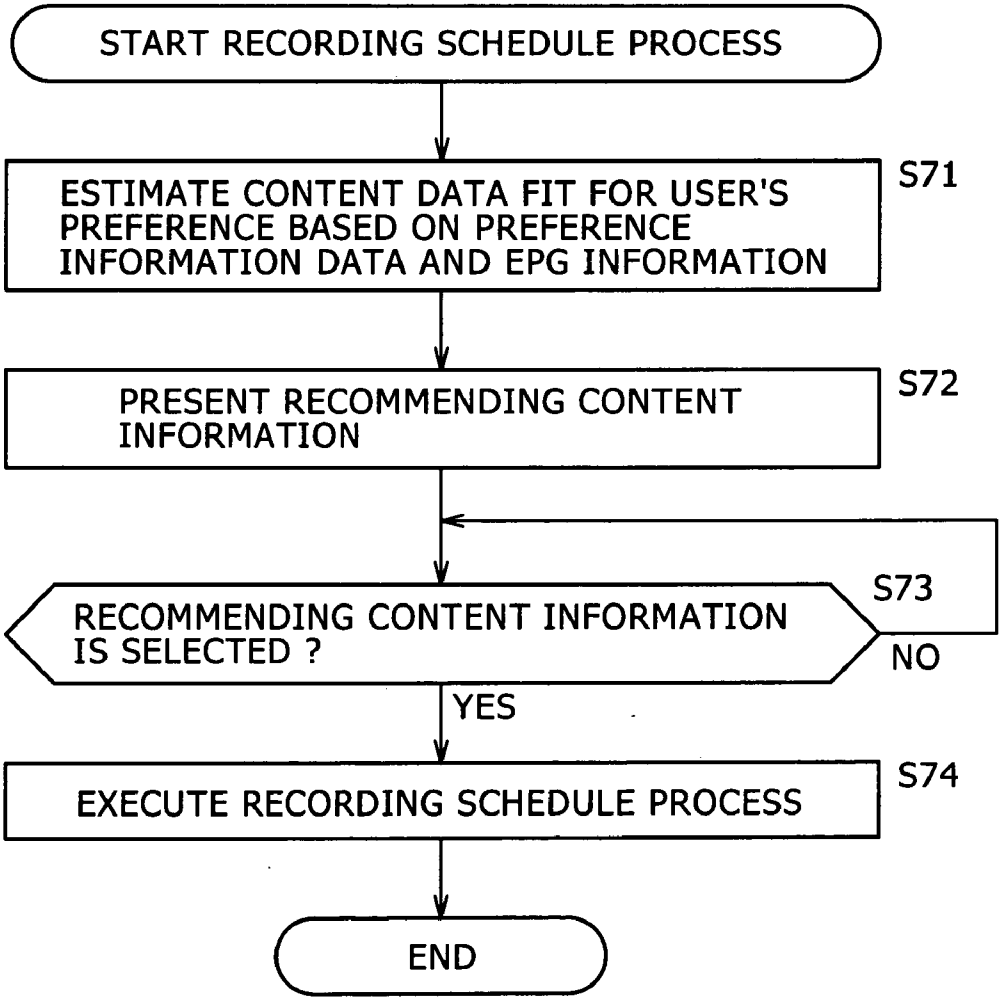

START RECORDING SCHEDULE PROCESS
ESTIMATE CONTENT DATA FIT FOR USER'S PREFERENCE BASED ON PREFERENCE INFORMATION DATA AND EPG INFORMATION
S71
PRESENT RECOMMENDING CONTENT INFORMATION
S72
RECOMMENDING CONTENT INFORMATION IS SELECTED ?
S73
NO
YES
EXECUTE RECORDING SCHEDULE PROCESS
S74
END

FIG. 11

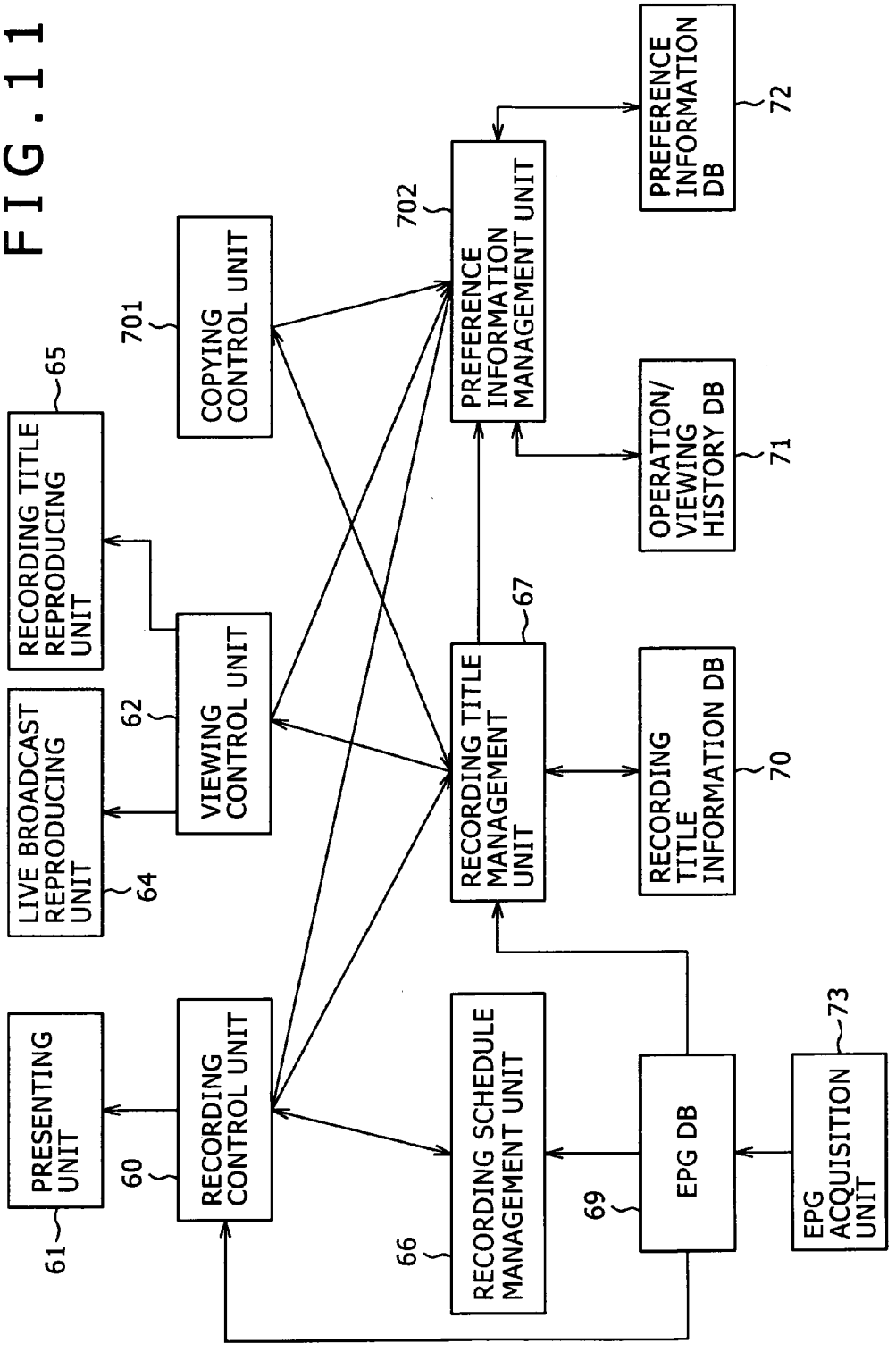

PRESENTING UNIT
61
RECORDING CONTROL UNIT
60
LIVE BROADCAST REPRODUCING UNIT
64
VIEWING CONTROL UNIT
62
RECORDING TITLE REPRODUCING UNIT
65
COPYING CONTROL UNIT
701
RECORDING SCHEDULE MANAGEMENT UNIT
66
EPG DB
69
EPG ACQUISITION UNIT
73
RECORDING TITLE MANAGEMENT UNIT
67
PREFERENCE INFORMATION MANAGEMENT UNIT
702
RECORDING TITLE INFORMATION DB
70
OPERATION/ VIEWING HISTORY DB
71
PREFERENCE INFORMATION DB
72

FIG. 12

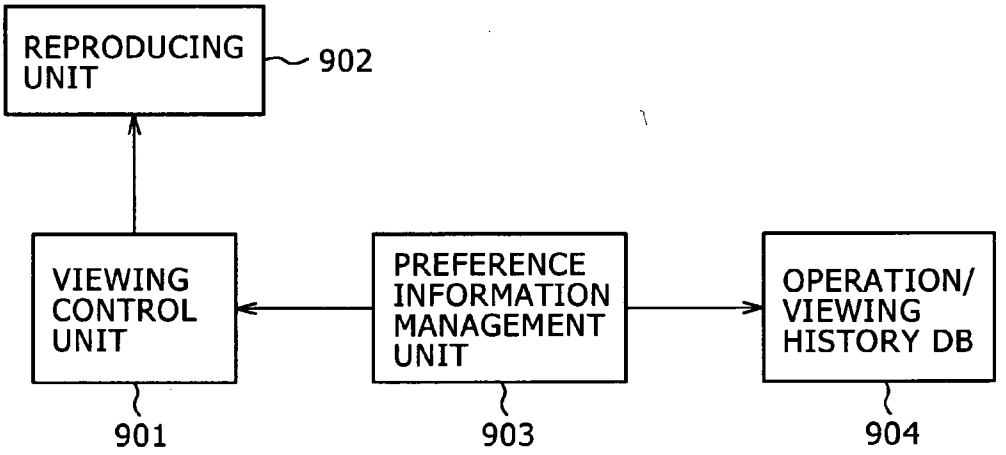

REPRODUCING UNIT
902
VIEWING CONTROL UNIT
PREFERENCE INFORMATION MANAGEMENT UNIT
OPERATION/ VIEWING HISTORY DB
901
903
904

FIG. 13

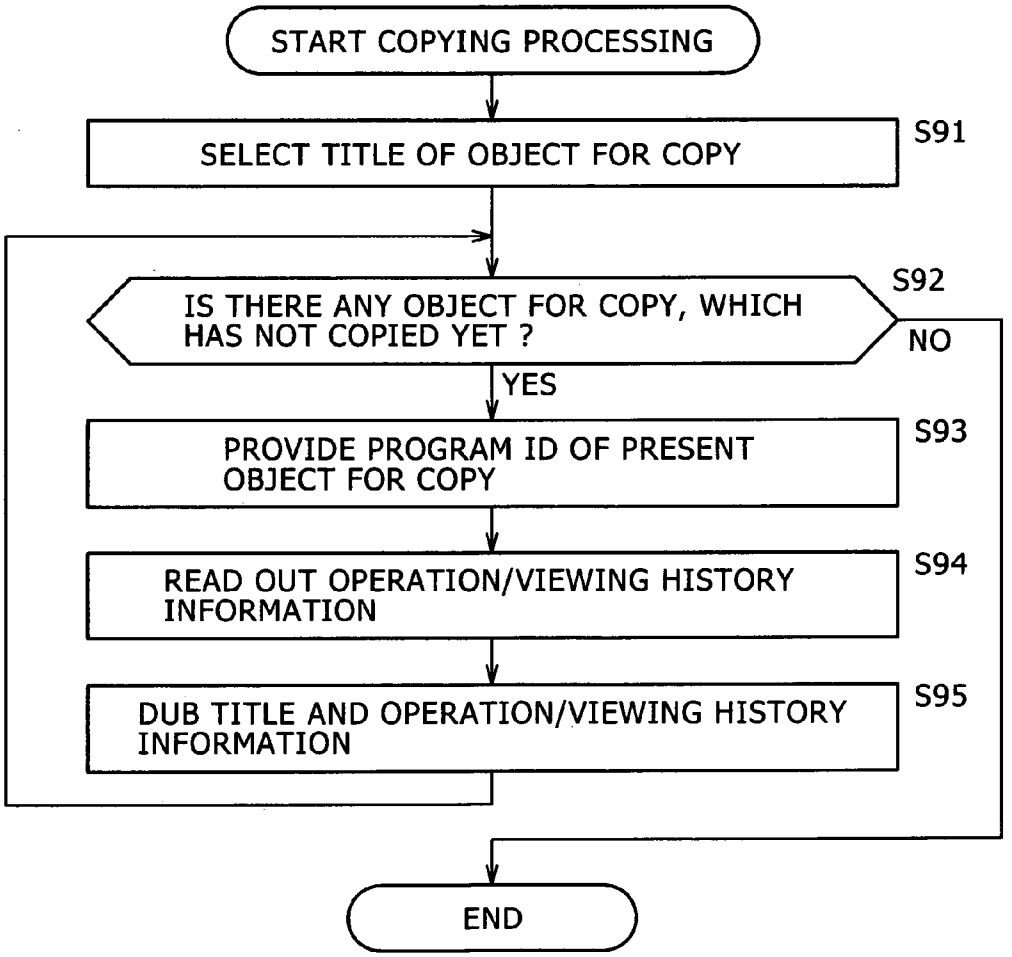
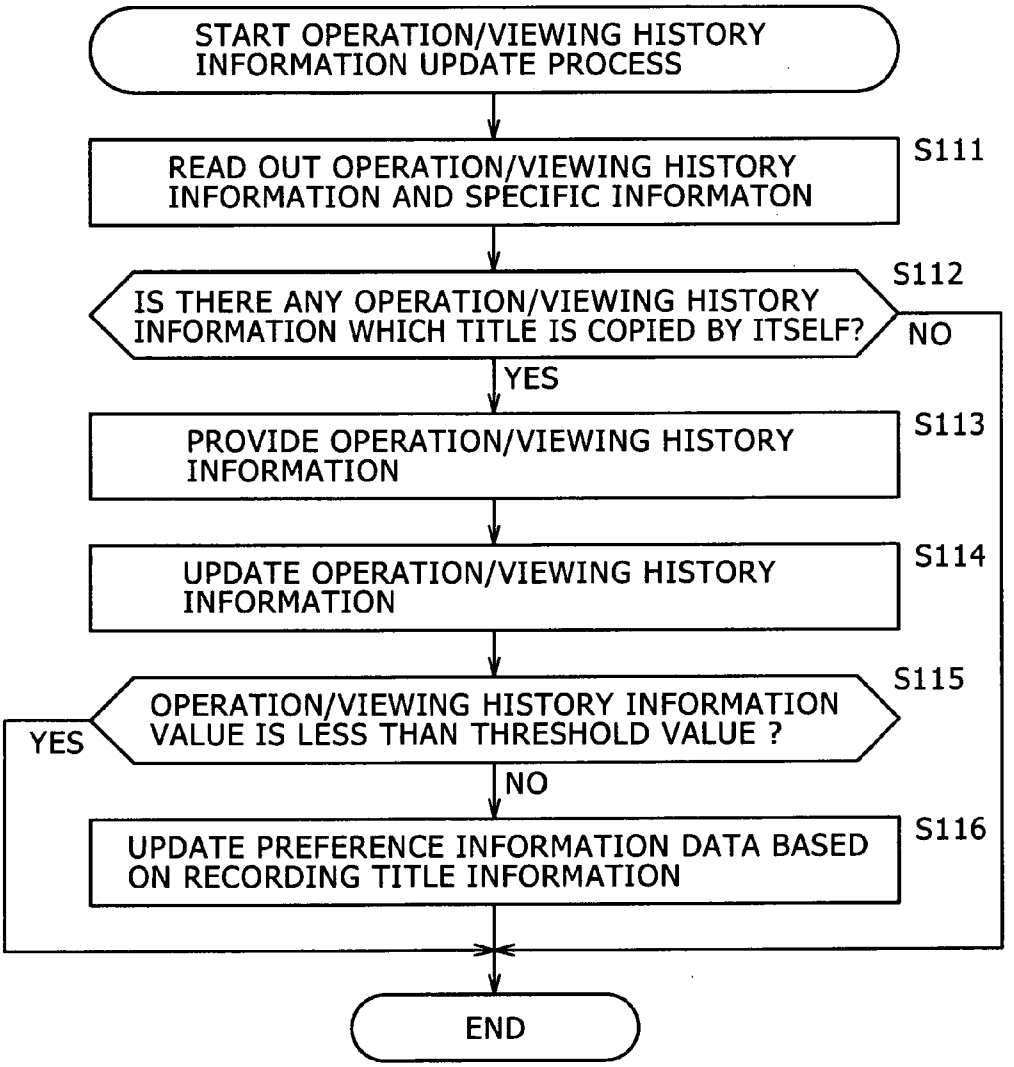

START COPYING PROCESSING
SELECT TITLE OF OBJECT FOR COPY
S91
IS THERE ANY OBJECT FOR COPY, WHICH HAS NOT COPIED YET ?
S92
NO
YES
PROVIDE PROGRAM ID OF PRESENT OBJECT FOR COPY
S93
READ OUT OPERATION/VIEWING HISTORY INFORMATION
S94
DUB TITLE AND OPERATION/VIEWING HISTORY INFORMATION
S95
END

FIG. 14


START OPERATION/VIEWING HISTORY INFORMATION UPDATE PROCESS
READ OUT OPERATION/VIEWING HISTORY INFORMATION AND SPECIFIC INFORMATON
S111
IS THERE ANY OPERATION/VIEWING HISTORY INFORMATION WHICH TITLE IS COPIED BY ITSELF?
S112
NO
YES
PROVIDE OPERATION/VIEWING HISTORY INFORMATION
S113
UPDATE OPERATION/VIEWING HISTORY INFORMATION
S114
OPERATION/VIEWING HISTORY INFORMATION VALUE IS LESS THAN THRESHOLD VALUE ?
S115
YES
NO
UPDATE PREFERENCE INFORMATION DATA BASED ON RECORDING TITLE INFORMATION
S116
END

INFORMATION PROCESSING APPARATUS, INFORMATION PROCESSING METHOD AND PROGRAM

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The present application claims priority from Japanese Patent Application No. JP 2005-260313 filed on Sep. 8, 2005, the disclosure of which is hereby incorporated by reference herein.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The present invention relates to an information processing apparatus, an information processing method and a program, and more particularly, to an information processing apparatus, an information processing method and a program that are all adaptable to acquire preference information representing user's preference with higher accuracy when content is copied to a another apparatus.

[0004] 2. Description of Related Art

[0005] In recent years, a content player adapted to record content of television broadcasting programs etc. with a large capacity recording medium such as a hard disk incorporated is in widespread use.

[0006] Among the content players of this type, there is available a player which acquires user's preference information from a history (or an operation history) of operations (such as rewinding and fast-forwarding, for instance) given by a user in the course of replay (or viewing) of content and a viewing history of the content, so as to perform presentation and automated recording or replay of the content estimated to be fit for user's preference based on the acquired preference information (See Japanese Patent Application Publication Numbers 2005-160114, 2005-80013, 2003-23589, for instance).

[0007] Further, in the content player, content is copied (moved) to a removable media such as a DVD-R/RW (Digital Versatile Disk Recordable/Rewritable) and a DVD+R/RW.

[0008] Recently, viewing of content at outdoors etc. has become possible by copying (dubbing) the content to a mobile-type player through an external I/F (Interface) such as a USB (Universal Serial Bus) interface, and by carrying around the mobile-type player.

[0009] However, if the content is once copied from the content player to the mobile-type player, the user may use the mobile-type player more than the content player to watch the copied content. Accordingly, an inadequate amount of the operation and/or viewing history may be stored in the content player.

[0010] Further, in a case where content, which is allowed to have one authorized copy for protection of a copyright (or copy-once-content), is to be copied, the content and/or content-related information contained in the content player is erased (or moved) when copying of the content is finished. Accordingly, after the content have been once copied, no the operation and/or viewing history of the once copied content is stored.

[0011] As a result, accuracy of the preference information acquired from the operation and/or viewing history of the content decreases. Thus, it becomes difficult to present appropriate content estimated to fit for the user's preference as recommending content based on the acquired preference information.

[0012] Accordingly, it is desirable to acquire preference information representing user's preference with higher accuracy. The present invention addresses this issue.

SUMMARY OF THE INVENTION

[0013] An information processing apparatus according to one aspect of the present invention includes an acquiring unit adapted to acquire preference information representing a user's preference based on an operation given by the user regarding content; a selecting unit adapted to select content and to designate the selected content as an object for copying; and a copying unit adapted to copy the selected content to another information processing apparatus. Further, if the object for copying is copied by the copying unit, the acquiring unit updates the preference information associated with the content of the copied object for copying.

[0014] The information processing apparatus may further include an estimating unit adapted to estimate the content fit for the user's preference based on the preference information; and a presenting unit adapted to present to the user information relating to the estimated content.

[0015] The information processing apparatus may further include a receiving unit adapted to receive the estimated content; and a recording controller unit adapted to cause the received content to be recorded.

[0016] The acquiring unit may be adapted to acquire the preference information based on a number of operations representing a number at which the operation was given by the user in the course of replay of the content, a number of viewings of the content and a viewing time of the content.

[0017] The information processing apparatus may further include a deciding unit adapted to decide whether the content that is an object for copying has been viewed, wherein if a result of the decision by the deciding unit is that the content that is an object for copying has not been viewed, the acquiring unit estimates the number of operations, the number of viewings or the viewing time of the content of the object for copying in the another information processing apparatus, and updates the preference information based on the estimated number of operations, number of viewings or viewing time.

[0018] The information processing apparatus may further include a receiving unit adapted to receive the number of operations, the number of viewings or the viewing time of the content of the object for copying from the another information processing apparatus. Further, the acquiring unit updates the preference information based on the number of operations, the number of viewings or the viewing time received by the receiving unit.

[0019] In the information processing apparatus, an increase/decrease change range of a value in the number of operations, the number of viewings, or the viewing time for the content that is the object of copying in the another apparatus, which are estimated by the acquiring unit, may be

changed depending on still another information processing apparatus to which the copied object for copying is sent.

[0020] An information processing method according to one aspect of the present invention includes acquiring preference information representing a user's preference based on an operation given by the user regarding content; selecting content that is an object for copying; copying the selected content to another information processing apparatus; and updating the preference information associated with the content of the copied object for copying if the object for copying is copied.

[0021] A program according to one aspect of the present invention causes a computer to perform an information processing method, the method including acquiring preference information representing a user's preference based on an operation given by the user regarding content; selecting content that is an object for copying; copying the selected content to another information processing apparatus; and updating the preference information associated with the content of the copied object for copying if the object for copying is copied.

[0022] In the above aspect of the present invention, the preference information representing the user's preference is acquired based on the operation given by the user to the content, the content that is an object for copying is selected, the selected content is copied to the another information processing apparatus, and if the object for copying is copied, the preference information associated with the content of the copied object for copying is updated.

[0023] As described the above, according to the present invention, it is possible to acquire the preference information representing the user's preference.

[0024] Further, according to the present invention, it is also possible to acquire the user's preference information with higher accuracy.

BRIEF DESCRIPTION OF THE DRAWINGS

[0025] The features and advantages of the present invention will become more apparent in the following description of presently preferred embodiments of the invention taken in conjunction with the accompanying drawings, in which:

[0026] FIG. **1** is a block diagram showing a configuration example of one embodiment of a video recording/reproducing apparatus to which the present invention is applied;

[0027] FIG. **2** is a block diagram showing a functional configuration example of a video recording/reproducing apparatus;

[0028] FIG. **3** is a block diagram showing a hardware configuration example of a mobile apparatus;

[0029] FIG. **4** is a view showing an example of program identification information;

[0030] FIG. **5** is a view showing an example of operation/viewing history information;

[0031] FIG. **6** is a view showing an example of preference information data;

[0032] FIG. **7** is a view showing an example of selection display;

[0033] FIG. **8** is a flowchart for illustrating reproducing process;

[0034] FIG. **9** is a flowchart for illustrating copying process;

[0035] FIG. **10** is a flowchart for illustrating recording schedule process;

[0036] FIG. **11** is a block diagram showing another functional configuration example of a video recording/reproducing apparatus;

[0037] FIG. **12** is a block diagram showing a functional configuration example of the mobile apparatus;

[0038] FIG. **13** is a flowchart for illustrating copying process; and

[0039] FIG. **14** is a flowchart for illustrating operation/viewing history information update process.

DETAILED DESCRIPTION

[0040] While embodiments of the present invention are now described, it is to be understood that the following is one illustration on a correspondence between constitutional requirements of the present invention and the embodiments contained in a present specification or drawings. This is a description to ascertain that the embodiments adapted to support the present invention are contained in the present specification or drawings. Thus, although there is any other embodiment not shown herein as that meeting the constitutional requirements of the present invention, while contained in the present specification or drawings, it is not to be construed that this embodiment is referred to that meeting no constitutional requirements of the present invention. Conversely, although the embodiment shown herein is that meeting the constitutional requirements, it is not to be construed that this embodiment is referred to that meeting no constitutional requirements other than the above.

[0041] Firstly, an information processing apparatus according to one aspect of the present invention includes an acquiring unit (or a preference information management unit **68** in FIG. **2**, for instance) for acquiring, based on an operation given by a user regarding content, preference information representing user's preference; a selecting unit (or a copying control unit **63** in FIG. **2** to perform processing in a step S**51** in FIG. **9**, for instance) for selecting content to be copied (object for copy); and a copying unit (or the copying control unit **63** in FIG. **2** to perform processing in a step S**57** in FIG. **9**, for instance) for copying the selected content obtained by the selecting unit to another information processing apparatus, wherein if the object for copy is copied by the copying unit, the acquiring unit updates (or processing in a step S**56** in FIG. **9**, for instance) the preference information associated with the content of the copied object for copy.

[0042] Secondly, the information processing apparatus according to one aspect of the present invention further includes an estimating unit (or a recording control unit **60** in FIG. **2**, for instance) for estimating the content fit for the user's preference; and a presenting unit (or a presenting unit **61** in FIG. **2**, for instance) for presenting, to the user, the information associated with the content estimated by the estimating unit.

[0043] Thirdly, the information processing apparatus according to one aspect of the present invention further includes a receiving unit (or a tuner **31** in FIG. **1**, for instance) for receiving the estimated content obtained by the estimating unit; and a recording controller unit (or the recording control unit **60** in FIG. **2**, for instance) for causing the received content obtained by the receiving unit to be recorded.

[0044] The information processing apparatus according to one aspect of the present invention allows the acquiring unit to acquire the preference information based on the number of operation representing a number at which the operation was given by the user during replay of the content, the number of viewing of the content and a viewing time of the content (or operation/viewing history information **351** in FIG. **5**, for instance).

[0045] Fourthly, the information processing apparatus according to one aspect of the present invention further includes a deciding unit (or the preference information management unit **68** in FIG. **2** to perform processing in a step S**53** in FIG. **9**, for instance) for deciding based on the number of viewing whether or not the content that is an object for copy is viewed, wherein if a result of decision by the deciding unit is that the content that is an object for copy is not viewed, the acquiring unit estimates the number of operation, the number of viewing or the viewing time of the content of the object for copy in the another information processing apparatus, and updates the preference information based on the estimated number of operation, number of viewing or viewing time.

[0046] Fifthly, the information processing apparatus according to one aspect of the present invention further includes a receiving unit (or a copying control unit **701** in FIG. **11** to perform processing in a step S**111** in FIG. **14**, for instance) for receiving, from the another information processing apparatus, the number of operation, the number of viewing or the viewing time of the content of the object for copy in the another information processing apparatus, wherein the acquiring unit updates (or processing in a step S**144** in FIG. **14**, for instance) the preference information based on the number of operation, the number of viewing or the viewing time received by the receiving unit.

[0047] An information processing method or a program according to one aspect of the present invention includes: acquiring (or the step S**56** in FIG. **9**, for instance), based on an operation given by a user regarding content, preference information representing user's preference; a selecting (or the step S**51** in FIG. **9**, for instance) content that is an object for copy; copying (or the step S**57** in FIG. **9**, for instance) the selected content to another information processing apparatus; and updating (or the step S**56** in FIG. **9**, for instance) the preference information associated with the content of the copied object for copy if the object for copy is copied.

[0048] Specific embodiments to which the present invention is applicable are now described in detail with reference to accompanying drawings.

[0049] FIG. **1** is a block diagram showing a configuration example of one embodiment of a video recording/reproducing apparatus **11** to which the present invention is applicable.

[0050] Referring to FIG. **1**, a server **2** is connected to the video recording/reproducing apparatus **11** through a network **1** formed with Internet, a WAN (Wide Area Network) or a LAN (Local Area Network) etc.

[0051] The server **2** provides broadcasting program information (or EPG (Electric Program Guide) information) and/or network-delivered content data for the video recording/reproducing apparatus **11** through the network **1**. It is to be noted that the EPG information includes information such as information representing a broadcasting schedule of programs and information used to identify the programs (which is hereinafter referred to as program identification information).

[0052] Further, a display apparatus **12**, an antenna **13** and a mobile apparatus **14** are all connected to the video recording/reproducing apparatus **11**. The video recording/reproducing apparatus **11** receives a broadcast wave of a program through the antenna **13**, permitting program content data obtained by demodulating the received broadcast wave to be recorded and/or displayed on the display apparatus **12** after being supplied thereto. Further, the video recording/reproducing apparatus **11** also permits the recorded program content data etc. to be copied to the mobile apparatus **14**.

[0053] The video recording/reproducing apparatus **11** includes the tuner **31**, an encoder **32**, a decoder **33**, an EPG acquisition module **34**, a CPU (Central Processing Unit) **35**, a main storage device **36**, a network interface **37**, a ROM (Read Only Memory) **38**, a main storage device **39**, an auxiliary storage device **40**, an input unit **41**, a drive **42**, an external interface **44**, and two buses **51** and **52**.

[0054] The tuner **31**, the encoder **32**, the decoder **33**, the EPG acquisition module **34**, the network interface **37**, the auxiliary storage device **40** and the input unit **41** are all connected to the bus **52**.

[0055] The tuner **31** demodulates the program's broadcast wave having been received through the antenna **13**, causing the resultant program content data to be outputted to the encoder **32**. There are some cases where the EPG information (or the broadcasting program information) is contained in a vertical blanking period of a telecast signal of the program's broadcast wave received through the antenna **13**. If this is the case, the tuner **31** extracts the contained EPG information, before outputting to the EPG acquisition module **34**.

[0056] The network interface **37** performs interfacing with the network **1**. For instance, the network interface **37** acquires the content data through the network **1**, causing the acquired content data to be supplied to the encoder **32** through the bus **52**. Further, the network interface **37** is also adapted to acquire the EPG information (which may be not only the EPG information of the content data acquired through the network **1** but also the EPG information of the program corresponding to the broadcast wave received through the antenna **13**) through the network **1**, causing the acquired EPG information to be supplied to the EPG acquisition module **34** through the bus **52**.

[0057] The encoder **32** encodes, in a MPEG (Moving Picture Experts Group) manner, for instance, the supplied program content data from the tuner **31** or the supplied content data from the network interface **37**, causing the encoded content data to be stored in the auxiliary storage device **40** after being supplied thereto through the bus **52**.

[0058] The auxiliary storage device **40** has a recording medium of a size providing a sufficient storage capacity, such as a hard disk, a magnetic tape, a removable disk and a flash memory, and permits the supplied content data from the encoder through the bus **52** to be stored in a storage area. It is to be noted that the content data stored in the auxiliary storage device **40** is generally referred to as a title. Further, the auxiliary storage device **40** is also adapted for storage of programs and/or data etc. supplied after being read from the removable media **43** mounted to the drive **42** described later, causing the stored programs and/or the data to be supplied to the main storage device **36** or **39** etc. based on a request from the CPU (Central Processing Unit) **35** etc.

[0059] The stored title in the auxiliary storage device **40** is outputted to the decoder **33** through the bus **52** based on an external request from the CPU **35** etc. to the auxiliary storage device **40**, for instance, and is then decoded in the MPEG manner before being supplied to the display apparatus **12**. It is to be noted that if the received program content data in the auxiliary storage **40** is not stored, the encoder **32** and the decoder **33** may also output, to the display apparatus **12**, the outputted program content data from the tuner **31** as it is.

[0060] The EPG acquisition module **34** causes the supplied EPG information from the tuner **31** or the network interface **37** to be stored in the main storage device **36** or **39** etc. after being supplied thereto through the bus **52**.

[0061] The input unit **41** includes units such as a keyboard, a mouse, a microphone and a receiving unit for receiving a command transmitted from a remote controller (not shown), and accepts a command from the user, causing the accepted command to be supplied to the CPU **35**.

[0062] The CPU **35**, the ROM **38** and the main storage device **39** formed with a RAM (Random Access Memory) etc., for instance, are also connected to the bus **52**. Programs, data or parameters required for the CPU **35** to perform various types of processing (such as processing to control the whole video recording/reproducing apparatus **11**, for instance) are properly stored in the main storage device **39**. Programs to be run by the CPU **35** are contained in the ROM **38**.

[0063] Further, the external interface **44** required for interfacing with the mobile apparatus **14** is also connected to the bus **52**. The external interface **44** is formed with a USB interface etc., for instance, and permits the title to be copied to the mobile apparatus **14** by, after reading out the title from the auxiliary storage **40**, transmitting the read title to the mobile apparatus **14** through a wired or wireless means.

[0064] Further, the drive **42** is also connected to the bus **52**, and is provided with the removable media **43** such as the magnetic disk, the optical disk, a magneto-optical disk and a semiconductor memory at need. A read computer program from the removable media is installed into the auxiliary storage device **40** at need. It is to be noted that the drive **42** may also acquire the content data from the removable media **43**, causing the acquired content data to be supplied to the encoder **32**.

[0065] The CPU **35** is also connected to the bus **51**, together with the encoder **32**, the decoder **33**, the EGP acquisition module **34** and the main storage device **36**. The main storage device **36** is formed with the RAM etc., in which programs, data or parameters required for the CPU **35** to perform various types of processing such as control processing relating to recording schedule and video recording based on the EGP information are properly stored.

[0066] FIG. **2** is a block diagram showing a functional configuration example with emphasis placed on a software configuration of the video recording/reproducing apparatus **11** shown in FIG. **1**.

[0067] The video recording/reproducing apparatus **11** shown in FIG. **2** includes the recording control unit **60**, the presenting unit **61**, a viewing control unit **62**, the copying control unit **63**, a live broadcast reproducing unit **64**, a recording title reproducing unit **65**, a recording schedule management unit **66**, a recording title management unit **67**, the preference information management unit **68**, an EPG DB **69**, a recording title information DB **70**, an operation/viewing history DB **71** and a preference information DB **72**.

[0068] It is to be noted that the EPG DB **69** is equivalent to the main storage device **39** in FIG. **1**, while the recording title information DB **70**, the operation/viewing history DB **71** and the preference information DB **72** are all equivalent to the auxiliary storage device **40** in FIG. **1**, for instance.

[0069] The recording control unit **60** estimates the content data fit for the user's preference based on the preference information supplied from the preference information management unit **68**. The recording control unit **60** also reads out program identification information **301** (See FIG. **4** described later) contained in the EPG information of the estimated content data from the EPG DB **69**. With the estimated content data specified as recommending content, the recording control unit **60** causes recommending content-related information (such as a name, a broadcast start time, a broadcast end time and a broadcast content of the recommending content, for instance) (which is hereinafter referred to as recommending content information) to be displayed (or presented) on the display apparatus **12** through the presenting unit **61** based on the program identification information **301** of the specified recommending content.

[0070] At this time, the user makes a selection of the recommending content information of the recommending content to be specified as an object for recording schedule by operating the input unit **41**, while taking a look at the displayed recommending content information on the display apparatus **12**. Provided that the recommending content corresponding to the selected recommending content information given by the user is specified as the object for recording schedule, the recording control unit **60** controls the recording schedule management unit **66** so that a recording schedule of the specified object for recording schedule is taken.

[0071] Further, in response to information (or content of a distribution source **314** shown in FIG. **4** described later) representing the distribution source of the object for recording schedule and a recording command that are both supplied from the recording schedule management unit **66**, the recording control unit **60** controls the tuner **31** so that the object for recording schedule is received. Then, the recording control unit **60** causes the received object for recording schedule to be stored (or recorded) in the auxiliary storage device **40**.

[0072] The recording control unit **60** controls the recording title management unit **67** to cause the program identi-

fication information **301** contained in the EPG information corresponding to the recommending content specified as the recorded object for recording schedule to be stored as the recording title information in the recording title information DB **70**.

[**0073**] In response to a command given by the user through the input unit **41**, the viewing control unit **62** controls the live broadcast reproducing unit **64** so that the program content data being presently received through the tuner **31** or acquired from the server **2** is reproduced (or displayed).

[**0074**] Further, the viewing control unit **62** also causes title-related information (such as a title name, for instance) (which is hereinafter referred to as title information) to be displayed on the display apparatus **12** based on the recording title information supplied from the recording title management unit **67**. At this time, the user makes the selection of the title information of the title to be specified as an object for viewing by operating the input unit **41**, while taking a look at the displayed title information on the display apparatus **12**. The viewing control unit **62** controls the recording title reproducing unit **65** so that the title corresponding to the selected title information given by the user is reproduced (or displayed) from the auxiliary storage device **40**.

[**0075**] The copying control unit **63** causes a selection display **501** (see FIG. **7** described later) for selection of an object for copy to be displayed on the display apparatus **12** based on the recording title information supplied from the recording title management unit **67**. At this time, the user makes the selection of the name etc. of the title of the object for copy by operating the input unit **41**, while taking a look at the displayed selection display **501** on the display apparatus **12**.

[**0076**] Provided that the title corresponding to the selected name etc. given by the user is specified as the object for copy, the copying control unit **63** reads out the object for copy from the auxiliary storage device **40**, causing the read object for copy to be copied to the mobile apparatus **14** through the external interface **44**. Further, the copying control unit **63** also controls the recording title management unit **67** so that the recording title information of the object for copy is supplied to the preference information management unit **68**.

[**0077**] Under control of the viewing control unit **62**, the live broadcast reproducing unit **64** causes the program content data being received through the tuner **31** or the content data being acquired through the network interface **37** to be displayed on the display apparatus **12**. Under control of the viewing control unit **62**, the recording title reproducing unit **65** reproduces the title contained in the auxiliary storage device **40**.

[**0078**] Under control of the recording control unit **60**, the recording schedule management unit **66** takes the recording schedule of the object for recording schedule. Specifically, the recording schedule management unit **66** reads out the program identification information **301** contained in the EPG information of the object for recording schedule from the EPG DB **69**, causing the read program identification information **301** to be stored as scheduling information in an incorporated storage unit (not shown). Then, the recording schedule management unit **66** provides the information representing the distribution source of the object for recording schedule and the recording command to the recording control unit **60** at the broadcast start time of the program corresponding to the recommending content specified as the object for recording schedule based on both of the scheduling information contained in the storage unit (not shown) and a present time measured by a time measuring unit (not shown).

[**0079**] Under control of the recording control unit **60**, the recording title management unit **67** reads out the program identification information **301** contained in the EPG information corresponding to the recorded recommending content from the EPG DB **69**, causing the read program identification information **301** to be stored as the recording title information in the recording title information DB **70**. Further, under control of the copying control unit **63**, the recording title management unit **67** also reads out the recording title information of the title specified as the object for copy from the recording title information DB **70**, causing the read recording title information to be supplied to the preference information management unit **68**.

[**0080**] The preference information management unit **68** creates, based on the recording title information supplied from the recording title management unit **67**, operation/viewing history information **351** (See FIG. **5** described later) specified as information representing an operation history and a viewing history of the title, causing the created operation/viewing history information **351** to be stored in the operation/viewing history DB **71**. Further, the preference information management unit **68** also updates the operation/viewing history information **351** contained in the operation/viewing history DB **71**, while monitoring the viewing control unit **62** and the copying control unit **63**.

[**0081**] Further, the preference information management unit **68** generates (or acquires) user's preference information data **401** (See FIG. **6** described later) based on the operation/viewing history information **351** contained in the operation/viewing history DB **71**, causing the acquired preference information data **401** to be stored in the preference information DB **72** before being managed. Further, the preference information management unit **68** also reads out the preference information data **401** from the preference information DB **72**, causing the read preference information data to be supplied to the recording control unit **60**.

[**0082**] An EPG acquiring unit **73** acquires the EPG information supplied from the tuner **31** or the network interface **37**, causing the acquired EPG information to be stored in the EPG DB **69**.

[**0083**] It is to be noted that when the video recording/reproducing apparatus **11** records the content data supplied through the network **1**, the EPG acquiring unit **73** acquires, from the network interface **37**, information supplied together with the content data to be recorded, that is, content data-related information equal to the program identification information **301**, causing the acquired content data related-information to be stored in the EPG DB **69**. The recording control unit **60**, the recording schedule management unit **66** and the recording title management unit **67** are all adaptable to similarly process also the above content data-related information as the program identification information **301** contained in the EPG information, so that a description of the program identification information **301** will be given as

that also including a description associated with the content data-related information, unless otherwise required for any description in distinction from each other.

[0084] FIG. **3** is a block diagram showing a hardware configuration example of the mobile apparatus **14** shown in FIG. **1**.

[0085] Referring to FIG. **3**, a CPU **102** performs various types of processing according to programs contained in a ROM **103** or programs having been loaded from a storage unit **105** into a RAM **104**. Data etc. required for the CPU **102** to perform the various types of processing is also properly stored in the RAM **104**.

[0086] The CPU **102**, the ROM **103** and the RAM **104** are interconnected through a bus **101**. An input/output interface **110** is also connected to the bus **101**.

[0087] A storage unit **105** formed with the hard disk etc., an output unit **106** including units such as a display formed with a CRT (Cathode Ray Tube) or a LCD (Liquid Crystal Display) etc. and a speaker, an input unit **107** including units such as the keyboard and the mouse, and a communication unit **108** formed with a modem etc. are connected to the input/output interface **110**.

[0088] The communication unit **108** performs communication with the video recording/reproducing apparatus **11**. The communication unit **108** permits the title to be copied by, after receiving the title from the video recording/reproducing apparatus **11**, causing the received title to be stored in the storage unit **105**, for instance.

[0089] A drive **109** is also connected to the input/output interface **110** at need, and is properly provided with a removable media **111** such as the magnetic disk, the optical disk, the magneto-optical disk and the semiconductor memory, permitting the read computer program from the removable media to be installed into the storage unit **105** at need.

[0090] FIG. **4** shows an example of program identification information **301** in the EPG information stored in the RPG DB **69** shown in FIG. **2**.

[0091] Referring to FIG. **4**, the program identification information **301** is given as a group of various types of program-related information formed with two items, "attribute" representing types of information and "content" thereof. As shown in FIG. **4**, the program identification information **301** contains information of attributes including a program ID (or an identification code) **311**, a broadcast start time **312**, a broadcast end time **313**, a distribution source **314**, a genre **315**, a name **316**, and content **317** and **318**,for instance.

[0092] The program ID **311** shows an ID for identifying the program programmed to be broadcast. The program identification information **301** shown in FIG. **4** gives the content of the program ID **311** as "00000001", for instance. The broadcast start time **312** and the broadcast end time **313** respectively show information representing a broadcast schedule of the program to be broadcast. The program identification information **301** shown in FIG. **4** gives the content of the broadcast start time **312** as "2001/01/01 01:00:00", and the content of the broadcast end time **313** as "2001/01/01 01:30:00", for instance.

[0093] It is to be noted that for the content data-related information, the broadcast start time **312** and the broadcast end time **313** may be in blank, or it is also allowable to use information representing a schedule of the content data to be released for the public in the server.

[0094] The distribution source **314** shows information representing the distribution source of the program. The program identification information **301** shown in FIG. **4** gives the content of the distribution source **314** as "ground wave broadcasting, XX-channel, and YYY station", which indicates that the program corresponding to the program identification information **301** is a program having been sent on the air from the YYY station as a broadcast program in the XX-channel involved in the ground wave broadcasting, for instance. It is to be noted that for the content data-related information, the distribution source **314** needs to be given a description of an address etc. of the server that is releasing the content data for the public.

[0095] The genre **315** shows information representing the genre (or a category) of the program content, and the program identification information **301** shown in FIG. **4** gives the content of the genre **315** as "News", for instance. The name **316** shows information representing a name of the program, and the program identification information **301** shown in FIG. **4** gives the content of the name **316** as "ZZZ News", for instance.

[0096] The content **317** and **318** respectively show information of characteristic keywords representing the program content, and the program identification information **301** shown in FIG. **4** gives the content of the content **317** as "AAA", and the content of the content **318** as "BBB", for instance.

[0097] It is to be noted that the program identification information **301** may be in the form of information including other information than the information shown in FIG. **4**, or that consisting of a part of the information shown in FIG. **4**. Alternatively, information contained in the program identification information **301** may be in the form of hierarchical-structured information.

[0098] The recording title information is referred to the program identification information **301** of the title, that is, the same group of information as the program identification information **301** shown in FIG. **4** is contained in the recording title information, so that its description is passed over.

[0099] FIG. **5** shows an example of operation/viewing history information **351** contained in the operation/viewing history DB **71** shown in FIG. **2**.

[0100] Referring to FIG. **5**, the operation/viewing history information **351** is given as a group of various types of information representing the operation history and the viewing history of the title and including two items, "attribute" representing types of information, and "content" thereof. As shown in FIG. **5**, the operation/viewing history information **351** contains information of attributes including a title ID **361**, a cumulative viewing time **362**, the number of viewing **363** and the number of operation **364**, for instance.

[0101] The title ID **361** shows the content of the program ID **311** (See FIG. **4**) of the program identification information **301** of the program corresponding to the title. The operation/viewing history information **351** shown in FIG. **5**

gives the content of the title ID **361** as "00000001", for instance. The cumulative viewing time **362** shows information representing a cumulative time that the title was viewed. The operation/viewing history information **351** shown in FIG. **5** gives the content of the cumulative viewing time **362** as "00:12:00 (12 minutes)", for instance.

[**0102**] The number of viewing **363** shows information representing a number at which the title was viewed (or reproduced), and the number of operation **364** shows information representing a number at which the operation (or the operation other than the operation required for replay) was given by the user in the course of replay of the title. The operation/viewing history information **351** shown in FIG. **5** gives the content of the number of viewing as "2", and the content of the number of operation **364** as "6", for instance.

[**0103**] It is to be noted that the operation/viewing history information **351** may be in the form of information including other information than the information shown in FIG. **5**, or that consisting of a part of the information shown in FIG. **5**. Alternatively, the information contained in the operation/viewing history information **351** may be in the form of hierarchical-structured information.

[**0104**] FIG. **6** shows an example of preference information data **401** contained in the preference information DB **72** shown in FIG. **2**.

[**0105**] Referring to FIG. **6**, the preference information data **401** includes, for instance, name keyword preference information **411** specified as the preference information data managed with the name as a key, keyword preference information **412** specified as the preference information data managed with the title content as the key, genre preference information **413** specified as the preference information data managed with the title genre as the key, broadcasting time period preference information **414** representing the preference information data managed with a title broadcasting time period as the key, and channel preference information **415** specified as the preference information data managed with a channel having broadcasted the title (when the title is of the acquired content data from the server **2**, the server etc. having released the acquired content data for the public is required as the key) as the key.

[**0106**] Specifically, each of the name keyword preference information **411**, the keyword preference information **412**, the genre preference information **413**, the broadcasting time period preference information **414** and the channel preference information **415** is in the form of a table including a group of records managed with the attribute contained in the recording title information as the key, and requires that a score representing a degree of user's preference is appended on a record basis.

[**0107**] The name keyword preference information **411** is given as the table with the content of the title **316** shown in FIG. **4** as the key, and includes a keyword (or the content of the name **316**) and the score (or the degree of user's preference) with respect to the keyword.

[**0108**] The keyword preference information **412** is given as the table with the entities of the content **317**, **318** shown in FIG. **4** or words contained in a detailed description (such as a description of the content and a cast etc. of the program) of the title as the key, and includes the keyword (or the words contained in the entities of the content **317**, **318**) and the score with respect to the keyword.

[**0109**] The genre preference information **413** is given as the table with the content (such as variety, news, drama, documentary, sports, music, and education etc.) of the genre **315** shown in FIG. **4** as the key, and includes the keyword (or the content of the genre **315**) and the score with respect to the keyword.

[**0110**] The broadcasting time period preference information **414** is given as the table with the broadcast start time **312** and/or the broadcast end time **313** shown in FIG. **4** as the key, and includes the broadcasting time period of the title obtained from the content of the broadcast start time **312** and/or the broadcast end time **313** and the score with respect to the broadcasting time period. In particular, the programs have features in program arrangements depending on the broadcasting time period, so that the broadcasting time period preference information **414** relating to the broadcasting time period described the above is used to represent the user's preference.

[**0111**] The channel preference information **415** is given as the table with the content of the distribution source **314** shown in FIG. **4** as the key, and includes the information, such as the channel having broadcasted the title (when the title is of the acquired content data from the server **2**, the name of the server etc. having released the acquired content data for the public is also required), obtained from the content of the distribution source **314** and the score with respect to the information. In particular, the programs have features in programming for each broadcasting station (or each channel), so that the channel preference information **415** relating to the channel is used to represent the user's preference.

[**0112**] These scores need to be set based on the operation/viewing history information **351** (See FIG. **5**) contained in the operation/viewing history DB **71** shown in FIG. **2** in a manner that provides higher values for the name keyword, the program content keyword, the genre, the broadcasting time period and the channel that are all contained in the recording title information corresponding to the title having been viewed or operated by the user, while providing lower values for the name keyword, the program content keyword, the genre, the broadcasting time period and the channel that are all contained in the recording title information corresponding to the title remaining to be viewed or operated by the user.

[**0113**] Specifically, setting of the scores is given in a calculating manner that permits the score with respect to each component (such as the name keyword, the program content keyword, the genre, the broadcasting time period and the channel) contained in the recording title information corresponding to the title having been viewed by the user to be incremented by 1, while providing no increment for the score with respect to each component contained in the recording title information corresponding to the title remaining to be viewed by the user. In this case, the higher the score is, the higher the degree of preference of a corresponding item (such as the name keyword, the program content keyword, the genre, the broadcasting time period and the channel) becomes attainable.

[**0114**] It is to be noted that the score calculating manner is not limited to the above, and any other calculating manner

may be also taken. Specifically, it is also allowable to take a manner that decrements the score of each item contained in the recording title information supposed to be unnecessary to be viewed or operated by the user, or alternatively, that gives weighting to the score for each item.

[0115] FIG. **7** shows an example of a selection display **501** displayed on the display apparatus **12** by the copying control unit **63** shown in FIG. **2**.

[0116] The selection display **501** shown in FIG. **7** includes a check box **511**, a recording title information display unit **512**, an execution button **513** and a cancel button **514**.

[0117] The check box **511** is equivalent to the recording title information display unit **512**, and is operated (or checked) when the user selects, as the object for copy, the title corresponding to the displayed recording title information (or information contained therein) on the recording title information display unit **512**.

[0118] The recording title information display unit **512** provides display of the whole or a part of the recording title information. In one display in FIG. **7**, there are shown the broadcast start time, the broadcast end time and the name among the components of the recording title information. Specifically, the entities of the broadcast start time **312**, the broadcast end time **313** and the name **316** all contained in the program identification information **301** shown in FIG. **4** are displayed.

[0119] The execution button **513** is selected (or operated) when the user puts copying of the title corresponding to each check-marked check box **511** into execution. When the execution button **513** is selected by the user, the copying control unit **63** causes a message describing that copying is started to be displayed on the display apparatus **12**. The cancel button **514** is selected when the user puts selection of the object for copy to a stop.

[0120] Reproducing process to be performed by the video recording/reproducing apparatus **11** shown in FIG. **2** is now described with reference to FIG. **8**. This reproducing process is started when a command to reproduce (or watch) the title was given through the operation of the input unit **41** by the user, for instance.

[0121] In a step S**31**, the preference information management unit **68** shown in FIG. **2** executes an initialization process. For instance, the preference information management unit **68** initializes setting of a timer (not shown) for measuring the viewing time and a counter (not shown) for counting the number of operation.

[0122] The processing in the step S**31** is followed by a step S**32**, where the preference information management unit **68** causes the timer (not shown) to start measurement of the viewing time according to a start timing for replay of the title, while monitoring the viewing control unit **62**, before the process goes on to a step S**33**.

[0123] In the step S**33**, the preference information management unit **68** decides whether or not input of any replay-related operation (such as temporary stop, rewinding, fast-forwarding) other than the operation adapted to issue the replay command has been given to the input unit **41** by the user, while monitoring the viewing control unit **62**. When a result of decision is that the input of the replay-related operation has been given, the process goes on to a step S**34**.

[0124] In the step S**34**, the processing to cause a value of the counter (not shown) for counting the number of operation to be counted up by "+1" is performed, and is followed by a step S**35**.

[0125] Conversely, when the result of decision in the step S**33** is that no input of the replay-related operation other than the operation adapted to issue the replay command has been given to the input unit **41** by the user yet, the process skips the step S**34** to go on to a step S**35**.

[0126] In the step S**35**, the preference information management unit **68** decides whether or not the replay of the title is finished, that is, the replay of the title has been put to a stop in response to the command from the user, or the replay of all the titles of the object for replay (or viewing) is finished, while monitoring the viewing control unit **62**. When the result of decision in the step S**35** is that no replay of the title is finished yet, the process is returned to the step S**33**, causing the above processing to be repeated until the replay of the title is finished.

[0127] Conversely, when the result of decision in the step S**35** is that the replay of the title is finished, the process goes on to a step S**36**, where the preference information management unit **68** brings the operation of the timer (not shown) to a stop, leading to a termination of measurement of the viewing time.

[0128] The process in the step S**36** is followed by a step S**37**, where the preference information management unit **68** acquires a count value available at the present time from the counter (not shown), before the process goes on to a step S**38**. In the step S**38**, the preference information management unit **68** updates the entities of the operation/viewing history information **351** contained in the operation/viewing history DB **71** based on the measured viewing time obtained by the timer (not shown) and the acquired count value obtained from the counter (not shown).

[0129] Specifically, the preference information management unit **68** gives a sum of the content (or a value) of the present cumulative viewing time **362** and the measured viewing time as an updated value of the cumulative viewing time **362**. Also, the preference information management unit **68** increments the value of the present number of viewing **363** by 1. Further, the preference information management unit **68** also gives a sum of the content (or a value) of the present number of operation **364** and the measured count value as an updated value of the number of operation **364**.

[0130] It is to be noted that when each of the updated values of the cumulative viewing time **362**, the number of viewing **363** and the number of operation **364** all contained in the operation/viewing history information **351** is not less than a prescribed threshold value, the preference information management unit **68** reads out the recording title information of the present object for replay from the recording title information DB **70** through the recording title management unit **67**, and updates the preference information data **401** contained in the preference information DB **72** based on the read recording title information.

[0131] A copying process required for the video recording/reproducing apparatus **11** shown in FIG. **2** to copy the title to the mobile apparatus **14** is now described with reference to FIG. **9**. This copying process is started when a copying command was given through the operation of the input unit

41 by the user to select the execution button 513 after checking the check box 511 of the selection display 501 shown in FIG. 7.

[0132] In a step S51, the copying control unit 63 selects the title to be specified as the object for copy in response to the command supplied through the input unit 41. For instance, the copying control unit 63 selects the title corresponding to the check box 511 having been checked by the user as the title to be specified as the object for copy.

[0133] The processing in the step S51 is followed by a step S52, where the copying control unit 63 decides whether or not there is the object for copy still remaining to be copied. When the result of decision is that there is the object for copy still remaining to be copied, the copying control unit 63 specifies, as a present object for copy, one of the objects for copy still remaining to be copied, before the process goes on to a step S53.

[0134] In the step S53, the preference information management unit 68 decides based on the operation/viewing history information 351 whether or not the present object for copy has been already viewed. For instance, the preference information management unit 68 reads out, from the operation/viewing history DB 71, the operation/viewing history information 351 having the same content of the title ID 361 as that of the program ID 311 of the title information of the present object for copy, and decides whether or not the content of the number of viewing 363 in the operation/viewing history information 351 is not less than 1.

[0135] When the result of decision in the step S53 is that the present object for copy has been already viewed, or when updating of the entities of the cumulative viewing time 362, the number of viewing 363 or the number of operation 364 is already finished in the reproducing process in FIG. 8, the process skips steps S54 to S56 to go on to a step S57.

[0136] Conversely, when the result of decision in the step S53 is that the present object for copy has not been viewed yet, the process goes on to the step S54, where the preference information management unit 68 estimates the time and the number of times at which the title would be viewed by the user or the number of times at which the operation would be given by the user after copying of the title to the mobile apparatus 14, and updates the operation/viewing history information 351 contained in the operation/viewing history DB 71.

[0137] For instance, the preference information management unit 68 updates the operation/viewing history information 351 in a manner that determines an increment or decrement range of values of the cumulative viewing time 362, the number of viewing 363 and the number of operation 364 based on a predefined function required to take, as parameters, the values of the cumulative viewing time 362, the number of viewing 363 and the number of operation 364.

[0138] After the user has completed copying of the title to the mobile apparatus 14, the preference information management unit 68, for instance, increments the value of the number of viewing 363 in the operation/viewing history information 351 by 1 based on the function required to take, as a parameter, the value of the number of viewing 363 having been estimated that the user would be sure to once watch the copied title.

[0139] It is to be noted that the above function may be also given to be variable depending on a copying destination. In this case, when the copying destination is specified as the removable media 43, for instance, it is allowable to provide a smaller increment range of the values of the cumulative viewing time, 362, the number of viewing 363 and the number of operation 364 as compared with the case where the copying destination is specified as the mobile apparatus 14, in consideration of a possibility that the copying of an unscheduled title to be viewed is also involved as a temporary measure.

[0140] The processing in the step S54 is followed by a step S55, where the preference information management unit 68 decides whether or not the values of the cumulative viewing time 362, the number of viewing 363 and the number of operation 364 in the operation/viewing history information 351 are less than the prescribed threshold value. When the result of decision is that the above values are less than the prescribed threshold value, the process skips a step S56 to go on to a step S57.

[0141] Conversely, when the result of decision is that the values of the cumulative viewing time 362, the number of viewing 363 and the number of operation 364 in the operation/viewing history information 351 are not less than the prescribed threshold value, the process goes on to the step S56, where the preference information management unit 68 reads out the recording title information of the present object for copy from the recording title information DB 70 through the recording title management unit 67, and updates the preference information data 401 contained in the preference information DB 72 based on the read recording title information. In other words, the preference information management unit 68 permits the preference information data 401 associated with the present object for copy to be updated based on the recording title information.

[0142] The processing in the step S56 is followed by a step S57, where the copying control unit 63 reads out the present object for copy from the auxiliary storage device 40, and copies the present object for copy to the mobile apparatus 14 by providing the read object for copy to the mobile apparatus 14 through the external interface 44. Then, the process is returned to the step S52, causing the above processing to be repeated until copying of all the objects for copy is finished.

[0143] Conversely, when the result of decision in the step S52 is that there is no object for copy still remaining to be copied, or that copying of all the objects for copy is finished, the process is brought to an end.

[0144] It is to be noted that while the above step S53 is required for the preference information management unit 68 to, by deciding whether or not the content of the number of viewing 363 is not less than 1, decide whether or not the present object for copy has been already viewed, it is also allowable to decide whether or not the content of the cumulative viewing time 362, for instance, exceeds 50% of a time (which is hereinafter referred to as a total viewing time) required for the user to watch all the titles specified as the object for copy. In this case, in the step S54, the preference information management unit 68 updates the content of the cumulative viewing time 362 to provide the content as much as 50 or 100% of the total viewing time. When the content of the cumulative viewing time 362 of the present object for copy is as much as 10% of the total

viewing time, for instance, the preference information management unit **68** causes the content of the cumulative viewing time **362** to be incremented by an amount as much as 40 or 90% of the total viewing time.

[**0145**] When not only the number of operation **361** but also the operation content history needs to be stored as the operation/viewing history information **351**, the preference information management unit **68** may also update the content of the operation/viewing history information **351** based on the stored operation content history.

[**0146**] An operation such as fast-forwarding at short intervals or skipping for 15 sec., when repeatedly given by the user earlier than copying, for instance, is supposed to be that frequently taken for the purpose of skipping over a commercial (CM) part contained in the object for copy. In this case, the preference information management unit **68** updates the operation/viewing history information **351**, on the presumption that the user would also watch the object for copy at a probability as high as 70% after a completion of copying. Alternatively, an edit operation, when repeatedly given by the user earlier than copying, for instance, is supposed to be that frequently taken for the purpose of cutting the CM part contained in the object for copy and/or effecting a cut operation to leave only a desired part contained therein. In this case, the preference information management unit **68** updates the operation/viewing history information **351** on the presumption that the user would also watch the object for copy over and over after the completion of copying.

[**0147**] Further, when no operation is given for a long period of time since a last operation having been given by the user to watch a beginning part of the object for copy only for a short period of time (or 10 sec., for instance) earlier than copying, the preference information management unit **68** updates the operation/viewing history information **351** on the presumption that the user would no more watch the object for copy after the completion of copying.

[**0148**] Also, while the above step S**53** decides whether or not the present object for copy has been already viewed, it is also allowable to decide whether or not the entities of the cumulative viewing time **352**, the number of viewing **363** or the number of operation **364** in the operation/viewing history information **351** of the present object for copy are not less than the threshold value.

[**0149**] As described the above, when the title is copied to the mobile apparatus **14**, the preference information management unit **68** estimates the viewing time, the number of viewing and the number of operation of the title in the mobile apparatus **14**, updates the operation/viewing history information **351**, and causes the preference information data **401** to be updated based on the updated operation/viewing history information **351**. Accordingly, in the case where copying of the title to the mobile apparatus **14** serving as the another apparatus is effected, the storage of the operation and/or viewing history of the copied title is also ensured, causing creation of more exact preference information data **401** to be attained.

[**0150**] Recording schedule process required for the video recording/reproducing apparatus **11** in FIG. **2** to take the recording schedule of the content data is now described with reference to FIG. **10**. This recording schedule process is started when a recording schedule command was given by operating the input unit **41** by the user, for instance.

[**0151**] In a step S**71**, the recording control unit **60** in FIG. **2** estimates the content data that would fit for the user's preference based on both of the preference information data **401** supplied from the preference information management unit **68** and the program identification information **301** contained in the EPG DB **69**.

[**0152**] When the key corresponding to the score of not less than the prescribed value in the name keyword preference information **411**, the keyword preference information **412**, the genre preference information **413**, the broadcasting time period preference information **414** or the channel preference information **415** is contained in the name **316**, the content **317** and **318**, the genre **315**, the broadcast start time **312**, the broadcast end time **313** or the distribution source **314**, for instance, the recording control unit **60** estimates the content data corresponding to the above program identification information **301** as the content data fit for the user's preference.

[**0153**] Then, with the estimated content data specified as the recommending content, the recording control unit **60** supplies the recommending content information to the presenting unit **61** based on the program identification information **301** of the specified recommending content.

[**0154**] The processing in the Step S**71** is followed by a step S**72**, where the presenting unit **61** presents (or displays) the recommending content information from the recording control unit **60** on the display apparatus **12**. At this time, the user makes the selection of the recommending content information of the content data to be specified as the object for recording schedule by operating the input unit **41**, while taking a look at the presented recommending content information on the display apparatus **12**.

[**0155**] The processing in the step S**72** is followed by a step S**73**, where the recording schedule control unit **60** decides based on the command given from the user through the input unit **41** whether or not the user has made the selection of the recommending content information of the content data to be specified as the object for recording schedule. When the result of decision is that the user has made no selection of the recommending content information, the recording schedule control unit **60** is placed in a wait state until the recommending content information is selected.

[**0156**] Conversely, when the result of decision in the step S**73** is that the user has made the selection of the recommending content information of the content data to be specified as the object for recording schedule, the recording control unit **60** provides the content of the program ID **311** of the object for recording schedule, before the process goes on to a step S**74**.

[**0157**] In the step S**74**, the recording schedule management unit **66** takes the recording schedule by, after acquiring the program identification information **301** of the object for recording schedule from the EPG DB **69** based on the content of the program ID **311** from the recording control unit **60**, causing the acquired information to be stored in the incorporated storage unit.

[**0158**] After the completion of the recording schedule, the recording schedule management unit **66** supplies the infor-

mation representing the content of the distribution source **314** and the recording command to the recording control unit **60** at the broadcast start time of the object for recording schedule based on both of the content of the broadcast start time **312** of the program identification information **301** contained in the incorporated storage unit and the measured present time given by the time measuring unit (not shown). The recording control unit **60** controls the tuner **31** to receive the object for recording schedule at the broadcast start time based on both of the information representing the content of the distribution source **314** and the recording command, causing the received object for recording schedule to be stored in the auxiliary storage device **40**.

[**0159**] After the completion of the storage of the object for recording schedule in the auxiliary storage device **40**, the recording control unit **60** supplies the content of the program ID **311** of the program identification information **301** of the object for recording schedule to the recording title management unit **67**. The recording title management unit **67** reads out the program identification information **301** of the object for recording schedule from the EPG DB **69** based on the content of the program ID **311**, causing the read program identification information to be stored as the recording title information in the recording title information DB **70** before providing the program ID of the recording title information to the preference information management unit **68**.

[**0160**] The preference information management unit **68** creates, based on the program ID supplied from the recording title management unit **67**, the operation/viewing history information **351** of the object for recording schedule requiring that the supplied program ID is specified as the content of the title ID **361**, causing the created operation/viewing history information to be stored in the operation/viewing history information DB **71**.

[**0161**] As described the above, the video recording/reproducing apparatus **11** in FIG. **2** permits the content data fit for the user's preference to be estimated based on the preference information data **401**, and with the estimated content data specified as the recommending content, causes the recommending content information of the specified recommending content to be presented. Thus, creation of the more exact preference information data **401** in the above copying process in FIG. **9** is supposed to be adaptable to provide the recommending content more fit for the user's preference for the user.

[**0162**] Accordingly, in the case where the title contained in the video recording/reproducing apparatus **11** is constantly viewed by the user after being copied to the mobile apparatus **14**, the video recording/reproducing apparatus **11** may also provide the recommending content more fit for the user's preference.

[**0163**] FIG. **11** is a block diagram showing another functional configuration example of the video recording/reproducing apparatus **11** in FIG. **1**.

[**0164**] The video recording/reproducing apparatus **11** in FIG. **11** is provided with a copying control unit **701** and a preference information management unit **702** as substitutes for the copying control unit **63** and the preference information management unit **68** of the video recording/reproducing apparatus **11** in FIG. **2**, and copies the operation/viewing history information **351** (See FIG. **5**) of the object for copy together with the title to be specified as the object for copy, when copying of the title is required. It is to be noted that like reference numerals are given to like units as those in FIG. **2**, so that their description is passed over.

[**0165**] Like the copying control unit **63** in FIG. **2**, the copying control unit **701** causes the selection display **501** (See FIG. **7**) for selection of the object for copy to be displayed on the display apparatus **12** based on the recording title information supplied from the recording title management unit **67**. Further, provided that the title corresponding to the check-marked check box **511** given by the user is specified as the object for copy, the copying control unit **701** reads out the object for copy from the auxiliary storage device **40** in response to the command from the input unit **41**.

[**0166**] Then, the copying control unit **701** controls the recording title management unit **67**, so that the program ID of the recording title information of the object for copy is supplied to the preference information management unit **702**. The copying control unit **701** appends specific information as information specifying the video recording/reproducing apparatus **11** having been copied, before copying of the object for copy and the supplied operation/viewing history information **351** (See FIG. **5**) from the preference information management unit **701** to the mobile apparatus **14** through the external interface **44** in FIG. **1**. It is to be noted that the specific information may be an ID unique to the video recording/reproducing apparatus **11**, or alternatively, when the copying control unit **701** manages a time (which is hereinafter referred to as a copying time) that the copying was effected, the copying time etc. is also available as the specific information.

[**0167**] Further, the copying control unit **701** reads out the operation/viewing history information **351** and the specific information from the mobile apparatus **14**, causing the read operation/viewing history information **351** to be supplied to the preference information management unit **701** based on the read specific information.

[**0168**] Like the preference information management unit **68** in FIG. **2**, the preference information management unit **702** creates the operation/viewing history information **351** based on the recording title information supplied from the recording title management unit **67**, causing the created operation/viewing history information to be stored in the operation/viewing history DB **71**. Further, the preference information management unit **702** updates the operation/viewing history information **351** contained in the operation/viewing history DB **71**, while monitoring the viewing control unit **62** and the copying control unit **701**.

[**0169**] Further, like the preference information management unit **68** in FIG. **2**, the preference information management unit **702** generates the user's preference information data **401** based on the operation/viewing history information **351** contained in the operation/viewing history DB **71**, causing the generated preference information data **401** to stored in the preference information DB **72** before being managed.

[**0170**] Further, the preference information management unit **702** reads out the operation/viewing history information **351** of the object for copy from the operation/viewing history DB **71** based on the program ID of the recording title

information of the object for copy supplied from the recording title management unit **67**, causing the read operation/viewing history information **351** to be supplied from the copying control unit **701**.

[**0171**] Further, the preference information management unit **702** also updates the operation/viewing history information **351** contained in the operation/viewing history DB **71** based on the operation/viewing history information **351** supplied from the copying control unit **701**.

[**0172**] FIG. **12** is a block diagram showing a functional configuration example of the mobile apparatus **14** connected to the video recording/reproducing apparatus **11** shown in FIG. **11** through the external interface **44**.

[**0173**] The mobile apparatus **14** in FIG. **12** includes a viewing control unit **901**, a reproducing unit **902**, a preference information management unit **903**, and an operation/viewing history DB **904**.

[**0174**] In response to the command given by the user through the input unit **107** in FIG. **3**, the viewing control unit **901** controls the reproducing unit **902**, so that the title contained in the storage unit **105** is reproduced (or displayed). The reproducing unit **902** reproduces the title under control of the viewing control unit **901**.

[**0175**] The preference information management unit **903** updates the operation/viewing history information **351** contained in the operation/viewing history DB **904**, while monitoring the viewing control unit **62**. The operation/viewing history DB **904** stores the operation/viewing history information **351** supplied from the copying control unit **701** in FIG. **11** and the appended specific information with respect thereto in such a manner as to be corresponded with each other.

[**0176**] The copying process required for the video recording/reproducing apparatus **11** in FIG. **11** to copy the title to the mobile apparatus **14** is now described with reference to FIG. **13**. This copying process is started when the copying command was given by operating the input unit **41** by the user to select the execution button **513** after checking the check box **511** of the selection display **501** in FIG. **7**.

[**0177**] The processing in steps S**91** and S**92** is the same as that in the steps S**51** and **52** in FIG. **9**, so that its description is passed over.

[**0178**] The processing in the step S**92** is followed by a step S**93**, where the copying control unit **701** supplies the program ID of the recording title information of the present object for viewing to the preference information management unit **702**, before the process goes on to a step S**94**.

[**0179**] In the step S**94**, the preference information management unit **702** reads out, from the operation/viewing history information DB **71**, the operation/viewing history information **351** having the same content of the title ID **361** as the supplied program ID in the step S**93**, causing the read operation/viewing history information to be supplied to the copying control unit **701**, before the process goes on to a step S**95**.

[**0180**] In the step S**95**, the copying control unit **701** effects appending of the specific information, before copying of the title specified as the present object for copy and the supplied operation/viewing history information **351** in the step S**94** to the storage unit **105** of the mobile apparatus **14** through the external interface **44**, leading to an end of the process.

[**0181**] As described the above, the user, if the title is once copied to the mobile apparatus **14** in FIG. **12**, may watch the copied title at a desired place, with the mobile apparatus **14** carried after being removed from the video recording/reproducing apparatus **11** in FIG. **11**, for instance. Specifically, in response to the viewing (or reproducing) command from the user, the viewing control unit **901** controls the reproducing unit **902**, so that the title to be specified as the copied object for reproducing in the storage unit **105** is reproduced.

[**0182**] Further, the viewing control unit **901** controls the reproducing operation to be performed by the reproducing unit **902** depending on the operation given by the user to the input unit **107** for performing the reproducing-related process other than the reproducing process. The preference information management unit **903** updates the operation/viewing history information **351** in the operation/viewing history DB **904** based on the viewing time, the number of viewing or the number of operation of the title, while monitoring the viewing control unit **901**.

[**0183**] When copying of a new title to the mobile apparatus **14** in FIG. **12** is required, the user makes reconnection between the mobile apparatus **14** and the video recording/reproducing apparatus **11** in FIG. **11**. At this time, the video recording/reproducing apparatus **11** in FIG. **11** reads out the operation/viewing history information **351** and the specific information from the operation/viewing history DB **904** of the mobile apparatus **14**, and updates the operation/viewing history information **351** in the operation/viewing history DB **71** based on both of the read operation/viewing history information **351** and the read specific information.

[**0184**] An operation/viewing history information update process required for the video recording/reproducing apparatus **11** in FIG. **11** to update the operation/viewing history information **351** is now described with reference to FIG. **14**. This operation/viewing history information update process is started when the connection of the mobile apparatus **14** to the video recording/reproducing apparatus **11** is established, for instance.

[**0185**] In a step S**111**, the copying control unit **701** reads out (or receives) the operation/viewing history information **351** and the specific information from the operation/viewing history DB **904** of the mobile apparatus **14**, before the process goes on to a step S**112**.

[**0186**] In the step S**112**, the copying control unit **701** decides based on the specific information whether or not the operation/viewing history information **351** of one's own copied title is contained in the read operation/viewing history information **351** in the step S**111**.

[**0187**] Specifically, when the ID of the video recording/reproducing apparatus **11** is given as the specific information, for instance, the copying control unit **701** decides whether or not one's own appended ID of the video recording/reproducing apparatus **11** agrees with the specific information. Alternatively, when the copying time is given as the specific information, the copying control unit **701** decides whether or not one's own managed copying time agrees with the specific information.

[0188] When the result of decision in the step S112 is that the operation/viewing history information 351 of one's own copied title is contained, the process goes on to a step S113, where the copying control unit 701 supplies the operation/viewing history information 351 of one's own copied title to the preference information management unit 702, before the process goes on to a step S114.

[0189] In the step S114, the preference information management unit 702 updates, based on the title ID 361 of the supplied operation/viewing history information 351 in the step S113, the operation/viewing history information 351 corresponding to the same title ID 361 as the title ID 361 of the supplied operation/viewing history information 351, providing the operation/viewing history information 351 to be supplied in the step S113.

[0190] The processing in the Step S114 is followed by a step S115, where the preference information management unit 702 decides whether or not the values of the cumulative viewing time 362, the number of viewing 363 and the number of operation 364 of the operation/viewing history information 351 are less than the prescribed threshold value. When the result of decision is that the above values are less than the prescribed threshold value, the process is brought to an end.

[0191] Conversely, when the result of the decision in the step S115 is that the values of the cumulative viewing time 362, the number of viewing 363 and the number of operation 364 of the operation/viewing history information 351 are not less than the prescribed threshold value, the process goes on to a step S116, where the preference information management unit 702 reads out the recording title information corresponding to the updated operation/viewing history information 351 in the step S114 from the recording title information DB 70 through the recording title management unit 67, and updates the preference information data 401 in the preference information DB 72 based on the read recording title information, leading to an end of the process.

[0192] It is to be noted that the processing in the steps S115 and S116 needs to be taken for each updated operation/viewing history information given in the step S114.

[0193] Conversely, when the result of decision in the step S112 is that no operation/viewing history information 351 of one's own copied title is contained, the process skips the steps S113 and S114, leading to an end of the process.

[0194] As described the above, the video recording/reproducing apparatus 11 in FIG. 11 permits one's own contained operation/viewing history information 351 to be updated after acquiring, from the mobile apparatus 14 in FIG. 12, the operation/viewing history information 351 of one's own copied title, that is, the operation/viewing history information 351 in which the viewing time, the number of viewing and the number of operation in the mobile apparatus 14 are all reflected, so that the preference information data 401 created based on the updated operation/viewing history information 351 results in more exact preference information data.

[0195] While the above is described as related to the recording schedule taken through the operation given by the user to select the content data to be specified as the object for recording schedule among the recommending content, it is to be understood that the present invention is not limited to the above selecting operation given by the user, and it is also allowable to automate the recording schedule of the recommending content. Alternatively, it is also allowable to take the recording schedule in such a manner that automated recording schedule is used for the content involving the corresponding preference information data 401 exceeding the prescribed threshold value among the recommending content, while the recording schedule through the operation by the user is used for only the content data selected as the object for recording schedule among the remaining recommending content.

[0196] The number of operation 364 may be also in the form of information representing not only the reproducing-related operations having been given by the user in the course of replay of the title, but also a number at which the operation for recording the content data was given by the user.

[0197] As described the above, the video recording/reproducing apparatus 11, when the object for copy is copied, ensures that the preference information management unit 68 updates the preference information data 401 associated with the title of the copied object for copy, permitting the preference information data 401 to be acquired with higher accuracy.

[0198] It is to be understood in the present specification that the steps describing the program stored in the program recording medium includes not only time-series processing to be performed in described sequence, but also processing to be performed in parallel or individually although not always performed in time series.

[0199] It is to be also understood that the embodiments of the present invention are not limited to the above, and various changes may be made without departing from the spirit and scope of the invention.

1. An information processing apparatus, comprising:

an acquiring unit adapted to acquire preference information representing a user's preference based on an operation given by the user regarding content;

a selecting unit adapted to select content and to designate the selected content as an object for copying; and

a copying unit adapted to copy the selected content to another information processing apparatus;

wherein if the object for copying is copied by the copying unit, the acquiring unit updates the preference information associated with the content of the copied object for copying.

2. The information processing apparatus according to claim 1, further comprising:

an estimating unit adapted to estimate the content fit for the user's preference based on the preference information; and

a presenting unit adapted to present to the user information relating to the estimated content.

3. The information processing apparatus according to claim 2, further comprising:

a receiving unit adapted to receive the estimated content; and

a recording controller unit adapted to cause the received content to be recorded.

4. The information processing apparatus according to claim 1, wherein:

the acquiring unit is adapted to acquire the preference information based on a number of operations representing a number at which the operation is given by the user during replay of the content, a number of viewings of the content, and a viewing time of the content.

5. The information processing apparatus according to claim 4, further comprising:

a deciding unit adapted to decide whether the content that is an object for copying has been viewed;

wherein if a result of the decision by the deciding unit is that the content that is an object for copying has not been viewed, the acquiring unit estimates the number of operations, the number of viewings or the viewing time of the content of the object for copying in the another information processing apparatus, and updates the preference information based on the estimated number of operations, number of viewings or viewing time.

6. The information processing apparatus according to claim 4, further comprising:

a receiving unit adapted to receive the number of operations, the number of viewings or the viewing time of the content of the object for copying from the another information processing apparatus;

wherein the acquiring unit updates the preference information based on the number of operations, the number of viewings or the viewing time received by the receiving unit.

7. The information processing apparatus according to claim 5, wherein:

an increase/decrease change range of a value in the number of operations, the number of viewings, or the viewing time for the content that is the object of copying in the another apparatus, which are estimated by the acquiring unit, is changed depending on still another information processing apparatus to which the copied object for copying is sent.

8. An information processing method, comprising:

acquiring preference information representing a user's preference based on an operation given by the user regarding content;

selecting content that is an object for copying;

copying the selected content to another information processing apparatus; and

updating the preference information associated with the content of the copied object for copying if the object for copying is copied.

9. A program causing a computer to perform an information processing method, the method comprising:

acquiring preference information representing a user's preference based on an operation given by the user regarding content;

selecting content that is an object for copying;

copying the selected content to another information processing apparatus; and

updating the preference information associated with the content of the copied object for copying if the object for copying is copied.

* * * * *