SPECIFICATION

DIGITAL BROADCASTING RECEIVER

TECHNICAL FIELD

The present invention relates to a digital broadcasting receiver and, more particularly, to a digital broadcasting receiver which is characterized in that illegal copying is inhibited to be carried out for digital broadcasting which is to be protected under the copyright.

BACKGROUND ART

Conventionally, when a digital broadcasting receiver displays a received video signal, if the received video signal is disallowed to be copied, the digital broadcasting receiver puts a copy-guard on an output video signal which is to be displayed.

Fig.7 is a diagram illustrating a structure of a prior art digital broadcasting receiver. In fig.7, reference numeral 1 denotes a digital broadcasting receiver. Numeral 2 denotes a tuner. Numeral 3 denotes a transport decoder. Numeral 4 denotes a selector switch. Numeral 5 denotes an MPEG decoder. Numeral 6 denotes an NTSC encoder. Numeral 7 denotes a digital interface. Numeral 8 denotes copy flag information.

Hereinafter, an operation of the digital broadcasting receiver having such a structure will be described.

The tuner 2 is connected to an antenna. Digital broadcasting that

is received by the tuner 2 is digital-demodulated and the demodulated broadcasting is input to the transport decoder as a data sequence in a form of a transport stream. A plurality of programs and control information are multiplexed in the data sequence in the form of transport stream. One is selected among the plurality of programs by the transport decoder 3, and copy flag information as to whether copying to an external recording device is allowed or disallowed is separated from the data sequence in a form of transport stream. In the normal receiving, the selector switch 4 is switched to be connected to a side of the transport decoder. The program data is MPEG-decoded by the MPEG decoder 5, and a digital video image and a voice are output. The digital video signal among those is converted into a television signal by the NTSC encoder 6 and the television signal is output. The copy flag information 8 separated by the transport decoder 3 is connected to the digital interface 7 and the NTSC encoder 6. When the copy flag information 8 shows that copying to an external recording device is disallowed, the digital interface 7 inserts information indicating the disallowance of copying into the digital output of the program data. Further, the NTSC encoder 6 inserts a copy protect pulse into the television signal that is output from the NTSC encoder 6.

As described above, when a received video signal is disallowed to be copied to an external recording device, the prior art digital broadcasting receiver cannot record broadcasting on a VTR or the like. Therefore, a viewer is always required to view broadcasting at the

instant time when the broadcasting is received.

The present invention is made in consideration of the above problems, and it is an object of the present invention to provide a digital broadcasting receiver which enables viewing the broadcasting at a time later than when the broadcasting is received, and can satisfy a condition of disallowance of copying when the broadcasting which is disallowed to be copied is received.

In order to solve the above problems, a digital broadcasting receiver according to the present invention comprises: a tuner unit for receiving digital broadcasting information including copyright information which shows whether copying to an external device is allowed or not, and detecting the copyright information in the received digital broadcasting information, an information storage unit for storing the received digital broadcasting information together with the copyright information detected in the received digital broadcasting information, and a decoder unit for decoding the received digital broadcasting information or digital broadcasting information read out from the information storage unit into an output signal in a form to be displayed, and when a copy-disallowance signal is detected in the digital broadcasting information read out from the information storage unit, this digital broadcasting receiver erases digital broadcasting information which is stored in the information storage unit and has been successively read out therefrom during a reproduction operation in which the digital broadcasting information is read out from the information storage unit and is

reproduced and displayed on a display device.

In addition, when a copy-disallowance signal included in the copyright information included in the received digital broadcasting information is detected while the received digital information is stored in the information storage unit, during receiving digital information, the digital broadcasting receiver inhibits outputting the received digital information as an output signal in a form to be displayed through the decoder unit. Further, when a copy-disallowance signal included in the copyright information included in the received digital information is detected while the digital information is being stored in the information storage unit, the digital broadcasting receiver outputs a message screen signal which is prepared in advance to an output unit for outputting an output signal in a form to be displayed.

According to the present invention, even when the received video signal is one that is disallowed to be copied to an external recording device, the viewer can view broadcasting at a time later than when the broadcasting is received with the copyright protection at that time being assured.

In addition, according to the present invention, in order to further assure the copyright protection, outputting of the video signal which is being received is inhibited while the digital broadcasting information which is disallowed to be copied is being stored, whereby the number of viewing times for the program under the copyright protection is limited to only one time.

DISCLOSURE OF THE INVENTION

A digital broadcasting receiver according to the present invention (claim 1) comprises: a tuner unit for receiving digital broadcasting information including copyright information which shows whether copying to an external device is allowed or not and detecting the copyright information included in the received digital broadcasting information, an information storage unit for storing the received digital broadcasting information together with the copyright information detected in the received digital broadcasting information, and a decoder unit for decoding the received digital broadcasting information or digital broadcasting information read out from the information storage unit into an output signal in a form to be displayed, and when a copy-disallowance signal is detected in the digital broadcasting information read out from the information storage unit, the digital broadcasting receiver erases digital broadcasting information which is stored in the information storage unit and has been successively read out therefrom during a reproduction operation for reading out the digital broadcasting information from the information storage unit and reproducing and displaying the same on a display device. Therefore, when received digital broadcasting information is disallowed to be copied to an external recording device, the received digital broadcasting information is internally and temporarily stored, and at the same time when this signal is being output, the digital broadcasting

information which has been temporarily stored and successively read out, is simultaneously erased, whereby the copyright protection for the received digital broadcasting information can be realized.

According to the present invention (claim 2), the digital broadcasting receiver of claim 1 comprises pointer control means for controlling a reading position where information is read out from the information storage unit when digital broadcasting information is reproduced from the information storage unit, and the pointer control means includes: a reading pointer for pointing the reading position where digital broadcasting information is read out from the information storage unit, and an erasing pointer for pointing a position where the digital broadcasting information is erased after it is read out, i.e., pointing a position which has been pointed by the reading pointer. Therefore, when a video signal is output, the stored video signal which has been finished in being output is simultaneously erased by utilizing an overwriting function of a storage device and a function of controlling plural pointers, whereby the copyright protection is realized.

A digital broadcasting receiver according to the present invention (claim 3) comprises: a tuner unit for receiving digital broadcasting information including copyright information which shows whether copying to an external device is allowed or not, and detecting the copyright information in the received digital information, an information storage unit for storing the received digital broadcasting information together with the copyright information in

the received digital broadcasting information, and a decoder unit for decoding the received digital broadcasting information or digital broadcasting information read out from the information storage unit, into an output signal in a form to be displayed, and when a copy-disallowance signal included in the copyright information in the received digital broadcasting information is detected while the received digital broadcasting information is stored in the information storage unit during receiving digital broadcasting information, the digital broadcasting receiver inhibits outputting the received digital broadcasting information as an output signal in a form to be displayed through the decoder unit. Therefore, the copyright protection is further reinforced.

According to the present invention (claim 4), the digital broadcasting receiver of claim 3 inhibits, when a copy-disallowance signal included in the copyright information in the received digital information is detected while the received digital broadcasting information is stored in the information storage unit, outputting the received digital broadcasting information as an output signal in a form to be displayed through the decoder unit, and outputs a message screen signal which is prepared in advance, to an output unit for outputting an output signal in a form to be displayed through the decoder unit. Therefore, the operation for the copyright protection is further clarified.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig.1 is a block diagram illustrating a digital broadcasting receiver according to a first embodiment of the present invention.

Fig.2 is a diagram schematically illustrating a structure of a program data in the first and a second embodiments of the present invention.

Fig.3 is a flowchart showing an operation at storing in the first embodiment of the present invention.

Fig.4 is a flowchart showing an operation at reading and erasing in the first and second embodiments of the present invention.

Fig.5 is a block diagram illustrating a digital broadcasting receiver according to the second embodiment of the present invention.

Fig.6 is a flowchart showing an operation storing in the second embodiment of the present invention.

Fig.7 is a block diagram illustrating a prior art digital broadcasting receiver.

Fig.8 is a diagram showing, as a table, a control method by an output control unit 27 in the first embodiment of the present invention.

Fig.9 is a diagram showing, as a table, a control method by an output control unit 67 in the second embodiment of the present invention.

BEST EMBODIMENTS FOR EXECUTING THE INVENTION

Hereinafter, embodiments of the present invention will be described with reference to figs.1 to 7.

Embodiment 1.

A first embodiment, corresponding to claims 1 and 2 of the present invention, will be described with reference to figs.1, 2, 3, and 4.

Fig.1 is a block diagram illustrating a digital broadcasting receiver according to the first embodiment of the present invention. In fig.1, reference numeral 11 denotes a digital broadcasting receiver. Numeral 12 denotes a tuner. Numeral 13 denotes a transport decoder. Numeral 14 denotes a selector switch. Numeral 15 denotes an MPEG decoder. Numeral 16 denotes an NTSC encoder. Numeral 17 denotes a scrambler. Numeral 18 denotes a descrambler. Numeral 19 denotes a recording pointer control unit. Numeral 20 denotes a reading (reproducing) pointer control unit. Numeral 21 denotes a simultaneous erasing pointer control unit. Numeral 22 denotes a hard disk interface. Numeral 23 denotes a hard disk. Numeral 26 denotes an input operation unit. Numeral 27 denotes an output control unit.

Hereinafter, an operation of the digital broadcasting receiver according to the first embodiment having such a structure will be described.

The tuner 12 is connected to an antenna. Digital broadcasting received by the tuner 12 is digital-demodulated, and the demodulated broadcasting is input to the transport decoder 13 as a data sequence in a form of transport stream. The data sequence in a transport stream includes a plurality of programs and control information multiplexed therein, and one is selected among the plurality of the programs by the transport decoder 13.

As operation states of the apparatus according to the first embodiment which can be selected by an operation of a user through the input operation unit 26, there are following three states:

1) "direct receiving" - receiving digital broadcasting and reproducing the same upon receipt;

2) "indirect receiving and storing" - receiving digital broadcasting and storing the same without reproducing the same upon receipt; and

3) "indirect receiving and reproducing" - reproducing the digital broadcasting which is received by the "indirect receiving".

These three states of "direct receiving", "indirect receiving and storing", and "indirect receiving and reproducing" can be assigned by an input by an operator through the input operation unit 26. In response to the assignment of the three states from the input operation unit 26, the output control unit 27 switches the selector switch 14 referring to a state of a copy flag, as shown in the table of fig.8.

Hereinafter, detailed descriptions are given of operations in the above-described three states.

Initially, in the "direct receiving" state, when "direct receiving" is assigned from the input operation unit 26, the selector switch 14 is switched to be connected to the transport decoder 13 controlled by the output control unit 27 (SW 14 is switched to 1, see fig.8). The program data of a program selected by the transport decoder 13 is MPEG-decoded by the MPEG decoder 15, and a digital video image and a voice are output. The digital video signal among those

is converted into a television signal by the NTSC encoder 16 and the television signal is output.

Fig.2 shows a stream structure of the program data selected by the transport decoder 13. Numeral 31 denotes a program data. Numeral 32 denotes a copy bit CB constituting a copy flag. Numeral 33 denotes a packet header. In fig.2, the program data 31 selected by the transport decoder 13 comprises packets, and each packet has a packet header 33. The packet header 33 includes a copy bit (CB) 32 indicating a copy flag concerning copyright information. Here, CB=0 means that copying to an external device is allowed and CB=1 means that copying to an external device is disallowed.

When this apparatus performs an "indirect receiving" operation relating to the "indirect receiving and storing" or "indirect receiving and reproducing", elements of, the scrambler 17, the descrambler 18, the recording pointer control unit 19, the reading pointer control unit 20, the simultaneous erasing pointer control unit 21, the hard disk interface 22, and the hard disk 23 shown in fig.1 are employed.

Fig.3 is a flowchart showing a control procedure at storing in the "indirect receiving and storing" operation among the above-described "indirect receiving" operations. As shown in fig.3, when the "indirect receiving and storing" is started, initial settings of, a receiving initial setting, a storing initial setting, and RP=0, are carried out in step S1. Then, in step S2, the packet header 33 of the program data 31 is examined by the scrambler 17 and the copy

flag 32 included therein is judged in step S3. When CB=0, it proceeds to step S4 where data of one packet pointed by the recording pointer RP is transmitted to the hard disk interface (HD-I/F) 22 without being scrambled. When CB=1 in step S3, it proceeds to step S5, and data of one packet pointed by the recording pointer RP is scrambled and transmitted to the hard disk interface (HD-I/F) 22. The scrambling of data means that data conversion is performed with a specific key for the content of a packet. When data is being stored onto the hard disk 23 in a state of "indirect receiving and storing" and where the copy bit shows the disallowance of copying, the selector switch 14 is in an open state.

Then, in step S6, referring to the value of the recording pointer RP, the pointer RP pointing the packet to be stored is incremented by one in the hard disk interface 22, and the program data is transmitted to the hard disk 23, as described above. In step S7, it is decided whether the storage is completed. In this way, the received program data having a time length which is set by the operator is stored on the hard disk 23.

Then, the program data stored in the hard disk 23 is read out from the hard disk 23 and is output through the hard disk interface 22 in the "indirect receiving and reproducing" operation among the above-described "indirect receiving" operations. In this case, as shown in fig.1, the selector switch 14 is switched to the side of the descrambler 18 (SW is switched to 2, see fig.8), whereby the descrambler 18 is connected with the MPEG decoder 15.

Fig.4 is a flowchart showing a control procedure at reading and erasing in the "indirect receiving and reproducing" operation among the above-described "indirect receiving" operations.

As shown in fig.4, when reading is started, initial settings of, a reading initial setting, a file opening, a reading pointer PP=0, and a simultaneous erasing pointer EP=0, are performed and then the hard disk interface 22 reads out the stored program data 31 as shown in fig.2, in step S1a.

The reading pointer PP is one for pointing a position where reading is to be performed. In step S2a, a packet header pointed by the reading pointer PP is read out. In step S3a, a copy flag CB included in the packet header 33 is judged in the descrambler 18. In accordance with a value of the copy flag CB, it proceeds to step S4a when CB=0, and data of one packet pointed by the reading pointer PP is transmitted to the MPEG decoder 15 as it is. Then, in step S5a, incrementing the reading pointer PP by one, processings are continued until the processing for the last packet is finished (this is judged in step S9a).

When it is judged CB=1 for the packet header in the read packet in step S3a, it proceeds to step S6a. Since the data of one packet pointed by the reading pointer PP has been scrambled, the data is descrambled by the descrambler 18 and is transmitted to the MPEG decoder 15. Further, when it is judged CB=1 for this packet header of the read packet, the reading pointer PP is incremented by one for the following reading as well as the simultaneous erasing pointer

EP is made to have a value which is smaller than the value of the reading pointer PP by one, in step S7a. Then, in step S8a, 0 is overwritten onto the entire data of the packet pointed by the simultaneous erasing pointer EP, thereby erasing the data of the packet the reading of which is already finished. While performing the above-described pointer control, processings are continued until the processing for the last packet is finished (this is judged in step S9a).

When it is judged YES in step S9a, i.e., when reading from the last packet is finished, the reading-and-erasing processing is ended when it is judged CB=0 in step S10a. When it is judged CB=1, it proceeds through step S11a to step S12a where the erasing processing with employing the overwriting is performed for the last packet, thereby performing final erasing, and finishing the reading-and-erasing processing.

The program data which is controlled to be stored to be read out as described above is, as shown in fig.1, transmitted to the MPEG decoder 15 to be decoded thereby, and a digital video image and a voice are output. The digital video signal is converted into a television signal by the NTSC encoder 6 and the television signal is output. In the descrambler 18, the copy flag CB is separated from the packet header, and the copy flag information 24 is used to control the NTSC encoder 16. When it is judged CB=1, the NTSC encoder 16 inserts a copy protect pulse into the television signal which is output from the NTSC encoder 16, and outputs the program data as a

copy-guarded signal.

As described above, according to this first embodiment, in order to reproduce the received broadcasting at a time later than when the broadcasting is received, the received broadcasting is temporarily stored and the stored broadcasting is read out to be output later as well as a copy-disallowance signal for inhibiting copying to an external recording device is stored together with the received broadcasting. Consequently, when the received broadcasting is read out and output, if the copy-disallowance signal is detected, the received and stored broadcasting is read out and output as well as simultaneously erased by performing overwriting, thereby satisfying the condition of disallowance for copying to an external recording device.

In the first embodiment, the method of reading and outputting as well as simultaneously erasing the received and stored broadcasting is achieved by performing overwriting with employing the simultaneous erasing pointer EP. However, this method of performing reading and outputting as well as simultaneous erasing can also be achieved by other methods of erasing stored video information associated with performing reading and outputting.

Further, in the first embodiment, the hard disk 23 is used as a unit for temporarily storing the received digital broadcasting information. However, any high-speed storage devices such as disk devices or semiconductor memories can be similarly employed.

Embodiment 2.

Next, a second embodiment, corresponding to claims 3 and 4 of the present invention, will be described with reference to figs. 2, 4, 5 and 6.

Fig.5 is a block diagram illustrating a digital broadcasting receiver according to the second embodiment. In fig.5, reference numeral 51 denotes a digital broadcasting receiver. Numeral 52 denotes a tuner. Numeral 53 denotes a transport decoder. Numeral 54 denotes a selector switch. Numeral 55 denotes an MPEG decoder. Numeral 56 denotes an NTSC encoder. Numeral 57 denotes a scrambler. Numeral 58 denotes a descrambler. Numeral 59 denotes a recording pointer control unit. Numeral 60 denotes a reading pointer control unit. Numeral 61 denotes a simultaneous erasing pointer control unit. Numeral 62 denotes a hard disk interface. Numeral 63 denotes a hard disk drive. Numeral 64 denotes a copy flag. Numeral 65 denotes an OSD (On Screen Demand) screen composition unit. Numeral 66 denotes an input operation unit. Numeral 67 denotes an output control unit. Numeral 68 denotes a message screen generating unit. Numeral 69 denotes a selector switch.

Hereinafter, an operation of the digital broadcasting receiver according to the second embodiment having such a structure will be described.

The tuner 52 is connected to the antenna. Digital broadcasting received by the tuner 52 is digital-demodulated, and the demodulated broadcasting is input to the transport decoder 53 as a data sequence in a form of a transport stream. The data sequence in a transport

stream includes a plurality of programs and control information multiplexed therein, and one is selected among the plurality of the programs by the transport decoder 53.

As operation states of the apparatus according to the second embodiment which can be selected by an operation of a user through the input operation unit 66, there are following three states, which are the same as those in the first embodiment:

1) "direct receiving" - receiving digital broadcasting and reproducing the same upon receipt;

2) "indirect receiving and storing" - receiving digital broadcasting and storing the same without reproducing the same upon receipt; and

3) "indirect receiving and reproducing" - reproducing the digital broadcasting which is received by the "indirect receiving and storing".

These three states of "direct receiving", "indirect receiving and storing", and "indirect receiving and reproducing", can be assigned by an input by an operator through the input operation unit 66. In response to the assignment of the three states from the input operation unit 66, the output control unit 67 switches the selector switch 54 as well as switches the selector switch 69, referring to a state of a copy flag, as shown in a table of fig.9.

Hereinafter, detailed descriptions are given of operations in the above-described three states.

Initially, in the "direct receiving", when "direct receiving"

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is assigned from the input operation unit 66, the selector switch 54 is switched to be connected to the transport decoder 53 side (SW is switched to 1, see fig.9), regardless of whether copying is allowed or disallowed, and the selector switch 69 is made in a connected state when copying is allowed, and is made open when copying is disallowed, controlled by the output control unit 67. In the "direct receiving" state, the program data is MPEG-decoded by the MPEG decoder 55 and a digital video image and a voice are output. When copying is allowed, the program data is stored on the hard disk 63 via the scrambler 57 because the selector switch 69 is turned on. On the other hand, when copying is disallowed, the data is not stored on the hard disk 63 because the selector switch 69 is turned off. In addition, the digital video signal of the program data transmitted to the MPEG decoder 55 side passes through the OSD composition unit 65, and is converted into a television signal by the NTSC encoder 56 and the television signal is output.

Fig. 2 shows a stream structure of the program data selected by the transport decoder 53, which is the same as that in the first embodiment. Numeral 31 denotes a program data. Numeral 32 denotes a copy flag CB. Numeral 33 denotes a packet header. In fig.2, the program data 31 selected by the transport decoder 13 comprises packets, and each packet has a packet header 33. The packet header 33 includes a copy bit (CB) 32 indicating the copy flag concerning copyright information. Here, CB=0 means that copying to an external device is allowed and CB=1 means that copying to an external device is

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disallowed.

In the "indirect receiving and storing" or "indirect receiving and storing" operation, elements, of the scrambler 57, the descrambler 58, the recording pointer control unit 59, the reading (reproducing) pointer control unit 60, the simultaneous erasing pointer control unit 61, the hard disk interface 62, the hard disk drive 63, the OSD composition unit 65, the output control unit 67, and the message screen generating unit 68 shown in fig.5, are employed.

When the input operation unit 66 is in the "indirect receiving and storing" state, the output control unit 67 switches the selector SW 54 in accordance with a state of the copy bit 32 of received digital information. Then, the selector SW 69 is in a connected state in both of the case when copying is allowed and the case when it is disallowed. This has an object of limiting the number of times of the viewer's viewing of a broadcasting program, which is protected under the copyright and for which program accounting is performed for each of the programs, so as to perform "storing" and "reproducing" of the broadcasting program in the "indirect receiving", to one time. For that purpose, in the "indirect receiving and storing" state, when the received digital signal is disallowed to be copied, a control procedure as described below is to be performed to inhibit outputting a video image of the received signal.

Fig.6 is a flowchart showing the control procedure at "indirect receiving and storing" operation. As shown in fig.6, when the "receiving and storing" operation is started, initial settings of,

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a receiving initial setting, a storing initial setting, and RP=0, are carried out in step S1b. Then, in step S2b, the packet header 33 of the program data 31 is examined by the scrambler 17 and the copy flag 32 included therein is judged in step S3b. When it is judged CB=0, it proceeds to step S4b and the output control unit 67 assigns "display the received video image". In this case, the selector switch 54 is switched to be connected to the side of the transport decoder 53, which is the side of a terminal of "1" and the selector switch 69 is made the connected state. Then in step S5b, the received packet pointed by the recording pointer RP is transmitted to the hard disk interface (HD-I/F) 62 without being scrambled.

When it is judged CB=1 in step S3b, it proceeds to step S6b, and the output control unit 67 assigns "display a message screen", and the selector switch 54 is switched to be disconnected and the selector switch 69 is made the connected state. At this time, the message screen generating unit 68 generates a massage showing "the received picture cannot be displayed during the recording operation due to the copyright protection", and the message is displayed on the screen through the OSD composition unit 65. Then in step S7b, data of one packet pointed by the recording pointer RP is scrambled and transmitted to the hard disk interface (HD-I/F) 62. Scrambling of data means that data conversion is performed with a specific key for the content of the packet. Then, in step S8b, referring to the value of the recording pointer RP, the pointer RP pointing the packet to be stored is incremented by one in the hard disk interface (HD-I/F)

62, and the program data is transmitted to the hard disk 63. In step S9b, it is judged whether the storage is completed, and when the storage is completed, the received program data having a time length which is set by the operator is stored on the hard disk 63.

When the input operation unit 66 assigns the "indirect receiving and reproducing" state, the program data stored in the hard disk 63 is read out from the hard disk 63 and is output through the hard disk interface (HD-I/F) 62. At this time, as shown in fig.5, the output control unit 67 judges the operation state and controls the selector switch 54 to connect the descrambler 58 with the MPEG decoder 55 (SW is switched to 2, see fig.9). Here, the selector switch 69 can be made either in the connected state or in an open state.

Fig. 4 is a flowchart showing a control procedure at "indirect receiving and reproducing" operation. The operation at this time is similar to the above-described operation, and thus the description is omitted.

As described above, according to this second embodiment, when a copy-disallowance signal is stored during the "indirect receiving and storing" operation, in order to assure the copyright protection, outputting of a video signal which is received is inhibited and a message screen is displayed in place of the received video signal, whereby the number of times of viewing the program which is under the copyright protection is limited to only one time. Therefore, when a program which is severely protected under the copyright, such as pay broadcasting, and for which program accounting is performed upon

receipt of each program, is received, and even when the viewing time is shifted later, the number of viewing times can be limited to only one time and the protection of the copyright is assured.

APPLICABILITY IN INDUSTRY

According to the digital broadcasting receiver of the present invention, when a received video signal is disallowed to be copied to an external recording device, the digital broadcasting receiver enables viewing the broadcasting by shifting a viewing time later, even when the broadcasting cannot be viewed upon receipt, and realizes the protection of copyright severely also in that case.

CLAIMS

1. A digital broadcasting receiver comprising:

a tuner unit for receiving digital broadcasting information including copyright information which shows whether copying to an external device is allowed or not and detecting the copyright information included in the received digital broadcasting information;

an information storage unit for storing the received digital broadcasting information together with the copyright information detected in the received digital broadcasting information; and

a decoder unit for decoding the received digital broadcasting information or digital broadcasting information read out from the information storage unit into an output signal in a form to be displayed, and

when a copy-disallowance signal is detected in the digital broadcasting information read out from the information storage unit, the digital broadcasting receiver erasing digital broadcasting information which is stored in the information storage unit and has been successively read out therefrom during a reproduction operation for reading out the digital broadcasting information from the information storage unit and reproducing and displaying the same on a display device.

2. The digital broadcasting receiver of claim 1 comprising:

pointer control means for controlling a reading position where information is read out from the information storage unit when digital



broadcasting information is reproduced from the information storage unit,

the pointer control means including:

a reading pointer for pointing the reading position where digital broadcasting information is read out from the information storage unit; and

an erasing pointer for pointing a position where the digital broadcasting information is erased after it is read out, i.e., pointing a position which has been pointed by the reading pointer.

3. A digital broadcasting receiver comprising:

a tuner unit for receiving digital broadcasting information including copyright information which shows whether copying to an external device is allowed or not, and detecting the copyright information in the received digital broadcasting information;

an information storage unit for storing the received digital broadcasting information together with the copyright information in the received digital broadcasting information; and

a decoder unit for decoding the received digital broadcasting information or digital broadcasting information read out from the information storage unit into an output signal in a form to be displayed, and,

when a copy-disallowance signal included in the copyright information in the received digital broadcasting information is detected while the received digital broadcasting information is stored in the information storage unit during receiving digital



broadcasting information, the digital broadcasting receiver inhibiting outputting the received digital broadcasting information as an output signal in a form to be displayed through the decoder unit.

4. The digital broadcasting receiver of claim 3 inhibiting, when a copy-disallowance signal included in the copyright information in the received digital information is detected while the received digital broadcasting information is stored in the information storage unit, outputting the received digital broadcasting information as an output signal in a form to be displayed through the decoder unit, and outputting a message screen signal which is prepared in advance, to an output unit for outputting an output signal in a form to be displayed through the decoder unit.

