DESCRIPTION

BROADCAST RECEPTION APPARATUS, BROADCAST RECEPTION SYSTEM, AND PORTABLE INFORMATION TERMINAL

Technical Field

The present invention relates to a broadcast reception apparatus and a broadcast reception system which allow the effective use of a portable information terminal powered by a secondary battery, such as a portable telephone set, a PHS (Personal Handy-phone system) terminal, a PDA (Personal Digital Assistant) terminal, a portable game machine, or the like, and a portable information terminal itself.

Background Art

One effort to enable a portable information terminal to receive broadcasts is a broadcast reception circuit that is incorporated in the portable information terminal.

However, the broadcast reception circuit incorporated in the portable information terminal needs a printed wiring board to have an increased area for accommodating the broadcast reception circuit, and also needs the portable information terminal itself to have an increased volume for housing circuit components of the broadcast reception circuit. As a result, the portable information terminal has an increased weight and consumes an increased amount of electric energy. For these reasons, the portable information terminal has its portability impaired to some extent.

Disclosure of Invention

The inventor of the present invention has noticed that many portable information terminals are powered by a secondary battery in view of its convenience, and such portable information terminals are normally used in such a mode that they are carried and used by the users in daytime, and connected to a battery charger to charge the secondary battery at night.

It is therefore an object of the present invention to provide a broadcast reception apparatus and a broadcast reception system which allow a portable information terminal free of a broadcast reception circuit to receive broadcast data, and a portable information terminal itself.

A broadcast reception apparatus according to the present invention comprises a reception circuit for receiving broadcasts, a charging circuit, and a connector for connection to a portable information terminal operable by a secondary battery included therein. The connector has a data transmitting terminal for transmitting data of a broadcast received by the reception circuit and a battery charging terminal for charging the secondary battery included in the portable information terminal with the charging circuit.

When the portable information terminal is connected to the connector of the broadcast reception apparatus, the portable information terminal can receive data of a broadcast received by the reception circuit through the data

transmitting terminal, and the secondary battery included in the portable information terminal can be charged through the battery charging terminal.

If the portable information terminal has a memory device, then when the portable information terminal is connected to the connector, the secondary battery is charged by the charging circuit through the battery charging terminal, and the data transmitted from the data transmitting terminal is stored into the memory device. The data stored in the memory device can be reproduced at a desired time while the portable information terminal is being carried by the user.

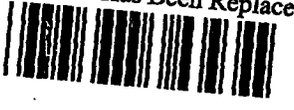
The broadcast reception apparatus may be used as a television receiver, a tuner box, a recording and reproducing device, a set top box, or a game machine with a tuber function.

The broadcast may comprise a data broadcast, for example.

The broadcast reception apparatus may have a timer-programmed recording function, and the data transmitted from the data transmitting terminal may be supplied through the connector to the portable information terminal while in the timer-programmed recording process.

A broadcast reception system according to the present invention comprises a broadcast reception apparatus and a battery charging device. The broadcast reception apparatus has a reception circuit for receiving broadcasts and a data transmitting connector for transmitting data of a broadcast

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received by the reception circuit. The battery charging device has a data receiving terminal for connection to the data transmitting connector, a terminal connector for connection to a portable information terminal operable by a secondary battery included therein, and a charging circuit for charging the secondary battery. The terminal connector has a data transmitting terminal for transmitting the data received through the data transmitting connector and the data receiving terminal to the portable information terminal, and a battery charging terminal for charging the secondary battery included in the portable information terminal with the charging circuit.

With the above arrangement, the broadcast reception apparatus and the battery charging device may be separate from each other.

In the broadcast reception system, if the portable information terminal has a memory device, then when the portable information terminal is connected to the terminal connector, the secondary battery is charged by the charging circuit through the battery charging terminal, and the data transmitted from the data transmitting terminal is stored into the memory device. The data stored in the memory device can be reproduced at a desired time while the portable information terminal is being carried by the user.

According to the present invention, a portable information terminal operable by a secondary battery comprises a connector having a battery charging terminal and a data re-

ceiving terminal, and a memory device. When an external battery charging terminal and an external data transmitting terminal are connected respectively to the battery charging terminal and the data receiving terminal, the secondary battery is charged from the external battery charging terminal through the battery charging terminal and data supplied from the external data transmitting terminal through the data receiving terminal is stored into the memory device.

In the portable information terminal, the data can be stored into the memory device while the secondary battery is being charged.

The data may be stored into the memory device according to a first-in, first-out process by erasing data previously stored in the memory device and storing newly transferred data in the memory device.

The portable information terminal may further comprise a display unit and/or a sound output unit. Therefore, the portable information terminal alone can reproduce the data as images and/or sounds at a desired time.

The above and other objects, features, and advantages of the present invention will become more apparent from the following description when taken in conjunction with the accompanying drawings in which preferred embodiments of the present invention are shown by way of illustrative example.

Brief Description of Drawings

FIG. 1 is a schematic perspective view of a system in-

cluding a television receiver according to an embodiment of the present invention;

FIG. 2 is a block diagram of a circuit arrangement of the system shown in FIG. 1;

FIG. 3 is a flowchart of an operation sequence of the system shown in FIG. 1 for charging a battery and transferring data;

FIG. 4 is a flowchart of an operation sequence of the system shown in FIG. 1 for operating a portable information terminal alone;

FIG. 5 is a schematic perspective view of a system including a recording and reproducing device according to another embodiment of the present invention;

FIG. 6 is a schematic perspective view of a system including a set top box according to still another embodiment of the present invention;

FIG. 7 is a schematic perspective view of a system including a tuner box according to yet another embodiment of the present invention;

FIG. 8 is a schematic perspective view of a system including a video game machine with a tuner function according to yet still another embodiment of the present invention;

FIG. 9 is a schematic perspective view of a broadcast reception system according to a further embodiment of the present invention; and

FIG. 10 is a block diagram of a circuit arrangement of the broadcast reception system shown in FIG. 9.

Best Mode for Carrying Out the Invention

FIG. 1 shows a system including a television receiver 10 as a broadcast reception apparatus according to an embodiment of the present invention.

As shown in FIG. 1, the television receiver 10 has a casing 20 including a front panel that supports thereon the front face of a cathode-ray-tube display unit 22 housed in the casing 20, a pair of speakers 24, a power supply switch 25, and a slot (holder) 18 in the form of a recess as a connector for a portable information terminal 14.

The front panel of the casing 20 also supports, near the slot 18, a charging indicator lamp 36 for indicating battery charging for the portable information terminal 14 and a reception indicator lamp 37 for indicating the reception of broadcast data.

The portable information terminal 14 may comprise a portable information terminal powered by a secondary battery, such as a portable telephone set, a PHS terminal, a PDA terminal, a portable game machine, or the like.

The television receiver 10 is connected by a coaxial cable 40 to a coaxial terminal 44 which is connected to an aerial antenna 42 for receiving data broadcasts, and also connected by a power supply cord 46 and an AC plug 48 to an AC outlet 50 which is supplied with a commercial AC electric power from an external AC power supply.

The portable information terminal 14 can be inserted

into and removed from the slot 18 that is defined in a lower area of the front panel of the casing 20.

The portable information terminal 14 has a liquid crystal display (LCD) unit 12 having a color liquid crystal screen of 320 pixels × 240 pixels. The portable information terminal 14 also has a casing 26 supporting thereon the liquid crystal display unit 12 and a control key assembly 32 including a cross key 28 and a decision key 30. The decision key 30 also functions as a power supply switch for the portable information terminal 14.

FIG. 2 shows in block form a basic arrangement of an electric circuit of the television receiver 10 and a basic arrangement of an electric circuit of the portable information terminal 14 that is removably connected to the television receiver 10.

In FIG. 2, the portable information terminal 14 is shown as being inserted into the slot 18 of the television receiver 10. Stated otherwise, the television receiver 10 and the portable information terminal 14 are shown as electrically connected to each other via connection terminals 62, 64 and connection terminals 66, 68.

For an easier understanding of the present invention, the connection terminals 62, 66 that are disposed in the slot 18 and the connection terminals 64, 68 that are disposed in a connector 29 of the portable information terminal 14 is shown as being connected to each other by single wires. Actually, however, the connection terminals 62, 64

are connected to each other by a plurality of wires, and the connection terminals 66, 68 are connected to each other by a plurality of wires.

The connection terminal 62 serves as a data transmitting terminal, and the connection terminal 66 serves as a battery charging terminal (battery charging output terminal). These connection terminals 62, 66 are disposed in the bottom of the slot 18. The connection terminal 64 serves as a data receiving terminal, and the connection terminal 68 serves as a battery charging terminal (battery charging input terminal). These connection terminals 64, 68 are disposed in the connector 29 that is located on the lower surface (bottom surface) of a lower end 16 (see FIG. 1) of the portable information terminal 14. When the connector 29 of the portable information terminal 14 is inserted into the slot 18 of the television receiver 10, the connection terminals 62, 64 are brought into contact with each other and hence electrically connected to each other, and the connection terminals 66, 68 are also brought into contact with each other and hence electrically connected to each other.

As shown in FIG. 2, the television receiver 10 has a tuner 51 as a data reception circuit capable of receiving data broadcasts. The tuner 51 extracts data from a television radio wave 53 received by an antenna 42 and sends the extracted data to a bus 54.

The television radio wave 53 is a data broadcasting radio wave which can distribute various digital contents,

i.e., various forms of information including pictures, images (moving and still images), sounds, characters, numerals, etc. representing programs and commercials that can be played back on television receivers and radio receivers, newspaper articles, and magazine articles, using vertical blanking intervals (VBIs) of NTSC broadcasts as ground-wave television broadcasts. Therefore, the television radio wave 53 can be received by the antenna 42 which may be a conventional Yagi antenna, for example.

The television radio wave 53 contains a plurality of channel waves. In order to select and receive a desired channel, the television receiver 10 has a channel control circuit 56 for switching to a selected frequency of the tuner 51 based on channel information that has been entered by a remote commander 38 functioning as a channel selecting means.

In the present embodiment, the antenna 42 and the tuner 51 receive ground-wave data broadcasts as described above. However, the principles of the present invention are also applicable to not only ground-wave data broadcasts, but also satellite digital broadcasts and ground digital broadcasts.

Data, i.e., an NTSC signal, selected and received by the tuner 51 and sent to the bus 54 is decoded by a data decoder 58. If the decoded NTSC signal contains data represents various contents, referred to above, multiplexed using VBIs, then the decoded data is transmitted to the portable information terminal 14 via an external interface 60, which comprises a serial interface, and the connection terminal 62

under the control of a microcomputer 100 that functions as a reception controller.

The data decoder 58 may be integrally combined with the microcomputer 100.

The data sent from the television receiver 10 to the portable information terminal 14 via the connection terminal 62 in the slot 18 is sent via the connection terminal 64 in the connector 29, an external interface 67, which comprises a serial interface, and a bus 74 to a data storage (memory device) 72, which comprises an electrically erasable programmable ROM (Read-Only Memory) such as a flash memory, under the control of a microcomputer 70. The data sent to the data storage 72 is stored in the data storage 72.

The data storage 72 may have a storage capacity of 16 MB if data of a data broadcast having a data rate of about 40 kbps is to be stored for at least 50 minutes (40 kbps ÷ 8 bits × 50 min. × 60 sec. = 15 MB).

Each of the microcomputers 100, 70 comprises a CPU (Central Processing Unit), a ROM, a RAM (Random-Access Memory), input and output interfaces, a clock as a clock means, a timer as a timing means, etc., and functions as a controller, an arithmetic unit, and a processor. Therefore, as described above, the function of the data decoder 58 may be performed by the microcomputer 100.

To the microcomputer 100 in the television receiver 10, there is connected a reception indicator lamp 37 that is controlled by the microcomputer 100 so as to be turned on

while a data broadcast is being received, data is being transferred from the television receiver 10 to the data storage 72 in the portable information terminal 14, and data is being stored into the data storage 72, and turned off otherwise.

The television receiver 10 also has a power supply circuit 80. The power supply circuit 80 converts an AC voltage such as of AC 100 V supplied from the AC outlet 50 of the commercial AC power supply into a DC voltage and supplies the DC voltage to all blocks in the television receiver 10.

A charging circuit 82 converts the DC voltage supplied from the power supply circuit 80 into a charging DC voltage, for example, and supplies the charging DC voltage through the connection terminal 66 to the portable information terminal 14. The charging DC voltage is applied via the connection terminal 68 to a secondary battery 84 in the portable information terminal 14 thereby to charge the secondary battery 84. The charging circuit 82 carries out a charging control process for detecting the temperature of the secondary battery 84 to control a charging current supplied thereto, detecting a remaining capacity of the secondary battery 84, and detecting a fully charged state of the secondary battery 84.

The secondary battery 84 may comprise a lithium ion battery, a nickel hydrogen battery, or the like.

The charging indicator lamp 36 is connected to the charging circuit 82. The charging indicator lamp 36 is con-

trolled by the charging circuit 82 such that it is turned on while the secondary battery 84 is being charged and turned off when the secondary battery 84 is fully charged.

The control key assembly 32 (see also FIG. 1) is connected to the bus 74 via an interface, not shown, and the LCD unit 12 is connected to the bus 74 via an LCD controller (LCDC), not shown.

A process of receiving a data broadcast with the tuner 51 and storing the data into the data storage 72 of the portable information terminal 14 while the secondary battery 84 of the portable information terminal 14 is being charged by the charging circuit 82 will be described in detail below with reference to FIG. 3.

In step S1 shown in FIG. 3, the portable information terminal 14 is inserted into the slot 18 and hence mounted in the television receiver 10 by the user. Usually, the portable information terminal 14 is mounted in the television receiver 10 when the user of the portable information terminal 14 gets home or goes to bed at night.

In step S2, the remote commander 38 sets up timer-programmed recording process. When a time to start the recording process is reached, the tuner 51 starts recording a desired channel that has been set up in the channel control circuit 56.

When the slot 18 and the connector 29 are connected to each other in step S1, the microcomputer 100 of the television receiver 10 wakes up. In step S3, DC electric power

converted from AC electric power supplied from the AC outlet 50 via the AC plug 48 is supplied from the power supply circuit 80 via the charging circuit 82, the connection terminal 66, and the connection terminal 68 to the secondary battery 84. At this time, the charging circuit 82 carries out its charging control process to monitor the charging current, the charged quantity (remaining capacity), the charging temperature, and the fully charged state, etc. When the secondary battery 84 starts being charged, the charging indicator lamp 36 is turned on.

In step S4, the tuner 51 receives the television radio wave 53 carrying a data broadcast via the antenna 42 and the coaxial cable 40.

If the television radio wave 53 is transmitted from a broadcasting station, not shown, during a fixed time, then the clock and timer of the microcomputer 100 may be used to supply electric power to the tuner 51, the data decoder 58, etc. only during that fixed time.

In this embodiment, it is assumed that the television radio wave 53 broadcast from a broadcasting station (not shown) contains data representing newspaper clippings about local news, economy news, and sports news (hereinafter referred to as "newspaper article data") from 4:00 am to 4:30 am as a VBI signal relative to the data broadcast, and the timer-programmed recording process is set up for that time period in step S2. The data of the VBI signal may be compressed. If the data of the VBI signal is compressed, then

the data decoder 58 stores a data expansion program, or the VBI signal contains an interleaved data expansion program, which will be loaded into the data decoder 58 when the VBI signal is decoded by the data decoder 58.

In step S4, the television radio wave 53 received by the antenna 42 is demodulated by the tuner 51 into an NTSC signal in the channel which has been selected by the channel selection circuit 56.

In step S5, the data decoder 58 decodes the NTSC signal in an attempt to separate data, i.e., newspaper article data, which has been multiplexed in the NTSC signal.

If data which has been multiplexed in the NTSC signal, i.e., newspaper article data, is produced the decoding process carried out by the data decoder 58 (YES in step S6), then the presence of the data is indicated from the data decoder 58 to the microcomputer 100.

The microcomputer 100 recognizes the presence of the data, and turns on the reception indicator lamp 37.

In step S7, the data decoder 58 transfers the newspaper article data as digital contents via the bus 54, the external interface 60, the connection terminals 62, 64, the external interface 67, and the bus 74 to the data storage 72 of the portable information terminal 14. In step S8, the transferred newspaper article data is stored in the data storage 72.

Thereafter, the processing in step S3 and following steps is repeated. Actually, if no multiplexed data is pre-

sent in the NTSC signal in step S6, then the processing in step S3 and following steps is also repeated.

The operation sequence shown in FIG. 3 is continued until the portable information terminal 14 is pulled out of, i.e., detached, from the television receiver 10. If an amount of data which exceeds the available storage capacity of the data storage 72 is transferred from the data decoding circuit 58 to the data storage 72, then a so-called FIFO (First In, First Out) process is carried out to update (overwrite) the stored data by erasing the data previously stored in the data storage 72 and storing the newly transferred data in the data storage 72.

The data storage 72 may be arranged such that the data stored in the data storage 72 will automatically be erased a certain period of time, e.g., 30 minutes, after the portable information terminal 14 is mounted in the television receiver 10.

After the portable information terminal 14 is removed from the television receiver 10 by the user at about 7 am, for example, the user presses the decision switch 30 continuously for a given period of time in step S11 shown in FIG. 4, turning on the portable information terminal 14.

In step S12, the microcomputer 70 reads the data from the data storage 72, and controls the LCDC (not shown) to reproduce the data on the LCD unit 12. Therefore, the newspaper article data received by the tuner 51 of the television receiver 10 is reproduced on the display screen of the

LCD unit 12. A sound output unit 76 having a speaker interface and an audio signal output terminal may be connected to the bus 74 in the portable information terminal 14, so that sounds may be reproduced by a speaker or earphone in the sound output unit 76 in synchronism with the reproduction of image data on the LCD unit 12. Only sounds of news or music may be reproduced by such a speaker or earphone.

While the newspaper article data is being reproduced in step S12, the user may use the cross key 28 to rewind, fast-feed, pause, or otherwise process the newspaper article data being reproduced.

When the decision key 30 is continuously pressed by the user for a given period of time while the newspaper article data is being reproduced in step S12, the portable information terminal 14 is turned off in step S13.

Contents data that can be received as data broadcasts are not limited to newspaper article data, but may include other data such as game data, fortune-telling data, etc. If such other data are included as contents data, then the user can execute such data as an interactive application such as a game on the portable information terminal 14 using the control key assembly 32.

Usually, the portable information terminal 14 is carried around by the user when the user goes out, and mounted in the television receiver 10 when the user gets home. If the broadcasting station has such an infrastructure that a data broadcast is on air from 4:00 am to 4:30 am next morn-

ing, then by the time the user goes out in the morning, the secondary battery 84 has been fully charged, and the latest data, e.g., today's newspaper article data, has been stored in the data storage 72.

Therefore, the user is able to reproduce the latest data stored in the data storage 72 of the portable information terminal 14 while the user is commuting on a commuter train, for example. As a result, the user who can use the television receiver 10 and the portable information terminal 14 can automatically receive and reproduce the latest data by connecting the portable information terminal 14 to the television receiver 10 after getting home everyday, for example.

The portable information terminal 14 arranged as shown in FIGS. 1 and 2 does not require a data reception circuit including the tuner 51 which has a large power requirement and a relatively large volume, and hence is relatively small in size and weight.

The user of the portable information terminal 14 is able to read newspaper articles as electronic data on the LCD unit 12. Therefore, the user find printed newspapers unnecessary, and hence the portable information terminal 14 is a paper resource saver. The portable information terminal 14 thus arranged can be used a novel video medium, not conventionally available, different from the conventional portable television receivers.

In the embodiment shown in FIGS. 1 and 2, the tuner 51

of the television receiver 10 is used, and the charging circuit 82 is included in the television receiver 10. However, the tuner 51, the channel control circuit 56, the charging circuit 82, and the data decoder 58 may be included in a recording and reproducing device 101 (see FIG. 5) such as a VTR (Video Tape Recorder) or the like, or a set top box 102 (see FIG. 6) for receiving CATV (CAble TeleVision) signals, or a tuner box 103 (see FIG. 7) for receiving various broadcasts including a satellite radio wave 53A with a satellite antenna 42A, or a video game machine 104 (see FIG. 8) with a tuner function.

Each of the recording and reproducing device 101, the set top box 102, the tuner box 103, and the video game machine 104 has the slot 18 having the connection terminal 62 as a data transmitting terminal and the connection terminal 66 as a battery charging terminal, the charging indicator lamp 36, and the reception indicator lamp 37. Therefore, each of the recording and reproducing device 101, the set top box 102, the tuner box 103, and the video game machine 104 can be used as a broadcast reception apparatus to which a television receiver 10 and the portable information terminal 14 can be connected. In FIGS. 5 through 8, the television receiver 10B comprises an ordinary television receiver.

FIG. 9 shows in perspective a broadcast reception system 200 according to a further embodiment of the present invention. FIG. 10 shows in block form a circuit arrangement of the broadcast reception system shown in FIG. 9.

Those parts shown in FIGS. 9 and 10 which are identical to those of the television receiver 10 and the portable information terminal 14 shown in FIGS. 1 and 2 are denoted by identical reference characters, and will not be described in detail below.

Basically, the broadcast reception system 200 shown in FIGS. 9 and 10 comprises a television receiver 10A having a data transmitting connector 118, a battery charging device 212 connected to the data transmitting connector 118 by a cable 210 dedicated for receiving data, and a portable information terminal 14 detachably inserted in a slot 18A defined in the battery charging device 212.

The data transmitting connector 118 is connected to the external interface 60 of the television receiver 10A and has a connection terminal 62A connected to a connection terminal 218 of the battery charging device 212 by the cable 210. The connection terminal 218 is connected by an internal wire 220 to a connection terminal 62 in a slot 18A defined as a terminal connector in the battery charging device 212.

The battery charging device 212 has a power supply cord 46A connected to an AC plug 48A for connection to the AC outlet 50. The battery charging device 212 has a power supply circuit 80A connected to the power supply cord 46A, a charging circuit 82 connected to the power supply circuit 80A and a connection terminal 66 in the slot 18A, a lamp indication control circuit 216 connected to the power supply circuit 80A, a charging indicator lamp 36 connected to the

charging circuit 82, and a reception indicator lamp 37 connected to the lamp indication control circuit 216.

The power supply circuit 80A outputs a DC electric power that is supplied to the charging circuit 82 and an input terminal of the lamp indication control circuit 216.

The internal wire 220 is connected to another input terminal of the lamp indication control circuit 216.

Other details of the broadcast reception system 200 shown in FIGS. 1 and 2 are identical to those of the television receiver 10 and the portable information terminal 14 shown in FIGS. 1 and 2.

When the portable information terminal 14 is inserted into the slot 18A of the battery charging device 212 and the secondary battery 84 is being charged by the charging circuit 82, the charging indicator lamp 36 is turned on. While broadcast data received by the tuner 51 of the television receiver 10A is being transferred via the external interface 60, the connection terminal 62A, the cable 210, the connection terminal 218, and the internal wire 220, the lamp indication control circuit 216 turns on the reception indicator lamp 37. At this time, the data is stored into the data storage 72 via the connection terminal 62, the connection terminal 64, the external interface 67, and the bus 74.

The broadcast reception system 200 shown in FIGS. 1 and 2 offers the same advantages as those of the system shown in FIGS. 1 and 2, and the portability of the portable information terminal 14 is not impaired.

According to the present invention, as described above, when the portable information terminal is connected to the connector of the broadcast reception apparatus, the portable information terminal can receive data via the data transmitting terminal, and the secondary battery in the portable information terminal can be charged by the charging circuit via the battery charging terminal.

The charging circuit may be included in the broadcast reception apparatus or in the battery charging device external to the broadcast reception apparatus. If the charging circuit is included in the battery charging device external to the broadcast reception apparatus, then data received by the broadcast reception apparatus can be sent through the battery charging device to the portable information terminal.

If the portable information terminal has a memory device, then when the portable information terminal is connected to the broadcast reception apparatus or the battery charging apparatus, the data supplied through the data transmitting terminal can be stored into the memory device while the secondary battery in the portable information terminal is being charged.

The data stored in the memory device can be reproduced with the display unit and/or the sound output unit on the portable information terminal alone at a desired time while the portable information terminal is being carried by the user.

With the above arrangement, even a portable information terminal which does not have a broadcast reception circuit is capable of receiving broadcast data. Since the portable information terminal has no broadcast reception circuit, its portability is not impaired.

Although certain preferred embodiments of the present invention have been shown and described in detail, it should be understood that various changes and modifications may be made therein without departing from the scope of the appended claims.

CLAIMS

1. A broadcast reception apparatus comprising:

a reception circuit (51) for receiving broadcasts;

a charging circuit (82); and

a connector (18) for connection to a portable information terminal (14) operable by a secondary battery (84) included therein;

said connector (18) having a data transmitting terminal (62) for transmitting data of a broadcast received by said reception circuit and a battery charging terminal (66) for charging the secondary battery included in said portable information terminal with said charging circuit.

2. A broadcast reception apparatus according to claim 1, wherein said portable information terminal has a memory device (72), the arrangement being such that when said portable information terminal is connected to said connector, said secondary battery is charged by said charging circuit through said battery charging terminal, and said data transmitted from said data transmitting terminal is stored into said memory device.

3. A broadcast reception apparatus according to claim 1, for use as a television receiver (10), a tuner box (103), a recording and reproducing device (101), a set top box (102), or a game machine (104) with a tuber function.

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4. A broadcast reception apparatus according to claim 1, wherein said broadcast comprises a data broadcast.

5. A broadcast reception apparatus according to claim 1, having a timer-programmed recording function, wherein when said portable information terminal is connected to said connector, said reception circuit starts operating at a time set up for starting a timer-programmed recording process, and said data transmitted from said data transmitting terminal is supplied through said connector to said portable information terminal while in the timer-programmed recording process.

6. A broadcast reception system comprising:

a broadcast reception apparatus (10A) and a battery charging device (212);

said broadcast reception apparatus having a reception circuit (51) for receiving broadcasts and a data transmitting connector (118) for transmitting data of a broadcast received by said reception circuit;

said battery charging device having a data receiving terminal (218) for connection to said data transmitting connector, a terminal connector (18A) for connection to a portable information terminal (14) operable by a secondary battery (84) included therein, and a charging circuit (82) for charging said secondary battery;



said terminal connector having a data transmitting terminal (62) for transmitting the data received through said data transmitting connector and said data receiving terminal to said portable information terminal, and a battery charging terminal (66) for charging the secondary battery included in said portable information terminal with said charging circuit.

7. A broadcast reception system according to claim 6, wherein said portable information terminal has a memory device (72), the arrangement being such that when said portable information terminal is connected to said terminal connector, said secondary battery is charged by said charging circuit through said battery charging terminal, and said data transmitted from said data transmitting terminal is stored into said memory device.

8. A broadcast reception system according to claim 6, wherein said broadcast reception apparatus is used as a television receiver (10B), a tuner box (103), a recording and reproducing device (101), a set top box (102), or a game machine (104) with a tuber function.

9. A broadcast reception system according to claim 6, wherein said broadcast comprises a data broadcast.

10. A broadcast reception system according to claim 6,

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wherein said broadcast reception apparatus has a timer-programmed recording function, wherein when said data receiving terminal is connected to said data transmitting terminal, and also when said portable information terminal is connected to said terminal connector, said reception circuit starts operating at a time set up for starting a timer-programmed recording process, and said data transmitted from said data transmitting terminal is supplied through said data transmitting connector and said terminal connector to said portable information terminal while in the timer-programmed recording process.

11. A portable information terminal operable by a secondary battery, comprising:

a connector (29) having a battery charging terminal (68) and a data receiving terminal (64); and

a memory device (72);

the arrangement being such that when an external battery charging terminal (66) and an external data transmitting terminal (62) are connected respectively to said battery charging terminal and said data receiving terminal, said secondary battery is charged through said battery charging terminal and data supplied through said data transmitting terminal is stored into said memory device.

12. A portable information terminal according to claim 11, wherein said data is stored into said memory device ac-

cording to a first-in, first-out process by erasing data previously stored in the memory device and storing newly transferred data in the memory device.

13. A portable information terminal according to claim 11, further comprising a display unit and/or a sound output unit.

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