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**WO 01/47258 A1**

(54) Title: TELEVISION RECEIVER REMOTE CONTROL SYSTEM WITH TELEVISION AUDIO

(57) Abstract: A television receiver remote control system having a receiver for receiving audio signal portions of signals carrying television channels, an audio transmitter for transmitting the audio signal portion of a selected one of the channels received by the receiver, and a remote control for remote operation of the receiver to select the audio signal portion of a desired channel for transmission by the transmitter, and for remote operation of a TV. The remote control includes an audio receiver for wireless receipt of the audio signal portion of the selected channel transmitted by the transmitter, and an audio speaker for converting the received audio signal portion into sound. The system permits the audio signal portion of any selected channel to be listened to with the remote control via the speaker without changing a channel selected on an associated TV.

## Television receiver remote control system with television audio

This invention relates to hand-held television receiver (TV) remote controls, and in particular, to a TV remote control system with TV audio that includes a hand-held remote control with conventional TV and video recording device functions, and an audio receiver and speaker arrangement that permits the audio signal portion of a secondary  
5 channel to be listened to without disturbing the audio and video of a primary channel tuned on an associated TV.

In the past, TVs permitted only a single television channel to be viewed and  
10 listened to at a time. However, many TVs are now equipped with picture in a picture systems (PIP) which permit simultaneous viewing of two or more television channels.

Most of these PIP equipped TV designs permit the audio of just one of the television channels to be listened to at a time. There are some PIP equipped TV designs that will permit the audio of two or more television channels to be simultaneously listened to  
15 through the speakers of the TV. Unfortunately, the different audio programs generated from the speakers of the same TV at the same time interfere with one another and make listening to either very difficult.

Accordingly, a system is needed which permits the audio of a secondary channel to be listened to without disturbing the audio and video of a primary channel tuned  
20 on an associated TV.

A television receiver remote control system comprising a receiver for receiving audio signal portions of signals carrying television channels, an audio transmitter  
25 for transmitting the audio signal portion of a selected one of the channels received by the receiver, and a remote control for remote operation of the receiver to select the audio signal portion of a desired channel for transmission by the transmitter, and for remote operation of a TV. The remote control includes an audio receiver for wireless receipt of the audio signal portion of the selected channel transmitted by the transmitter, and an audio speaker or

headset connection for converting the received audio signal portion into sound. The system may permit the audio signal portion of any selected channel to be listened to with the remote control via the speaker without changing a channel selected on an associated TV.

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The advantages, nature, and various additional features of the invention will appear more fully upon consideration of the illustrative embodiments now to be described in detail in connection with accompanying drawings wherein:

- FIG. 1 is a schematic view of a TV remote control system with TV audio  
10 according to a first embodiment of the invention;
- FIG. 2 is a schematic plan view of the hand-held remote control of the system;
- FIG. 3A is a schematic front elevational view of the TV audio  
receiver/transmitter base unit of the system;
- FIG. 3B is a schematic rear elevational view of the TV audio  
15 receiver/transmitter base unit of the system;
- FIG. 4A is a schematic view of a TV remote control system with TV audio  
according to a second embodiment of the invention;
- FIG. 4B is a schematic diagram detailing the modifications made to the VCR  
used in the second embodiment of the system;
- 20 FIG. 5 is a schematic view of a TV remote control system with TV audio  
according to a third embodiment of the invention; and
- FIG. 6 is a schematic view of a TV remote control system with TV audio  
according to a fourth embodiment of the invention.
- It should be understood that the drawings are for purposes of illustrating the  
25 concepts of the invention and are not to scale.

FIG. 1 shows a TV remote control system 10 with TV audio according to a  
first embodiment of the invention. The system 10 includes a hand-held remote control 12 and  
30 a TV audio receiver/transmitter base unit 14.

As shown in FIG. 2, the hand-held remote control 12 conventionally includes  
a keypad 16, an infrared transmitter 18, and associated other components and electrical  
circuitry 20 which enable it to be operated as a universal television remote control with  
standard TV and VCR functions. In accordance with the invention, the remote control 12

further includes an antenna 22 and audio receiver circuitry 24 for wireless receipt of the audio signals transmitted by the TV audio receiver/transmitter base unit 14 (Fig. 1), and an audio speaker 26 and associated signal amplification circuitry 24 for converting the audio signals into sound. The audio receiver and signal amplification circuitry 24 used in the remote control 12 are of known construction and operation. The remote control 12 is also provided with an audio function keypad 28 and associated electrical circuitry 30 for operating the TV audio receiver/transmitter base unit via the infrared transmitter 18. The audio keypad 28 typically provides volume control functions 32 for the audio generated by the remote control 12, a 3-way switch 34 for selecting among a television, a video cassette recorder, and the remote control audio, and power buttons 36 for all three functions (TV, VCR, and audio). The remote control 12 can be further provided with an earphone jack 38 for using standard headsets 39 and a rechargeable battery pack (not shown).

As shown in FIGS. 3A and 3B, the TV audio receiver/transmitter base unit 14 includes known components and circuitry 40 for receiving wireless and cable television signals carrying UHF and VHF channels, for tuning and selecting a particular one of these channels via the remote control, and for transmitting the audio signal portion of a selected channel to the remote control. An antenna 42 is provided for receiving wireless television signals and transmitting the audio signal portion of a selected channel to the remote control 12. A coaxial cable connection 44 is also provided for connecting the base unit 14 to a coaxial cable (not shown) that carries television signals.

The TV audio receiver/transmitter base unit 14 further includes an A/C power cord connection 46 for electrically connecting the base unit into a standard electrical outlet, and an infrared remote sensor 48 for receiving infrared control signals from the remote control 12 that permit channel selection and power the base unit 14 on and off. Integrated into the base unit 14 is a charging station 50 (Fig. 1) for holding the remote control 12 when not in use and recharging its battery pack. The charging station 50 includes an A/C to D/C power supply 52 and known battery charge control circuits 54. A channel display 56 can also be provided for displaying channels selected by the remote control.

The TV remote control system 10 of the invention advantageously allows a user to listen to the audio of a selected television channel from any location within the transmitting range of the TV audio receiver/transmitter base unit 14 using the hand-held remote control 12. The system 10 also allows a user to listen to the audio of a secondary television channel (or audio surf from channel to channel) via the remote control 12 and base unit 14 without disrupting the audio and video of a primary channel selected on an associated

TV. Accordingly, the use of the system 10 with a television receiver containing a PIP system (not shown) brings audio to the secondary picture.

FIG. 4A shows a TV remote control system 60 with TV audio according to a second embodiment of the invention. This embodiment of the system 60 combines the remote control 12 of the first embodiment with a video recording device such as a conventional video cassette recorder (VCR) 62, modified with a conventional audio transmitter unit 64 that transmits the audio signal portion of a channel selected on the VCR 62 to the audio receiver 24 (Fig. 2) of the remote control 12. A free standing charging station 66 can be provided for holding the remote control 12 when not in use and recharging its rechargeable battery pack. The charging station 66 typically includes a cradle 68 for holding the remote control 12, an AC to DC power supply 70, and known battery charge control circuits (not visible). A digital channel display 78 can be provided on the front of the VCR 62 to display the selected audio channel. The modified VCR 62 can be used alone as a tuner to permit the audio of any selected television channel to be heard through the remote control 12. More typically however, the modified VCR 62 can be connected to a TV (not shown), and used as a tuner to permit a user to listen to the audio of any selected television channel through the remote control 12 without interrupting the audio or video of the selected television channel being viewed on the TV.

As shown in FIG. 4B, the audio transmitter 64 is connected to the audio preamplification circuitry 72 of the VCR 62. The audio transmitter 64 includes an antenna 74 for receiving wireless TV signals. The VCR's control circuitry 76 is adapted to enable or disable the audio transmitter 64.

FIG. 5 shows a TV remote control system 80 with TV audio according to a third embodiment of the invention. This embodiment of the system 80 is substantially identically to the system 60 of the third embodiment except that the audio transmitter is an external unit 82 that attaches directly to the audio terminals 84 on the back of the VCR 86. The external audio transmitter 82 can be provided with a manual on/off switch 83 to allow activation thereof. It is also possible to provide the external audio transmitter 82 with an infrared sensor 85 for remote activation thereof via the infrared transmitter 18 of the remote control 12.

FIG. 6 shows a TV remote control system 90 with TV audio according to a fourth embodiment of the invention wherein the remote control 12 of the first embodiment and the charging station 66 of the second and third embodiments, are combined with a PIP equipped TV 91 with two tuners 92, 93.

In this system 90, one of the two tuners 92, 93 of the TV 91 provides the same receiving function as the TV audio receiver/transmitter unit of the first embodiment, i.e., it receives wireless and cable television signals carrying UHF and VHF channels and is tunable to a particular channel via the remote control 12. The audio transmission function is provided by a modifying the TV 91 with an audio transmitter 94 and antenna 96 that transmits the audio portion of a selected television channel to the remote control 12. The TV 91 can be modified with the audio transmitter 94 in substantially the same manner as was the VCR in the second or third embodiments of the invention.

Hence, the system 90 of the fourth embodiment allows a user to listen to the audio of a secondary television channel (or audio surf from channel to channel) via the remote control 12 and one of the two tuners 92, 93 of the TV 91, without disrupting the audio and video of a primary channel selected on the TV 91 with the other one of the two tuners 92, 93.

It should be understood that the various receiver and transmitter components and electrical circuitry used in the TV remote control system of the invention can be adapted for monaural, high fidelity stereo, or any other sound reproduction scheme of the audio signal. It should be further understood that these various receiver and transmitter components and electrical circuitry are well known in the art and are commercially available. Therefore, detailed descriptions of these components and electrical circuitry are unnecessary and have not been provided. Additionally, the receiver for receiving audio signal portions of signals carrying television channels can be embodied as any conventional video recording and/or reproduction device such as a digital video disk (DVD) that is capable of being modified or adapted to selectively transmit the audio signal portions of signals carrying television channels to the remote control.

While the foregoing invention has been described with reference to the above embodiments, various modifications and changes can be made without departing from the spirit of the invention. Accordingly, all such modifications and changes are considered to be within the scope of the appended claims.

## CLAIMS:

1. A television receiver remote control system (10, 60, 80, 90) comprising:
  - a receiver (40, 62, 86, 92) for receiving audio signal portions of signals carrying television channels;
  - an audio transmitter (40, 64, 82, 94) for transmitting the audio signal
  - 5 portion of a selected one of the channels received by the receiver; and
  - a remote control (12) for remote operation of the receiver to select the audio signal portion of a desired television channel for transmission by the transmitter, and for remote operation of a TV, the remote control (12) including an audio receiver (24) for receipt of the audio signal portion of the selected channel transmitted by the transmitter and
  - 10 for transferral of the audio signal portion to an audio speaker (26) for converting the received audio signal portion into sound;
  - wherein the audio signal portion of any selected channel can be listened to with the remote control via the speaker.
- 15 2. The ... according to claim 1, wherein the remote control (12) comprises said audio speaker (26).
3. The television receiver remote control system (10, 60, 80, 90) according to claim 1 or 2 wherein the remote control (12) further includes an external connection (38) for
- 20 a headset.
4. The ... according to claim 1, wherein the audio signal portion of the selected channel can be listened to without changing a channel selected on an associated TV.
- 25 5. The television receiver remote control system (10) according to claim 1, wherein the receiver and the audio transmitter (40) are components of a free standing base unit (14).

6. The television receiver remote control system (10) according to claim 5, wherein the base unit (14) includes a charging station (50) for holding the remote control (12) when not in use and recharging a battery pack contained in the remote control (12).
- 5 7. The television receiver remote control system (90) according to claim 1, wherein the receiver (92) and the audio transmitter (94) are components of a two-tuner TV (91).
8. The television receiver remote control system (60) according to claim 1,  
10 wherein the receiver (62) and the audio transmitter (64) are components of a video recording device.
9. The television receiver remote control system (90) according to claim 1, wherein the audio transmitter is an external unit (94) connectable to at least one output of a  
15 TV (91) or a recording device.
10. The television receiver remote control system (10, 60, 80, 90) according to claim 1, wherein the remote control (12) further includes a keypad (28) that provides audio functions associated with the audio receiver (24) and the speaker (26).  
20
11. A television receiver remote control (12) with television audio for remotely tuning a receiver that receives audio signal portions of signals carrying television channels, and for remotely operating a TV, the remote control (12) comprising an audio receiver (24) for receipt of the audio signal portion of a selected channel transmitted by an audio  
25 transmitter associated with the receiver and for transferral of the audio signal portion to an audio speaker (26) for converting the audio signals into sound;  
wherein the audio signal portion of any selected channel can be listened to with the remote control (12) via the speaker (26).
- 30 12. The ... according to claim 11, wherein the remote control (12) comprises said audio speaker (26)
13. The television receiver remote control (12) according to claim 11, wherein the remote control (12) further includes an external connection (38) for a headset.



14. The television receiver remote control (12) according to claim 11, further comprising a keypad (28) that provides audio functions associated with the audio receiver (24) and the speaker (26).

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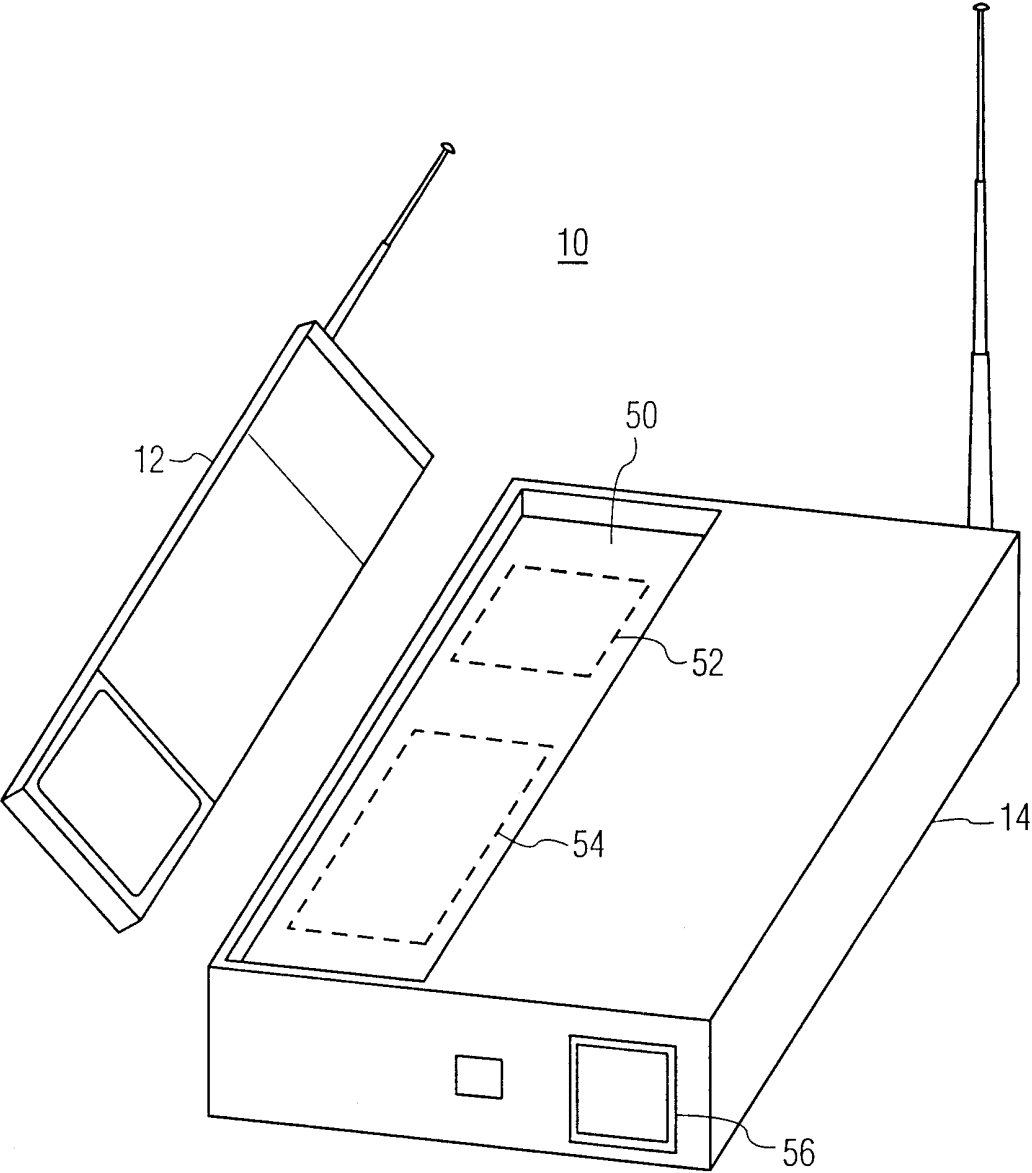


FIG. 1

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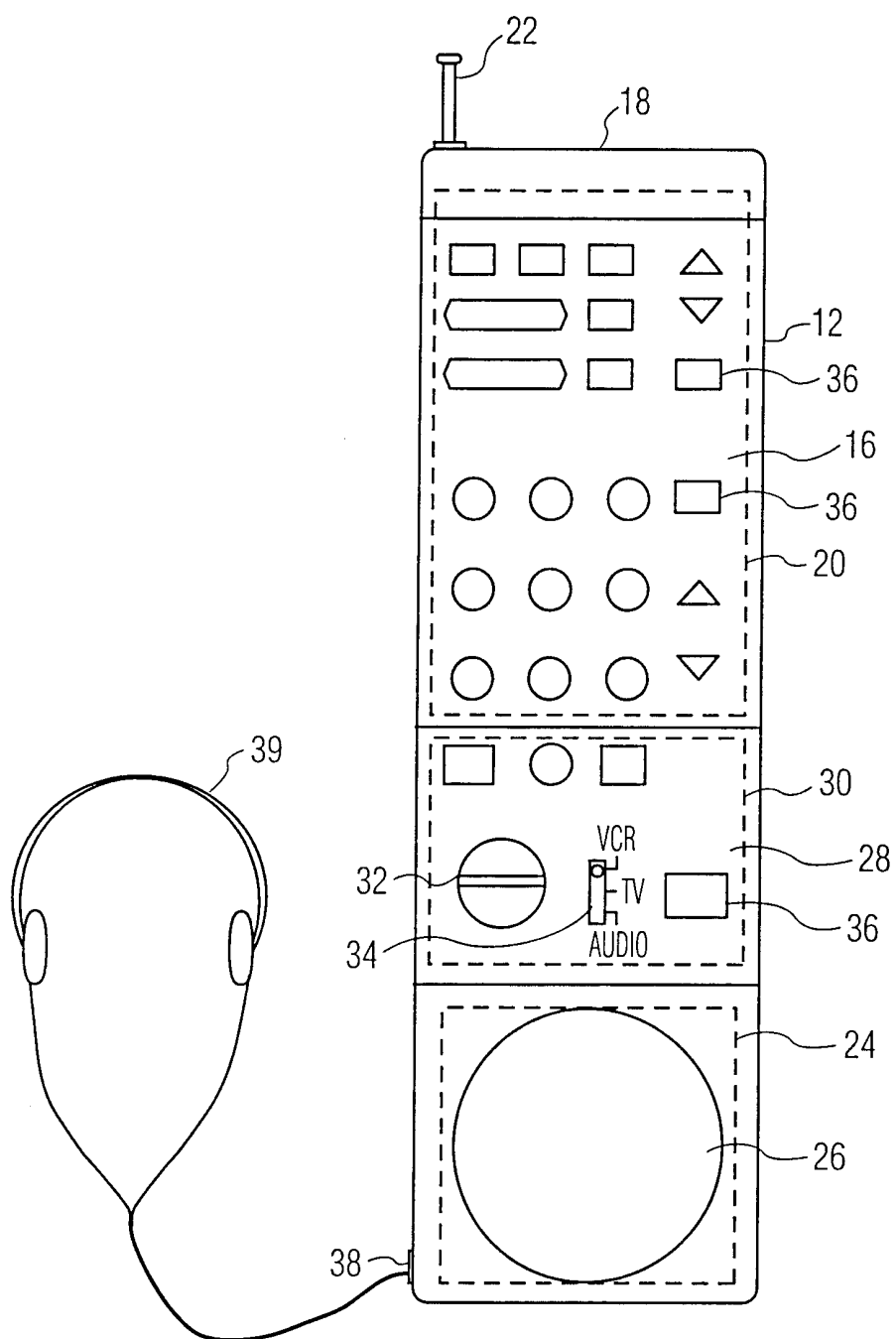


FIG. 2

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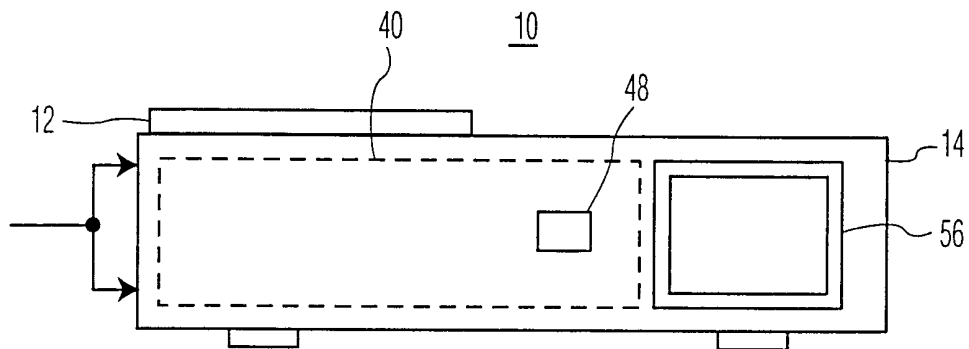


FIG. 3A

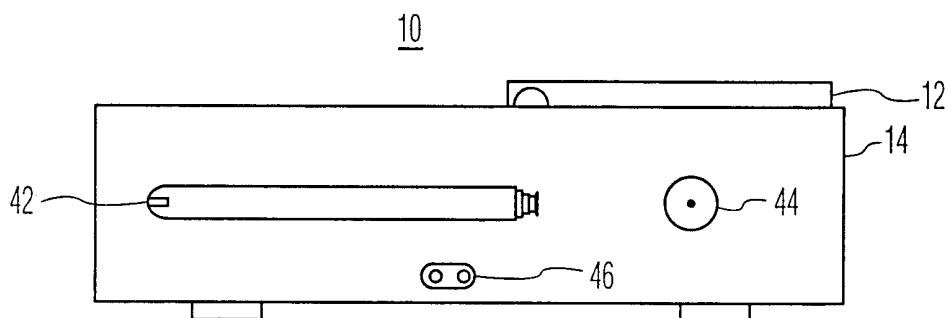


FIG. 3B

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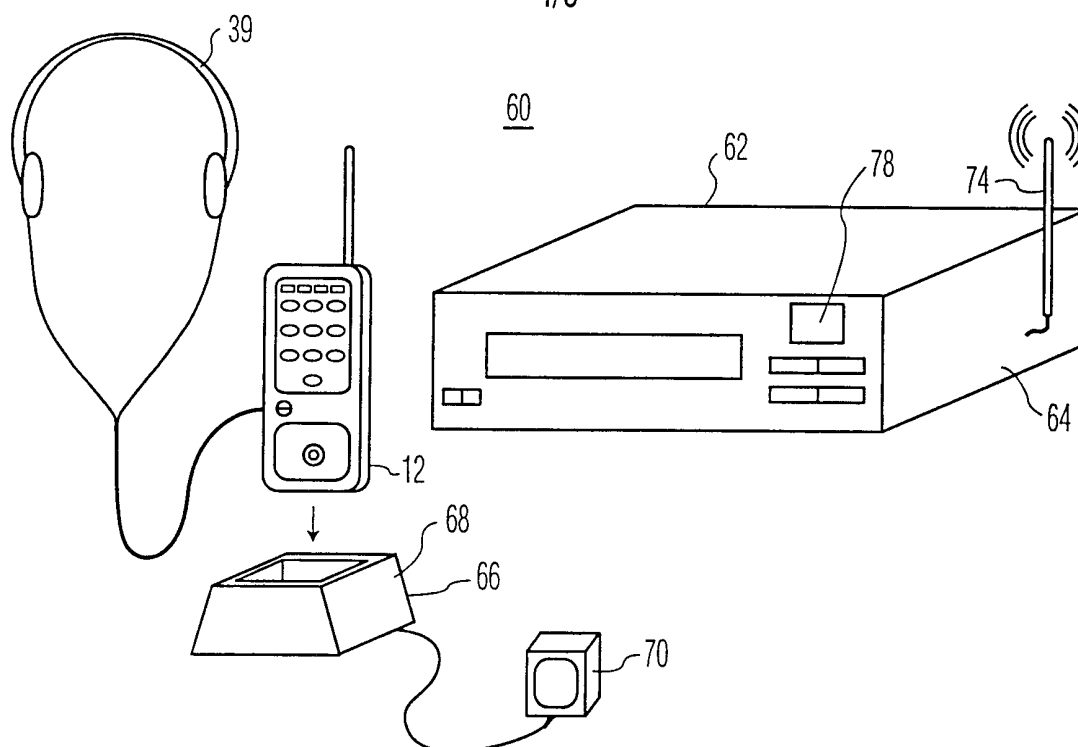


FIG. 4A

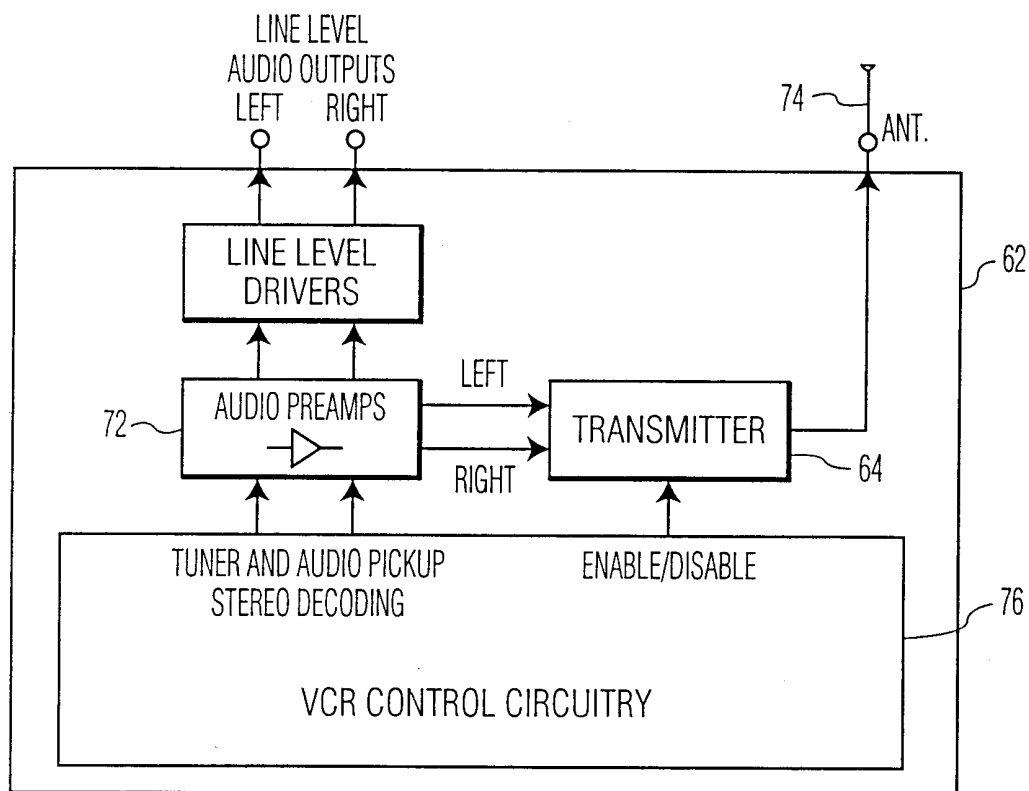


FIG. 4B

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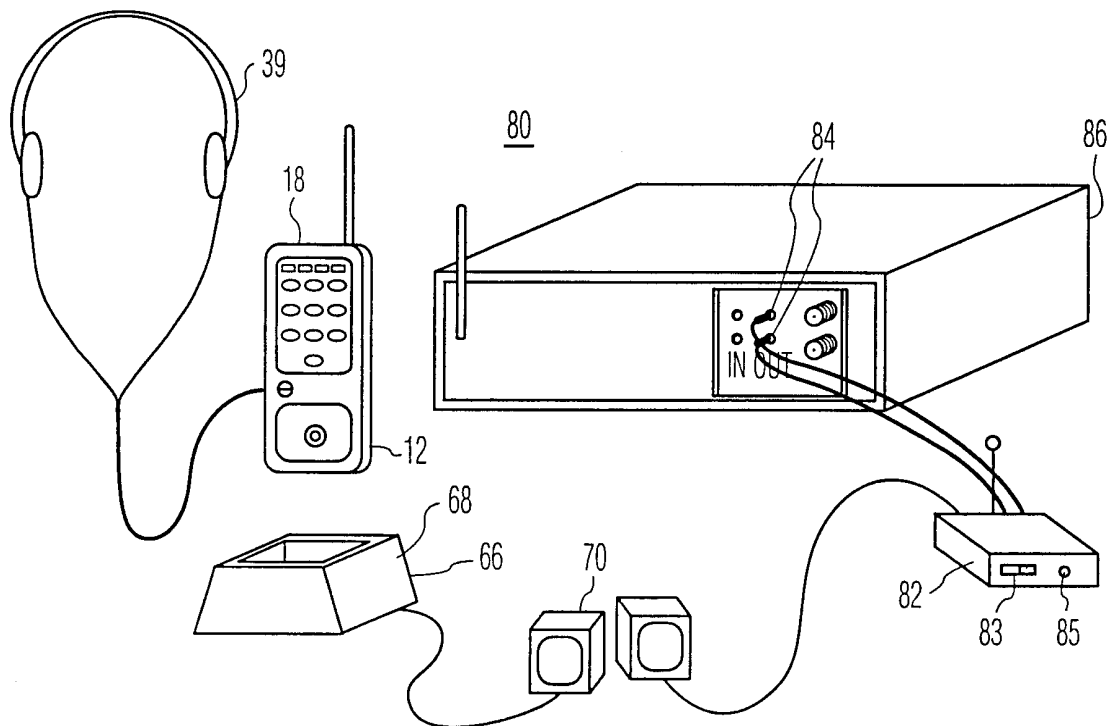


FIG. 5

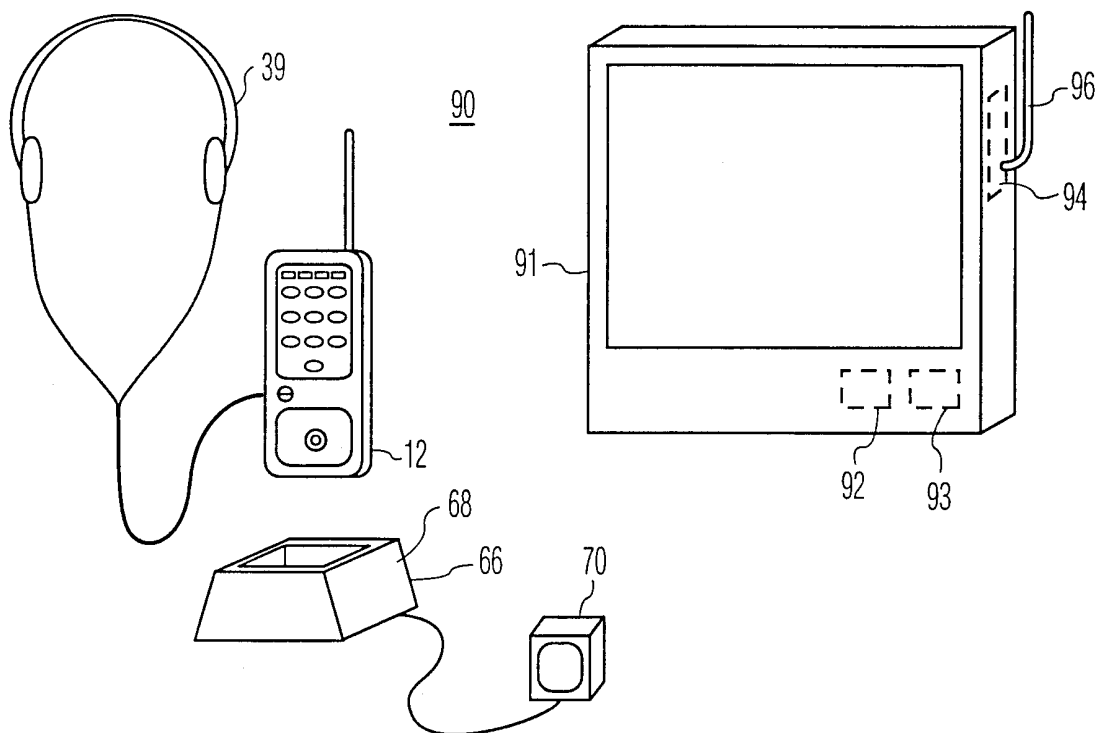


FIG. 6

# INTERNATIONAL SEARCH REPORT

Int. Application No  
PCT/EP 00/12378

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 H04N5/45 H04N5/60

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 H04N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

26 March 2001

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# INTERNATIONAL SEARCH REPORT

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