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(54) Title: MODULAR REMOTE CONTROL DEVICE

(57) **Abstract:** Control of consumer electronics equipment is achieved using first and second remotes. The first remote is capable of controlling the equipment directly, the second remote is capable of controlling the equipment via the first remote. The second remote is in the form of a detachable module at the first remote.

MODULAR REMOTE CONTROL DEVICE

RELATED APPLICATIONS

The following applications are incorporated herein by reference:

U.S. Serial No. 09/434,155 (Attorney docket PHA 23,783) filed 11/4/99;

U.S. Serial No. 09/128,839 (Attorney docket PHA 23,469) filed 8/4/98;

5 U.S. Serial No. 09/129,300 (Attorney docket PHA 23,470) filed 8/5/98;

U.S. Serial No. 09/271,200 (Attorney docket PHA 23,607) filed 3/17/99;

U.S. Serial No. 09/311,128 (Attorney docket PHA 23,501) filed 5/13/99;

U.S. Serial No. 09/210,416 (Attorney docket PHA 23,522) filed 12/11/98.

10 FIELD OF THE INVENTION

The invention relates to the field of remote control devices, also known as “remotes”, and, in particular, to remotes that comprise a graphical user interface (GUI) with a touch screen.

15 BACKGROUND OF THE INVENTION

The term “remote” or “remote control device” as used herein refers to a device that enables a user to control another device through wireless communication. A known universal, programmable remote with a touch screen is the PRONTO™ by Philips Electronics, introduced into the market in September of 1998. More information about the
20 PRONTO™ is available at the website <http://www.pronto.philips.com>.

SUMMARY OF THE INVENTION

A touch screen and a battery pack make such full-fledged remote rather large and heavy. Channel surfing with such a remote may be experienced as not as convenient as
25 with a more traditional and lean remote. It is an object of the invention to provide an ergonomic solution while retaining the advantages of universal programmable remotes such as the Pronto™. The invention provides therefore a combination of a first remote control device for enabling a user to directly control the equipment, and a second remote control device for enabling the user to control the equipment via the first remote control device.

Advantageously, the second remote may be in the form of a detachable module or detachable keys or buttons for the first remote. Advantageously, also, the first remote is user programmable. Further objects and advantages will be apparent in the following.

5 BRIEF DESCRIPTION OF THE DRAWING

The invention is described below in further detail and by way of non-limiting example with reference to the accompanying drawing wherein Figs. 1 - 3 are diagrams illustrating embodiments of a combination remote according to the invention. Throughout the figures, like reference numerals indicate similar or corresponding features.

10

DETAILED EMBODIMENTS

Fig. 1 is a diagram of a combination 101 in the invention. Combination 101 comprises a first remote 102 and a second remote 106, here drawn as separate entities for clarification. Combination 101 preferably functions as a universal and programmable remote such as the Pronto TM for control of CE equipment 112 when the user interacts with combination 101. Equipment 112 comprises in this example, consumer electronics equipment, such as a television set, an audio system, a VCR, a home entertainment system, a hard-disk drive (HDD) digital recorder, etc. Other types of equipment, e.g., a PC, can be adapted to be remotely controlled by remotes 102 and 106 as well.

First remote 102 communicates directly with CE equipment 112 via a wireless connection 104. Wireless connection 104 is of any suitable type, such as RF (radio frequency) or IR (infrared). Since CE equipment typically requires an IR input for remote control, connection 104 is preferably IR, with optional features for an additional RF connection. Optionally, an RF to IR conversion unit (not shown) is used, if connection 104 is only an RF and equipment 112 is IR controllable. Such a unit would preferably include IR shooters wired into place near any IR receivers of devices to be controlled. Alternatively, the conversion unit could use a powerful IR blaster placed somewhere near equipment 112. Second remote 106 enables the user to control equipment 112 indirectly via first remote 102 as is discussed in further detail below.

First remote 102 comprises a display 103 with a touch sensitive LCD screen. Display 103 is suitable for graphical display of a menu with control options or other user interface elements according to what is necessary for control of, e.g., equipment 112. First remote 102 is preferably user-programmable, and includes macro-editing capabilities and dedicated data processing components. Connection 104 may be used, in addition to supplying

commands to control equipment 112, for receiving information. For instance, remote 102 may receive programming information from a processing device (e.g., a PC or modem, not shown) rather than being manually programmed by the user. The programmability of the first remote 102 may, among other things, a) allow combination 101 to deal with more than one
5 type of equipment, including equipment or functionalities not presently known; or b) allow modification of some functioning of combination 101 itself, such as a user interface function.

The second remote 106 comprises a number of hard buttons or hard keys, such as buttons 107. The second remote 106 is preferably of a relatively simple sort. Remote 106 has hard keys 107 for providing fixed control signals to be interpreted via processing
10 capabilities local to the first remote 102. The second remote 106 may communicate with the first remote 102 wirelessly at 105, for instance by RF or IR connection. In order to avoid interference between connections 104 and 105, the connection 104 is, e.g., IR while the connection 105 is RF, or both connections 104 and 105 are IR but use functionally different frequency bands. In addition, the second remote 106 is preferably detachably mounted to the
15 first remote 102. Communication between remotes 106 and 105 when physically connected can use the wireless connection 105 or a galvanic connection bypassing the wireless part of the signal path of connection 105. The latter is achieved through proper mounting slots and plugs.

Remotes 102 and 106 can each be thought of as a separate remote. Functional
20 options for the combination 101 are divided between those displayed on the screen 103 and those specified by the buttons 107. Preferably, the most commonly used functional options are assigned to the hard buttons 107. For instance, for control of a television receiver, the buttons 107 preferably include volume up, volume down, mute, channel up, and channel down. Since the first remote 102 is programmable, keys 107 can be assigned any function by
25 changing the mapping within the unit 102 as the latter functions as a programmable interface between equipment 112 and second remote 106. This function assignment can be dynamic in the sense that changes in remote 102 can change the mapping. For example, changing remote 102 from "TV mode" to "CD mode" can change mapping of the volume up and volume down buttons 107 of remote 106 to either the TV volume up/down or the CD-player's
30 volume up/down codes.

Fig. 2 is a diagram of an embodiment of the combination 101 in which the second remote 106 is detachably, physically mounted on top of the first remote 102. A functional connection between remotes 102 and 106 uses wireless connection 105, or, alternatively, yields a galvanic connection between remotes 102 and 106 using, e.g.,

complementary electrically conductive parts 202 and 204 located in remotes 102 and 106. Optionally, upon the mechanical connection having been established between remotes 102 and 106 the mechanical connection triggers remote 102 to change, e.g., the representation of a graphical user interface on screen 103, e.g., to avoid the control options of hard buttons 107 of remote 106 being duplicated by the options graphically represented at touch screen 103. In this embodiment, the remotes 102 and 106 can function together in a fashion similar to the known PRONTO's. However, the user can detach part 106 and zap through the TV channels manipulating only remote 106 while leaving remote 102 on the table.

Figs.3 and 4 illustrate a specific manner of mechanically coupling remotes 102 and 106. The mechanical connection between remotes 102 and 106 can be obtained in a variety of ways. For example, remote 106 slides into place guided by suitably profiled rails or channels in an upper surface of remote 102, or gets locked in place through an elastic snap fitting and one or more spring-loaded metal balls that fit in a recess at the surface of remote 102. For example, parts 202 and 204 can include the metal balls to establish an electric connection between remotes 102 and 106 when remote 106 is locked and kept in place, thus providing a wired signal path from remote 106 to remote 102 for control of equipment via remote 102. More specifically, Figs. 3 and 4 illustrate an embodiment of combination 101, wherein an upper face 302 of remote 102 accommodates touch screen 103 and has a profiled recess 304. The shape of recess 304 matches the shape of a sliding shoe 306 on the bottom of remote 106. When sliding shoe 306 is put into place in recess 304, the position of remote 106 is laterally fixed by the walls of recess 304. Sliding shoe 306 is longitudinally fixed when a spring-loaded metal ball 308 snaps into a hole 310 in recess 304. The spring-loaded ball cooperate with hole 310 to enable easy disassembly of configuration 101 by pulling remotes 102 and 106 apart.

In another configuration (not shown) shoe 306 is accommodated on upper surface 302 of remote 102, and recess 304 is formed on the back of remote 106. Shoe 306 and recess 304 preferably have suitable ergonomic shapes, e.g., with rounded corners, to facilitate handling the remotes 102 and 106 in operational use.

Advantageously, the remote 102 of the combination 101 in the invention can be equipped with a larger screen than known remotes, because the second remote 106 remains small and can be easily used in a handheld fashion, while leaving the remote 102 with the larger screen on a table, for instance for channel surfing.

From reading the present disclosure, other modifications will be apparent to persons skilled in the art. Such modifications may involve other features which are already

known in the design, manufacture and use of remotes and which may be used instead of or in addition to features already described herein. Although claims have been formulated in this application to particular combinations of features, it should be understood that the scope of the disclosure of the present application also includes any novel feature or novel combination
5 of features disclosed herein either explicitly or implicitly or any generalization thereof, whether or not it mitigates any or all of the same technical problems as does the present invention. The applicants hereby give notice that new claims may be formulated to such features during the prosecution of the present application or any further application derived therefrom.

CLAIMS:

1. A combination of a first remote control device (102) for enabling a user to remotely control electronic equipment (112) directly and a second remote control device (106) for enabling the user to remotely control the equipment via the first remote control device.
5
2. The combination of claim 1, wherein the second device is physically detachably connectable with the first device.
3. The combination of claim 2, wherein the second device is capable of serving
10 as a component of a user-interface of the first device when connected.
4. The combination of claim 1, wherein the first device uses a first protocol (104) for the communicating with the equipment, and the second device uses a second protocol (105) for communicating with the first device, and wherein the first and second protocols
15 differ from one another.
5. The combination of claim 4, wherein the first protocol uses IR, (104) and the second protocol uses RF (105) .
- 20 6. The combination of claim 1, wherein at least the first device or the second device is user-programmable.
7. The combination of claim 1, wherein the first device comprises a universal programmable remote control device.
25
8. The combination of claim 1, wherein the first device is configurable to provide a first plurality of control functions, the second device provides a second plurality of control functions, and wherein the second plurality is smaller than the first plurality.

9. A remote control device (106) for indirect user-control of electronic equipment (112) via a further remote control device (102), the further device being capable of providing direct user-control of the equipment.
- 5 10. The device of claim 9, being detachably connectable to the further device.
11. The device of claim 10, serving as a component of a user-interface of the further device when connected.

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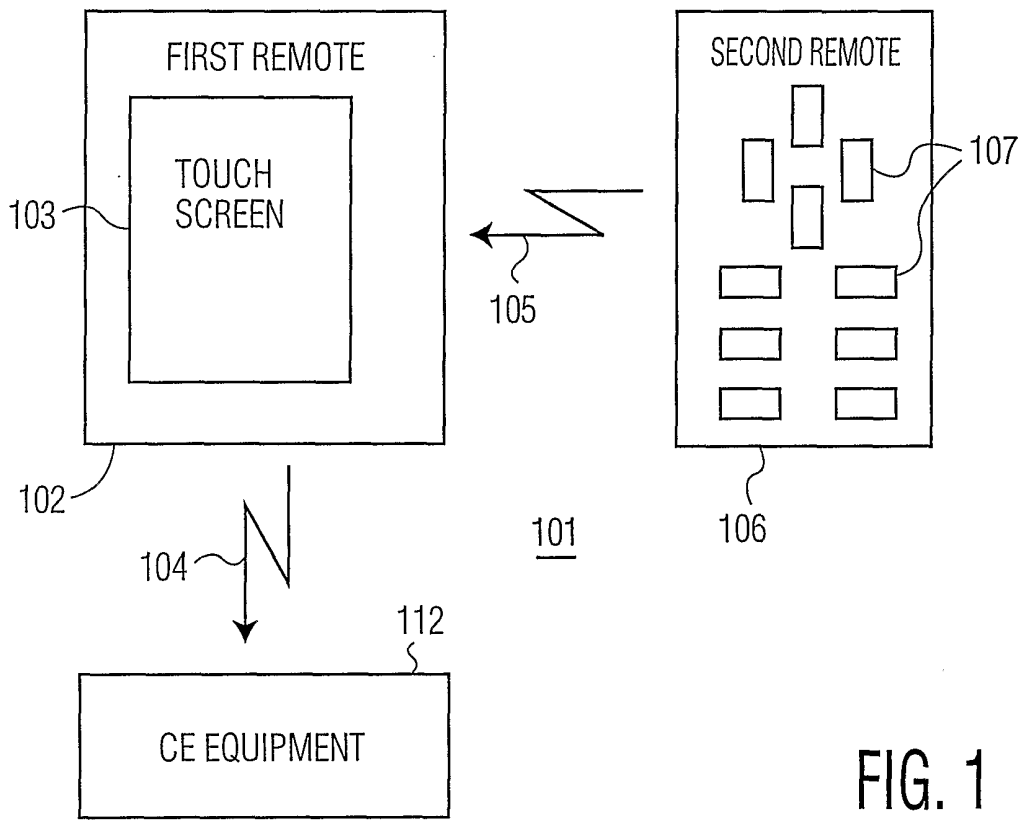
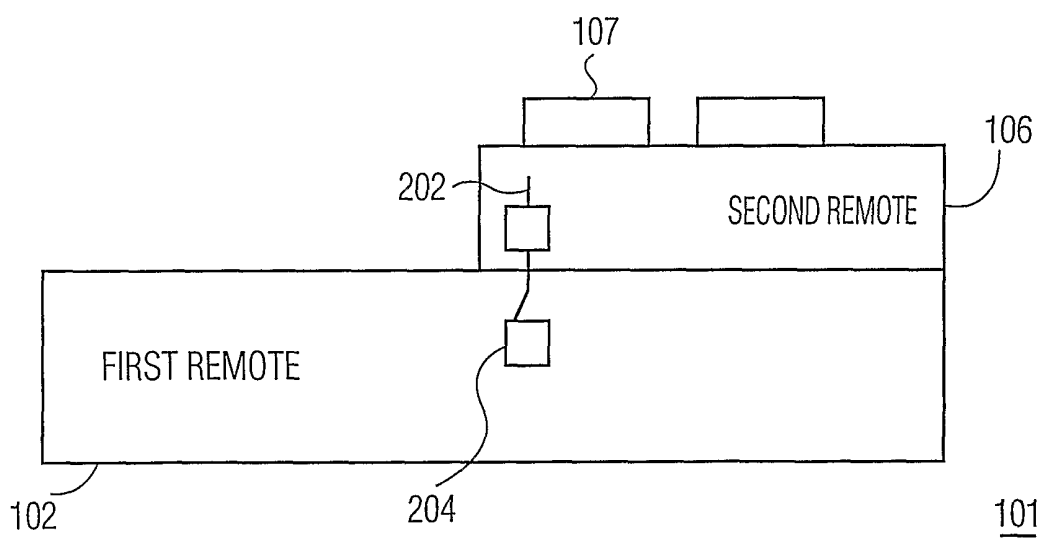


FIG. 2

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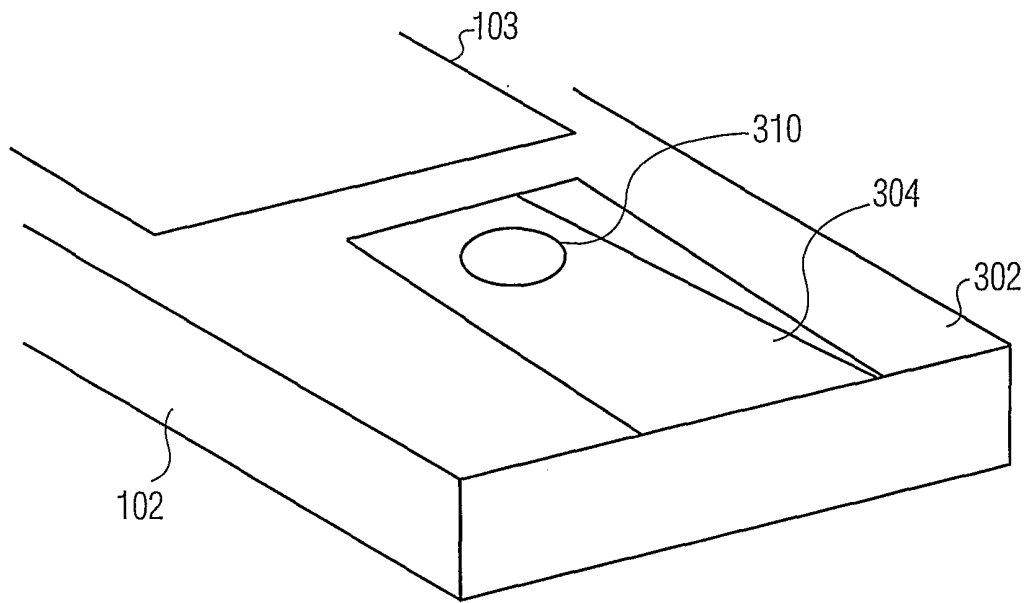
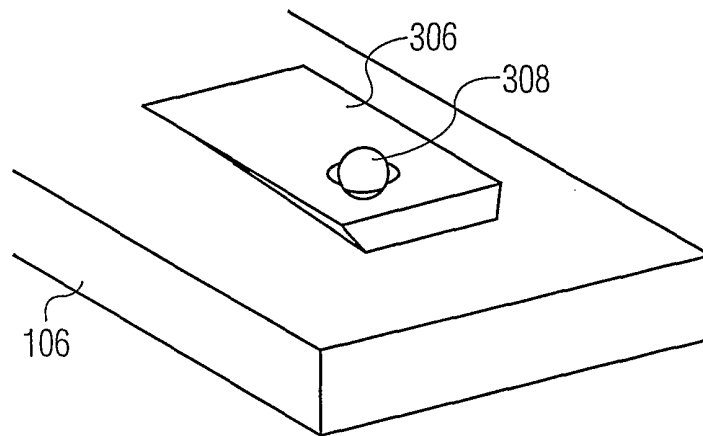


FIG. 3

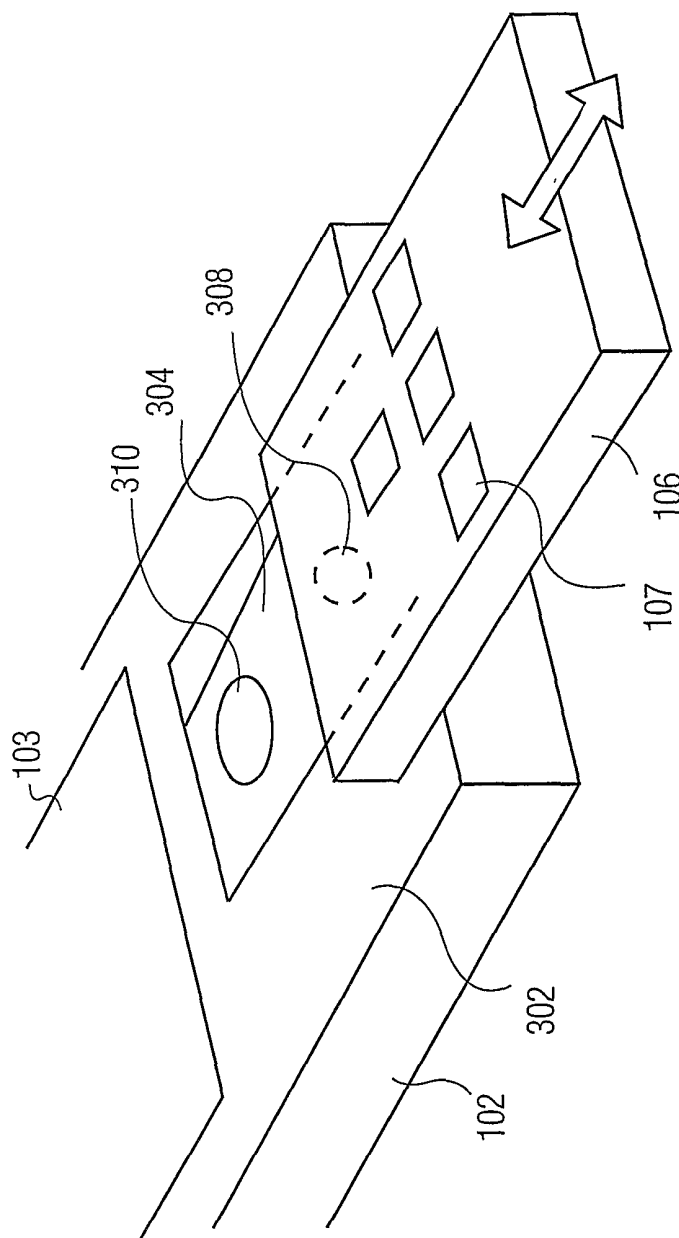


FIG. 4