(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
8 May 2003 (08.05.2003)

PCT

(10) International Publication Number
WO 03/038659 A1

(51) International Patent Classification[7]: G06F 17/20

(21) International Application Number: PCT/IB02/04762

(22) International Filing Date: 31 October 2002 (31.10.2002)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/330,861 1 November 2001 (01.11.2001) US

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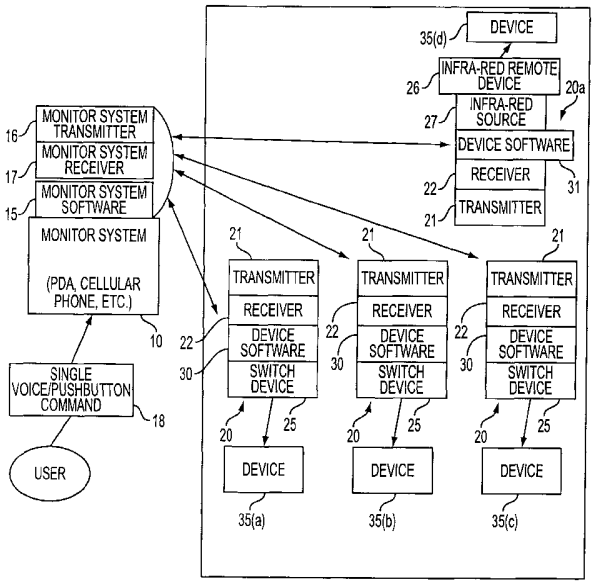
(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*
— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: METHOD AND APPARATUS FOR REMOTELY ACTIVATING APPLIANCES OR DEVICES



(57) Abstract: An apparatus system and method for remotely activating appliances. A monitor system (10) allows a user to input instructions into the monitor system by pushbutton activation or voice command. The monitor system transmits the instructions in the form of a command to a device system (20). The device system has a switch device (25) which is connected to an electrical device (the remote appliance 35) either internally or externally. The switch device activates the electrical device according to the instructions received from the monitor system. The device system then transmits a signal back to the monitor system to let the user know if the electrical device was activated or not.

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METHOD AND APPARATUS FOR REMOTELY ACTIVATING APPLIANCES OR DEVICES

Related Applications

This application claims the benefit of U.S. provisional application 60/330,861, filed on November 1, 2001, which is incorporated herein by reference in its entirety for all purposes.

Field of the Invention

An illustrative, non-limiting embodiment of the invention relates to remotely activating appliances. More specifically, the non-limiting embodiment relates to a system that allows the control of existing appliances by remote operation using a voice command and/or a push button command from a cellular phone, personal digital assistant ("PDA"), or other device.

Background of the Invention

Systems have been developed in which various "intelligent" devices or appliances are remotely controlled. In a hypothetical remote control system, a user or home owner can program the system to automatically control various appliances or devices by entering a particular command from a remote location. For instance, the user can create an "Enter Home" mode to turn on or off various devices when he or she has entered or is about to enter his or her home. In such an example, the user may program the system such that, when he or she activates the "Enter Home" mode of the system, the system turns on certain lights in the user's home, turns off a

security alarm for the home, and adjusts the heating or air conditioning unit in the user's home so that the home is at a comfortable temperature.

While the remote control system described above is convenient for the user, the appliances and devices used in the system must be specifically designed with the "intelligence" necessary to respond to the remote commands. In addition, the system requires the pre-installation of a specific control center to both receive various commands and appropriately output additional commands to control the various appliances and devices. Accordingly, installing a remote control system is extremely expensive. In addition, if a user currently owns conventional appliances (i.e. appliances that cannot be remotely controlled) and would like to create a remote control system, he or she would have to replace the conventional appliances with new appliances having the required "intelligence". Replacing the conventional appliances or devices adds to the expense of the remote control system and is wasteful.

In addition, manufacturers of home and office appliances have not developed cheaper "intelligent" versions of their products. In many cases, the manufacturers lack the technological ability required to produce cheaper versions of the appliances or devices. Also, such manufacturers are concerned about the competitiveness of such cheaper appliances, because, even though such appliances are less expensive than typical intelligent devices, they are still more expensive than current "non-intelligent" products.

Accordingly, a customer or home owner who desires remote home capabilities should ideally be able to economically integrate such capabilities with his or her conventional, "non-intelligent" home or office appliances (e.g., gates, lamps, heaters, alarm systems, etc.). In addition, a home owner may desire to define two different "Enter Home" scenarios, which are

customized to two different users. For example, the home owner may wish to define an "Enter Home" scenario that activates an alarm system, opens the door, boils coffee, and turns on certain lights. On the other hand, children of the home owner may prefer to define an "Enter Home" scenario that activates bedroom audio systems and turns on bedroom lights.

Summary of Illustrative, Non-Limiting Embodiments of the Invention

Illustrative, non-limiting embodiments of the present invention overcome the disadvantages associated with some remote home systems and other disadvantages. Also, the present invention is not required to overcome the above or other disadvantages, and an illustrative, non-limiting embodiment of the present invention may not overcome any disadvantages.

An illustrative, non-limiting embodiment of the present invention allows a user to turn conventional, "non-intelligent" appliances into remotely controlled "intelligent" devices. The embodiment can be utilized with any appliance or electrical device, including, but not limited to, coffee makers, lights, stereos, televisions, electric gates, etc.

An illustrative, non-limiting embodiment of the present invention provides a two-side suite comprising software and hardware systems, respectively called a monitor system and a device system. In the embodiment, the monitor system, which resides in a cellular phone, PDA, or other device permits a single voice activated and/or pushbutton activated operation (like a car remote control). This command activates a series of user predefined activities, such as, but not limited to, "Turn on lights", "Turn alarm off", "Turn on TV", and "Turn on electric fireplace".

In one implementation, the device system comprises a switch device, which may be a pre-programmed switch, and receives the monitor system commands. Then, the device system instructs the switch device to perform an appropriate switching or other operation and sends a confirmation signal back to the monitor system. Customers having the monitor system installed in their cellular phone or PDA can purchase the device system and attach it to any electronic appliance. Also, the device system can be in the form of an adapter or can be contained within or integrated into the device. In a simplistic exemplary arrangement, the device system can be plugged into a power outlet of a user's home, and the device or appliance can be plugged into the device system. In one example, a simple introduction procedure is performed to enable the monitor system to recognize a device or appliance connected to the device system. After such procedure, the recognized device can be activated in any scenario along with other defined devices. Also, the devices are given a name in the introduction procedure (e.g. Coffee Maker).

In an illustrative, non-limiting embodiment, the monitor/device suite enables any owner of a voice activated or pushbutton activated displaying device, such as a cellular phone or PDA, to obtain very advanced "intelligent home" services in a fraction of the price of any conventional system. Moreover, each user residing in the home can define their own "intelligent home" setup using their own devices (e.g. a reading lamp) as well common home devices (e.g. a home alarm system).

By using a device system in accordance with one embodiment, appliance producers do not have to invest in new technologies in order to produce intelligent versions of their products. They can optionally integrate the device system into their products, and every suitable monitor system can communicate with them immediately.

According to the present invention, there is provided an apparatus system for remotely activating appliances comprising: (a) a monitor system which allows a user to input instructions; and (b) a device system having a switch device which is connected to an electrical device, wherein the instructions input by a user are transmitted by the monitor system to the device system, which then activates the electrical device according to the instructions received from the monitor system by using the switch device and then transmits a signal back to the monitor system concerning the status of the electrical device.

According to another embodiment of the present invention, there is provided a method for remotely activating appliances comprising: (a) installing monitor system software into a monitor system, the monitor system software capable of transmitting and receiving signals from a remote device system; (b) attaching the device system to an electrical device, the device system capable of transmitting and receiving signals from the monitor system and activating the electrical device upon command; (c) introducing the electrical device to the monitor system via the device system; (d) activating the electrical device by transmitting a user input command from the monitor system to the device system; and (e) confirming the activation of the electrical device by a confirmation signal transmitted from the device system to the monitor system, wherein, when the electrical device is properly activated, the device system sends a positive confirmation signal to the monitor system, and when the electrical device cannot be properly activated, the device system sends a negative confirmation signal to the monitor system. In a non-limiting implementation, if the device is not responding after a predefined period the monitor system displays an error message for that device as well.

Brief Description of the Drawings

Aspects of illustrative, non-limiting embodiments of the present invention will become more apparent by describing in detail embodiments thereof with reference to the attached drawings in which:

Fig. 1 shows a schematic diagram of an intelligent home system according to an illustrative, non-limiting embodiment of the invention;

Fig. 2 is a flowchart describing an illustrative, non-limiting example of a monitor system in accordance with an illustrative embodiment ;

Fig. 3 is a continuation of the flowchart shown in Fig. 2 and describes an illustrative, non-limiting example of monitor mode operations in accordance with an illustrative embodiment;

Fig. 4 is a continuation of the flowchart shown in Fig. 2 and describes an illustrative, non-limiting example of device mode operations in accordance with an illustrative embodiment;

Fig. 5 is a continuation of the flowchart of Fig. 3, which describes an illustrative, non-limiting example of voice command definition operations in accordance with an illustrative embodiment;

Fig. 6 is a flowchart which describes an illustrative, non-limiting example of voice command activation operations in accordance with an illustrative embodiment;

Fig. 7 is a flowchart describing an illustrative non-limiting example of operations of a device system in accordance with an illustrative embodiment;

Fig. 8 shows a non-limiting example of an image of the PDA screen in accordance with an illustrative embodiment;

Fig. 9 shows a non-limiting example of an image of an intelligent system welcome screen in accordance with an illustrative embodiment;

Fig. 10 shows a non-limiting example of an image of a main monitor activation screen in accordance with an illustrative embodiment;

Fig. 11 shows a non-limiting example of an image of a mode activation screen in accordance with an illustrative embodiment;

Fig. 12 shows a non-limiting example of an image of a mode activation result in accordance with an illustrative embodiment;

Fig. 13 shows a non-limiting example of an image of a modes operation main screen in accordance with an illustrative embodiment;

Fig. 14 shows a non-limiting example of an image of add/delete modes in accordance with an illustrative embodiment;

Fig. 15 shows a non-limiting example of an image of a new mode introduction screen in accordance with an illustrative embodiment;

Fig. 16 shows a non-limiting example of an image of a delete mode operation in accordance with an illustrative embodiment;

Fig. 17 shows a non-limiting example of an image of an edit mode operation in accordance with an illustrative embodiment;

Fig. 18 shows a non-limiting example of an image of a show Mode operation in accordance with an illustrative embodiment;

Fig. 19 shows a non-limiting example of an image of a define mode operation in accordance with an illustrative embodiment;

Fig. 20 shows a non-limiting example of an image of a devices operation main screen in accordance with an illustrative embodiment;

Fig. 21 shows a non-limiting example of an image of a show devices screen in accordance with an illustrative embodiment;

Fig. 22 shows a non-limiting example of an image of an introduction device first screen in accordance with an illustrative embodiment;

Fig. 23 shows a non-limiting example of an image of a device code confirmation procedure screen in accordance with an illustrative embodiment;

Fig. 24 shows a non-limiting example of an image of a device name introduction procedure screen in accordance with an illustrative embodiment;

Fig. 25 shows a non-limiting example of an image of a device name confirmation screen in accordance with an illustrative embodiment;

Fig. 26 shows a non-limiting example of an image of a device clearing procedure screen in accordance with an illustrative embodiment;

Fig. 27 shows a non-limiting example of an image of a device clearing confirmation screen in accordance with an illustrative embodiment;

Fig. 28 shows a non-limiting example of an image of a PDA screen in accordance with an illustrative embodiment;

Fig. 29 shows a non-limiting example of an image of a check device screen in accordance with an illustrative embodiment;

Fig. 30 shows a non-limiting example of an image in which a device is indicated to be an infra-red ("IR") remote device in accordance with an illustrative embodiment;

Fig. 31 shows a non-limiting example of an image of an alternate show devices module screen in accordance with an illustrative embodiment;

Fig. 32 shows a non-limiting example of an image of a normal cellular phone display screen in accordance with an illustrative embodiment;

Fig. 33 shows a non-limiting example of an image of a cellular monitor activation main screen in accordance with an illustrative embodiment;

Fig. 34 shows a non-limiting example of an image of display mode definitions in accordance with an illustrative embodiment;

Fig. 35 shows a non-limiting example of an image of a successful device response in accordance with an illustrative embodiment;

Fig. 36 shows a non-limiting example of an image of a faulty mode activation result in accordance with an illustrative embodiment;

Fig. 37 shows a non-limiting example of an image of a display where a user can define a mode in accordance with an illustrative embodiment;

Fig. 38 shows a non-limiting example of an image of a display where a user can add a mode name, add a new device, or define a mode in accordance with an illustrative embodiment;

Fig. 39 shows a non-limiting example of an image of a display where a user can key in a new mode name in accordance with an illustrative embodiment;

Fig. 40 shows a non-limiting example of an image of the new mode name being displayed on an activation main menu in accordance with an illustrative embodiment;

Fig. 41 shows a non-limiting example of an image of a display where a user can add a new device to the system in accordance with an illustrative embodiment;

Fig. 42 shows a non-limiting example of an image where a user starts the introduction operation in accordance with an illustrative embodiment;

Fig. 43 shows a non-limiting example of an image of a display where an introduction operation is complete in accordance with an illustrative embodiment;

Fig. 44 shows a non-limiting example of an image of a display where a user is prompted to enter a new name for a new device in accordance with an illustrative embodiment;

Fig. 45 shows a non-limiting example of an image of a display where a user can define a mode in accordance with an illustrative embodiment;

Fig. 46 shows a non-limiting example of an image of a display where a user can choose various devices that the user would like activated in a particular mode in accordance with an illustrative embodiment;

Fig. 47 shows a non-limiting example of an image where a user is prompted to add a voice label after selecting the desired mode in accordance with an illustrative embodiment;

Fig. 48 shows a non-limiting example of an image where a user is prompted to confirm a selection and start recording a voice label in accordance with an illustrative embodiment;

Fig. 49 shows a non-limiting example of an image showing a recording in progress in accordance with an illustrative embodiment;

Fig. 50 shows a non-limiting example of an image showing a completed recording process in accordance with an illustrative embodiment;

Fig. 51 shows a non-limiting example of an image of a cellular phone default screen for voice activation in accordance with an illustrative embodiment;

Fig. 52 shows a non-limiting example of an image of a voice command screen in accordance with an illustrative embodiment;

Fig. 53 shows a non-limiting example of an image of a voice negative match screen in accordance with an illustrative embodiment;

Fig. 54 shows a non-limiting example of an image of a voice positive match screen in accordance with an illustrative embodiment;

Fig. 55 shows a non-limiting example of an image of a performing voice command screen in accordance with an illustrative embodiment;

Fig. 56 shows a non-limiting example of an image of a voice activation positive result; and

Fig. 57 shows a non-limiting example of an image of a voice activation negative result in accordance with an illustrative embodiment.

Description of Illustrative Non-Limiting Embodiments of the Invention

The following description of illustrative non-limiting embodiments of the invention discloses specific configurations and components. However, the embodiments are merely examples of the present invention, and thus, the specific features described below are merely used to more easily describe such embodiments and to provide an overall understanding of the present invention. For example, in the description below, some of the embodiments are used in a home, but such implementation is merely for illustration purposes only, and is not intended to limit the invention in any way. Clearly, the illustrative embodiments may be used in virtually any other location, such as a school, office, factory, warehouse, store, gas station, restaurant, etc.

Furthermore, the descriptions of various configurations and components of the embodiments that are known to one skilled in the art are omitted for the sake of clarity and brevity.

Fig. 1 shows an illustrative, non-limiting embodiment of the present invention. As shown in the figure, the embodiment comprises a monitor system 10 and a plurality of device systems 20. Each of the monitor system 10 and the device systems 20 may be implemented via hardware, software, or a combination of hardware and software.

The monitor system 10 may be contained in an electronic device that is specifically designed to house the monitor system 10 for use in the remote control system. Alternatively, the monitor system 10 may be incorporated into an electronic device that is capable of performing functions besides the functions of the remote control system. For example, the monitor system may be incorporated into a cellular phone, a PDA, a pager, a standalone or laptop personal computer, etc. Specific, non-limiting examples in which the monitor system 10 is incorporated into a cellular phone 320 and a PDA 80 are described below, and the present invention is clearly not limited by the electronic device in which the monitor system 10 resides.

As noted above, in one implementation, the monitor system 10 is wholly or partly contained in the PDA 80 (Fig. 8) and comprises monitor system software 15, a monitor system transmitter 16, a monitor system receiver 17, and an input device 18. The input device 18 can comprise virtually any type of input device that enables a user or external device to input a command or data to the monitor system 10. For example, the input device 18 may include a voice activated input device or pushbutton and/or keypad input device. The commands input to the monitoring system 10 may be used to activate a series of user predefined activities, which

may include (but not limited to), turning on a light, turning off an alarm, turning on a television, and turning on an electric fireplace.

The monitor system software 15 enables the monitor system 10 to communicate with various devices and can be installed for use by the monitor system 10 in any number of ways. For example, the monitor system software 15 may reside on a card, the card may be inserted into the PDA 80, and the PDA 80 and/or monitor system 10 may read the software 15 from the card and permanently or temporarily store the software 15. Alternatively, the monitor system software 15 may be integrated or embedded in the original software of the PDA 80 with a microchip or other hardware. In yet a further example, the monitor system software 15 may be downloaded into the PDA 80 from the Internet or other external device as an independent JAVA application or other language-based application.

In the present embodiment, four device systems 20 and 20a are provided. Three of the device systems 20 comprise a transmitter 21, a receiver 22, a switch device 25, and device software 30 and are respectively coupled to appliances or devices 35a to 35c (generally referred to as devices 35). A fourth device system 20a comprises a transmitter 21, a receiver 22, an infra-red remote device 26, an infra-red source 27, and device software 31. In a non-limiting implementation, the device system 20a has the same structure as the device systems 20, but clearly, the device systems 20a and 20 can have different structures. In an additional or alternative implementation, the device software 31 of the device system 20a is a different version or otherwise different than the device software 30 of the device system 20. However, in another embodiment, the software 30 and the software 31 may have the same version or be at least substantially the same. As shown in Fig. 1, the device system 20a is coupled to and controls a

device 35d (generally referred to as a device 35 or along with the devices 35). While four device systems 20 and 20a are shown in Fig. 1, the invention is clearly not limited to the number of device systems 20 and 20a, and more or less device systems 20 and 20a may be used.

Each of the device systems 20 receives commands from the monitor system 10 (via the receiver 22), performs an appropriate switching operation (e.g. on or off) or other operation based on the commands, and sends a confirmation signal back to the monitor system 10 (via the transmitter 21). In one implementation, the device system 20 is pre-programmed by the device software 30, and the device software 30 may be installed in virtually any manner, including (but not limited to) the manners discussed above in conjunction with the monitor system 10. Furthermore, in a non-limiting scenario, each device system 20 may be manufactured by different manufactures, and thus, the electronics and software contained in the different device systems 20 may be different.

A user having the monitor system 10 installed in his or her PDA 80 may purchase a device system 20 and attach it to (or install it in) any electronic appliance or device 35 to be controlled. The device system 20 can be in the form of an adapter or can be contained within or integrated into the device 35. In one non-limiting and simplistic implementation, the device system 20 can be simply plugged into a standard power outlet in the user's home, and the device 35 can be plugged into an outlet of the device system 20.

After the system 20 is coupled to the appliance or device 35 (e.g. the device 35a), a simple introduction procedure (described in more detail below) is executed so that the monitor system 10 recognizes the device 35a (e.g. a radio). Once the monitor system 10 recognizes the

radio 35a, it can be activated in any scenario along with other defined devices (e.g. devices 35b and 35c).

As described above, the monitor system 10 may output commands to the device system 20 for the radio 35a to selectively instruct the radio to turn "on" or "off". Furthermore, the command are not limited to "on" or "off" commands and can include any commands used to control an electronic appliance or device. For example, the monitor system 10 may output a "volume up" or "volume down" command to the radio 35a via the device system 20. Also, if the device 35b is a television, the monitor system 10 may output a "contrast up" or "contrast down" command to the television 35b via the device system 20.

As illustrated in Fig. 1, the monitor system 10 outputs commands and data to the device systems 20 via the monitor system transmitter 16, and each device system 20 receives the commands and data via its corresponding receiver 22. Conversely, each device system 20 outputs commands and data (e.g. a confirmation signal) to the monitor system 10 via its corresponding transmitter 21, and the monitor system 10 receives the commands and data via the monitor system receiver 17.

Examples of the various components, software, hardware, etc. described above are contained at the website located at http://www.bluetooth.com/, and the website is incorporated herein by reference in its entirety for all purposes. In addition, upon reading the present specification, one skilled in the art would understand how to combine one or more conventional components (e.g. a transmitter and receiver) to create a non-limiting embodiment of the invention.

A non-limiting embodiment of the operation of the monitor system 10 and the device systems 20 is illustrated by the flow diagrams shown in Figs. 2-7. Also, in the present embodiment, the monitor system 10 is contained in the PDA 80, and various images displayed on the screen of the PDA 80 are shown in Figs. 8-31.

As shown in Fig. 2, when the PDA 80 is turned on, a main PDA screen 82 (Fig. 8) is displayed (Fig. 2 (operation S1)) and comprises a particular icon 84 representing the monitor system 10. In this example, the icon 84 is labeled BHS-BlueHome, but the icon 84 can be labeled with the name of any manufacturer or provider of the technology or with any other desired name or design.

When the user selects the icon 84, an intelligent system application is executed, and a welcome screen 90 (Fig. 9) is displayed on the PDA 80 (Fig. 2 (operation S2)). The welcome screen 90 is displayed for a predetermined period of time (e.g. two seconds), and after such time, a mode activation screen 100 (Fig. 10) is displayed (Fig. 2 (operation S3)). As shown in Fig. 10, the screen 100 contains a mode list 102, a mode activation button 104, a modes button 106, and a devices button 108. The mode list 102 contains a list of user defined modes and/or predetermined modes. In the specific, non-limiting example shown in Fig. 10, the mode list 102 contains an "Enter" mode, an "Exit" mode, a "Sleep" mode, and a "Wakeup" mode.

Mode Activation

When the user selects mode activation button 104, monitor system 10 outputs various commands and/or data to the device systems 20 that correspond to the devices 35 associated with the mode that was highlighted in the mode list 102 (Fig. 10). (In the present embodiment, the

commands and/or data are transmitted to the device systems 20 respectively corresponding to the devices 35. However, to facilitate the following description, such operation will be generally referred to as transmitting commands and/or data to the devices 35 in some instances).

After transmitting the commands and/or data, the mode activation message screen 110 (Fig. 11) is displayed and contains an activation list 112 indicating devices 35 to which the commands and/or data were sent (Fig. 2 (operation S4)). In the current example, the "Enter" mode 109 is highlighted in mode list 102 when the activation button 104 is selected. Thus, the commands and/or data are sent to the devices 35 associated with the "Enter" mode 109 (i.e. the main lights 35, the coffee maker 35, and the home alarm 35). In the present example, commands and/or data are output to turn on the main lights 35 and coffee maker 35 and to turn off the alarm 35. Afterwards, the mode activation message screen 110 is displayed, and the activation list 112 indicates that commands and/or data were sent to the main lights 35, coffee maker 35, and home alarm 35. In a non-limiting implementation, the commands and/or data are transmitted via the monitor system transmitter 16 as a high frequency radio signal, but virtually any other transmission signal can be implemented.

When the various devices 35 receive the commands and/or data transmit, they transmit a confirmation signal and/or other appropriate response to the monitor system 10. In a non-limiting implementation, the responses are transmitted from device transmitters 21 (Fig. 1) as a high frequency radio signal back to the monitor system receiver 17 (Fig. 1). However, virtually any type of transmission signal may be used to transmit the responses. If all of the responses from the devices 35 indicate that the commands and/or data were properly received, the mode activation result screen 120 (Fig. 12) indicates that all of the devices 35 were activated,

deactivated, or controlled as requested (Fig. 2 (operation S5)). On the other hand, if one (or more) of the devices 35 fails to respond within a predetermined period of time or sends a response indicating that it is faulty or not properly activated, deactivated, or controlled, the mode activation result screen 120 will identify the malfunctioning device and the cause of the malfunction.

Modes Operation

Returning again to Fig. 10, if the user selects the modes button 106 (Fig. 2 (operation S3)), the modes operation screen 130 (Fig. 13) is displayed (Fig. 2 (operation S6)). As in the case of the mode activation screen 100 (Fig. 10), the modes operation screen 130 comprises a mode list 136. Similarly, the mode list 136 contains a list of user defined modes and/or predetermined modes, and in the specific, non-limiting example shown in Fig. 13, the list 136 contains an "Enter" mode, an "Exit" mode, a "Sleep" mode, and a "Wakeup" mode. The modes operation screen 130 also comprises an OK button 132, an add/delete mode button 133, a define mode's devices button 134, and show mode's devices button 135. As shown in Fig. 2, if the user presses the OK button 52, the operation returns to operation S3 and the mode activation screen 100 (Fig. 10) is redisplayed (Fig. 2 (operations S6 and S3)).

As shown in Fig. 3, if the define mode's device button 134 is selected, the define mode devices screen 190 (Fig. 19) is displayed, and the user can define the properties of the mode highlighted in the mode list 136 (Fig. 3 (operation S12)). In the present, non-limiting example, the "Enter" mode 109 is highlighted in the mode list 136 contained in the modes operation screen 130 (Fig. 13). Subsequently, when the define mode's devices button 134 is pressed, the define

mode devices screen 190 (Fig. 19) is displayed, and identifies the "Enter" mode 109. In addition, the devices 35 (i.e. the main lights 35, coffee maker 35, and home alarm 35) that are activated, deactivated, or otherwise controlled during the "Enter" mode are contained in a device list 191.

As further shown in Fig. 19, the define mode devices screen 190 comprises a device options area 192. The area 192 identifies the device 35 highlighted in the device list 191 and provides various options for controlling the device 35. In the specific non-limiting example, the main lights 35 are highlighted in the device list 191, and the device options area 192 identifies the main lights 35 and comprises a turn on box 193. If the user places a "check" in the turn on box 193, the main lights 35 will be turned on when the "Enter" mode is activated, and if the user does not place a "check" in the box 193, the main lights 35 will be turned off when the "Enter" mode is activated. Although the device options area 192 of the present example only enables a user the define whether the main lights 35 are turned on or off during the "Enter" mode, the area 192 may indicate other manners in which a device 35 can be controlled. For example, depending on which device is being controlled, the area 192 may provide options to brighten or dim lights (without turning them completely on or off), to turn volumes up or down, etc. In other words, the manners in which the various devices 35 can be controlled are limited only by the functions performed by and capabilities of the devices 35.

The define mode devices screen 190 also comprises an add device button 194. If the user selects such button 194, various devices 35, which have been previously defined or "introduced" to the system 10, are listed on the screen (not shown) of the PDA 80. (A non-limiting example of the manner in which devices 35 are introduced to the system 10 is described in more detail

below). After the devices 35 are listed on the screen, the user can select one of the devices 35, and the selected device 35 is associated with the "Enter" mode 109. Subsequently, the user can define the manner in which the additional device 35 is controlled during the "Enter" mode 109 by using the define mode devices screen 190 in the manner described above.

In addition to the add device button 194, the define mode devices screen 190 also comprises a clear device button 195. If the user selects such button 195, the device which is highlighted in the device list 191 is deleted from the list 191 and is no longer associated with the current mode. In the specific, non-limiting example, if the define mode device screen 190 shown in Fig. 10 is displayed on the PDA 80 and the user selects the clear device button 195, the main lights 35 will be deleted from the device list 191. As a result, the main lights 35 are no longer associated with the "Enter" mode 109, and when the "Enter" mode 109 is subsequently activated, the system will only turn on the coffee maker 35 and turn off the home alarm 35.

Returning to Fig. 13, when the user highlights a particular mode (e.g. the "Enter" mode 109) in the mode list 136 and presses the show button 135, the show mode screen 180 (Fig. 18) is displayed on the screen of the PDA 80 (Fig. 3 (operation S11)). The show mode screen 180 contains a mode list 182 that lists all of the devices 35 that are controlled during the selected mode (i.e. the "Enter" mode 109). Also, the mode list 182 indicates how each device 35 will be controlled during the "Enter" mode 109. For instance, the list 182 indicates that the main lights 35 will be turned on during the "Enter" mode 109. In addition, if the user presses the OK button 184 while the show mode screen 180 is displayed, the modes operations screen 130 (Fig. 13) is redisplayed (Fig. 3 (operations S11 and S6)).

When the add/delete mode button 133 contained in the modes operations screen 130 (Fig. 13) is selected, the add/delete mode screen 140 (Fig. 14) is displayed (Fig. 3 (operation S7)). The add/delete mode screen 140 comprises a mode list 141, a new button 142, a delete button 143, an edit button 144, and a save button 145.

If the user presses the new button 142 on the add/delete mode screen 140, the new mode screen 150 (Fig. 15) is displayed (Fig. 3 (operation S8)). The new mode screen 150 comprises a mode list 151 and a new mode entry area 154 that prompts the user to enter the name of a new mode. In the specific, non-limiting example shown in Fig. 15, the user enters the name "New Mode" in the area 154. Subsequently, when the user presses the save button 145, the new mode name "New Mode" is saved and added to the mode list 151. After the new mode is added, it can be defined and configured in the manners described above and below.

If the user highlights a mode contained in the mode list 141 of the screen 140 (Fig. 14) and presses the delete button 143, the delete mode screen 160 (Fig. 16) is displayed (Fig. 3 (operation S9)). The delete mode screen 160 contains a prompt 162 asking the user to confirm that he or she would like the highlighted mode deleted from the system. In the specific example shown in Fig. 14, the "Enter" mode 109 is highlighted in the mode list 141 when the delete button 143 is selected. As a result, the delete mode screen 160 shown in Fig. 16 displays a prompt 162 asking the user to confirm that he or she would like the "Enter" mode 109 deleted. If the user selects the OK button 164, the "Enter" mode 109 will be deleted and no longer displayed on the mode list 141 in the add/delete mode screen 140 (Fig. 14). On the other hand, if the user selects the cancel button 166, the add/delete mode screen 140 (Fig. 14) is displayed in the manner as it was displayed before the delete button 143 was selected.

If the user presses the edit button 144 on the add/delete mode screen 140 (Fig. 14), the edit mode screen 170 (Fig. 17) is displayed (Fig. 3 (operation S10)). The edit mode screen 170 enables the user to change the mode name to suit user's individual needs. For example, if the user highlights the "Wakeup" mode in the mode list 141 contained in the add/delete mode screen 140 (Fig. 14) and selects the edit button 144, the edit mode screen 170 (Fig. 17) is displayed and provides an edit mode entry area 172 prompting the user to enter a new name for the "Wakeup" mode. If the user enters the name "Wake Me Up" and presses the save button 145, the "Wakeup" mode is renamed as the "Wake Me Up" mode, as shown in the mode list 141 in Fig. 17.

Device Operation

Returning to Fig. 10, when a user selects the devices button 108 from the mode activation screen 100, the devices main screen 200 (Fig. 20) is displayed on the PDA 80 (Figs. 2 and 4 (operation S13)). The devices main screen 200 comprises an OK button 202, a show button 204, an introduce button 209, a clear button 206, a check button 207, and a fault simulator button 208. When the user selects the OK button 202, the mode activation screen 100 shown in Fig. 10 is redisplayed (Fig. 2 (operation S13)).

When the user selects the show button 204, the show devices screen 210 (Fig. 21) is displayed on the PDA 80 (Fig. 4 (operation S14)). The show devices screen 210 contains a device list 212 that lists all of the devices 35 that have been introduced to and are known by the monitor system 10. In the current, non-limiting example, the devices 35 that are known by the monitor system 10 are the main lights 35, bathroom heater 35, garage gate 35, coffee maker 35,

electric fireplace 35, home alarm 35, and TV-living room 35. When the OK button 214 shown on the screen 210 is selected, the devices main screen 200 (Fig. 20) is redisplayed. (Fig. 4 (operations S14 and S13)).

When the user presses the introduce button 209 on the devices main screen 200 (Fig. 20), the device code introduction screen 220 (Fig. 22) is displayed (Fig. 4 (operation S15)). The introduction screen 220 enables a user to introduce a new device 35 to the monitor system 10. In one illustrative, non-limiting implementation, the introduction screen 220 comprises a prompt 222 that asks the user to enter a device code 224, which uniquely identifies a particular device 35. The code 224 may be supplied to the user by the manufacturer of the device, the monitor system 10, or another source. Additionally or alternatively, the user can input the brand name, serial number, etc. of the device 35 as the device code 224. In another implementation, the device code introduction screen 220 may enable the user to identify a particular device 35 by browsing through a list of devices 35, which have been previously stored in the PDA 80 or monitor system 10. The list of devices may be initially stored in the PDA 80 and/or updated by downloading information via a memory device (e.g. memory card, optical disk, floppy disk, hard drive, etc.), the Internet, or other external source. In yet a further implementation, a manufacturer of a particular type of device 35 may provide a different or unique device code 224 to different consumers who purchase the same type of device 35. By providing different or unique device codes 224 for the same type of device 35, unauthorized activation of devices 35 by other people who have the same intelligent home monitor system technology can be avoided.

The unique device code 224 is a security means for preventing unauthorized persons to activate the device 35. For example, if an intruder equipped with his or her own monitor system

10 knows the code 224 for a home owner's alarm system 35, he or she may be able to perform an identification procedure or other procedure to deactivate the alarm system 35. Thus, in one embodiment, the code 224 supplied by the manufacturer of the device 35 or device system 20 or 20a is known only to the specific home owner that purchases the specific device 35 or device system 20 or 20a. In such case, when the monitor system sends an "identify" command (as described below) to a device 35, the device 35 replies with its own unique code 224. This code 224 is compared to the device code 224 entered by the user via the screen 220 shown in Fig. 22. If the two codes 224 are identical, the identification procedure continues, but if the two codes do not match, the procedure is aborted.

Once the particular device 35 has been identified (e.g. once the device code 224 is entered), the device code confirmation screen 230 (Fig. 23) is displayed on the PDA 80 (Fig. 4 (operation S16)). The device code confirmation screen 230 contains a send button 232 and prompts the user to select the send button 232 to introduce the particular device 35 to the monitor system 10.

After the send button 232 is selected, the monitor system 10 sends the device code 224 (and/or other relevant information) to the particular device 35 to check its validity. In one non-limiting implementation, the monitor system 10 instructs the monitor system transmitter 16 to transmits a check device code signal to the various receivers 22 of the various devices 35. As one example, the signal may be transmitted as a high frequency radio signal, but the transmission signal is not limited to a high frequency radio signal.

In response to the check device code signal, each device 35 (or device system 20) transmits its internal device code 224 (and/or other relevant information) to the monitor system

10. If the information transmitted from one of the receivers 22 of the devices 35 matches the information, which was entered into the monitor system 10 and which relates to the particular device 35, the monitor system 10 acknowledges the existence of the particular device 35 in the device system 20. As a result, the monitor system 20 displays the phrase "Device introduced" on the device code confirmation screen 230 as shown in Fig. 23. If none of the information transmitted from the receivers 22 of the devices 35 matches the information relating to the particular device 35, an error is deemed to have occurred, and the devices main screen 200 shown in Fig. 20 is redisplayed (Fig. 4 (operations S16 and S13)). Furthermore, although not shown in the figures, an error message indicating such error may be displayed on the PDA 80.

Assuming that no error has occurred and the monitor system 10 acknowledges the existence of the particular device 35 or the device system 20, the device name introduction screen 240 (Fig. 24) is displayed on the PDA 80 (Fig. 4 (operation S17)). The screen 240 prompts the user to enter a device name 246 for the particular device 35 that was just introduced to the system. After the user inputs the name 246, the monitor system 10 determines whether or not the newly introduced device 35 is controlled by a device system 20 (having a switch device 25) or is controlled by or relates to a device system 20a (having a remote device 26) (Fig. 4 (operation S23)). A remote device 26 can utilize IR or other signals to control another device. For example, if the remote device 26 is used to control a video cassette recorder ("VCR"), the remote device 26 may output an IR or other signal representing VCR commands, such as, play, record, fast forward, rewind, pause, power on, and power off commands.

In the present embodiment, the screen 240 displays a prompt 247 requesting the user to input a command indicating if the newly introduced device 35 corresponds to or is controlled by

a switch device 25 or a remote device 26. In the current example, the prompt 247 requests the user to "check" a box if the device corresponds to or is controlled by a remote device 26 and requests the user to leave the box "unchecked" if the device corresponds to or is controlled by a switch device 25. If the user checks the box, the monitor system 10 determines that the newly added device 35 relates to or has a corresponding remote device 26 (Fig. 4 (operation S23)), and subsequently, the screen 240 displays a select brand prompt 306 and a manufacturer list 302 as shown in Fig. 30. The select brand prompt 306 prompts the user to scroll through the manufacturer list 302 and choose the manufacturer (or brand name) of the remote device 26. As is well known in the art, each manufacturer has its own set of definitions and standards for their remote devices 26. Thus, by identifying the brand name, the monitor system 10 knows which commands to send to the remote device 26 to ensure its proper operation. Once the brand is selected (Fig. 4 (operation S24)), the user selects the confirm button 248, and the device name confirmation screen 250 (Fig. 25) is displayed (Fig. 4 (operation S18)).

On the other hand, if the user does not check the box contained in the prompt 247 before the confirm button 248 is selected, the monitor system 10 determines that the newly added device 35 does not relate to and does not contain a corresponding remote device 26 (Fig. 4 (operation S23)). Afterwards, the device name confirmation screen 250 (Fig. 25) is displayed (Fig. 4 (operation S18)). As shown in Fig. 25, the screen 250 indicates that the device 35 was successfully defined, and after a predetermined period of time (e.g. a few seconds), the devices main screen 200 (Fig. 20) is automatically redisplayed (Fig. 4 (operations S18 and S13)).

Alternatively, the device code 224 or other information used to identify the device 35 may indicate whether the newly introduced device 35 corresponds to a switch device 25 or a

remote device 26. In such case, the user does not have to input any information to the monitor system 10 to indicate whether the device 35 relates to a switch device 25 or a remote device 26.

Instead of requiring the user to select a brand name of the remote device 26 or if the remote device 26 has an unknown brand name, the user can systematically go through the manufacturer list 302 shown in Fig. 30 until the remote device 26 successfully controls a corresponding device 35. Alternatively or additionally, the monitor system 10 may automatically "learn" the appropriate commands needed to properly operate the remote device 26. Such a "learning" operation may be similar to those used in conjunction with universal remote controllers, and one skilled in the art would understand how to implement a "learning" operation upon reading the present specification. In such a scenario, the user may not be required to enter a brand name or other information relating to the device 35 or remote device 26. Furthermore, the manufacturer list 302 is merely an illustrative example of how the brand name of the remote device 26 may be entered, and virtually any manner of inputting a brand name or other identifying information can be employed.

If remote devices 26 are utilized by the system, the show devices screen 210 shown in Fig. 21 can be modified to indicate whether or not the device 35 is controlled by a remote device 26 or a switch device 25. An example of such a modified show devices screen 310 is shown in Fig. 31.

When the devices main screen 200 (Fig. 20) is displayed and the user presses the clear button 206, the clear device screen 260 (Fig. 26) is displayed (Fig. 4 (operation S19)). The screen 260 comprises a device list 262, a clear button 264, and an OK button 266. If the user highlights a device 35 from the device list 262 and presses the clear button 264, the clear device

confirmation screen 270 (Fig. 27) is displayed (Fig. 4 (operation S20)). The clear device confirmation screen 270 comprises an OK button 272 and a cancel button 274. If the OK button 272 is pressed, the highlighted device 35 is deleted from the system 10. In the specific non-limiting example, if the user highlights the "My New Device" device 35 on the clear device screen 260 (Fig. 26) and presses the clear button 264, the clear device confirmation screen 270 (Fig. 27) is displayed. If the user presses the OK button 272 contained in the screen 270, the "My New Device" device 35 is deleted from the device list 262 as shown in Fig. 28.

If the user presses the OK button 266 shown in Figs. 26 and 28, the devices main screen 200 (Fig. 20) is redisplayed (Fig. 4 (operations S19 and S13)).

Returning to Fig. 20, if the user presses the check button 207 on the devices main screen 200, the check devices status screen 290 (Fig. 29) is displayed on the PDA (Fig. 4 (operation S22)). The screen 290 comprises a device status list 292 and an OK button 294. Before the screen 290 is generated, the monitor system transmitter 16 (Fig. 1) transmits a status request command to the various device receivers 22 respectively corresponding to the devices 35 (or device systems 20 and 20a). Once the status of each device 35 (or device system 20 or 20a) is determined, the transmitter 21 corresponding to the device 35 (or device system 20 or 20a) sends the status back to the monitor system 10. An improper reply or the absence of a reply from a device 35 (or device system 20 or 20a) indicates a faulty device 35. In addition, if the user presses the OK button 294 on the check devices status screen 290, the devices main screen 200 (Fig. 20) is redisplayed (Fig. 4 (operations S22 and S13)).

Description of the Device System Flowchart

An illustrative, non-limiting embodiment of the operation of a device system 20 or 20a is shown in Fig. 7. Initially, the device system 20 or 20a is in a "sleep mode" and waits to receive a command from the monitor system 10 (Fig. 7 (operations S100 and S110)). When a command is received (Fig. 7 (operation S110)), the device system 20 or 20a exits the "sleep mode" and determines whether or not the command is a legal or valid command (Fig. 7 (operation S120)). If the device system 20 or 20a detects an illegal or invalid command, it returns to the sleep mode (Fig. 7 (operations S120 and S100)).

If the device system 20 or 20a detects a legal command, the system 20 or 20a analyzes the command (Fig. 7 (operation S130)). In one illustrative embodiment, the device system 20 or 20a determines if the command is a switch command or an identification command. If the command is a switch command, the appropriate operation if performed to control the device 35 (Fig. 7 (operation S140)). For example, if the device 35 is a lamp and the switch command is an instruction to turn the lamp off, the device software 30 analyzes the switch command and instructs the corresponding switch device 25 (e.g. an integrated micro-switch) to block the flow of power to the lamp. Subsequently, the software 30 instructs the corresponding transmitter 21 to send a confirmation signal to the monitor system 10 (Fig. 7 (operation S150)). Then, the device system 20 or 20a returns to the sleep mode (Fig. 7 (operation S100)) and awaits another command from the monitor system 10. If the switch command is in the form of an infra-red command, an infra-red source 27 receives the command and sends an appropriate command to the infra-red remote device 26.

If the device system 20 or 20a determines that the command is an identification command (Fig. 7 (operation S130)), the device software 30 reads the device code 224 or other information

that identifies the device 35. Then, the device system 20 or 20a sends the device code 224 or other information to the monitor system 10 as an identification command reply message.

An alternative, non-limiting embodiment of the invention may be utilized with a cellular phone 320 instead of a PDA 80. Due to the similar nature of the PDA 80 and the cellular phone 320 (at least with respect to the functions described above), one skilled in the art would clearly know how to implement the illustrative, non-limiting embodiments via the cellular phone 320 upon reviewing the specification and drawings of the present application.

Also, as in the case of the PDA 80, the monitor system software 15 may reside on a card, the card may be inserted into the cellular phone 320, and the phone 320 and/or monitor system 10 may read the software 15 from the card and permanently or temporarily store the software 15. Alternatively, the monitor system software 15 may be integrated or embedded in the original software of the cellular phone 80 with a microchip or other hardware. In yet a further example, the monitor system software 15 may be downloaded into the cellular phone from the Internet or other external device as an independent JAVA application or other language-based application.

Since the screens displayed on the cellular phone 320 are similar to the screens displayed on the PDA 80, similar functions and operations of the cellular phone 320 will be omitted for the sake of clarity and brevity.

Fig. 32 shows a display screen of a cellular phone 320, which acts as the monitor system 10 in the present embodiment. The cellular phone 320 comprises a toggle button 322, and when the toggle button 322 is pressed, a cellular monitor activation main screen 330 is displayed as shown in Fig. 33. The display of the screen 330 is not limited to pressing the toggle button 322,

and other methods can be utilized to display the screen 330. For example, another button or a predetermined sequence of buttons can be pressed to display the screen 330.

The activation main screen 330 is similar to the mode activation screen 100 of the PDA 80 shown in Fig. 10 and comprises a mode list 332. The user can select a mode by highlighting the mode on the list 332 and pressing the send button 334. After the user selects a mode (e.g. the "Enter" mode), the mode definitions screen 340 is displayed for the "Enter" mode as shown in Fig. 34. The mode definitions screen 340 displays the particular devices 35 associated with the "Enter" mode, along with the manner in which the devices 35 will be controlled during the "Enter" mode. When the user presses a select button 344 (or other appropriate button or sequence of buttons), the monitor system 10 transmits an appropriate signal to each of the receivers 22 of the device systems 20 or 20a for each the devices 35 listed on the screen 340 so that the devices 35 are controlled in the identified manner.

In the present, non-limiting example, when the user presses the select button 344 to activate the "Enter" mode, the corridor lights, bathroom heater, and John's audio will turn on, and the home alarm will turn off. As in the embodiment utilizing the PDA 80, once the control of the listed devices 35 is completed, a response signal is sent back from the device transmitters 21 to the phone 320.

As shown in Fig. 35, the display of the cellular phone 320 indicates that all of the device systems 20 or 20a for the devices 35 controlled during the "Enter" mode were properly controlled. However, if one of the devices 35 is not controlled as intended, the cellular phone 320 displays a message identifying the error. Fig. 36 shows an illustrative example of a message that is displayed when a coffee maker 35 was not controlled adequately. If the phone 320 is

displaying the screen shown in Fig. 35 or Fig. 36, the user can push an arrow button 352 to return to the cellular activation main screen 330 (Fig. 33).

If the user highlights and selects the "define" option 372 from the cellular activation screen 330 (as shown in Fig. 37) and presses the select button 344, the user can define the various modes and devices 35 in a manner which is similar to the manner described above in conjunction with the PDA 80. When the "define" option 372 is selected, the screen 380 shown in Fig. 38 is displayed. The screen 380 contains an add mode name option 382, an add new device option 384, and define a mode option 386.

If the user highlights add mode name option 382 and pushes the select button 344, the enter new mode name screen 390 is displayed as shown in Fig. 39. When the screen 390 displayed, the user can enter a new mode name (e.g. "New Mode") and press the select button 344. Afterwards, the new mode name will then appear on the cellular activation main screen 330 as shown in Fig. 40.

If the user highlights the add new device option 384 on the screen 380 (as shown in Fig. 41) and pushes select button 344, the user can add a new device 35 for a mode via an introduction operation. In the present, non-limiting embodiment, the introduction operation is similar to the operation explained above in conjunction with the PDA 80. As shown in Fig. 42, after the new device 35 has been defined, a screen 420 is displayed, which prompts the user to press the send button 334 and wait for the introduction operation to be completed. Once the introduction operation is complete (in a manner similar to the manner described above in conjunction with the PDA 80), a screen 430, which indicates that the new device 35 was properly introduced, is displayed as shown in Fig. 43. Also, as shown in Fig. 43, the screen 430 prompts

the user to press the select button 344. After the user presses the select button 344, a screen 440 is displayed and prompts the user to enter a name for the new device, as shown in Fig. 44.

If the user highlights the define a mode option 386 on the screen 380 (as shown in Fig. 45) and pushes select button 344, a select mode devices screen 460 is displayed as shown in Fig. 46. From this screen 460, the user can indicate which device 35 he or she would like to be controlled during a particular mode. In the illustrative example, the user can press the arrow button 352 to scroll through the listed devices 35 and press the select button 344 to select a particular device 35 to be included in the mode. As shown in Fig. 46, the arrow button 352 can highlight a box 462 next to one of the listed devices 35, and the select button 344 can be used to selectively "check" or "de-check" the box 462. If the box 462 corresponding to a particular listed device 35 is checked, it is included in the mode. In contrast, if the box 462 is not checked, the corresponding device 35 is not included in the mode.

Also, as shown in Fig. 46, drop down boxes 464 are respectively provided next to the listed devices 35. If a particular drop down box 464 is selected (e.g. via the arrow and select buttons 352 and 344), the manner in which the corresponding device 35 is controlled during the mode can be edited, the name of the device 35 can be changed, etc. Such operations are similar to the operations described above.

The cellular phone 320 push button activation embodiment was briefly described above. However, all the operations and functions described in reference to the PDA 80 and the operations shown in Figs. 1-4 can be implemented into the cellular phone 320.

In yet another illustrative, non-limiting embodiment, the intelligent system technology can be used in a cellular phone 320 that employs voice command activation. This embodiment

employs standard voice recognition technology to provide hands free command activation of remote devices. In this non-limiting embodiment, the cellular phone 320 allows for both the push button activation as described above in reference to Figs. 1-4, in addition to the voice command definition, recognition and activation, as described below.

As shown in Fig. 3, during the add/delete mode (Fig. 3 (operation S7)), the user can edit a mode by either going to an edit mode screen (Fig. 3 (operation S10)) or can define the mode's label using voice recognition by selecting a voice label option, (Fig. 3 (operation S25)). After selecting the voice label option, a voice command definition operation is performed. An illustrative, non-limiting embodiment of the voice command definition operation is shown in Fig. 5. The voice label option can be added to a cellular phone display screen, along with the other operations as necessary. For example, a voice label option can be added to the display screen 330 (Fig. 33) of the cellular phone 320.

Due to the current availability of voice recognition technology in cellular phones, one skilled in the art will be able to understand and achieve the following operations for recording a voice label. As shown in Fig. 5, a user selects a mode 470 that will receive a voice label as shown in Fig. 47 (Fig. 5 (operation S26)). Once the mode 470 is selected, a screen 480 (Fig. 48) is displayed that prompts the user to confirm the selection and to start recording after a beep signal or other indication (Fig. 5 (operation S27)). After the beep or other indication, the screen 490 (Fig. 49) is displayed and prompts the user to begin recording the voice label (Fig. 5 (operation S28)). Once the voice label has been recorded, the screen 500 (Fig. 50) is displayed on the cellular phone 320 and indicates that the voice label has been successfully recorded (Fig. 5 (operation S29)). The mode voice label is now able to be activated by voice command.

An illustrative, non-limiting embodiment of a voice command activation routine is shown in Fig. 6, which is a continuation from the flowchart of Fig. 2. As shown in Fig. 51, a phone default screen 510 (Fig. 51) is initially displayed (Fig. 6 (operation S30)). From the default screen, the user is able to activate the voice recognition application. Activating the voice recognition application can vary, depending on the manufacturer specifications. For example, Nokia cellular phones access voice activation applications by holding down the "menu" button for more than two seconds, while in Samsung cellular phones, a specific button can be pressed to access the application. Therefore, a wide variety of manners can be used to access the application.

Once the voice recognition application is activated, the voice command screen 520 (Fig. 52) is displayed and prompts the user to enter the voice command (Fig. 6 (operation S31)). After the voice command is entered, the application determines if the command matches a previously defined voice label (Fig. 6 (operation S32)). If no match is found, an appropriate message is displayed on the screen 530 as shown in Fig. 53 (Fig. 6 (operation S33)). In one embodiment, the screen 530 contains a prompt asking the user if he or she would like to try to enter the voice command again. If the user indicates that he or she would like to try to reenter the command (i.e. by pressing an appropriate button, combination of buttons, etc.) the screen 520 shown in Fig. 52 is displayed again (Fig. 6 (operation S31)). On the other hand, if the user indicates that he or she does not want to try to reenter the command, the default screen 510 shown in Fig. 51 is displayed again (Fig. 6 (operation S30)). In an alternative implementation, when no match is found in operation S32 for a first time, the screen 520 shown in Fig. 52 is automatically redisplayed (Fig. 6 (operation S31)) without any input from the user. Then, if the user again attempts to reenter

the voice command but no match is found in operation S32 for a second time, the default screen 510 shown in Fig. 51 is automatically redisplayed (Fig. 6 (operation S30)). Of course, in either implementation, the number of attempts permitted by the system can vary as needed.

If, in operation S32, the voice command is recognized, a screen 540 (Fig. 54) is displayed. The screen 540 indicates that the voice label has been found and displays the voice label 542. Subsequently, the application determines if the voice label 542 is related to a telephone call or a remote device operation (Fig. 6 (operation S34)). If the label 542 relates to a telephone call, a routine for making the call is executed (Fig. 6 (operation S35)). On the other hand, if the label relates to a remote device operation (e.g. activating the "Enter Home" mode), the mode is activated and a corresponding screen 550 is displayed as shown in Fig. 55 (Fig. 6 (operation S36)). The mode is activated in a manner that is similar to the manner described above in conjunction with the PDA 80 and utilizes transmitters, receivers, device systems, etc. to turn on, turn off, or control various devices 35.

Once the activation of the operation or mode is performed, a determination is made to assess whether or not the mode was successfully performed (Fig. 6 (operation S37)). If the mode was successfully performed, the screen 560 shown in Fig. 56 is displayed (Fig. 6 (operation S38)). On the other hand, if the mode was not successfully performed, the screen 570 shown in Fig. 57 is displayed (Fig. 6 (operation S38)). As shown in Fig. 57, the screen 570 shows which particular device 35 could not be controlled properly. Furthermore, the screen 570 may display the cause of the error, if known.

The previous description of the preferred embodiments is provided to enable a person skilled in the art to make and use the present invention. Moreover, various modifications to

these embodiments will be readily apparent to those skilled in the art, and the generic principles and specific examples defined herein may be applied to other embodiments without the use of inventive faculty. For example, some or all of the features of the different embodiments discussed above may be combined into a single embodiment. Conversely, some of the features of a single embodiment discussed above may be deleted from the embodiment. Therefore, the present invention is not intended to be limited to the embodiments described herein but is to be accorded the widest scope as defined by the limitations of the claims and equivalents thereof.

What is claimed is:

1. A method for remotely controlling devices comprising:

controlling an electrical device through use of a monitor system and a device system by transmitting a command from the monitor system to the device system, which commands the device system to control the electrical device,

wherein the monitor system is a user controlled hand-held display device, and

wherein the device system comprises a switch device attached to the electrical device, the switch device being capable of controlling the electrical device.

2. The method of claim 1, further comprising installing monitor system software into the monitor system, the monitor system software capable of transmitting and receiving signals from a remote device system, wherein

the software can be loaded using a JAVA application, integrated into the original software of the cellular phone during manufacturing, or installed in the form of a card.

3. The method of claim 1, further comprising identifying a new electrical device, which is input in the monitor system by transmitting a device code input by the user to the device system, and having the new electrical device transmit back its internal device code so that the monitor system is capable of controlling the new electrical device in future commands.

4. The method of claim 1, further comprising deleting the electrical device from the device system if the user no longer wants to be able to control the electrical device.

5. The method of claim 1, further comprising checking the status of the electrical device to determine whether the electrical device is faulty or ready to be controlled.

6. The method of claim 1, further comprising asking the user whether the electrical device is a remote device or a switch device, wherein

if the electrical device is a remote device, then the electrical device is a infra-red device and the user must enter the manufacturer of the electrical device so that the monitor system knows which command to send to the infra-red device.

7. The method of claim 1, further comprising checking the legality of the command to see if the device system is capable of following the command.

8. The method of claim 1, further comprising confirming the control of the electrical device by a confirmation signal transmitted from the device system to the monitor system, wherein

when the electrical device is properly controlled, the device system sends a positive confirmation signal to the monitor system, and when the electrical device cannot be properly controlled, the device system sends a negative confirmation signal to the monitor system.

9. The method of claim 1, further comprising putting the electrical device in a mode, wherein the mode can group different electrical devices together so that when a user activates the mode, each electrical device listed in the mode is controlled at the same time.

10. A method for remotely controlling devices comprising:

controlling an electrical device through use of a voice command given to a monitor system by transmitting the voice command from the monitor system to a device system, the voice command instructs the device system to control the electrical device,

wherein the monitor system is a user controlled hand-held display device,

wherein the device system comprises a switch device attached to the electrical device, the switch device being capable of controlling the electrical device.

11. The method of claim 10, further comprising installing monitor system software into the monitor system, the monitor system software capable of transmitting and receiving signals from a remote device system, wherein

the software can be loaded using a JAVA application, integrated into the original software of the cellular phone during manufacturing, or installed in the form of a card.

12. The method of claim 10, further comprising identifying a new electrical device, which is input in the monitor system by transmitting a device code input by the user to the device system, and having the new electrical device transmit back its internal device code so that the monitor system is capable of controlling the new electrical device in future commands.

13. The method of claim 10, further comprising deleting the electrical device from the device system if the user no longer wants to be able to control the electrical device.

14. The method of claim 10, further comprising checking the status of the electrical device to determine whether the electrical device is faulty or ready to be controlled.

15. The method of claim 10, further comprising asking the user whether the electrical device is a remote device or a switch device, wherein

if the electrical device is a remote device, then the electrical device is a infra-red device and the user must enter the manufacturer of the electrical device so that the monitor system knows which command to send to the infra-red device.

16. The method of claim 10, further comprising checking the legality of the command to see if the device system is capable of following the command.

17. The method of claim 10, further comprising confirming the control of the electrical device by a confirmation signal transmitted from the device system to the monitor system, wherein

when the electrical device is properly controlled, the device system sends a positive confirmation signal to the monitor system, and when the electrical device cannot be

properly controlled, the device system sends a negative confirmation signal to the monitor system.

18. The method of claim 10, further comprising putting the electrical device in a mode, wherein the mode can group different electrical devices together so that when a user activates the mode, each electrical device listed in the mode is activated at the same time.

19. The method of claim 18, further comprising labeling the mode with a voice label which is recorded by the user, so that the mode can be controlled by voice command.

20. A method for remotely controlling devices comprising:

installing monitor system software into a monitor system, the monitor system software capable of transmitting and receiving signals from a remote device system;

attaching the device system to an electrical device, the device system capable of transmitting and receiving signals from the monitor system and controlling the electrical device upon command;

introducing the electrical device to the monitor system via the device system; and

controlling the electrical device by transmitting a user input command from the monitor system to the device system.

21. The method of claim 20, further comprising identifying a new electrical device, which is input in the monitor system by transmitting a device code input by the user to the device

system, and having the new electrical device transmit back its internal device code so that the monitor system is capable of controlling the new electrical device in future commands.

22. The method of claim 20, further comprising deleting the electrical device from the device system if the user no longer wants to be able to control the electrical device.

23. The method of claim 20, further comprising checking the status of the electrical device to determine whether the electrical device is faulty or ready to be controlled.

24. The method of claim 20, further comprising asking the user whether the electrical device is a remote device or a switch device, wherein

if the electrical device is a remote device, then the electrical device is a infra-red device and the user must enter the manufacturer of the electrical device so that the monitor system knows which command to send to the infra-red device.

25. The method of claim 20, further comprising checking the legality of the command to see if the device system is capable of following the command.

26. The method of claim 20, further comprising confirming the control of the electrical device by a confirmation signal transmitted from the device system to the monitor system, wherein

when the electrical device is properly controlled, the device system sends a positive confirmation signal to the monitor system, and when the electrical device cannot be properly controlled, the device system sends a negative confirmation signal to the monitor system.

27. The method of claim 20, further comprising putting the electrical device in a mode, wherein the mode can group different electrical devices together so that when a user activates the mode, each electrical device listed in the mode is controlled at the same time.

28. A method for remotely controlling devices comprising:

installing monitor system software into a monitor system, the monitor system software capable of transmitting and receiving signals from a remote device system;

attaching the device system to an electrical device, the device system capable of transmitting and receiving signals from the monitor system and controlling the electrical device upon command;

introducing the electrical device to the monitor system via the device system;

controlling the electrical device by transmitting a user input command from the monitor system to the device system; and

confirming the control of the electrical device by a confirmation signal transmitted from the device system to the monitor system, wherein

when the electrical device is properly controlled, the device system sends a positive confirmation signal to the monitor system, and when the electrical device cannot be

properly controlled, the device system sends a negative confirmation signal to the monitor system.

29. The method of claim 28, further comprising identifying a new electrical device, which is input in the monitor system by transmitting a device code input by the user to the device system, and having the new electrical device transmit back its internal device code so that the monitor system is capable of controlling the new electrical device in future commands.

30. The method of claim 28, further comprising deleting the electrical device from the device system if the user no longer wants to be able to control the electrical device.

31. The method of claim 28, further comprising checking the status of the electrical device to determine whether the electrical device is faulty or ready to be controlled.

32. The method of claim 28, further comprising asking the user whether the electrical device is a remote device or a switch device, wherein

if the electrical device is a remote device, then the electrical device is a infra-red device and the user must enter the manufacturer of the electrical device so that the monitor system knows which command to send to the infra-red device.

33. The method of claim 28, further comprising checking the legality of the command to see if the device system is capable of following the command.

34. The method of claim 28, further comprising putting the electrical device in a mode, wherein the mode can group different electrical devices together so that when a user activates the mode, each electrical device listed in the mode is controlled at the same time.

35. A method for remotely controlling devices comprising:

installing monitor system software into a monitor system, the monitor system software capable of transmitting and receiving signals from a remote device system;

introducing an electrical device to the monitor system via the device system, wherein the device system in integrated into the electrical device;

controlling the electrical device by transmitting a user input command from the monitor system to the device system; and

confirming the control of the electrical device by a confirmation signal transmitted from the device system to the monitor system, wherein

when the electrical device is properly controlled, the device system sends a positive confirmation signal to the monitor system, and when the electrical device cannot be properly controlled, the device system sends a negative confirmation signal to the monitor system.

36. A method for remotely controlling devices comprising:

introducing an electrical device to a monitor system via a device system, both the monitor system and device system capable of transmitting and receiving signals; and

controlling the electrical device by transmitting a user input command from the monitor system to the device system, wherein

the device system is attached to the electrical device and upon receiving a command from the monitor system, the device system controls the electrical device.

37. A method for introducing an device capable of being remotely controlled by a monitor/device system comprising:

entering a device code into a monitor system;

transmitting a command from the monitor system to a device system instructing the device system to transmit back a device code of an electrical device, which is connected to the device system; and

checking the device code entered into the monitor system with the device code transmitted from the device system, wherein

if the device code entered into the monitor system and the device code transmitted from the device system are identical, the electrical device is entered into the monitor system and can be controlled by transmitting a command signal from a monitor system to a device system instructing the device system to control the electrical device.

38. An apparatus system for remotely controlling devices comprising:

a monitor system which allows a user to input instructions; and

a device system having a switch device which is connected to an electrical device, wherein

the instructions input by a user are transmitted by the monitor system to the device system, which then controls the electrical device according to the instructions received from the monitor system by using the switch device and then transmits a signal back to the monitor system concerning the status of the electrical device.

39. The apparatus of claim 38, wherein the monitor system comprises software enabling it to communicate with the device system.

40. The apparatus of claim 39 wherein the software comprises a transmitter and receiver.

41. The apparatus of claim 39, wherein the software is loaded into the monitor system in the form of a card.

42. The apparatus of claim 39, wherein the software is loaded into the monitor system as an independent JAVA application.

43. The apparatus of claim 39, wherein the software is already integrated in the original software during manufacturing of the monitor system.

44. The apparatus of claim 38 wherein the monitor system further comprises a display for displaying the instructions transmitted to the device system as well as the status of the controlled electrical device.

45. The apparatus of claim 38, wherein the monitor system is a cellular phone.

46. The apparatus of claim 38, wherein the monitor system is a personal digital assistant (PDA).

47. The apparatus of claims 45 or 46, wherein the instructions are input by a pushbutton operation.

48. The apparatus of claim 45, wherein the instructions are input using a voice activated operation.

49. The apparatus of claim 38, wherein the device system comprises a switch device which performs the control of the electrical device.

50. The apparatus of claim 49, wherein the switch device is in the form of an adapter.

51. The apparatus of claim 49, wherein the switch device is integrated into the electrical device during manufacturing.

52. The apparatus of claim 49, wherein the switch device is in the form of an infra-red remote.

53. The apparatus of claim 38, wherein the electrical device is a home appliance.

54. The apparatus of claim 38, wherein the control of the electrical device turns the electrical device on or off.

55. The apparatus of claim 38, wherein the device system comprises software enabling it to communicate with the device system.

56. The apparatus of claim 38, wherein the device system further comprises a transmitter.

57. The apparatus of claim 38, wherein the device system further comprises a receiver.

58. The apparatus of claim 38, where there are multiple device systems and multiple electrical devices.

59. The apparatus of claim 38, wherein the electrical device can be put in a mode with other electrical devices, so that when the mode is activated, all the electrical devices listed in the mode will be controlled.

60. A device control system, comprising:

a monitor controller; and

a device controller located remotely from the monitor controller,

wherein the device controller is configurable to control any one of a plurality of types of devices;

wherein a user can selectively instruct the monitor controller to output at least one configuration command to instruct the device controller to selectively control a particular device from among the plurality of types of devices, and

wherein after the device controller receives the configuration command, the device controller is capable of receiving a control command from the monitor controller and controlling the particular device in accordance with the control command.

61. A device control method, comprising:

instructing a monitor controller to output at least one configuration command to a device controller, wherein the device controller is located remotely from the monitor controller;

configuring the device controller, in accordance with the configuration command, to selectively control a particular device from among a plurality of types of devices;

after the device controller is configured, outputting a control command from the monitor controller to the device controller; and

controlling the particular device, via the device controller, in accordance with the control command.

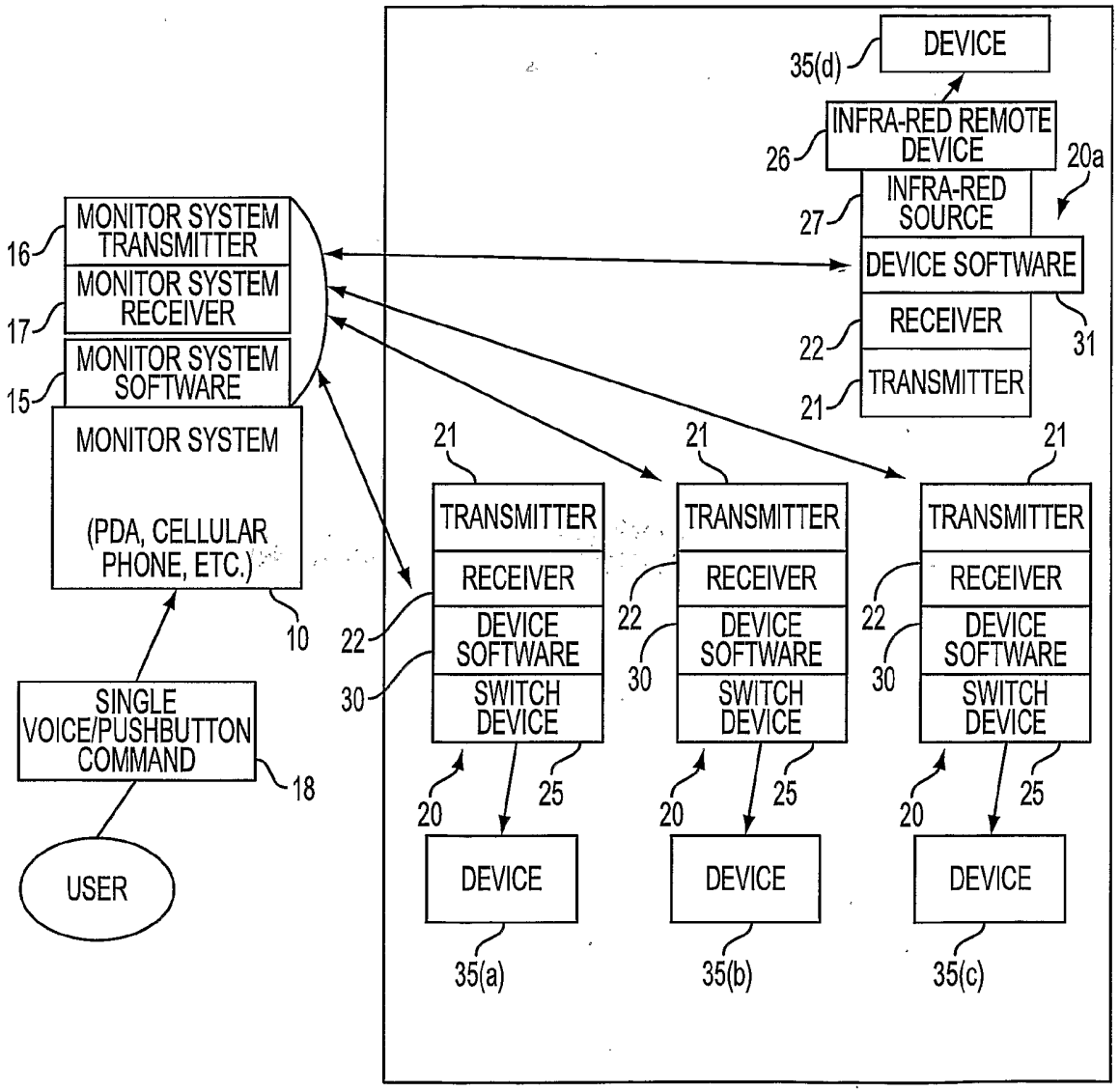
DEVICE
35(d)
INFRA-RED REMOTE DEVICE
26
20a
INFRA-RED SOURCE
27
DEVICE SOFTWARE
RECEIVER
22
31
TRANSMITTER
21
MONITOR SYSTEM TRANSMITTER
16
MONITOR SYSTEM RECEIVER
17
MONITOR SYSTEM SOFTWARE
15
MONITOR SYSTEM
(PDA, CELLULAR PHONE, ETC.)
10
SINGLE VOICE/PUSHBUTTON COMMAND
18
USER
TRANSMITTER
RECEIVER
DEVICE SOFTWARE
SWITCH DEVICE
22
30
20
25
DEVICE
35(a)
35(b)
35(c)

FIG. 1

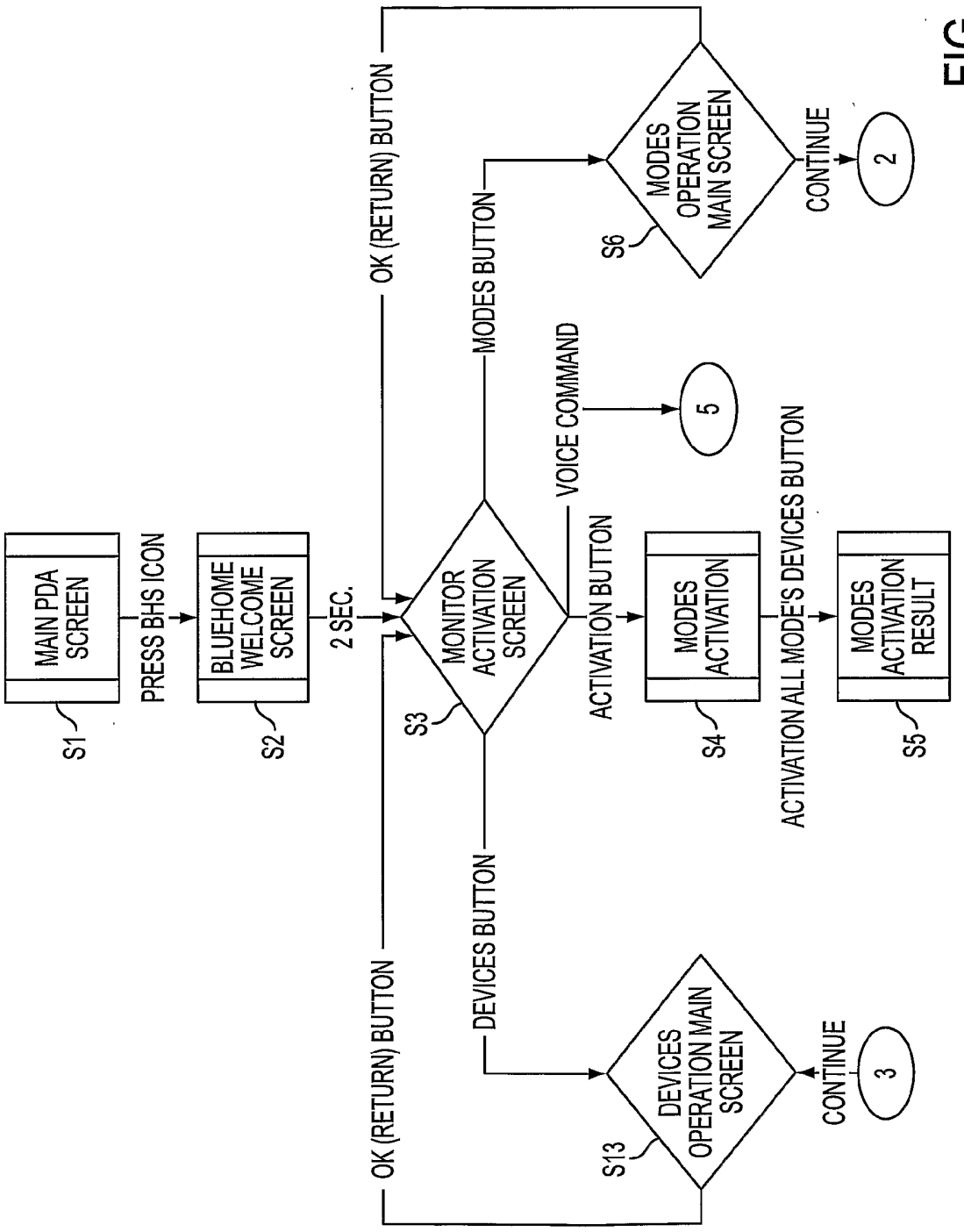
MAIN PDA SCREEN
S1
PRESS BHS ICON
BLUEHOME WELCOME SCREEN
S2
2 SEC.
MONITOR ACTIVATION SCREEN
S3
OK (RETURN) BUTTON
MODES BUTTON
MODES OPERATION MAIN SCREEN
S6
CONTINUE
2
VOICE COMMAND
5
ACTIVATION BUTTON
MODES ACTIVATION
S4
ACTIVATION ALL MODE'S DEVICES BUTTON
MODES ACTIVATION RESULT
S5
DEVICES BUTTON
OK (RETURN) BUTTON
DEVICES OPERATION MAIN SCREEN
S13
CONTINUE
3

FIG. 2

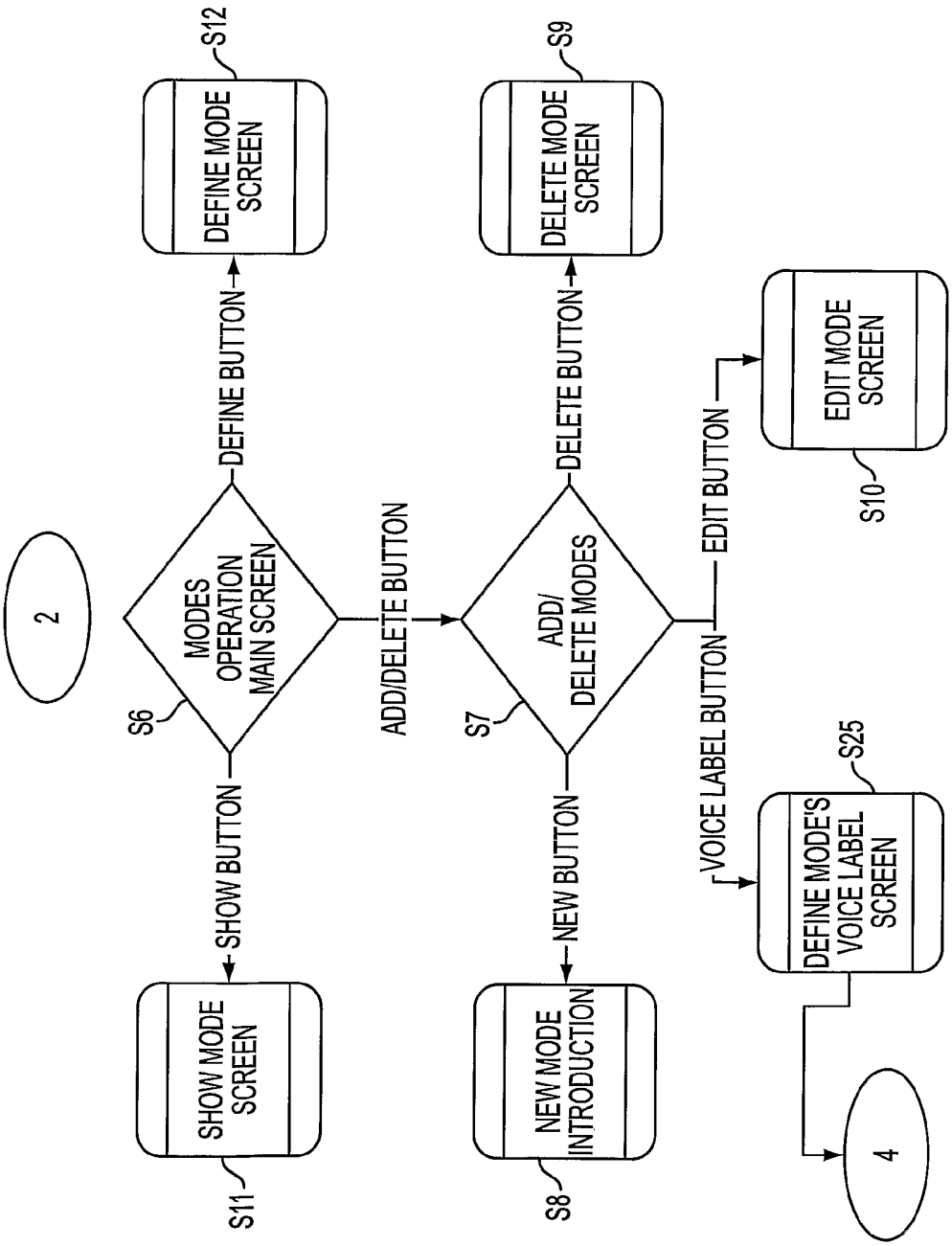
2
MODES OPERATION MAIN SCREEN
S6
DEFINE BUTTON
SHOW BUTTON
ADD/DELETE BUTTON
ADD/ DELETE MODES
S7
DELETE BUTTON
NEW BUTTON
EDIT BUTTON
VOICE LABEL BUTTON
DEFINE MODE SCREEN
S12
DELETE MODE SCREEN
S9
EDIT MODE SCREEN
S10
SHOW MODE SCREEN
S11
NEW MODE INTRODUCTION
S8
DEFINE MODE'S VOICE LABEL SCREEN
S25
4

FIG. 3

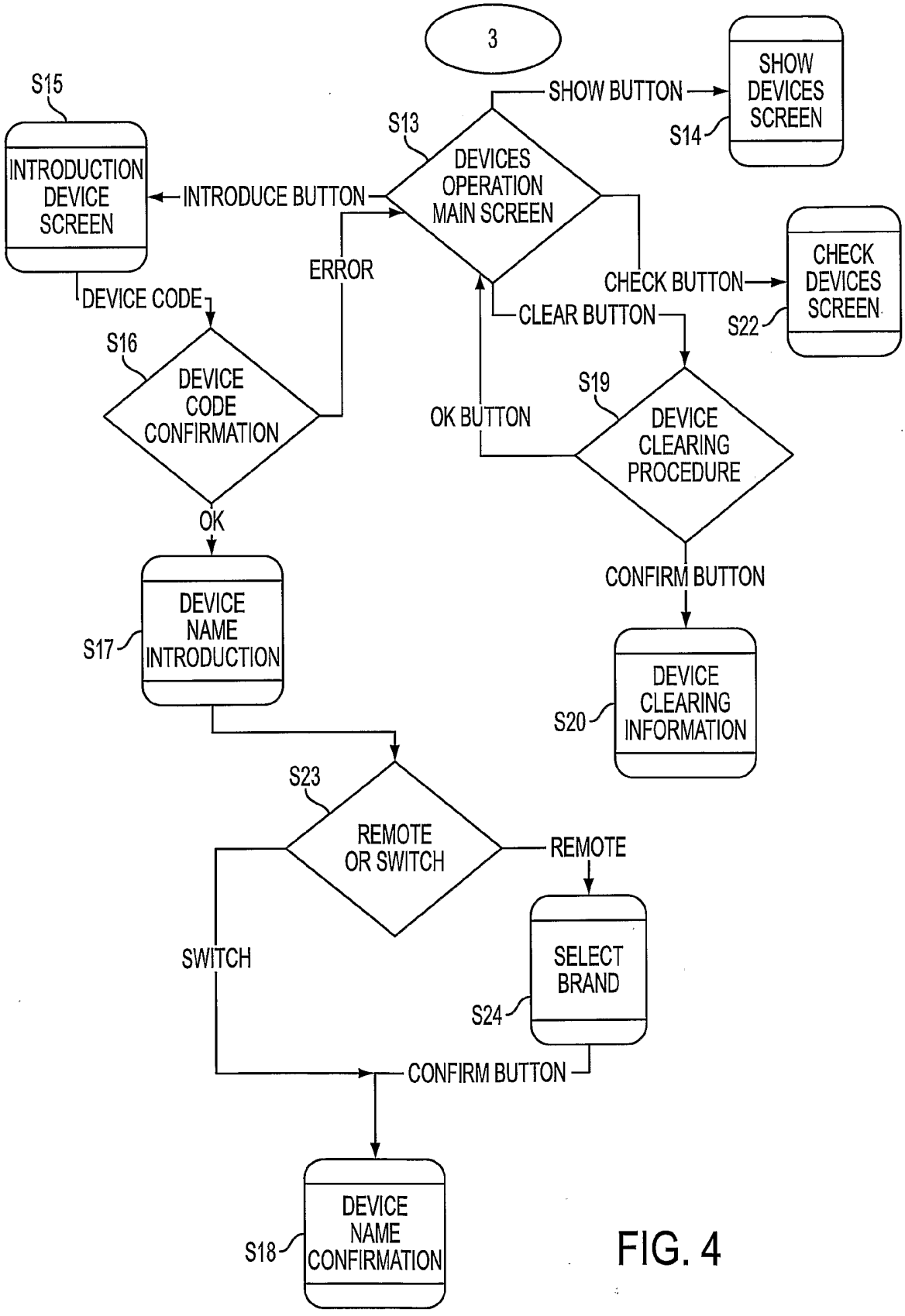
3
SHOW BUTTON
SHOW DEVICES SCREEN
S14
S15
S13
INTRODUCTION DEVICE SCREEN
INTRODUCE BUTTON
DEVICES OPERATION MAIN SCREEN
CHECK BUTTON
CHECK DEVICES SCREEN
S22
ERROR
DEVICE CODE
CLEAR BUTTON
S16
DEVICE CODE CONFIRMATION
S19
OK BUTTON
DEVICE CLEARING PROCEDURE
OK
CONFIRM BUTTON
DEVICE NAME INTRODUCTION
S17
DEVICE CLEARING INFORMATION
S20
S23
REMOTE OR SWITCH
REMOTE
SWITCH
SELECT BRAND
S24
CONFIRM BUTTON
DEVICE NAME CONFIRMATION
S18

FIG. 4

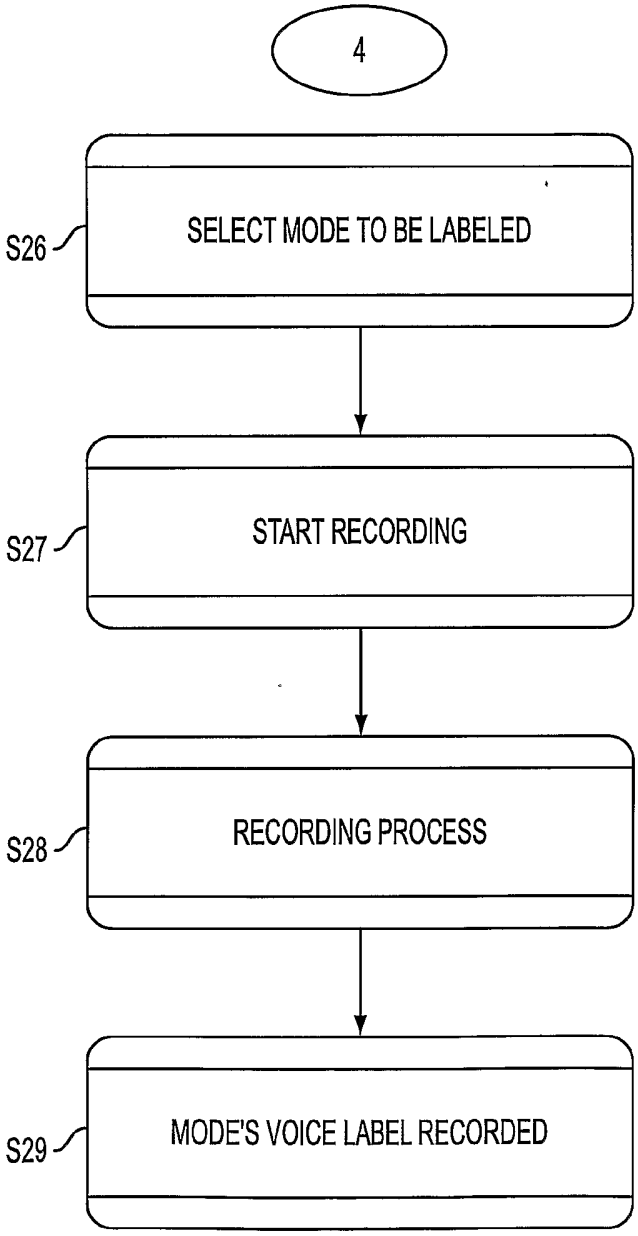
4
S26
SELECT MODE TO BE LABELED
S27
START RECORDING
S28
RECORDING PROCESS
S29
MODE'S VOICE LABEL RECORDED

FIG. 5

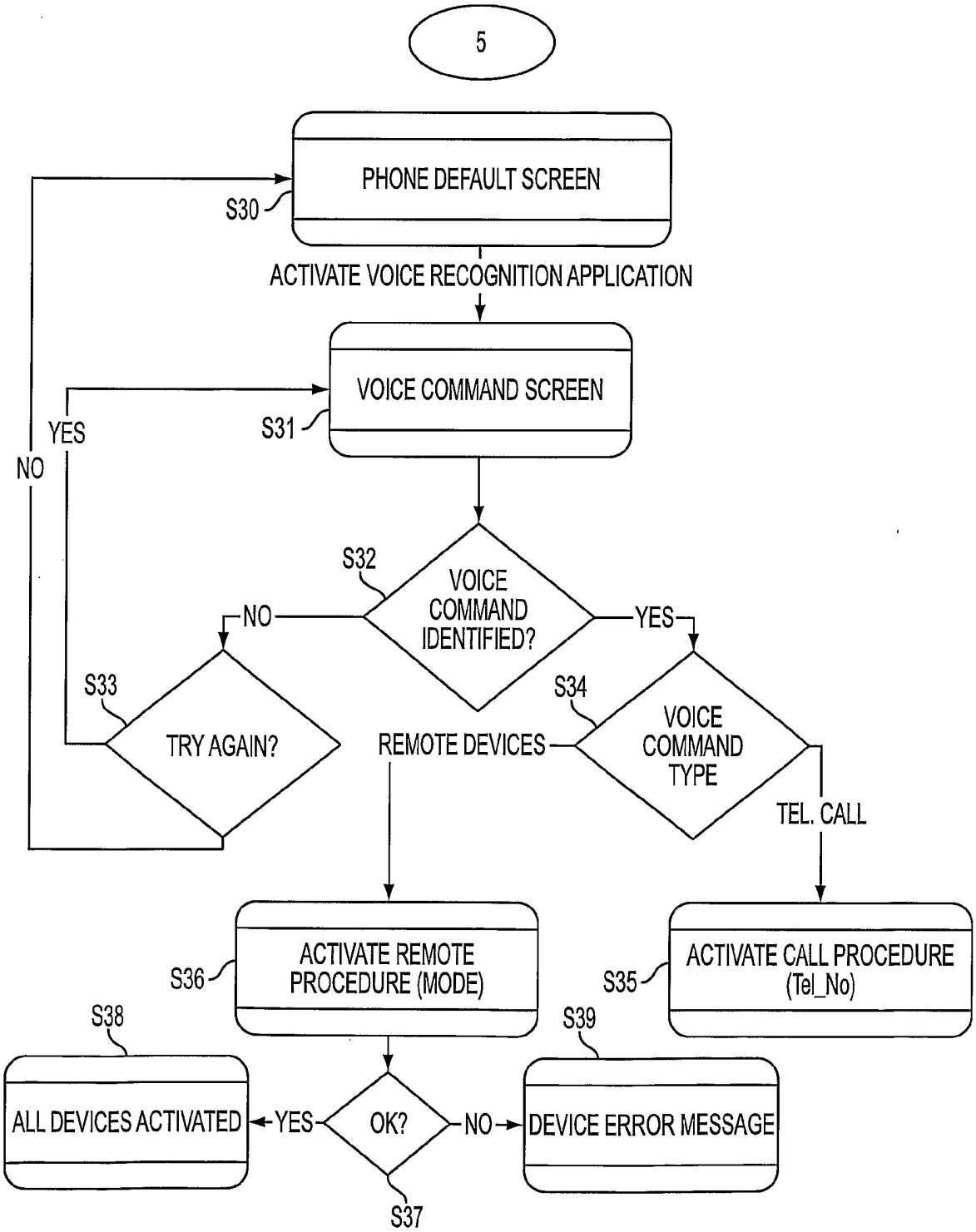
5
PHONE DEFAULT SCREEN
S30
ACTIVATE VOICE RECOGNITION APPLICATION
VOICE COMMAND SCREEN
S31
YES
NO
S32
VOICE COMMAND IDENTIFIED?
NO
YES
S33
TRY AGAIN?
REMOTE DEVICES
S34
VOICE COMMAND TYPE
TEL. CALL
ACTIVATE REMOTE PROCEDURE (MODE)
S36
ACTIVATE CALL PROCEDURE (Tel_No)
S35
S38
S39
ALL DEVICES ACTIVATED
YES
OK?
NO
DEVICE ERROR MESSAGE
S37

FIG. 6

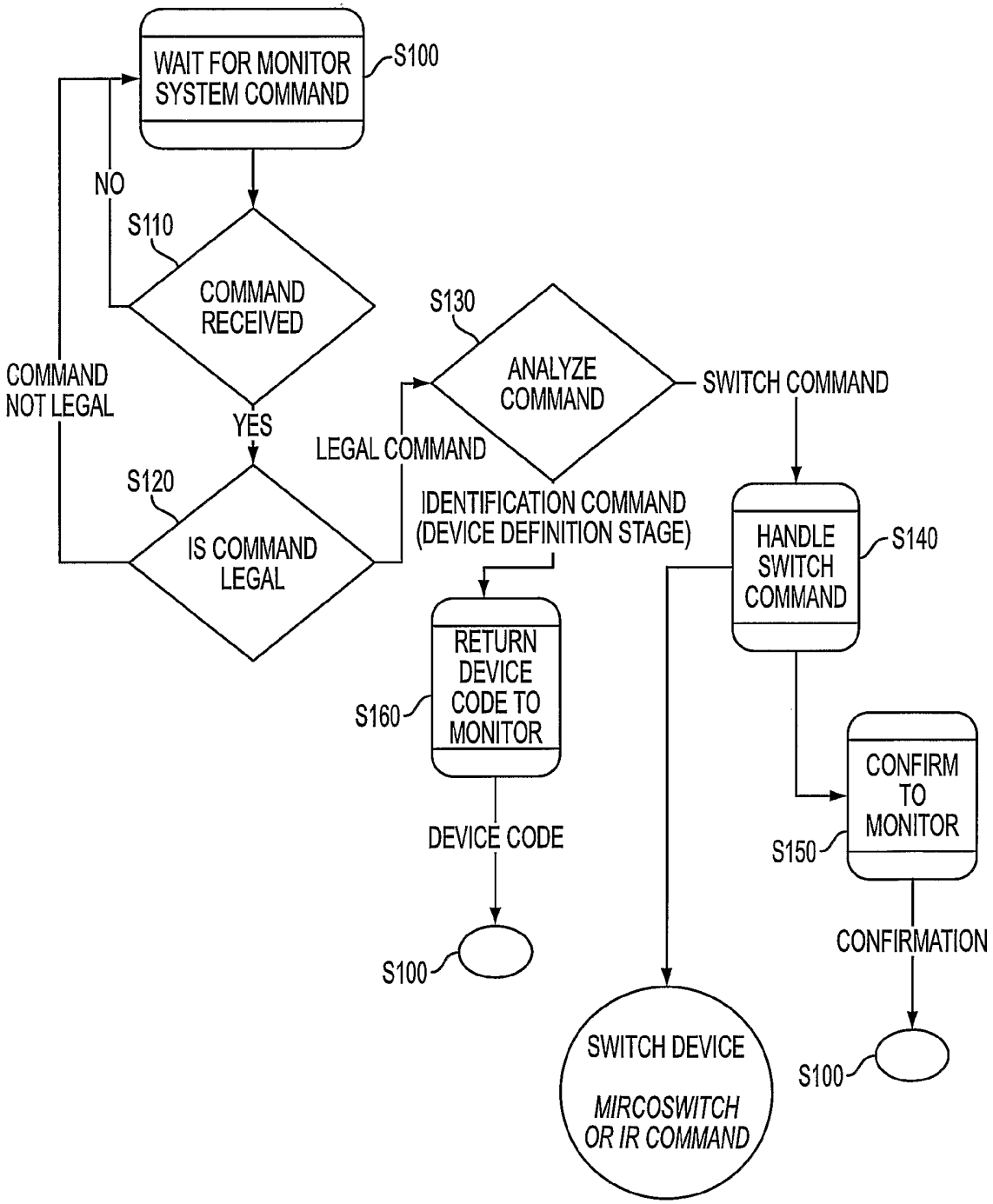
WAIT FOR MONITOR SYSTEM COMMAND
S100
NO
S110
COMMAND RECEIVED
COMMAND NOT LEGAL
YES
S120
IS COMMAND LEGAL
S130
ANALYZE COMMAND
LEGAL COMMAND
SWITCH COMMAND
IDENTIFICATION COMMAND (DEVICE DEFINITION STAGE)
HANDLE SWITCH COMMAND
S140
RETURN DEVICE CODE TO MONITOR
S160
DEVICE CODE
S100
CONFIRM TO MONITOR
S150
CONFIRMATION
S100
SWITCH DEVICE
MIRCOSWITCH OR IR COMMAND

FIG. 7

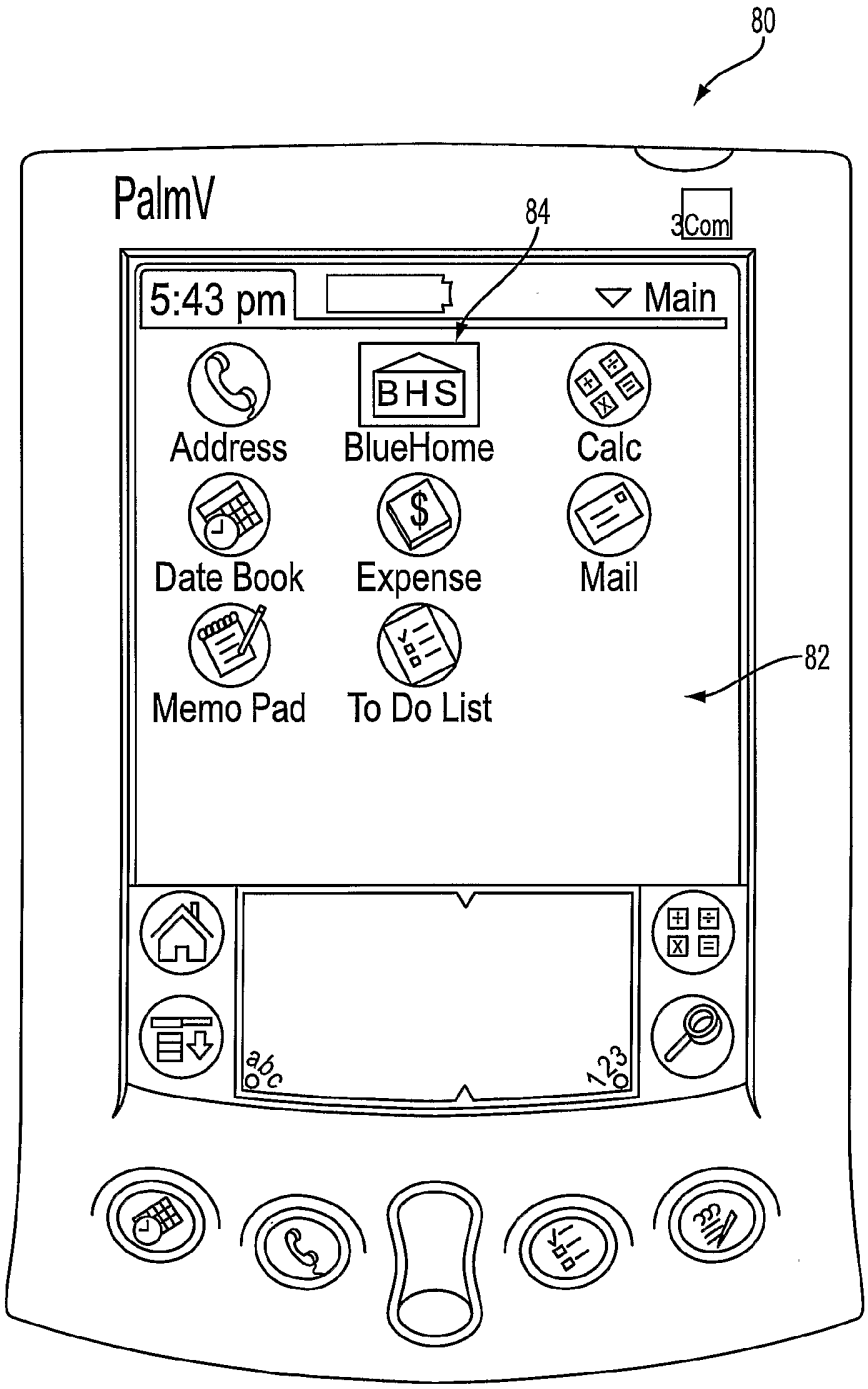
80
PalmV
3Com
84
5:43 pm
Main
BHS
Address
BlueHome
Calc
Date Book
Expense
Mail
Memo Pad
To Do List
82
abc
123

FIG. 8

PalmV
3Com
90
BlueHome™ Systems
Intelligent Home Solutions
abc
123

FIG. 9

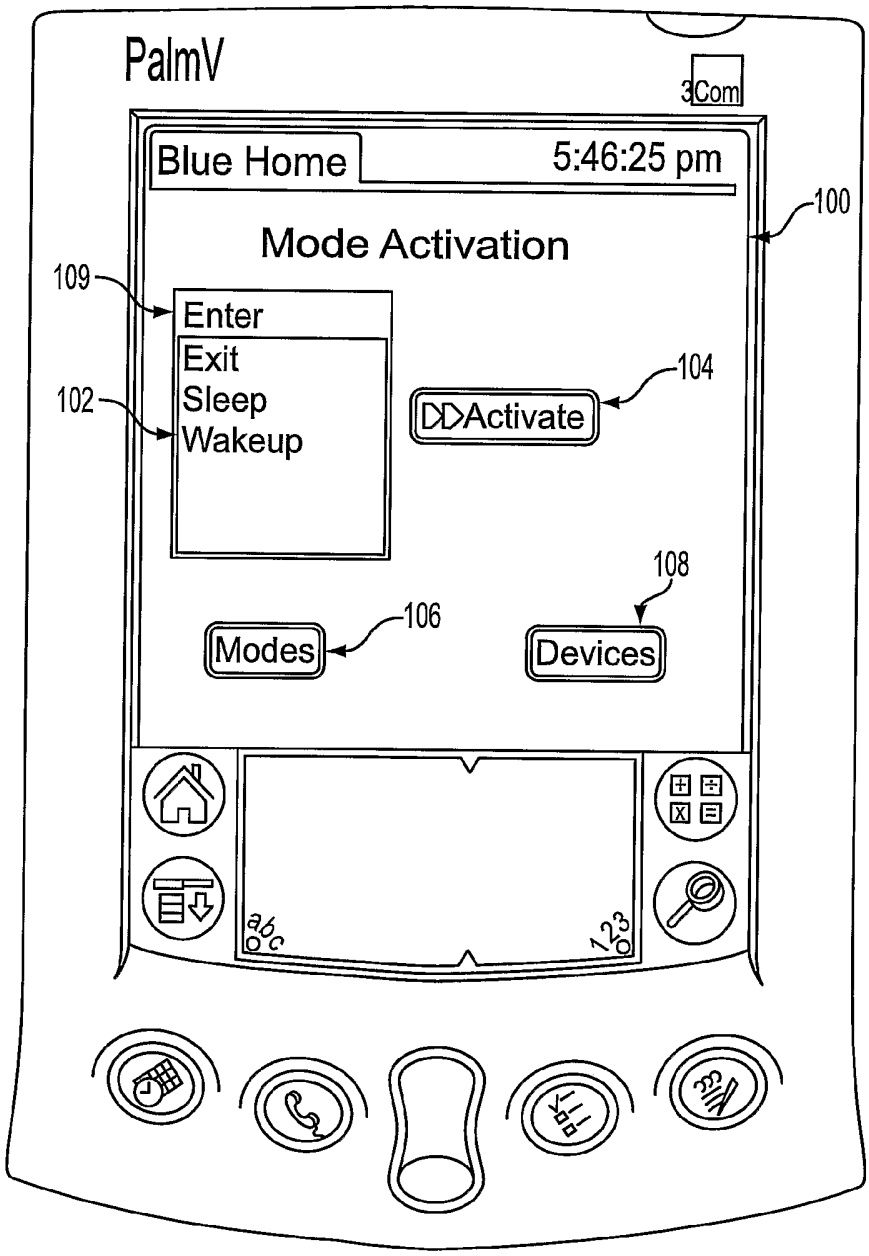
PalmV
3Com
Blue Home
5:46:25 pm
Mode Activation
100
109
Enter
Exit
Sleep
Wakeup
102
104
Activate
108
106
Modes
Devices
abc
123

FIG. 10

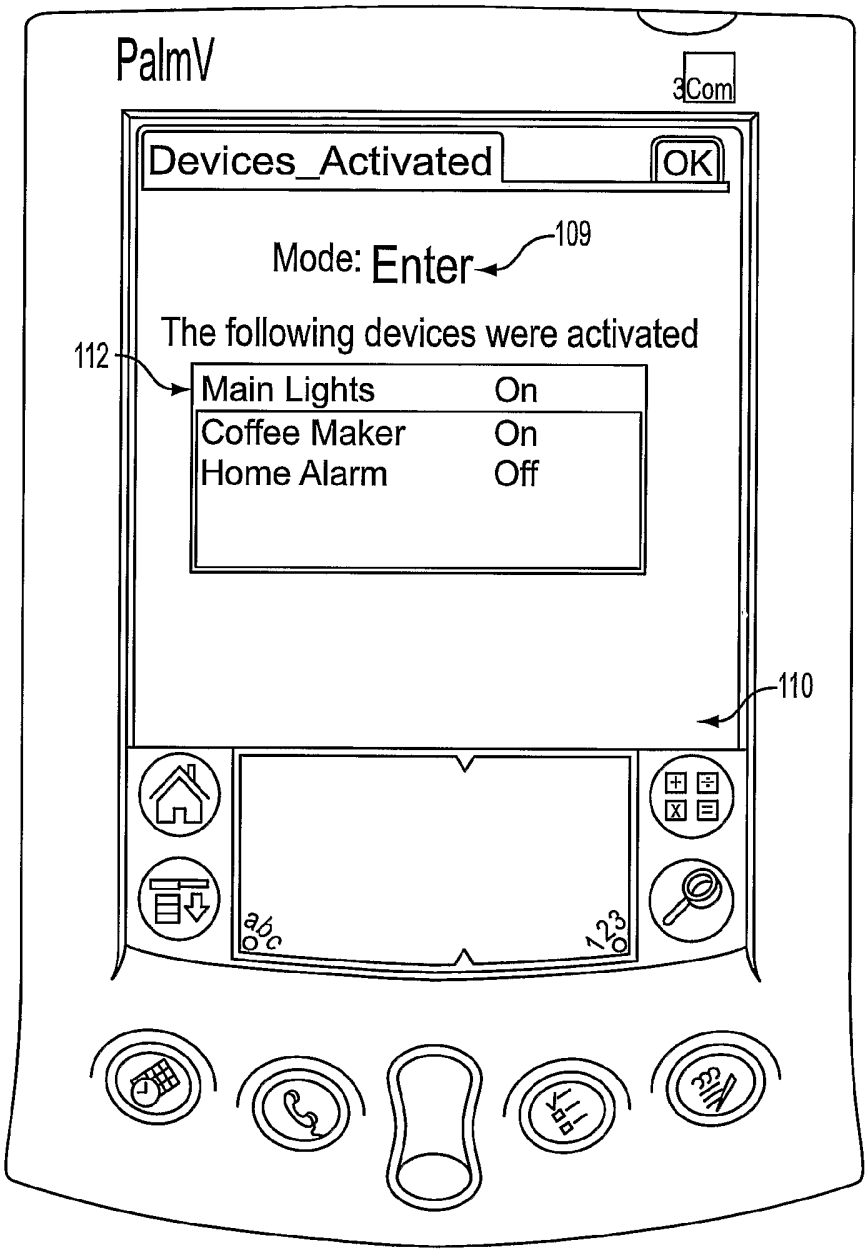
PalmV
3Com
Devices_Activated
OK
Mode: Enter
109
The following devices were activated
112
Main Lights On
Coffee Maker On
Home Alarm Off
110
abc
123

FIG. 11

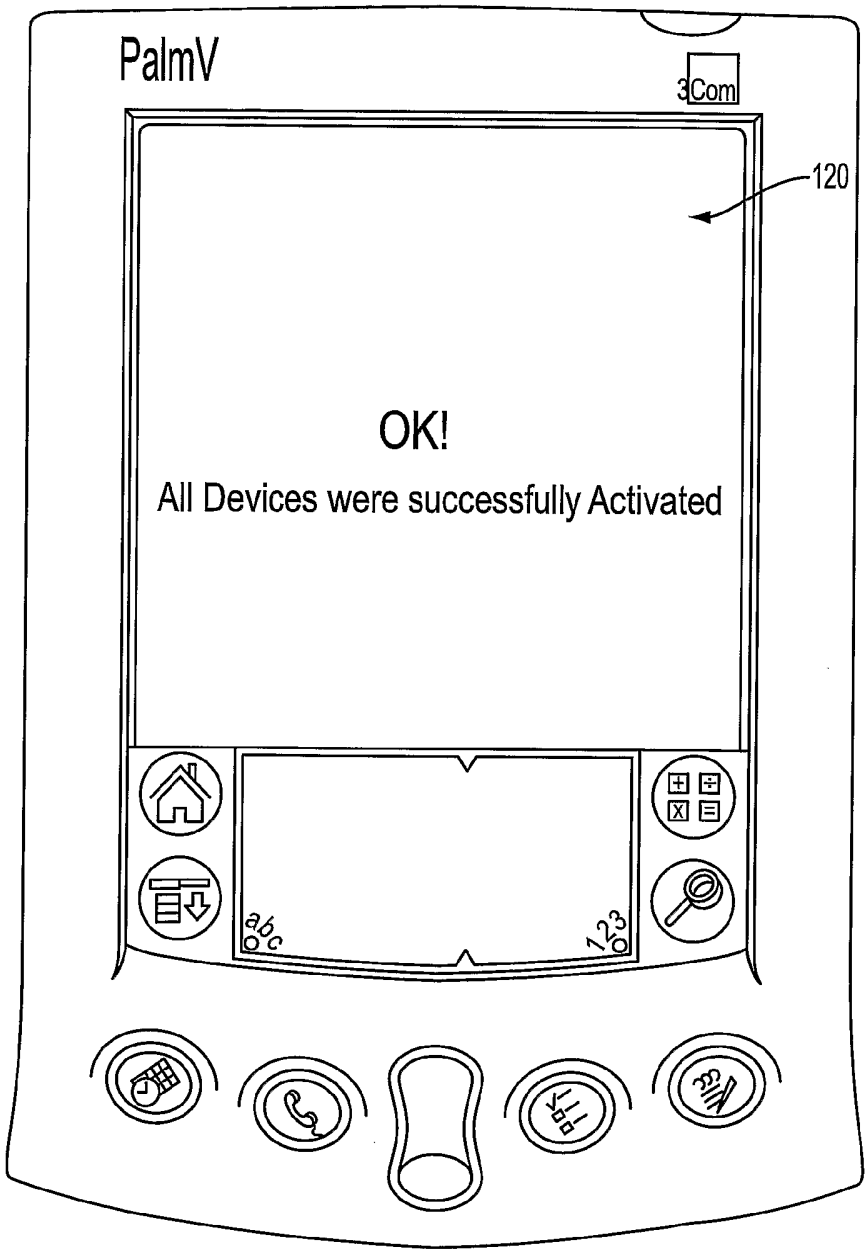
PalmV
3Com
120
OK!
All Devices were successfully Activated
abc
123

FIG. 12

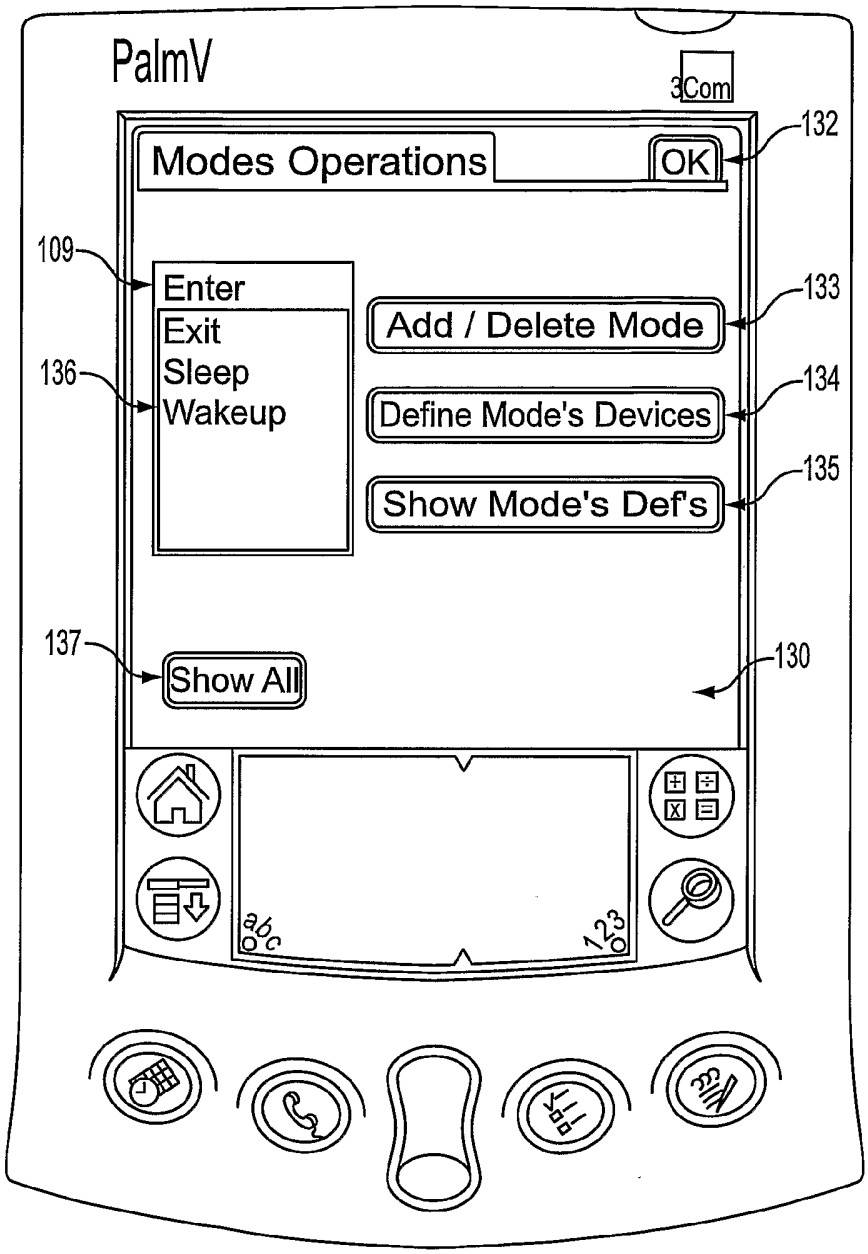
PalmV
3Com
Modes Operations
OK
132
109
Enter
Exit
Sleep
Wakeup
136
Add / Delete Mode
133
Define Mode's Devices
134
Show Mode's Def's
135
137
Show All
130
abc
123

FIG. 13

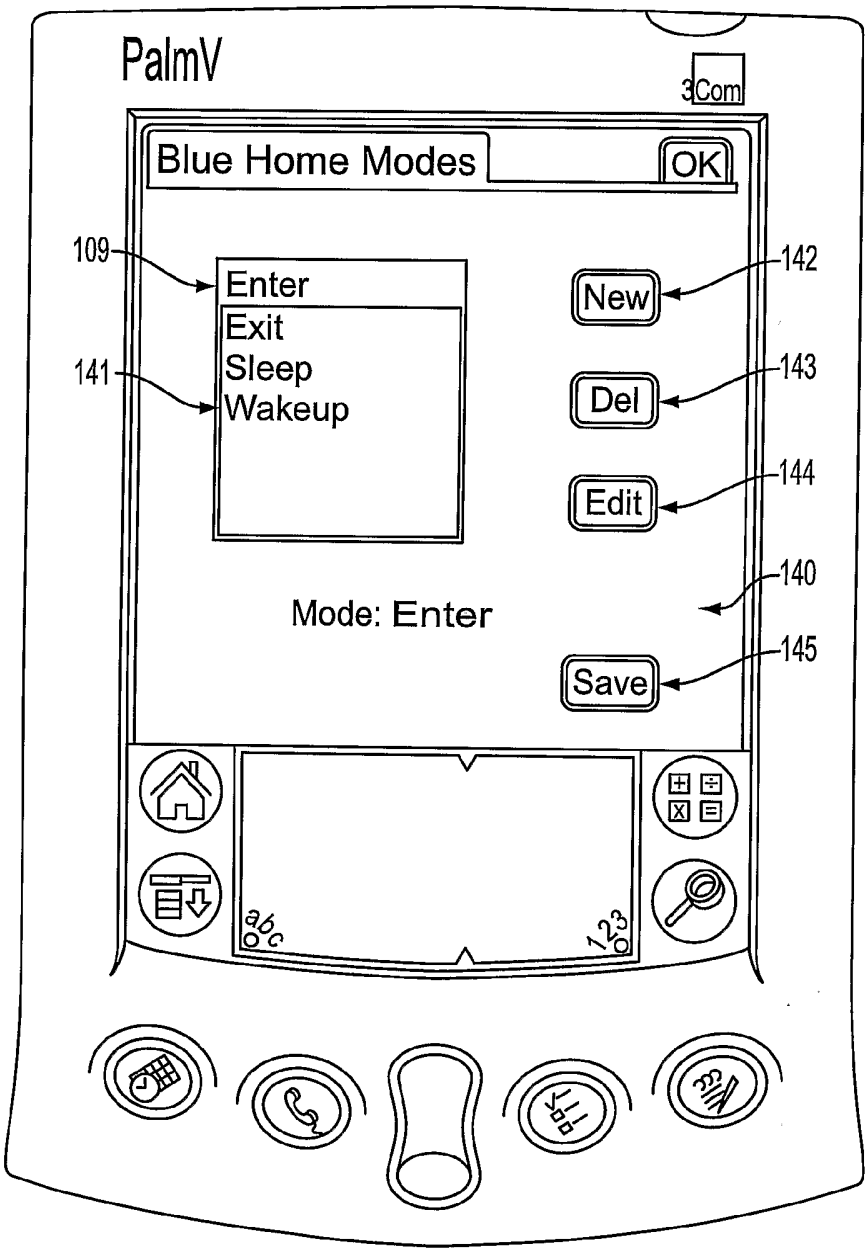
PalmV
3Com
Blue Home Modes
OK
109
Enter
Exit
Sleep
Wakeup
141
New
142
Del
143
Edit
144
140
Mode: Enter
Save
145
abc
123

FIG. 14

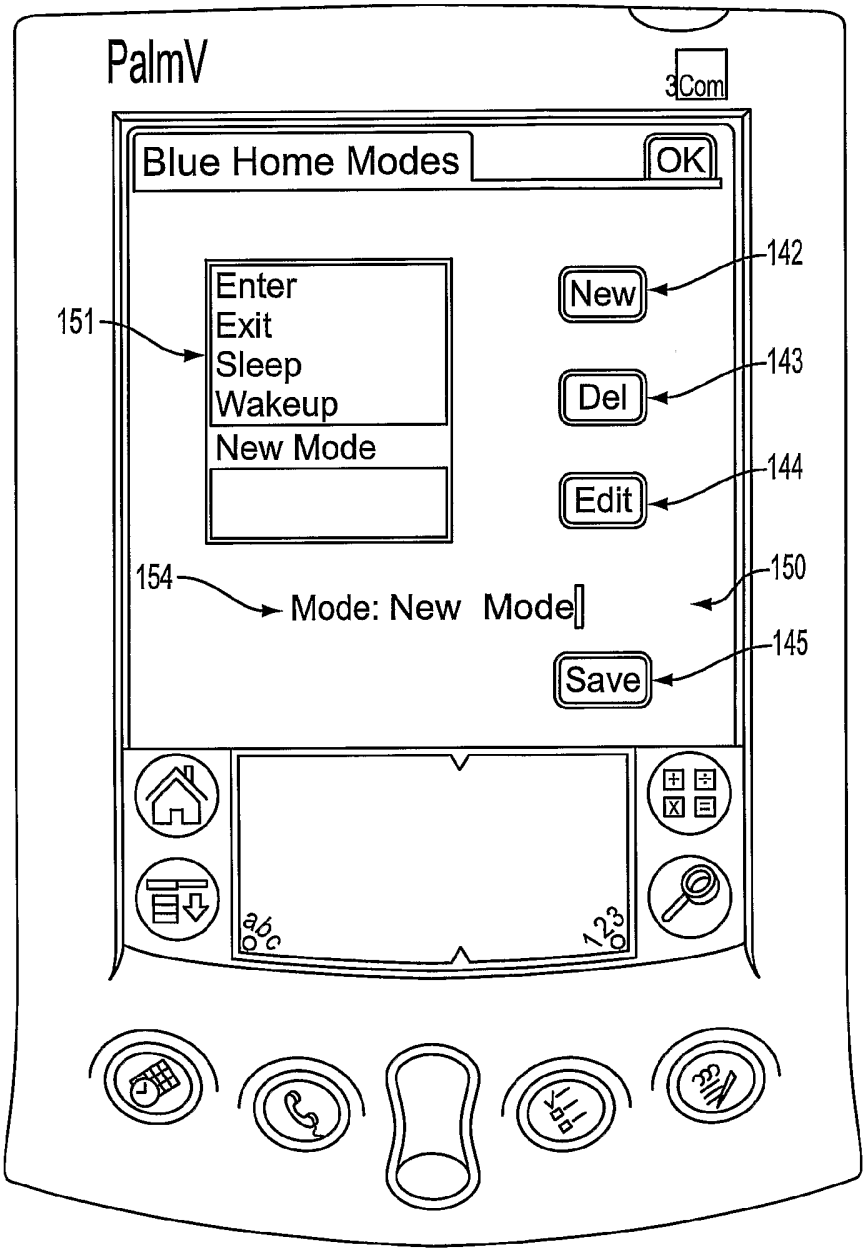
PalmV
3Com
Blue Home Modes
OK
Enter
Exit
Sleep
Wakeup
New Mode
151
New
142
Del
143
Edit
144
154
Mode: New Mode
150
Save
145
abc
123

FIG. 15

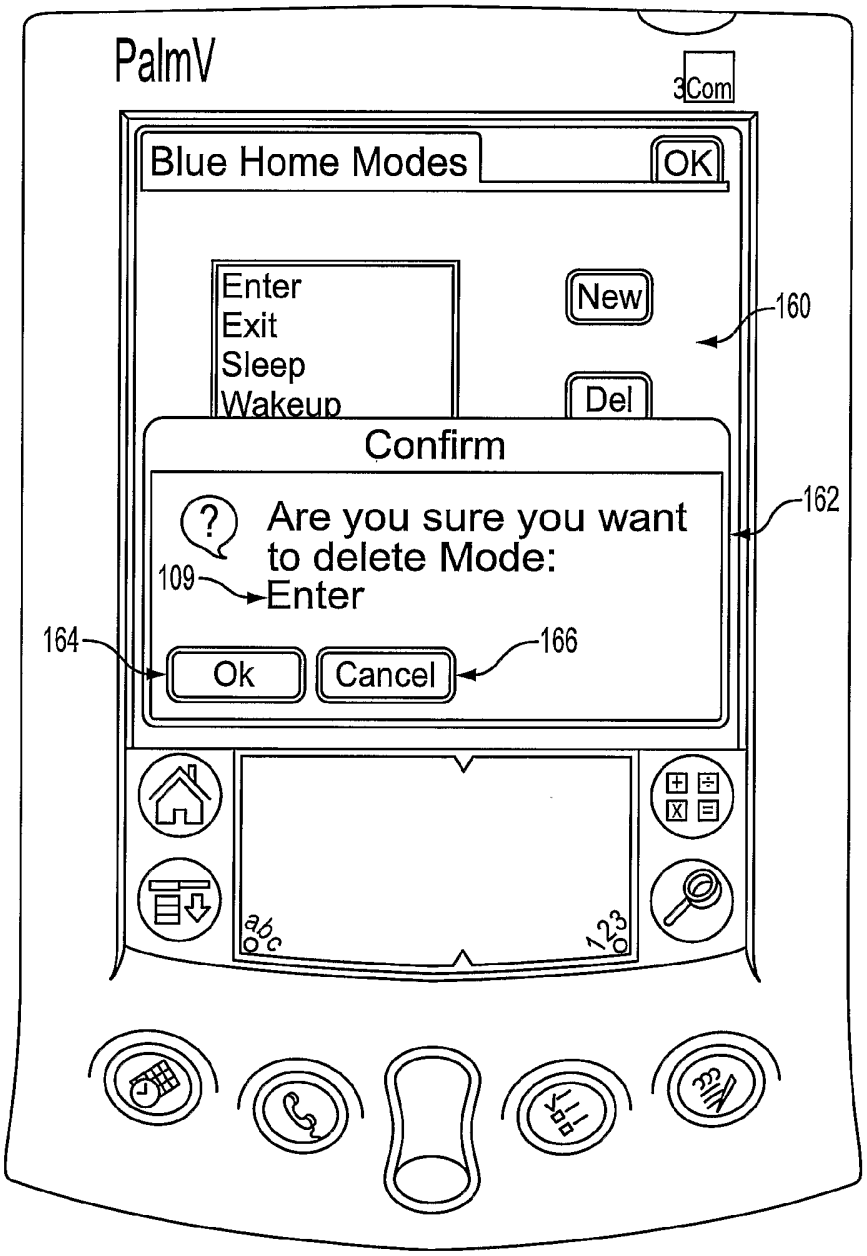
PalmV
3Com
Blue Home Modes
OK
Enter
Exit
Sleep
Wakeup
New
Del
160
Confirm
Are you sure you want to delete Mode:
Enter
109
162
164
Ok
Cancel
166
abc
123

FIG. 16

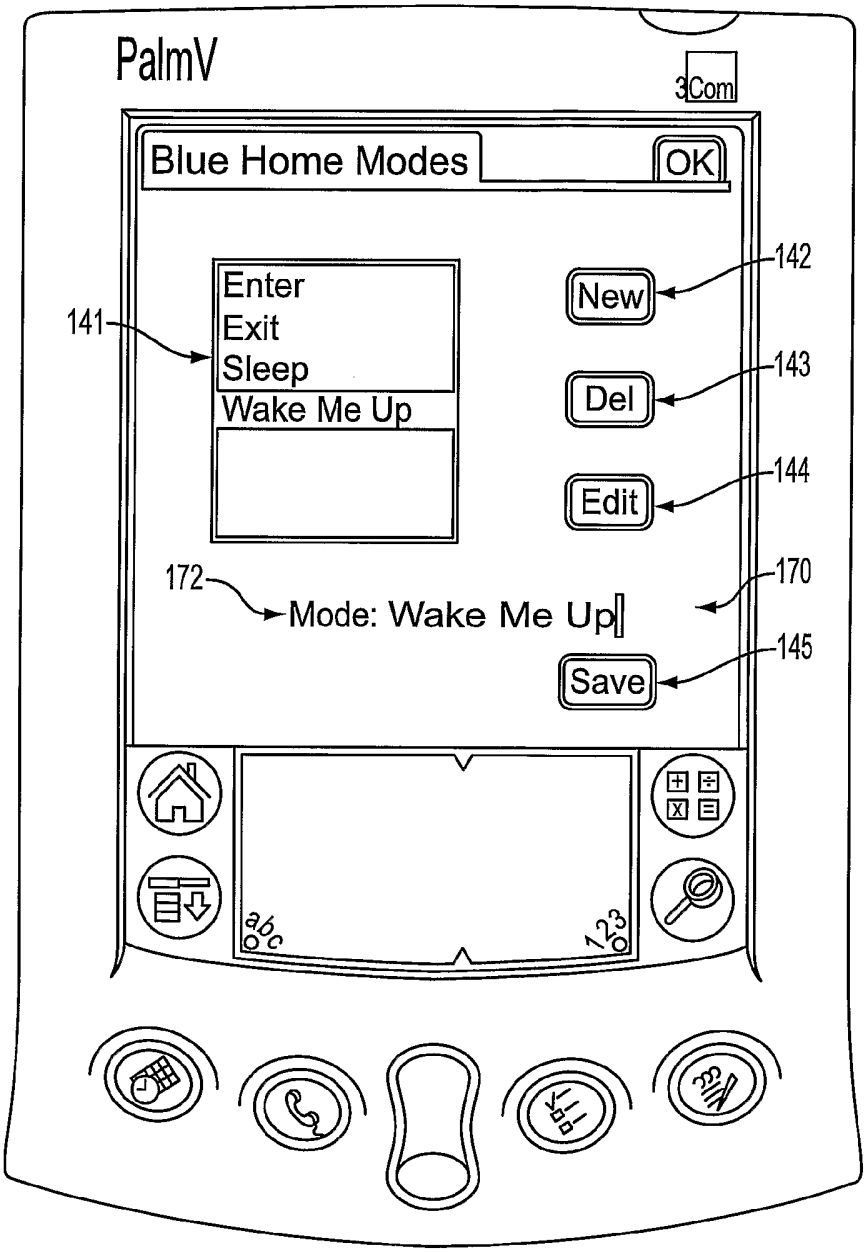
PalmV
3Com
Blue Home Modes
OK
Enter
Exit
Sleep
Wake Me Up
141
New
142
Del
143
Edit
144
172
Mode: Wake Me Up
170
Save
145
abc
123

FIG. 17

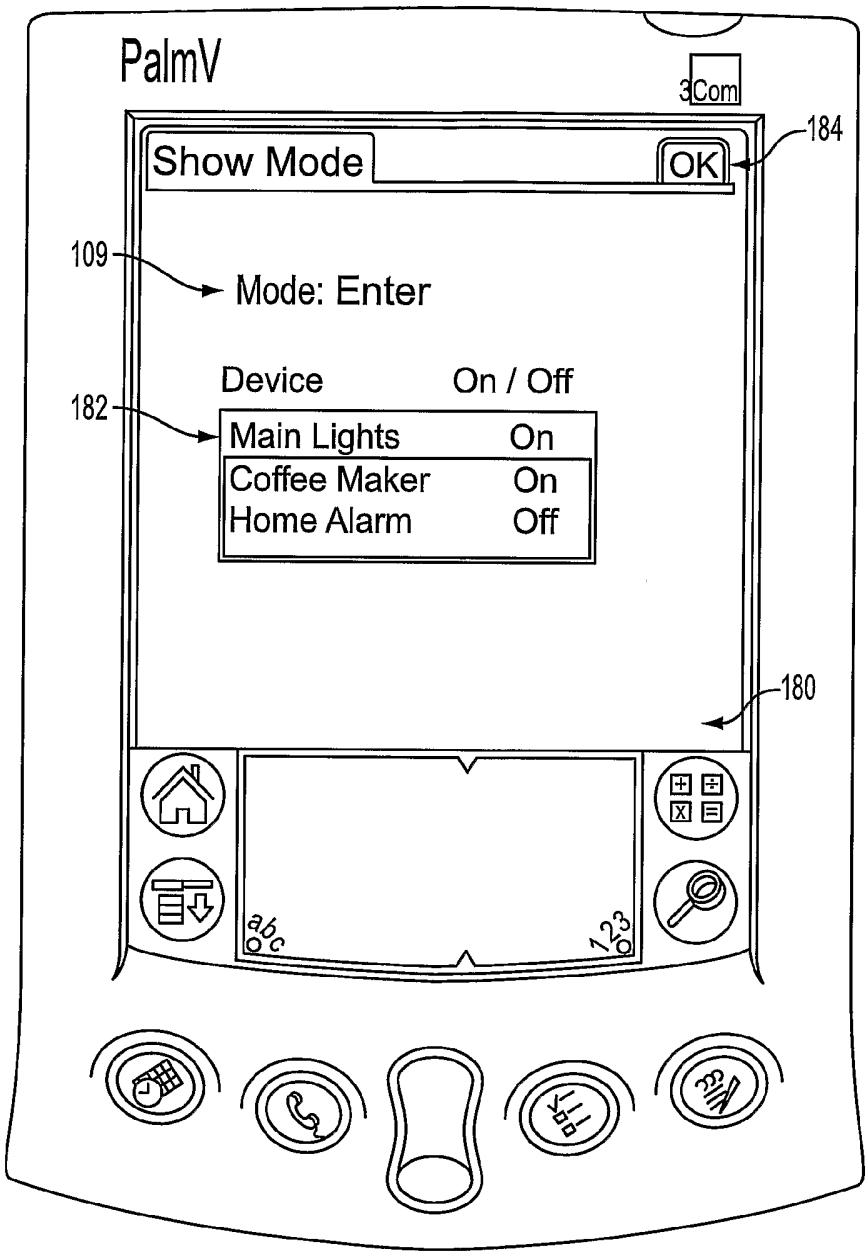
PalmV
3Com
Show Mode
OK
184
109
Mode: Enter
Device
On / Off
182
Main Lights
On
Coffee Maker
On
Home Alarm
Off
180
abc
123

FIG. 18

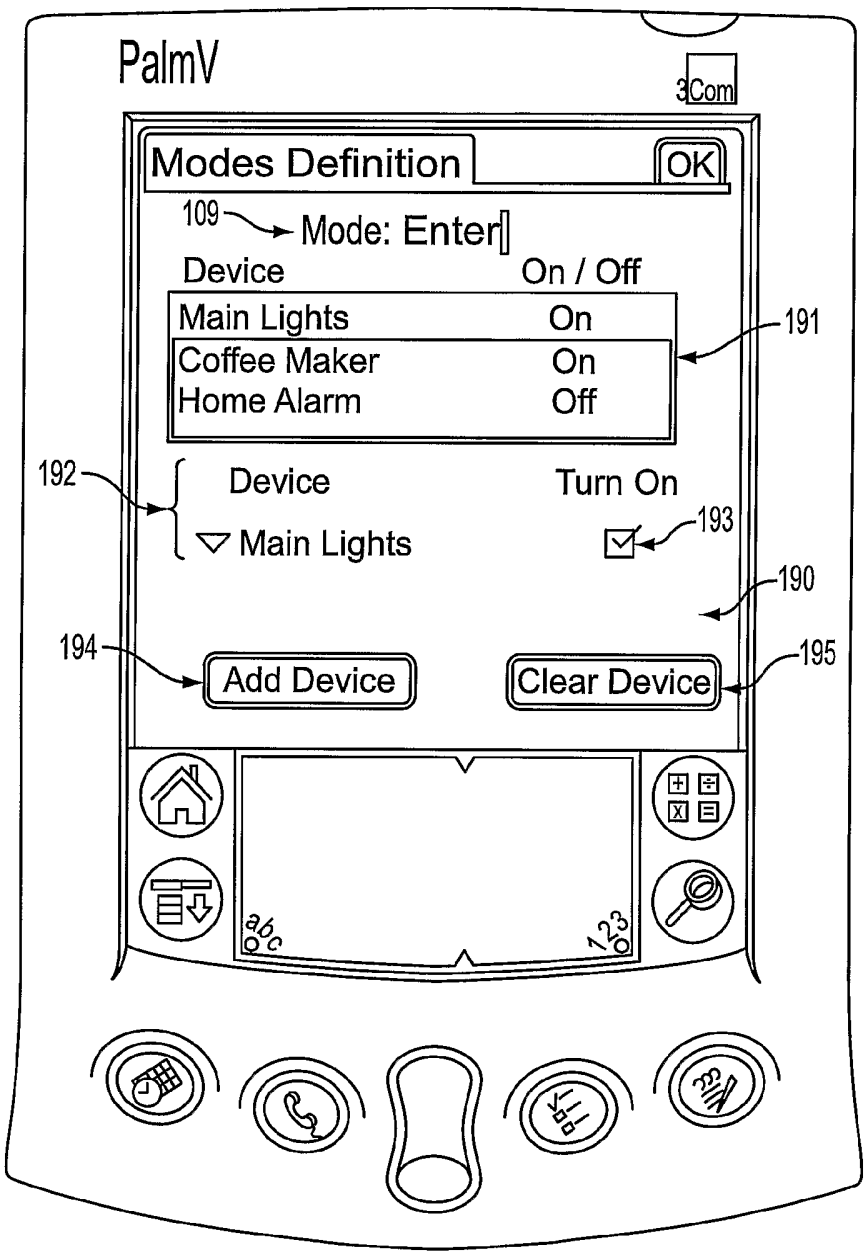
PalmV
3Com
Modes Definition
OK
109
Mode: Enter
Device
On / Off
Main Lights
On
Coffee Maker
On
Home Alarm
Off
191
192
Device
Turn On
Main Lights
193
190
194
Add Device
Clear Device
195
abc
123

FIG. 19

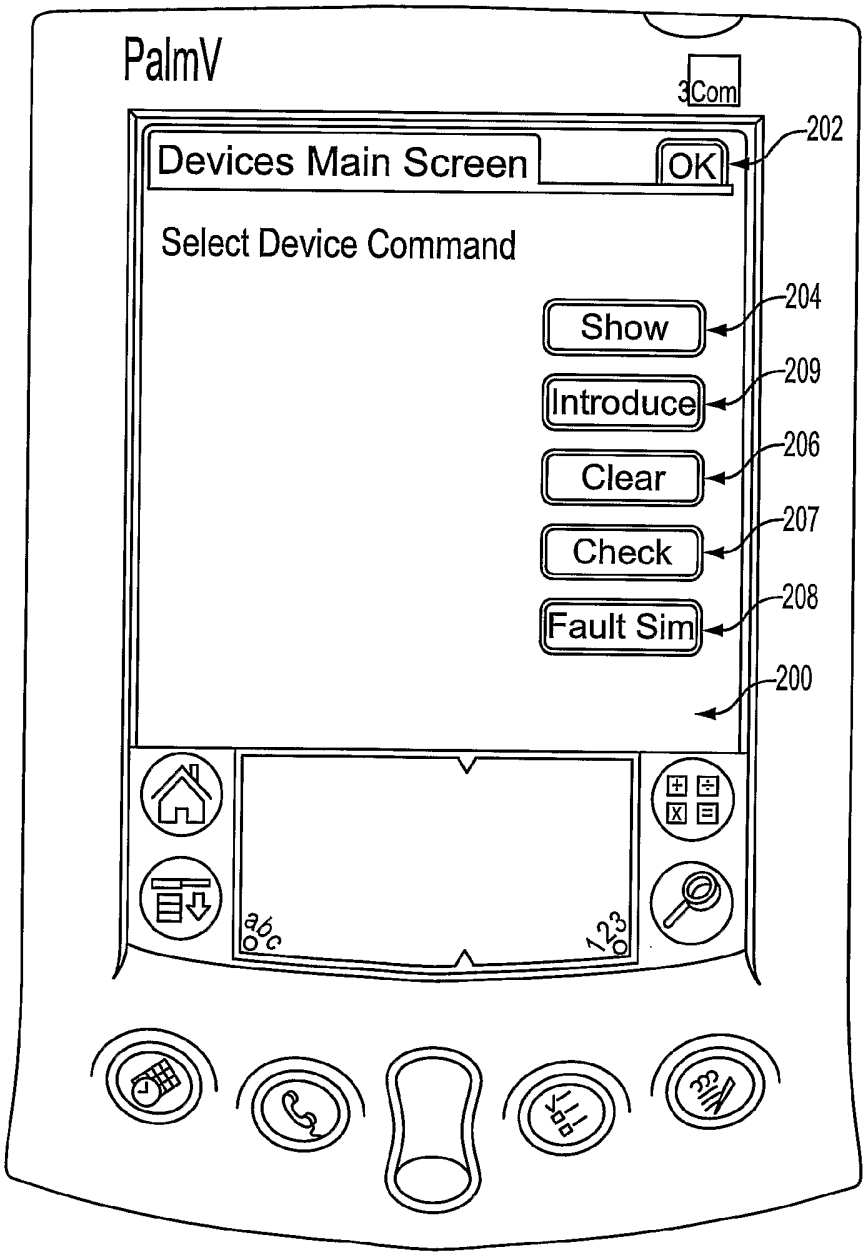
PalmV
3Com
Devices Main Screen
OK
202
Select Device Command
Show
204
Introduce
209
Clear
206
Check
207
Fault Sim
208
200
abc
123

FIG. 20

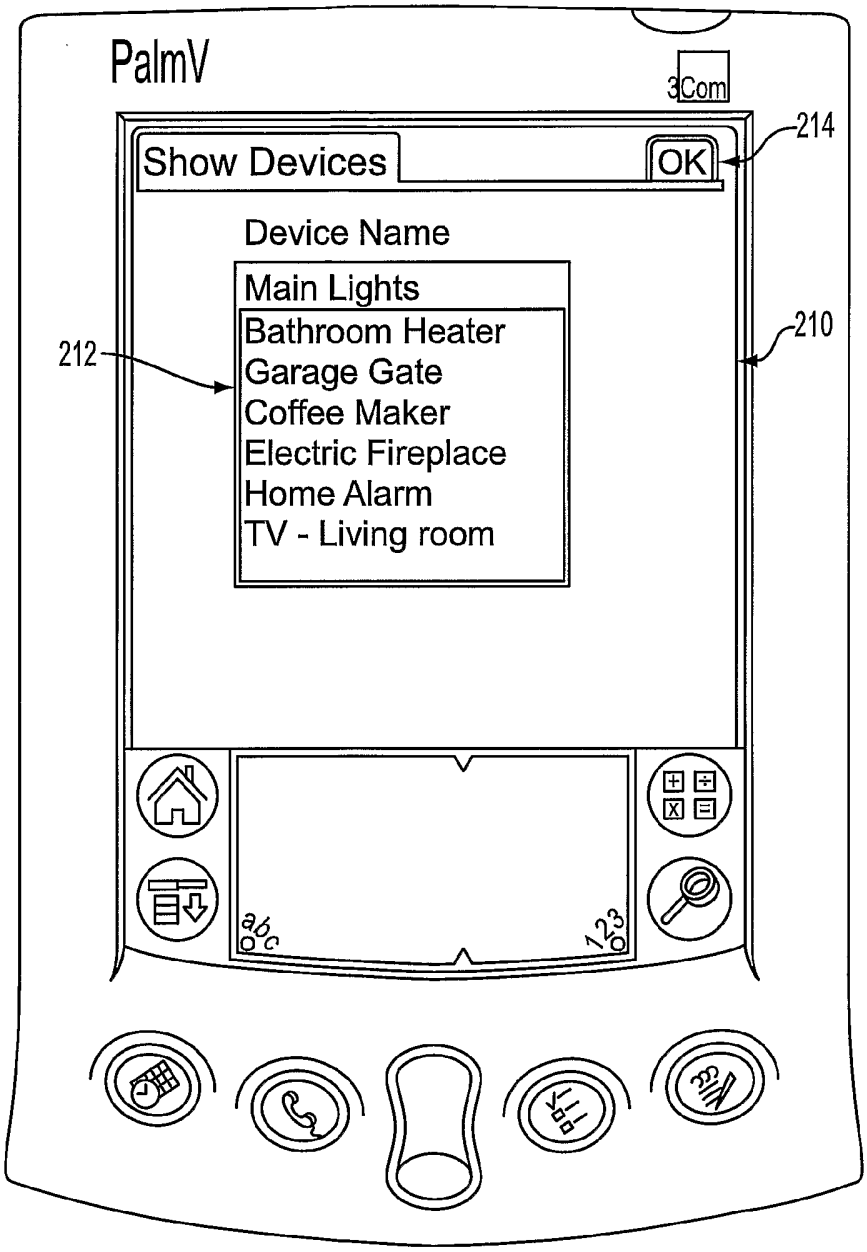
PalmV
3Com
Show Devices
OK
214
Device Name
Main Lights
Bathroom Heater
Garage Gate
Coffee Maker
Electric Fireplace
Home Alarm
TV - Living room
212
210
abc
123

FIG. 21

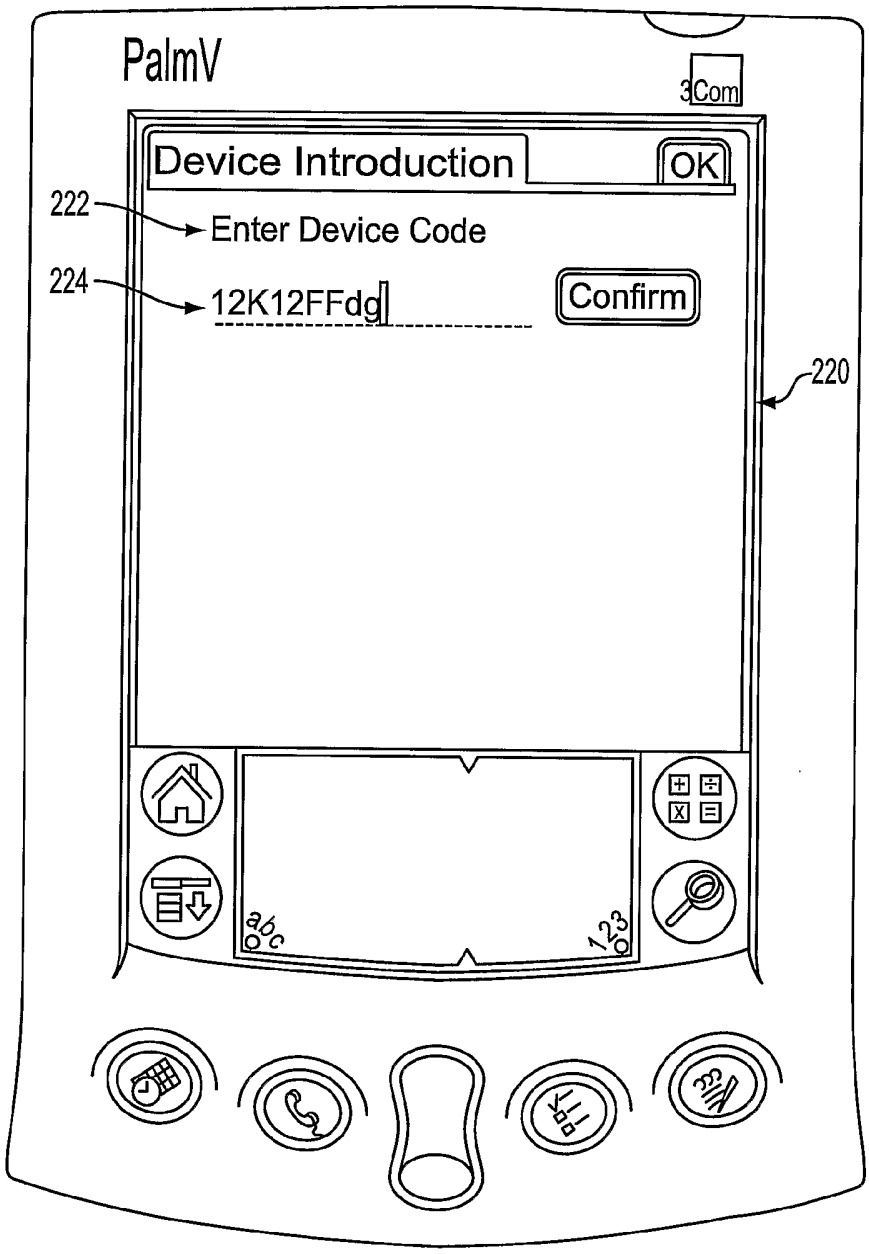
PalmV
3Com
Device Introduction
OK
222
Enter Device Code
224
12K12FFdg
Confirm
220
abc
123

FIG. 22

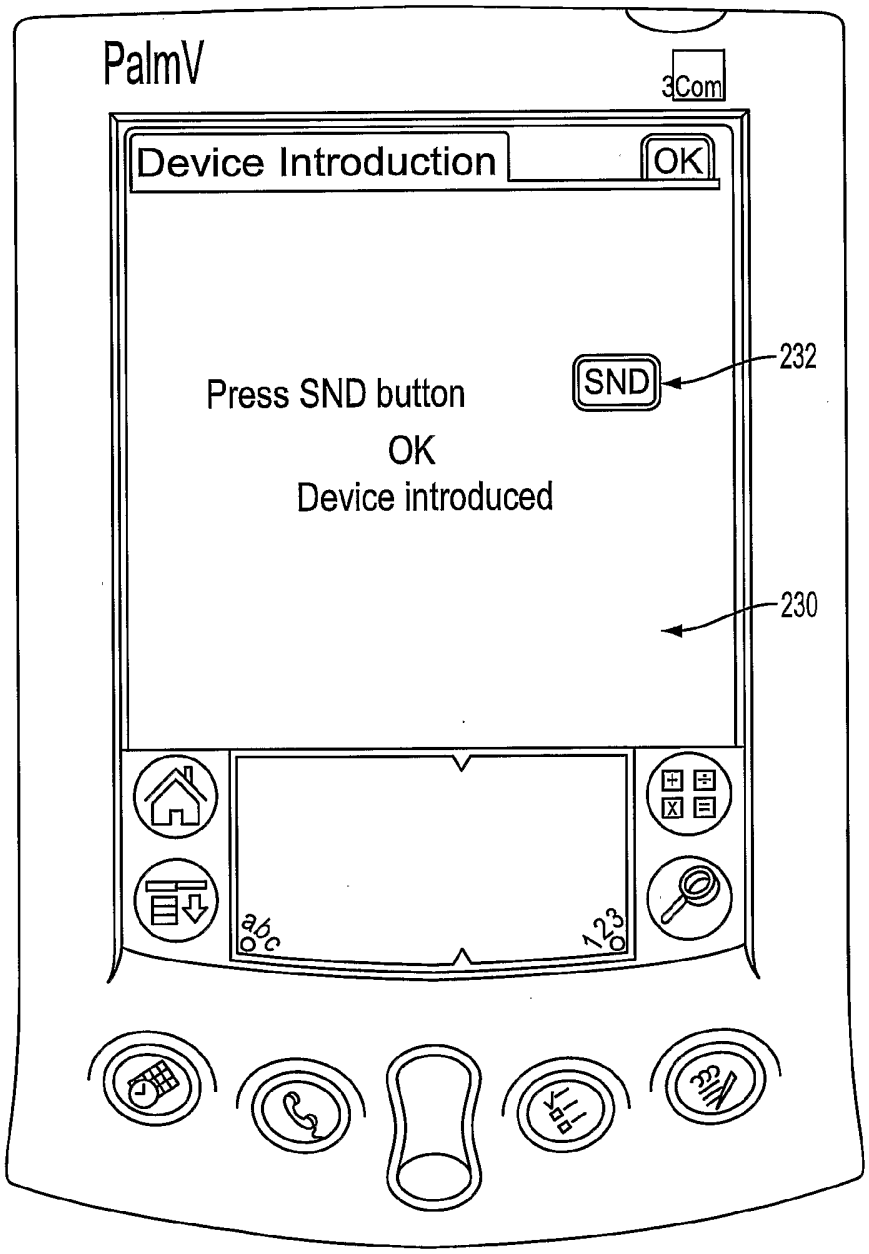
PalmV
3Com
Device Introduction
OK
Press SND button
SND
232
OK
Device introduced
230
abc
123

FIG. 23

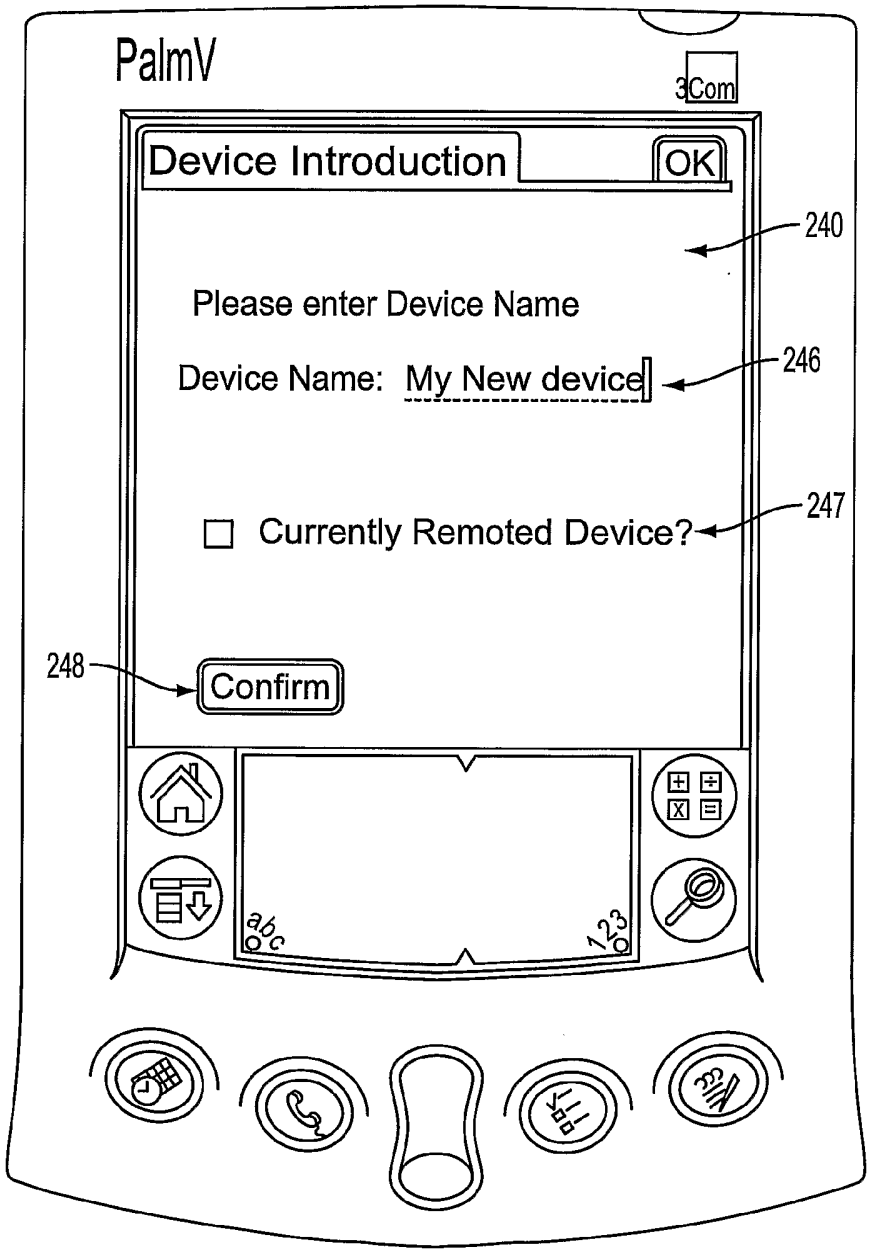
PalmV
3Com
Device Introduction
OK
240
Please enter Device Name
Device Name: My New device
246
Currently Remoted Device?
247
248
Confirm
abc
123

FIG. 24

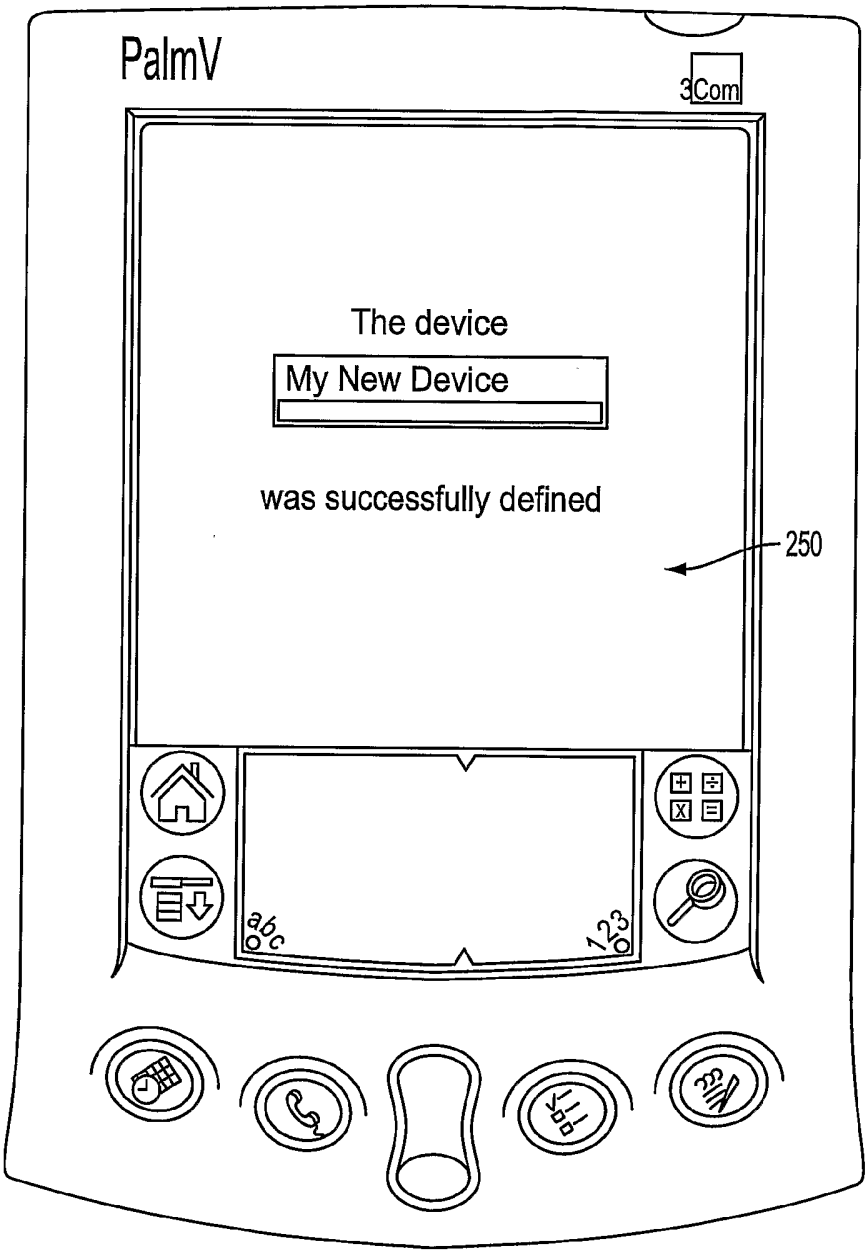
PalmV
3Com
The device
My New Device
was successfully defined
250
abc
123

FIG. 25

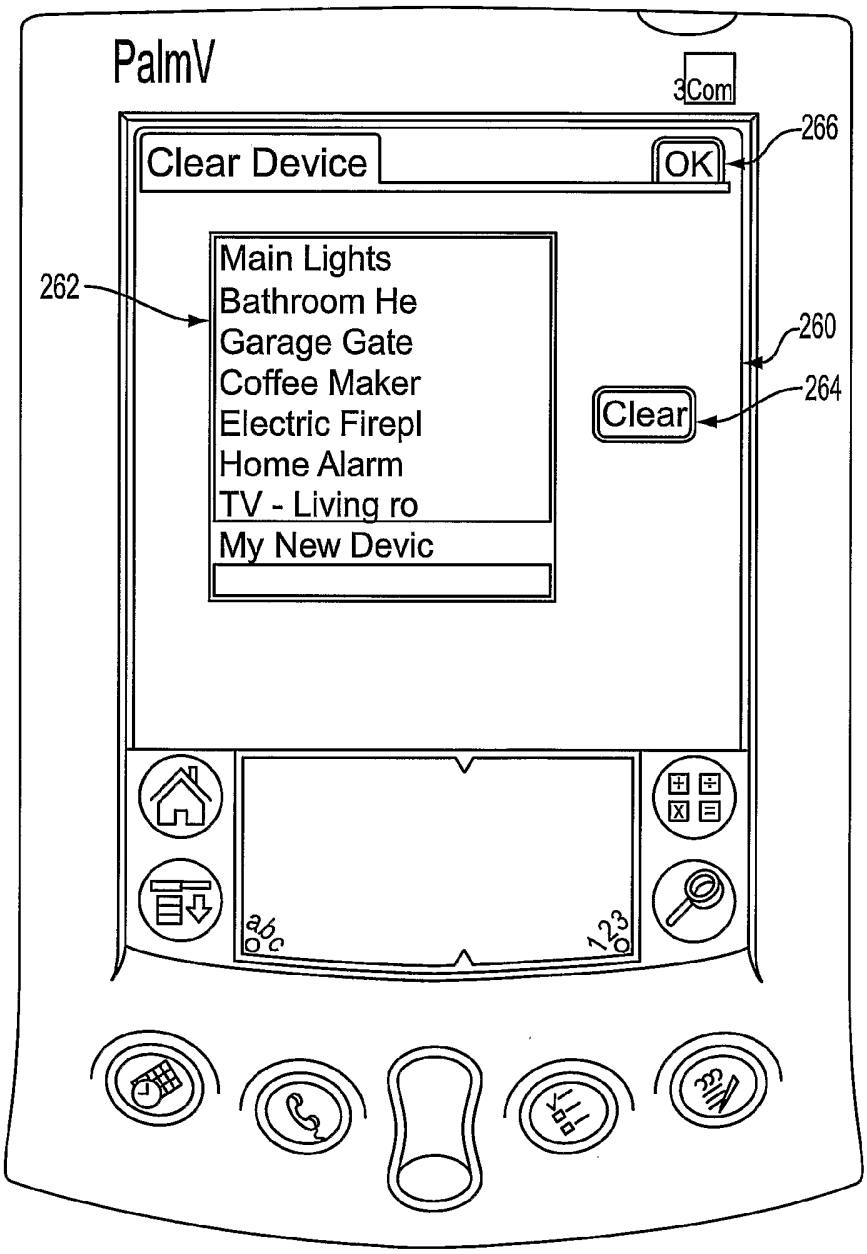
PalmV
3Com
Clear Device
OK
266
262
Main Lights
Bathroom He
Garage Gate
Coffee Maker
Electric Firepl
Home Alarm
TV - Living ro
My New Devic
260
Clear
264
abc
123

FIG. 26

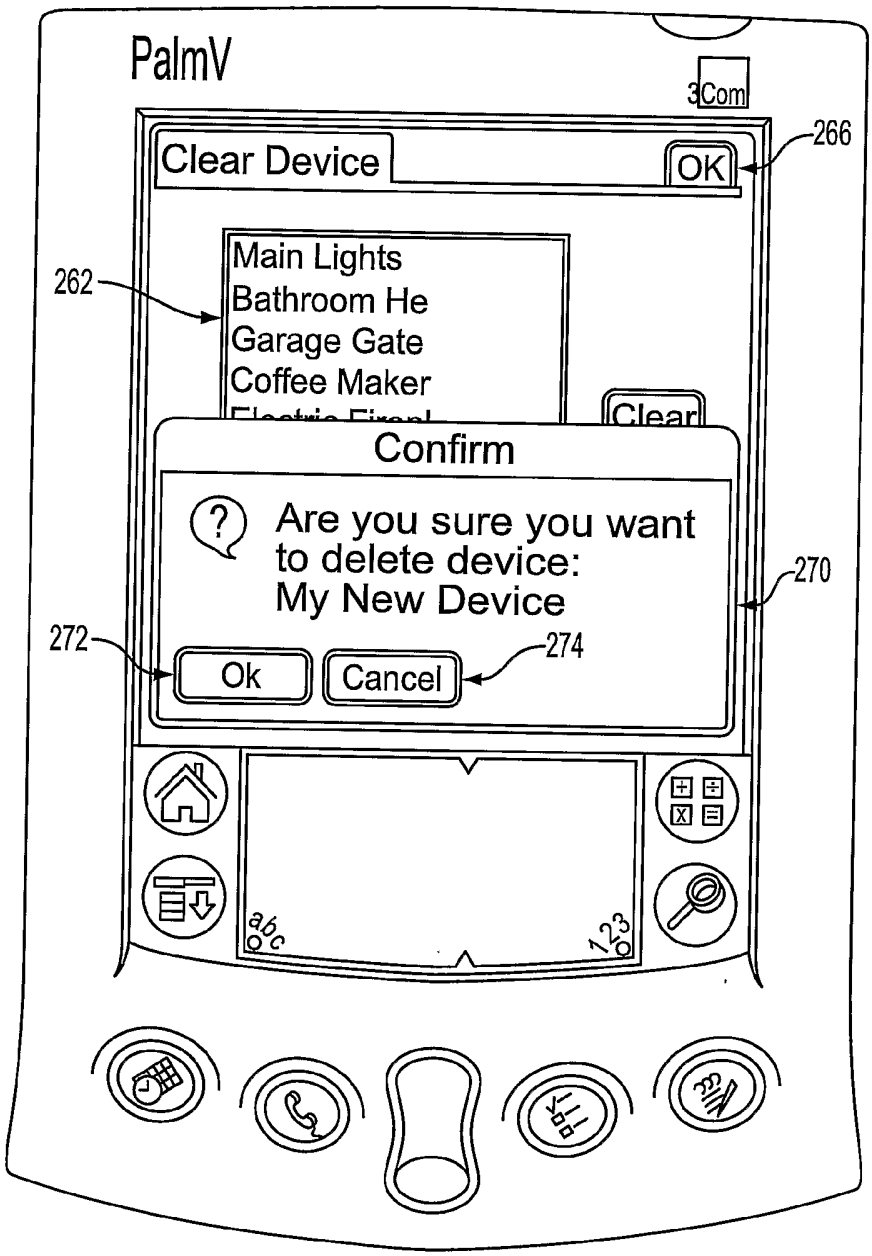
PalmV
3Com
Clear Device
OK
266
Main Lights
Bathroom He
Garage Gate
Coffee Maker
262
Clear
Confirm
Are you sure you want to delete device: My New Device
270
272
Ok
Cancel
274
abc
123

FIG. 27

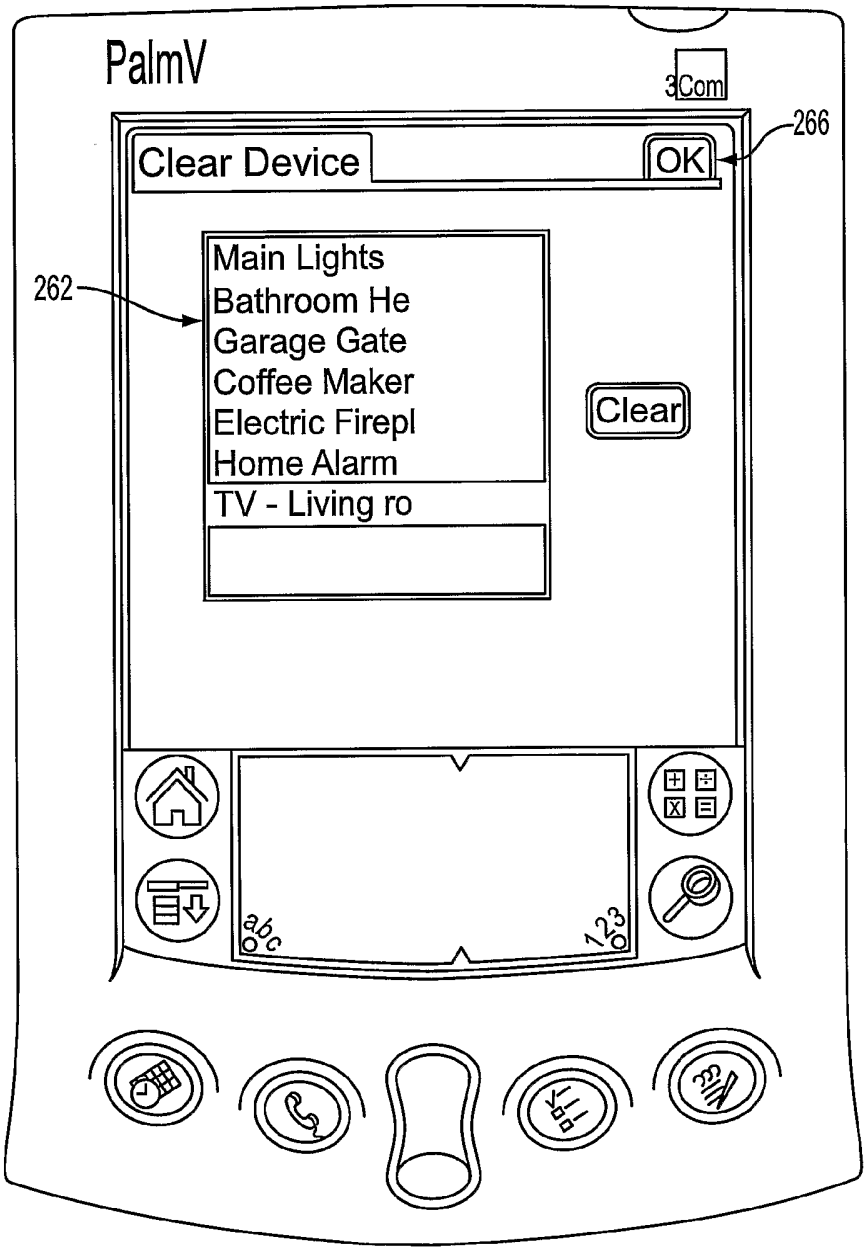
PalmV
3Com
Clear Device
OK
266
262
Main Lights
Bathroom He
Garage Gate
Coffee Maker
Electric Firepl
Home Alarm
TV - Living ro
Clear
abc
123

FIG. 28

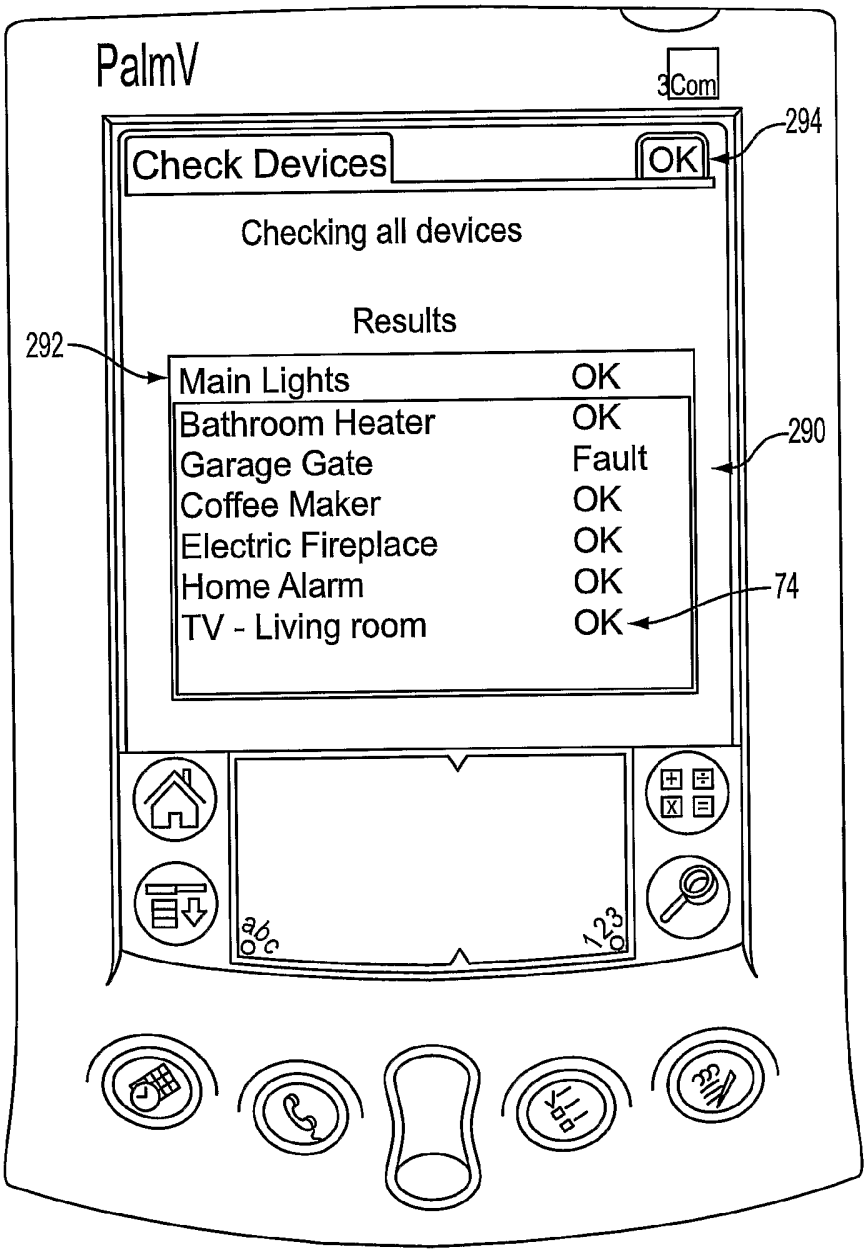
PalmV
3Com
Check Devices
OK
294
Checking all devices
Results
292
Main Lights OK
Bathroom Heater OK
Garage Gate Fault
Coffee Maker OK
Electric Fireplace OK
Home Alarm OK
TV - Living room OK
290
74
abc
123

FIG. 29

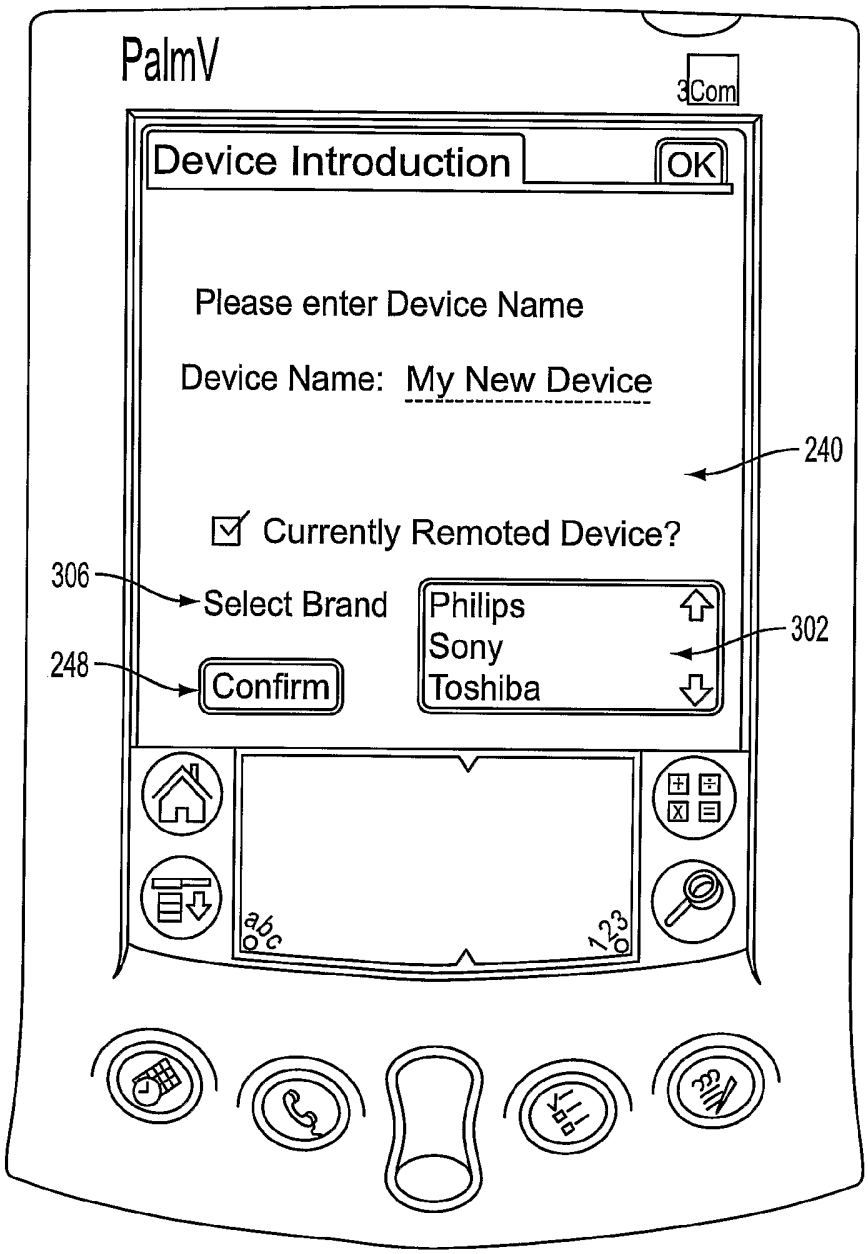
PalmV
3Com
Device Introduction
OK
Please enter Device Name
Device Name: My New Device
240
Currently Remoted Device?
306
Select Brand
Philips
Sony
Toshiba
302
248
Confirm
abc
123

FIG. 30

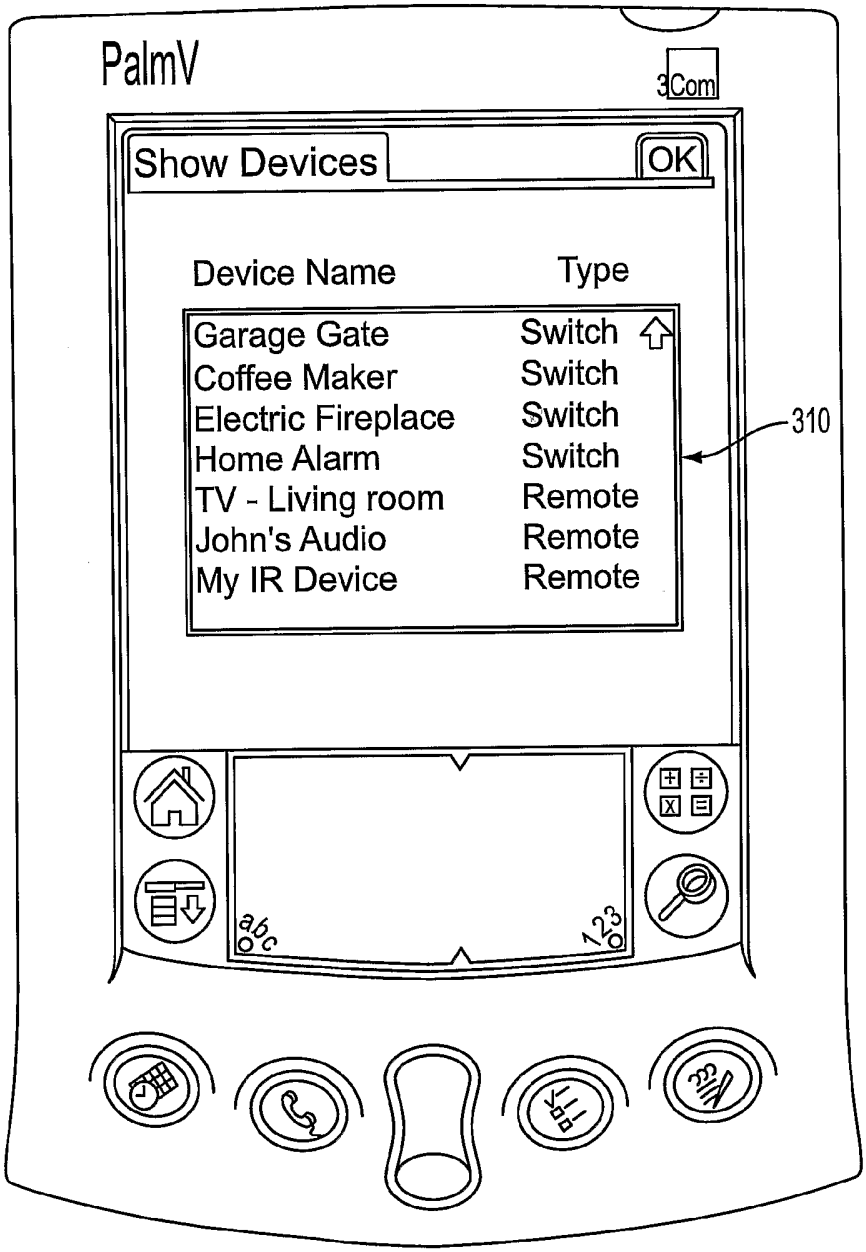
PalmV
3Com
Show Devices
OK
Device Name
Type
Garage Gate
Switch
Coffee Maker
Switch
Electric Fireplace
Switch
Home Alarm
Switch
TV - Living room
Remote
John's Audio
Remote
My IR Device
Remote
310
abc
123

FIG. 31

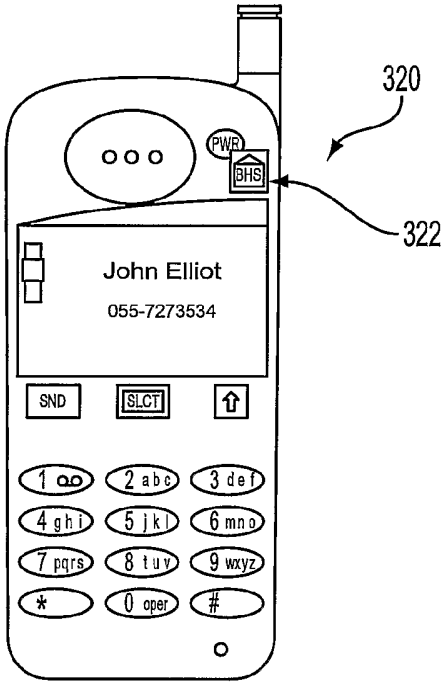
320
PWR
BHS
322
John Elliot
055-7273534
SND
SLCT
1 oo
2 abc
3 def
4 ghi
5 jkl
6 mno
7 pqrs
8 tuv
9 wxyz
*
0 oper
#

FIG. 32

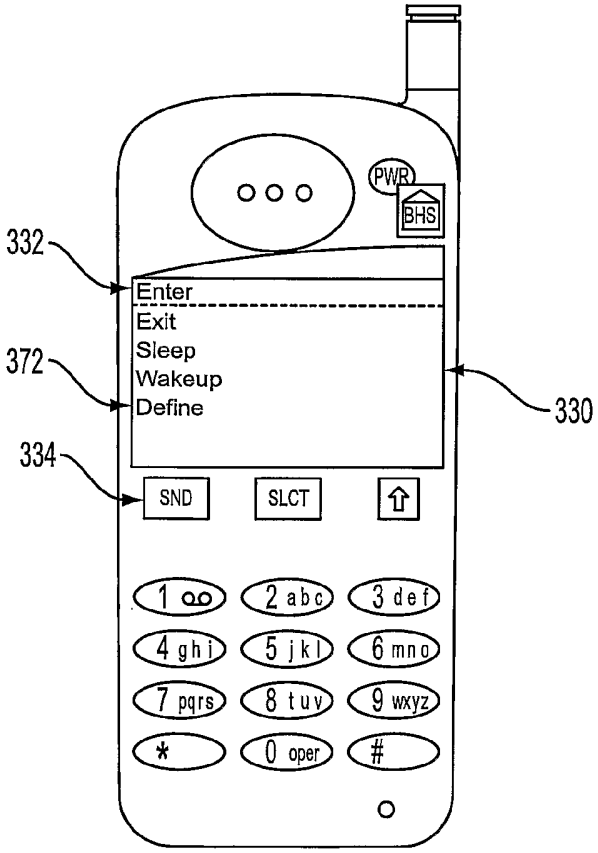
332
372
334
330
PWR
BHS
Enter
Exit
Sleep
Wakeup
Define
SND
SLCT
1 oo
2 abc
3 def
4 ghi
5 jkl
6 mno
7 pqrs
8 tuv
9 wxyz
*
0 oper
#

FIG. 33

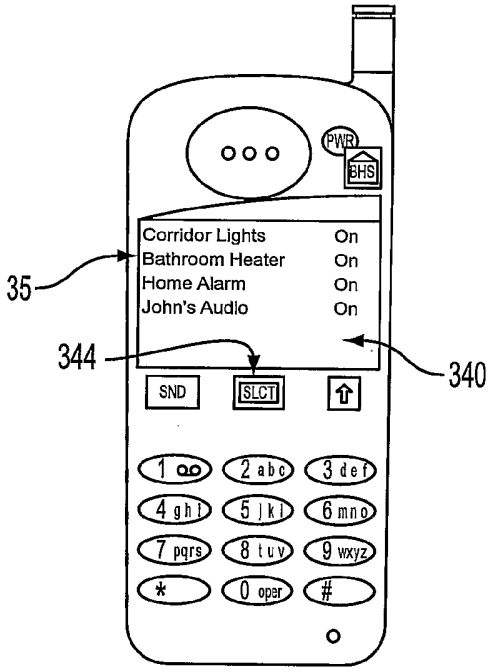
PWR
BHS
Corridor Lights On
Bathroom Heater On
Home Alarm On
John's Audio On
35
344
340
SND
SLCT
1 2 abc 3 def
4 ghi 5 jkl 6 mno
7 pqrs 8 tuv 9 wxyz
* 0 oper #

FIG. 34

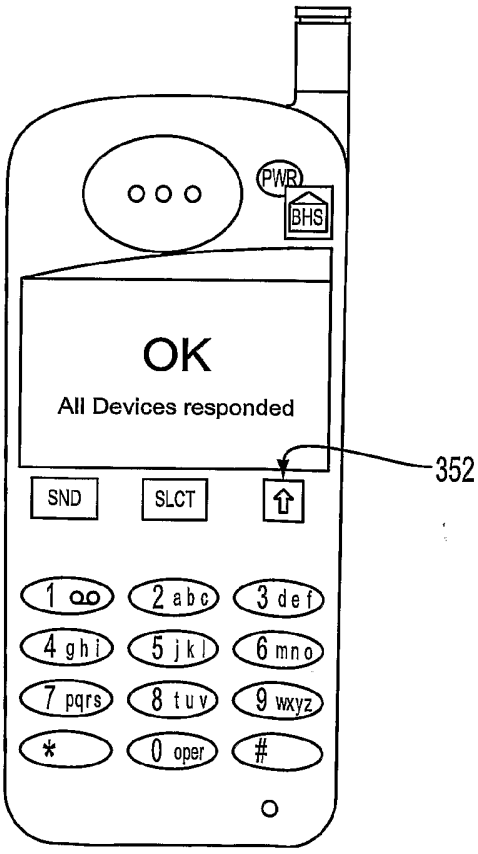
PWR
BHS
OK
All Devices responded
352
SND
SLCT
1 2 abc 3 def
4 ghi 5 jkl 6 mno
7 pqrs 8 tuv 9 wxyz
* 0 oper #

FIG. 35

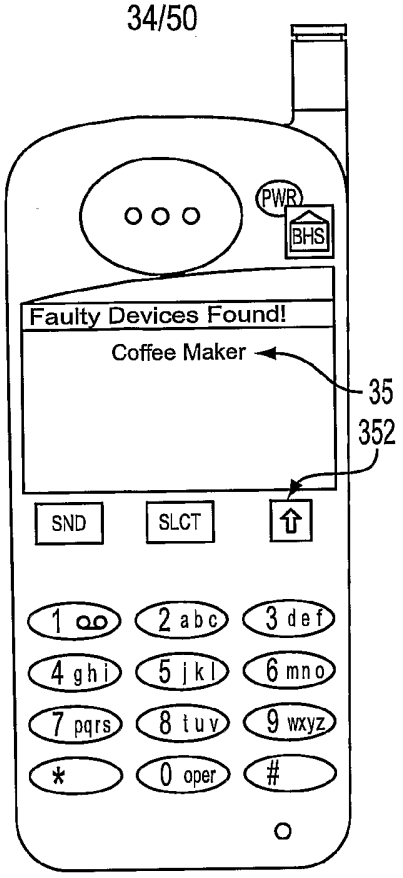
PWR
BHS
Faulty Devices Found!
Coffee Maker
35
352
SND
SLCT
1 oo
2 abc
3 def
4 ghi
5 jkl
6 mno
7 pqrs
8 tuv
9 wxyz
*
0 oper
#

FIG. 36

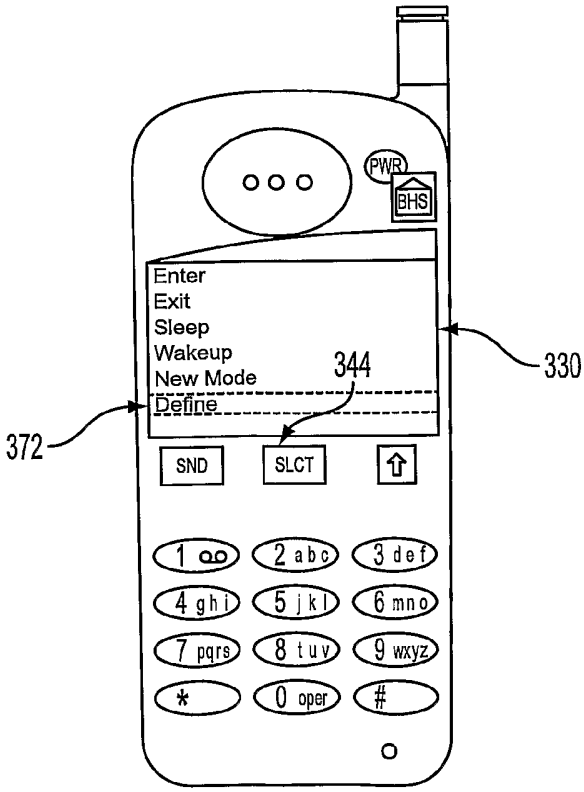
PWR
BHS
Enter
Exit
Sleep
Wakeup
New Mode
Define
344
330
372
SND
SLCT
1 oo
2 abc
3 def
4 ghi
5 jkl
6 mno
7 pqrs
8 tuv
9 wxyz
*
0 oper
#

FIG. 37

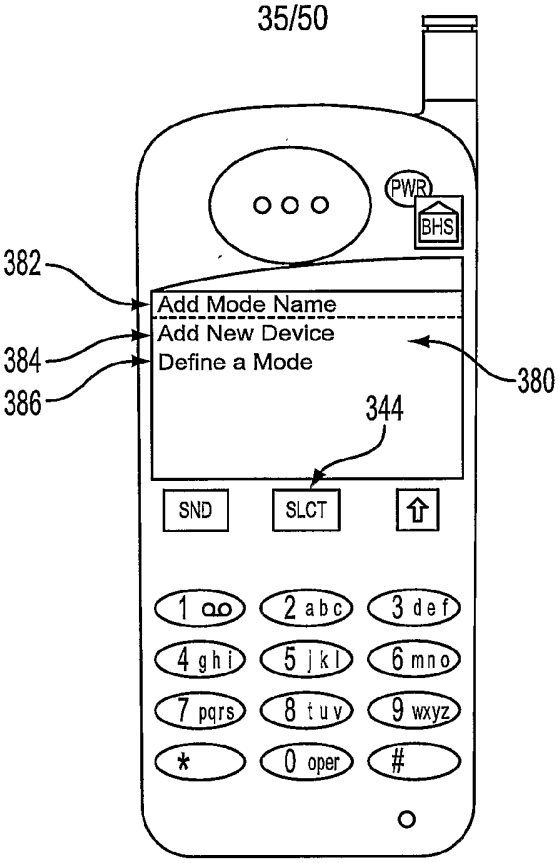
PWR
BHS
382
Add Mode Name
Add New Device
384
Define a Mode
386
380
344
SND
SLCT
1 oo
2 abc
3 def
4 ghi
5 jkl
6 mno
7 pqrs
8 tuv
9 wxyz
*
0 oper
#

FIG. 38

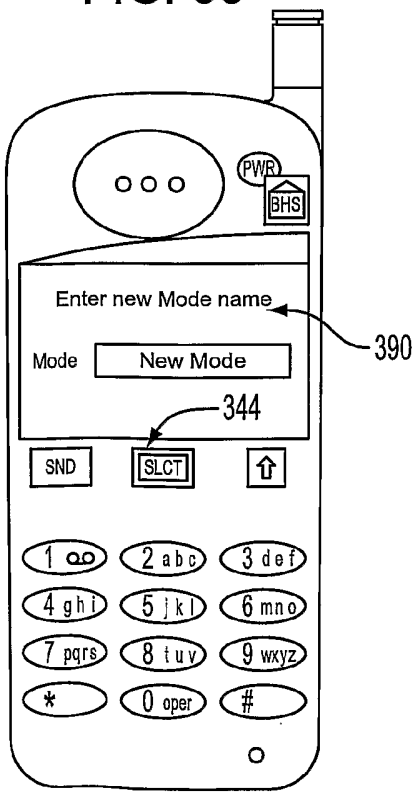
PWR
BHS
Enter new Mode name
390
Mode
New Mode
344
SND
SLCT
1 oo
2 abc
3 def
4 ghi
5 jkl
6 mno
7 pqrs
8 tuv
9 wxyz
*
0 oper
#

FIG. 39

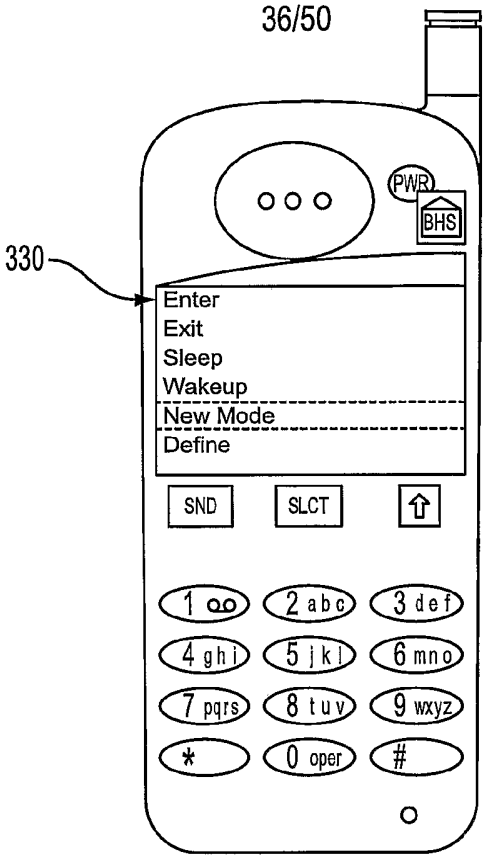
330
PWR
BHS
Enter
Exit
Sleep
Wakeup
New Mode
Define
SND
SLCT
1 oo
2 abc
3 def
4 ghi
5 jkl
6 mno
7 pqrs
8 tuv
9 wxyz
*
0 oper
#

FIG. 40

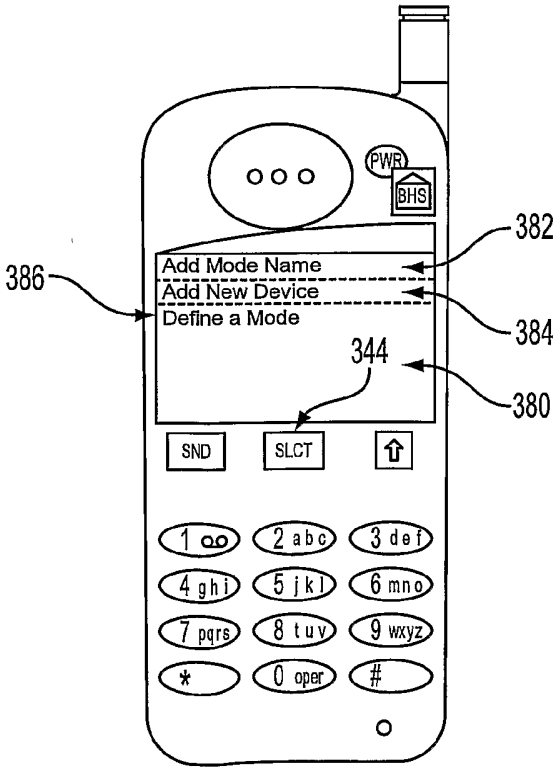
386
382
384
344
380
PWR
BHS
Add Mode Name
Add New Device
Define a Mode
SND
SLCT
1 oo
2 abc
3 def
4 ghi
5 jkl
6 mno
7 pqrs
8 tuv
9 wxyz
*
0 oper
#

FIG. 41

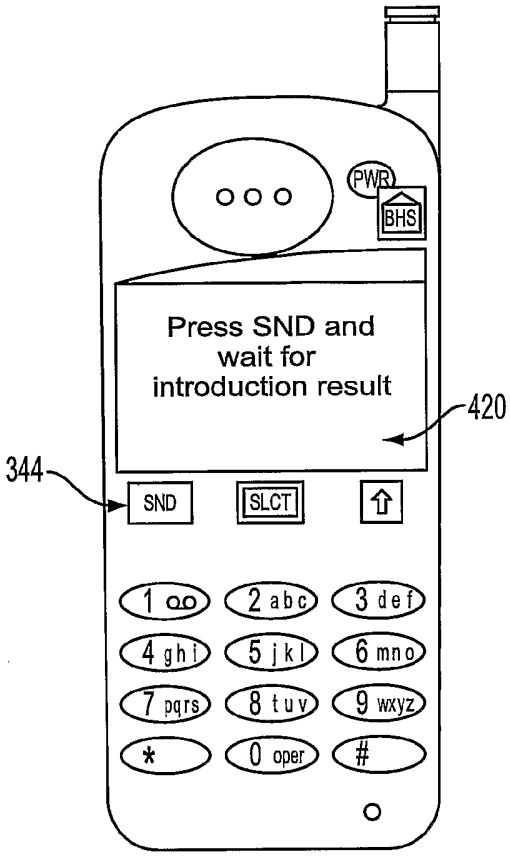
PWR
BHS
Press SND and wait for introduction result
420
344
SND
SLCT
1 oo
2 abc
3 def
4 ghi
5 jkl
6 mno
7 pqrs
8 tuv
9 wxyz
*
0 oper
#

FIG. 42

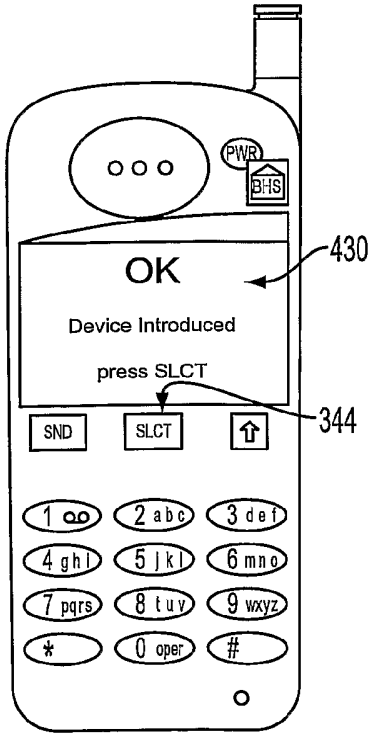
PWR
BHS
OK
Device Introduced
press SLCT
430
344
SND
SLCT
1 oo
2 abc
3 def
4 ghi
5 jkl
6 mno
7 pqrs
8 tuv
9 wxyz
*
0 oper
#

FIG. 43

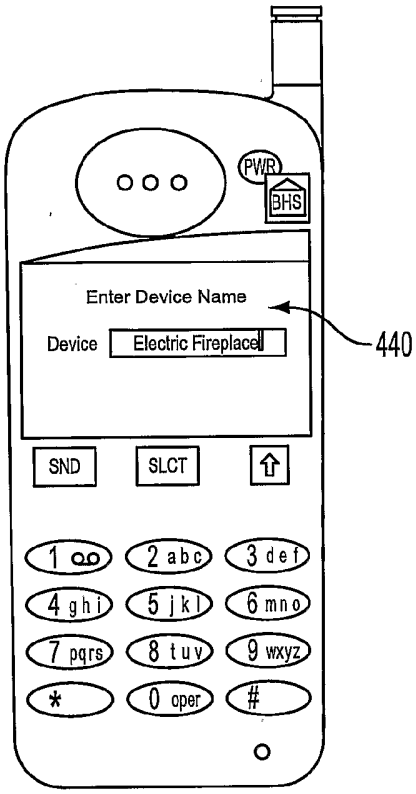
PWR
BHS
Enter Device Name
Device
Electric Fireplace
440
SND
SLCT
1 oo
2 abc
3 def
4 ghi
5 jkl
6 mno
7 pqrs
8 tuv
9 wxyz
*
0 oper
#

FIG. 44

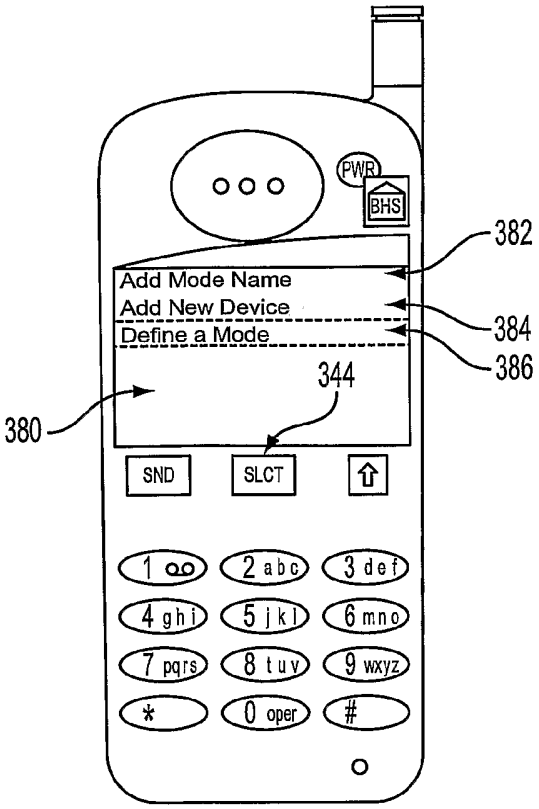
PWR
BHS
382
Add Mode Name
Add New Device
384
Define a Mode
386
344
380
SND
SLCT
1 oo
2 abc
3 def
4 ghi
5 jkl
6 mno
7 pqrs
8 tuv
9 wxyz
*
0 oper
#

FIG. 45

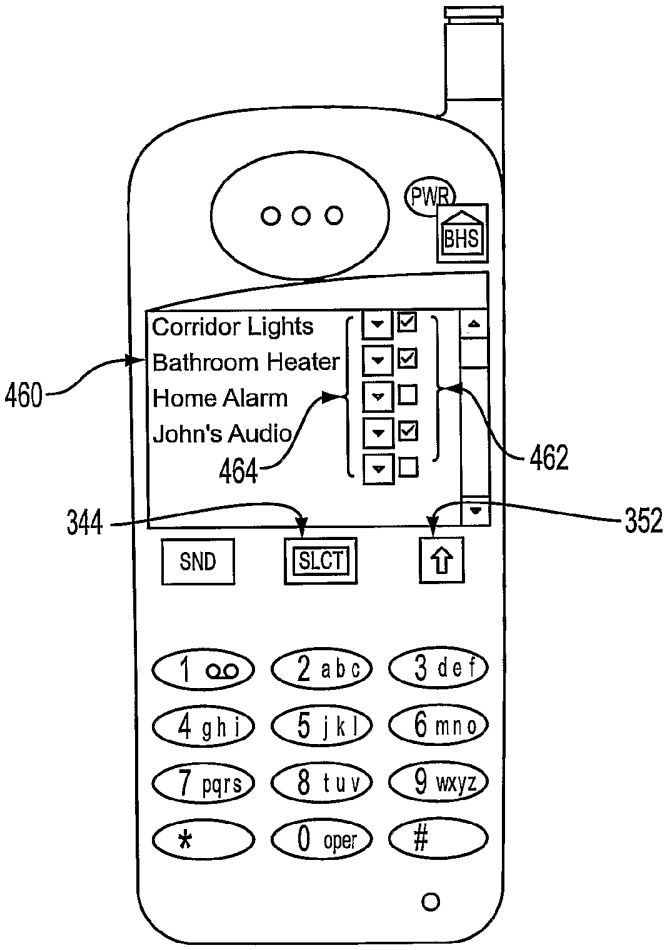
PWR
BHS
Corridor Lights
Bathroom Heater
Home Alarm
John's Audio
460
464
462
344
352
SND
SLCT
1 oo
2 abc
3 def
4 ghi
5 jkl
6 mno
7 pqrs
8 tuv
9 wxyz
*
0 oper
#

FIG. 46

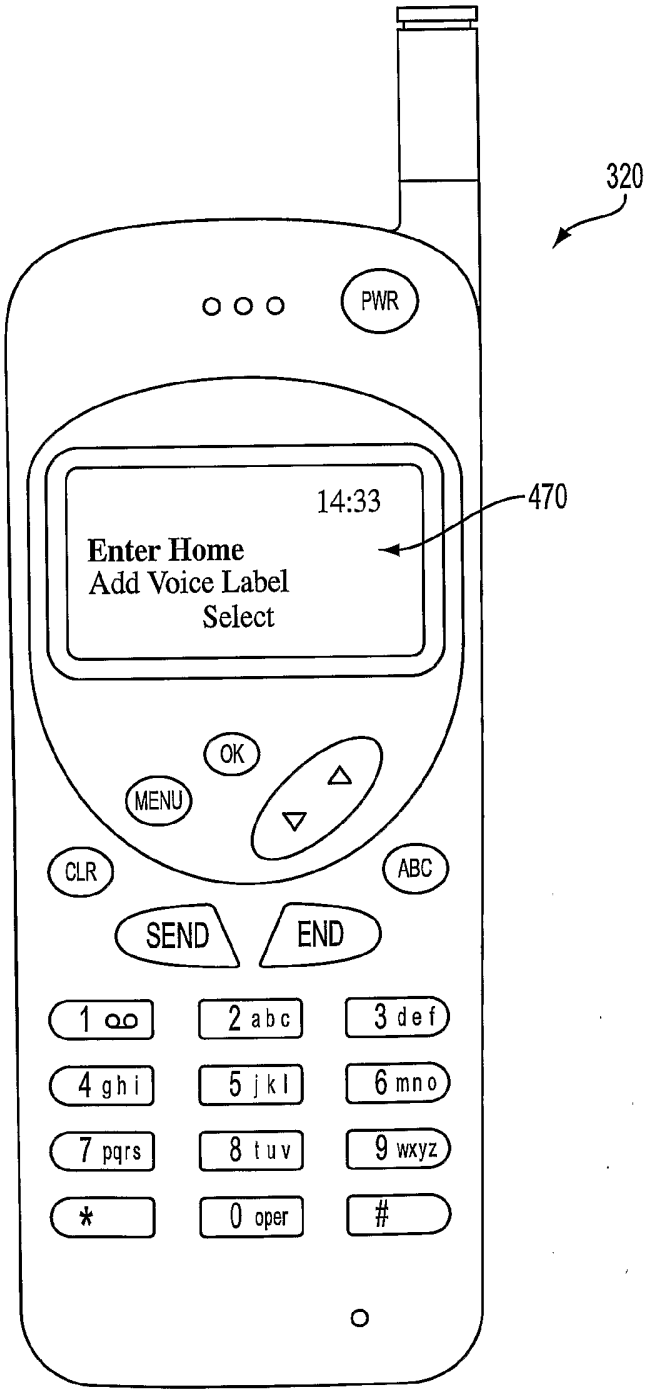
320
PWR
14:33
Enter Home
Add Voice Label
Select
470
OK
MENU
CLR
ABC
SEND
END
1 oo
2 abc
3 def
4 ghi
5 jkl
6 mno
7 pqrs
8 tuv
9 wxyz
*
0 oper
#

FIG. 47

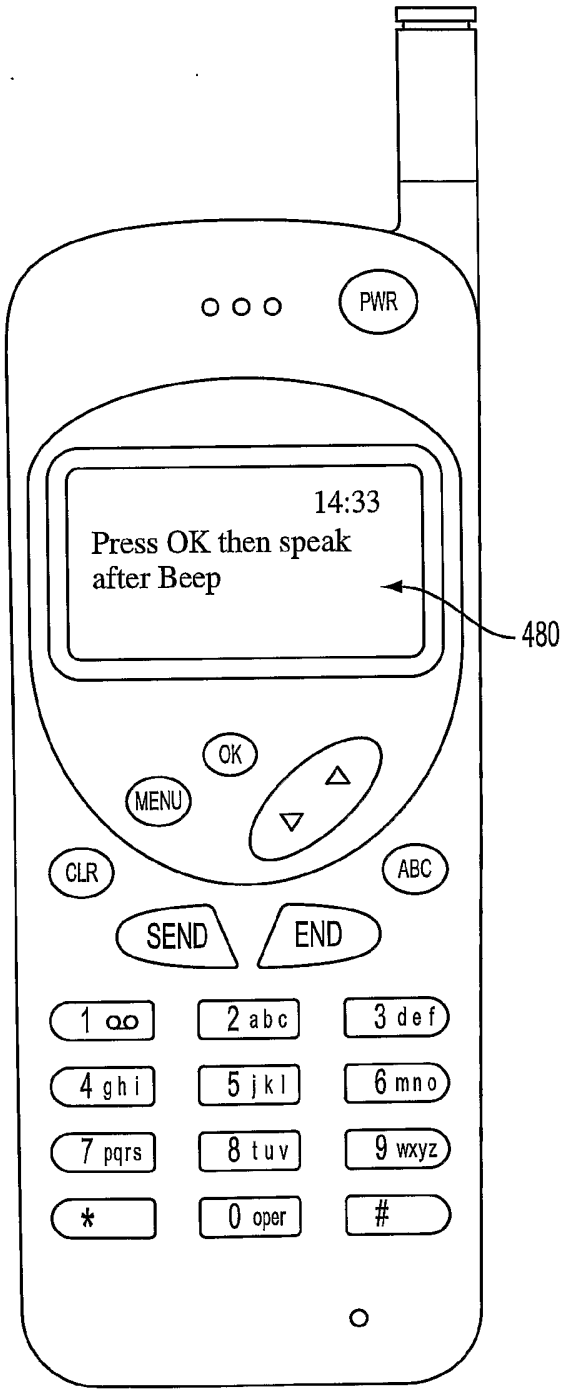
PWR
14:33
Press OK then speak
after Beep
480
OK
MENU
CLR
ABC
SEND
END
1 oo
2 abc
3 def
4 ghi
5 jkl
6 mno
7 pqrs
8 tuv
9 wxyz
*
0 oper
#

FIG. 48

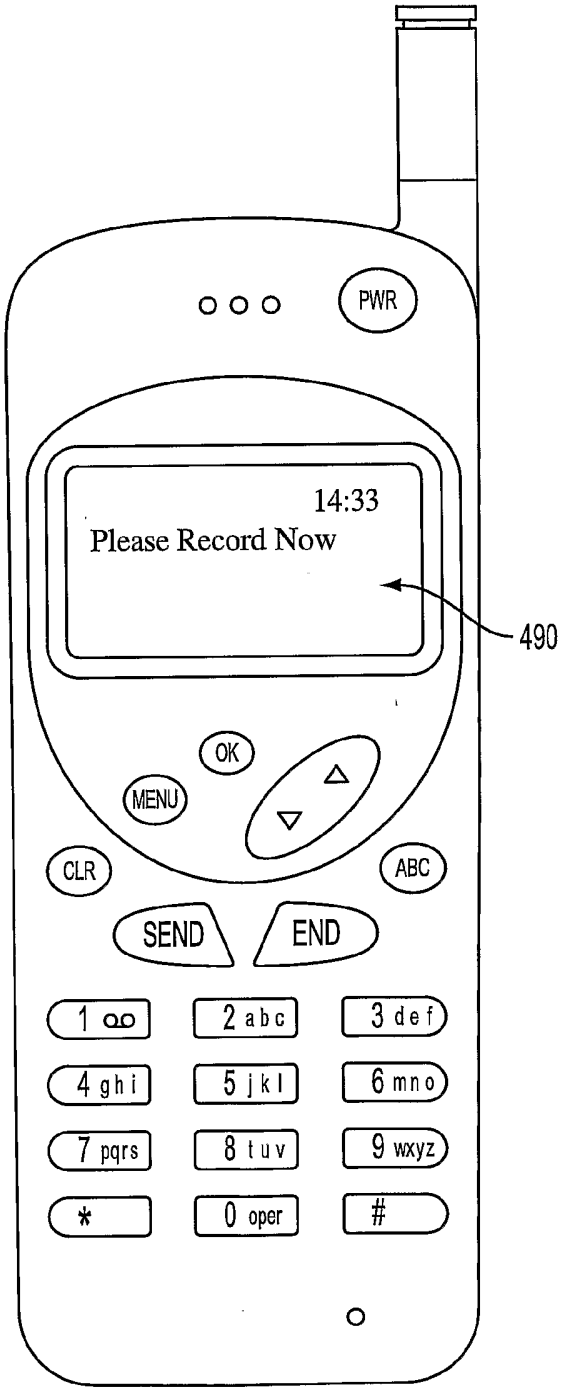
PWR
14:33
Please Record Now
490
OK
MENU
CLR
ABC
SEND
END
1
2 abc
3 def
4 ghi
5 jkl
6 mno
7 pqrs
8 tuv
9 wxyz
*
0 oper
#

FIG. 49

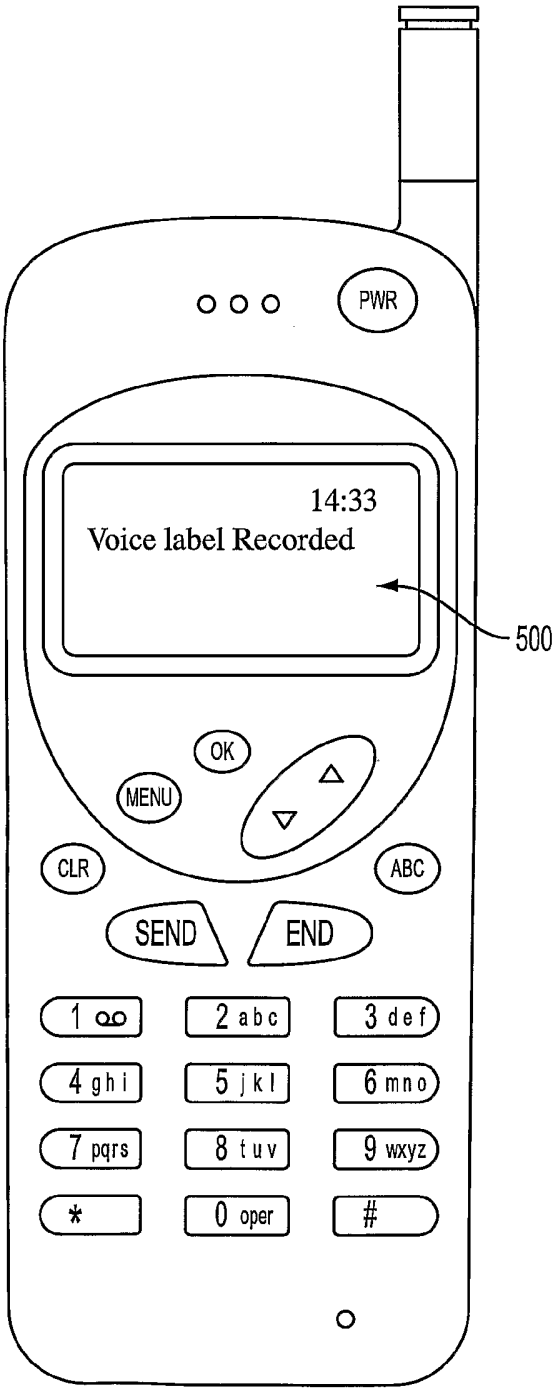
PWR
14:33
Voice label Recorded
500
OK
MENU
CLR
ABC
SEND
END
1 oo
2 abc
3 def
4 ghi
5 jkl
6 mno
7 pqrs
8 tuv
9 wxyz
*
0 oper
#

FIG. 50

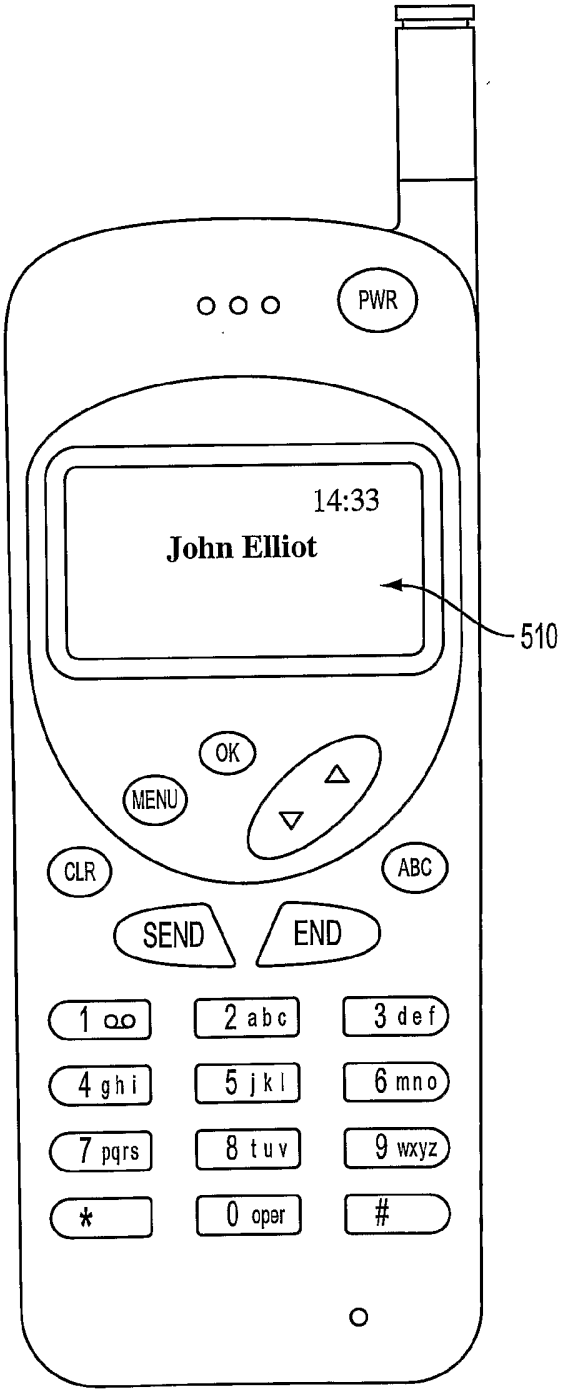
PWR
14:33
John Elliot
510
OK
MENU
CLR
ABC
SEND
END
1 oo
2 abc
3 def
4 ghi
5 jkl
6 mno
7 pqrs
8 tuv
9 wxyz
*
0 oper
#

FIG. 51

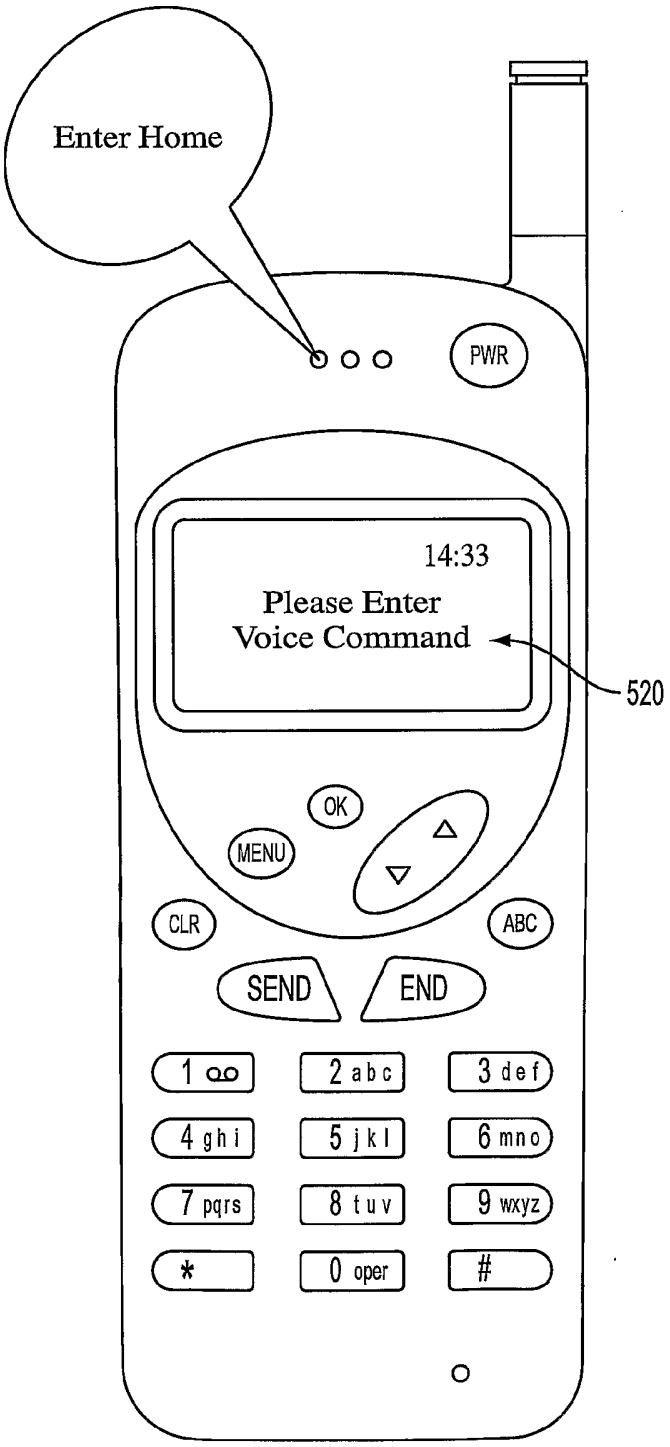
Enter Home
PWR
14:33
Please Enter
Voice Command
520
OK
MENU
CLR
ABC
SEND
END
1 oo
2 abc
3 def
4 ghi
5 jkl
6 mno
7 pqrs
8 tuv
9 wxyz
*
0 oper
#

FIG. 52

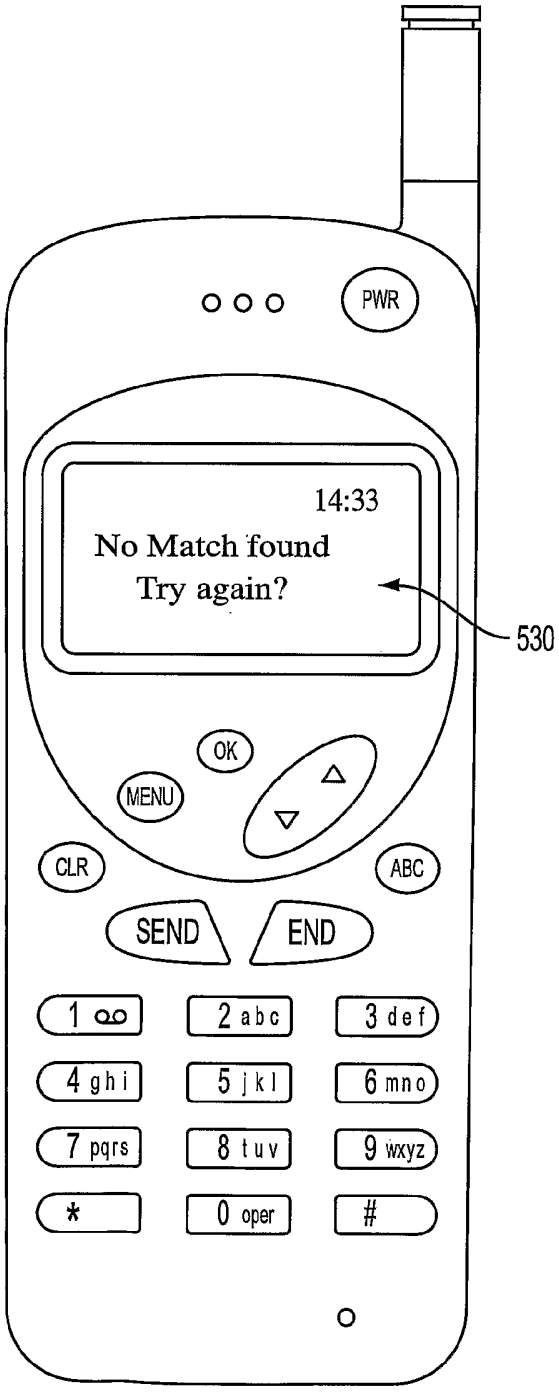
PWR
14:33
No Match found
Try again?
530
OK
MENU
CLR
ABC
SEND
END
1 oo
2 abc
3 def
4 ghi
5 jkl
6 mno
7 pqrs
8 tuv
9 wxyz
*
0 oper
#

FIG. 53

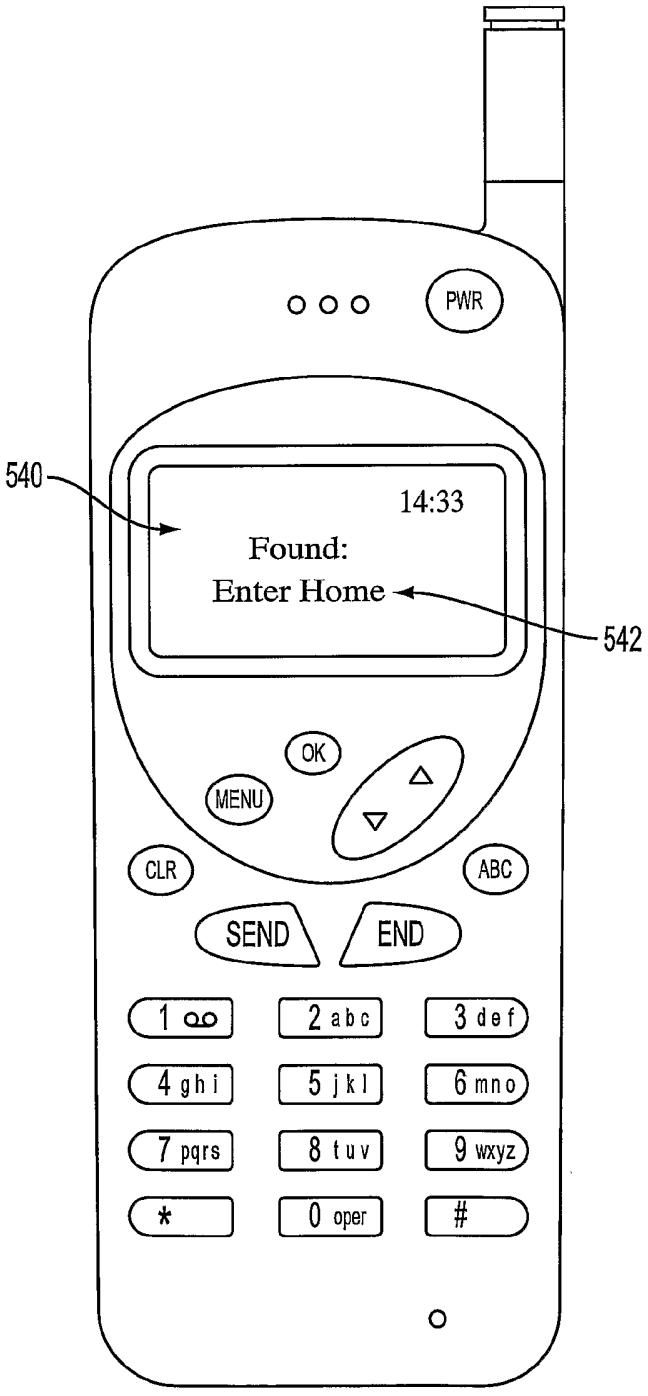
PWR
540
14:33
Found:
Enter Home
542
OK
MENU
CLR
ABC
SEND
END
1
2 abc
3 def
4 ghi
5 jkl
6 mno
7 pqrs
8 tuv
9 wxyz
*
0 oper
#

FIG. 54

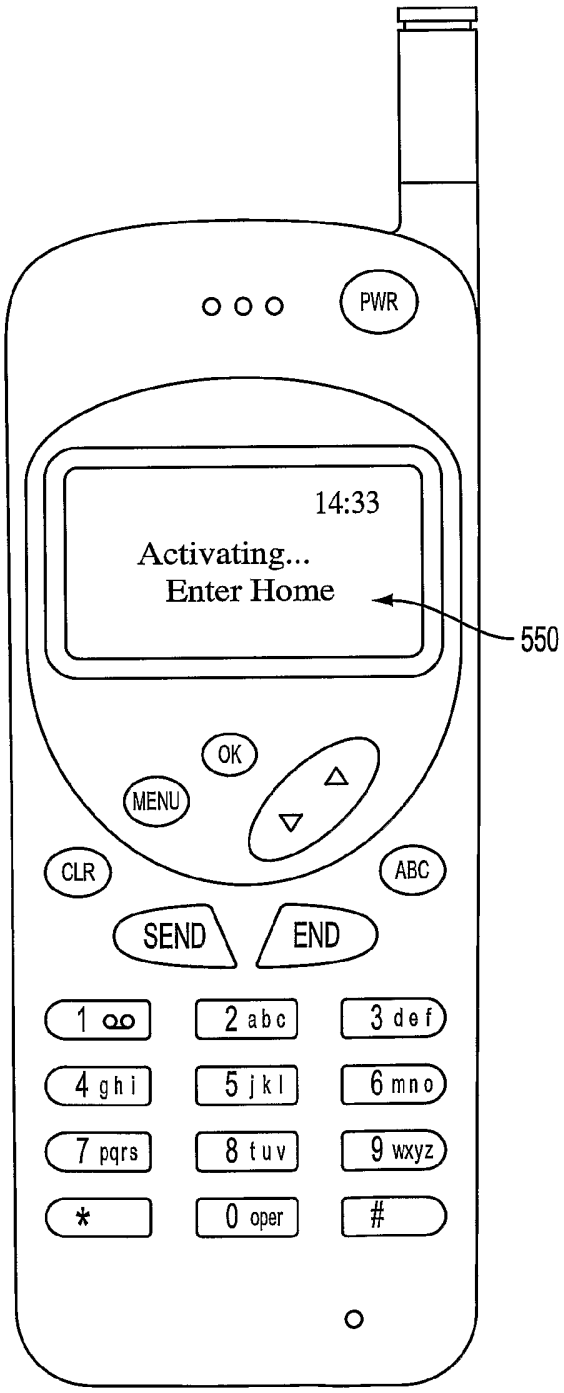
PWR
14:33
Activating...
Enter Home
550
OK
MENU
CLR
ABC
SEND
END
1 oo
2 abc
3 def
4 ghi
5 jkl
6 mno
7 pqrs
8 tuv
9 wxyz
*
0 oper
#

FIG. 55

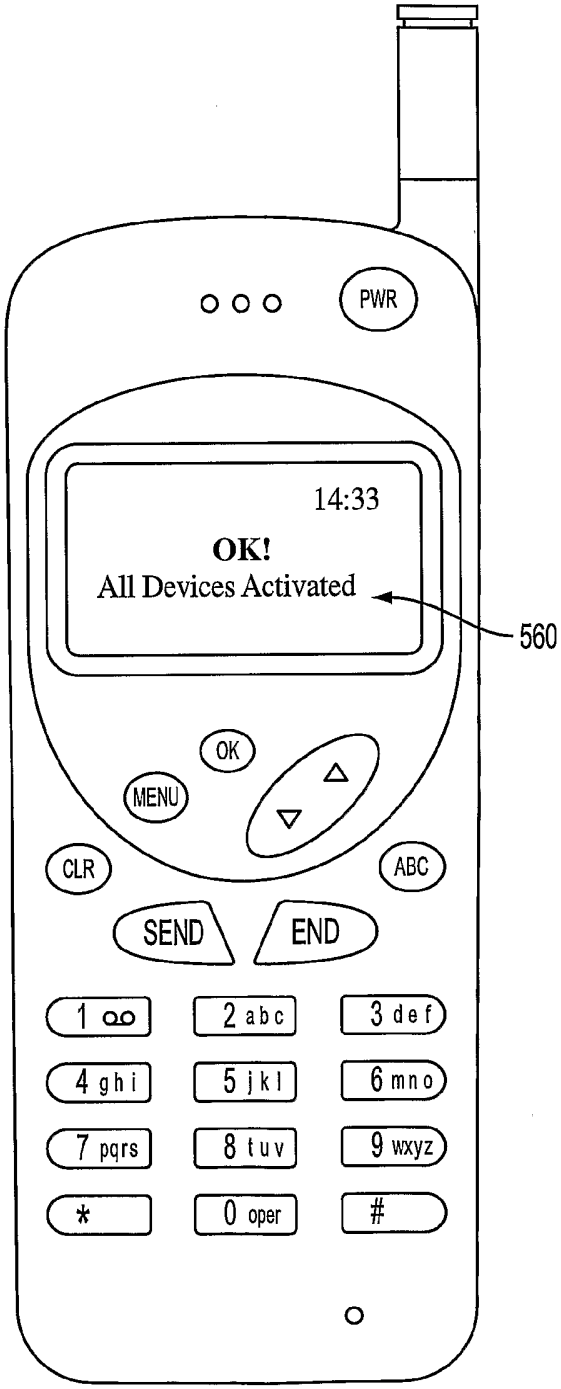
PWR
14:33
OK!
All Devices Activated
560
OK
MENU
CLR
ABC
SEND
END
1 oo
2 abc
3 def
4 ghi
5 jkl
6 mno
7 pqrs
8 tuv
9 wxyz
*
0 oper
#

FIG. 56

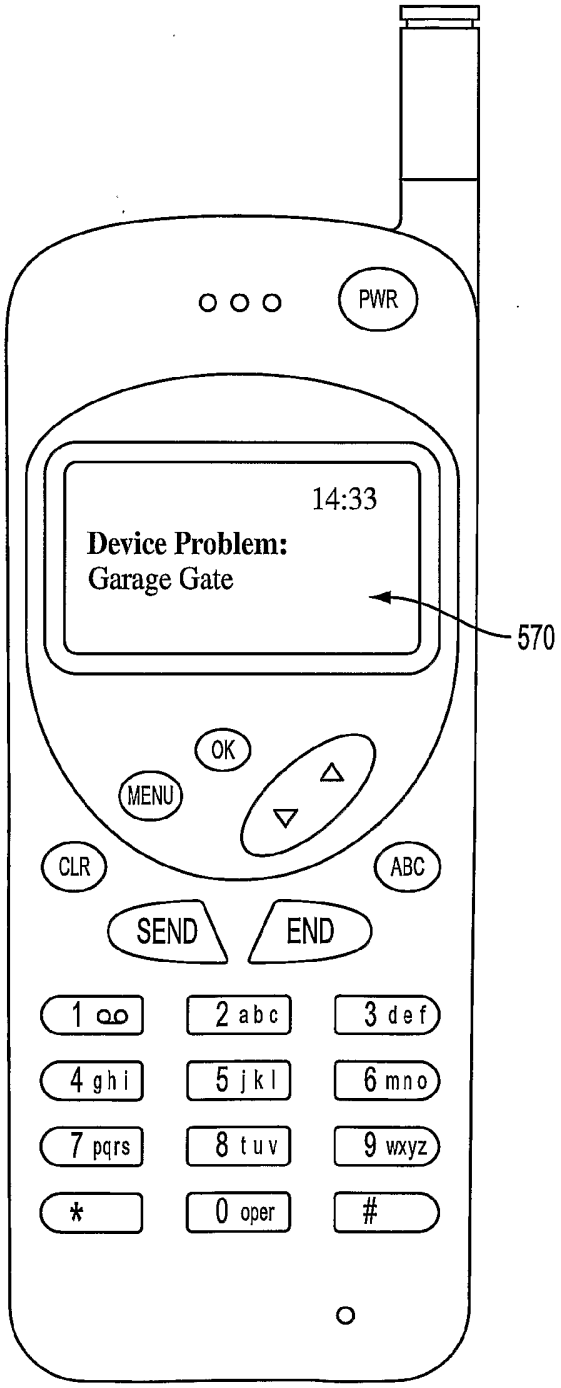
PWR
14:33
Device Problem:
Garage Gate
570
OK
MENU
CLR
ABC
SEND
END
1 oo
2 abc
3 def
4 ghi
5 jkl
6 mno
7 pqrs
8 tuv
9 wxyz
*
0 oper
#

FIG. 57

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB02/04762

A. CLASSIFICATION OF SUBJECT MATTER
IPC(7) : G06F 17/20
US CL : 341/176; 348/734; 704/275; 713/1
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)
U.S. : 341/176; 348/734; 704/275; 713/1

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 practicable, search terms used)
EAST

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y,P	US 6,407,779 B1 (HERZ) 18 June 2002, especially claims 2 & 6.	1-59
Y,P	US 6,401,059 B1 (SHEN et al) 04 June 2002, abstract.	1-59
Y	US 6,055,478 A (HERON) 25 April 2000, especially claim 16.	1-59
Y,P	Universal Electronics Press Release, "Universal Electronics Unveils Nevo: A Platform for the Connected Home and Office", 18 June 2002.	1-59
Y	Okada, Hiromu, "PalmRemote for Palm OS(R)", 22 July 2001.	1-59
Y	Strietelmeier, Judy, "Official Gadgeteer Hands On Review: OmniRemote", 23 May 1999.	1-59

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

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Date of the actual completion of the international search	Date of mailing of the international search report
17 March 2003 (17.03.2003)	01 APR 2003
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703)305-3230	Authorized officer Thomas C. Lee Peggy Harvard Telephone No. 703-305-3900

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