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Harris et al.

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(54) **STATE-BASED REMOTE CONTROL SYSTEM**

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(51) **Int. Cl.**[7] **G08C 19/00**; G05B 23/02

(52) **U.S. Cl.** **340/825.69**; 340/825.72; 340/3.2

(58) **Field of Search** 340/825.69, 825.72, 340/825.49, 310.06, 825.37, 3.2, 3.1; 700/83; 398/1, 106, 115, 126, 127; 219/497, 413, 483

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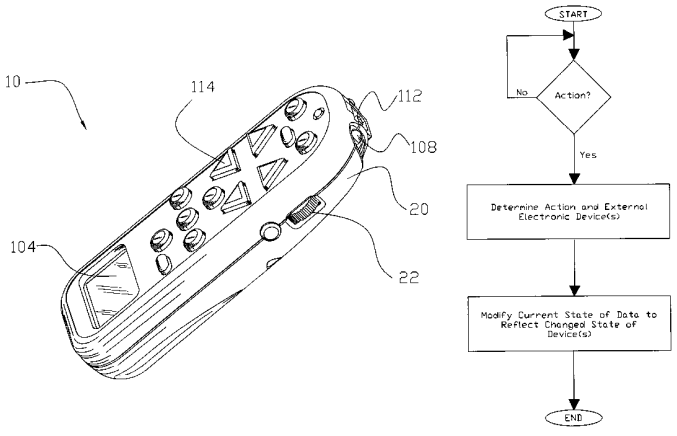
(57) **ABSTRACT**

A state-based remote control system for providing efficient and simple operation of a plurality of electronic devices as a coordinated system based upon an overall task. The state-based remote control system includes a housing, a keypad in communication with an electronic system contained within the housing, and a communication device in communication with the electronic system for communicating with external electronic devices. The electronic system monitors the buttons selected by a user to determine the state of all external electronic devices that are to be controlled. When the user selects a task (e.g. watch television), the electronic system automatically determines the actions required to achieve the desired task based upon the current state of the external electronic devices. After the task has been fulfilled, the electronic system updates the data to reflect the modified state of the external electronic devices.

35 Claims, 12 Drawing Sheets



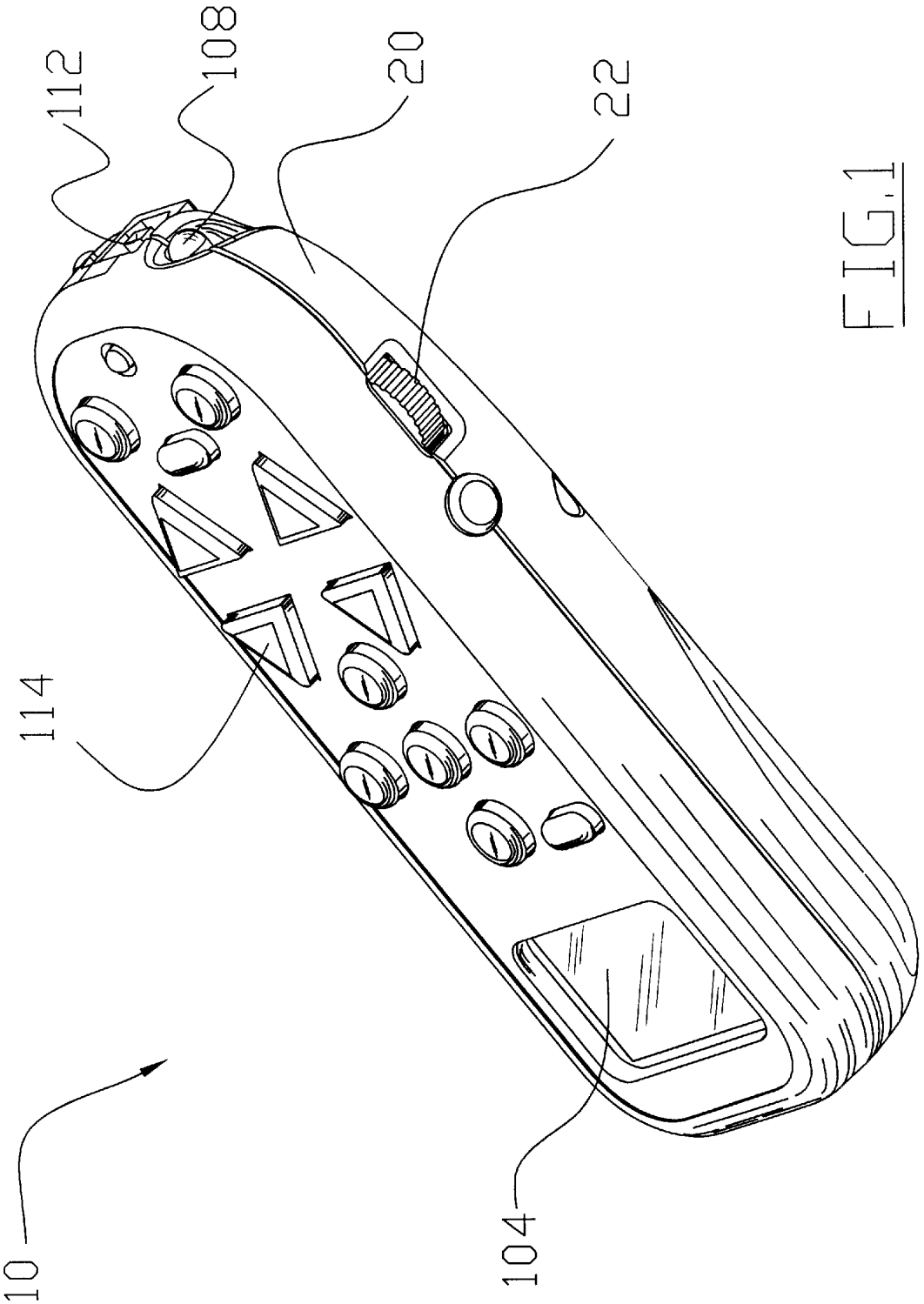


FIG. 1

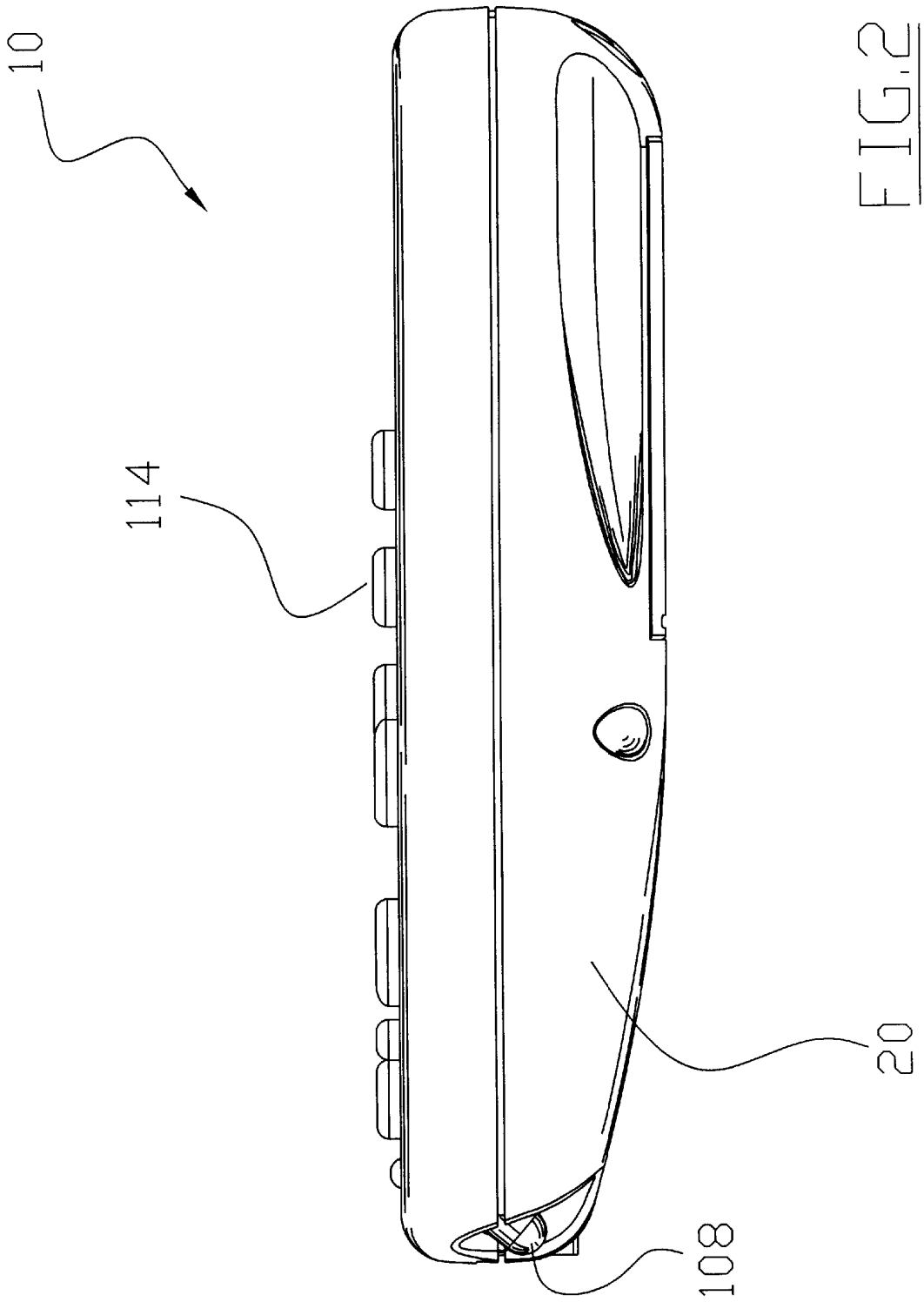


FIG.2

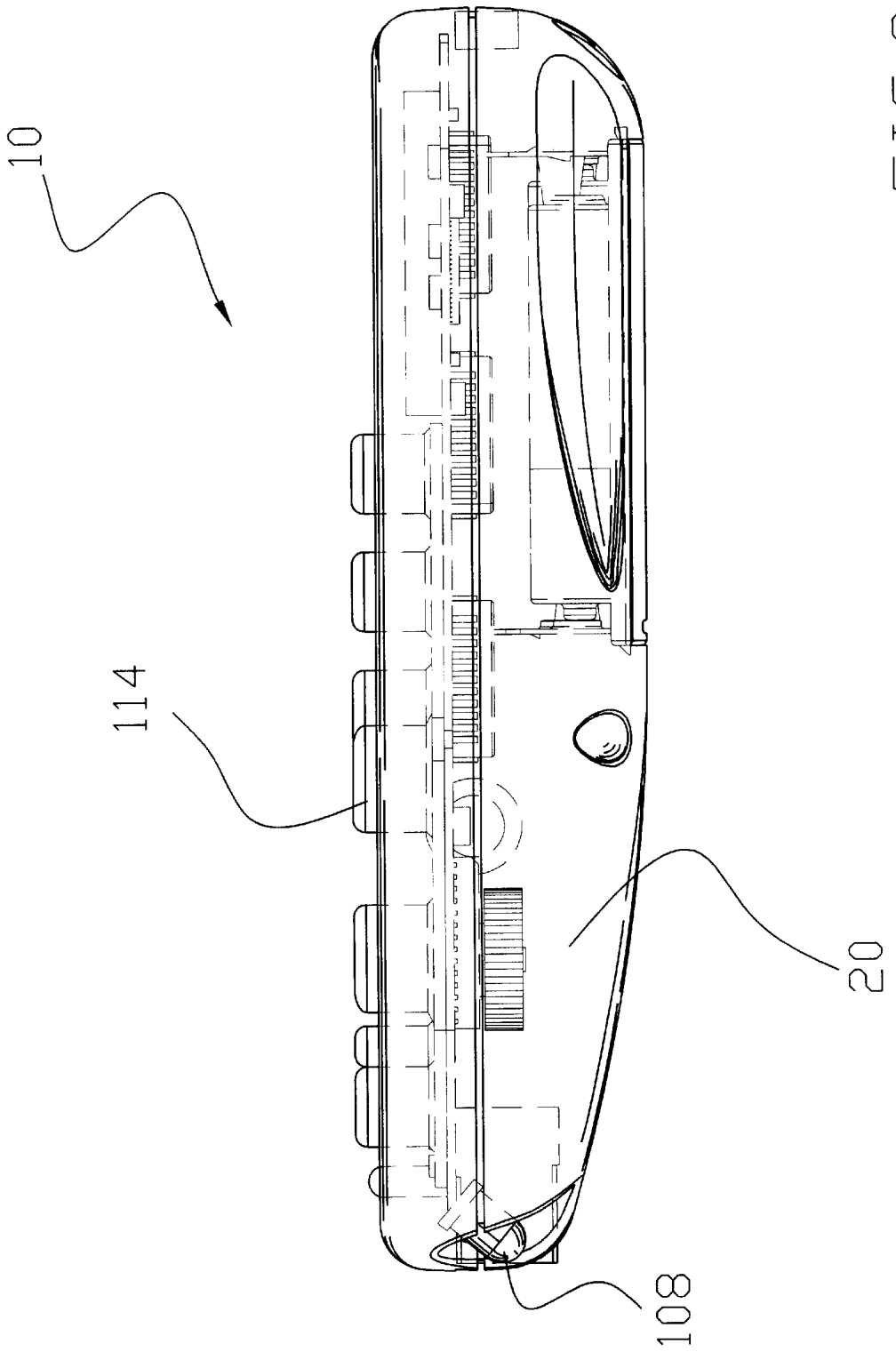


FIG.3

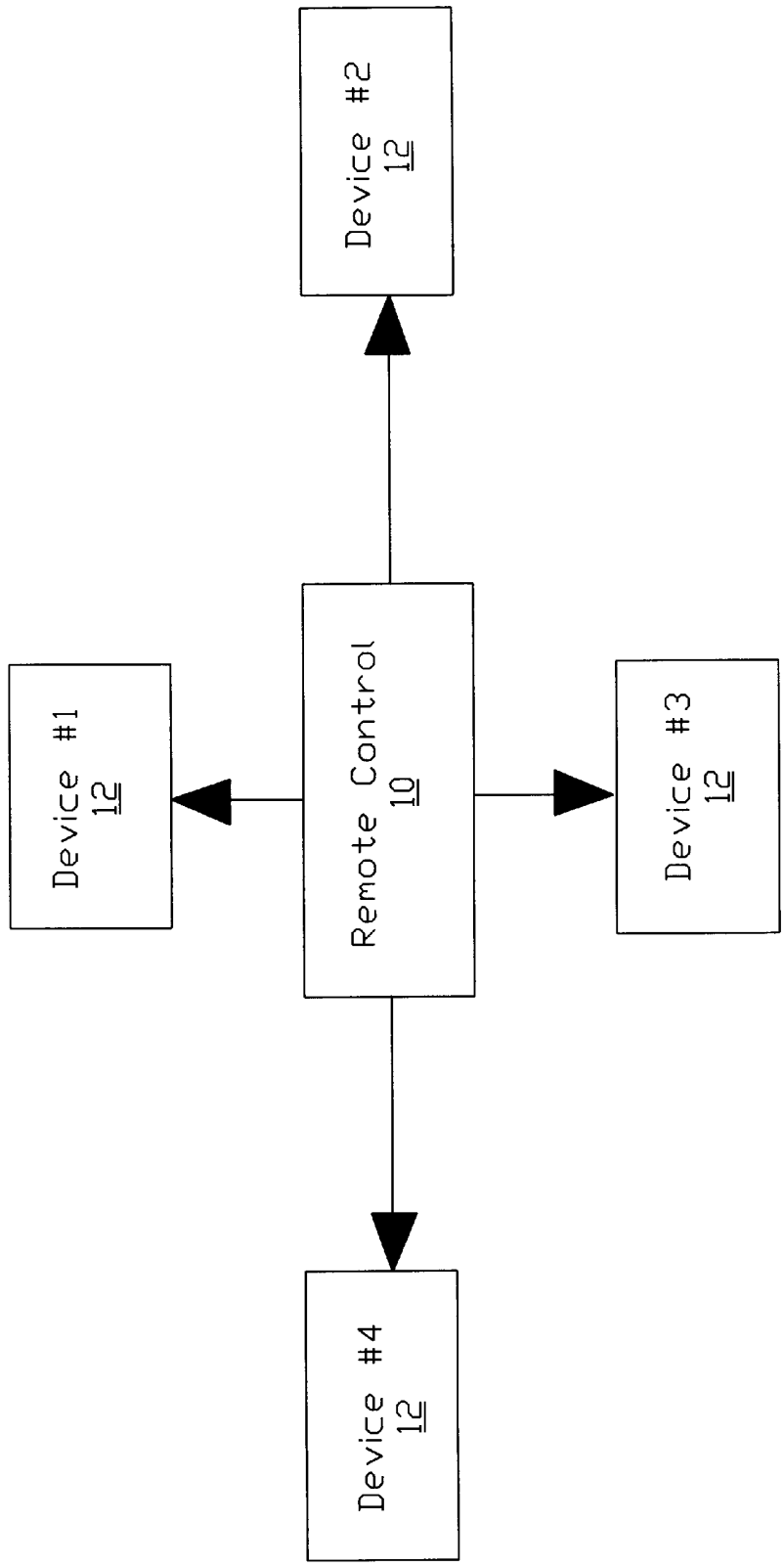

Device #2
12
Device #1
12
Remote Control
10
Device #3
12
Device #4
12

FIG. 4

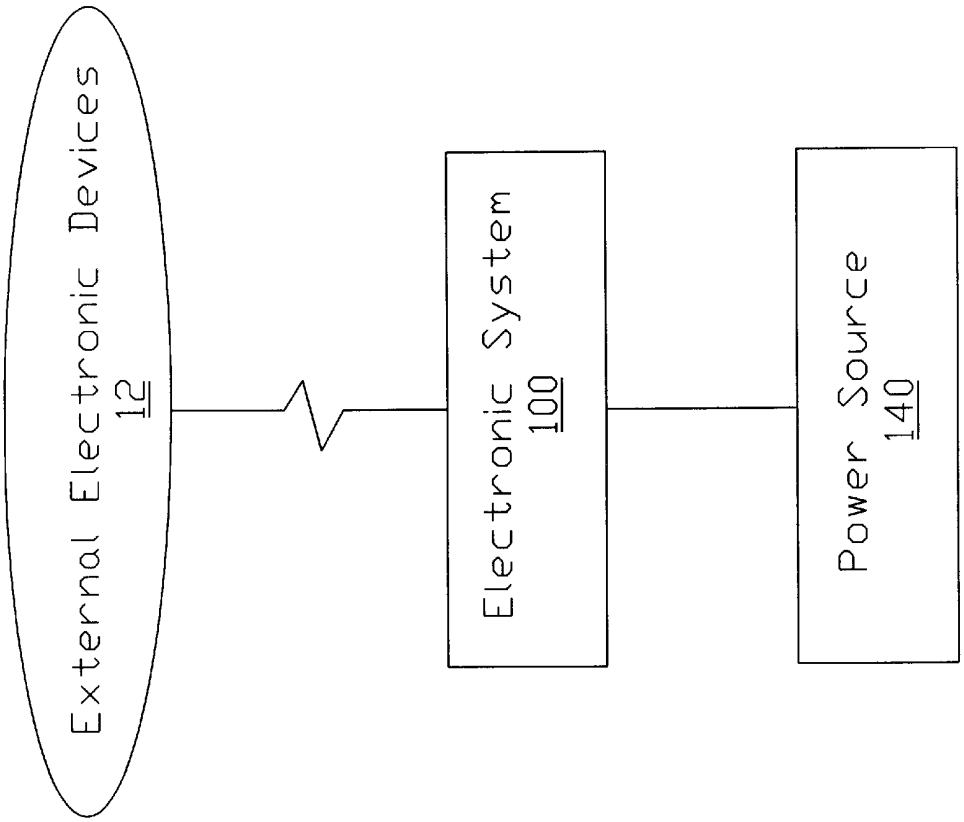

External Electronic Devices
12
Electronic System
100
Power Source
140

FIG. 5

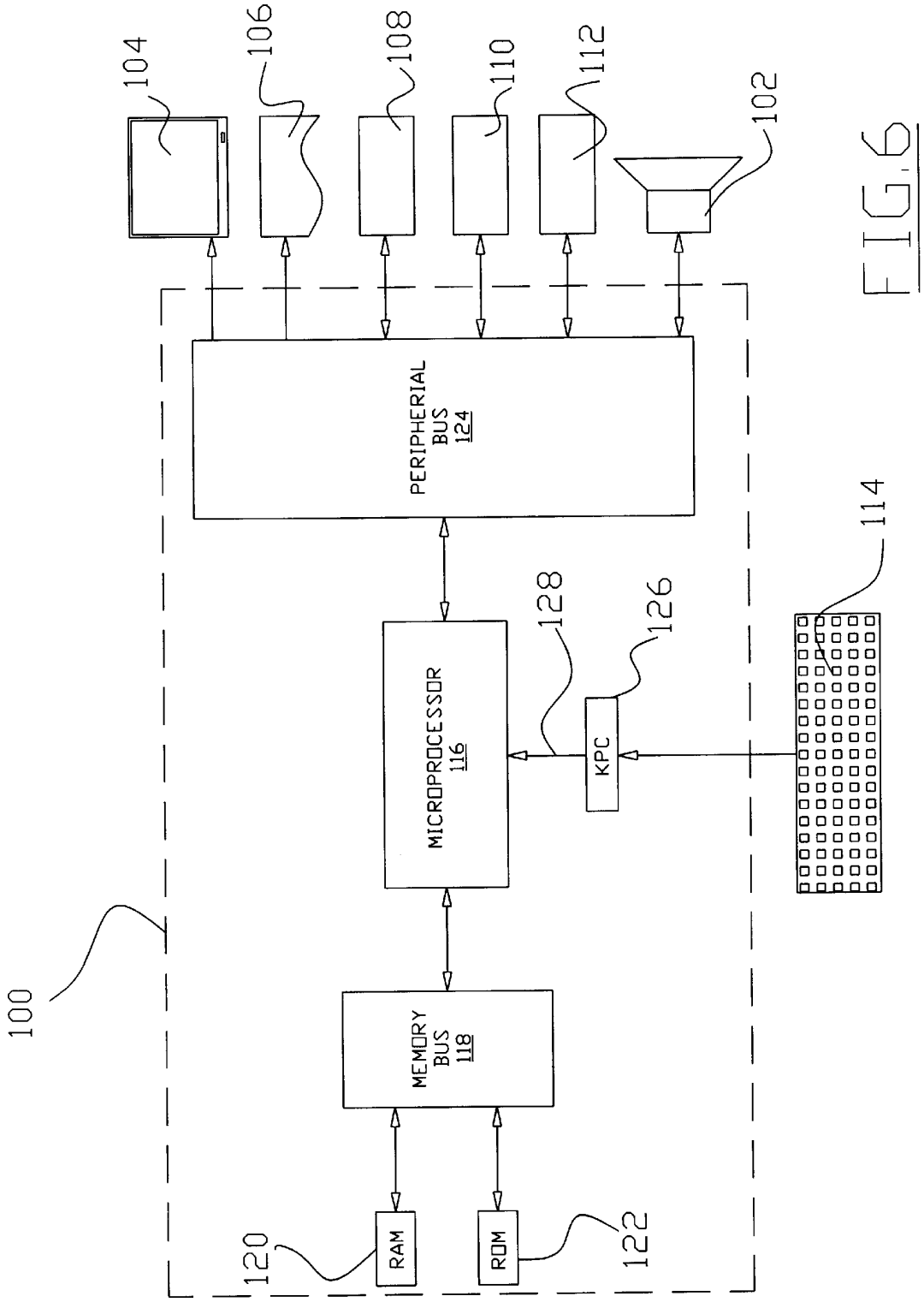

104
106
108
110
112
102
PERIPHERIAL BUS 124
114
128
126
MICROPROCESSOR 116
KPC
100
MEMORY BUS 118
120
RAM
ROM
122

FIG. 6

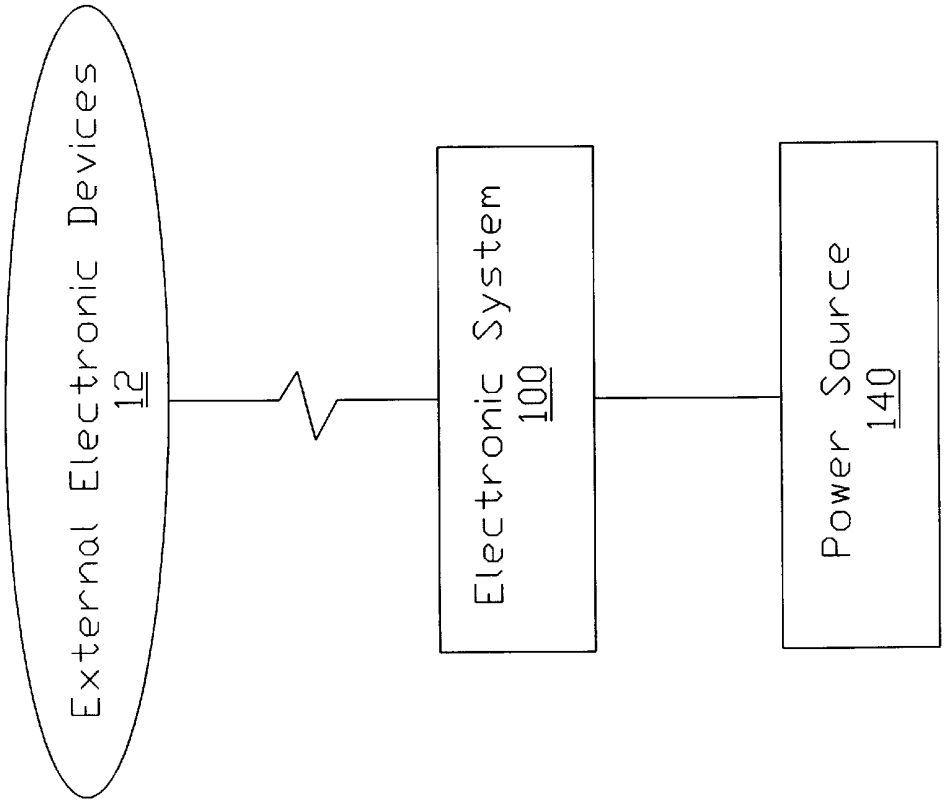

External Electronic Devices
12
Electronic System
100
Power Source
140

FIG. 7

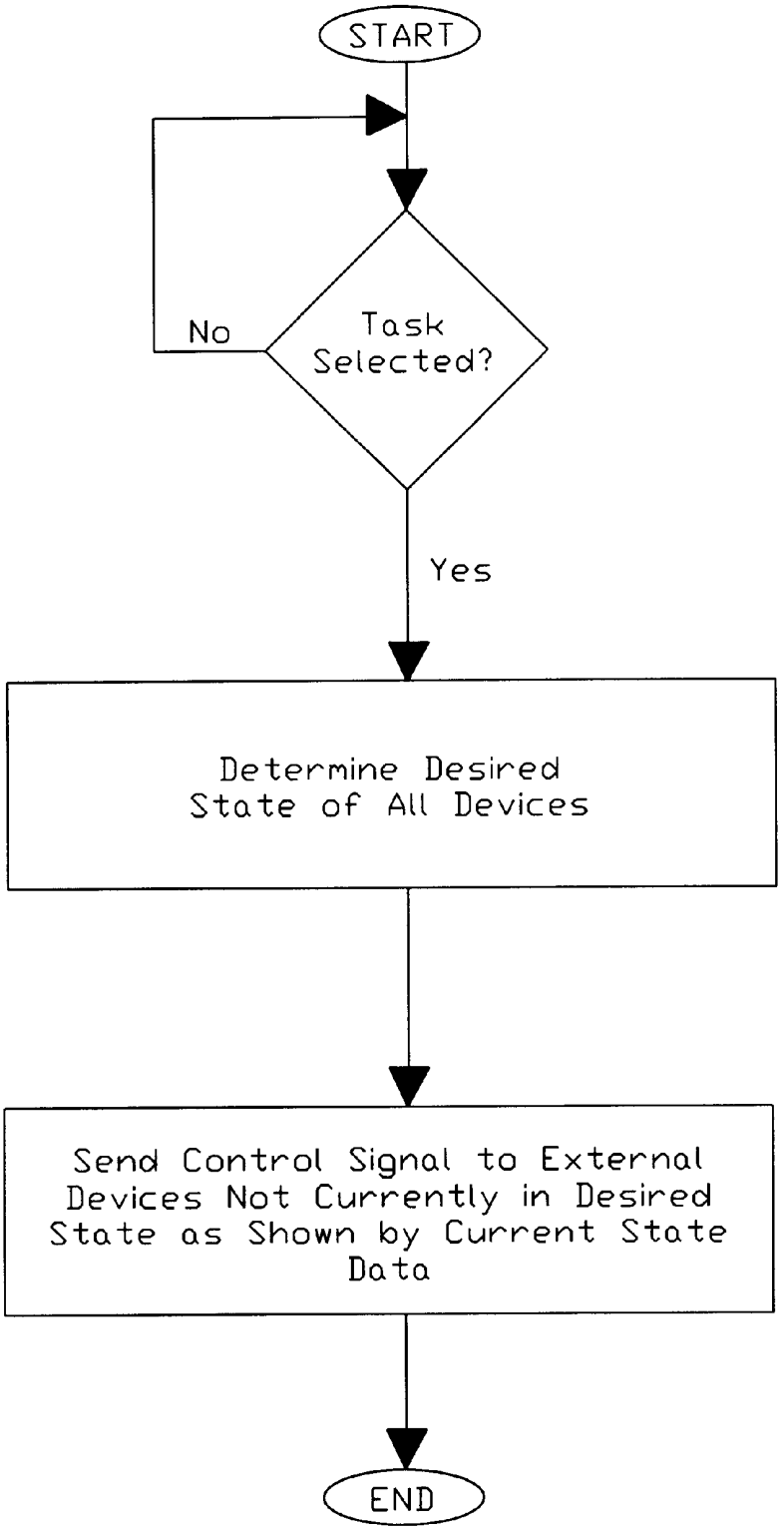

START
Task Selected?
No
Yes
Determine Desired State of All Devices
Send Control Signal to External Devices Not Currently in Desired State as Shown by Current State Data
END

FIG. 8

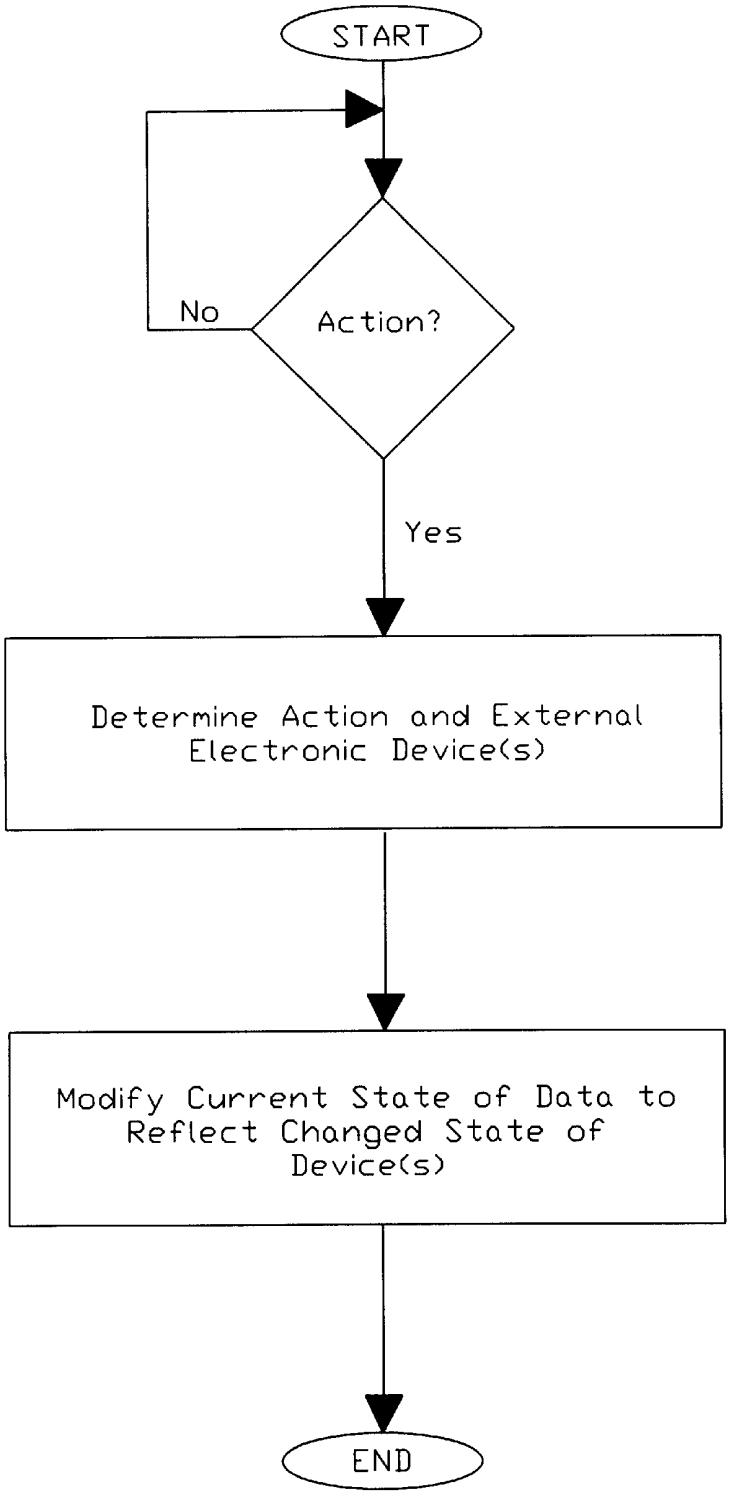

START
Action?
No
Yes
Determine Action and External Electronic Device(s)
Modify Current State of Data to Reflect Changed State of Device(s)
END

FIG. 9

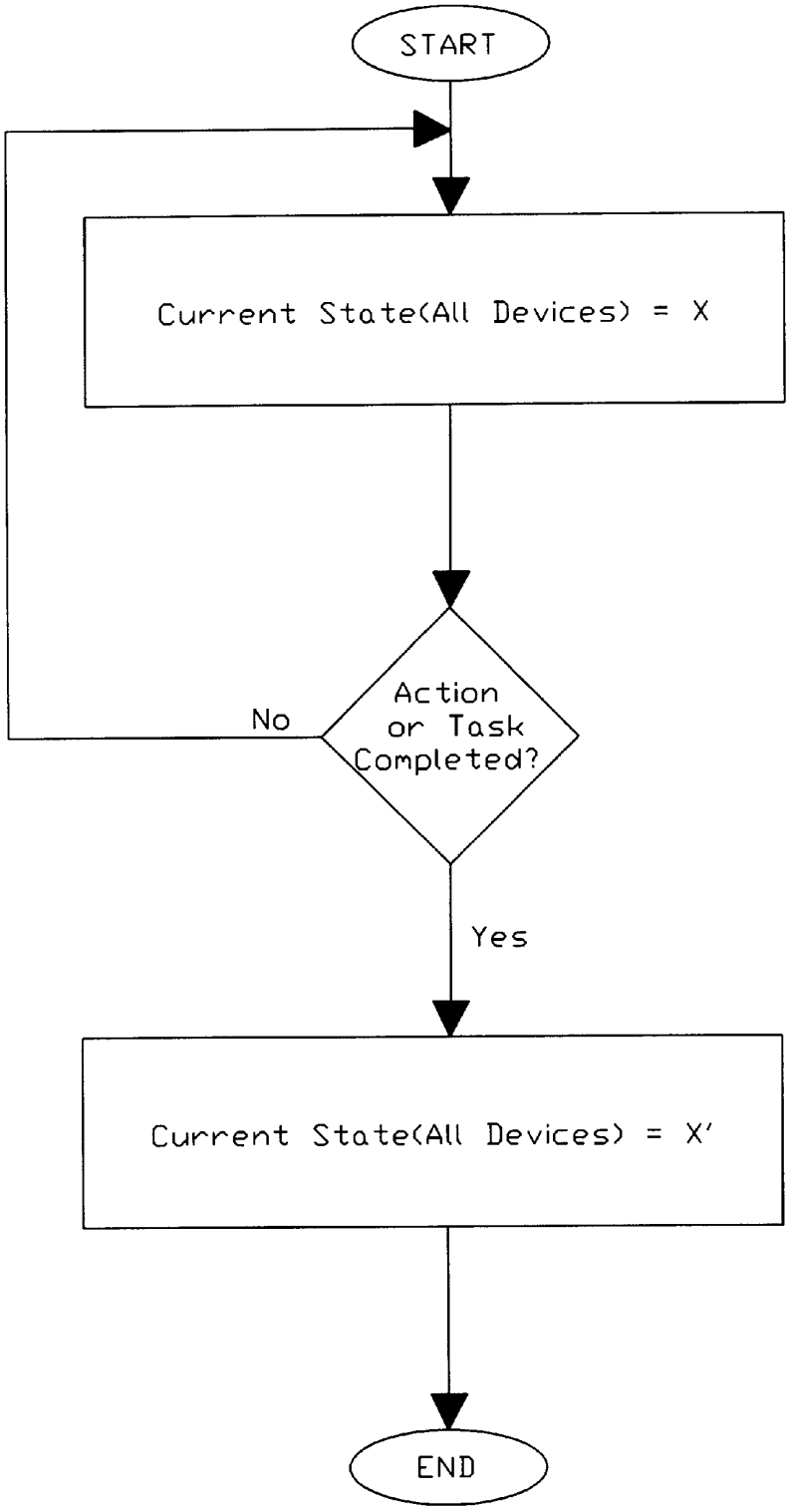

START
Current State(All Devices) = X
Action or Task Completed?
No
Yes
Current State(All Devices) = X'
END

FIG.10

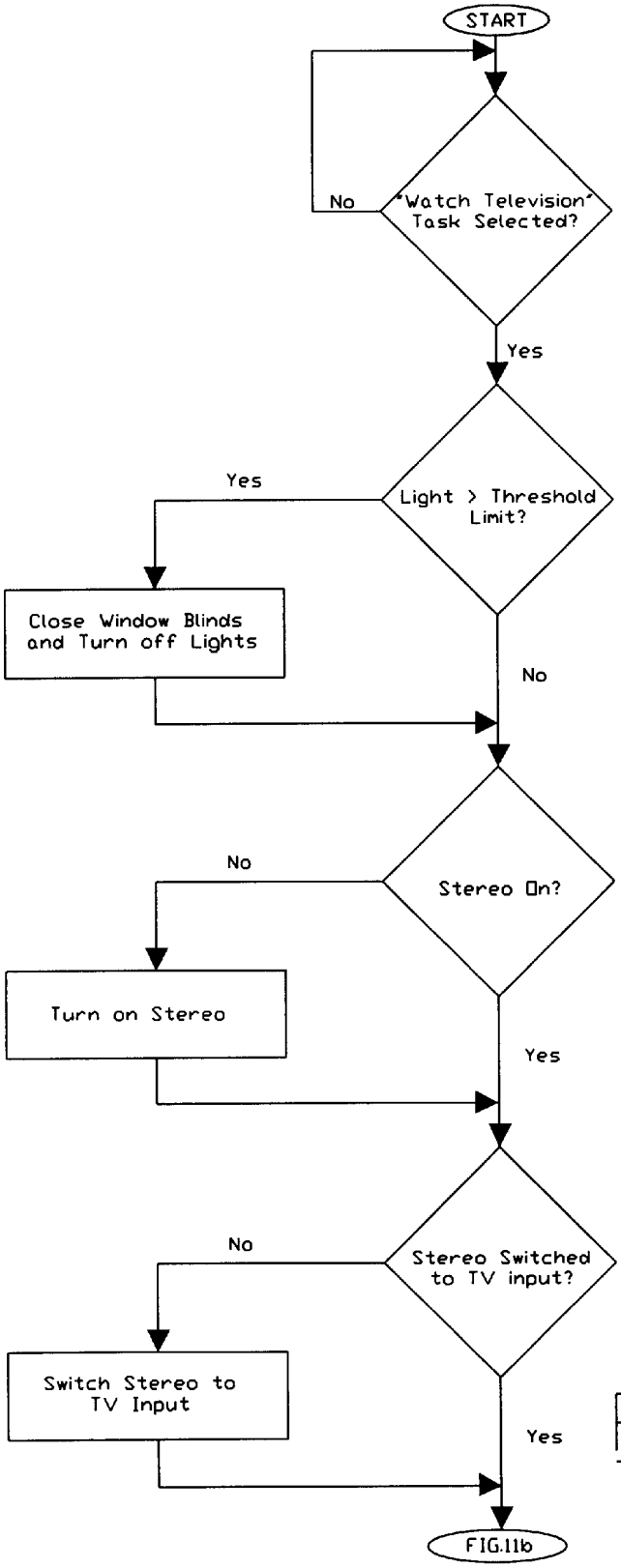

START
"Watch Television" Task Selected?
No
Yes
Light > Threshold Limit?
Yes
Close Window Blinds and Turn off Lights
No
Stereo On?
No
Turn on Stereo
Yes
Stereo Switched to TV input?
No
Switch Stereo to TV Input
Yes
FIG.11b

FIG.11a

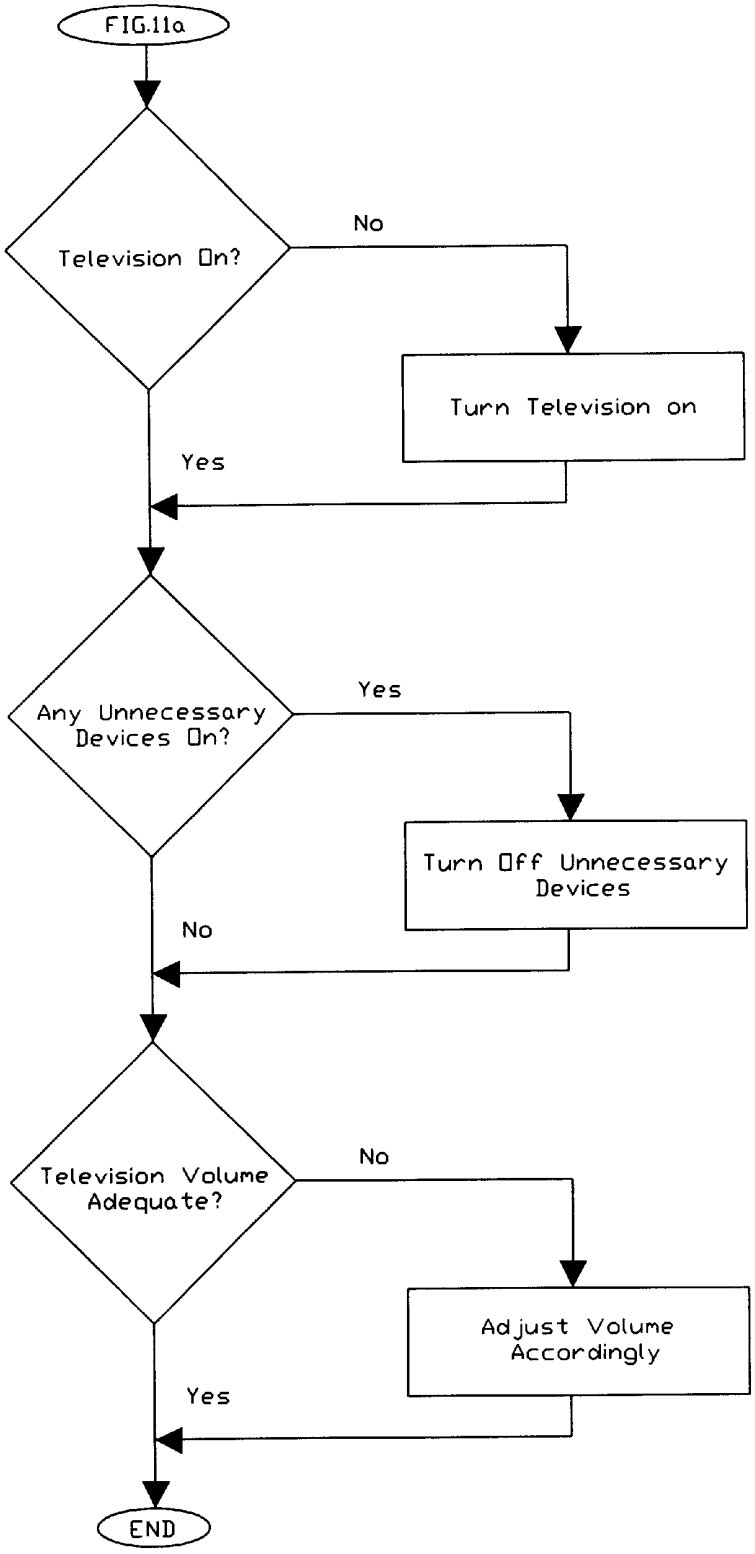


FIG.11a
Television On?
No
Turn Television on
Yes
Any Unnecessary Devices On?
Yes
Turn Off Unnecessary Devices
No
Television Volume Adequate?
No
Adjust Volume Accordingly
Yes
END

FIG.11b

STATE-BASED REMOTE CONTROL SYSTEM

CROSS-REFERENCE TO RELATED U.S. PROVISIONAL PATENT APPLICATIONS

I hereby claim benefit under Title 35, United States Code, Section 119(e) of U.S. provisional patent application Serial No. 60/189,487 filed Mar. 15, 2000, and U.S. provisional patent application Serial No. 60/253,727 filed Nov. 29, 2000. This application is a continuation of the 60/189,487 and 60/253,727 applications. The 60/189,487 and 60/253,727 applications are currently pending. The 60/189,487 and 60/253,727 applications are hereby incorporated by reference into this patent application.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates generally to remote control devices and more specifically it relates to a state-based remote control system for providing efficient and simple operation of a plurality of electronic devices as a coordinated system based upon an overall task.

2. Description of the Prior Art

Remote control devices have been in use for years. Remote control devices are utilized to operate various external electronic devices including but not limited to televisions, stereos, receivers, VCRs, DVD players, CD players, amplifiers, equalizers, tape players, cable units, lighting, window shades and other electronic devices. A conventional remote control is typically comprised of a housing structure, a keypad within the housing structure for entering commands by the user, electronic circuitry within the housing structure connected to the keypad, and a transmitter electrically connected to the electronic circuitry for transmitting a control signal to an electronic device to be operated.

The user depresses one or more buttons upon the keypad when a desired operation of a specific electronic device is desired. For example, if the user desires to turn the power off to a VCR, the user will depress the power button upon the remote control which transmits a "power off" control signal that is detected by the VCR resulting in the VCR turning off.

Because of the multiple electronic devices currently available within many homes and businesses today, a relatively new type of remote control is utilized to allow for the control of a plurality of electronic devices commonly referred to as a "universal remote control." Most universal remote controls have "selector buttons" that are associated with the specific electronic device to be controlled by the remote control (i.e. television, VCR, DVD player, etc.).

A few universal remote controls allow for "macros" to be programmed into the remote control so that when a preprogrammed button is depressed a string of commands is executed as programmed. For example, if the user desires to operate their television along with the stereo receiving input from the television, the user would program a macro for turning on the television, turning on the stereo and then switching the input to the stereo for receiving audio input from the television. The main problem with conventional universal remote controls is that they are unable to detect or monitor the state of a particular electronic device. Another problem with conventional universal remote controls is that when a preprogrammed macro is executed, an undesirable effect can occur wherein electronic devices that are desired to be turned on are actually turned off. For example, if the television is already on but the stereo is tuned to a local radio station and the user selects the above macro the power to the television would actually be turned off instead of maintained on.

Recently, universal remote controls have been developed that communicate via radio frequency (RF) with external sensing devices that are connected to the electronic devices for detecting the current state of the electronic device. Other remote controls are able to receive and display information from the electronic device they control such as displaying the name of a radio station on a display of the remote. These devices are relatively expensive and again difficult to utilize for the average consumer.

The main problem with conventional remote control devices is that they are typically unable to know the particular "state" of an electronic device they are to control, particularly universal remote controls. A further problem with conventional remote controls that do allow for advanced configuration thereof to compensate for the various states of the electronic device is that they are often times difficult for the average consumer to utilize. Another problem with conventional remote control devices is that they force consumers to view their electronic devices "individually" (i.e. turn television on, turn stereo on, switch audio input on stereo to television) rather than in broad "tasks" (e.g. watch television).

While these devices may be suitable for the particular purpose to which they address, they are not as suitable for providing efficient and simple operation of a plurality of electronic devices as a coordinated system based upon an overall task. Conventional remote controls are typically programmed to operate only one electronic device. Conventional universal remote controls are typically programmed to operate electronic devices "individually" or are difficult to configure to automated control of a plurality of electronic devices.

In these respects, the state-based remote control system according to the present invention substantially departs from the conventional concepts and designs of the prior art, and in so doing provides an apparatus primarily developed for the purpose of providing efficient and simple operation of a plurality of electronic devices as a coordinated system based upon an overall task.

SUMMARY OF THE INVENTION

In view of the foregoing disadvantages inherent in the known types of remote controls now present in the prior art, the present invention provides a new state-based remote control system construction wherein the same can be utilized for providing efficient and simple operation of a plurality of electronic devices as a coordinated system based upon an overall task.

The general purpose of the present invention, which will be described subsequently in greater detail, is to provide a new state-based remote control system that has many of the advantages of the remote controls mentioned heretofore and many novel features that result in a new state-based remote control system which is not anticipated, rendered obvious, suggested, or even implied by any of the prior art remote controls, either alone or in any combination thereof.

To attain this, the present invention generally comprises a housing, a keypad in communication with an electronic system contained within the housing, and a communication device in communication with the electronic system for communicating with external electronic devices. The electronic system constantly monitors the buttons selected by a

user to determine the state of all external electronic devices that are to be controlled. When the user selects a task (e.g. watch television), the electronic system automatically determines the actions required to achieve the desired task based upon the current state of the external electronic devices. After the task has been fulfilled, the electronic system updates the data to reflect the modified state of the external electronic devices.

There has thus been outlined, rather broadly, the more important features of the invention in order that the detailed description thereof may be better understood, and in order that the present contribution to the art may be better appreciated. There are additional features of the invention that will be described hereinafter and that will form the subject matter of the claims appended hereto.

In this respect, before explaining at least one embodiment of the invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and to the arrangements of the components set forth in the following description or illustrated in the drawings. The invention is capable of other embodiments and of being practiced and carried out in various ways. Also, it is to be understood that the phraseology and terminology employed herein are for the purpose of the description and should not be regarded as limiting.

A primary object of the present invention is to provide a state-based remote control system that will overcome the shortcomings of the prior art devices.

A second object is to provide a state-based remote control system for providing efficient and simple operation of a plurality of electronic devices as a coordinated system based upon an overall task.

Another object is to provide a state-based remote control system that provides for intuitive operation of a plurality of electronic devices.

An additional object is to provide a state-based remote control system that allows for the simple operation of a plurality of electronic devices based upon an overall "task" instead of specific controls for specific electronic devices.

A further object is to provide a state-based remote control system that is simple and easy to utilize for the average consumer.

Another object is to provide a state-based remote control system that does not require significant programming prior to usage.

An additional object is to provide a state-based remote control system that is affordable.

Other objects and advantages of the present invention will become obvious to the reader and it is intended that these objects and advantages are within the scope of the present invention.

To the accomplishment of the above and related objects, this invention may be embodied in the form illustrated in the accompanying drawings, attention being called to the fact, however, that the drawings are illustrative only, and that changes may be made in the specific construction illustrated and described within the scope of the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

Various other objects, features and attendant advantages of the present invention will become fully appreciated as the same becomes better understood when considered in conjunction with the accompanying drawings, in which like reference characters designate the same or similar parts throughout the several views, and wherein:

FIG. **1** is an upper perspective view of the present invention.

FIG. **2** is a side view of the present invention.

FIG. **3** is a side view of the present invention illustrating electronic circuitry within.

FIG. **4** is a block diagram illustrating the communications between the present invention and a plurality of external electronic devices.

FIG. **5** is a block diagram illustrating the electronic system of the present invention electrically connected to the power source and in communication with the external electronic devices.

FIG. **6** is a block diagram illustrating the electronic system along with a plurality of accessory devices connected to thereof.

FIG. **7** is a flowchart illustrating the initial programming of the present invention prior to usage.

FIG. **8** is a flowchart illustrating the modification of the state of external electronic devices not in the desired state as desired within a task to be performed.

FIG. **9** is a flowchart illustrating an action performed upon one or more external devices and modifying the memory within the electronic system accordingly.

FIG. **10** is a flowchart illustrating the modification of the memory within the electronic system to reflect the changed state of the external electronic devices after a task or an action has been completed.

FIGS. **11***a–b* is a flowchart providing an example task for watching television being executed.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Turning now descriptively to the drawings, in which similar reference characters denote similar elements throughout the several views, FIGS. **1** through **11** illustrate a state-based remote control system **10**, which comprises a housing **20**, a keypad **114** in communication with an electronic system **100** contained within the housing **20**, and a communication device **108** in communication with the electronic system **100** for communicating with external electronic devices **12**. The electronic system **100** constantly monitors the buttons of the keypad **114** and other switches selected by a user to determine the state of all external electronic devices **12** that are to be controlled. When the user selects a task (e.g. watch television), the electronic system **100** automatically determines the actions required to achieve the desired task based upon the current state of the external electronic devices **12**. After the task has been fulfilled, the electronic system **100** updates the data to reflect the modified state of the external electronic devices **12**.

A. Housing Structure

The present invention generally is comprised of a housing **20** having a structure and shape similar to conventional remote control devices. The housing **20** may be constructed of various types of materials and shapes as can be appreciated by one skilled in the art. The housing is preferably structured to be ergonomic for a majority of users.

B. Electronic System

The present invention is utilized to control and operate various external electronic devices including but not limited to televisions, stereos, receivers, VCRs, DVD players, CD players, amplifiers, equalizers, tape players, cable units, satellite dish receivers, lighting, window shades and other electronic devices. Almost any number of external electronic devices may be controlled by the present invention as will be discussed in further detail.

FIG. **6** is a block diagram of an exemplary electronic system **100** for practicing the various aspects of the present invention. The electronic system **100** is preferably enclosed within the housing. A portable power source **140** is electrically connected to the electronic system **100** for providing electrical power to the electronic system **100**. The power source **140** may be comprised of any power source such as a battery structure (disposable or rechargeable), solar cells, or direct power.

The electronic system **100** preferably includes a display screen **104**, a network interface **112**, a keypad **114**, a microprocessor **116**, a memory bus **118**, random access memory (RAM) **120**, a speaker **102**, read only memory (ROM) **122**, a peripheral bus **124**, a keypad controller **126**, and a communications device **108**. As can be appreciated, the electronic system **100** of the present invention may be comprised of any combination of well-known computer devices, personal digital assistants (PDAs), laptop computers, remote control devices and other similar electronic structures.

The microprocessor **116** is a general-purpose digital processor that controls the operation of the electronic system **100**. The microprocessor **116** can be a single-chip processor or implemented with multiple components. Using instructions retrieved from memory, the microprocessor **116** controls the reception and manipulations of input data and the output and display of data on output devices.

The memory bus **118** is utilized by the microprocessor **116** to access RAM **120** and ROM **122**. RAM **120** is used by microprocessor **116** as a general storage area and as scratch-pad memory, and can also be used to store input data and processed data. ROM **122** can be used to store instructions or program code followed by microprocessor **116** as well as other data.

Peripheral bus **124** is used to access the input, output and storage devices used by the electronic system **100**. In the described embodiment(s), these devices include a display screen **104**, an accessory device **106**, a speaker **102**, a communications device **108**, and a network interface **112**. A keypad controller **126** is used to receive input from the keypad **114** and send decoded symbols for each pressed key to microprocessor **116** over bus **128**.

The display screen **104** is an output device that displays images of data provided by the microprocessor **116** via the peripheral bus **124** or provided by other components in the electronic system **100**. Other output devices such as a printer, plotter, typesetter, etc. can be utilized as an accessory device **106**.

The microprocessor **116** together with an operating system operate to execute computer code and produce and use data. The computer code and data may reside on RAM **120**, ROM **122**, or other storage mediums. The computer code and data could also reside on a removable program medium and loaded or installed onto the electronic system **100** when needed. Removable program mediums include, for example, PC-CARD, flash memory, and floppy disk.

The network interface **112** is utilized to send and receive data over a network connected to other electronic systems. The network interface may be comprised of a Universal Serial Bus (USB), an external bus standard that supports data transfer rates of 12 Mbps (12 million bits per second). A single USB port can be used to connect up to 127 peripheral devices, such as mice, modems, and keyboards. An interface card or similar device and appropriate software implemented by microprocessor **116** can be utilized to connect the electronic system **100** to an existing network and transfer data according to standard protocols including data over a global computer network such as the Internet.

The keypad **114** is used by a user to input commands and other instructions to the electronic system **100**. Other types of user input devices can also be used in conjunction with the present invention. For example, pointing devices such as a computer mouse, a jog switch **22**, a track ball, a stylus, or a tablet to manipulate a pointer on a screen of the electronic system **100**.

The present invention can also be embodied as computer readable code on a computer readable medium. The computer readable medium is any data storage device that can store data which can be thereafter be read by a electronic system. Examples of the computer readable medium include read-only memory, random-access memory, magnetic data storage devices such as diskettes, and optical data storage devices such as CD-ROMs. The computer readable medium can also be distributed over a network coupled electronic systems so that the computer readable code is stored and executed in a distributed fashion.

The communications device **108** may be comprised of any well-known communication system that allows communications with external electronic devices. The communications device **108** may provide for various types of communication such as but not limited to via infrared (IR), wireless (e.g. BLUETOOTH), unidirectional, bi-directional, radio frequency (RF), visible light, ultrasonic and various other means for communicating with external electronic devices.

The environmental unit **110** senses environmental information such as lighting, motion, orientation, temperature, audio and other environmental information. The environmental unit **110** communicates the detected environmental information to the microprocessor **116** for consideration in controlling the external electronic devices. The environmental unit **110** includes the appropriate sensors such as light sensors, temperature sensors, sound sensors and other desirable sensors to determine the environment conditions external of the housing.

Input into the electronic system is accomplished mainly through the usage of the keypad **114**. The keypad **114** includes a plurality of buttons that allow the user to execute one or more commands. The keypad **114** allows for the control of basic functions such as volume, channel manipulation, mute, and last channel. However, the keypad **114** may also include several buttons that represent a specific task such as watch television, listen to radio and various other tasks. Various other input devices may be utilized to input data into the electronic system such as a jog switch **22** (i.e. dial), motion and orientation detectors, touch sensitive screens and voice recognition. The display **104** provides information to the user such as possible tasks to complete or the current state of the external electronic devices.

C. Initializing/Synchronizing of Electronic System with External Devices

Prior to utilizing the present invention, the user must program the electronic system **100** to not only recognize all of the external electronic devices **12** to be controlled but also as to each external electronic device **12** respective current "states" (i.e. on, off, current input, current output, etc.) as is shown in FIG. **7** of the drawings.

The initial programming of the electronic system **100** may be accomplished through various well-known means such as entering a code for each specific external electronic device. "Sampling" of a signal from a remote control utilized to control a specific electronic device may also be utilized to assist in the programming of the electronic system **100**. Various other methods may be utilized to program the electronic system **100** to recognize and control the external electronic devices **12** which are well known in the art.

After all of the external electronic devices **12** have been properly programmed into the electronic system **100**, the user then must program the "current state" of each external electronic device into the electronic system **100**. This is accomplished typically by the user answering a series of questions shown on the display regarding each display. For example, the display may ask "Is the television turned on?" which the user would respond to. It can be appreciated that there can also be a default state for all of the external devices as being "off." All of the programmed "Current State Data" is stored within memory of the electronic system **100**.

D. Current State Data

"Current State Data" is data information relating to the current state of each of the external electronic devices **12** stored within the electronic system **100**. The "state" of an external electronic device **12** is comprised of various variables such as but not limited to power on, power off, volume level, mute on, mute off, audio input, audio output, video input, video output, lights on, lights off, shades open, shades closed, and various other states common to external electronic devices **12**. The Current State Data is updated as actions and/or tasks are performed to provide an accurate reflection of the actual current state of the external electronic devices **12**. The Current State Data is utilized by the electronic system **100** to determine what external electronic devices **12** require modification when a "task" is selected by the user to prevent undesirable events from occurring.

E. Actions

An "action" is a specific event that occurs that typically only affects one of the external devices. An example of an action is when the user selects the power button on the keypad **114** to turn off the television which causes the television to switch from on to off or vice-versa.

The Current State Data is immediately modified to reflect the changed state of the television or other external electronic device after an action occurs as shown in FIGS. **9** and **10** of the drawings. The Current State Data is constantly updated to maintain an accurate reflection of the actual current state of the external electronic devices **12**.

F. Tasks

A "task" may be comprised of one or more "actions" depending upon (1) the desired state of all external devices as prescribed by the task, and (2) the current state of all external devices. Examples of tasks are "watch television," "listen to radio," "watch video," "listen to CD's," "watch DVD", and so forth. There are many more tasks that may accomplished with the present invention that are not discussed but are deemed readily apparent to one skilled in the art.

Each task has a "desired state" for each of the external electronic devices **12**. When a task is selected, either through the keypad or the display, the electronic system **100** immediately determines the Current State Data and compares this data to the "Desired State Data" for all of the external electronic devices **12**. After determining which external electronic devices **12** are in the desired state and which are not in the desired state, the electronic system **100** transmits a communication signal to the external electronic devices **12** that are not in the desired state to switch to the desired state based upon the task to be performed.

Another function of the present invention is to allow for the electronic system **100** to determine what menu options (i.e. "tasks") that are available upon the display **104** based upon the current state of the external electronic devices **12**. For example, if the television is currently on, the menu within the display may display the "Turn Television Off" task instead of the "Turn Television On" task which is not required.

G. Watch Television Task Example

Assuming for the sake of example that a user using the present invention has (1) interior lighting, (2) electronically controlled shades, (3) a stereo, (4) a television, (5) a CD player, and (6) a VCR which are programmed and synchronized within the electronic system as stated above. FIG. **11** illustrates the "WATCH TELEVISION" task. Below is a sample listing of the "Current State Data" prior to the selection of the WATCH TELEVISION task as shown in FIG. **11** of the drawings.

Current State Data

External Device	Initial State Prior to Execution of Task
1. Room Lighting	Lights turned on and shades open during evening hours.
2. Stereo	Turned on with input audio from CD player.
3. Television	Turned off with volume very high.
4. CD Player	On and playing CD.
5. VCR	Off.

After selecting the desired WATCH TELEVISION task, the electronic system **100** immediately reads the Current State Data and compares the same to the "Desired State Data." Below is a listing of the Desired State Data for the WATCH TELEVISION task.

Desired State Data

External Device	Desired State After Execution of Task
1. Room Lighting	Light threshold at a minimum.
2. Stereo	Turned on with input audio from television.
3. Television	Turned on with volume at a low-medium setting.
4. CD Player	Off.
5. VCR	Off.

After comparing the Current State Data to the Desired State Data, the electronic system **100** determines that the room lighting needs to be reduced by turning off lights and closing shades along with switching the audio input to the television. The electronic system **100** further determines that the television needs to be turned on and the CD player turned off. Below is a listing of the individual actions that the electronic system **100** takes to perform the WATCH TELEVISION task.

Actions Performed to Reach Desired State

External Device	Action Performed
1. Room Lighting	Turn lighting off and close shades
2. Stereo	Switch input audio to television.
3. Television	Turn on and reduce volume to low-medium setting.
4. CD Player	Turn off.
5. VCR	No action taken.

After the specific actions are executed to accomplish the overall task, the memory within the electronic system **100** is automatically updated to reflect the various changes to the state of each individual external electronic device **12** for reference later. Below is a listing of the Current State Data after the WATCH TELEVISION task has been performed.

Current State Data (After Execution of Task)	
External Device	Current State After Execution of Task
1. Room Lighting	Light threshold at a minimum.
2. Stereo	Turned on with input audio from television.
3. Television	Turned on with volume at a low-medium setting.
4. CD Player	Off.
5. VCR	Off.

The above process is repeated for the life of the state-based remote control system **10**. If additional external electronic devices are added to the overall entertainment system of the user, the user simply programs the added device **12** into the electronic system **100** and synchronizes the electronic system **100** accordingly.

As to a further discussion of the manner of usage and operation of the present invention, the same should be apparent from the above description. Accordingly, no further discussion relating to the manner of usage and operation will be provided.

With respect to the above description then, it is to be realized that the optimum dimensional relationships for the parts of the invention, to include variations in size, materials, shape, form, function and manner of operation, assembly and use, are deemed to be within the expertise of those skilled in the art, and all equivalent structural variations and relationships to those illustrated in the drawings and described in the specification are intended to be encompassed by the present invention.

Therefore, the foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

We claim:

1. A state-based remote control system, comprising:

an electronic system capable of storing, calculating and updating a simulated current state data relating to at least one external electronic device;

a communication device connected to said electronic system for emitting a control signal to said at least one external electronic device; and

an input unit connected to said electronic system for communicating with said electronic system;

wherein said simulated current state data is calculated based upon at least one action performed by said electronic system in controlling said at least one electronic device.

2. The state-based remote control system of claim **1**, wherein said input unit includes a keypad having a plurality of buttons.

3. The state-based remote control system of claim **2**, wherein said input unit includes a display.

4. The state-based remote control system of claim **1**, wherein said electronic system is capable of performing tasks based upon a desired state data as compared to said simulated current state data.

5. The state-based remote control system of claim **1**, wherein said electronic system only modifies a state of an electronic device that has a simulated current state that does not match a desired state.

6. The state-based remote control system of claim **1**, wherein said communication device is able to transmit and receive data.

7. The state-based remote control system of claim **1**, wherein said electronic system is programmable to allow for the control of a plurality of external electronic devices.

8. A method of operating a state-based remote control system having an electronic system with a communication device and an input device for controlling at least one external electronic device, said method comprising the steps of:

(a) determining a simulated current state data of said at least one external electronic device;

(b) receiving an action request from said input device with respect to said at least one external electronic device;

(c) performing said action request by communicating to said at least one external electronic device; and

(d) modifying said simulated current state data to reflect a new state of said at least one external electronic device based upon said action request.

9. The method of operating a state-based remote control system of claim **8**, wherein said step (a) comprises asking a series of questions of a user regarding the current state of each of said external electronic devices.

10. The method of operating a state-based remote control system of claim **8**, wherein said step (a) comprises assuming all of said external electronic devices are in a predetermined current state.

11. A method of operating a state-based remote control system having an electronic system with a communication device and an input device for controlling a at least one external electronic device, said method comprising the steps of:

(a) determining a simulated current state data of said at least one external electronic device;

(b) receiving a task request from said input device with respect to said at least one external electronic device, wherein said task request has a desired state data stored within said electronic system;

(c) determining which of said external electronic devices require a modification to their respective state in order to achieve said desired state data; and

(d) modifying at least one selected external electronic device to conform to said desired state data.

12. The method of operating a state-based remote control system of claim **11**, including the following step:

(e) updating said simulated current state data to reflect a new state of said at least one selected external electronic device.

13. The method of operating a state-based remote control system of claim **11**, wherein said step (a) comprises asking a series of questions of a user regarding an actual current state of each of said at least one external electronic device.

14. The method of operating a state-based remote control system of claim **11**, wherein said step (a) comprises assuming said at least one external electronic device is in a predetermined current state.

15. The method of operating a state-based remote control system of claim **11**, wherein said step (c) comprises comparing said simulated current state data with said desired state data.

16. The method of operating a state-based remote control system of claim **11**, including the step of:

(e) displaying a menu containing at least one task that are dependent upon a state of said at least one external electronic device.

17. A remote control apparatus, comprising:

a means for storing, calculating and updating a simulated current state data relating to at least one external electronic device, wherein said simulated current state data is calculated based upon at least one action performed in controlling said at least one electronic device;

a communication device in communication with said means, wherein said communication device is capable of emitting at least one control signal to said at least one external electronic device; and

an input device in communication with said means.

18. The remote control apparatus of claim 17, wherein said means is capable of performing tasks based upon a desired state data as compared to said simulated current state data.

19. The remote control system of claim 17, wherein said means only modifies a state of one or more electronic devices that has a simulated current state that does not match a desired state.

20. A remote control apparatus, comprising:

an electronic circuit for storing, calculating and updating a simulated current state data relating to at least one external electronic device, wherein said simulated current state data is calculated based upon at least one action performed in controlling said at least one electronic device;

a communication device in communication with said electronic circuit, wherein said communication device is capable of emitting at least one control signal to said at least one external electronic device; and

an input device in communication with said electronic circuit.

21. The remote control apparatus of claim 20, wherein said electronic circuit is capable of performing tasks based upon a desired state data as compared to said simulated current state data.

22. The remote control system of claim 20, wherein said electronic circuit only modifies a state of one or more electronic devices that has a simulated current state that does not match a desired state.

23. A method of operating a remote control for controlling at least one electronic device, said method comprising the steps of:

determining a simulated current state data of said at least one electronic device;

receiving an action request from said input device with respect to said at least one electronic device;

performing said action request by communicating to said at least one external electronic device; and

modifying said simulated current state data to reflect a new state of said at least one external electronic device based upon said action request.

24. The method of operating a remote control system of claim 23, wherein said step of determining a simulated current state data comprises asking a series of questions of a user regarding the current state of said at least one electronic device.

25. The method of operating a remote control system of claim 23, wherein said step of determining a simulated current state data comprises assuming said at least one electronic device is in a predetermined current state.

26. A method of operating a remote control system for controlling at least one electronic device, said method comprising the steps of:

determining a simulated current state data of said at least one electronic device;

receiving a task request for said at least one electronic device, wherein said task request has a desired state data;

determining if said at least one electronic device requires a modification to its respective state in order to achieve said desired state data; and

modifying a selected electronic device to conform to said desired state data if a modification of state is required.

27. The method of operating a remote control system of claim 26, including updating said simulated current state data to reflect a new state of said selected electronic device.

28. The method of operating a remote control system of claim 26, wherein said step of determining a simulated current state data comprises asking a series of questions of a user regarding an actual current state of each of said at least one external electronic device.

29. The method of operating a remote control system of claim 26, wherein said step of determining a simulated current state data comprises assuming said at least one external electronic device is in a predetermined initial current state.

30. The method of operating a remote control system of claim 26, wherein said step of determining if said at least one electronic device requires a modification comprises comparing said simulated current state data with said desired state data.

31. The method of operating a remote control system of claim 26, including the step of displaying a menu containing at least one task that is dependent upon a state of said at least one electronic device.

32. A method of operating a remote control system for controlling at least one electronic device, said method comprising the steps of:

determining a simulated current state data of said at least one electronic device;

receiving a task request for said at least one electronic device, wherein said task request has a desired state data;

determining if said at least one electronic device requires a modification to its respective state in order to achieve said desired state data based upon a comparison of said simulated current state data with said desired state data;

modifying a selected electronic device to conform to said desired state data if a modification of state is required; and

updating said simulated current state data to reflect a new state of said selected electronic device.

33. The method of operating a remote control system of claim 32, wherein said step of determining a simulated current state data comprises asking a series of questions of a user regarding an actual current state of each of said at least one external electronic device.

34. The method of operating a remote control system of claim 32, wherein said step of determining a simulated current state data comprises assuming said at least one external electronic device is in a predetermined initial current state.

35. The method of operating a remote control system of claim 32, including the step of displaying a menu containing at least one task that is dependent upon a state of said at least one electronic device.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 6,784,805 B2
APPLICATION NO. : 09/804718
DATED : August 31, 2004
INVENTOR(S) : Harris et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

IN THE CLAIMS, should read

-- 1. A state-based remote control, comprising:

a remote control capable of storing, calculating and updating a simulated current state data relating to at least one external electronic device;

a communication device connected to said remote control for emitting a control signal to said at least one external electronic device; and

an input unit connected to said remote control for communicating with said remote control;

wherein said simulated current state data is calculated and updated based upon at least one action performed by said remote control in controlling said at least one electronic device prior to a next action or a next task.

2. The state-based remote control of Claim 1, wherein said input unit includes a keypad having a plurality of buttons.

3. The state-based remote control of Claim 1, wherein said input unit includes a display.

4. The state-based remote control of Claim 1, wherein said remote control is capable of performing tasks based upon a desired state data as compared to said simulated current state data.

5. The state-based remote control of Claim 1, wherein said remote control only modifies a state of an electronic device that has a simulated current state that does not match a desired state.

6. The state-based remote control of Claim 1, wherein said communication device is able to transmit and receive data.

7. The state-based remote control of Claim 1, wherein said remote control is programmable to allow for the control of a plurality of external electronic devices.

8. A method of operating a state-based remote control having an electronic circuit with a communication device and an input device for controlling at least one external electronic device, said method comprising the steps of:

(a) determining a simulated current state data of said at least one external electronic device;

(b) receiving an action request or a task request from said input device with respect to said at least one external electronic device;

(c) performing said action request or said task request by communicating to said at least one external electronic device; and

(d) modifying said simulated current state data to reflect a new state of said at least one external electronic device based upon said action request or said task request prior to a next action request or a task request.

CERTIFICATE OF CORRECTION

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APPLICATION NO. : 09/804718
DATED : August 31, 2004
INVENTOR(S) : Harris et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

9. The method of operating a state-based remote control of Claim 8, wherein said step (a) comprises asking a series of questions of a user regarding the current state of each of said at least one external electronic device.

10. The method of operating a state-based remote control of Claim 8, wherein said step (a) comprises assuming said at least one external electronic device is in a predetermined current state.

11. A method of operating a state-based remote control having an electronic circuit with a communication device and an input device for controlling at least one external electronic device, said method comprising the steps of:

(a) determining a simulated current state data of said at least one external electronic device;

(b) receiving a task request from said input device with respect to said at least one external electronic device, wherein said task request has a desired state data stored within said electronic circuit;

(c) determining which of said at least one external electronic device require a modification to their respective state in order to achieve said desired state data;

(d) modifying at least one selected external electronic device to conform to said desired state data; and

(e) updating said simulated current state data to reflect a new state of said at least one selected external electronic device prior to a next task or a next action.

12. Canceled

13. The method of operating a state-based remote control of Claim 11, wherein said step (a) comprises asking a series of questions of a user regarding an actual current state of each of said at least one external electronic device.

14. The method of operating a state-based remote control of Claim 11, wherein said step (a) comprises assuming said at least one external electronic device is in a predetermined current state.

15. The method of operating a state-based remote control of Claim 11, wherein said step (c) comprises comparing said simulated current state data with said desired state data.

16. The method of operating a state-based remote control of Claim 11, including the step of: (e) displaying a menu containing at least one task that is dependent upon a state of said at least one external electronic device.

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It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

17. A remote control apparatus, comprising:

a means for storing, calculating and updating a simulated current state data relating to at least one external electronic device, wherein said simulated current state data is calculated and updated based upon at least one action performed in controlling said at least one electronic device prior to a next action or a next task;

a communication device in communication with said means, wherein said communication device is capable of emitting at least one control signal to said at least one external electronic device; and

an input device in communication with said means.

20. A remote control apparatus, comprising:

an electronic circuit for storing, calculating and updating a simulated current state data relating to at least one external electronic device, wherein said simulated current state data is calculated based upon at least one action performed in controlling said at least one electronic device prior to a next action or a next task;

a communication device in communication with said electronic circuit, wherein said communication device is capable of emitting at least one control signal to said at least one external electronic device; and

an input device in communication with said electronic circuit.

21. The remote control apparatus of Claim 20, wherein said electronic circuit is capable of performing tasks based upon a desired state data as compared to said simulated current state data.

22. The remote control apparatus of Claim 20, wherein said electronic circuit only modifies a state of one or more electronic devices that has a simulated current state that does not match a desired state.

23. A method of operating a remote control for controlling at least one electronic device, said method comprising the steps of:

determining a simulated current state data of said at least one electronic device; receiving an action request from said input device with respect to said at least one electronic device;

performing said action request by communicating to said at least one external electronic device; and

modifying said simulated current state data to reflect a new state of said at least one external electronic device based upon said action request prior to a next action request or a next task request.

24. The method of operating a remote control of Claim 23, wherein said step of determining a simulated current state data comprises asking a series of questions of a user regarding the current state of said at least one electronic device.

25. The method of operating a remote control of Claim 23, wherein said step of determining a simulated current state data comprises assuming said at least one electronic device is in a predetermined current state.

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APPLICATION NO. : 09/804718
DATED : August 31, 2004
INVENTOR(S) : Harris et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

26. A method of operating a remote control for controlling at least one electronic device, said method comprising the steps of:

determining a simulated current state data of said at least one electronic device; receiving a task request for said at least one electronic device, wherein said task request has a desired state data; determining if said at least one electronic device requires a modification to its respective state in order to achieve said desired state data;

modifying a selected electronic device to conform to said desired state data if a modification of state is required; and

updating said simulated current state data to reflect a new state of said selected electronic device prior to a next task or a next action.

27. Canceled

28. The method of operating a remote control of Claim 26, wherein said step of determining a simulated current state data comprises asking a series of questions of a user regarding an actual current state of each of said at least one external electronic device.

29. The method of operating a remote control of Claim 26, wherein said step of determining a simulated current state data comprises assuming said at least one external electronic device is in a predetermined initial current state.

30. The method of operating a remote control of Claim 26, wherein said step of determining if said at least one electronic device requires a modification comprises comparing said simulated current state data with said desired state data.

31. The method of operating a remote control of Claim 26, including the step of displaying a menu containing at least one task that is dependent upon a state of said at least one electronic device.

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

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APPLICATION NO. : 09/804718
DATED : August 31, 2004
INVENTOR(S) : Harris et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

32. A method of operating a remote control for controlling at least one electronic device, said method comprising the steps of:

determining a simulated current state data of said at least one electronic device;

receiving a task request for said at least one electronic device, wherein said task request has a desired state data;

determining if said at least one electronic device requires a modification to its respective state in order to achieve said desired state data based upon a comparison of said simulated current state data with said desired state data;

modifying a selected electronic device to conform to said desired state data if a modification of state is required; and

updating said simulated current state data to reflect a new state of said selected electronic device prior to a next action request or a next task request.

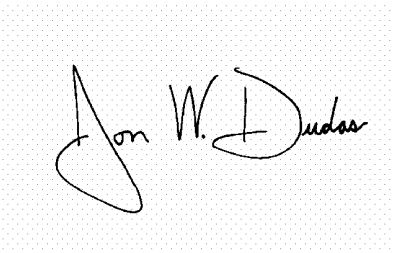
33. The method of operating a remote control of Claim 32, wherein said step of determining a simulated current state data comprises asking a series of questions of a user regarding an actual current state of each of said at least one external electronic device.

34. The method of operating a remote control of Claim 32, wherein said step of determining a simulated current state data comprises assuming said at least one external electronic device is in a predetermined initial current state.

35. The method of operating a remote control of Claim 32, including the step of displaying a menu containing at least one task that is dependent upon a state of said at least one electronic device. --

Signed and Sealed this

Nineteenth Day of September, 2006



JON W. DUDAS
Director of the United States Patent and Trademark Office