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H4T TBLM T109 T131 T149 T150
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S2108 S2124 S2125 S2205 S2206 S2210 S2212 S2215

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US 5440325 A

(58) Field of Search
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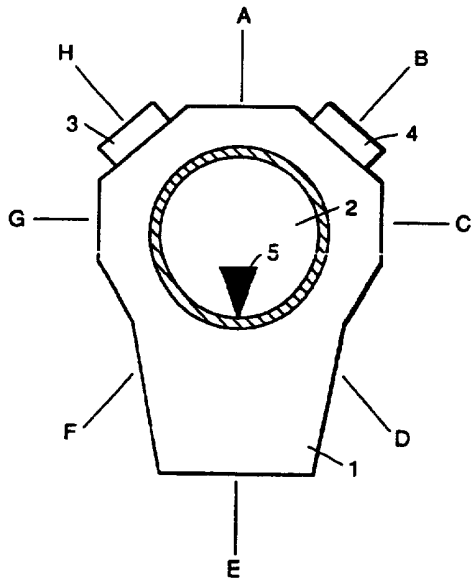
INT CL^6 G06F

(54) Abstract Title
Selecting display icons

(57) A media selecting device enables a user to easily select any one of hierarchically-related icons by moving a series of icons across a display screen by turning a rotary disk-type knob (2), a first change-over button (3) being pressed when the required icon is at a central position,thereby displaying icons of a lower hierarchical layer as a static array from which one can be selected by turning the knob to the appropriate angle and pressing the button (3), there being a second change-over button (4) for cancelling the selected icon and displaying icons of a higher hierarchical layer. The icons have different three-dimensional shapes and are disposed in a three-dimensional virtual space, thus increasing the visibility and controllability of the device.

FIG.1



GB 2 322 463 A

FIG.1

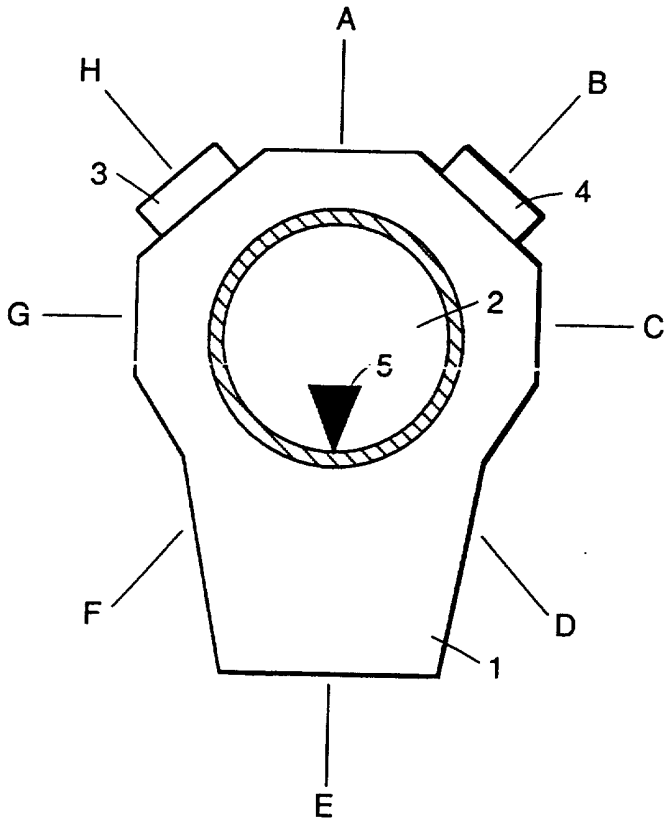


FIG.2

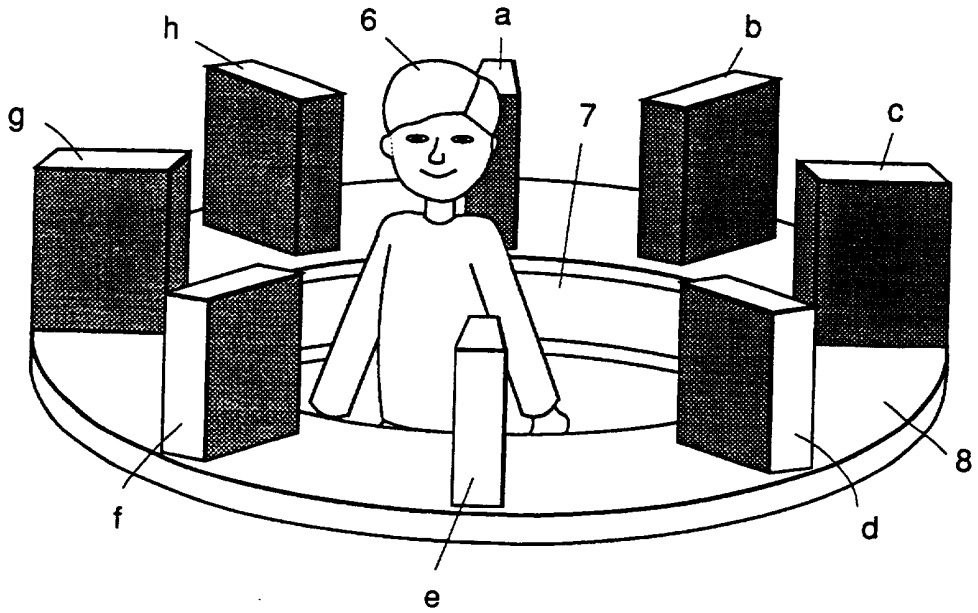


FIG.3A

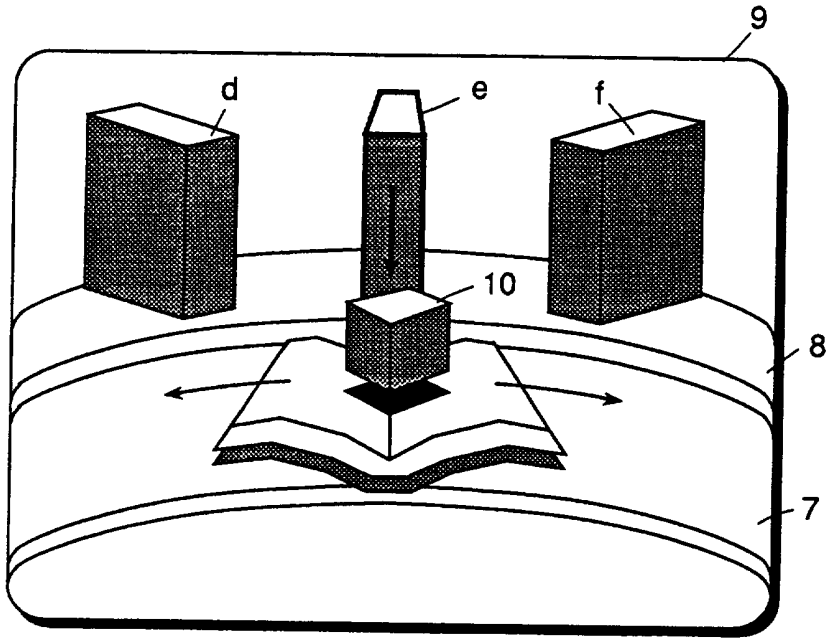


FIG.3B

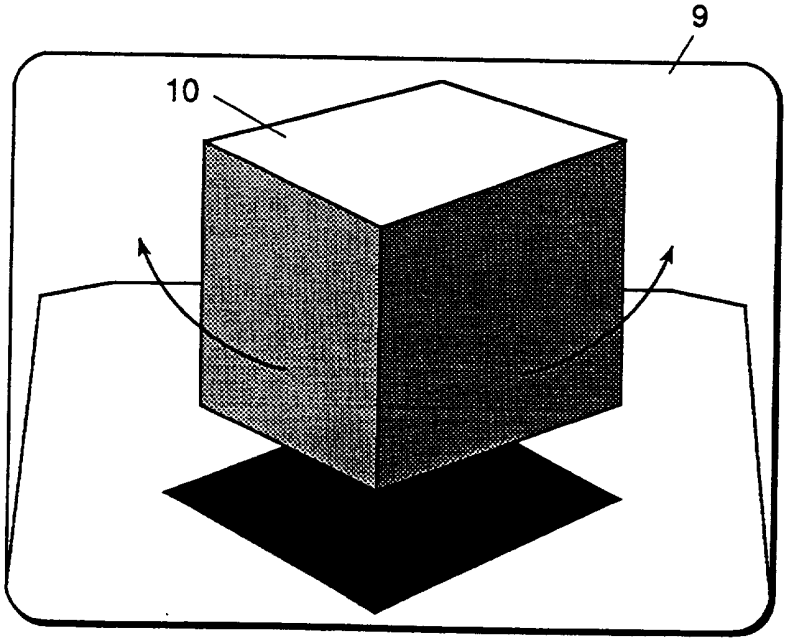


FIG.4A

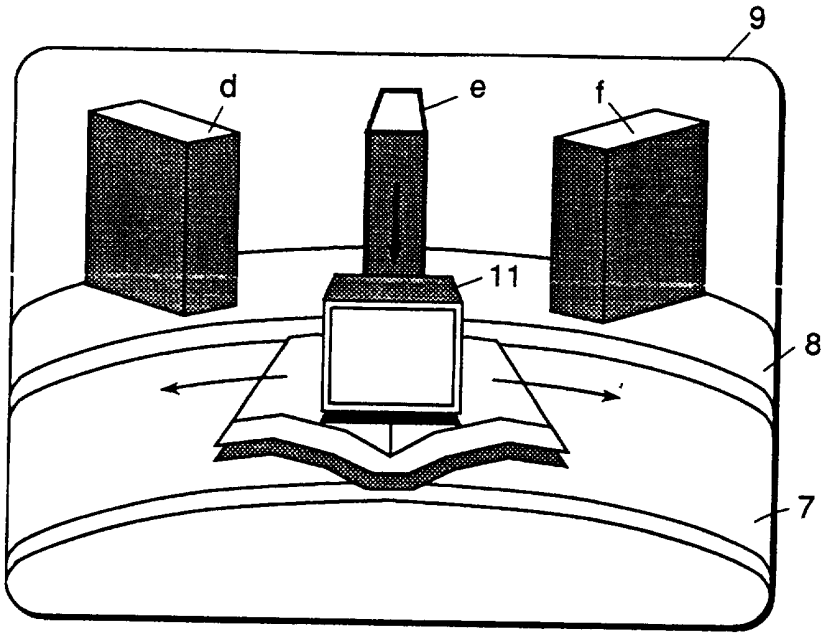


FIG.4B

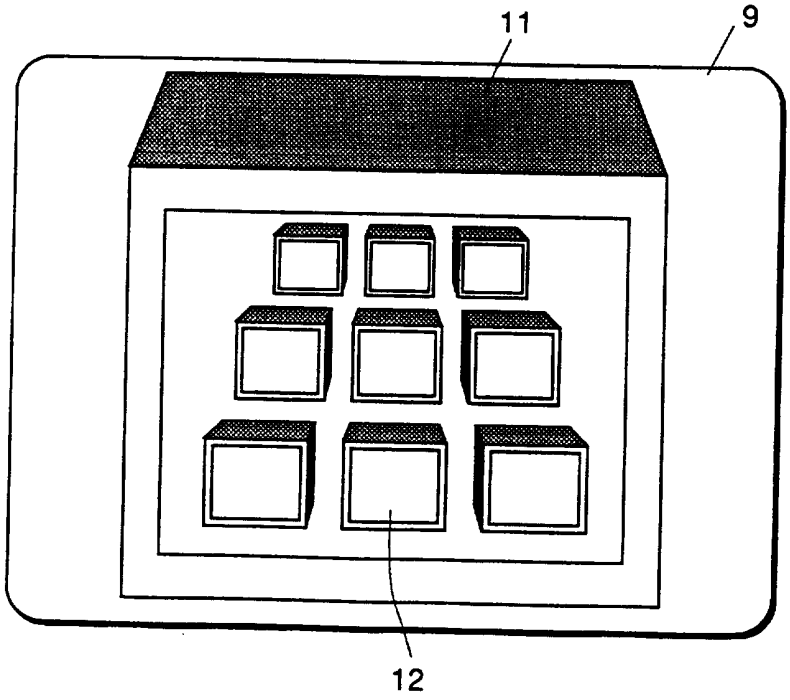


FIG.5A

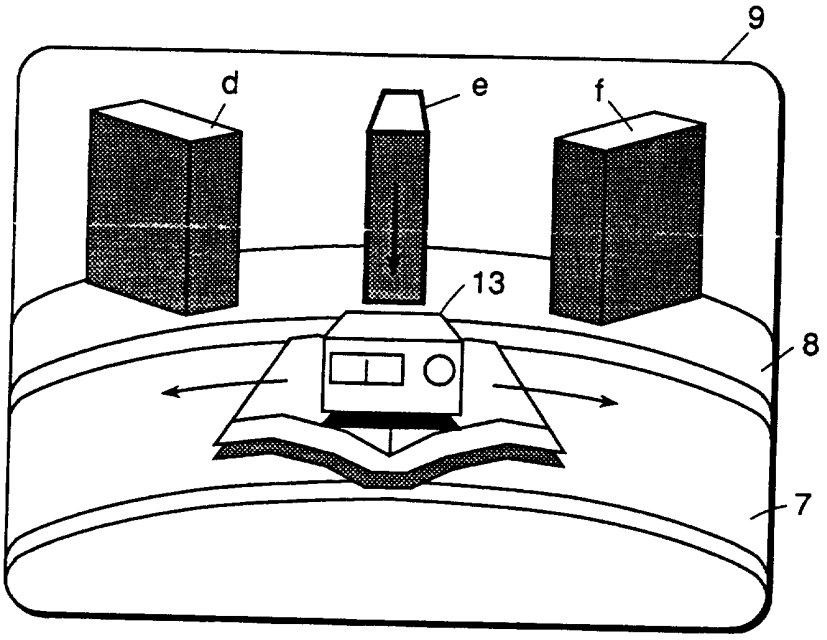

9
d
e
f
13
8
7

FIG.5B

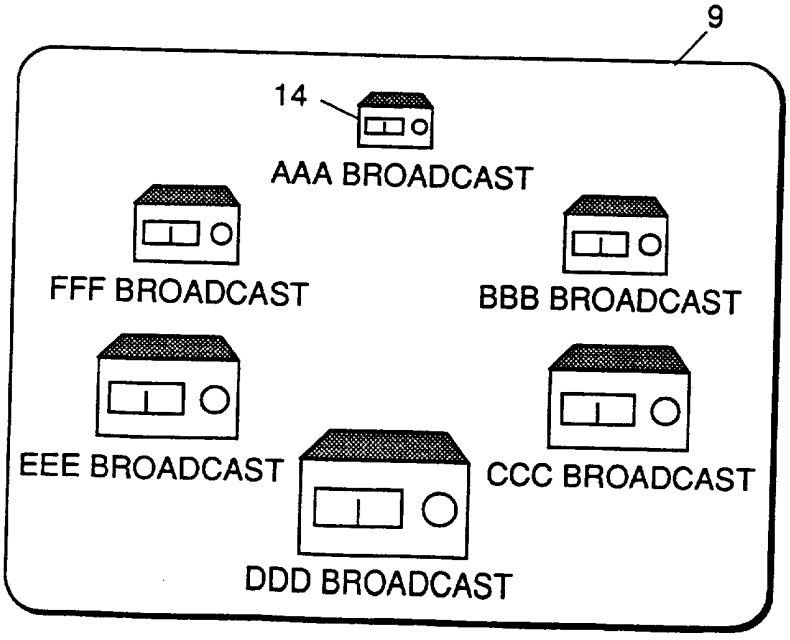

9
14
AAA BROADCAST
FFF BROADCAST
BBB BROADCAST
EEE BROADCAST
CCC BROADCAST
DDD BROADCAST

FIG.6A

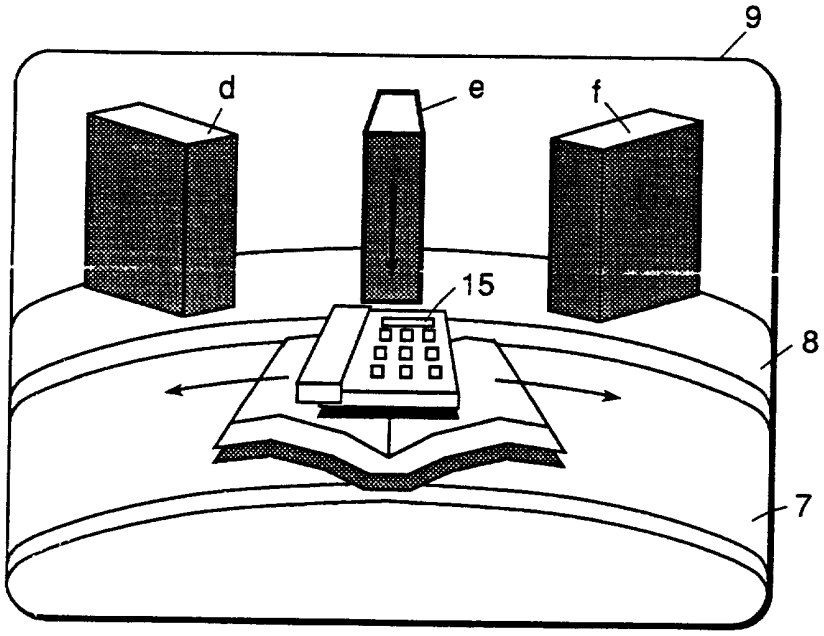

9
d
e
f
15
8
7

FIG.6B

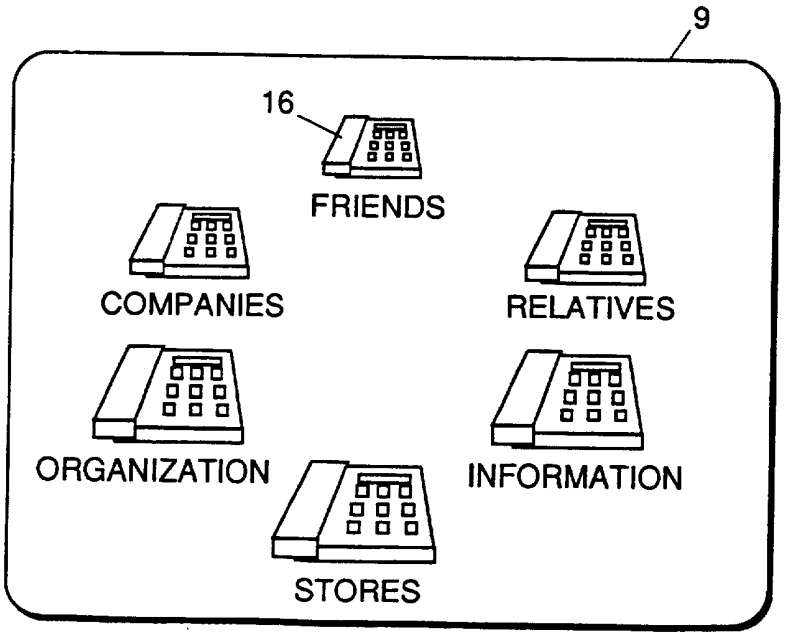

9
16
FRIENDS
COMPANIES
RELATIVES
ORGANIZATION
INFORMATION
STORES

FIG.7A

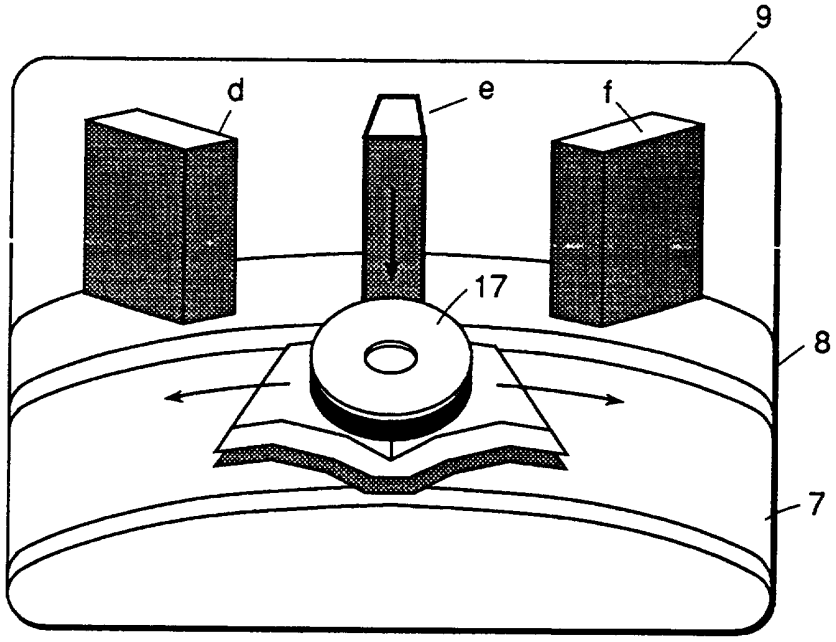

9
d
e
f
17
8
7

FIG.7B

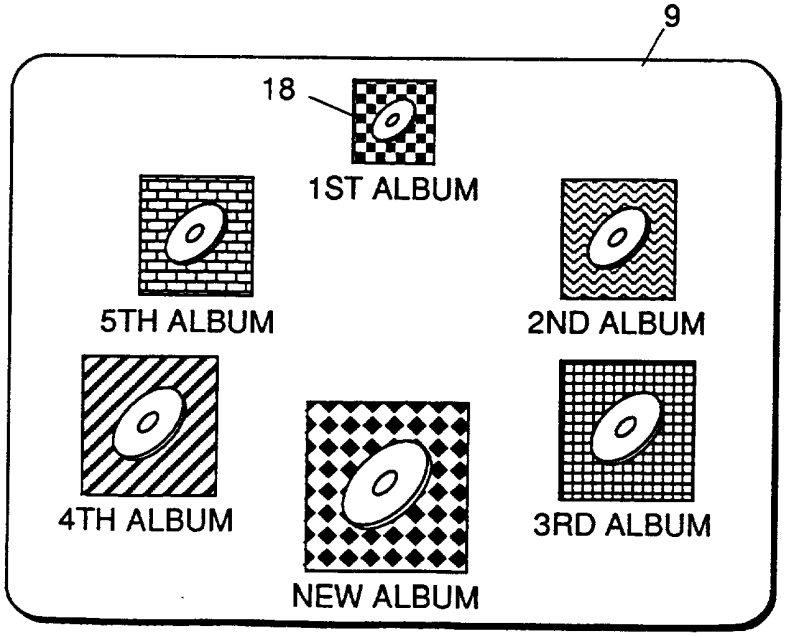

9
18
1ST ALBUM
5TH ALBUM
2ND ALBUM
4TH ALBUM
3RD ALBUM
NEW ALBUM

FIG.8A

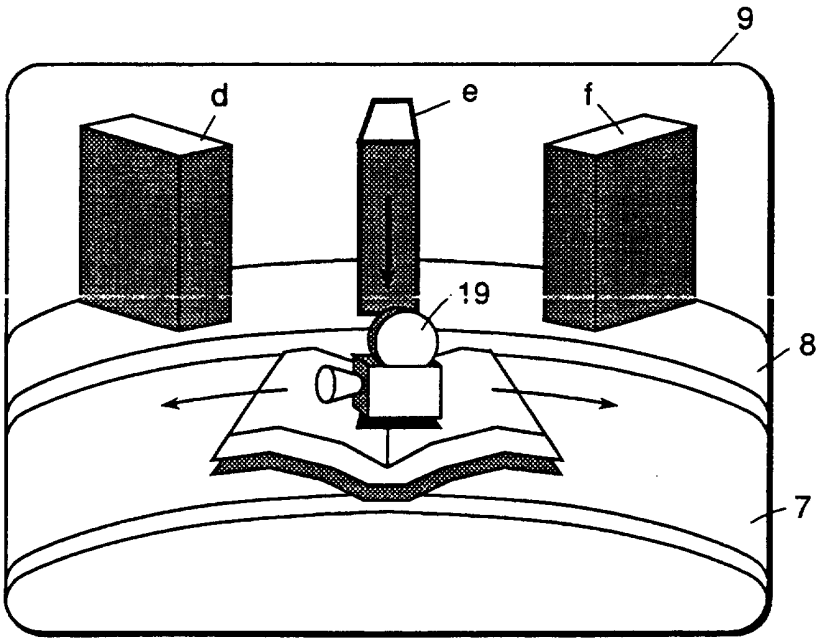


FIG.8B

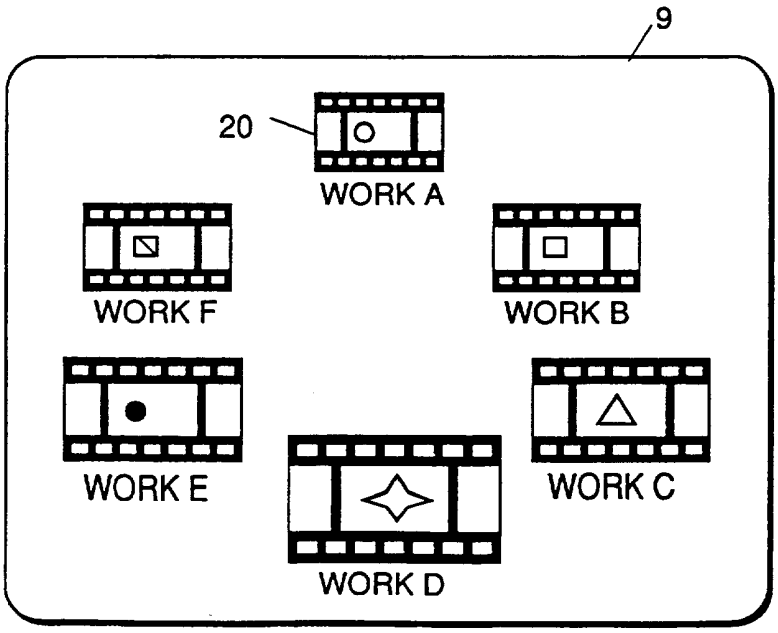


FIG.9A

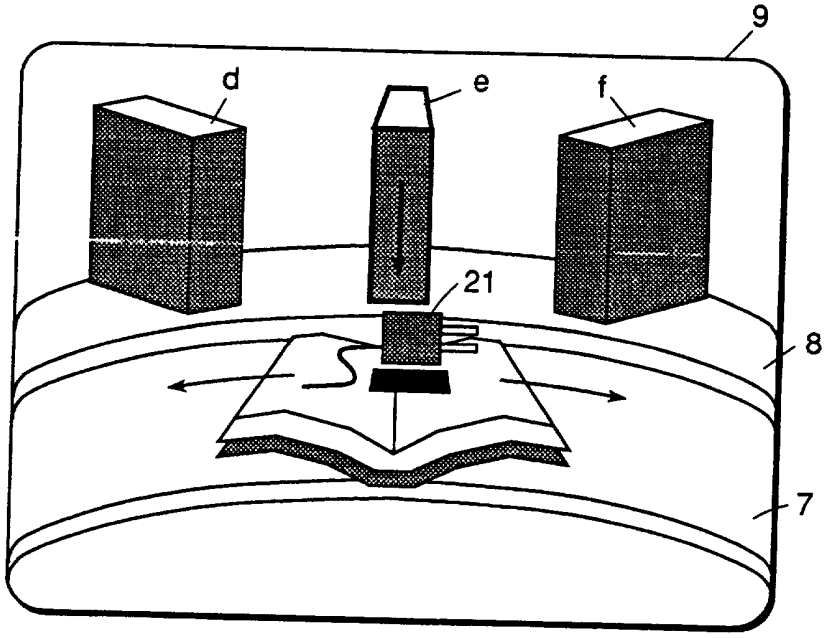

9
d
e
f
21
8
7

FIG.9B

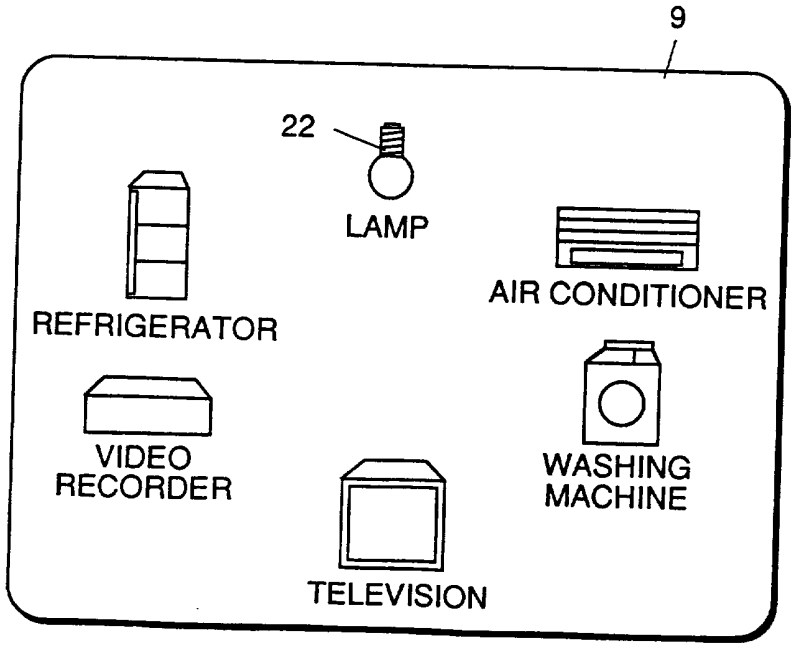

9
22
LAMP
REFRIGERATOR
AIR CONDITIONER
VIDEO RECORDER
WASHING MACHINE
TELEVISION

FIG.10A

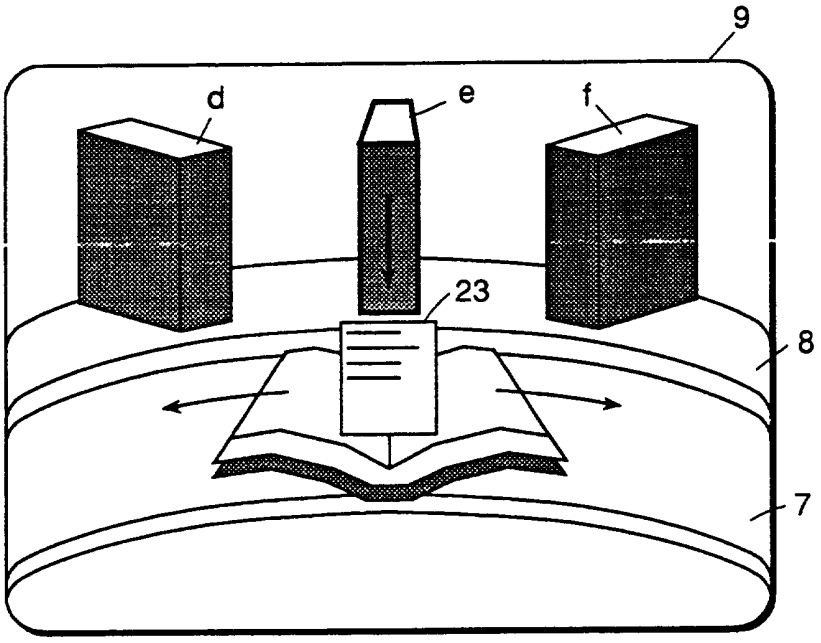


FIG.10B

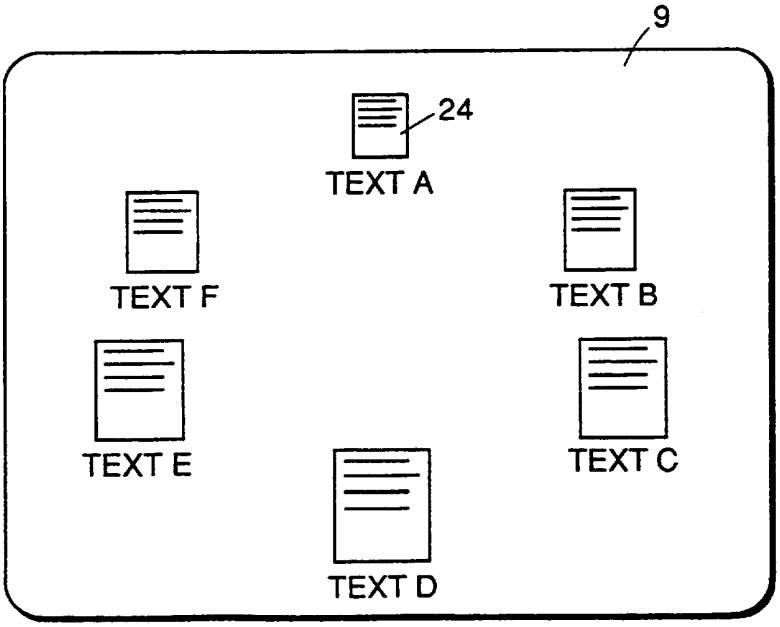


FIG.11A

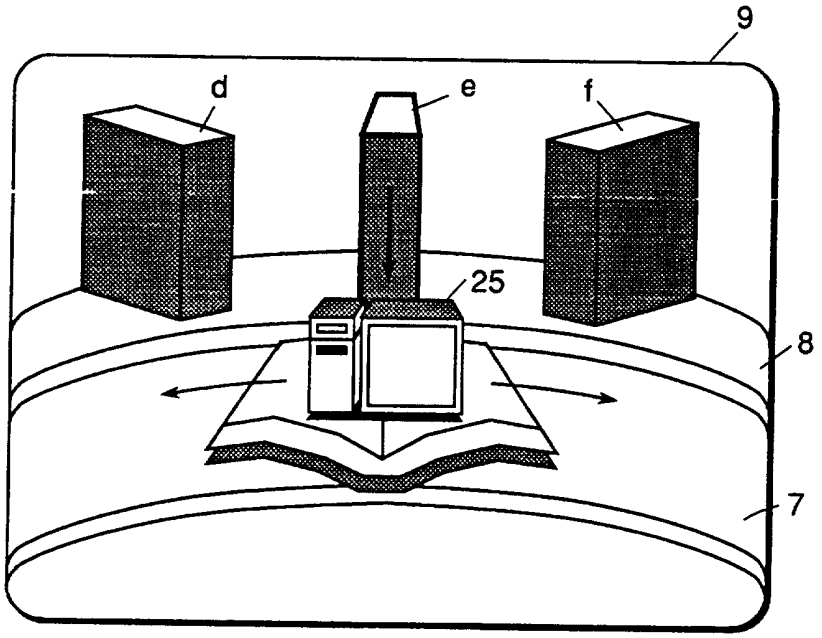


FIG.11B

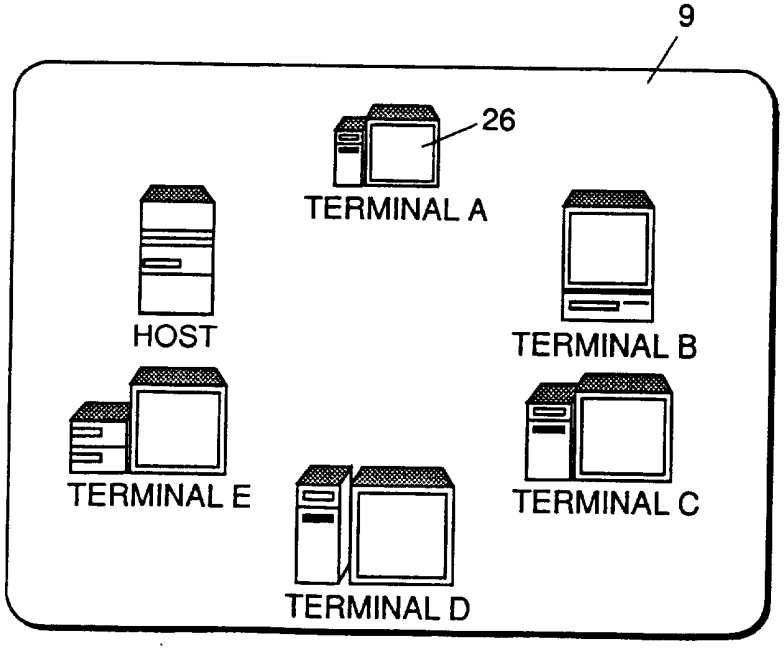


FIG.12A

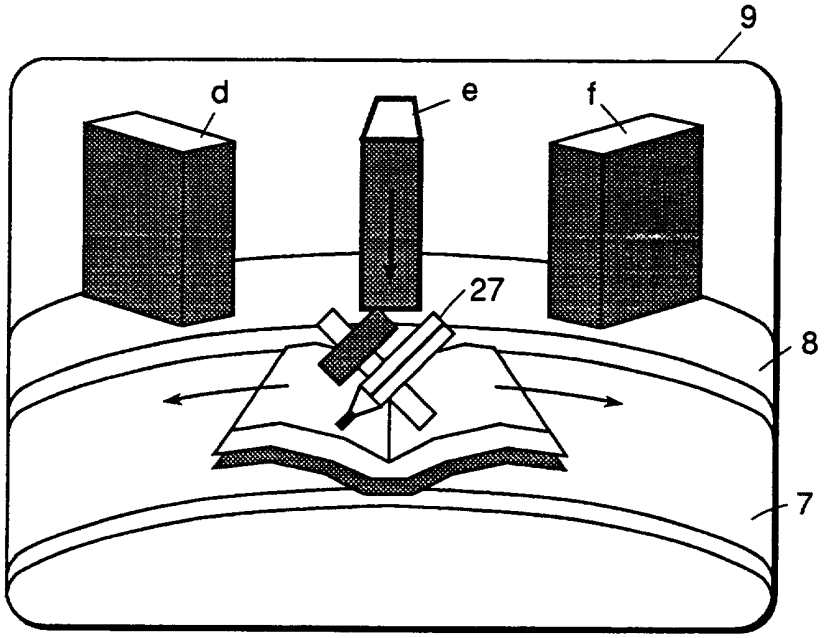


FIG.12B

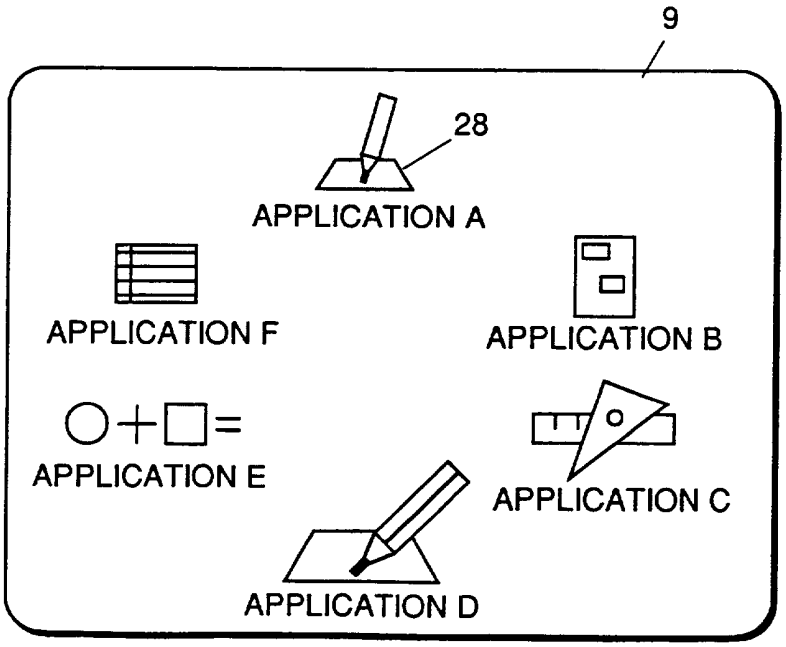


FIG.13A

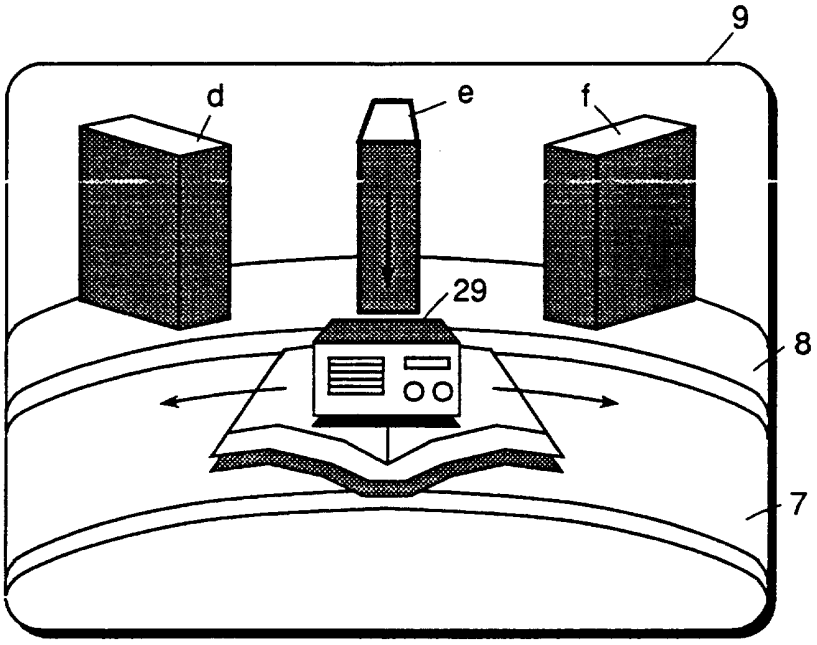


FIG.13B

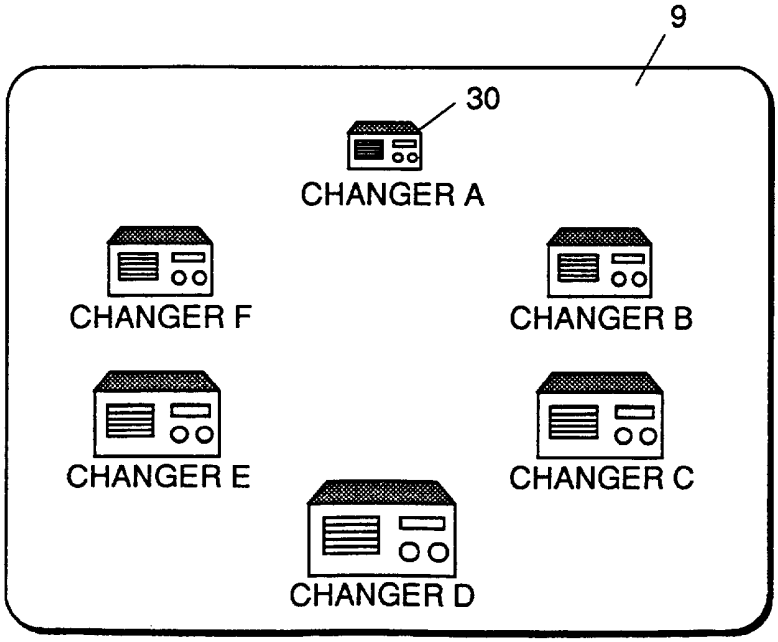


FIG.14A

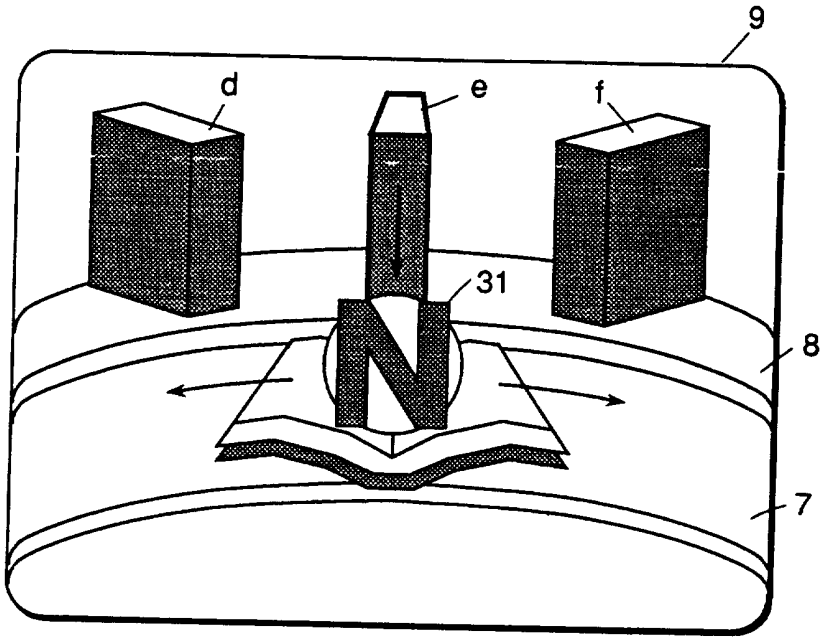


FIG.14B

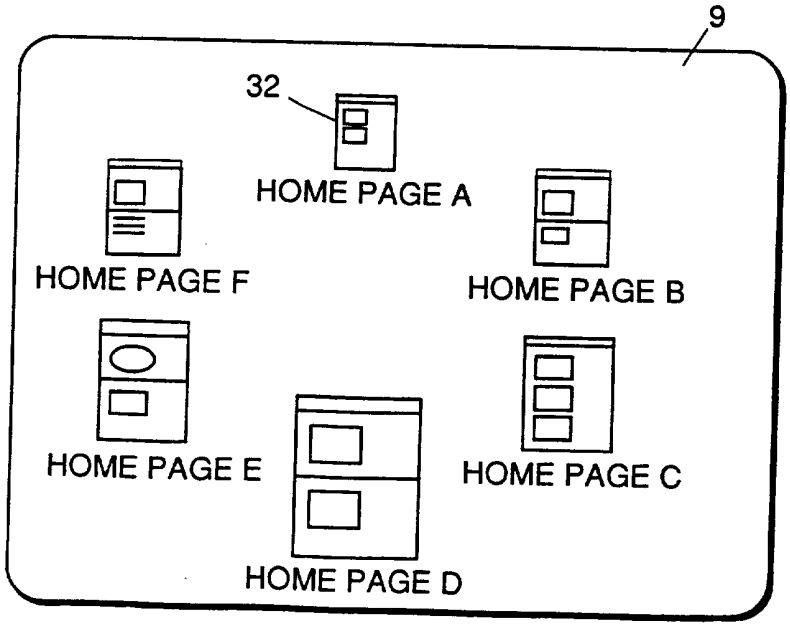
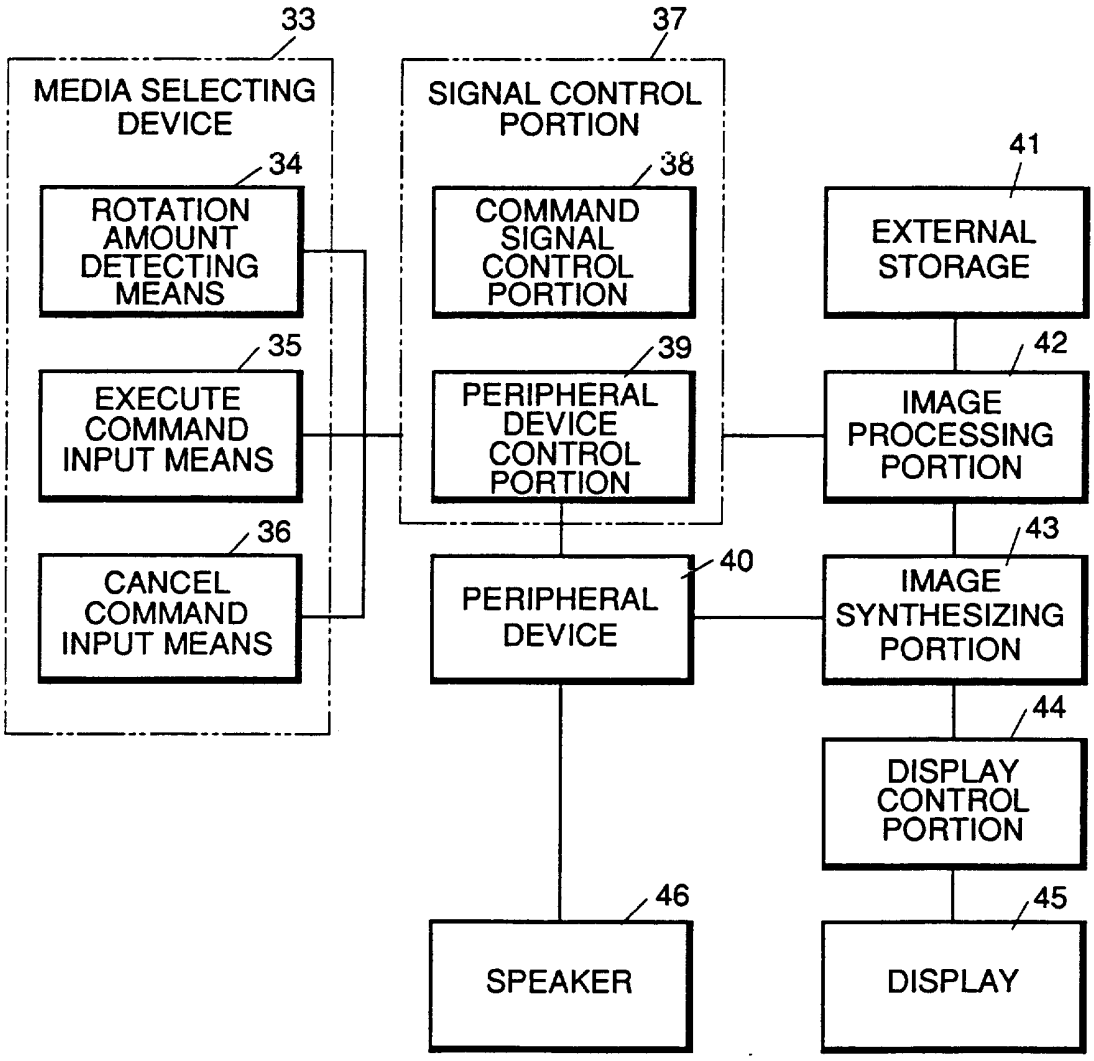


FIG.15


33
MEDIA SELECTING DEVICE
34
ROTATION AMOUNT DETECTING MEANS
35
EXECUTE COMMAND INPUT MEANS
36
CANCEL COMMAND INPUT MEANS
37
SIGNAL CONTROL PORTION
38
COMMAND SIGNAL CONTROL PORTION
39
PERIPHERAL DEVICE CONTROL PORTION
40
PERIPHERAL DEVICE
46
SPEAKER
41
EXTERNAL STORAGE
42
IMAGE PROCESSING PORTION
43
IMAGE SYNTHESIZING PORTION
44
DISPLAY CONTROL PORTION
45
DISPLAY

MEDIA SELECTING DEVICE

BACKGROUND OF THE INVENTION

The recent remarkable development of television technology has been reflected in producing television receivers (hereinafter referred to as TV) which are featured by a variety of additional functions. Furthermore, TVs may be used for displaying, besides usual TV broadcasts, a variety of other media such as satellite multichannel broadcast, CS broadcast, television game broadcast, music broadcast "karaoke" and so on. Such multi-function multi-channel TVs may be associated with complicated manipulation with an increased number of remote control buttons on a remote control unit. Many attempts have been made to improve the maneuverability of control means.

A television broadcast channel selecting device, which is one of basic functions of a television receiver, is now considered. A typical electronic tuner of the TV is used for selecting a broadcast channel by applying a selecting a tuning voltage. The use of this electronic tuner enables a user to easily select a desired broadcast channel by pressing a corresponding channel selecting button on a remote control panel.

Sometime the user wants to make a short view of what current programs are broadcast at receivable channels on the TV screen to decide a program to enjoy. In this case, the user has to sequentially select channels by pressing a number of (e.g., ten) channel-selecting buttons on the control panel, recognizing a channel number every time before pressing the buttons. The provision of TV-channel selecting buttons "UP" and "DOWN" is also proposed, which method, however, can not directly select a desired channel and requires repeatedly pressing the button "UP" or "DOWN" until the desired channel number appears. It may take time and labor. Moreover both methods are limited to the number of channels to be selected.

Recently, there has been devised a channel selection aiding method by which a screen of a TV is temporally divided into a plurality of windows and still pictures of different TV broadcast channels are simultaneously displayed one in each window. This method may facilitate the selection of any desired program, but it involves a problem that an increasing number of receivable TV broadcast channels requires more divisions of the TV screen. This makes each window be smaller in area and be harder to recognize a picture displayed therein.

The above-mentioned techniques relate to TV tuners

for selecting one of receivable broadcast channels. Furthermore, the user of TVs may encounter in many circumstances the similar difficulty to select one from a large number of media or data.

Besides the foregoing remote control functions, selection of a particular one from a large number of things is also achieved by using a matrix switch which selects a particular button existing at one of cross points formed by rows and columns. This switch, however, has the limitation on the number of buttons and requires the user to accurately recognize a desired cross-point in the matrix.

The user interface of a computer terminal has hierarchically-ordered folders that can hold a number of files and can be opened downwards in the hierarchy to select a particular one of files. In this case, folders are successively presented in a two-dimensional plane on a TV monitor. With a large hierarchy containing a large number of folders, there may occur a problem that the screen of the monitor is crowded with the folders overlapping one another. This takes much times to open the folders and makes it harder to find a desired file.

Recently, another method has been proposed, which enables the user to access by means of a mouse to any one of many icons representing representative items in

a pseudo-virtual space on a monitor screen to obtain lower-layer icons related to the accessed representative icons. The icons used thereon are hard to distinguish from one another since they have similar shape with character expressions underneath. In order to promptly select a particular one of many representative icons disposed in the space, the user has to keep in own memory the whereabouts of particular icons to be often selected. Furthermore, the icons lacking in three-dimensional shape information have no possibility of distinguishing from each other by utilizing the depth of space.

In addition, Japanese Laid-open Patent Publication Nos. 7-49764, 7-84746 and 7-114451 disclose methods of displaying icon menu, each of which uses a menu of three-dimensionally represented icons to make easier for the user to recognize and select a particular one of many icons. The presentation of icons in the depth in a three-dimensional space, however, encounters a problem that selectable icons may not easily be distinguished and selected since icons disposed in the depth are smaller and a system for indicating a particular place in the space becomes complicate.

Namely, three-dimensional icons as compared with conventional two-dimensional icons are easier to be recognized owing to their three-dimentional shape in

the depth direction. However, the icons disposed in the depth of the space may be smaller, any place in the three-dimensional space may be frequently designated and it becomes difficult to determine icons to be selectable or to position a cursor on an area of a selectable icon by using a mouse.

The techniques disclosed in Japanese Laid-open Patent Publication Nos. 7-49764 and 7-114451 have common problems that icons with names indicated underneath, arranged in an image of room space, are hard to designate by a cursor and have not enough size to be easily distinguished especially in the depth of the room space. Sometimes, icons themselves may become smaller as if it is eraser. It is difficult to correctly position a cursor over a particular one among a large number of such three-dimensional icons by using a conventional mouse. Consequently, both methods have a limitation on the size and the number of icons to be displayed.

The technique described in Japanese Laid-open Patent Publication No. 7-84746 requires the user to be skilled in manipulating a pointing device for rotating each cube side by side to select one of icons disposed on side surfaces of the cube. The selecting operation is complicate. Furthermore, it is also difficult to find a desired icon because icons on surfaces of the

cube have no linkage with each other.

SUMMARY OF THE INVENTION

The present invention relates to a media selecting device and more particularly to a media selecting device using icons disposed in a virtual space, and directed to provide a media selecting device which is capable of easily selecting any desired one of a large number of icons representing respective media.

An object of the present invention is to provide a media selecting device for selecting any one of media by selecting corresponding one of icons representing respective media and contained in one of hierarchical layers, which device comprises: display means for displaying a plurality of icons in one of the hierarchical layers; icon-selecting means for selecting any one of the icons by using a rotary disc type knob that can be turned in both directions to change the displaying order of the icons in both directions; a first change-over switch button for presenting icons in a lower hierarchical layer related to the current selected icon or deciding the current selected icon to select the corresponding medium there through; and a second switch button for cancelling the current selected icon and presenting icons of an upper

layer related to the cancelled icon. Namely, the present invention is intended to create a media-selecting device which realizes an excellent visibility of icons and controllability and enables the user to easily select any desired one of icons representing corresponding media on a display screen by turning a selecting knob to point a corresponding position on its scale with no need of positioning a cursor over the icon on the screen and to freely changing a hierarchical layers of icons from up to down and reverse by using at least two buttons "Execute" and "Cancel" (first and second change-over button).

Another object of the present invention is to provide a media selecting device wherein the display means presents three-dimensional icons that are easily distinguishable from one another by their three-dimensional shapes and locations in a three-dimensional virtual space on a display screen and, therefore, enables the user to intuitively recognize the location of any desired icon in the virtual space.

Another object of the present invention is to provide a media-selecting device which is capable of displaying an icon selected by the icon selecting means in a clearly distinguishable way (e.g., by changing brightness), thus making easier for the user to select any one of icons on a display screen.

Another object of the present invention is to provide a media selecting device which can be easily adapted to a variety of media selecting applications by setting selectable media (items) at respective icons and which can easily select any one of receivable television broadcast channels by selecting corresponding one of icons on a display screen.

Another object of the present invention is to provide a media-selecting device which can be easily adapted to a variety of media selecting applications by setting selectable media (items) at respective icons and which can easily select any one of receivable voice broadcast channels by selecting corresponding one of icons on a display screen.

Another object of the present invention is to provide a media-selecting device which can be easily adapted to a variety of media selecting applications by setting selectable media (items) at respective icons and which can easily select any one of telephone numbers and/or facsimile numbers by selecting corresponding one of icons on a display screen.

Another object of the present invention is to provide a media-selecting device which can be easily adapted to a variety of media selecting applications by setting selectable media (items) at respective icons and which can easily select any one of audio recording

means by selecting corresponding one of icons on a display screen.

Another object of the present invention is to provide a media-selecting device which can be easily adapted to a variety of media selecting applications by setting selectable media (items) at respective icons and which can easily select any one of video recording means by selecting corresponding one of icons on a display screen.

Another object of the present invention is to provide a media-selecting device which can be easily adapted to a variety of media selecting applications by setting selectable media (items) at respective icons and which can easily select any one of controllers of household electrical appliances by selecting corresponding one of icons on a display screen.

Another object of the present invention is to provide a media-selecting device which can be easily adapted to a variety of media selecting applications by setting selectable media (items) at respective icons and which can easily select any one of text data by selecting corresponding one of icons on a display screen.

Another object of the present invention is to provide a media-selecting device which can be easily adapted to a variety of media selecting applications by

setting selectable media (items) at respective icons and which can easily select any one of computer processors by selecting corresponding one of icons on a display screen.

Another object of the present invention is to provide a media-selecting device which can be easily adapted to a variety of media selecting applications by setting selectable media (items) at respective icons and which can easily select any one of application programs by selecting corresponding one of icons on a display screen.

Another object of the present invention is to provide a media-selecting device which can be easily adapted to a variety of media selecting applications by setting selectable media (items) at respective icons and which can easily select any one of autochangers by selecting corresponding one of icons on a display screen.

BRIEF DESCRIPTION OF DRAWINGS

Fig. 1 is a plan view of a media selecting device according to one aspect of the present invention.

Fig. 2 is a conceptual view showing an example of a virtual reality space image presented by a media selecting device according to one aspect of the present

invention.

Figs. 3A and 3B are illustrative of an image, viewed from a view-point of an observer, in the virtual-reality space presented by the media selecting device of Fig. 2.

Figs. 4A and 4B are conceptual illustration of a media selecting device according to another aspect of the present invention, which is used for selecting a particular one of TV broadcast programs.

Figs. 5A and 5B are conceptual illustration of a media selecting device according to another aspect of the present invention, which function corresponds to a tuner of a radio receiver.

Figs. 6A and 6B are conceptual illustration of a media selecting device according to another aspect of the present invention, which media content consists of telephone sets.

Figs. 7A and 7B are conceptual illustration of a media selecting device according to another aspect of the present invention, which media content consists of CD player sets.

Figs. 8A and 8B are conceptual illustration of a media selecting device according to another aspect of the present invention, which media content consists of video player sets.

Figs. 9A and 9B are conceptual illustration of a

media selecting device according to another aspect of the present invention, which media content consists of home automation controller.

Figs. 10A and 10B are conceptual illustration of a media selecting device according to another aspect of the present invention, which media content consists of text information.

Figs. 11A and 11B are conceptual illustration of a media selecting device according to another aspect of the present invention, which media content consists of computing processors.

Figs. 12A and 12B are conceptual illustration of a media selecting device according to another aspect of the present invention, which media content consists of application programs.

Figs. 13A and 13B are conceptual illustration of a media selecting device according to another aspect of the present invention, which media content consists of auto-changers.

Figs. 14A and 14B are conceptual illustration of a media selecting device according to another aspect of the present invention, which media content consists of browser programs of an internet.

Fig. 15 is a block diagram showing an example of construction of a media selecting device according to the present invention.

PREFERRED EMBODIMENTS OF THE INVENTION

A media selecting device according to the present invention is intended to easily select a particular one of media by selecting corresponding one of icons disposed in a three-dimensional space on a display screen, which is provided with a unique media selecting system that can select icons in succession by turning a rotary disc type knob. This media selecting device enables a user to easily select any small icon disposed in the depth of the three-dimensional space with no need of determining which icons are selectable (i.e., eliminating the possibility of selecting an object that can not be selected). The selecting device is simple in construction and easy to operate, allowing the user to select the object in an intuitive way. The hierarchical presentation of lower-layer icons enables the user to easily recognize enlarged icons in the same layer, preventing the display screen from being crowded with a large number of icons overlapping one another. In other words, the media selecting device according to the present invention can present icons at an excellent visibility and be so easily controlled that icons may be recognized at a glance and any desired one of them can be easily selected and acknowledged.

As a stated above, the problems involved in the prior art devices for selecting three-dimensional icons disposed in a virtual three-dimensional space can be solved by a system including the media selecting device according to the present invention, which device can facilitate the selection of any desired medium by using a rotary disc type knob for selecting corresponding one of three-dimensional icons representing respective media and displayed in one of the hierarchical layers. To select a desired icon from a menu, for example, the knob is turned to place its pointer at a corresponding position and, then, a button of the knob is pressed to select the medium through that icon.

Namely, the media selecting device according to the present invention has the icon selecting means for selecting any desired one of multiple icons disposed in a three-dimensional virtual space on a display screen, a first change-over button for recognizing the icon selected by the icon selecting means, accessing thereto and displaying icons of a lower layer linked with the accessed icon, and a second change-over button for cancelling current displayed icons and presenting icons of an upper layer in a virtual space on the display screen, wherein the icon selecting means can successively select icons by turning its rotary disk type knob. This enables the user to easily select any

desired one of icons representing respective media stored in the corresponding addresses.

The application of the media selecting device according to the present invention enables the user to easily select any one of icons disposed in a three-dimensional virtual space on the display screen by turning the rotary disk type knob and further to display icons of a lower layer or an upper layer related to the selected icon on the display screen by pressing the first or second change-over button. Namely, icons can be easily recognized in a space and in a simply structured hierarchy. This realizes easy selection of any desired one among a large number of items represented by the icons.

Referring the accompanying drawings, preferred embodiments of the present invention will be described below in detail. In drawings, like elements are given like reference numerals throughout, omitting repeated explanation. Fig. 1 is a plan view of a media selecting device according to an aspect of the present invention. This media-selecting device comprises a main body of media selecting device 1, a turning knob 2 for selecting a desired icon, a execution input button (first change-over button) 3 and a cancellation input button (second change-over button) 4. An arrow 5 indicates a selecting direction and characters A - H

indicate the direction of the turning knob 2.

Fig. 2 is a conceptual illustration of a virtual reality space created on a display screen by a media selecting device according to the present invention. In Fig. 2, there is shown a user 6, a lower round table 7, an upper round table 8 and books a to h (each of them is as a metaphor for an icon).

The virtual reality space is occupied by a user 6 surrounded by a lower round table 7 and a larger upper round table 8 disposed above the lower round table 7 and books a - h placed on the upper round table 8. Each of the books is used as a metaphor for an icon. A rotation amount of the turning knob 2 of the media selecting device (Fig. 1) correctly corresponds to a rotation amount of the upper round table 8 of Fig. 2. Therefore, any desired one of the books a - h disposed in the virtual space can be recognized at a glance therein and intuitively selected by turning the turning knob 2 to position its pointer at corresponding one of the angular positions A to H.

The books may be differently colored or provided with different textures or different background images so that they may be more easily recognized at respective positions on the upper round table 8.

The books as metaphors for icons may be changed by other metaphors, e.g., TV monitors, computer terminals,

home pages of an internet, or jackets for compact discs (CDs) depending upon objects that the icons represent. Furthermore, the media selecting device may be provided with an image input means for inputting, e.g., CD jacket images for texture mapping of icons.

Fig. 3A is illustrative of a virtual reality space image viewed from the viewpoint of the user shown in Fig. 2. In Figs. 3A and 3B, numeral 9 is a display and numeral 10 is a media content.

In the virtual space presented on a screen of the display 9, there is a user 6 surrounded by lower round table 7 and upper round table 8 on which books (d, e, f) are placed. The book "e" on the screen is selected and visually distinguished when the turning knob 2 of the media selecting device (Fig. 1) is turned to position its arrow 5 at position "E". The execution input button 3 of the media selecting device (Fig. 1) is then pressed to call for a program that in turn is executed to automatically transfer the book "e" onto the lower round table 7 and open that book thereon. The media content 10 is presented above the open pages of the book "e". The cancellation input button 4 of the media selecting device (Fig. 1) is now pressed to cancel the program for the book "e". The book "e" is automatically closed and returned onto the lower round table 7.

Fig. 3B shows the media (Fig. 3A) in an accessed state. In Fig. 3B, there is shown a practical example of the media content 10 of the book "e" that is established by pressing the execution input button 3 of the media selecting device in the state shown in Fig. 3A. The book "e" is accessed and further processable by the user.

In this instance, the media content 10 of the book "e" presented on the display screen represents a three-dimensional model that can be freely turned about its vertical axis (i.e., turnable in horizontal directions). When the cancellation input button 4 of the media selecting device is pressed, accessing to the media content 10 is cancelled and the users' eye is automatically returned to the state shown in Fig. 3A.

Figs. 4A and 4B are conceptual views of a media selecting device according to another aspect of the present invention, wherein the media content consists of TV programs. An image seen from the viewpoint of a viewer is presented on a display screen in Fig. 4A and an accessed image is presented in Fig. 4B.

In Fig. 4A, a TV monitor 11 represents a particular genre. In Fig. 4B, there is shown a practical example of an image of the TV monitor 11 automatically accessed by pressing the execution input button 3 after selecting the TV monitor 11 in the stage of Fig. 4A.

Further pressing the execution input button 3 causes a group of TV monitors 12 of a lower hierarchical layer to be presented on the enlarged screen of the TV monitor 11. The turning knob 2 is then turned to select any desired TV monitor among the group of TV monitors 12, whereon a program can be observed. The cancellation input button 4 of the media selecting device is now pressed to cancel a screen image of the group of TV monitors 12. Further pressing the cancellation input button 4 cancels the access to the TV monitor 11 and causes the viewpoint of the viewer to automatically return to the position of Fig. 4A.

Figs. 5A and 5B are conceptual views of a media selecting device according to another aspect of the present invention, wherein the media content consists of radio tuners. An image seen from the viewpoint of a viewer is presented on a display screen in Fig. 5A and an accessed image is presented in Fig. 5B. In Figs. 5A and 5B, numeral 13 is a radio tuner and numeral 14 is a group of radio tuners.

In Figs. 5A and 5B, there are shown practical examples of a method for selecting any desired one of radio tuners 14 representing respective broadcast channels. The operation is the same as described in the case of Fig. 4B.

Figs. 6A and 6B are conceptual views of a media selecting device according to another aspect of the present invention, wherein the media content consists of telephone sets. An image seen from the viewpoint of a viewer is presented on a display screen in Fig. 6A and an accessed image is presented in Fig. 6B. In these figures, numeral 15 is a telephone set and numeral 16 is a group of telephone sets.

In Figs. 6A and 6B, there are shown practical examples of a method for dialing any desired one of telephone sets 16. The operation is the same as described in the case of Fig. 4B.

Figs. 7A and 7B are conceptual views of a media selecting device according to another aspect of the present invention, wherein the media content consists of a CD player and compact disks (CDs). An image seen from the viewpoint of a viewer is presented on a display screen in Fig. 7A and an accessed image is presented in Fig. 7B. In these figures, numeral 17 is a CD player and numeral 18 is a group of CDs.

In Figs. 7A and 7B, there are shown practical examples of a method for selecting and enjoying any desired one of compact disks 18. The operation is the same as described in the case of Fig. 4B.

Figs. 8A and 8B are conceptual views of a media selecting device according to another aspect of the

present invention, wherein the media content consists of a video player and video programs. An image seen from the viewpoint of a viewer is presented on a display screen in Fig. 8A and an accessed image is presented in Fig. 8B. In these figures, numeral 19 is a video player and numeral 20 is a group of video programs.

In Figs. 8A and 8B, there are shown practical examples of a method for selecting and reproducing any desired one of video programs 20. The operation is the same as described in the case of Fig. 4B.

Figs. 9A and 9B are conceptual views of a media selecting device according to another aspect of the present invention, wherein the media content consists of a home automation controller and objects to be controlled by the controller. An image seen from the viewpoint of a viewer is presented on a display screen in Fig. 9A and an accessed image is presented in Fig. 9B. In these figures, numeral 21 is a home automation controller and numeral 22 is a group of household electrical appliances.

In Figs. 9A and 9B, there are shown practical examples of a method for turning on and off the power source of any one of household electrical appliances 22. The operation is the same as described in the case of Fig. 4B.

Figs. 10A and 10B are conceptual views of a media selecting device according to another aspect of the present invention, wherein the media content consists of text information. An image seen from the viewpoint of a viewer is presented on a display screen in Fig. 10A and an accessed image is presented in Fig. 10B. In these figures, numeral 23 is text information and numeral 24 is pieces of text information.

In Figs. 10A and 10B, there are shown practical examples of a method for presenting any desired text among the pieces of text information 24. The operation is the same as described in the case of Fig. 4B.

Figs. 11A and 11B are conceptual views of a media selecting device according to another aspect of the present invention, wherein the media content consists of personal computers. An image seen from the viewpoint of a viewer is presented on a display screen in Fig. 11A and an accessed image is presented in Fig. 11B. In these figures, numeral 25 is a computer processor and numeral 26 is a group of computers processors.

In Figs. 11A and 11B, there are shown practical examples of a method for accessing any one of computer processors 26. The operation is the same as described in the case of Fig. 4B.

Figs. 12A and 12B are conceptual views of a media selecting device according to another aspect of the

present invention, wherein the media content consists of application programs. An image seen from the viewpoint of a viewer is presented on a display screen in Fig. 12A and an accessed image is presented in Fig. 12B. In these figures, numeral 27 is an application program and numeral 28 is a group of application programs.

In Figs. 12A and 12B, there are shown practical examples of a method for start any one of application programs 28. The operation is the same as described in the case of Fig. 4B.

Figs. 13A and 13B are conceptual views of a media selecting device according to another aspect of the present invention, wherein the media content consists of auto-changer device. An image seen from the viewpoint of a viewer is presented on a display screen in Fig. 13A and an accessed image is presented in Fig. 13B. In these figures, numeral 29 is an auto-changer and numeral 30 is a group of auto-changers.

In Figs. 13A and 13B, there are shown practical examples of a method for reproducing a medium on any one of auto-changers 30. The operation is the same as described in the case of Fig. 4B.

Figs. 14A and 14B are conceptual views of a media selecting device according to another aspect of the present invention, wherein the media content consists

of browser program. An image seen from the viewpoint of a viewer is presented on a display screen in Fig. 14A and an accessed image is presented in Fig. 14B. In these figures, numeral 31 is a browser program and numeral 32 is a group of home pages.

In Figs. 14A and 14B, there are shown practical examples of a method for displaying any one of home pages 32. The operation is the same as described in the case of Fig. 4B.

Fig. 15 is a block diagram showing a construction of a media selecting device according to the present invention. In Fig. 15, a main body of the media selecting device 33 is composed of a rotation amount detecting means 34 for detecting a rotation amount of a turning knob for selecting any one of various kinds of media, an execute command input means 35 for inputting a command to execute the selection and a cancel command input means 36 for inputting a command to cancel the selection. A signal control portion 37 converts a signal received from the media selecting device into a signal suitable to a software used and controls the converted signal. The signal control portion 37 includes a command signal control portion 38 for controlling a command signal transmitted from the media selecting device and a peripheral device control portion 39 for controlling connected thereto peripheral

devices 40 according to the signal given from the command signal control portion 38. An image processing portion 42 performs operations on an image to be presented according to the signal from the command signal control portion 38 and loads data from an external storage 41 as the need be. An image synthesizing portion 43 synthesizes an image from an image generated by the image processing portion 42 and an image transferred from the peripheral device 40 controlled by the peripheral device control portion 39. A display control portion 44 controls an image synthesized by the image synthesizing portion 43 so that it can be presented on a display 45. A speaker 46 supplies a speech signal from the peripheral device 40.

The following description relates to an exemplified construction of a media selecting device according to the present invention, which is intended to select any desired one of TV broadcast channels.

The media selecting device comprises: an electronic tuner for receiving television broadcast waves and selecting a television broadcast signal of a particular broadcast channel by means of a tuning voltage and demodulating the signal; a first channel-select voltage generating circuit for generating tuning voltage signals of respective channels for the electronic tuner in a specified order; a second

channel-select voltage generating circuit for generating a tuning voltage selected for the electronic tuner by corresponding a television broadcast channel to an icon of a media selecting device; a channel-select voltage switching circuit for selecting a tuning voltage of the first or second channel-select voltage generating circuits and sending it to the electronic tuner; small icon generating means for sampling TV signals outputted by the electronic tuner at a specified period, performing time compression and thinning out horizontal scanning lines; an image memory for storing image signals outputted by the small icon generating means into addresses corresponding to respective channel numbers; a selected state displaying circuit for visually indicating the selected state of an icon according to an instruction of the icon selecting means; and a selected state indication synthesizing circuit for combining a still picture of each channel stored in the image memory with the selected state indication received from the icon selecting means.

An exemplified construction of a media selecting device according to the present invention, which is intended to select any one of voice broadcast channels.

The media selecting device comprises: an electronic tuner for receiving voice broadcast waves, and

selecting a voice signal of a particular voice-broadcast channel by using a tuning voltage and demodulating the signal; a first channel-select voltage generating circuit for generating tuning voltage signals of respective channels for the electronic tuner in a specified order; a second channel-select voltage generating circuit for generating a tuning voltage selected for the electronic tuner by corresponding the voice broadcast channel to an icon of a media selecting device; a channel-select voltage switching circuit for selecting a tuning voltage of the first or second channel-select voltage generating circuit and sending it to the electronic tuner; small icon generating means for generating a small icon from a voice broadcast signal outputted by the electronic tuner; an image memory for storing image signals outputted by the small icon generating means into addresses corresponding to respective channel numbers; a selected state displaying circuit for visually indicating a selected state of an icon according to an instruction of the icon selecting means; and a selected state indication synthesizing circuit for combining a small icon of each channel stored in the image memory with the selected state indication received from the icon selecting means.

A media selecting device according to one aspect

of the present invention can easily select any desired one of icons representing corresponding media on a display screen by setting a pointer of a turning knob at a corresponding position on its scale with no need of positioning a cursor over the icon on the screen. The device is also provided with at least two buttons "Execute" and "Cancel" (first and second change-over button) for freely changing-over hierarchical layers of icons from up to down and reverse, making the hierarchical structure of icons be very simple. The media selecting device is thus excellent in visibility and controllability.

In a media selecting device according to another aspect of the present invention, icons can be easily distinguished one another by their three-dimensional shapes and locations in a three-dimensional virtual space on a display screen. This enables a user to intuitively recognize the location of any desired icon in the virtual space.

A media selecting device according to another aspect of the present invention has an increased visibility of icons, enabling the user to easily select any one of icons on a display screen.

According to aspects of the present invention, it is possible to create a variety of media selecting devices adapted to a variety of applications by linking

icons with various kinds of media or apparatus.

CLAIMS

1. A media selecting device for selecting any one of media by selecting corresponding one of icons contained in a same hierarchical layer of group of icons representing respective media and related according to plurality of series structured by hierarchical layers, comprising:

display means for displaying a plurality of icons existing in the same hierarchical layer;

icon-selecting means for selecting any one of the icons by using a disc type knob rotatable in both directions by which the displaying order of the icons are changeable in both directions;

a first change-over button for presenting icons of a lower hierarchical layer related to the current selected icon or deciding the current selected icon to select the corresponding medium therethrough; and a second change-over button for cancelling the current selected icon and presenting icons of an upper layer related to the cancelled icon.

2. A media selecting device as defined in claim 1, characterized in that a plurality of series of icons each provided with specified three-dimensional shape information and three-dimensional location information are disposed in a three-dimensional virtual space and

the display means can be operated according to the selection of the three-dimensional icons.

3. A media selecting device as defined in any one of claims 1 and 2, characterized in that an icon selected by the icon selecting means is clearly distinguished from others by visually expressing means including changing brightness.

4. A media selecting device as defined in any one of claims 1 to 3, characterized in that the selectable media are television broadcast channels which are preset to respective icons so that any one of the television broadcast channels can be selected by selecting corresponding one of the icons.

5. A media selecting device as defined in any one of claims 1 to 4, characterized in that the selectable media are voice broadcast channels which are preset to respective icons so that any one of the voice broadcast channels can be selected by selecting corresponding one of the icons.

6. A media selecting device as defined in any one of claims 1 to 5, characterized in that the selectable media are telephone numbers and/or facsimile numbers which are preset to respective icons so that any one of the telephone numbers and/or facsimile numbers can be selected by selecting corresponding one of the icons.

7. A media selecting device as defined in any one of

claims 1 to 6, characterized in that the selectable media are audio recording means which are preset to respective icons so that any one of the audio recording means can be selected by selecting corresponding one of the icons.

8. A media selecting device as defined in any one of claims 1 to 7, characterized in that the selectable media are video recording means which are preset to respective icons so that any one of the video recording means can be selected by selecting corresponding one of the icons.

9. A media selecting device as defined in any one of claims 1 to 8, characterized in that the selectable media are household electrical-appliance controllers which are preset to respective icons so that any one of the household electrical-appliance controllers can be selected by selecting corresponding one of the icons.

10. A media selecting device as defined in any one of claims 1 to 9, characterized in that the selectable media are text data which are preset to respective icons so that any one of the text data can be selected by selecting corresponding one of the icons.

11. A media selecting device as defined in any one of claims 1 to 10, characterized in that the selectable media are computer processors which are preset to respective icons so that any one of the computer

processors can be selected by selecting corresponding one of the icons.

12. A media selecting device as defined in any one of claims 1 to 11, characterized in that the selectable media are application programs which are preset to respective icons so that any one of the application programs can be selected by selecting corresponding one of the icons.

13. A media selecting device as defined in any one of claims 1 to 12, characterized in that the selectable media are autochangers which are preset to respective icons so that any one of the autochangers can be selected by selecting corresponding one of the icons.

14. Apparatus for permitting selection of any one of a group of icons simultaneously displayed on a display screen in one of a series of hierarchical layers of selection, the apparatus comprising: display control means for generating video signals forming the images for display on the screen; and icon-selection means including a selector member which is manually operable for forward and reverse sequential selection through said group of icons; said display control means being arranged to enable the icon selection performed by operation of said selector member to be visually recognised on the screen.

15. Any of the media selecting devices, substantially as hereinbefore described with reference to the accompanying drawings.

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Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.P): G4H (HRE), H4T (TBLM)

Int Cl (Ed.6): G06F

Other:

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X,P	EP 0767418 A1	(SONY) eg abstract	14
X,P	WO 97/17661 A1	(CAMBRIDGE CONSULTANTS) eg abstract	14
X	US 5524196	(BLADES) eg abstract	14
X	US 5440325	(EDMARK) eg column 5 line 23 to column 6 line 7, and column 6 lines 24-39	1,14 at least

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
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