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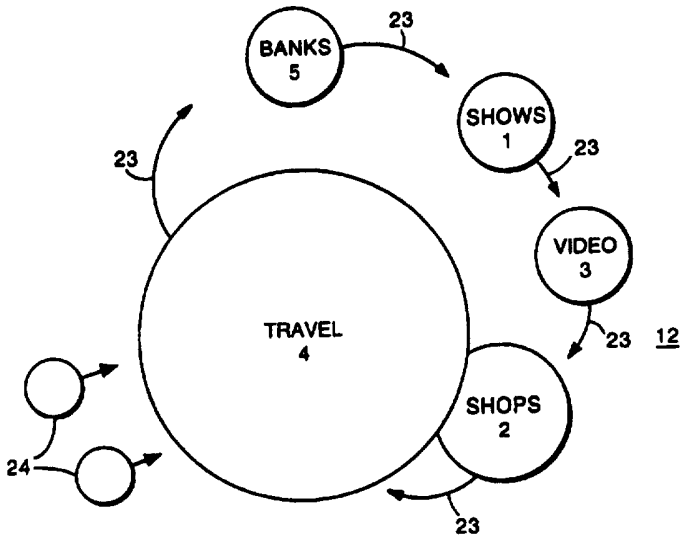
(54) Title: A METHOD AND APPARATUS FOR SELECTING AN OPTION OR OPTIONS ON A COMPUTER SYSTEM

(57) Abstract

The invention provides a method and apparatus for selecting an option on a computer system wherein the options are represented by icons the visual significance of which is varied. This enables a number of options to be displayed on the screen with each option being displayed at least for some time in a way which enables it to be easily identified by a user.



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A METHOD AND APPARATUS FOR SELECTING AN OPTION OR OPTIONS ON A COMPUTER SYSTEM

This invention relates to a method and apparatus for selecting an option or options on a computer system, including interactive television and video systems.

It has long been recognised that the weakest link in any computer system is the so called "man-machine interface". Computer systems are necessarily designed by computer literate people but most end-users will not be computer literate. The end-users are merely interested in the options the computer system will perform. What is obvious to a system designer may be an unfathomable step to an end-user. Much effort is now being devoted to "user friendliness" of computer systems.

Users of computer systems will be familiar with the use of icons signifying various options which may be selected and used on the system. Typical icons include a pictorial representation of a calculator signifying an arithmetical function, a page of a document signifying a word-processing function and an artists brush signifying a drawing function.

An on-screen menu is normally provided with a display of "icons" representing the available options. In this specification, the term "icon" is used to refer to the image associated with a selectable option. This "icon" may be a graphic, text or moving image, for example, or some combination. Icons are usually selected by moving a cursor to the icon and "clicking on" to it under mouse control. It will be appreciated that where there are a large number of options, the result will be a display where the icons are small and difficult to see.

In other systems, such as text retrieval systems, information is retrieved and displayed from incoming television signals to a television by keying in numbers from a remote control handset. The numbers for the options are displayed on the screen as a menu or index. This system has been found cumbersome to use since the user is normally seated some distance away from the television screen and the large listings of options displayed results in the numbers being displayed at a size which is difficult for the user to clearly perceive especially if that person has less than perfect eyesight.

In an effort to reduce the clutter of the display multi-page menus have been used, each page (screen) displaying a few of the available options. Systems have been devised which attempt to prioritise options by ordering them according to frequency of utilisation - i.e. more frequently used options are placed on higher level menus than those less often accessed. Two such systems which similarly involve updating the arrangement of menus of application icons whenever an application has been used, for example, are described in EP427264 and EP601320. However, such systems suffer from the evident disadvantage that only a limited number of options can be displayed at one time. A user is still required to actively search out other options not associated with the most frequently used applications appearing on a top level screen. In order to display all the options it is necessary for the user to input an instruction via a cursor, keyboard or handset to move to the next page or back to the previous page. This requires the user to remember the required input to change page or to read information from a screen-displayed aide-memoir. The screen-displayed aide-memoir will, in fact, add to the problem of screen-clutter that the multi-page menu approach seeks to address. Thus, the aide-memoir is made small. It will be understood that there is an uneasy trade-off between providing this information at a size users can discern and increasing screen clutter.

It will be readily appreciated that the above mentioned problems are significant for users in systems where the user has a strong desire to use the options that the system has to offer. These problems are even more significant where the system is one which provides goods and services for sale to the user. Lack of user friendliness then becomes a significant inhibitor which can dissuade users from persevering to discover all the features of the system and thus full sales potential of the system is not achieved.

According to the present invention there is provided a method of selecting an option or options on a computer system comprising displaying icons each representative of an option or a set of options offered by the system; varying the visual significance of at least one of the icons through a range of visual significance; monitoring for a user input and selecting the option or set of options corresponding to the user input.

By dynamically varying the visual significance of the icon it is possible to produce a display which is uncluttered even though a large number of icons may be present. The user's attention will be drawn to the icon which is most visually significant and the user can then make an input to select that option, if desired, or wait for another to be raised to his attention. In contrast with previous menu systems, where options are displayed in lists or as groups of icons, which may be reordered, but which are essentially static at the time a user is seeking to make a selection, the present invention provides a method for actively bringing different options to the attention of a prospective user to aid the selection process. The options effectively come to the user rather than the user having to ferret them out himself.

The change in visual significance may be caused by an icon moving against a background of stationary icons or moving in a different manner to the other icons which may also be moving. Another way in which the visual significance may be varied is by changing the colour, brightness, contrast or shape of the icon or by highlighting it in some way by for example creating a frame about the icon of contrasting colour.

Preferably, as the at least one icon increases in visual significance at least one other icon decreases in visual significance. This is preferred since it will ensure that the display remains uncluttered because an increase in size of the icon will be compensated for by a decrease in size of another icon. Particularly preferred is a method in which the rate of decrease in visual significance approximately matches the rate of increase.

Advantageously, the icon is changed in visual significance by a change in size relative to at least some of the other icons.

An advantage of changing the size of the icon is that a larger number of icons can be displayed on one screen without giving a cluttered appearance, for example, because the icons can be made smaller initially. The change in visual significance could then be an increase in size thus making the icon more prominent and also easier for the user to discern what it represents. An apparent increase in size of one icon may also be achieved by reducing the size of the others.

Another way in which the visual significance could be varied could be for the icon's position in the display to be varied. For example, an icon could be

moved to a central location in the display perhaps with this location being highlighted.

The change in visual significance may be achieved by a combination of the above described methods. Preferably, the change in visual significance is achieved by a movement and change in size. This is preferred since it is particularly effective in gaining the user's attention since it may, preferably, be used to create the impression of movement in three dimensions on a two-dimensional display.

Whilst present display formats such as television screens or visual display units (VDU) are two-dimensional it is envisaged that the invention could be used on a three dimensional display using holographic techniques. In such techniques it may be possible to project holographic images of the icons in free space and to move the icons towards or away from the user to change the visual significance.

In the described embodiment the icons are representations of spheres containing information appropriate to the option the icon represents. The icons may also contain or comprise numbers, letters or other indicia to enable the user to make a corresponding input to the system. For example the icons may be selected by number the user entering at a handset the number shown by the icon. Alternatively, the icons may be colour coded and an appropriate colour button depressed on the handset or other input device. The information could be pictorial information.

Another way in which the visual significance could be varied is to animate pictorial information held in or associated with the icon or for the information to be made visually significant by increasing its brightness or bringing it into focus from a blurred state.

It is envisaged that where there are more options than can be displayed in an uncluttered way on a display, icons will, preferably, periodically leave the display or cease to be displayed and new icons will be displayed in their stead. After a period of time the original icon or icons may return to "displace" the new icons or other icons. The advantage of this is that there is no need for the user to switch between menus and options, the less able user will be able to allow the system to expose all options. In this way all users can be exposed to the options available without there having to be any user input. This feature will be particularly important where the system is concerned with selling goods or

services. The amount of time that any icon appears in the display could be controlled. Icons may be displayed for equal lengths of time or for a length of time dependant on commercial circumstances such as a cost levied by the system operator to the goods or services provider for displaying that organisation's icon.

The visual significance of a newly displayed icon may be enhanced in some way by for example the icon moving at a relatively rapid rate in comparison to the other icons , an auditory alarm signifying the event or a change in shape, colour, brilliance or contrast, or by flashing or a combination of these.

The user inputs to select an option may be via devices such as a mouse, a keyboard or a keypad either linked to the system by a cable or using wireless technology including infra-red, ultrasound and the like.

Other ways of selecting the option could also be used, for example, by sound, voice command, touching the display screen or even, where a holographic display is used, touching or capturing the icon.

The option could be selected by inputting indicia associated with the icon such as numbers or letters or by controlling a displayed cursor to move it over the icon.

Where there is a significant number of options available for selection, conveniently the same indicia may be associated with different options as the different options are raised in visual significance at different times. This has the advantage that where there is a greater number of options available than are immediately selectable (eg from a conventional 0-9 numeric keypad) the system still remains easy to use without requiring the use of supplemental keypad buttons (eg 1+ for 10-19; 2+ for 20-29 etc. as commonly found on TV remote controls). Thus as the various options available are varied in visual significance, the same indicia (say 0-9) can be associated with the first ten options initially as these are raised in visual significance, then with the second ten and so on. The dynamic variation in visual significance allows indicia (and one set of associated options) to be removed from view for a period and then re-introduced into view associated with a new set of options.

According to a second aspect of the invention there is provided apparatus for presenting and enabling user selection of an option or set of options provided by a computer system comprising:

means for displaying icons representative of the options;

means for monitoring for a user input indicative of a particular option or options being selected; and

means for varying the visual significance of at least one of the displayed icons through a range of visual significance.

Conveniently, the apparatus comprises a display unit; a user input device and a processor connected to control images for display on the display unit and to monitor for a user input, via the user input device, of a selection by the user of a particular option or options, wherein the processor is programmed to control the dynamic variation in visual significance on the display unit of an image representative of at least one option.

Specific embodiments of the invention will now be described, by way of example only, with reference to the drawings in which:-

Figure 1 shows a computer system in accordance with the invention; and

Figure 2 shows a display of the system shown in Figure 1.

Figure 1 shows a computer system for supplying video films and shopping services to subscribers. The system comprises a central computer 1 which is connected via telephone lines 2 and 3 and a telephony network 4 to a number of subscriber units one of which, subscriber unit 5, is shown. An input port 7 of the subscriber unit 5 is connected to the telephone line 3 which also serves a telephone 6 located in the subscriber's premises. An output port 8 of the subscriber unit 5 is connected via co-axial cable 9 to an aerial socket 10 of a television set 11. The television set 11 provides a display device for the system on the screen 12 of which video films and goods and services information may be displayed.

A subscriber 13 is shown watching the screen 12 and controlling the system by means of a hand-held remote control unit 14 having a keypad 15. The remote control unit 14 transmits commands entered on the keyboard 15 via a flashing infra-red diode 16 to the subscriber unit 5 in a well known manner.

The subscriber unit 5 is located in a convenient position close to the television 11. The unit 5 includes a microprocessor 17, an input/output device 18, a memory 19, a receiver 20 and a video generator 21. The memory 19 will include random access memory (RAM) and read only memory (ROM) in the form of

semiconductor chips. A bus 22 is provided to interlink these units as shown in the figure and to allow the passage of data and control information.

In operation video and control signals will be transmitted over the telephony network 2, 3 and 4 to the subscriber unit 5 from the central computer 1. This information is transmitted in a frequency band which does not affect normal operation of the telephone 6, that is to say, the telephone 6 and the system may be used simultaneously without any interference.

The video and control signals are passed via the port 7, input output device 18 and bus 22 to the microprocessor 17. This interprets the control signals and passes the video signals to the video generator 21. (Some of the control information or video signals may also be stored in the memory 19 for future use).

At the video generator 21, the video signals are converted to a suitable frequency for the television 11 that is a frequency comparable to the normal television signals received by the aerial from television broadcast services. The television 11 then displays the video images on the screen 12.

As earlier described, the subscriber 13 controls the system by use of the infra-red remote control unit 14. The infra-red signals from this unit are received by a sensor in the receiver unit 20 of the subscriber unit 5. The receiver unit 20 decodes the received signal and passes on the control information to the microprocessor 17.

The control information will be used by the microprocessor 17 to control the video sequence that is displayed by the television 11 or it may be interpreted as an instruction such as an order for a service or goods which needs to be transmitted back to the central computer 1. If the information is to be transmitted back, then it is passed back via the input/output device 18 and the telephony network 2, 3, 4. Again the information will be transmitted as a signal at a frequency which does not affect normal operation of the telephony network.

The way in which options are selected on the system will now be described.

The television screen 12 is more clearly shown in figure 2. The video sequence displayed on the screen 12 is of five spheres moving about the screen area, and at the same time changing size through a range of sizes. This gives the impression of a circulatory motion in three dimensions with the spheres each in

turn apparently moving towards the front of the display (closer to subscriber 13) and then retreating to the back of the display (away from the subscriber 13). Thus each sphere in turn assumes a visually significant position where the user can easily view the sphere whilst other spheres recede. The motion is indicated in the figure by illustrative arrows 23.

Each sphere is an icon for a particular set of options offered by the system. In figure 2, the most visually significant set of options is one concerned with travel services labelled with the indicia numeral "4". The "rearmost" icon is concerned with a set of banking services options labelled with numeral "5". The icons bearing the respective indicia numerals "1", "3" and "2" are concerned with options for theatre and cinema, video films offered by the system and shopping options respectively.

The duration of the period for which each icon is displayed as most visually significant is kept the same for each icon in order that each supplier of the services or goods under the icon has identical exposure to the customer. In other embodiments it may be desirable to vary the duration, for example, where it is desired to charge a supplier for display of an option depending on the length of time the associated icon is most visually significant.

The subscriber 13 is able to select an option in one of two ways with the remote control unit 14 in this embodiment.

The fist way is to depress a key on the keypad 15 that corresponds to the icon numeral, that is to say, in order to select travel options key number "4" is depressed, for shops key number "2" and so on.

The second way is to press key "0" when the desired option is most visually prominent.

The receiver 20 detects the key press and passes the number to the processor 17. The processor 17 transmits this information to the control computer 1 and the next video signals concerning the selected option are transmitted and then displayed as before.

If the key depressed is "0", then the processor 17 transmits to the control computer information including the number of the option represented by the icon that is most visually significant at the time the key is depressed. The central computer 1 again responds by sending further video signals concerning that option.

The further video signals could comprise further icons in the form of spheres as earlier described. For example, the set of travel could include spheres for particular travel operator or for travel to particular destinations. These sub-options could include further sub-options. Selection of a sub-option would be the same as earlier described for an option.

When the subscriber wishes to order goods or a service the processor 17 passes the information to the central computer 1 and the goods are dispatched or service arranged.

Figure 2 shows a screen with five icons. Where further options are available an icon can leave the screen to be replaced by another icon representing another set of options. This event would be accompanied by a alarm note being sounded by the television speaker.

Further spheres may enter the display area representing special events such as advertisements of special offers. In this embodiment these are smaller colour coded spheres 24 which collide with and bounce off the five option icons. The subscriber selects these icons by depressing the corresponding coloured button on the keypad 15.

Whilst in the described embodiment the icons include descriptors such as travel, shows and the like it would also be possible for the icons to include pictures still or animated of scenes relevant to the option. Thus, the travel sphere could include picture of trains, boats and planes.

Whilst the embodiment described above involves interaction with a remote, on-line information system, it will be readily apparent that the invention is equally applicable to options on computer systems in general, including, for example, individual, personal computer systems where the options are simply programs, or options within a program held on such a computer system.

CLAIMS

1. A method of selecting an option or options on a computer system comprising displaying icons each representative of an option or set of options offered by the system;

varying the visual significance of at least one of the icons through a range of visual significance;

monitoring for a user input, and, in response to a user input, selecting the option or set of options corresponding to the user input.

2. A method as claimed in claim 1 wherein as the at least one icon increases in visual significance at least one other icon decreases in visual significance.

3. A method as claimed in claim 2 wherein the decrease in visual significance occurs at a rate substantially equal to a rate at which the visual significance increases.

4. A method as claimed in any preceding claim 1 wherein the change in visual significance is caused at least in part by varying the icon or icons size.

5. A method as claimed in any preceding claim wherein the change in visual significance is caused, at least in part, by varying the position at which an icon is displayed.

6. A method as claimed in any preceding claim wherein the change in visual significance is caused, at least in part, by a change in colour.

7. A method as claimed in any preceding claim wherein the visual significance of at least some of the icons is varied in a sequence.

8. A method as claimed in any preceding claim wherein the displayed position of at least one of the icons is varied together with a variation in size.

9. A method as claimed in any preceding claim wherein there are at least two sets of icons, a first set of icons and a second set of icons, the first set of icons being displayed whilst the second set of icons are not displayed or displayed in a substantially visually less significant way than the first set, and wherein icons are transferred between the sets in order to vary the options presented to the system user.

10. A method as claimed in any preceding claim wherein at least one icon is depicted as a sphere.

11. A method as claimed in any preceding claim wherein indices are associated with icons for different options and a user can select an option by selecting the relevant one of the indices, at least one of the indices being associated with a first icon and/or option when its associated icon is first raised in visual significance and a second icon and/or option when that is subsequently raised in visual significance

12. Apparatus for presenting and enabling user selection of an option or set of options provided by a computer system comprising:

means for displaying icons representative of the options;

means for monitoring for a user input indicative of a particular option or options being selected; and

means for varying the visual significance of at least one of the displayed icons through a range of visual significance.

13. Apparatus as claimed in claim 12 wherein the visual significance is varied by a change in displayed size of an icon or icons.

14. Apparatus as claimed in claim 12 or 13 wherein the visual significance is varied by a change in displayed position.

15. Apparatus as claimed in claim 14 wherein the visual significance is varied by both a change in displayed position and size, the variation being such as to create an impression on the user of three dimensional movement.

Fig.1.

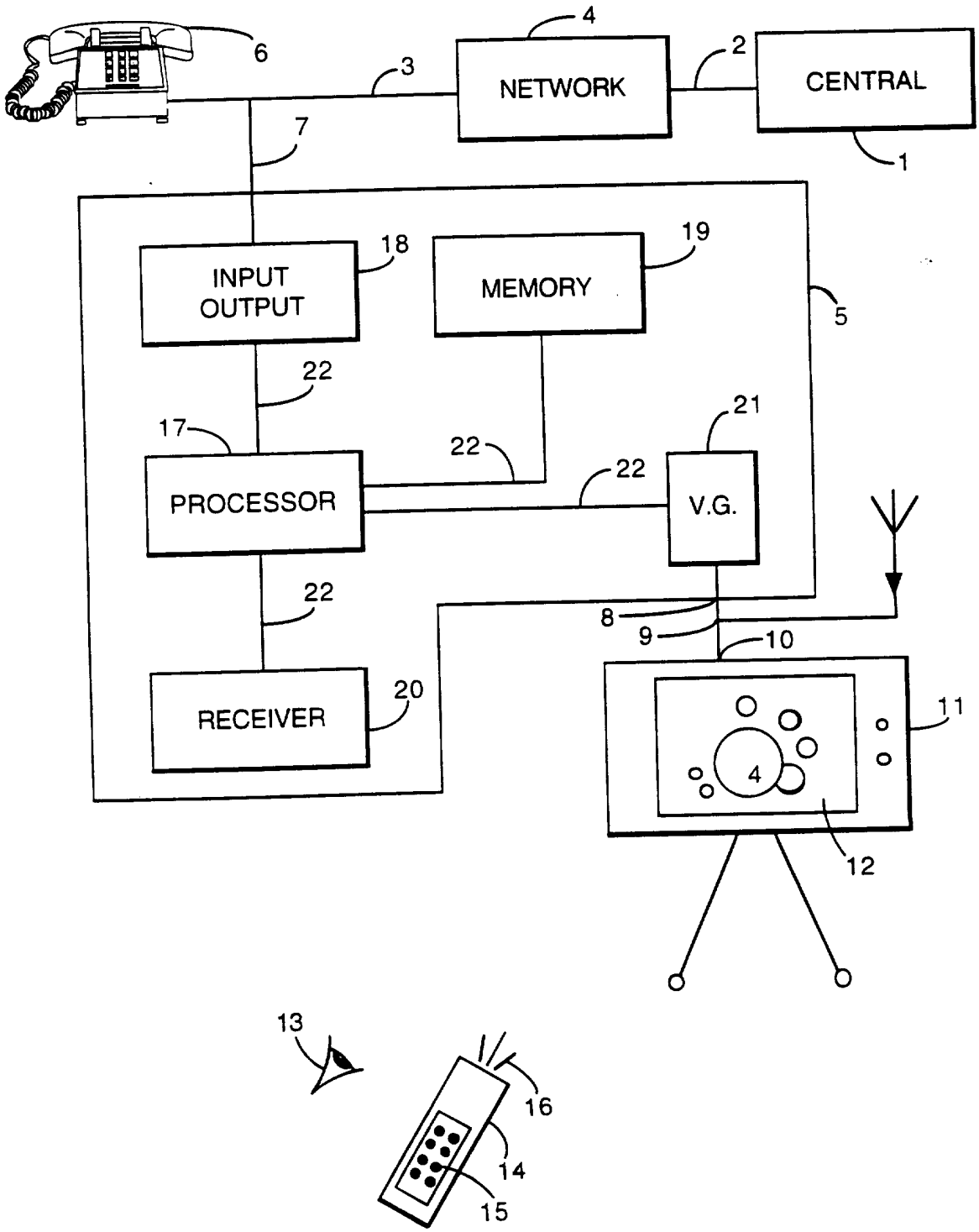
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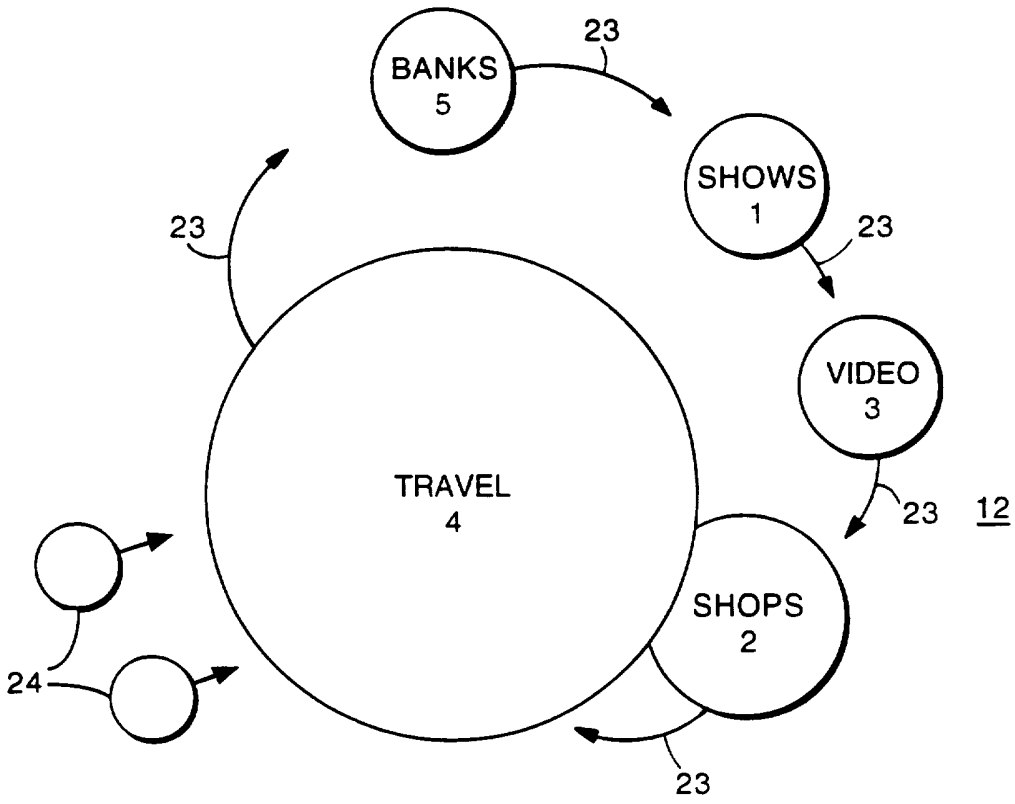
Fig.2.



INTERNATIONAL SEARCH REPORT

Interna al Application No
PCT/GB 95/02944

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 G06F9/44

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 G06F

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

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP,A,0 427 264 (FUJITSU LTD) 15 May 1991 see column 1, line 11 - line 20 see column 1, line 44 - line 49 see column 6, line 18 - line 33 see column 7, line 9 - column 9, line 21	1-15
Y	EP,A,0 601 320 (TOKYO SEIMITSU CO LTD) 15 June 1994 see column 1, line 44 - column 2, line 43	1-15

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

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
1 March 1996	08.03.96

Name and mailing address of the ISA	Authorized officer
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.ormation on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)		Publication date
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