Title: AN APPARATUS AND A METHOD OF PROVIDING INFORMATION TO A USER

Abstract: An apparatus and a method of providing information to a user, such as for the user to navigate in the items. The items are provided in an order, and navigation in the order will provide different items on the display. When reaching an end of the order, the items displayed on the display are displaced a fraction of an extent of the display or the items on the display and subsequently returned to the original position in order to inform the user that the end of the order has been reached.
AN APPARATUS AND A METHOD OF PROVIDING INFORMATION TO A USER

The present invention relates to an apparatus and a method of providing information to a user and in particular of a new manner of illustrating to the user that an end of a list of information items, in which the user navigates, has been reached.

In this type of menu, a number of predetermined information items are to be provided to the user, so as to e.g. select one thereof. In order for the user to be able to navigate in the items, an order thereof is selected as well as a direction which is correlated with navigation means, such as buttons, a cursor, a mouse or the like. Thus, different items may be illustrated or selected by the user navigating in the items using the navigation means.

A number of different types of menus exist, such as drop down menus, which are normally provided on displays large enough to show the full menu, or menus on smaller displays which are made endless so that if the end has been reached, further navigation in that direction will simply start from the other end of the list of items.

Different manners of providing information may be seen in: US-B-6366302, 56777 08, 2002/041292, 6128012 as well as in GB-A-2382292.

However it is desired to be able to illustrate to the user that all items have now been browsed through.

It is clear that the same method may be used even when browsing in a single large piece of information, such as a file (text, images, etc), this piece of information may be taken as a number of items provided in the order in which these are present in the information/file.

One solution to that problem is solved by a first aspect of the invention relating to an apparatus for providing information to a user, the apparatus comprising:

1. means for providing a plurality of information items, and an order thereof, to be provided to the user,

2. a display or monitor for displaying the information items to the user,
3. at least two means for the user to input navigation information each relating to a direction, in the order, in which the user may navigate in the information items, one of the two means relating to one direction, in the order, and the other of the two means relating to another direction,

4. means for, when the user operates an inputting means, displaying, on the monitor or display initially displaying one or more first of the information items, one or more other of the items to the user, the other information items being neighbouring, in the order and in the direction related to by the operated inputting means, to the displayed first information items, and

5. means for, when the user operates an inputting means and when no more items are provided in the related direction, firstly translating the items provided on the display or monitor a fraction of an extension of the extent of the display or monitor in a predetermined direction on the display or monitor and subsequently returning the information provided to the original position.

In the situation where the browsing or navigation takes place in a single file, this file will comprise individual elements, such as lines, paragraphs, words, parts or the like, which are provided in a predetermined order. Also, if a single piece of information is e.g. an image, this image may be split up into multiple information items corresponding to different areas or parts of the image, where the order describes the relative positions of the individual areas or parts in relation to each other. One manner of splitting up an image would be into columns and rows, normally of pixels to be provided on the display. Consequently, navigation/browsing in a file of that type will be identical to one where a plurality of items, that may be independent of each other, is browsed/navigated.

The displacing in the predetermined direction is performed with only a fraction of the extent of the display or monitor in that direction, or an extent of the item(s) provided on the display or monitor in that direction, so that the user is able to learn that no new item(s) is/are provided. This is a sign that the end of the order has been reached.

In the present context, the order of the information items describes the order in which the items are provided on the display or monitor during step 4 where navigation is performed in the items. The items may be provided in a list, which defines the order. The direction then being a direction in the - or along - list. Normally, this order is the same each time the user navigates in the items, so that the user more easily can navigate, but this is not a requirement.
A popular manner of understanding the direction is that the items are provided in the order along the direction, and the display is provided on top of the list in order to provide some of the item(s). Navigation in a certain direction will displace the display in the direction in order to change the contents of the display.

The order may be any type of order, such as a sorted or a non-sorted order. The sorting may be an alphabetical sorting or a sorting after size, importance, date, content, frequency of use or the like.

The direction in the items is along or opposite to the order in the sense that navigation along the direction will provide neighbouring (to the items presently provided on the display/monitor) items further along the order or oppositely to the order.

The inputting means may be provided as a single means operable in two different manners, such as a mouse or joystick movable in at least two different manners or directions. Alternatively, a plurality of means, such as touch buttons, active areas on a touch screen, or the like, may be provided, one for navigation in or opposite to the direction.

In the present context, the display or monitor may be any sort of display or monitor, such as a touch screen, a CRT, a LCD screen, or any type of computer/PDA monitor.

Normally, the display or monitor is too small to display all the information items, which is the reason for the navigation. In this respect, however, it should be noted that only a certain area may be provided for the information providing, whereby the display or monitor may be able to contain all information items, but the area is not. However, the present invention is also useful when all items are displayed in that it will inform the user that the end of the list has been reached.

In the present context, no more items are provided when, in the direction, an end of a list of the items has been reached. Thus, if the navigation started from the other end of the list, all items have been navigated through. Naturally, however, the navigation may start at any position in the order.

The fraction of the extent of the display or monitor is a fraction of the extent of the item(s) illustrated, so that the item(s) is/are not fully removed from the display/monitor but may be displaced sufficiently for the user to see that no new items are displayed. In this manner, the fraction may be as little as one pixel on a display or as much as all but one pixel. However, normally, a fraction being between 2% and 50%, such as between 5% and 25% of the extent of the display or of the information item in the predetermined direction.
The displaced item(s) may be maintained in the displaced position for any period of time before returning the item(s) to the original position. This period of time preferably is large enough to ensure that the user actually realizes that the end of the order has been reached.

In a preferred embodiment, this timing may be adapted to the user's desires in the same manner as computer keyboard and computer mouse timing may be adapted to the individual user.

In this connection, the predetermined direction may be any direction, normally in the plane of the display. Thus, as the direction pretended by the inputting means will normally be in the plane of the display, the predetermined direction may be in that direction or in a direction at an angle thereto, such as perpendicularly thereto. However, the information may also be altered so as to pretend a displacement out of the plane. An enlargement of the image of the information item will make the information item seem to displace out of the plane of the display and toward the user, whereas a reduction in the size will make the item seem to displace away from the user.

In a preferred embodiment, the inputting means relate to two opposite directions in a plane of the display or monitor, and at an angle to the predetermined direction. In this manner, the user will experience the browsing as a browsing in a linear list of items along a given direction (such as up/down or left/right). Then, reaching the end of the order will be a displacement at an angle to this direction, which will make it easier for the user to differ between normal browsing and the "encounter" of an end of the order of items.

In another embodiment, the means for displaying the other information comprises means for displaying both the other information item(s) and at least part of the first information item(s), the at least part of the first item(s) being positioned, in the display, further in the related direction than the other item(s). In this manner, the browsing in a direction of the items will not entirely replace the item(s) provided in the display/monitor but will move parts thereof in the direction of the browsing and provide new (neighbouring) items in the other parts of the display in order for the user to follow the "movement" of the information items during navigation. This enhances the user's understanding during navigation.

In a preferred embodiment, the means for displaying the other information comprises means for scrolling the first information item(s) and the other item(s) in the related direction on the display or monitor. In this respect, scrolling means that information item(s) which will actually be fully removed from the display/monitor are not merely removed by overwriting the screen image by the final image desired but are moved sequentially in the desired direction and are finally not provided, when any remaining parts of the first item(s) and the other item(s) is/are provided.
A second aspect of the invention relates to a method of providing information to a user, the method comprising:

1. providing a plurality of information items, and an order thereof, to be provided to the user, 

2. providing at least two means for the user to input navigation information each relating to a direction, in the order, in which the user may navigate in the information items, one of the two means relating to one direction, in the order, and the other of the two means relating to the other direction, 

3. firstly displaying first information item(s) on a monitor or display, 

4. secondly displaying, when the user operates an inputting means, on the monitor or display initially displaying one or more other of the items to the user, the other information items being neighbouring, in the order and in the direction related to by the operated inputting means, to the displayed first information items, and 

5. thirdly translating, when the user operates an inputting means and when no more items are provided in the direction related to by the operated inputting means, the items provided on the display or monitor a fraction of an extension of the extent of the display or monitor in a predetermined direction on the display or monitor and subsequently returning the information provided to the original position. 

As indicated above, in a preferred embodiment, step 2. comprises providing inputting means relating to two opposite directions in a plane of the display or monitor, and at an angle to the predetermined direction. 

Also, step 4. may comprise displaying both the other information item(s) and at least part of the first information item(s), the at least part of the first item(s) being positioned, in the display, further in the related direction than the other item(s). 

In addition, step 4. preferably comprises scrolling the first information item(s) and the other item(s) in the related direction on the display or monitor. 

In a third aspect, the invention relates to an apparatus for presenting information to a user, comprising:
a display adapted to display at least part of a number of elements of a list of information items, the list comprising a first and a last information item, and

means allowing a user to scroll the list in opposite directions,

wherein the apparatus is adapted to move at least one of the displayed items back and forth when the user attempts to scroll past the first or last information item.

As is also mentioned above, the scrolling is a manoeuvring in the set of items. In addition, the back and forth motion of the item(s) preferably is a movement only a fraction of the extent of the display in the direction of motion in order to make it clear to the operator, that no more items are displayable.

A last aspect of the invention relates to a method for presenting information to a user, comprising:

- displaying at least part of a number of elements of a list of information items, the list comprising a first and a last information item,

- allowing a user to scroll the list in opposite directions, and

- moving at least one of the displayed items back and forth when the user attempts to scroll past the first or last information item.

Naturally, embodiments of the first, second, third, and fourth aspects may be interchanged in order to provide additional functionality to the apparatus or method.

In the following, a preferred embodiment of the invention will be described with reference to the drawing, wherein:

- figure 1 illustrates an apparatus incorporating the invention,
- figure 2 illustrates browsing in items on a display,
- figure 3 illustrates the display providing two information items,
- figure 4 illustrates the display of figure 3 with the items displaced, and
- figure 5 illustrates the display of figure 4 with the information items repositioned.
Figure 1 illustrates an apparatus 10 having a display 12 for providing information to a user. The apparatus 10 further has two navigation buttons 14 and 16 for navigating in information provided on the display.

The operation of the apparatus 10 is controlled by a controller 18 holding the information items to be provided as well as an order thereof. The controller is adapted to provide information items on the display 12 and for determining an operation of a button 14/16. When such an operation is determined, the information items provided on the display 12 are replaced as illustrated in Figure 2.

In figure 2, three items, Item 1, Item 2, and Item 3 are provided on the display. When operating the button 16 (as illustrated by the top arrow), the display is shifted relatively in the direction of the arrow on the button 16 so that items 2, 3, and 4 are now provided on the display. Another operation of the button 16 provides items 3, 4, and 5 on the display.

Also illustrated is the operation of the button 14 (the lower arrows), where the opposite shifting is seen.

This is standard browsing in this type of menus or in information larger than what can be provided on the display at one time.

Figure 3 illustrates a display displaying two information items, the top one being a point in time (11:35:44) and the lower one being an image representing two instances of the point in time and a pictogram of a clock.

In this embodiment, these items are the last two items in the order, whereby a navigation further down (operation of the button 16) will not provide any new items. In order to inform the user of this fact, the items provided are shifted, as is seen in figure 4, in a direction, which here is chosen to be perpendicular to the direction of browsing as illustrated by the arrows on the buttons 14 and 16. This direction may be any direction in or out of the plane of the display.

Having displaced the items on the display for a predetermined period of time, the items are returned to the positions of figure 3 in order to be fully visible to the user.

Another navigation using the button 16 will provide the same reaction by the apparatus 10.
Naturally, the same reaction may be provided when reaching the other end of the order of items and when operating the button 14.

The present apparatus 10 may be any apparatus comprising therein a number of items to be provided to a user for e.g. navigation and subsequent selection/activation or the like. Naturally, the items provided may each be correlated to or represent an operation, a function, a selection or the like which the user may activate when navigating to the item and subsequently selecting the item, such as by activating another button (not illustrated). Alternatively, the navigation may be in e.g. a text file which the user is altering or generating. In that situation, the order of individual items may change over time, but this is not a problem.

The present apparatus may be a medical sensor/analyser or dosing apparatus as well as a mobile telephone, PDA, or a PC, any type of handheld device (normally having a display of limited size) or any other type of medium or apparatus having a display and having a number of items to be provided to the user.
CLAIMS

1. An apparatus (10) for providing information to a user, the apparatus comprising:

   1. means (18) for providing a plurality of information items, and an order thereof, to be provided to the user,

   2. a display or monitor (12) for displaying the information items to the user,

   3. at least two means (14,16) for the user to input navigation information each relating to a direction, in the order, in which the user may navigate in the information items, one (14) of the two means relating to one direction, in the order, and the other (16) of the two means relating to the other direction, and

   4. means for, when the user operates an inputting means (14,16), displaying, on the monitor or display (12) initially displaying one or more first of the information items, one or more other of the items to the user, the other information items being neighbouring, in the order and in the direction related to by the operated inputting means (14,16), to the displayed first information items,

characterized in that the apparatus further comprises means for, when the user operates an inputting means and when no more items are provided in the direction related to by the operated inputting means (14,16), firstly translating the items provided on the display or monitor (12) a fraction of an extension of the extent of the display or monitor (12) in a predetermined direction on the display or monitor (12) and subsequently returning the information provided to the original position.

2. An apparatus according to claim 1, wherein the inputting means (14,16) relate to two opposite directions in a plane of the display or monitor (12), and at an angle to the predetermined direction.

3. An apparatus according to claim 1 or 2, wherein the means (12) for displaying the other information comprises means for displaying both the other information item(s) and at least part of the first information item(s), the at least part of the first item(s) being positioned, in the display, further in the related direction than the other item(s).
4. An apparatus according to any of the preceding claims, wherein the means (12) for displaying the other information comprises means for scrolling the first information item(s) and the other item(s) in the related direction on the display or monitor.

5. A method of providing information to a user, the method comprising:

1. providing a plurality of information items, and an order thereof, to be provided to the user,

2. providing at least two means (14,16) for the user to input navigation information each relating to a direction, in the order, in which the user may navigate in the information items, one (14) of the two means relating to one direction, in the order, and the other (16) of the two means relating to the other direction,

3. firstly displaying first information item(s) on a monitor or display (12), and

4. secondly displaying, when the user operates an inputting means, on the monitor or display (12) initially displaying one or more other of the items to the user, the other information items being neighbouring, in the order and in the direction related to by the operated inputting means, to the displayed first information items,

characterized in that the method further comprises the step of thirdly translating, when the user operates an inputting means (14,16) and when no more items are provided in the direction related to by the operated inputting means (14,16), the items provided on the display or monitor (12) a fraction of an extension of the extent of the display or monitor (12) in a predetermined direction on the display or monitor (12) and subsequently returning the information provided to the original position.

6. A method according to claim 5, wherein step 2. comprises providing inputting means (14,16) relating to two opposite directions in a plane of the display or monitor (12), and at an angle to the predetermined direction.

7. A method according to claim 5 or 6, wherein step 4. comprises displaying both the other information item(s) and at least part of the first information item(s), the at least part of the first item(s) being positioned, in the display (12), further in the related direction than the other item(s).
8. A method according to any of the claims 5-7, wherein step 4 comprises scrolling the first information item(s) and the other item(s) in the related direction on the display or monitor (12).

9. An apparatus for presenting information to a user, comprising:

- a display adapted to display at least part of a number of elements of a list of information items, the list comprising a first and a last information item, and

- means allowing a user to scroll the list in opposite directions,

wherein the apparatus is adapted to move at least one of the displayed items back and forth when the user attempts to scroll past the first or last information item.

10. A method for presenting information to a user, comprising:

- displaying at least part of a number of elements of a list of information items, the list comprising a first and a last information item,

- allowing a user to scroll the list in opposite directions, and

- moving at least one of the displayed items back and forth when the user attempts to scroll past the first or last information item.
Figure 1

Figure 2