

TACTILE OVERLAYS FOR SCREENS**CROSS REFERENCE TO RELATED APPLICATIONS**

This is a divisional of U.S. application Ser. No. 10/113, 105, filed Mar. 29, 2002 now U.S. Pat. No. 6,864,878 by the same inventors, and claims priority therefrom.

BACKGROUND AND SUMMARY

The embodiments disclosed herein relate generally to a method and apparatus for assisting the blind with graphical user interfaces (GUIs), especially touch screen devices, and more specifically to the use of transparent overlays having tactilely readable features such as, for example, Braille characters thereon.

As electronic devices are becoming increasingly prevalent in the world, the use of devices having GUIs is becoming increasingly necessary for the normal performance of a number of major life activities. For example, working, learning, and generally enhancing the quality of life. Yet, although these devices are easily accessible to most people, they are partially or entirely inaccessible to certain individuals with disabilities, whose normal performance of major life activities is thereby substantially limited.

In the office, workers use computers, fax machines, printing devices, such as copiers and printers, and other electronic equipment. Often, the equipment will include a screen having a GUI thereon. Further, some devices will include touch screens, where the device not only communicates to the user through visual means, but the user communicates to the device by touching the screen.

Currently, blind or visually impaired operators cannot read the information displayed by a GUI, nor can they use a touch screen on a printing device, since there are typically no non-visual means for communicating information to them to guide them to the appropriate selection areas. A blind operator must enlist the help of a sighted user in completing the most simple of programming tasks.

In considering the applications of Section 508 of the Americans with Disabilities Act (29 U.S.C. §794d), business equipment will have to be designed to allow for easier access by a wider body of users, with a variety of physical limitations.

U.S. Pat. No. 6,059,575 to Murphy discloses a tactile recognition input device, which includes a plurality of activation keys movable in a direction generally parallel to the input device to activate the input device and transmit input signals. Each of the keys includes a tactilely recognizable region including, for example, a Braille character. A tactile recognition overlay is used with an existing input device, such as a membrane computer keyboard.

U.S. Pat. No. 6,278,441 to Gouzman et al. disclose an electronic data display system which includes a system for containing a multiple data field environment (MDFE) including portions of displayable data; at least first and second displays for displaying data contained within the MDFE, capable of displaying data selected from different portions of the MDFE, wherein at least one of the displays is a tactile display; apparatus for selecting data for display by the first display, from a first portion of the MDFE; and apparatus for selecting data for display by the second display, from a second portion of the MDFE, different from the first portion. Gouzman et al. also disclose that preferably, two or more of the at least first and second displays are tactile displays.

All references cited in this specification, and their references, are hereby incorporated by reference in their entirety where appropriate for relevant teachings of additional or alternative details, features, and/or technical background.

The embodiments disclosed herein include a series of flexible overlays that mount over the surface of a touch screen, and have areas that communicate information tactilely to users, along with a form or audible feedback to direct the user to the required areas. The face of the overlay contains at least one tactilely readable area that describes the function selection that resides immediately beneath it (over the field that the sighted person would see and use). In embodiments, Braille instructions specifically are used to communicate information to the user.

In embodiments, the flexible overlay is substantially transparent, so that an operator with full visual acuity can see through the overlay without interference. A fully sighted user can thus assist the visually impaired operator in efficiently learning to use this system.

In embodiments, the flexible overlay is substantially opaque. An image of the corresponding screen display is included thereon so that a fully sighted user can thus assist the visually impaired operator.

In embodiments, a single overlay comprises a plurality of tactilely readable areas, wherein a first area corresponds to a first selectable feature of a first display and a second area corresponds to a second selectable feature of a second display, thereby enabling the overlay to be used with both displays.

BRIEF DESCRIPTION OF THE DRAWINGS

The embodiments will be described in detail herein with reference to the following figures in which like reference numerals denote like elements and wherein:

FIG. 1 illustrates a graphic representation of a printing device.

FIG. 2 illustrates an exemplary embodiment of a display of a first GUI as it would appear on a screen.

FIG. 3 illustrates a first exemplary embodiment of an overlay corresponding to the touch screen interface of FIG. 2.

FIG. 4 illustrates the overlay of FIG. 3 superimposed over the touch screen interface of FIG. 2.

FIG. 5 illustrates a flow chart corresponding to the method of using the overlay of FIG. 3.

FIG. 6 illustrates a schematic view of an overlay for use with the exemplary displays shown in FIGS. 7-10.

FIG. 7 illustrates an exemplary embodiment of a first display of a second GUI with the overlay of FIG. 6 placed on top of it.

FIG. 8 illustrates an exemplary embodiment of a second display of a second GUI with the overlay of FIG. 6 placed on top of it.

FIG. 9 illustrates an exemplary embodiment of a third display of a second GUI with the overlay of FIG. 6 placed on top of it.

FIG. 10 illustrates an exemplary embodiment of a fourth display of a second GUI with the overlay of FIG. 6 placed on top of it.

FIG. 11 illustrates a second exemplary embodiment of an overlay corresponding to the touch screen interface of FIG. 2.