

ACTIVE EDGE USER INTERFACE

BACKGROUND OF THE INVENTION

[0001] The present invention relates generally to interface devices, and more particularly to a user interface device that includes dynamically configurable flexible touch areas located near the perimeter of a display to support interactive communication between a user and a user environment.

[0002] There is always a need for user interface devices that simplify human interaction with computers. Current user interface devices include the keyboard, mouse, and touch-screen systems. Each of these user interface devices offer varying functionality in a desktop environment.

[0003] The keyboard allows a user to enter text and symbol information into a computer, and provides predefined keys for executing specific functions (e.g., “save” and “exit” functions). The introduction of the windows-based operating system exposed the limitations of the keyboard, which often required a user to perform multiple keystrokes to execute simple computer functions. To take advantage of the user-friendly, windows-based environment, the mouse was created to provide “point-and-click” functionality. This user interface tool significantly increased the efficiency of a computer session regardless of whether a user performed simple word processing or engaged in complex computer-generated graphic designs. For example, selecting and opening a word processing file typically required three or more keystrokes with a keyboard. However, with a mouse, the user can simply point to the file on the desktop or in a pull down menu and click on the file to open it.

[0004] Although preferred in a desktop environment, keyboards and mice are not readily adaptable to smaller computing devices, such as palm-sized computers, wireless communication products, and public kiosks where space is at a premium. For these user environments, touch-screen systems seem to be the preferred choice of users since they do not require physical keys or buttons to enter data into each device. By eliminating physical keys, small computing device manufacturers can significantly reduce the size and weight of the device, characteristics that appeal to consumers. Moreover, through a touch-screen system, a user can interact with a public kiosk using only a display to request and retrieve information. Touch-screen systems typically include a touch-responsive medium that senses a human touch on a particularly area of the display and software to implement a function associated with the touched area.

[0005] One example of a touch-screen interface is found in U.S. Pat. No. 5,594,471 to Deeran et al. (the “’471 patent”). The ’471 patent discloses an industrial computer workstation with a display and a touch-screen. The touch-screen includes a display touch zone that overlaps the display and a border touch zone located outside the display. Portions of the display touch zone and the border touch zone are programmable as user input areas of the touch-screen and are identified to a user via removable templates. Although convenient, touch-screen systems such as the touch-screen interface of the ’471 patent have disadvantages. Removable templates on a touch-screen display can be lost, destroyed, or misplaced, and when using a finger to select an item on a touch-screen, the user’s hand can often block a view of the screen. Furthermore, touch-screens quickly become dirty, especially when installed in a public kiosk or an industrial

environment, and they do not support key travel—a sliding motion across the screen to execute a function (e.g., scrolling through data) or “two-step” functionality—the ability to implement multiple functions from a single predetermined area of the user interface device.

[0006] Therefore, it is desirable to provide an improved user interface device that is robust and ergonomically correct to create a user-friendly environment that does not require physical keys, templates, or touching the actual display.

SUMMARY OF THE INVENTION

[0007] Systems and methods consistent with the present invention provide a user interface device that includes dynamically configurable flexible touch areas located near the perimeter of a display to support interactive communication between a user and a user environment.

[0008] Specifically, a user interface consistent with this invention comprises a display; an input device located adjacent an edge of the display, and operatively connected to the display to respond to a physical contact; and a processor for executing user interface software configured to implement a function in response to the physical contact on the input device.

[0009] A method for implementing a user interface comprises the steps of generating an image on a display in response to at least one of a human touch and a first pressure on a predetermined area of an input device adjacent the display; and implementing a function associated with the image when a second pressure is applied to the predetermined area of the input device.

[0010] Both the foregoing general description and the following detailed description are exemplary and explanatory and are intended to provide further explanation of the invention as claimed.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] The accompanying drawings, which are incorporated in and constitute a part of the specification, illustrate presently preferred embodiments of the invention and, together with the preceding general description and the following detailed description, explain the principles of the invention.

[0012] In the drawings:

[0013] **FIG. 1** illustrates an active edge user interface consistent with the present invention;

[0014] **FIG. 2a** illustrates a cross-sectional view of a user input device at rest consistent with the present invention;

[0015] **FIG. 2b** illustrates a cross-sectional view of the user input device in **FIG. 2a** with contact applied;

[0016] **FIG. 2c** illustrates a cross-sectional view of the user input device in **FIG. 2a** with additional contact applied;

[0017] **FIG. 3a** illustrates a cross-sectional view of another user input device at rest consistent with of the present invention;

[0018] **FIG. 3b** illustrates a cross-sectional view of the user input device in **FIG. 3a** with contact applied;