

KEYBOARD WITH INTEGRATED KEY AND TOUCHPAD

BACKGROUND

[0001] Keyboards and pointing devices are common input devices for computers, laptops, cell phones, PDAs (personal digital assistants) and other electronic devices. Mice, track points and touchpads are some common types of pointing devices. There have been several efforts to incorporate computer cursor or pointer control (mouse functions) into a keyboard. Many of these attempts have been made on a laptop and typically include a resistive or capacitive touchpad located below the spacebar, or provide a track point (or mini-joystick) pointing device between the keys on the keyboard. There has even been an attempt to provide a mini joystick or track point within a spacebar key as a pointing device. Some of these techniques can be inconvenient and difficult to learn because they may require an interrupting motion by the user to move the fingers or hand from a resting or home position on the keyboard to the location of the pointing device, which may be a significant change in the user's typing behavior.

SUMMARY

[0002] Various embodiments are disclosed relating to a keyboard with integrated key and touchpad. In an example embodiment, a keyboard may be provided that includes a plurality of keys, each key capable of being pressed (or actuated) to select one or more keyboard inputs. The keyboard may also include a micro (or miniature) touchpad provided on an upper surface of a first key of the keys to allow pointer control by moving a finger or other object across a top surface of the micro touchpad.

[0003] According to another example embodiment, a keyboard may be provided that includes a plurality of keys, each key capable of being pressed to select one or more keyboard inputs. The keyboard may also include a micro touchpad provided on an upper surface of a first key of the keys, the micro touchpad being adapted to allow at least small-scale pointer control by moving a finger or other object across a top surface of the micro touchpad. The keyboard may further include a macro touchpad including a touch sensor provided on an upper surface of each of a plurality of the keys, the macro touch pad being adapted to allow at least large-scale pointer control by moving a finger or other object across a top surface of one or more the plurality of keys of the macro touchpad.

[0004] According to another example embodiment, a method of selecting touchpad input and key input may be provided. The method may include determining if a key has been pressed, and determining if touch activity is detected. If a key has been pressed, then key input may be enabled and touch input may be disabled for a period of time after each key has been pressed. Otherwise, if a key has not been pressed, then touch input may be enabled. Also, if a key has not been pressed and if touch input is detected, then key input may be disabled.

[0005] This summary is provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description. This summary is not intended to identify key features or essential features of the

claimed subject matter, nor is it intended to be used as an aid in determining the scope of the claimed subject matter.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] FIG. 1 is a block diagram of a keyboard 100 according to an example embodiment.

[0007] FIG. 2 is a schematic diagram illustrating a mechanical architecture of a key according to an example embodiment.

[0008] FIG. 3 is a flow chart 300 illustrating operation of a keyboard control system according to an example embodiment.

[0009] FIG. 4 is a flow chart 400 illustrating operation of a keyboard control system according to another example embodiment.

DETAILED DESCRIPTION

[0010] Referring to the Figures in which like numerals indicate like elements, FIG. 1 is a block diagram of a keyboard 100 according to an example embodiment. Keyboard 100 may be any type of keyboard, such as a keyboard for a personal computer (PC), laptop, cell phone or personal digital assistant (PDA) or other device. A keyboard controller 102 may be provided within keyboard 100 to perform various electronic functions related to keyboard 100, such as receiving and identifying data (e.g., from pressed keys or other input), and forwarding data to another processor or controller (e.g., host processor), not shown, for display or processing.

[0011] Keyboard 10 may include a number of keys, such as key 104. Each key on keyboard 100 may be pressed (or actuated), for example, to select or input a specific keyboard input, such as a character, letter, number, control input, etc. Any type of key may be used. In an example embodiment, one or more (or even all) of the keys of keyboard 100 may be capable of traveling a distance (key displacement) of at least 0.1 mm, or of at least 0.2 mm, or of at least 0.3 mm between a pressed (or down) position to an not pressed (or up) position. Having keys in a keyboard that may travel a significant distance, such as greater than 0.1 mm, or greater than 0.2 mm, or greater than 0.3 mm for example, may provide a more expected conventional or natural keyboard feel for the user when typing, although this is not required. In other embodiments, one or more (or even all) of the keys on the keyboard 100 may be capable of traveling at least 1 mm, or in other embodiments, at least 2 mm or more (between pressed and not pressed positions), although such a minimum travel distance for keys is not required according to an example embodiment.

[0012] According to an example embodiment, a key 110 may include a micro (or miniature) touchpad 112 on an upper surface of key 110 to allow pointer or cursor control or movement by moving (or dragging) a finger or other object across a top surface of the micro touchpad 112 (by moving the finger across the top surface of the key 110). By integrating a micro touchpad 112 within a surface of key 110 on keyboard 100, a more convenient interface may be provided since the user may not necessarily be required to move his/her fingers or hand from their home or ordinary position on the keyboard when controlling or moving a pointer or cursor or performing mouse type functions.