

[0128] A small active keyboard system where some or all components of the system are configured as a sleeve 490 to operatively attach to and be used in combination with a handheld device in the form of a PDA is shown in FIG. 27A. The sleeve 490 is configured for ambidextrous use by including keys or buttons on the left side of the sleeve 490 and a rocker pad or joystick selector on the top and bottom of the sleeve 490 that enables ambidextrous use of the PDA by right and left handed individuals by inverting the sleeve 490 so the keys or buttons are on one side or the other. The sleeve 490 is a device in which a regular PDA can be placed, and includes some or all components of an active keyboard system according to the invention, such as selectors, keys, a microcontroller, etc.

[0129] A sleeve 492 with some or all components of an active keyboard system according to the invention, and configured to operatively attach to and be used in combination with a handheld device in the form of a larger PDA is shown in FIG. 27B, and is configured for ambidextrous use by including sets of keys or buttons on the left and right sides of the sleeve 492, as well as two joystick selectors on the upper left and upper right of the sleeve 490.

[0130] A handheld active keyboard system 500 configured as a cell phone is shown in FIG. 28. The cell phone 500 includes an ergonomic housing with a display and a visual grid image showing multiple cells 502 and a selection pointer 504 surrounding one column of the grid image. The cell phone 500 also includes a selector 506, side buttons or keys 508, a microphone 510, and a speaker 512. The visual grid image shown in FIG. 28 represents a power-on screen that may be shown when the cell phone 500 is turned on or is activated. The power-on screen provides the ability of the user to have instant access to major functional modes including typing a memo, obtaining voice mail, using a calculator, reviewing/editing a schedule, dialing a number, using a phone book, sending/receiving e-mail, using caller ID, using the Internet, guarding use of the cell phone 500, etc. The selection pointer 504 is controlled by movement sensor(s).

[0131] FIG. 29 illustrates the cell phone 500 in text mode. The display is split to show the typed text and a key assignment grid. Only one hand is needed to type and the typing speed is much faster than multi-tapping. FIG. 30 illustrates how the left/right sensor moves the selection pointer 504 left and right, and how the up/down sensor switches between the panes in the image 530. Typing without the movement sensor(s) may also be effected using the side buttons 508 and/or a selector.

[0132] As illustrated in FIG. 31, an active keyboard system 540 configured as a cell phone for left hand use may be configured for ambidextrous use by equipping the cell phone 540 with a duplicate selector so the cell phone 540 can be turned over for right hand use. The cell phone active keyboard system 550 in FIG. 32 has built in movement sensor(s) and can detect natural swinging and/or lateral/vertical hand moves. The sensors provided on the cell phone 550 may be configured to have one, two, or three orthogonal axes to allow detecting motion in all three dimensions.

[0133] User interactions with a cell phone are generally involved in managing existing data and phone applications, such as a phone book, call history, phone features, a calendar/schedule, a pocket office, etc. The functional use of a

handheld active keyboard system configured as a cell phone using a phone/address book is illustrated in FIGS. 33 and 34 via 560 and 570. As illustrated the phone/address book is selected from the power-on screen and a particular name can be found by scrolling, or may be selected using the text mode. Final name choice is made by a key. The phone number, email, and/or address may be selected in the same manner, as shown via 580 in FIG. 35. The outgoing, incoming, or missed call history may be obtained in the same manner, as shown via 590 in FIG. 36. An existing number in call history may be obtained in the same manner, as shown via 600 in FIG. 37, and a new number in call history may be obtained in the same manner, as shown via 610 in FIG. 38. Calendar features may be obtained in the same manner, as shown via 620 in FIG. 39.

[0134] FIG. 40 shows how selector functions and/or side button functions may be utilized to emulate mouse clicks in a browsing mode of an appropriately configured active keyboard system cell phone. FIG. 41 shows via 640 how the selection pointer of an active keyboard system can be used with navigating maps via tilt controlled movement. FIGS. 42 and 43 show via 650 and 660 how a cell phone active keyboard system can be used to navigate maps in the browsing mode.

[0135] FIG. 44 shows via 670 how an appropriately configured active keyboard system can be used to browse Internet web pages, where movement sensor(s) can control the motion of the display window over an Internet site, a five position thumb joystick selector can emulate mouse cursor and clicks to select an item on the web page, and the keys can be used to effect type, copy, paste, and more functions, and how the side bars can be controlled by movement sensor(s).

[0136] FIG. 45 shows via 680 how an appropriately configured active keyboard system can be used to effect a pocket office and control the cursor by the thumb joystick selector, and control type, copy, paste, and more functions by the keys, and how the side bars can be controlled by movement sensor(s). FIG. 46 shows via 690 how an appropriately configured active keyboard system can be used to play a game by using the thumb joystick to effect aiming and firing, and how the position of the site can be moved by tilting the system to move left, right, forward, back, and zoom in/out.

[0137] An active keyboard system according to the invention provides a grid with three dimensional presentation of the alphabet, rock-n-scroll up, down, left, and right movement, dual pointing devices for web access, message viewing, and gaming. A sleeve with active keyboard system input means and an optional microcontroller may be used as a plug-in for a traditional handheld device to configure it with active keyboard system functionality. The active keyboard system can provide ambidexterity, external movement compensation (e.g., by a bracelet, a holster, internal dual sensors, etc.), and active keyboard software options including adaptive threshold code, sliding zero code, step motion code, calibration code, step or scroll resolution code, grid presentation code, grid population code, application adapter code, and/or sound code.

[0138] An active keyboard system according to the invention provides simple and intuitive controls in the form of a selector, such as a 5-way joystick selector, a movement