

ous or analog data. By way of example, the sensor may be configured to measure the position or the amount of tilt of the touch pad 34 relative to the frame when a user presses on the touch pad 34. Any suitable mechanical, electrical and/or optical switch or sensor may be used. For example, tact switches, force sensitive resistors, pressure sensors, proximity sensors, and the like may be used. In some case, the spring bias for placing the touch pad 34 in the upright position is provided by a movement indicator that includes a spring action.

[0051] FIG. 4 is a simplified block diagram of a computing system, in accordance with one embodiment of the present invention. The computing system generally includes an input device 40 operatively connected to a computing device 42. By way of example, the input device 40 may generally correspond to the input device 30 shown in FIGS. 2, 3A and 3B, and the computing device 42 may correspond to a computer, PDA, media player or the like. As shown, the input device 40 includes a depressible touch pad 44 and one or more movement indicators 46. The touch pad 44 is configured to generate tracking signals and the movement indicator 46 is configured to generate a button signal when the touch pad is depressed. Although the touch pad 44 may be widely varied, in this embodiment, the touch pad 44 includes capacitance sensors 48 and a control system 50 for acquiring the position signals from the sensors 48 and supplying the signals to the computing device 42. The control system 50 may include an application specific integrated circuit (ASIC) that is configured to monitor the signals from the sensors 48, to compute the angular location, direction, speed and acceleration of the monitored signals and to report this information to a processor of the computing device 42. The movement indicator 46 may also be widely varied. In this embodiment, however, the movement indicator 46 takes the form of a switch that generates a button signal when the touch pad 44 is depressed. The switch 46 may correspond to a mechanical, electrical or optical style switch. In one particular implementation, the switch 46 is a mechanical style switch that includes a protruding actuator 52 that may be pushed by the touch pad 44 to generate the button signal. By way of example, the switch may be a tact switch.

[0052] Both the touch pad 44 and the switch 46 are operatively coupled to the computing device 42 through a communication interface 54. The communication interface provides a connection point for direct or indirect connection between the input device and the electronic device. The communication interface 54 may be wired (wires, cables, connectors) or wireless (e.g., transmitter/receiver).

[0053] Referring to the computing device 42, the computing device 42 generally includes a processor 54 (e.g., CPU or microprocessor) configured to execute instructions and to carry out operations associated with the computing device 42. For example, using instructions retrieved for example from memory, the processor may control the reception and manipulation of input and output data between components of the computing device 42. In most cases, the processor 54 executes instruction under the control of an operating system or other software. The processor 54 can be a single-chip processor or can be implemented with multiple components.

[0054] The computing device 42 also includes an input/output (I/O) controller 56 that is operatively coupled to the

processor 54. The I/O controller 56 may be integrated with the processor 54 or it may be a separate component as shown. The I/O controller 56 is generally configured to control interactions with one or more I/O devices that can be coupled to the computing device 42 as for example the input device 40. The I/O controller 56 generally operates by exchanging data between the computing device 42 and I/O devices that desire to communicate with the computing device 42.

[0055] The computing device 42 also includes a display controller 58 that is operatively coupled to the processor 54. The display controller 58 may be integrated with the processor 54 or it may be a separate component as shown. The display controller 58 is configured to process display commands to produce text and graphics on a display screen 60. By way of example, the display screen 60 may be a monochrome display, color graphics adapter (CGA) display, enhanced graphics adapter (EGA) display, variable-graphics-array (VGA) display, super VGA display, liquid crystal display (e.g., active matrix, passive matrix and the like), cathode ray tube (CRT), plasma displays and the like. In the illustrated embodiment, the display device corresponds to a liquid crystal display (LCD).

[0056] In most cases, the processor 54 together with an operating system operates to execute computer code and produce and use data. The computer code and data may reside within a program storage area 62 that is operatively coupled to the processor 54. Program storage area 62 generally provides a place to hold data that is being used by the computing device 42. By way of example, the program storage area may include Read-Only Memory (ROM), Random-Access Memory (RAM), hard disk drive and/or the like. The computer code and data could also reside on a removable program medium and loaded or installed onto the computing device when needed. In one embodiment, program storage area 62 is configured to store information for controlling how the tracking and button signals generated by the input device are used by the computing device 42.

[0057] FIG. 5 is a simplified perspective diagram of an input device 70, in accordance with one embodiment of the present invention. Like the input device shown in the embodiment of FIG. 3, this input device 70 incorporates the functionality of a button (or buttons) directly into a touch pad 72, i.e., the touch pad acts like a button. In this embodiment, however, the touch pad 72 is divided into a plurality of independent and spatially distinct button zones 74. The button zones 74 represent regions of the touch pad 72 that may be moved by a user to implement distinct button functions. The dotted lines represent areas of the touch pad 72 that make up an individual button zone. Any number of button zones may be used. For example, two or more, four, eight, etc. In the illustrated embodiment, the touch pad 72 includes four button zones 74A-74D.

[0058] As should be appreciated, the button functions generated by pressing on each button zone may include selecting an item on the screen, opening a file or document, executing instructions, starting a program, viewing a menu, and/or the like. The button functions may also include functions that make it easier to navigate through the electronic system, as for example, zoom, scroll, open different menus, home the input pointer, perform keyboard related actions such as enter, delete, insert, page up/down, and the