

programmed to move a cursor at a speed corresponding to the amount of tactile pressure exerted on the touchpad.

[0014] Despite all of the input devices known in the art, none provide multifunctional keys, buttons or other input areas (collectively referred to as “input segments”), wherein the various functions can be controlled without either lifting a finger or stylus off of the input segment, shifting a finger or finger pressure to a different portion of the input segment, or employing a second input segment. It would be highly advantageous to be able to control multiple functions of an input device without having to reposition a finger or stylus.

SUMMARY OF THE INVENTION

[0015] The above-described prior art is rife with problems stemming from the fact that accessing various functions controlled by a multifunctional input segment cannot be achieved without having to reposition one’s finger or a stylus on that segment. This often causes unintended input, which requires additional time and physical stress to correct.

[0016] For example, the proper functioning of multidirectional multifunctional keys requires that the keys are large enough and spaced far enough apart so that the user can distinguish and perform the different directions functions (i.e., move the finger or shift finger pressure to a different part of the key) without inadvertently triggering an undesired function of that same key or of a neighboring key on the keyboard. This is particularly difficult if the user has larger fingers.

[0017] Control of input on multifunctional keys that require repeated depressing within a time interval can be difficult and frustrating. Users of such keys often produce unwanted characters that need to be erased, or inadvertently pass by the desired character in a multifunction cycle of a key requiring the repeated depression of the key within the time interval to recycle to the desired character.

[0018] Requiring a second key to be depressed to invoke additional functions is less convenient for the user and, for smaller handheld devices, is cumbersome.

[0019] The present invention solves the problem set forth above by providing an input device in communication with a computer, said input device comprising a multifunctional input segment, wherein force of pressure exerted on said multifunctional input segment determines which function is outputted by said computer. The invention reduces repetitive stress, reduces unintended triggering of functions, requires less effort to input data and is more secure than a typical keyboard in that a video of finger movement would not provide full information as to what data was being inputted.

[0020] The term “input device” as used herein includes, but is not limited to a keyboard, such as a qwerty or other type of computer keyboard, a chorded keyboard, a keypad, a key-based control panel or another array of control keys; a pointing device, such as a computer mouse, trackball, touchpad, trackpad, joystick, pointing stick, stylus, light pen, or light gun (e.g., Zapper Light Gun (Nintendo Entertainment System)); a cyberglove; a graphical input device, such as a graphics tablet (or digitizing tablet), a touch screen or other touch-sensitive display; a game controller such as a gamepad (or joystick), a paddle, a floor pad or a Power Pad; arrays of control buttons on electronic devices, such as computer peripherals (such as printers, scanners, networking devices, devices bridging the computer to another electronic device) stand-alone digital devices (such as digital cameras, digital video recorders, digital music players, GPS devices and recorders),

televisions, CD players and appliances; control panels in vehicles, including control panels for stereos, radar detectors and GPS devices in vehicles; control panels in flight controllers, etc.

[0021] Preferably, the input device is selected from a computer keyboard, a touchpad, a touch screen or a mouse.

[0022] The input device may be in communication with the computer via a direct connection (as in when the input device is part of the same electronic device as the computer, a wired connection, a wireless connection, or through the internet, an intranet or other network connection.

[0023] As used herein, a computer may be “in communication” with an input device or a multifunctional input segment of said input device if the input is communicated to the computer in such a manner that a processor can carry out the intended function. Such communication may be achieved directly through the device or input segment or indirectly through one or more intermediate devices, computers, detectors, translators, switches or the like.

[0024] The term “computer” as used herein, includes any electronic device that comprises a processor, can receive input and generate output based upon said input. This includes, but is not limited to, laptop and desktop computers, cell phones, PDAs, computerized appliances, ATM machines, VCRs, DVD players and recorders, digital music recorders, printers, facsimile machines, smart keyboards, scanners, GPS navigation devices, computers or chips that control vehicle functions, voice prompt systems, weapon system controllers, gaming devices, device-specific and universal remote control units, a device that is a combination of one or more of the foregoing (such as a PDA/cell phone combination), and the like.

[0025] The term “multifunctional input segment” as used herein refers to a portion of an input device that controls two or more different functions each leading to a different output. Examples of a multifunctional input segment are a key; a button (including a mouse button); a portion of a touch-sensitive device; a portion of an electronic stylus; a joystick, joystick, wheel or other device wherein directionality controls function; a finger of a motion sensing glove (cyberglove); or a finger, stylus or other pointing device used in conjunction with a video recorder that can detect and distinguish movement or with a motion detector. In the case of a video recorder or a motion detector, the distance and direction that the finger, stylus or other pointing device is moved is what triggers different functions. In a more preferred embodiment, the input device of this invention comprises a plurality of multifunctional input segments.

[0026] Preferably, the multifunctional input segment is selected from a key, a button, a portion of a touch screen, a portion of a touchpad or a portion of an electronic stylus.

[0027] The term “force of pressure exerted by a user on said multifunctional input segment” as used herein means how hard a multifunctional input segment is pressed or the distance such an input segment is moved. Typically pressure is exerted by a user’s hand, particularly a finger, or by a device controlled by a user’s hand, such as a stylus.

[0028] The way in which the force of pressure is detected according to this invention can be varied. In one embodiment, a pressure-sensitive device measures the force exerted on the multifunctional input segment. The pressure-sensitive device communicates the measured force to the computer in communication with said input device, which, in turn, translates the measurement into instructions to carry out the function