

[0065] The different outputted functions that may be controlled from a multifunctional input segment include, but are not limited to, different characters (numbers, letters, symbols, punctuation marks), different predicted words in conjunction with an autofill function, different phonemes (such as used in stenography), different font styles, different font sizes, different font types, text color, different repeat rate, different menu choices (i.e., scrolling through a menu, optionally while displaying the result of the currently selected menu item), and capitalization and other case changes or combinations of any of the above. More preferably, the different outputted functions of a multifunctional input segment correspond to different characters, font size or font style. Most preferably, the different outputted functions of a multifunctional input segment correspond to different characters.

[0066] In an alternate embodiment, the invention provides an input device with multiple input segments, wherein each input segment has at least two different states corresponding to the force of pressure exerted by a user on said segment and wherein output is produced dependent upon the combination of segments upon which force of pressure is applied and upon the amount of force of pressure applied on each segment. The output of each combination produced on such a device is preferably a character, a phoneme, a word, or a phrase. For example, a five key (designated “A”, “B”, “C”, “D” and “E”) input device wherein each key has two states of response to force of pressure (designated “1” and “2” for the purposes of description) in addition to an unpressed state (designated “0”) provides 35-1 (when each of the 5 keys is in the 0 state no output is produced) or 242 possible single and multiple key combinations.

[0067] In a preferred embodiment, the combinations are limited to one and two key combinations because of practicality and ease of user control. In this preferred embodiment, there are 10 single key combinations (“1” or “2” for each of the five keys) and 40 two key combinations (four combined states—“1-1”, “1-2”, “2-1” and “2-2”—for any two key set; and 10 possible two key sets—“AB”, “AC”, “AD”, “AE”, “BC”, “BD”, “BE”, “CD”, “CE”, and “DE”) allowing for 50 different outputs. This is sufficient to produce all 26 letters, all 10 digits and 14 other characters. Such an input device should be capable of producing any desired text with a single hand.

[0068] In another example an input device with 8 multifunctional input keys and three possible depressed states for each key in addition to an unpressed state can produce 48-1 or 65,535 different combinations. If each combination resulted in the output of a different word, the input device would be capable of producing more than enough outputs to cover an average educated person’s entire vocabulary. In a preferred embodiment, certain combinations of keys would produce words corresponding to specific parts of speech (e.g., nouns, verbs, adjectives) to make the use of the input device easier to learn.

[0069] A plurality of multifunctional input segments on the input devices of this invention may be arrayed in various configurations. The choice of configuration is typically based upon the function of the input device. In a more preferred embodiment, the input device is a mobile phone keypad comprising 12 multifunctional input segments arrayed in a typical 4x3 grid. Other arrays, including circular arrays, linear arrays and other grid arrays can also be employed.

[0070] The input device of the invention may itself comprise two separate parts. In one embodiment, the input device comprises two parts, each comprising four or five multifunc-

tional input segments. The device is designed to be held in a users hands; one part in each hand. This device is preferably used to produce characters and symbols to output text.

[0071] The input devices of the present invention can be used in numerous product applications including, but not limited to, mobile phones, desktop computers, public computer terminals such as ATM machines and internet kiosks, vehicle computers, PDAs, portable digital music playback devices, in-home stereos, car stereos, musical instrument controllers, tablet or notebook computers, appliance controllers, robot controls, game or toy controllers, hand-held electronic games, home or building control systems, flight controllers, arcade games, bike gadgets, motorcycles, ATVs, snowmobiles, medical equipment, research equipment, fish finders, GPS devices, cash registers, customer ordering devices, internet terminals, devices for impaired persons, scuba gear or surgery control devices.

[0072] Each of the embodiments for multifunctional input segments and input devices that comprise them described above are also applicable to monofunctional input segments. Although embodiments relating to monofunctional input segments are less preferred, to the extent that they are novel and unobvious, they are part of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0073] FIG. 1 depicts multiple side views of a multifunctional input segment of this invention.

[0074] FIG. 2 depicts multiple top views of a portion of an input device of this invention comprising a plurality of multifunctional input segments.

[0075] FIG. 3 depicts a laptop computer of this invention comprising a plurality of multifunctional input segments.

[0076] FIG. 4 depicts a cellular phone of this invention comprising a plurality of multifunctional input segments.

[0077] FIG. 5 depicts the relationship between depth of depression and force required for a multifunctional key of this invention.

[0078] FIG. 6 depicts a mouse of this invention comprising a plurality of multifunctional input segments.

[0079] FIG. 7, panels A and B, depict character maps of a keypad of this invention comprising twelve multifunctional keys.

[0080] FIG. 8 depicts a character map of a qwerty keyboard of this invention wherein each key is a multifunctional input segment.

[0081] FIG. 9 depicts a character map of a multifunctional input segment-containing input device of this invention capable of all functions producible on a standard 101 key computer keyboard.

[0082] FIG. 10 depicts the functional groupings for each multifunctional input segment present in an input device of this invention.

[0083] FIG. 11 depicts a character map of a 12 multifunctional input segment-containing input device of this invention.

DETAILED DESCRIPTION OF THE INVENTION

[0084] Certain embodiments of the present invention are described below. It is, however, expressly noted that the present invention is not limited to these embodiments, but rather the intention is that additions and modifications to what is expressly described herein also are included within the scope of the invention. Moreover, it is to be understood that