

MULTI-CONFIGURATION PORTABLE ELECTRONIC DEVICE AND METHOD FOR OPERATING THE SAME

FIELD OF THE INVENTION

[0001] The present invention generally relates to the field of portable electronic devices, and more particularly to portable electronic devices that are adaptable to multiple functional configurations.

BACKGROUND OF THE INVENTION

[0002] Electronic devices, particularly portable electronic devices, are widely used for business and personal activities, and are continually increasing in popularity. Portable electronic devices (interchangeably referred to herein as “portable devices” and “devices”) include, for example, cellular (or wireless) phones and other voice communication devices (e.g., two-way radios), personal digital assistants (“PDAs”) and electronic organizers, pagers and text messaging devices, handheld computers (including “palmtop” and “tablet” computers) and internet browsers, navigation devices and satellite communication devices such as global positioning systems (“GPSs”), cameras, video game devices, media players (e.g., music players and video players), portable medical devices, data collection devices such as environmental monitoring systems, and so on.

[0003] Users continually desire increased functionality from portable electronic devices. Moreover, because of the large assortment of portable devices that are available, and the wide variety of functions that these portable devices are each able to perform individually, it would be desirable to integrate the capabilities and functionality of different devices into a single portable device, so as to eliminate the need to carry multiple devices. From a user’s perspective, eliminating the need to carry multiple devices is a significant advantage because carrying multiple devices is cumbersome and increases the likelihood that one or more devices will be lost or damaged. Additional advantages that can be realized by integrating the capabilities of multiple devices into a single device include eliminating the need to purchase multiple devices, as well as eliminating the need to purchase and maintain separate batteries and accessories for each separate device.

[0004] However, integration of multiple device capabilities into a single device is hindered by the need to provide an ergonomic user interface that is effective for multiple different modes of operation. For example, cellular phones typically have a standardized numeric keypad. On the other hand, text messaging pagers, PDAs, hand-held computers, and other devices on which a user commonly enters text, typically have a “QWERTY” (or “text”) keypad similar to the conventional keyboard layouts of computers and typewriters. Furthermore, the physical layout generally differs between different keypad configurations, making integration more difficult. For example, QWERTY keypads are generally wider than standardized numeric keypads.

[0005] In addition to the aforementioned problems associated with the user interface, integration of multiple devices into a single device is made more problematic because different types of devices typically require different displays for optimal presentation of information, depending on the intended purpose. For example, a small display is usually

sufficient for cellular phones, which typically display only a limited number of alphanumeric characters, such as names and telephone numbers. On the other hand, text messaging pagers, PDAs, hand-held computers, and other devices that display lengthier text and/or graphics generally benefit from having a wider display.

[0006] Although multi-functional electronic devices are desirable, users also favor portable devices that are compact and lightweight. Thus, major challenges are confronted in the competing design objectives of integrating multi-functional capabilities into a single device, while also minimizing the size and weight of the device.

[0007] Therefore a need exists to overcome the problems with the prior art as discussed above.

SUMMARY OF THE INVENTION

[0008] Briefly, in accordance with one aspect of the present invention, there is provided a multi-configuration portable electronic device that includes at least one processor, a first body element including at least one input, and a second body element including a display. The second body element is pivotally coupled to the first body element such that the device can be positioned into a plurality of physical configurations. In response to a change in the physical configuration of the device, there is a change in at least two of a mode of operation of the input device, a mode of operation of the display, and an active software application being executed by the processor. In one preferred embodiment, the physical configurations of the device include a portrait configuration in which the device functions as a wireless phone and a camera, and a landscape configuration in which the device functions as a text messaging pager, PDA, handheld computer, electronic organizer, or media player.

[0009] In accordance with another aspect of the present invention, there is provided a method of operating a portable electronic device having a plurality of physical configurations. According to the method, an interrupt is generated in response to a change in the physical configuration of the device. In response to the interrupt, there is changed at least two of a mode of operation of an input (e.g., a keypad or mouse) of the device, a mode of operation of a display of the device, and an active software application being executed on the device.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] FIG. 1 shows an isometric view of a multi-configuration portable electronic device in the portrait configuration in accordance with a preferred embodiment of the present invention.

[0011] FIG. 2 shows an isometric view of a multi-configuration portable electronic device in the landscape configuration in accordance with a preferred embodiment of the present invention.

[0012] FIG. 3 shows an isometric view of the underside of a circuit board and a flip cover of a multi-configuration portable electronic device in the portrait configuration in accordance with a preferred embodiment of the present invention.

[0013] FIG. 4 shows an isometric view of the underside of a circuit board and a flip cover of a multi-configuration