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**METHOD AND APPARATUS FOR
IMPLEMENTING A VIRTUAL ROTARY DIAL
PAD ON A PORTABLE ELECTRONIC
DEVICE**

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FIELD OF THE INVENTION

Embodiments relate generally to the implementation of a virtual rotary dial pad on a portable electronic device and related methods and apparatuses disclosed herein.

BACKGROUND OF THE INVENTION

Portable electronic devices such as mobile telephones or personal digital assistants (PDAs) generally include a keypad for user input. Traditionally, the keypad is a set of physical keys or buttons that a user may push in order to make user selections. For instance, a cellular telephone may include a grid of physical keys or buttons that may be pushed in order to dial a phone number. However, in more recent portable electronic devices, the keypad is implemented as a virtual keypad displayed on a touch screen. The touch screen of the portable electronic device displays regions that may be touched by a user. The regions may be associated with digits 0-9, although other associations are possible (e.g., *, #, etc.). Selection of a region by a user results in the dialing of the corresponding digit in a phone number. The regions act as buttons or keys and generate a signal when touched. The signals generated are interpreted by the portable electronic device and result in the dialing of a phone number defined by the numbers associated with the touched regions.

Generally, a touch screen of a portable electronic device displays the virtual push button dial pad when the device is in a phone number dialing mode. In this mode, not only does the device display a dialing key pad, but the device also interprets user input through the dialing keypad in order to assemble and dial phone numbers. When the device is not in a phone number dialing mode, the virtual dial pad is not displayed and user input does not automatically result in the dialing of a phone number.

In many cases, the virtual dial pad displayed on a portable electronic device touch screen is similar in orientation and function to a standard touch tone telephone dialing pad. That is, the numbered buttons are arranged in four rows of keys, three columns wide. Numbers 0-9 are represented on the virtual "keys." A "star" ("*") key and a "pound" ("#") key are usually also displayed. Other alpha-numeric symbols may also be associated with the virtual keys. Using this standard orientation, a user may dial a phone number by pushing the appropriate virtual keys. Thus, a user may dial a phone number using a touch screen of the portable electronic device in a way that is similar to most other touch tone dial pads function.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 illustrates a portable electronic device for communicating with a network in accordance with an embodiment disclosed herein.

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FIG. 2 illustrates the internal components of the portable electronic device in accordance with an embodiment disclosed herein.

FIG. 3 illustrates a conventional dial pad configuration on a portable electronic device.

FIGS. 4A, 4B and 4C illustrate dial pad configurations in accordance with an embodiment disclosed herein.

DETAILED DESCRIPTION OF THE INVENTION

Example embodiments and applications will now be described. It should be appreciated that other embodiments may be realized and structural or logical changes may be made to the disclosed embodiments.

An advantage of using a touch screen to display a virtual dial pad is that the dial pad need not be limited to a specific orientation such as the standard dial pad orientation. Because there is a desire, and even a need, for additional virtual dial pads to be used on a portable electronic device with a touch screen, embodiments of virtual rotary dial pads integrated into the portable electronic device are disclosed below.

FIG. 1 illustrates a portable electronic device **210** according to a disclosed embodiment. The portable electronic device **210** is a dual mode (simultaneous data and voice communication capabilities) device, personal digital assistant, etc. Such devices include BlackBerry™ devices by Research in Motion Limited of Ontario, Canada, or Palm® Treo™ devices by Palm, Inc. of California, U.S.A. to name a few. In addition, the portable electronic device **210** may be a cellular telephone. The device **210** includes a portable housing **212** and a touch screen display **214** such as a capacitive or resistive touch screen display. The device **210** may also include a physical keyboard, though, as explained below, a physical keyboard can be replaced by a virtual keyboard on the touch screen display **214**. The device **210** may include additional physical buttons such as a menu button **216**, a go back button **217**, a dial button **218** and an end call button **219**. The menu button **216**, when pushed, results in the display of a menu on the touch screen display **214**. The go back button **217** allows a user to go back to a previously viewed image or page on the display **214**. The dial button **218** and end call button **219**, as explained in more detail below, are used to begin and end phone calls. The device **210** also includes a plurality of additional physical buttons **222** that may be used to activate certain default applications or features of the device **210** when pushed, or which may be customizable to perform desired functions when pushed. The touch screen display **214** displays menus and applications that may be selected by a user through touching the appropriate region of the touch screen display **214**.

The device **210** also includes internal components that may be implemented through a combination of both hardware and software. Internal components **800** of the device **210** are illustrated in FIG. 2. The portable electronic device **210** includes a number of components such as a main processor **802** that controls the overall operation of the portable electronic device **210**. Communication functions, including data and voice communications, are performed through a communication subsystem **804**. The communication subsystem **804** receives messages from and sends messages to a wireless network **850**. In this example embodiment of the portable electronic device **210**, the communication subsystem **804** is configured in accordance with the Global System for Mobile Communication (GSM) and General Packet Radio Services (GPRS) standards. The GSM/GPRS wireless network is used worldwide and it is expected that these standards will be superseded eventually by Enhanced Data GSM Environment