

designated item. In addition to the centralized navigation tool 128, the navigation row has a connect key 106 to place and answer telephone calls, a menu key 107 which displays a menu associated with a given application page, an escape key 109 which returns to the previously displayed application page, and a disconnect key 108 which disconnects or terminates a telephone call. While these keys are shown in FIG. 2A, other exemplary embodiments will not display the connect 106 and disconnect keys 108 unless the telephone application is running. Alternatively, the connect and disconnect keys 106, 108 appear when a telephone call is received when running another application.

[0081] In another exemplary embodiment, when a telephone application is running or when the device 300b is operating in a telephone mode, a telephone key arrangement 282 is shown on the adaptive display screen 322 of the handheld device 300b shown in FIG. 2B. This telephone key arrangement is in the ITU standard phone layout as described above and which users are familiar. In addition to the arrangement shown on the adaptive display screen 322, the shape changing upper surface layer 208 takes on a tactilely perceptible shape which could be like one of the ones described above. This would enable the user based upon touch to distinguish whether the "1" or "2" key was actuated. In addition, a navigational key arrangement 285 is provided above the telephone key arrangement 282. Similar to other navigation row arrangements, this navigational key arrangement 285 has a centralized scrolling navigation key 440, a connect key 146, a menu key 147, an escape key 149, and disconnect key 148. The centralized navigation key 440 is one that allows the user to scroll through a list of items and select a user-designated item. The outer ring 442 of the centralized scrolling navigation key 440 allows the user to navigate in a single direction such as up or down. This can be achieved by user placing their finger inside the outer ring 442 and moving in a clockwise or counterclockwise direction. The select key 444 in the center of the outer ring 442 enables the user to select an item that was designated through the use of the outer ring 442. In at least one embodiment, the outer ring 442 is also contoured to provide a tactilely perceptible area associated with the visually displayed outer ring 442. In addition, the select key 444 can be controlled to exhibit a specialized shape such that it is perceptible. For example the select key 442 could have a surface which is raised as compared to the outer ring 442. Other known surface configurations are also considered within the scope of this disclosure.

[0082] In addition to the keys presented on the display screen 322, the handheld device 300b shown in FIG. 2B has a programmable physical key 150 on the side of the device 300. This programmable physical key 150 can be programmed to provide various functions relating to the handheld device 300b. For example, it could be used to switch between telephone and data/text modes of operation. In another embodiment this key 150 would function as a way to return to a home screen.

[0083] In another exemplary embodiment, the handheld electronic device 300b has a reduced alphabetic key arrangement 281, a navigational key arrangement 285, and an application page 290 shown on the adaptive display screen 322 (as shown in FIG. 12). The visual arrangement of the reduced alphabetic keys 281 shown has been described above, and in one embodiment, the shape of the upper surface changes shape based on this reduced alphabetic key arrangement 281. The shape of the upper surface can also be one of the surface

changes as described above. The navigational key arrangement 285 has a centralized navigation key 128, a connect key 146, a menu key 147, an escape key 149, and a disconnect key 148 (as shown in FIG. 12). The centralized navigation key 128 has directional arrows, a select button 416, and an outer ring 420. In this embodiment, the left directional arrow 412 is visually signified by the outlined arrow and additionally the upper surface changes in response to the displayed arrow such that a bump 414 is created on the upper surface within the outlined arrow. The other directional arrows shown in the figure also exhibit this characteristic. Likewise, the select button 416 is visually signified with a circle shown on the display screen 322 and a bump 418 created by the upper surface in response to the displayed select key 416. These changes in the upper surface are given as an additional example of possible surface changes that can be made in response to the displayed navigation key 128. In other embodiments, the surface characteristic can be one of those described above.

[0084] Other examples of visual key arrangements are shown in FIGS. 13 and 14. The arrangement shown in FIG. 13 has an optionally displayed top row of keys for placing and receiving telephone calls. While this row is shown in FIG. 13, other exemplary embodiments of this arrangement may not display this row of keys until a telephone call is received or a telephone mode is enabled. Likewise the "QW" key in FIG. 14 has a connect symbol and the "OP" key has a disconnect symbol, these symbols may be shown either routinely or only once a telephone call is received if the device 300b is operating in a non-telephone mode. Additionally the upper surface of the shape-adaptive display screen 322 exhibits bumps within the visually outlined keys. For example, the "OP" key has a surface bump 278. These visual arrangements and surface characteristics are provided as additional examples to the above described visibly different key arrangements and shape-adaptive upper surface.

[0085] In at least one embodiment, the shape-adaptive, upper surface is incorporated into a handheld electronic device 300c which has a physical keyboard 332 as shown in FIG. 15. In the embodiment shown in FIG. 15, the navigational inputs 190 is provided above physical keyboard 332 and below the display screen 322. This navigational inputs 190 has a layout similar to that of FIG. 1 with a connect key 6, a menu key 7, an auxiliary user input 328, an escape key 9, and a disconnect key 8. When the telephone mode or application is enabled, the display screen 322 of the handheld device 300c displays a telephone key arrangement 282 on the display screen 322. The shape-adaptive display screen 322 of the present technology changes the shape of the upper surface in dependence upon the visually presented telephone arrangement 282. The shape that the upper surface assumes in one embodiment is one in which each of the keys has a bump that is centered in the target area of the two-dimensional key zone. Other surface changes as those described above can also be incorporated into this telephone key arrangement 282.

[0086] In yet another embodiment, a method 500, shown in FIG. 17, is provided for changing the shape of an adaptive display screen 322 which is configured for incorporation on a multi-mode, microprocessor-controlled wireless handheld communication device 300 having capabilities for at least voice and text or data modes of communication. The method 500 enters a mode of operation of the handheld wireless communication device 300 (block 510). This mode of operation can be selected by the user or entered through incoming