

[0044] FIG. 4b illustrates an exemplary mobile terminal embodying the first aspect of the second advantageous embodiment of the present invention in a side view,

[0045] FIG. 5a illustrates an exemplary mobile terminal embodying the second aspect of the second advantageous embodiment of the present invention in a perspective view,

[0046] FIG. 5b illustrates an exemplary mobile terminal embodying the second aspect of the second advantageous embodiment of the present invention in a side view,

[0047] FIG. 6a illustrates an exemplary mobile terminal embodying the third aspect of the second advantageous embodiment of the present invention in a perspective view,

[0048] FIG. 6b illustrates an exemplary mobile terminal embodying the third aspect of the second advantageous embodiment of the present invention in a side view,

[0049] FIG. 7a illustrates movements of a finger on the touch pad of an exemplary mobile terminal according to the present invention, and

[0050] FIG. 7b illustrates movements of a cursor on the display of an exemplary mobile terminal according to the present invention.

#### DETAILED DESCRIPTION

[0051] FIG. 1 illustrates a flow diagram of an exemplary method 100 for providing a mobile terminal according to an advantageous embodiment of the present invention comprising a touch pad UI input device. Especially the method 100 may be implemented in a flip-type terminal construction. The method may be considered to run as a loop, where in step 102 the position or the angle of the touch pad UI relative to the mobile terminal where the touch pad UI is hinged is observed. In step 104 it is observed whether the touch pad is closed whereupon the mobile terminal is operated for example on standby mode and the touch pad UI acts as a mechanical protector for the display of the mobile terminal and also for the sensitive surface of the touch pad UI in step 106. If the touch pad UI is not closed the opening angle of the touch pad UI is observed in step 108 and if the opening angle is in a certain area, for example between 5° and at maximum approximately 180°, the touch pad UI is operated as a typical touch pad UI input device in laptops, where the mobile terminal may read the output of the touch pad UI for example in similar way as a laptop in step 110.

[0052] If the touch pad UI is, however, opened completely in step 112 (approximately 360°, whereupon the touch pad UI is flipped to the back side of the mobile terminal) the touch pad UI is operated in so-called two-hand-mode, where the user can hold the mobile terminal with both hands seeing the display and controlling the touch pad UI input device for example with his middle fingers, which fingers among others basically support the mobile terminal in the back side and in fact touch at least partly the touch sensitive surface of the touch pad UI in step 114. In this mode the touch pad UI is located advantageously directly behind the display, whereupon an illusion may be achieved where the touch pad UI and display seems to operate "transparently". In addition in the two-hand-mode a conversion for the direction data of the fingers movements on the touch pad UI is typically made, especially in direction perpendicular to the hinge, because the cursor movements on the display depends on the

position angle of the touch pad relative to the mobile terminal. Let us consider the flip-type terminal construction, where the touch pad UI is hinged to the mobile terminal at the lowest part, for example.

[0053] Now, if the touch pad UI is opened approximately 90° and a user moves his finger towards the hinge on the touch pad (farther from him) or alternatively if the touch pad is opened approximately 180° and a user moves his finger towards the hinge (upward) on the touch pad, the cursor advantageously moves up on the display, but if the touch pad is opened much over 180° (for example completely or approximately 360°) and the user moves his finger again towards the hinge (now downward) on the touch pad, the cursor should logically moves, however, downward on the display. Similar-type conversion has to be done also in situations, where the touch pad UI is hinged to the mobile terminal at somewhere else, such as at the right or left part.

[0054] Otherwise, if the method does not observe the position angle of the touch pad UI relative to the mobile terminal, the method may go back to step 102.

[0055] FIG. 2 illustrates a flow diagram of an exemplary method 200 for providing a mobile terminal according to an additional advantageous embodiment of the present invention comprising a touch pad UI input device. The method 200 may be implemented both in a flip-type and monoblock-type terminal constructions.

[0056] The method may be considered to run as a loop, where in step 202 the position of at least one fingertip of a user on the touch pad of the mobile terminal may be observed. The position data of the fingertip on the surface of the touch pad UI may be converted into the corresponding position data of the cursor on the display in step 204, when the cursor may be displayed in step 206 in a meaningful position on the display relative to the position of the fingertip on the touch pad so that if the user moves his finger on the surface of the touch pad the cursor will move on the display of the mobile terminal logically to the same direction as the finger on the touch pad.

[0057] In step 208 presses of the user fingertip on the touch pad UI may be observed, especially if the touch pad UI is pressure sensitive touch pad UI input device. The presses of the fingertip on the touch pad UI may be determined as a click-operation in step 210, where the position of the fingertip at the moment when the touch pad is pressed is also registered because the appropriate input command depends on the position of the fingertip on the touch sensitive surface of the touch pad UI or the cursor on the display. Alternatively the user may press a certain button locating, for example, in the front side of a mobile terminal in step 208. The button may be pressed for example by a thumb. In step 210 the presses may be associated also to other functions, such as zoom-function, instead of simple click-operation.

[0058] FIG. 3a illustrates a front part and FIG. 3b a back side part of an exemplary mobile terminal 300 embodying the first advantageous embodiment of the present invention. The mobile terminal 300 is a monoblock-type mobile terminal, where the touch pad UI input device 304 is advantageously arranged fixedly into the back side of the mobile terminal 300 (opposite side of the display 302 in the mobile terminal 300). The touch pad 304 is advantageously