

8 can also be placed in an other part of the housing than the front panel 2a. The keyboard element 3 includes the keyboard 4 of the mobile station. In addition, the body housing element includes a sensor element 27, such as a switch, which recognizes if the keyboard element 3 is out or pushed into the body housing element 2.

[0022] The display 5 is preferably a depression responsive touch sensitive liquid crystal display (LCD), which also recognizes a touch with a weak intensity. The liquid crystal display is provided with, for instance, a touch sensitive membrane or other corresponding and well known technology, which also recognizes the touching point. When the keyboard element is not exposed, or it is pushed into the body 2 as shown in FIG. 2, this touch sensitive display 5 preferably comprises a group 9 of activation areas for activating the telephone functions of the device 1 by touching the activation areas 13 and preferably at least one display area 10 for presenting variable information, such as a telephone number, the state of the battery 11 of the device and the strength of the signal 12 received by the device 1. The user activates the operations normally by depressing the keys lightly with a finger, but the depression can also be carried out with a pointed object or the like, when the touch-recognition technology used allows it. The points to be depressed, or the activation areas 13 for activating different telephone functions of the device 1 can also be shown by rectangles, circles or corresponding figures drawn on the display 5 by the control program of the device 1, combined with symbols or other markings in connection with the figures, when required. The size, shape and location of these activation areas 13 and the display area 10 can vary. In addition, there can be many separate display areas 10 on the display.

[0023] The telephone functions mentioned above are preferably functions which can be performed in conventional telephones with a memory for telephone numbers and the corresponding names. Functions like this are calling, answering an incoming call and retrieving a telephone number from the memory. The number memory can be browsed, for example, by function keys 8 or by activation areas 13 created for browsing.

[0024] Other functions that are well known from conventional mobile stations and PDA devices, such as handling text messages, saving telephone numbers, keeping a calendar and selecting a ringing tone, are preferably performed when the keyboard element 3 is drawn out from the bottom of the body housing element 2. Then the user has a display area 10 with the full size of the display 5 available for the presentation of information and a good keyboard 4 for the input of information. It is also possible that part of the display 5 is reserved for the use of the activation areas 9, whereby only part of the area of the display 5 remains for the use of the display area 10. However, when the keyboard element is drawn out, the need for activation areas is smaller, and thus more room remains for the display area than when the keyboard element 3 is pushed into the body housing element 2.

[0025] FIG. 3 shows a cross-section of a keyboard element 3 of a mobile station according to a preferred embodiment of the invention. This keyboard element 3 preferably comprises a housing element 14, a touch sensitive element 19 known per se and a keyboard mat 16 known per se, which in turn consists of keys 15a, 15b, spring means 17 and a support means 18. The spring means is preferably made of some elastic material, and it is fastened to both the support means and the key, thus tying the key and the support means elastically together. The

purpose of the spring means is to enable the mobility of the keys so that the key can be pressed down 15b, and when the key is released, it returns up 15a. The support means 18 is preferably a plate made of rigid material with holes for each key 15a, 15b supported by a spring means 17. The support means 18 is fastened at the edges securely to the housing 14 of the keyboard element so that when the keys are up 15a, the touching element 20 of each key is essentially at the same, specified distance from the touch sensitive element. This distance can be, for example, 0.3-1.0 mm.

[0026] The implementation of the keyboard 4 is such that a keyboard plate 16 is placed over the touch sensitive element 19. This keyboard plate is installed over the touch sensitive element as fixed. The keyboard plate is preferably a keyboard mat, whereby the user gets a good tactile feel of the keyboard and as good feedback as possible when a key is depressed. Then an experienced writer can write merely on the basis of the feel and looking at the writing on the display. In the scope of this invention, the keyboard plate 16 can also be a membrane (not shown), preferably a bubble membrane, on which key markings have been made for showing the places of the keys 15a, 15b. An alternative way for manufacturing the keyboard plate 16 is to form the keyboard plate 16 of separate keys and a supporting plate (not shown). One more alternative is to manufacture the keyboard plate 16 with two-phase injection moulding. Then the frame is made of rigid material, such as rigid plastic, and in the second phase its holes are filled by injection moulding with some softer and more elastic material, such as a soft plastic mixture, thus forming the keys (15a, 15b) so that the frame and the keys form a solid entity.

[0027] The touch sensitive element 19 can be implemented so, for instance, that it is preferably formed of two essentially rectangular membranes of the same size 19a, 19b (FIG. 4), which are arranged at a specified distance from each other and preferably essentially parallel. The membrane on top, or the one on which the touch is targeted, is made of some resistive material. On the upper membrane there are two conductors Xin, Yin connected on adjacent sides, and the other sides are connected to the 0 potential. On the lower membrane there are also conductors Xout and Yout connected on adjacent sides. Xin and Xout are connected on the same sides of the membranes 19a, 19b and essentially at the same points. Correspondingly, Yin and Yout are connected on the same sides of the membranes 19a, 19b and essentially at the same points.

[0028] When a key is pressed down 15b, the touching element 20 presses the touch sensitive element 19 below it with such a great strength that the upper membrane 19a touches the surface of the lower membrane 19b, and thus a contact is created between the membranes. An A/D converter 22b detects the depression by examining at times, which is called polling, whether a key has been depressed. For the duration of the polling, a constant voltage is preferably switched from the D/A converter 22a to the Xin line, for example, and the voltage of the Xout line is measured. If the voltage differs essentially from zero, a key has been depressed, whereupon the X coordinate is calculated from the voltage value. The voltage in the Xout line is the higher the closer the contact point is to the edge to which the conductors Xin and Xout are connected. After this, the Y coordinate is received in a corresponding manner preferably by switching a constant voltage to the Yin line from the D/A converter 22a and by measuring the voltage of the Yout line. The voltage in the Yout line is also the higher the closer the contact point is to the edge to which the conductors Yin and Yout are connected. For the duration of