

[0028] In order to give the user a first message to the effect that the control element which is shown three-dimensionally (especially when a plurality of such control elements are shown simultaneously on the screen), has also been activated for a command input, that is, that such an input is therefore possible via the control element, the piezoelectric layer 6 or the layer sections 7 that have already been actuated and deformed in order to display the control element is/are actuated in such a way via the control device 9 that they vibrate at a certain, preferably relatively low, frequency  $f_1$  as is shown by the two-headed arrows in the respective layer sections 7. This means that not only does the user feel the position of the control element and know that he is touching the correct section of the user interface with his finger 10, but he also immediately receives through his finger a haptically perceptible information signal indicating that he can in fact input a command via said control element. During actuation, during which the voltage that induces the geometrical deformation of the piezoelectric layer sections is varied according to the frequency  $f_1$ , the electrically induced displacement of the piezoelectric sections continuously changes, whilst at the same time a minimum displacement is retained to show the three-dimensional control element.

[0029] If the user, having ascertained haptically that he can in fact input a command via the control element that he has touched, actually wishes to make such an input, he presses with his finger 10 on this section of the user interface 8, as shown in FIG. 3 by the arrow P. This leads firstly to the detection matrix of the user interface 8, which, as mentioned above, is not shown in further detail, producing an electric signal S when the touch is sufficient, which signal shows the electric information as the consequence of the command input. Said signal S is transmitted to the control unit 9. As soon as the signal is present, the control device 9 then actuates the layer sections 7 that have already been actuated beforehand in such a way that they vibrate at a frequency  $f_2$  which is perceptibly higher than the frequency  $f_1$  in order to give the user the haptically perceptible acknowledgement signal to the effect that his command input has been recognized and that a command signal has been generated. The user can perceive a clear difference in the information that has been given to him.

[0030] As an alternative to changing the frequency between the two states "indicating an active state" and "acknowledgement following the input of a command," it is also possible to vary the mechanical impulse that can be generated via the layer sections 7 and the deformation thereof. Proceeding from FIG. 2, the layer sections 7 can be actuated at a low voltage to provide the information "active state" such that the displacement thereof is slight and consequently a lower mechanical deformation and thus a weaker impulse is transmitted, whilst to provide the "acknowledgement," the layer sections 7 are actuated at the same frequency but at a higher voltage, which leads to a perceptibly greater mechanical displacement and thus to a stronger mechanical impulse that can be perceived by the user.

[0031] In the form of a sketch illustrating the principle involved, FIG. 4 gives an exploded view showing the elements known from FIG. 1, the liquid crystal display 2, piezoelectric layer 6, and user interface 8. The liquid crystal display 2 shows in the example used a slide 11, which slide

can be "moved" along a track 12, which is also shown, in order to input a command. A corresponding "slide 11'" is replicated by corresponding actuation of the piezoelectric layer 6, the piezoelectric layer sections 7 being actuated in such a way that a lateral limit for the slide 11' is created, so that firstly said slide 11' can be felt on the user interface 8 by the user through his finger 10 and secondly a slight hollow is created or can be felt, which hollow is made by the layer sections 7 limiting it at the edges, which sections are actuated and thus deformed. Said hollow receives the finger 10 (or even a user pen or suchlike which is held in the hand) and guides it slightly. If the slide 11 or 11' is/are now moved along the track 12, the finger 10 first presses the slide 11' which is represented three-dimensionally, as shown by the arrow P and then pushes it to the right or left along the straight track 12 as shown by the two-headed arrow B. Depending on the direction of movement, there are continual changes in firstly the actuation of the piezoelectric layer sections 7 in order to complete the slide movement three-dimensionally and represent it in a haptically perceptible manner. After there has also been a continuous command input resulting from the movement of the slide 11', that is, in response to a change in a control or regulating parameter, the part of the layer sections 7 of the piezoelectric layer 6 used to generate the vibration or impulse signal is actuated via the control device 9 that represents the acknowledgement, said part being that virtually in front of the finger 10 in the direction of movement. Thus the user therefore likewise continuously receives information to the effect that the slide- or control change has also actually resulted in the generation of a corresponding command signal.

[0032] In the form of a sketch illustrating the principle involved, FIG. 5 now gives two views of the screen which show the adjustment of any parameter e.g. of an operational parameter of a unit or a machine. In the left-hand view of the screen, the initial parameter is the parameter "a", which can be arbitrary in nature and have an arbitrary information content. Assigned thereto are two control elements 13, which can be displayed to the user three-dimensionally in the manner described above. Let us assume that the user would like to change the parameter "a", which is possible by pressing the control element 13a, which is marked with the "+" sign. The adjustment of the parameter is to be achieved blind, for instance, since the user would like to look at another part of the unit, on which the reaction to his adjustment of the parameter can be seen.

[0033] If the control element 13a, which is marked with the "+" sign is pressed, it first vibrates at the frequency  $f_2$ , that is, at the frequency that has already been described, which represents the acknowledgement relating to the forthcoming generation of the command signal and thus of the change in the parameter resulting therefrom. The parameter "a" changes continuously, as long as the control element 13a is pressed. This is effected for a time  $\Delta t$ , until the parameter has changed to its maximum value "z". A further change of parameter is impossible or would result in the parameter being changed into a danger zone, which is not supposed to happen. In order to inform the user thereof, the frequency at which the acknowledgement signal is generated via the piezoelectric layer and hence via the control element 13a changes perceptibly compared to the frequency  $f_2$ , such that the user can easily detect this. For example, the frequency