

- [0059] 13 a slide,
- [0060] 14 selectable zones,
- [0061] 15 a fixed, planar surface,
- [0062] 16 electrodes,
- [0063] 17 magnets,
- [0064] 18 electro-rheological fluid, in fluid form,
- [0065] 19 electro-rheological fluid, in solid form,
- [0066] 20 sensor film,
- [0067] 21 magneto-rheological fluid, in fluid form,
- [0068] 22 magneto-rheological fluid, in solid form,
- [0069] 25 an operator control panel,
- [0070] 26 selectable zones for direction data,
- [0071] 27 selectable zones for telephone operator control, 28 a handwritten input,
- [0072] 29 lifting elements,
- [0073] 30 a display device,
- [0074] 31 a list,
- [0075] 32 and 33 input boxes,
- [0076] 34 display of an assignment of the operator control device with the functions of a telephone keypad

[0077] FIG. 1 illustrates an operator control device 1 according to an example embodiment of the present invention as a perforation matrix with plungers in the state with a soothed surface such as may be used for handwritten inputs.

[0078] FIG. 2 is an exemplary illustration of the possible user prompting system on a display device 30, for example on an LCD display, for controlling a navigation system by handwritten inputs on the operator control device 1 illustrated in FIG. 1. The freely selectable inputting of handwritten characters allows lists with extensive selection possibilities such as, for example, destination data for a navigation system, to be efficiently limited. The recognition result of the handwritten input 6 which is made on the operator control panel 2 is displayed to the user in the input box 32. Incorrect inputs may be erased by the user by, for example, simply inputting a transverse line from right to left on the operator control panel.

[0079] If a selection is limited by handwritten inputs to the extent that the remaining selection possibilities may be selected by scrolling, i.e., with incremental upward or downward movements of the mark in the list 31, the input possibility on the operator control panel 2 may be switched over to this operator control mode automatically by controlling the operator control sequence or manually by the user. When there is a pressure-sensitive sensor system of the operator control panel, this may be brought about by the user by, for example, briefly pressing twice on the operator control panel.

[0080] The character recognition mode for the outlined use of the operator control device 1 is then ended and the operator control panel 2 is switched over, for example, into a selection mode for scrolling through a list.

[0081] For this purpose, for example, three areas which may be sensed in a tactile fashion are presented in a vertical arrangement on the operator control panel 2 by raising

plungers, the functionalities “move mark upward”, “select the marked position” and “move mark downward” corresponding, as selectable zones, to the areas. In this case, for example, the selectable zone with the function “move mark upward” may be shaped by the plungers as a triangle with the tip upward, and the selectable zone with the function “move mark downward” may be shaped as a triangle with the tip downward; and the function “selection of the marked position” may be given a round shape for the purpose of better tactile differentiation for the two other functions.

[0082] Touching and pressing down the upper selectable zone causes the mark in the list 31 to be moved one position upward, with the list 31 being updated, if appropriate, with inputs which have been invisible. Touching and pressing down the lower zone of the operator control panel causes the mark to be correspondingly moved downward. A marked position is, for example, selected in a valid fashion by touching the central zone of the operator control panel 2 and pressing it down. For the illustrated example this means that the selected town is transferred into the input box 32 as a destination for the navigation system.

[0083] FIG. 3 illustrates the underside of a touch-sensitive operator control panel 2 which is reconfigured to form a perforation matrix, with the electrode array of the sensor system and the bores for the plungers.

[0084] The bores in operator control panel are located centrally in the electrodes of the capacitive sensor system so that interruptions are not produced in the conductive layer. (The electrodes of the illustrated capacitive sensor system on the operator control panel 2 are designated by 8; isolated areas are designated by 9.) The sensor functions of the touch-sensitive operator control panel 2 for determining position and for inputting characters may thus be readily ensured despite the bores 7.

[0085] FIG. 4 illustrates an example of an actuator system for raising the plungers 4 out of the surface of the operator control panel 2. The plungers 4 are raised successively by a slide 13. Depending on the width of a slide 13, only a single row of plungers is moved by the slide, or a plurality of slides are moved simultaneously by plungers. The slide 13 may be shaped such that it firstly raises a number of plungers in the pushing direction and allows them to drop again further to the rear. A plurality of patterns which may be sensed in tactile fashion may be generated on the operator control panel by various arrangements of such slides, which may be pushed, for example, under the operator control surface from all four sides, and by slides which are shaped in the same manner or differently and by inserting the slides to different degrees under the operator control panel.

[0086] For a simplified actuator system, the plungers may be combined on mounts 10 to form groups with a plurality of plungers. However, it is also possible to raise the plungers individually or in groups by lifting devices instead of by slides, and to generate different patterns, which be sensed in a tactile fashion, on the operator control panel by appropriately structuring the lifting devices.

[0087] FIG. 5 illustrates an operator control device 11 according to an example embodiment of the present invention, in the state with a structured surface which is arranged in a manner which may be sensed in a tactile fashion. The arrangement of the surface is brought about by a rheological fluid which is located between a planar, solid underlying surface and a touch-sensitive film lying on it, the latter being fixedly connected to this underlying surface at the edge of