

perforation matrix. If the selectable zones are formed as areas with raised plungers, a capacitive sensor system may be more favorable owing to the distance between a finger and the surface of the perforation matrix. If, on the other hand, the selectable zones are formed as countersunk areas—between areas with raised plungers—the sensor system may be implemented in a capacitive or resistive fashion.

[0019] If the touch-sensitivity of the operator control panel is to be implemented by the plungers, they may be equipped, for example, with a capacitive sensor system. In an example embodiment of the plungers made of optical waveguide material, the finger position may also be detected by detecting reflections or shadowing. If the selectable zones are represented areas with raised plungers, a pressure-sensitive sensor system may also be used to detect the finger position.

[0020] If the operator control panel is used to detect handwriting, all the plungers are lowered in the perforation matrix so that the operator control panel has an essentially planar and smooth surface. The recognition of the characters which are input by following the finger position may be carried out by a sensor system in the perforation matrix or a sensor system in the plungers.

[0021] An example embodiment of the plungers may be manufactured from light-guiding material and may be illuminated by a light source underneath the actuator system since in this manner the respective structuring of the operator control panel may be visually underlined by the illumination, and the operator control device may thus be easily located even at night.

[0022] An example embodiment of the operator control device may provide that the surface of the operator control panel is arranged as a touch-sensitive film which is undetachably connected to a planar, fixed underlying surface at the edge of the operator control panel, and the space between the underlying surface and film is filled with a rheological fluid which may be solidified and fluidized again by an actuator system. Rheological fluids are characterized by the fact that their viscosity may be controlled. The viscosity of electro-rheological fluids is influenced by electrical fields, and that of magneto-rheological fluids is influenced by magnetic fields.

[0023] The touch-sensitive sensor system may be integrated into the film which is at the top on the operator control panel since the film is directly in contact with the touching finger, as a result of which the greatest possible degree of proximity to the sensor system may be achieved. This sensor system may be implemented in a capacitive or resistive fashion, in which case a resistive sensor system may also be operated with gloves.

[0024] The structuring of the operator control panel may be achieved by hardening the rheological fluid in accordance with the respective configuration and activation of the elements of the actuator system. Since the fluid in the region between the film and fixed underlying surface does not predefine a structure for the conditioning of a surface which may be sensed, the areas in which the fluid is to be solidified are determined solely as a function of the structuring and flexibility of the elements of the actuator system.

[0025] The areas with solidified fluid may be sensed by touch through the film resting on the fluid in comparison with the areas with non-solidified fluid since they may be

sensed as a thickened portion compared to the areas which are not solidified and in the areas which are not solidified the fluid may be expelled by the probing finger. In this context, the selectable zones may be respectively represented by the solidified or the fluidized areas. The surface structure may be completely disintegrated by deactivating the actuator system so that a finger or stylus may easily expel the fluid and the film is pressed directly onto the planar, fixed underlying surface. In this form, the operator control panel provides the possibility of making handwritten inputs on the touch-sensitive film.

[0026] An electro-rheological fluid may be used as a Theological fluid. The solidification of the fluid is brought about by electrical fields which may be generated by an actuator system. The actuator system may include, for example, electrode pairs which are opposite one another on the underside of the touch-sensitive film and on the surface of the solid, planar surface under the film. The electrodes may, for example, be pressed onto the respective surface, ensuring the largest possible degree of evenness of the operator control panel.

[0027] A magneto-rheological fluid may also be used as Theological fluid. The solidification of the fluid is brought about by magnetic fields which may be generated by a corresponding actuator system. The actuator system elements may include, for example, magnets which are located under the operator control panel and which are moved closer to the operator control panel from below—and thus to the magneto-rheological fluid—in order to generate magnetic fields which act on the magneto-rheological fluid. In order to cancel the magnetic field, the magnets are moved again to a suitable distance from the magneto-rheological fluid. In this context, the magnetic may also be generated by rotatably mounted magnets, by tilting through 90 degrees, or sufficiently weakened again, with the axis of rotation arranged perpendicular to the field lines of the magnets. In addition, there is the possibility of shielding the magnets from the magneto-rheological fluid on the actuator path by a film or a piece of sheet metal.

[0028] For the reliable operation of the operator control device, the operator control device may be accommodated in an area which is directly within reach of the driver, as the primary user of the device. For the visual orientation of the user by the functional assignment of the operator control panel, it may be provided that the selectable menu items are displayed in the field of vision of the driver. This may be implemented by a display device which is separated from the operator control device and is located in the field of vision of the user. In this manner, the driver may be distracted least by the road traffic when operating the systems by the operator control device while driving.

[0029] The selectable menu items, such as correspond to the functional assignment of the zones which may be selected on the operator control panel, may be arranged on the display device in a manner which corresponds to the arrangement of the menu items on the operator control panel. Information for user prompting is additionally represented on the display device in order to provide user-friendly support for the systems and functions which may be operated by the operator control device.

[0030] One manner of accommodating the operator control device is to install it in the armrest between the driver's