but may alternatively be arranged in a curved plane or on a first plane and then wrapped around to a second plane substantially perpendicular to the first plane, or any other suitable arrangement. The surface **115** may alternatively include lumps, bumps, depressions, textures, or may be a surface of any other suitable type or geometry. The fluid vessel **127** preferably includes a cavity **125** and the displacement device **130** preferably influences the volume of fluid **112** within the cavity **125** to expand and retract the cavity **125**. The fluid vessel **127** may alternatively be a channel **138** or a combination of a channel **138** and a cavity **125**, as shown in FIG. **4***b*. As shown in the variation shown in FIG. **4***b*, the substrate **120** preferably defines a fluid outlet **116** that allows fluid to flow between the channel **138** and the cavity **125** to deform and un-deform a particular region of the surface **113**. The fluid outlet may be formed into the substrate, for example, the fluid outlet **116** may be a series of bores that are machined into the substrate in between the channel **138** and the cavity **125** as shown in FIG. **4***b* or an open orifice between the cavity **125** and the channel **138** as shown in FIG. **4***a*, but may alternatively be a property of the material, for example, the substrate **120** may include a porous material that includes a series of interconnected cavities that allow fluid to flow through the substrate **120**. The substrate **120** may define any suitable number of fluid outlets **116** that are of any suitable size and shape. The tactile interface layer may also include a fluid outlet layer (not shown) that defines the fluid outlets **116** that is separate from substrate **120** and arranged in between the substrate **120** and layer **110**. However, any other suitable arrangement of the fluid outlets **116** may be used. As shown in FIG. **4***b*, the portion of the substrate **120** (or the fluid outlet layer) that includes the fluid outlets **116** may also function to provide a support for the layer **110** to substantially prevent the layer no from substantially depressing into the channel **138** when force is applied over the particular region **113**. However, the substrate **120** may be arranged in any other suitable manner and may provide support for the layer **110** in any other suitable way.

[0014] The layer no is preferably attached to the substrate **120** (or fluid outlet layer) at an attachment point **117** that at least partially defines the size and/or shape of the particular region **113**. In other words, the attachment point **117** functions to define a border between a deformable particular region of the surface **113** and the rest of the surface **115** and the size of the particular region **113** is substantially independent of the size of the cavity **124** and/or the channel **138**. The attachment point **117** may be a series of continuous points that define an edge, but may alternatively be a series of non-continuous points. The attachment point **117** may be formed using, for example, adhesive, chemical bonding, surface activation, welding, or any other suitable attachment material and/or method. The method and material used to form the attachment point **117** is preferably of a similar optical property as the layer **110** and the substrate **120**, but may alternatively be of any other optical property. Other portions of the layer **110** and substrate **120** not corresponding to a particular region of the surface **113** may also be adhered using similar or identical materials and methods to the attachment point **117**. Alternatively, the layer no and substrate **120** may be left unattached in other portions not corresponding to a particular region of the surface **113**. However, the layer **110** and the substrate **120** may be arranged in any other suitable manner.

[0015] The fluid vessel **127** may also include a second cavity **125***b*. When the second cavity **125***b* is expanded, a second particular region **113** on the surface **115** is preferably deformed. The displacement device **130** preferably influences the volume of fluid **112** within the second cavity **125***b* independently of the cavity **125**, but may alternatively influence the volumes of fluid **112** within both cavity and second cavity **125** and **125***b* substantially concurrently. Alternatively, the user interface enhancement system **100** may include a second displacement device **130** that functions to influence the volume of fluid **112** within the second cavity **125***b* to expand and retract the second cavity **125***b*, thereby deforming a second particular region **113** of the surface. The second cavity **125***b* is preferably similar or identical to the cavity **125**, but may alternatively be any other suitable kind of cavity. The following examples may be described as expanding a fluid vessel **127** that includes a cavity **125** and a channel **138**, but the fluid vessel **127** may be any other suitable combination of combination of cavity **125** and/or channel **138**. The tactile interface layer **100** may also include a display **150** coupled to the substrate **120** and adapted to output images to the user. As described above, the tactile interface layer **100** may also include a sensor **140** that functions to detect inputs from the user. The sensor **140** may be a capacitive sensor, a pressure sensor, a touch sensitive display, or any other suitable sensor type that detects the presence of a user input. The sensor **140** may be located within the fluid vessel **127**, substantially adjacent to the fluid vessel **127** (as shown in FIGS. **4***a* and **4***b*), remote from the fluid vessel **127**, remote from a cavity **125** but fluidly coupled to the fluid vessel **127**, or in any other suitable location.

[0016] The tactile interface layer **100** of the preferred embodiments has been specifically designed to be used as the user interface for an electronic device **10**, more preferably in an electronic device **10** that benefits from an adaptive user interface. The electronic device **10** may or may not include a display and/or a touch sensor, for example, an automotive console, a desktop computer, a laptop computer, a tablet computer, a television, a radio, a desk phone, a mobile phone, a PDA, a personal navigation device, a personal media player, a camera, a watch, a remote control, a mouse, a trackpad, or a keyboard. The tactile interface layer **100** may, however, be used as the user interface for any suitable device **10** that interfaces with a user in a tactile and/or visual manner. The tactile interface layer **100** is preferably integrated with the device, for example, in the variation wherein the tactile interface layer **100** includes a sensor **140**, the tactile interface layer **100** is preferably assembled into the device **10** and presented to the user as one unit. Alternatively, the tactile interface layer **100** may function as an accessory to a device **10**, the user may be presented the tactile interface layer **100** and the device **10** as two separate units wherein, when coupled to each other, the tactile interface layer **100** functions to provide tactile guidance to the user and/or to receive user inputs. However, any other suitable arrangement of the tactile interface layer **100** may be used.

[0017] As shown in FIG. **5**, the surface **115** of the tactile interface layer **100** preferably remains flat until tactile guidance is to be provided to the user at the location of the particular region **113**. The displacement device **130** then preferably expands the cavity **125** to expand the particular region **113** outward, forming a deformation that may be felt by a user, and providing tactile guidance for the user. The expanded particular region **113** preferably also provides tactile feedback to the user when he or she applies force onto the particular region **113** to provide input. Alternatively, the dis-