sensors **150**, **160** to a dataset. For example, the dataset may be a table or library of pressure-related readings that indicate the location of a pressure increase given particular outputs from the first and/or second pressure sensors **150**, **160**; this preferably indicates the particular deformed region to which the input force **129** is applied. In the example arrangement shown in FIG. **2**, a user input at a deformable region **126**C preferably results in comparison of pressure readings at the first and second sensors **150**, **160** that is different than a pressure reading comparison resulting from a user input at a deformable region **126**B; the processor **170** determines the input based on these comparisons. This method of determining the location of the user input may also facilitate determining locations of user inputs that are provided on the tactile surface **122** simultaneously. For example, in the arrangement shown in FIG. **2**, simultaneous user inputs provided at deformable region **126**A and deformable region **126**B preferably result in a comparison of pressure readings (at the first and second pressure sensors **150**, **160**) that is different than a pressure reading comparison resulting from simultaneous user inputs provided at deformable region **126**B and deformable region **126**C; both such pressure reading comparisons are preferably different than the pressure reading comparison resulting from a single user input provided at deformable region **126**A. Preferably, each deformable region **126** has a distinct input characteristic, such as a distinct time period over which an input force applied on a deformable region **126** is transmitted, as a fluid pressure change, from the deformable region **126** to a pressure sensor(s) **150** or **160** in terms of time differences. This preferably permits determination of multiple input locations attributed to multiple simultaneous input forces at a plurality of deformable regions **126**; specifically, this preferably allows the processor **170** to resolve multiple input locations at once by looking at the combination of pressure signals at each sensor **150**, **160**. Furthermore, the processor **170** may take into account one or more previous input force locations and or relevant timing of previous input forces when determining a more recent input location. The number of pressure sensors and deformable regions is preferably chosen to ensure that each deformable region has such a unique characteristic.

[0057] In the variation of the deformable region **126** that functions as a slider or a pointing stick, as the user varies the location of the user input along the slider or the direction of the input on the pointing stick, the pressure detected by the first and second pressure sensors **150**, **160** may be compared to a data set that includes pressure readings expected for such applied inputs. However, the dataset may include any suitable type of data against which the processor **170** may: compare data gathered from the pressure sensors **150**, **160**; and determine the location of a user input **129** (or a plurality of simultaneous user inputs). This method is particularly useful in a device in which the specific locations of user inputs on deformable regions must be predicted; in such a device, the pressure sensors **150**, **160** may be the only sensors necessary to detect relevant details (e.g., location and magnitude) of the user input **129**, and this preferably decreases the number and complexity of sensors in the device. However, any number of pressure sensors may be incorporated into the user interface system **100** and any other suitable method for determining the location of the user input **129** may be used. The processor may also compare the outputs of any number and/or combination of pressure sensors within the user interface system **100**.

[0058] The pressure sensors **150**, **160** and the processor **170** may also enhance the performance of the user interface system **100** or the electronic device **210** in which the user interface system **100** is implemented. For example, the processor **170** may determine that the detected pressure within the fluid channel **132** is lower than a predetermined threshold (such as for more than a threshold period of time) and may actuate the displacement device **140** to displace additional fluid into the fluid channel **132**. Alternatively, the pressure sensors **150**, **160** may detect the ambient air temperature; the processor **170** may, in turn, determine that the ambient temperature has decreased and thus actuate the displacement device **140** to displace fluid out of the fluid channel **132** to decrease the fluid pressure within the fluid channel **132** in order to protect the user interface system **100** from damage, such as from excessive internal pressures. However, the pressure sensors **150**, **160** and processor **170** may alternatively cooperate to perform any other suitable function.

11. The Method

[0059] As shown in FIG. **14**, the method S**100** of the preferred embodiment functions to determine an input location on a tactile surface of the user interface system **100**. The steps include: displacing fluid through a fluid channel and a series of fluid ports to outwardly deform a plurality of deformable regions of a tactile layer S**110**; detecting a change in fluid pressure at a first location within the fluid channel due to an input force applied to the tactile surface at a particular deformable region S**120**; detecting a change in fluid pressure at a second location within the fluid channel due to the input force applied to the tactile surface S**130**; and selecting the particular deformable region, from the plurality of deformable regions, as the input location based upon a comparison of the changes in fluid pressure detected at the first and second locations within the fluid channel S**140**. The step of displacing the fluid through the fluid channel S**110** is preferably performed by a displacement device, as described above. The steps of detecting the fluid pressure changes at the first and second locations within the fluid channel S**120**, S**130** are preferably performed by the first and second pressure sensors described above. The step of selecting the particular deformable region S**140** is preferably performed, by the processor, via the methods describes above.

[0060] As a person skilled in the art will recognize from the previous detailed description and from the figures and claims, modifications and changes can be made to the preferred embodiments of the invention without departing from the scope of this invention defined in the following claims.

We claim:

1. A user interface system comprising:

a volume of fluid;

a tactile layer defining an outer tactile surface touchable by a user and a back surface opposite the tactile surface and including an undeformable region and a plurality of deformable regions, wherein the deformable regions are operable between:

a retracted state, wherein the deformable regions are substantially flush with the undeformable region; and

an expanded state, wherein the deformable regions are substantially proud of the undeformable region;

a substrate joined to a portion of and retaining the back surface of the undeformable region, defining a fluid port per deformable region, and defining a fluid channel,