reference is made to the embodiment of FIG. **2**. For ease of explanation, in the following discussion, all cavities **520***a*, **520***b*, **520***c* . . . **520***r* are inflated and deflated at the same time. Note that in some implementations, depending in the specific applications, cavities, e.g., cavities **520***a*, **520***b*, **520***c* . . . **520***r*, can be inflated and/or deflated individually, in subsets and/or as a complete set.

[0035] In this embodiment, inflating pump **572** is activated for a pre-determined period of time whenever cavities **520***a*, **520***b*, **520***c* . . . **520***r* need to be inflated. Note that deflating pump **576** remains "off" during inflation of cavities **520***a*, **520***b*, **520***c* . . . **520***r*. As a result, pump **572** is able to transfer fluid from fluid reservoir **574** to cavities **520***a*, **520***b*, **520***c* . . . **520***r*, until the required fluid pressure is accomplished. Inflating pump **572** is now deactivated, and both pumps **572**, **576** are "off". Fluid pressure is maintained in cavities **520***a*, **520***b*, **520***c* . . . **520***r* to keep them inflated.

[0036] Conversely, deflating pump **576** is activated for a pre-determined period of time whenever cavities **520***a*, **520***b*, **520***c* . . . **520***r* need to be deflated. Inflating pump **572** remains "off" during deflation of cavities **520***a*, **520***b*, **520***c* . . . **520***r*. As a result, deflating pump **576** is able to transfer fluid from cavities **520***a*, **520***b*, **520***c* . . . **520***r* back to fluid reservoir **574** to, until the required fluid pressure returns to the original value when deflating pump **576** is turned "off".

[0037] Other pump configurations are also possible. For example, it is possible to replace pumps **572**, **576** with a single bi-directional pump. It may also be possible to deflate cavities by opening value(s) to the fluid reservoir and let the fluid pressure decrease without the need for a separate deflating pump.

[0038] FIG. **7** is a block diagram illustrating one exemplary implementation of a device **700** incorporating a touch sensitive user interface in accordance with the present invention. Device **700** includes a microprocessor (CPU) **710**, a button array controller **720**, pump(s) **721**, and button array **100**. Depending on the implementation, device **700** may also include pressure sensor(s) **722** and valve(s) **723** coupled to pump(s) **720**. Device **700** also includes a display controller **730** coupled to a display screen **280**, and a touch screen controller **740** coupled to touch sensing layer **260**.

[0039] FIG. **8** is a flowchart illustrating the operation of touch screen assemblies of the present invention, including the embodiments shown in FIGS. **2**, **3**A, **3**B and **4**. Referring to FIGS. **5** through **8**, and using the embodiment of FIG. **2** as an example, in step **820**, when display controller **730** causes display screen **280** to display a keypad, e.g., a telephone interface, button array controller **720** activates pump(s) **721** which causes button array **100**, corresponding to the keys of keypad, to be inflated by increasing the pressure of the button fluid in cavities **220***a*, **220***b*, **220***c* (step **830**).

[0040] In step **840**, touch sensing layer **260** senses the location(s) of the user's depressions on one or more of corresponding membrane portions **210***a*, **210***b*, **210***c* of button array **100**. Touch sensing layer **260** then outputs the coordinate(s) of the sensed location(s) to processor **710** via touch screen controller **740** (step **840**).

[0041] If processor **710** recognizes that the sensed location (s) correspond to an "EXIT" type key, for example, a "CALL" key or an "END" key in this exemplary telecom implementation, then button array **200** is deflated (step **860**). Otherwise, touch sensing layer **260** continues to sense location(s) of subsequent user depression(s) and outputting the sensed location(s) coordinates to touch screen controller **740** (repeat step **840**, **850**).

[0042] Many modifications and additions are contemplated within the spirit of the present invention. For example, it is possible to add distortion correction capability to display screens **280**, **380**, **480** for correcting any optical distortion that may be introduced by button array **100**. It may also be possible to include a set of pressure sensors coupled to each of the corresponding cavities of button array **100** thereby eliminating the need for touch sensing layers **260**, **360**, **460**.

[0043] While the present invention has been described with reference to particular embodiments, it will be understood that the embodiments are illustrative and that the inventive scope is not so limited. In addition, the various features of the present invention can be practiced alone or in combination. Alternative embodiments of the present invention will also become apparent to those having ordinary skill in the art to which the present invention pertains. Such alternate embodiments are considered to be encompassed within the spirit and scope of the present invention. Accordingly, the scope of the present invention is described by the appended claims and is supported by the foregoing description.

What is claimed is:

1. A touch sensitive display assembly comprising:

a touch screen configured to display at least one input key; and

a button array operatively coupled to the touch screen, wherein the button array having at least one button corresponding to the at least one input key, the button array including:

a substrate; and

a button membrane attached to the substrate thereby forming at least one enclosed cavity corresponding to the at least one button, and wherein the at least one enclosed cavity is configured to be inflated and deflated.

2. The touch sensitive display assembly of claim **1** wherein the touch screen includes a touch sensing layer and a display screen, and wherein the button array is sandwiched between the touch sensing layer and the display screen.

3. The touch sensitive display assembly of claim **1** wherein the button array is located below the touch screen.

4. The touch sensitive display assembly of claim **1** wherein the button array is located above the touch screen.

5. The touch sensitive display assembly of claim **1** further comprising at least one pump configured to inflate and deflate the at least one enclosed cavity.

6. The touch sensitive display assembly of claim **1** further comprising a reservoir coupled to the at least one pump.

7. The touch sensitive display assembly of claim **1** further comprising a valve coupled between the at least one pump and the button array.

8. The touch sensitive display assembly of claim **1** further comprising a second button, and wherein the at least one button and the second button are inflated and deflated separately.

9. The touch sensitive display assembly of claim **1** further comprising a second button, and wherein the at least one button and the second button are inflated and deflated together.

10. The touch sensitive display assembly of claim **1** further comprising at least one corresponding pressure sensor coupled to the at least one cavity, and wherein the touch