such as a pen or other input methods, and are not relevant for purposes of teaching the present invention.

[0048] Referring now to FIG. **2**, we see the added layer of moveable or electrically moveable material that allows for the present invention to be used in a variety of ways, including the Braille touch screen and/or the tap and drop system. The layers are labeled C-T would be a cover layer and would not be unlike those used in typical prior art touch screens and which are discussed above. The F or shape-changing layer consists of the electrical or magnetically changing fluid/materials which is in of itself a complex science and will be discussed further below. The main thrust of the invention is that by adding the electrically shaped changing layer through its many configurations, the "screen" now becomes a tactically-based screen in which a sight user can have an enhanced computing experience and which a sightless person can use as a sighted person would. The additional layer(s) shown in FIG. **2** are the electrical layer(s), which can have many configurations and will be discussed below. Some of the configurations include the channel style or matrix style touch screen system in which each pixel, or as in the present invention "tixel" tactile pixel, individually and electronically connects the electrically changing layer or F changing layer to the needed electrical impulse. In FIG. **2**, the LCD display is shown at the bottom layer, which assumes that this optional feature would be one of the tactically-enhanced embodiments of the invention as opposed to the pure Braille-based version. Of course, there is no reason that a display screen cannot partially have an LCD display beneath the tactile-based computing layers or computing system while other portions simply use the tactile-based system without any display. The advantage of not needing a visual display is apparent: the electrical layer and shape changing layer as well as the cover layer can be made from materials that may not be as translucent as they would be if the display layer needed to be visible, as would be the case in the above discussed prior art type screen shown in FIG. **1**.

[0049] A sample channel system is shown in FIG. **3** in which an electrical pulse, which may be high or low depending on the needs of the manufacturer or end user, is shown through a pulse arrow. The square wave is shown in the fluidic or electro-heleological layer which creates a physical rise in the layer. Above that layer, a tactile-based square, bump or dot, as it may be, embodied in the display screen is actually felt by the user. Of course, this is a very simplified diagram shown in one dimension and may be many configurations and two dimensions. A more detailed version of how the tactile display system may be implemented is shown in FIGS. **4**A and **4**B through a "micro channel" system, in which a layer of material encompasses the fluidic layer or electro-heleological layer and is actually rigid in certain spots and weakened in other spots. Thus, where the material is shown to be in solid, it will not change shape; however, when the material is shown and dotted in FIG. **4**B, the material changes shape creating a micro channel in which certain areas of the surface of the display screen will rise when appropriate electrical pulses are provided to the flexible material medium. For example, in FIG. **4**A, there are three raised areas created through electrical pulses to three of the flexible materials. Thus the fourth flexible material area at the end does not have an electrical pulse supplied to it and hence will not raise to the surface layer to create a tactile-based signal or point. FIGS. **4**A and B show that the electrically responsive expanding material can be implanted in "channels" (shown in more than one dimension in FIG. **6**) and/or be strategic configured underneath specifically configured material in the cover layer, such that the cover layer is easily expanded when the electrical signal is driven.

[0050] The electrical pulse or supply system which creates the tactile bumps in the display screen are diagrammatically shown in FIG. **5**. The power is supplied to an area or channel in this case, which may be completed by a loop through touch, digitizing pen or a simple circuit in which the channel creates a state in the fluid, which when supplied with a pulse, changes the viscosity or form and hence creates a change in the surface layer. Thus, the three electrical pulses shown with the arrows result in three raised bumps on the surface display.

[0051] An example of how the tactile-based display system may be configured in two dimensions is shown in a very simple fashion in FIG. **6** in which two lines of point-based computing, as also shown in FIGS. **4** and **5**, could be constructed. Thus a series of points created along two dimensions can easily be imagined by regarding FIG. **6** taking into consideration FIGS. **4** and **5**.

[0052] Referring now to FIG. **7**, an optical distortion embodiment of the display is shown. While the optical distortion system is not anticipated to be particularly useful for vision impaired users, there are many various uses that have optical distortion by either the use of convex or concavity (e.g. the use convex or concave changes in the screen's surface layer) of the surface layer of the screen which may be implemented. Thus, for example, if a particular section of a screen needed magnification, it could be created through convex/concave tactile-based system: the screen would simply respond to the touch of a user and create the signals that change the viscosity in the fluidic layer and raise the layer of the computer screen shown by the arrows.

[0053] FIGS. **9** and **10** are illustrative of the Braille capabilities of the present invention. For example, in FIG. **9**, a finger is running a single access path in which there are bumps and crevices that correspond to different forms of Braille which also could be shapes, letters, numbers or buttons. As the finger moves along linearly, it may be able to detect particular patterns thus allowing the tactile display to be "read" by the finger.

[0054] FIG. **10** is a larger illustration of how a Braille mode implementation of the invention may be used along two axes. Although it is shown in only one axis, a series of pixels are in raised status and a series are in flat status, meaning that they have a certain pattern on the screen which might be read by a finger or two fingers or the like. FIG. **11**, however, shows a more complex embodiment of the invention in which the tactile display is "in responsive reconfiguration mode" allowing the user to tactically interact with the screen in a way that may be considered Braille writing or reading, or simply allow the user to respond to the screen with icons. Although the finger shows only a couple of concave and convex portions of the display surface, one could imagine that the screen in two dimensions may be configured in any number of shapes that would enhance a sight-impaired user's ability to exploit the computer. The different configurations could also enhance an LCD screen