present on the aforesaid flexible surface is performed twice in order to obtain a first position, a first orientation, a second position, and a second orientation; and the aforesaid step of making a change to the information displayed by the aforesaid display in response to line of bend position, orientation, and changes thereto as determined by computing the difference between first and second values.

[0015] The invention further broadly and generally provides a method for controlling a display comprising a first line of bend, the aforesaid method comprising: (a) creating a first position measurement of the position of the aforesaid first line of bend; and (b) creating a first orientation measurement of the orientation of the aforesaid first line of bend.

[0016] In an exemplary embodiment, the method further comprises mapping a combination of at least the aforesaid first position measurement and the aforesaid second orientation measurement to a controller function.

[0017] In an exemplary embodiment, the method further comprises: creating a second position measurement of a second line of bend; creating a second orientation measurement of a second line of bend; and mapping a combination of at least the aforesaid first position measurement, the aforesaid second position measurement, the aforesaid first orientation measurement, and the aforesaid second orientation measurement to a controller function.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] **FIG. 1***a* shows a display in accordance with the claimed invention in which a flexible surface displaying an image is attached to a rigid line detector and controller.

[0019] **FIG. 1***b* shows a the display of **FIG. 1***a* to depict one possible arrangment of piezo-electric bimorph sensors.

[0020] **FIG. 1***c* shows the flexible surface of a display in accordance with the claimed invention. A line of bend is visible.

[0021] **FIG. 2***a* shows the flexible surface of a flexible display in which strain gauge bend sensors are arranged in layers, each layer having a different sensor alignment in order to detect different positions and orientations of a line of bend. The resulting criss-cross patern is displayed.

[0022] **FIG. 2***b* shows the flexible surface of a flexible display in which strain gauge bend sensors are distributed along the edges of the flexible surface in order to detect different positions and orientations of a line of bend.

[0023] **FIG. 2***c* shows the flexible surface of a flexible display in which small strain gauge bend sensors distributed upon the flexible surface of the flexible display in order to detect different positions and orientations of a line of bend.

[0024] **FIG. 3***a* shows **4** bend sensor layers labeled L**1**-L**4** wherein sensors are arranged in different orientations. These layers are overlapped to form the sensor arrangement shown in **FIG. 2***a*.

[0025] **FIG. 3***b* shows layers L**1** and L**2** of the display in **FIG. 3***a* to show that a line of bend will change the bend sensors which are arranged perpendicular to line of bend will be activated upon the display.

[0026] **FIG. 4***a* shows a display in accordance with the current invention both before and after user manipulation to select subsequent items from a list appearing on the display.

[0027] **FIG. 4***b* shows a display in accordance with the current invention both before and after user manipulation to select previous items from a list appearing on the display.

[0028] **FIG. 5** shows two strain gauge bend sensors where one expresses a bend of approximately 20 degrees and the other expresses a bend of approximately 60 degrees. Here, degrees of bend are measured at the two ends of the sensor and are relative to the sensor in its normal flattened state.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

[0029] As will be understood the present application discloses the use of a flexible display as an input device. An exemplary display may be constructed by providing sensors to measure the amount of bend found exhibited by a display composed of electronic ink or organic light emitting diodes. Strain gauges can be used to detect bends in the display. Different types of bend sensors may even be used in combination if so desired. In one embodiment, the bend of the display can be measured by peizo-electric bimorphs, which can increase or decrease voltage depending on the degree of bend. Because only the sensors longitudinally perpendicular to the line of bend will change values, an array of peizo-electric bimorphs strategically distributed within the flexible surface of the display will indicate where the bend is located and how the bend is oriented.

[0030] **FIG. 1***a* shows one display according to the current invention. The display shown has a flexible surface **1** which exhibits the image of a face **6**. The image in the example shown is generated by OLEDs, which cover the flexible surface and hide an array of peizo-electric bimorph bend sensors **2** which are shown in **FIG. 1***b*. The bend sensors **2** provide a plurality of bend measurements which are used by a line detection device **4** in order to detect the orienation and position of lines of bend **3** (as shown in **FIG. 1***c*) which may be present on the flexible surface of the display. The detected lines are used as user input by a display controller **5** which makes changes to the image **6** when warranted by the input within the context of some application. **FIG. 1***c* shows that a deformation in the flexible surface **1** of a display in accordance with the present invention can generate a line of bend **3**. As will be understood, the line of bend **3** can be obtained in a number of ways.

[0031] **FIG. 5** shows two strain gauge bend sensors **2**, identical but for different degrees of bend. One sensor **2** (*a*) is shown bent at approximately 20 degrees measured from the ends of the sensor. The other sensor **2** (*b*) is shown bent at approximately 60 degrees. These sensors will provide different values to the line detection device **4**, which may distinguish between these degrees of bend to determine where lines of bend may be expressed on the flexible surface **1**. A line detection device **4** in accordance with the present invention may determine position, orientation, and degree of bend for lines present on the flexible surface **1** with the level of precision and in a manner appropriate for the number and arrangement of sensors **2** on the flexible surface **1**.

[0032] **FIGS. 2***a*, **2***b*, and **2***c* show three strategies that may be used in applying strain gauge sensors **2** to the flexible surface of a display in accordance with the present invention. The flexible surface **1** shown in **FIG. 2***a* contains 4 layers of sensors which have been arranged to cover the display from edge to edge. Because the layers are oriented