conducting fibres and insulating fibres. An example of a fabric of this type is disclosed in International Patent Publication No. WO 00/72240.

First electrically conducting layer **102** is provided with a first pair of conducting members **105**, **106**, with one extending along each edge of a first pair of opposed edges of the layer. In response to an electrical potential applied between these conducting members **105**, **106** electrical current may flow across first layer **102** in a direction indicated by arrow **107**.

Similarly, second electrically conducting layer **103** is provided with a second pair of conducting members **108**, **109**, with one extending along each edge of a second pair of opposed edges of the layer. In response to an electrical potential applied between these conducting members **108**, **109** electrical current may flow across second layer **103** in a direction indicated by arrow **110**.

In sensor **101**, the second pair of opposed edges of second layer **103** is the opposite pair to the first pair of opposed edges of the first layer **102**. Thus, two electrical currents running in perpendicular directions may be generated within sensor **101**.

As described in European Patent Publication No. EP 0 989 509, this electrical arrangement allows the sensor to detect both the position of a mechanical interaction within the sensing area (X-axis and Y-axis data) and an additional property of the mechanical interaction, for example the extent or pressure of the mechanical interaction (Z-axis data).

FIG. **2**

A cross section of sensor **101** is shown in FIG. **2**. Each electrically conducting layer **102**, **103** is a conductive textile layer having associated compliance and undulate characteristics.

It can be seen that where no pressure is applied to sensor **101**, the upper first electrically conducting layer **102** is spaced from the second electrically conducting layer **103** by the intermediate separating layer **104**.

FIG. **2** shows a mechanical interaction under manually applied pressure, at a position between supporting portion **202** and neighbouring supporting portion **203** of the intermediate separating layer **104**. Under the action of finger **201** pressing on the first conducting layer **102**, the first conducting layer **102** is brought into contact with the second conducting layer **103**. Thus, where pressure is applied, the conducting layers **102**, **103** are brought together to make electrical contact, as illustrated at location **204**, and in this way a conductive path through the sensor **101** is formed.

A characteristic of this type of sensor is that the response to applied pressure is dependent upon the compliance of the actuator applying the pressure. The actuator should be sufficiently compliant in the Z-axis to locally deform a conductive layer into an aperture of the separator layer. In practice if the actuator is pointed, the applied pressure may result in only a single contact with the fabric being forced into one aperture only. Alternatively pressure is applied over a broader area, resulting in multiple contacts through multiple holes in the intermediate separating layer. An actuator having a hard, flat surface requires a greater degree of force to be used to establish an electrical contact than an actuator having a soft, compliant surface. This property may be modified by the incorporation of an additional layer, on top or underneath the sensor, which is compliant in the Z-axis. The additional layer may be a fabric or a foam layer.

FIG. **3**

A three layer construction in which each layer is bendable can be utilised to form a flexible sensor. Flexible position detector **301** of FIG. **3** utilises such a construction and is provided with a cover outlining keys of a keypad. The layers of the flexible detector **301** are held together around the perimeter of the detector **301**, within margin **302**. Flexible detector **301** as a whole is bendable, and may be folded as illustrated.

The response of detector **301** to a mechanical interaction depends on factors relating to the production sensitivity of the detector **301**, the presence of set within the layers of the detector **301** and the position of a mechanical interaction within the sensing area of the detector **301**.

The production sensitivity of a sensor is the general inherent sensitivity to which the sensor is manufactured. It is to be appreciated that detector **301** is required to trigger under manually applied pressure but is not to be so sensitive as to trigger when no deliberate press on the detector **301** is made.

Flexible sensors can be prone to undesirable triggering. Undesirable triggering may arise from internal forces within the sensor that are introduced during manufacture, for example deviations from the sensor pattern during manufacture may result in misalignment of layers or the occurrence of creases or puckering within the layers. Undesirable triggering of a sensor may also arise from internal forces within the sensor accrued by use of the sensor, for example from bending or flexing of the sensor, or from general wear and tear.

It is to be appreciated that naturally occurring variations within the construction materials can also affect sensor performance and cause natural discrepancies in the response of the sensor.

Variations within the sensor construction can affect the compliance of the layers across the sensing area. In some cases, gradients in tensile forces across the layers of a sensor may render mechanical interactions at some locations less distinguishable than mechanical interactions at other locations. For example, looking at detector **301**, it may be found that mechanical interactions closer to the margin **302** are less distinguishable than mechanical interactions at more central locations.

Another factor that may bring about variations in trigger response is the electrical arrangement utilised to effect sensing. For example, the relative position of a mechanical interaction with respect to one or more conducting members may determine how detectable to the sensor the mechanical interaction is. Thus, it can be found that the response of a sensor to the same applied pressure varies according to the location at which the pressure is applied.

It is desirable to improve the uniformity of response of individual sensors and, in particular from a commercial perspective, to improve the uniformity of response between like sensors. It is therefore desirable to "smooth out" unavoidable variations in sensor sensitivity.

FIG. **4**

The production sensitivity to which sensors are manufactured is based on a production tolerance, which provides a measure of the activation force of a sensor, applicable across the entire sensing area. Production tolerances function to facilitate selection of an appropriate sensor for a particular application and also to facilitate quality control.

The production tolerance of a sensor may define a lower threshold force which when applied to the sensor will not trigger an output, and an upper threshold force which when