The ink soaks through the thickness of the fabric **1303** to produce an array of conductive islands **1304** that provide a conductive path through the thickness of fabric layer **1302** The pattern and spacing of the dots **601** and **602** is chosen to be different from the pattern and spacing of the conductive islands **1304** and so potential problems with Moire effect interference and synchronised overlapping are avoided. Typically, the insulating dots **601** and **602** have a spacing of three millimetres whereas the conducting islands have a spacing of 1.3 millimetres.

[**0081**] Therefore, the sensor **1301**, like the previously described sensors, has a structure which allows it to be folded without producing a conductive path between the outer conductive layers at the fold, while at the same time allowing a suitably small externally applied force to bring the outer layers into contact with the central layer, which then provides a conductive path between the outer two layers.

[**0082**] A sensor **1401** for detecting force and area separately is illustrated in **FIG. 14**. The sensor **1401** has a multi-layer construction. In effect, two sensors are combined. A first, comprising the arrangement shown in **FIG. 12** using substantially incompressible elements **1203**, and a second utilising the highly compressible central layer indicated in **FIG. 11**. Thus layers **1402** and **1406** are constructed in accordance with fabric layer **201**, layer **1404** is constructed in accordance with fabric layer **202**, layer **1403** is similar to layer **1202** and layer **1405** is similar to layer **1102**. When pressure is applied to the sensor, a lower outer plane **1402** makes physical contact with a first inner layer **1403**. The first inner layer **1403** makes physical contact with a layer **1404**. A substantially compressible layer **1405** forms the next layer, and an outer layer **1406** forms the final stage of the construction. Electrical signals may be applied to layers **1402**, **1404** and **1406**, in order to detect the effect of mechanical interactions with the partially conductive layers **1403** and **1405**. Layers **1402**, **1404** and **1406** are of a similar construction to layers **201** and **202**, and they are orientated such that the contacting portions on layer **1406** are parallel to those of layer **1402** and perpendicular to those of layer **1404**. Using this construction, the characteristics of the two detectors are combined. From a first set of measurements, in respect of layers **1402**, **1403** and **1404**, an area of applied pressure may be determined. A second set of measurements, in respect of layers **1404**, **1405** and **1406**, determines a value related to the product of force and area. (The two sets of measurements are similar to those made for the previously described detectors and are described below.) The applied force may then be determined by dividing a second reading by a first reading. Readings related to force and area are thereby obtained independently, thus also allowing a calculation for pressure, being force divided by area, to be made along with x and y co-ordinates obtained as described below with respect to FIGS. **15** A-D, **16-20**.

[**0083**] A procedure for measuring the position of a force applied to a position sensor of the types described above and a second characteristic of that force is illustrated by **FIGS. 15A, 15B, 15**C and **15**D. The outer conductive layers of the same type as layers **201** and **202** are represented schematically by potentiometers **1501** and **1502** and the resistance of the conductive path between the outer layers at the location of the applied force is represented by variable resistor **1503**.

[**0084**] A first measurement is shown in **FIG. 15A**. Five volts are applied to connector **211**, while connector **212** remains disconnected. Connector **207** is connected to ground via a resistor **1504** of known value. Thus current flows from connector **211** through a first part of layer **202** indicated by a first part **1505** of potentiometer **1502**, through the conductive path indicated by variable resistor **1503** having resistance Rv, through a first part of layer **201**, indicated by a first part **1506** of potentiometer **1501** and through the known resistor **1504**. The voltage, **V1** appearing at connector **207** is measured and since this is equal to the voltage drop across resistor **1504**, **V1** is directly proportional to the current flowing from connector **211**.

[**0085**] A second measurement is shown in **FIG. 15B**. Five volts are applied to connector **206**, while connector **207** is disconnected. Connector **212** is connected to ground via a resistor **1507** of known resistance. The voltage **V2**, dropped across resistor **1507** is measured. Voltage **V2** is directly proportional to the current flowing through a second part of layer **201** indicated by a second part **1508** of potentiometer **1501**, through the conductive path indicated by variable resistor **1503** having resistance Rv, through a second part of layer **202** indicated by a second part **1509** of potentiometer **1502** and through resistor **1507**.

[**0086**] The sum of the resistance of first part **1506** and second part **1508** of potentiometer **1501** is approximately equal to the resistance between connector **206** and **207** on layer **201**, and is therefore substantially constant during the measurements, since they occur in rapid succession. Similarly the sum of the resistance of first part **1505** and second part **1509** of potentiometer **1502** is approximately equal to the resistance between connector **211** and **212** on layer **202**, and is also substantially constant during the measurements. As a result, the relationship **1510** exists between the resistance Rv, of the conductive path between the outer layers, and the measured voltages **V1** and **V2**. i.e. the resistance Rv between the outer layers is proportional to the sum of the reciprocal of voltage **V1** and the reciprocal of voltage **V2**.

[**0087**] Depending upon the type of sensor used the resistance Rv depends upon area of the applied pressure or a function of the area and the force as illustrated by relationship **1511**. Thus from the voltage measurements **V1** and **V2** an indication of the area over which the force is applied, or an indication of the area and the applied force may be determined.

[**0088**] A third measurement is shown in **FIG. 15C**. Five volts is applied to connector **212** while connector **211** is grounded, and so a potential gradient is produced across layer **202**. A voltage measurement is made at connector **207** using a high impedance device and so the voltage appearing on layer **202** at the position of the applied force is determined. This voltage, **V3** is directly proportional to the distance of the centre of the applied force from contacting portion **218** and indicates its x axis position.

[**0089**] A fourth measurement is shown in **FIG. 15D**. Five volts are applied to connector **207** and connector **206** is grounded. A voltage measurement is made of voltage **V4** appearing at connector **212**. Voltage **V4** is directly proportional to the distance of the centre of the applied force from contacting portion **216** and indicates its Y axis position. Therefore voltage **V3** and **V4** provide information as to the two dimensional position of the applied force on the sensor.