[0048] The knitted central layer **203** has a compressible structure which becomes more conductive (less resistive) when it is compressed. This is due to loops in the conductive fibre coming increasingly into contact with other such loops as they are pressed together. As a result of this, the resistance between the outer layers at location **502** decreases as the force, indicated by arrow **501**, increases. In addition, if the pressure applied to the sensor at location **502** is kept constant but the area over which it is applied is increased, then the resistance between the outer layers decreases, due to the increasing number of conducting fibres in the central layer coming into contact with the outer layers.

[0049] The sensor shown in **FIG. 5** is folded at location **504** resulting in a tendency for one of the conducting layers to be brought into contact with the central layer. A property of many fabrics is that they may stretch in response to tensional forces but they may be compressed less easily in response to compressive forces. Consequently, rather than being compressed as such, fabrics tend to fold and bunch at positions where compressive force is being applied.

[0050] Certain constructions of fabric behave in the opposite way, being more easily compressed than stretched and in this case electrical contact at location **505** is made between the central layer **203** and the outer layer **201**. In practice it is extremely rare for contact due to such compression and extension forces to occur simultaneously on both sides of the central layer at the location of a fold.

[0051] In the situation shown in **FIG. 5, a** fold has been created at position **504**. In response to this fold, the outer circumferences of the fabric assembly will tend to be in tension and will therefore stretch, with the inner circumferences of the fabric assembly being in compression, resulting in bunching. This bunching will in turn cause radial force outwards, thereby tending to cause its outward circumferences to come into contact with inner circumferences of adjoining layers. Compression forces are therefore applied and hence bunching occurs towards the inside of a fold.

[0052] As shown in **FIG. 5** conducting layer **202** has been brought into contact at location **505** with central layer **203** through insulating layers **205**. As a result of this folding, electrical contact occurs where these two layers are brought into contact. However, a similar contact does not occur between central layer **203** and conductive layer **201**. Consequently, although conduction occurs between conducting layer **202** and central layer **203**, there is no similar conduction between central layer **203** and conductive layer **201** such that the presence of the fold does not result in spurious output signals.

[0053] Thus, the application of force, indicated by arrow **501**, does result in all of the conductive layers being brought into contact such that current may flow between the layers to which voltage has been applied. However, when a sharp fold is introduced into the detector, as illustrated at **504**, it is only possible for conduction to occur between two of the layers. Consequently, insulation still exists between the central layer and the other outer layer such that this is not interpreted as an application of force or similar mechanical interaction of interest.

[0054] In theory, it is possible for a fold to result in current being transmitted along the central layer **203** to an actual point of mechanical interaction. For this reason, it is preferable for the central layer **203** to have relatively low conductivity along the layer compared with conductivity across its thickness. This is further improved if the central layer **203** has a characteristic such that its conductivity significantly increases when the material is placed under pressure. Thus, a compressed portion at a position of a mechanical interaction will tend to have a relatively low resistance. This compares with the uncompressed central layer which will tend to have a much higher resistance. This, in combination with the relative length of the central layer between the position of a fold and the position of a mechanical interaction, will ensure that the degree of current being transmitted in this way is relatively small compared to the degree of current being transmitted at an actual mechanical interaction.

[0055] A portion of the position sensor of the preferred embodiment is shown in the cross-sectional view of **FIG. 6**. The outer fabric conducting layers **201** and **202** and the central layer **203** are of the same type as those described with reference to **FIGS. 2 and 3**. However, in this embodiment an array of insulating adhesive dots **601** provides the insulating separating means between the outer layer **201** and central layer **203**, and a similar array of dots provides the insulating separating means between the outer layer **202** and central layer **203**. The insulating adhesive is a polyurethane adhesive available from Penn Nyla, of Nottingham, Great Britain, but similar materials, of different qualities, are commonly available from a variety of manufacturers. Such adhesives are commonly used as continuous layer laminates, for waterproofing fabrics. The adhesive is applied by mixing with a solvent and printing the liquid solution. The adhesive is then heat cured after the layers are assembled.

[0056] The array of adhesive dots provide the same insulating function as the previously described mesh layers but also serve to attach the layers to their adjacent layer or layers. Thus, no further lamination process is required.

[0057] Alternatively, the adhesive dots may be replaced by stripes of adhesive, or a network of lines of adhesive.

[0058] A portion of an alternative position sensor **701** embodying the present invention is shown in the cross-sectional view of **FIG. 7**. The sensor has two outer layers **702** and **703** separated by a central layer **203** of the type previously described with reference to **FIG. 2**. The outer layers **702** and **703** are woven using alternating strands of insulating yarn **704** and conductive fibre **705** in both the warp and the weft. The non-conducting yarn **704** is of a larger diameter than that of the conductive fibre **705** and so the conductive fibre is recessed below the general surface of the layers **702** and **703**. The recessing of the conductive fibre **705** is further enhanced by using a single filament fibre of carbon coated nylon **6**, while the insulating yarn is made by twisting together a bundle of fine insulating fibres of polyester, each of which is of a thinner diameter than the conductive fibre. The conductive fibre is therefore considerably less compressible and flexible than the insulating yarn and so it tends to remain straighter than the insulating yarn in the woven fabric.

[0059] The conductive fibre **705** in the warp and the weft of the layer **702** thus forms a conductive layer which allows conduction in all directions along the layer **702**. The conductive layer so formed, is recessed from the conductive fibre in the central layer by means of the insulating yarn **704**.