Thus, the system of the type illustrated in **FIG. 10**, is used in combination with the detector of the type illustrated in **FIG. 9** it is possible to make reference to the parameters of location in two-dimensions, force or pressure, the area of application and orientation.

[**0079**] In the preferred embodiment, electrical characteristics of voltage and current are measured. Alternatively, it would be possible to determine the resistance or the resistivity of the conducting sheets. Problems may be encountered when using alternating currents due to energy being radiated from the conducting sheets. However, in some situations it may be preferable to use alternating currents, in which further electrical characteristics of the detector may be considered, such as capacitance, inductance and reactance etc.

[**0080**] The detector shown in **FIG. 11**, constructed from conducting planes **102** and **103**, operates satisfactorily if the plane of the detector is maintained substantially flat. This does not create a problem in many applications where relatively flat operation is considered desirable. However, although constructed from fabric, thereby facilitating bending and folding operations, the reliability of the detector in terms of its electrical characteristics cannot be guaranteed if the detector planes are folded or distorted beyond modest operational conditions.

[**0081**] A detector is shown in **FIG. 11**, constructed from fabric having electrically conductive elements to define at least two electrically conductive planes. The detector is conFigured to produce an electrical output in response to a mechanical interaction, as illustrated in **FIG. 1**. At least one of the planes includes first portions and second portions in which the first portions have a higher resistance than said second portions and the first higher resistance portions are more flexible than the second portions. In this way, flexing occurs at the portions of high resistance, where contact between the planes has little effect, while the lower resistance portions, where contact does have a strong electrical effect, remain substantially rigid such that the flexing of the material does not occur over these portions of the detector.

[**0082**] Portions **1101** have a relatively high resistance compared to portions **1102**. Portions **1101** are not involved in terms of creating an electrical reaction in response to a mechanical interaction. The electrical responses are provided by the more rigid weave of portions **1102**. The purpose of portions **1101** is detailed in **FIG. 11B**. A curvature has been applied to the detector but the configuration is such that normal operation is still possible. The flexing has occurred predominantly at portions **1101**. However, portions **1102** have remained straight thereby ensuring that they remain displaced from each other, even when a curvature is present, such that the detector is still available for detecting the presence of a mechanical interaction.

[**0083**] The rigidity of portions **1102** may be enhanced as shown in **FIG. 12A**. A first plane **1201** has rigid portions **1202** and flexible portions **1203**. A second plane **1204** has relatively rigid portions **1205** and relatively flexible portions **1206**. The relatively flexible portions **1205** physically contact against similar portions **1203** in the first plane **1201**. In order to ensure that there is no, or at least minimal electrical interaction at these points of contacts, the electrical resistance of the flexible portions **1203** and **1206** is relatively high. A partially insulating layer may be provided between the conducting layers, as shown in **FIG. 1**. However, the flexible portions **1203** act as insulating separators therefore in this embodiment the provision of a separation layer is not essential. Furthermore, the rigidity of the interacting sections, in terms of the rigid portions **1202** and **1205**, has its rigidity further enhanced by the presence of relatively solid intermediate plates **1208**.

[**0084**] Flexing of the construction shown in **FIG. 12A** is substantially similar to that provided by the embodiment shown in **FIG. 11B**. The flexing of the embodiment shown in **FIG. 12A** is detailed in **FIG. 12B**. Flexing occurs at the position of the relatively flexible portions **1203** and **1206**. The rigidity of portions **1202** and **1205** is enhanced by the provision of more solid plates **1208**. Thus, the embodiment shown in **FIGS. 12A and 12B** may have more strenuous flexing forces applied thereto such that mechanical interaction detection is maintained even under severe operating conditions.

[**0085**] The provision of the flexible portions effectively provide lines over the surface of the conducting planes where folding is permitted. Thus, complex curvatures may be obtained by a number of folds being effected at a plurality of these preferred foldable lines, thereby allowing complex shapes to be attained while maintaining the desired electrical characteristics.

[**0086**] An alternative embodiment is shown in **FIG. 13** in which a first cooperating plane has flexible high resistive portions **1301** and rigid conducting portions **1302**. This plane co-operates with a second plane **1303** of substantially homogenous construction. Thus, sufficient flexing and insulation is provided by the non-conducting flexible portions **1301** of the lower co-operating plane **1304**. The rigidity of conducting portions **1302** may be enhanced in a fashion substantially similar to that provided by **FIG. 12A** as illustrated in **FIG. 14**. The device includes an outer plane **1401** of substantially homogenous conducting construction. Below this, there is provided a second co-operating plane **1402** and the two planes may be separated by an insulating layer not shown in the example. The second plane or layer includes flexible non-conducting portions **1403** and more rigid conducting portions **1404**, substantially similar to those shown in **FIG. 13**. In addition, rigid plates **1405** are provided below each rigid portion **1404** thereby significantly enhancing the rigidity of these portions. Thus, the construction in **FIG. 14** is capable of withstanding more aggressive working environments compared to the lighter construction shown in **FIG. 13**. In the construction shown in **FIGS. 13 and 14** the outer layers, **1303** and **1401** respectively, are fabricated in a substantially elastic fashion, thereby providing for a stretching or extension of this layer during flexing operations.

[**0087**] The detector shown in **FIG. 1** is capable of accurately detecting the position of a mechanical interaction and as previously described, it is also possible to determine other characteristics of the mechanical interaction by modifying other electrical properties. A problem with the detector shown in **FIG. 1** is that it experiences difficulties if more than one unconnected mechanical interaction takes place. If a first mechanical interaction were to take place and, simultaneously, a second mechanical interaction were to take place, displaced from the first, it would not be possible, using the configuration shown in **FIG. 1**, to identify the