ciated that the input data is effectively delayed and does not represent a condition of the electrical characteristics at an instant. If in practice, the delay between measurements becomes too large, it becomes necessary to enhance the frequency of operation of circuits within the control system shown in **FIG. 2**. Thus, the rate of conversion for converter **203** would need to be increased and the circuitry would need to be redesigned for high frequency operation. This in turn could create problems in terms of high frequency interference resulting in enhanced shielding being required for the facility as a whole.

[**0057**] When output condition number one is selected, an output voltage at **108** is determined. On the next cycle, identified as output condition number two, the current flowing through connector **108** is determined. On the next iteration, under output configuration number three, the voltage appearing at connector **112** is determined and on the next cycle, identified as condition number four, the current flowing through connector **112** is determined. After each of these individual measurements, new data is generated in response to steps **303** and **304** such that resulting output registers are being regularly updated on a continual basis, such that the processing system **131** may effectively perform a continual monitoring operation in terms of changes made to the mechanical interactions with the detector **101**.

[**0058**] In a typical implementation, the four characteristic measurements, making up a complete cycle, will be repeated at a frequency of between twenty-five to fifty times per second. In situations where such a repetition rate is not required, it may be preferable to increase the duration of the wait states and thereby significantly reduce overall power consumption.

[**0059**] Planes **102**, **103** and **104** of the detector **101** are detailed in **FIG. 4**. Planes **101** and **103** are of substantially similar construction and are constructed from fabric having electrically conductive elements **402** in plane **102** along with similar electrical conductive elements **403** in plane **103**. Thus, it is possible for a voltage indicative of position to be determined when conductive elements **402** are placed in physical contact with conductive elements **403**.

[**0060**] The overall resistivity of planes **402** and **403** are controlled by the inclusion of non-conducting elements **404** and **405**. Thus, resistivity is controlled by controlling the relative quantities and/or densities of conductive elements **402** with non-conductive elements **404**. Resistivity may also be controlled by selecting an appropriate fibre type, adjusting the thickness of the fibre or adjusting the number of strands present in a yarn.

[**0061**] Plane **104** represents a non-conducting insulating spacer positioned between the two conducting planes **102** and **103**. Plane **104** is constructed as a moulded or woven nylon sheet having an array of substantially hexagonal holes **411**, the size of holes **411** is chosen so as to control the ease with which it is possible to bring conductive elements **402** into physical contact with conductive elements **403**. Thus, if relatively small holes **411** are chosen, a greater force is required in order to bring the conductive elements together. Similarly, if the size of the hole is increased, less force is required in order to achieve the conductive effect. Thus, the size of holes **411** would be chosen so as to provide optimal operating conditions for a particular application. Operating conditions may also be adjusted by controlling the thickness of layer **104**, its surface flexibility and the contour of co-operating planes **102** and **103**.

[**0062**] When a potential is applied across one of the conducting planes, the actual potential detected at a point on that plane will be related to the position at which the measurement is made. Thus, a direct voltage measurement from the co-operating plane gives a value from which a positional co-ordinate may be determined. By reversing the plurality of the planes and taking a measurement from the opposing plane, two coordinates are obtained from which it is then possible to identify a precise location over the planar surface.

[**0063**] In addition to measuring position on the planar surface, the present invention is directed at identifying additional electrical properties in order to determine properties of the mechanical interaction. As previously described, the system is configured to measure currents in addition to measuring voltages.

[**0064**] When the two conducting planes are brought into mechanical contact, due to a mechanical interaction, the amount of current flowing as a result of this contact will vary in dependence upon the actual position of the plane where the mechanical interaction takes place. The position of the mechanical interaction has also been determined with reference to voltages and it could be expected that these two quantities will vary in a substantially similar way, each representing the same physical situation. Experience has shown that variations in measured current do not follow exactly the same characteristic as variations in measured voltage. As illustrated in **FIG. 5**, the amount of current flowing due to a mechanical interaction will depend upon the position of a mechanical interaction **501**. However, in addition to this, the amount of current flow will also depend upon the size of the mechanical interaction. As the size of the mechanical interaction increases, there is a greater area of contact and as such the overall resistance of the mechanical interaction is reduced. However, it should be appreciated that variations in terms of current with respect to interaction size is a sophisticated relationship, given that, in addition to the resistivity of the contact area **501**, the resistivity of the actual electrical connections within the sheet must also be taken into account.

[**0065**] Thus, current is transmitted through a region **502** in order to provide a current to the contact region **501**. Some aspects of this effect will be compensated with reference to position calculations and other variations due to this effect may be compensated by a non-linear analysis of the input data.

[**0066**] Contact area resistivity is illustrated generally at **510** and shows that the amount of current flowing between plane **102** and plane **103** is considered as being related to the area of mechanical interaction, which is related to the area of contact externally and to the level of externally applied mechanical force.

[**0067**] The resulting non-linear relationship between the force area product and the resulting current flow is illustrated generally at **520**. At **521** there is an initial threshold point, identifying the point at which the gap starts to be closed, followed by an operational part of the curve **522** which may give useful indications of pressure up to point **523**, whereafter the relationship becomes very non-linear until position **524** where the relationship effectively saturates.