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(54) Title: CURRENT AND VOLTAGE MEASURING UNIT

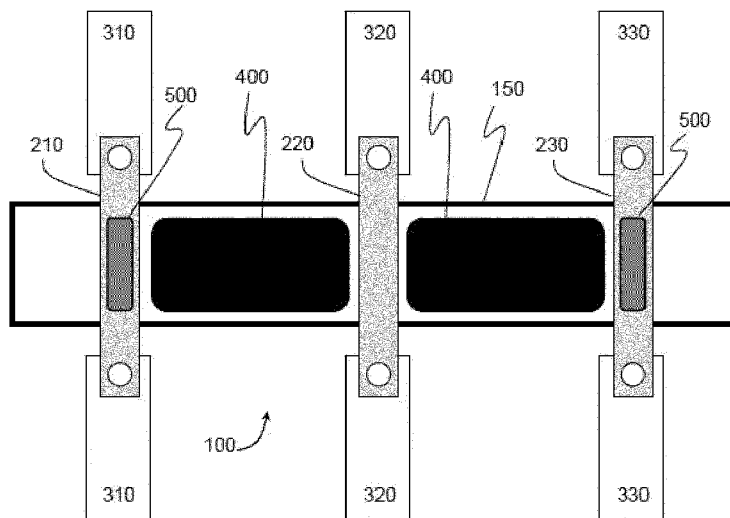


FIG. 1

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(57) Abstract: Power generation is becoming more diverse as renewable energy becomes more widely available - smart meters can help with calculating the energy supplied, ensuring a correct degree of compensation and tracing down sources of problems such as faults, short-circuits, power spikes, unbalanced loads and a drop in power quality. Current smart meters are often difficult to install, often due to the clamps that must be clipped around the conductors to measure current - several different diameters must be provided to reduce the risk that the diameter is unsuitable. A measuring unit (100) is provided for simultaneous measurement of two current values and two voltage values of a power line (300 with three high-voltage conductors, the measuring unit (100) comprising three two-pole electrical interconnections, each interconnection being configured to be connected between two separated ends of a high-voltage conductor; a first (610) and second (630) current sensor, configured and arranged to measure a current through the first interconnection (210) and through

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the third (230) interconnection respectively; and a first (710) and second (720) voltage sensor, configured and arranged to measure a voltage between the first (210) and second (220) interconnection and between the second (220) and third (230) interconnection; the measurement of the two current values and the two voltage values is at a floating potential. This measuring unit (100) may be installed directly on all three phases, of a substation for example, with its own internal power source and with no ground connection. The actual measurements are done between the phases. Current may be measured using a Hall sensor, a shunt sensor, a Rogowski coil current sensor or a transformer, as for instance a nano-core current transformer. Voltage may be measured using a voltage divider. Based on high accuracy, the device may perform both commercial energy metering and measurements/monitoring of electrical parameters for technical purposes (e.g. power quality, voltage or current variations). Such features are important for power systems with high penetration of variable renewable energy resources such as solar PV or wind.