dioxythiophene/polystyrenesulfonic acid). Other conductive resins or resins containing particles of conductive metal oxides can be used instead. Overlying conductive electrode **41** is insulating, acrylic layer **42**. Overlying insulating layer **42** is conductive layer **43**, which is preferably the same material as conductive layer **41**. As illustrated in FIG. **4**, layers **41** and **43** are patterned to provide a plurality of areas of overlap, forming a plurality of capacitors. Acrylic layer **45** (FIG. **3**) overlies conductive layer **43** and provides a clear, hard coating for the sensor.

[**0036**] The three electrode structure, including layers **34**, **36**, and **39**, provide electrical isolation of the EL panel from other electronics, including capacitive sensor **33** and whatever circuitry may by underneath layer **39**.

[**0037**] As known in the art, a single conductive layer exhibits a capacitance relative to a human body, which acts as a sink for electric charge. The conductive layers **41** and **43** form a complex web of capacitances, of which the areas of overlap exhibit the greatest capacitance. Determining the location of a touch is a matter of sensing the capacitance on the several stripes in layer **41** and the several stripes in layer **43**, yielding the location of the touch in an X-Y coordinate system. The electronics for this function are known in the art; e.g. see U.S. Pat. No. 3,482,241 (Johnson).

[**0038**] Not shown in FIG. **3** are bus bars. These are thicker, peripheral, conductive layers that make contact with at least one edge of the electrodes in capacitive sensor **33** and EL panel **32** to provide low resistance paths to external leads. The structure and arrangement of bus bars are not part of the invention.

[**0039**] The electrodes in a capacitive sensor can have many configurations. FIG. **5** is a plan view of plurality of electrodes disposed in a circle on the same surface. Sensor **50** includes a plurality of electrodes, interconnected by resistors, to provide a "rotary" type of sensor. Electrode **51** is coupled to electrode **52** by resistor **53**, which can be implemented as a screen printed conductor with low carbon content, which increases the resistivity of the conductor. A plurality of leads, such as lead **55**, is used for sensing contact. Central area **57** can include a further electrode or be left blank. Referring also to FIG. **2**, with central area **57** corresponding to key **24**, electrode **51** corresponds to key **58**, electrode **52** corresponds to key **58**, and so on around central area **57** for a total of nine keys.

[**0040**] FIG. **6** illustrates an alternative form of rotary sensor in which conductive annulus **58** is contacted by three electrodes, such as electrode **59**. The number of electrodes is not critical. In this embodiment of the sensor, location is determined by sensing differences among the capacitances at the electrodes to determine location. The central aperture can overlie a dome switch, if desired, or be left empty.

[**0041**] FIG. **7** illustrates an alternative embodiment for the capacitive sensor in which electrode **60** has several leads, such as lead **62**, attached to contact area **63**, which can simply be an area of overlap between lead **62** and electrode **60**. By measuring capacitance or resistance, one can locate a touch on electrode **60** relative to the corners. Obviously, one does not actually touch an electrode. One touches the outer surface of the sensor, which is coated with a protective layer. Electrode **60** is particularly useful for slide sensors, such as slide **23** (FIG. **2**).

[**0042**] In accordance with one aspect of the invention, at least conductive layers **41** and **43** are screen printed from ink containing particles of acicular ITO. Acicular ITO is known in the art as a transparent conductor; see U.S. Pat. No. 5,580,496 (Yukinobu et al.) and the divisional patents based thereon (U.S. Pat. Nos. 5,820,843, 5,833,941, 5,849,221). Acicular ITO has a fibrous structure composed of 2-5 μm thick by 15-25 μm long ITO needles. The needles are suspended in an organic resin, e.g. polyester.

[**0043**] Acicular ITO is different in kind from other forms of the material. A cured, screen printed layer of acicular ITO is approximately five times more conductive than conventional layers containing ITO powder but is about two thirds less conductive than sputtered ITO, which is more difficult to pattern than screen printable materials. Thus, acicular ITO can be formulated to provide a resistivity of 10^2 to 10^5 Ω/□, for a capacitive sensor. Depending upon the longest dimension of the layer, or a portion of a layer if patterned, a resistivity of approximately 10^5 Ω/□ is preferred. Antimony tin oxide is less conductive than acicular ITO, is also suitable, and is less expensive than acicular ITO. The resistivity of the conductive layers in EL lamp **32** should be less than 10^2 Ω/□,

[**0044**] FIG. **8** is a cross-sectional view of a back lit capacitive sensor constructed in accordance with an alternative embodiment of the invention. In this embodiment, phosphor layer **37** is deposited on ITO layer **34** and layers **38** and **39** are deposited as described above. Conductive layer **79**, which was middle electrode **36** in FIG. **3**, overlies insulating layer **78** and is now a rear electrode. ITO layer **34** and rear electrode **79** are preferably grounded to provide an electrostatic shield between panel **32** and the capacitive sensor.

[**0045**] In portable electronic devices, an EL lamp is powered by an inverter that converts direct current from a battery into alternating current. In order for an EL lamp to glow sufficiently, a peak-to-peak voltage in excess of about one hundred and twenty volts is necessary. The frequency of the alternating current through an EL lamp affects the life of the lamp, with frequencies between 200 hertz and 1000 hertz being preferred. Operating efficiencies dictate higher switching frequencies. The result is that an EL lamp is pulsed at high frequency, tens of kilohertz, in a first polarity, then pulsed at high frequency in the opposite polarity to produce alternating current. The result is a high frequency AC field near the electrodes of an EL lamp.

[**0046**] Capacitive coupling between EL panel and an overlying capacitive sensor is prevented by grounded conductive layer **71**. Insulating layer **72** separates conductive layer **71** from conductive layer **73**. Conductive layer **73** is charged to provide a sense field. Protective layer **74** prevents damage to conductive layer **73**.

[**0047**] As indicated by the dashed lines, a backlit capacitive touch sensor constructed in accordance with the invention can overlie a contact type of switch array, including elastic layer **81**, which includes an array of pins for actuating the switches (not shown), and elastic layer **83**, which contains a plurality of domes for providing tactile feedback. A switch is actuated by pushing downward on layer **74**.

[**0048**] Contact switches and capacitive sensors would not normally occupy the same area. FIG. **8** is intended to