

about 5 microns, most preferably about 12 microns to about 8 microns. The spacer dots are then cured using ultraviolet light energy level of less than about 1000 mJ/cm<sup>2</sup>, preferably less than about 500 mJ/cm<sup>2</sup>, most preferably less than about 400 mJ/cm<sup>2</sup> and/or drying at less than about 300 degrees C. for less than about 40 minutes, preferably less than about 200 degrees C. for less than about 20 minutes, most preferably less than about 100 degrees C. for less than about 10 minutes. The coated lites with dots **30** thereon are then washed using conventional glass washing techniques, inspected, and cut to final touch screen dimensions using conventional glass cutting techniques. Dielectric materials and adhesives are applied to the resulting rigid glass coated substrate. The flexible conductive top sheet **40** is then bonded to the conductive glass substrate **10** with the spacer dots **30** separating the top sheet from the coated glass substrate. A flexible electric connector is electrically connected to the complete assembly for attachment to the information device. The device is then inspected and tested electronically. The resulting product is the complete interactive information device **60**.

[0023] Alternately, as shown in embodiment **60'** in FIG. 1A, transparent, insulating spacer members or dots **30a**, which are substantially similar to spacer dots **30** described above, may be arranged and located on surface **51** of conductive thin film coating **50** in the same manner as described above for dots **30** on surface **22** also to avoid false-touch sensing of the touch screen.

[0024] In yet another embodiment **60''**, shown in FIG. 1B, spacer members or dots **30b** may be located and arranged on surface **22** of conductive coating **20** while spacer members **30c** may be arranged and located on surface **51** of conductive thin film coating **50**. Spacer members or dots **30b** and **30c** are substantially similar to spacer members or dots **30** described above. In embodiment **60''**, however, spacer dots **30b**, **30c** alternate on opposite sides of the gap on coatings **20**, **50** and are spaced at greater a distance from one another on each of the opposing surfaces so as not to be aligned with or engage one another but allow the conductive coatings **20**, **50** to engage one another between the spacer dots when flexible film **40** is touched or pressed.

#### EXAMPLE

[0025] A preferred synthesis for the spacer dot paste was produced with a mixture of 118.2 g glycidoxypropyltrimethoxysilane, 13.5 g bidistilled water and 4 g hydroxypropyl cellulose refluxed for 24 hours. The mixture was filtered afterwards. In addition, a mixture of 10 g of 30% by weight colloidal silicon dioxide in isopropanol and 2.4 mg 40% by weight tetrahexylammoniumhydroxide in water was produced under stirring. 20 g of glycidoxypropyltrimethoxysilane and 3 g of 30% by weight colloidal silicon dioxide in isopropanol/40% by weight tetrahexylammoniumhydroxide in water mixture were mixed, water and alcohol were removed by distillation (temperature at 60 degrees C., pressure at 200 mbar, removal of 25.4% of the mixture). Afterwards 2 weight percent of the photoinitiator Union Carbide Cyacure UVI 6974 were added.

[0026] While several forms of the invention has been shown and described, other forms will now be apparent to those skilled in the art. Therefore, it will be understood that the embodiments shown in the drawings and described

above are merely for illustrative purposes, and are not intended to limit the scope of the invention which is defined by the claims which following including the doctrine of equivalents.

The embodiments of the invention in which an exclusive property or privilege is claimed are as follows:

1. An interactive information device comprising:

at least one rigid, transparent substrate;

a first transparent, electrically conductive layer supported by a surface of said rigid substrate;

a flexible transparent substrate at least partially aligned with said rigid substrate, said flexible substrate having a surface which faces said surface of said rigid substrate, and a second transparent, electrically conductive layer on said surface of said flexible substrate; said flexible substrate being spaced from said rigid substrate to provide a gap between said conductive layers;

a plurality of insulating spacer members on at least one of said electrically conductive layers whereby said flexible substrate may be flexed by pressing to engage said electrically conductive layers; and

wherein said spacer members comprise polymeric material including at least some inorganic material.

2. The interactive information device of claim 1 wherein said inorganic material comprises nanoscale particles.

3. The interactive information device of claim 2 wherein said nanoscale particles include nanoparticle metal oxides.

4. The interactive information device of claim 3 wherein said nanoscale particles include a pigment.

5. The interactive information device of claim 3 wherein said nano-particle metal oxides include material selected from the group consisting of titanium dioxide, barium titanium oxide, silicon oxide, zirconium dioxide, tantalum pentoxide, silver, nickel, molybdenum and platinum.

6. The interactive information device of claim 1 wherein said spacer members have an index of refraction of at least about 1.49 measured at the sodium D line.

7. The interactive information device of claim 1 wherein said spacer members have an index of refraction within the range of about 1.49 to about 2.0 measured at the sodium D line.

8. The interactive information device of claim 1 wherein said spacer members have an index of refraction of about 1.75 to about 1.95 measured at the sodium D line.

9. The interactive information device of claim 1 wherein said spacer members have an index of refraction substantially optically matched to the index of refraction of the transparent, electrically conductive layer on which they are positioned.

10. The interactive information device of claim 1 wherein at least one of said spacer members comprises a width dimension of at least about 15 microns.

11. The interactive information device of claim 10 wherein at least one of said spacer members comprises a height dimension of at least about 3 microns.

12. The interactive information device of claim 10 wherein at least one of said spacer members comprises a height dimension of about 3 microns to about 25 microns.

13. The interactive information device of claim 1 wherein at least one of said spacer members comprises a width dimension of about 15 microns to about 125 microns.