

[0032] Devices according to the invention may include a signal processing means. The signal processing means preferably processes information regarding the signals produced by the deflection sensors to provide information regarding the locations and magnitudes of forces applied to the flexible surface.

[0033] The processing means may comprise electronic circuitry which has been deposited directly onto the membrane (partially or entirely).

[0034] As will be apparent to those skilled in the art in the light of the foregoing disclosure, many alterations and modifications are possible in the practice of this invention without departing from the scope thereof. For example, the deflection sensors may comprise other devices deposited on the flexible surface and capable of measuring deflections of the flexible surface. For example, the deflection sensors could comprise small coils patterned on the flexible surface which detect proximity to a ferromagnetic base layer (not shown). Accordingly, the scope of the invention is to be construed in accordance with the substance defined by the following claims.

What is claimed is:

1. A touch-sensitive device comprising:
  - a layer of a compressible resilient material;
  - a flexible membrane disposed on the compressible resilient material; and,
  - a plurality of deflection sensors formed on the flexible membrane;
 wherein each of the deflection sensors comprises one or more electronic components formed on the membrane and wherein the electronic components of each of the deflection sensors comprise a light detector and the touch-sensitive device comprises at least one light source.
2. A touch-sensitive device according to claim 1 wherein the light detectors are formed on an inside face of the membrane at an interface between the membrane and the compressible resilient material.
3. The touch-sensitive device of claim 1 wherein the compressible resilient material is translucent.
4. The touch-sensitive device of claim 3 wherein the compressible resilient material comprises a foam.

5. The touch-sensitive device of claim 4 wherein the compressible resilient material comprises a polyurethane foam.

6. The touch-sensitive device of claim 1 wherein the electronic components of each of the deflection sensors comprise a light source.

7. The touch-sensitive device of claim 6 comprising a reflective layer on a side of the compressible resilient material away from the flexible membrane.

8. The touch-sensitive device of claim 7 wherein the compressible resilient material comprises an aperture underlying each of the deflection sensors.

9. The touch-sensitive device of claim 6 wherein the compressible resilient material is translucent.

10. The touch-sensitive device of claim 9 wherein the compressible resilient material comprises a foam.

11. The touch-sensitive device of claim 10 wherein the compressible resilient material comprises a polyurethane foam.

12. The touch-sensitive device of claim 1 wherein the deflection sensors are arranged in a regular array.

13. The touch-sensitive device of claim 12 wherein the deflection sensors are arranged in a rectangular array.

14. The touch-sensitive device of claim 13 wherein a spacing between adjacent ones of the deflection sensors is in the range of about 0.5 mm to about 25 mm.

15. The touch-sensitive device of claim 14 wherein the spacing between adjacent ones of the deflection sensors is in the range of 5 mm±1 mm.

16. The touch-sensitive device of claim 1 comprising a flexible display on the flexible membrane.

17. The touch-sensitive device of claim 16 wherein the flexible display comprises an array of thin film transistors on the flexible membrane.

18. The touch-sensitive device of claim 1 comprising a data processor connected to receive signals from the deflection sensors and configured to determine at least one point at which a force is being applied to the touch-sensitive device from the signals.

19. The touch-sensitive device of claim 18 wherein the data processor comprises at least some flexible electronic devices on the flexible membrane.

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