

tactile sensation generator **200**, a force that resists approach of the sensor **300** is generated the same as in parallel movement. This force may control elasticity and withdrawal, and as a result, viscosity may be perceived. A distance between the tactile sensation generator **200** and the sensor **300** may be calculated from electrostatic capacity between the tactile sensation generator and the sensor.

[0037] As described above, tactile information is added to a conventional display that provides visual information, to provide the tactile information as well as the visual information. Also, a tactile sensation generator provides an electrostatic force and is formed to have a coil-shaped circuit so that it can implement a magnetic force through a simple structure as well.

[0038] Further, the tactile sensation generator is formed to have a multilayer structure that can provide an electric force and a magnetic force to simultaneously represent an electrostatic force and a magnetostatic force. In addition, a sensor connects a plurality of sensing pixels formed of a metal material using an insulated line, so that sensing efficiency is enhanced to provide a user with more accurate information.

[0039] Exemplary embodiments of the invention are shown in the drawings and described above in specific terms. However, no part of the above disclosure is intended to limit the scope of the overall invention. It will be understood by those of ordinary skill in the art that various changes in form and details may be made to the exemplary embodiments without departing from the spirit and scope of the present invention as defined by the following claims.

What is claimed is:

1. A tactile and visual display device comprising:
 - a display unit comprising a plurality of scan lines, a plurality of data lines and a plurality of pixels;
 - a tactile sensation generator mounted over the display unit, transmitting light emitted from the pixels, comprising a transistor electrically connecting a plurality of corresponding pixels formed to correspond to the pixels with adjacent corresponding pixels, and generating an electrostatic force or a magnetostatic force; and

a sensor in contact with the corresponding pixels to sense the electrostatic force or magnetostatic force generated by the tactile sensation generator.

2. The device of claim 1, wherein the corresponding pixels of the tactile sensation generator comprise:

- a transparent electrode transmitting light emitted from the display unit;
- a plurality of address lines and a plurality of scan lines electrically connected to the transparent electrode;
- a plurality of transistors transmitting a signal applied to the address line in response to a scan signal applied to the scan line; and
- a capacitor storing a voltage corresponding to the transmitted signal.

3. The device of claim 1, wherein the sensor comprises a pad portion comprising sensing pixels corresponding to the corresponding pixels and a pad connector having one end electrically connected to the pad portion and the other end electrically connected to the tactile sensation generator.

4. The device of claim 3, wherein the sensing pixels use a metal material or a conductive material having transparency to sense an electrostatic force.

5. The device of claim 4, wherein the sensing pixels use one of Au, Al, Fe, Ag, Pt, ITO and IZO.

6. The device of claim 3, wherein the sensing pixels use a permanent magnet to sense a magnetostatic force.

7. The device of claim 3, wherein the sensing pixels use a metallic permanent magnet to sense an electric force and a magnetic force.

8. The device of claim 3, wherein the pad portion uses a material having elasticity and ductility.

9. The device of claim 8, wherein the material having elasticity and ductility comprises rubber, polymer, paper, natural fiber and synthetic fiber.

10. The device of claim 1, wherein the transistor connecting each of the corresponding pixels is driven to form rotating current, so that a magnetic force is generated and elasticity and viscosity are represented.

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