CAPACITIVE-TYPE TOUCH PANEL

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims priority of Taiwanese Application No. 096123484, filed on Jun. 28, 2007.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] This invention relates to a capacitive-type touch panel, more particularly to a capacitive-type touch panel including first and second conductors having sections, each having a fine conductor line-constructed structure.

[0004] 2. Description of the Related Art

[0005] FIG. **1** illustrates a conventional capacitive-type touch panel that includes a transparent substrate **11**, a first electrode unit **12** formed on a top surface of the transparent substrate **11**, a second electrode unit **13** formed on a bottom surface of the transparent substrate **11**, a conductive first connecting line unit **15** connected to the first electrode unit **12**, a conductive second connecting line unit **16** connected to the second electrode unit **13**, and a controller **14** connected to the first and second connecting line units **15**, **16**.

[0006] FIG. **2** illustrates another conventional capacitive-type touch panel that includes a transparent substrate **21**, a first electrode unit **22** formed on a top surface of the transparent substrate **21**, an insulator layer **24** disposed on the first electrode unit **22**, and a second electrode unit **23** formed on a top surface of the insulator layer **24**.

[0007] When the aforesaid conventional capacitive-type touch panels are activated, an electric field distribution is generated between the first and second electrode units **12**, **13** (**22**, **23**). At this time, when the user operably touches the capacitive-type touch panel at one location, the electric field at the location is changed, which results in a change in the capacitance between the first and second electrode units **12**, **13** (**22**, **23**) at the location, thereby permitting identification of the coordinates of the location through the controller **14**.

[0008] Since the first and second electrode units **12**, **13** (**22**, **23**) of the aforesaid conventional capacitive-type touch panels are made from a transparent conductive material, such as indium tin oxide (ITO), which has a much higher sheet resistance compared to those of metals, such as Cu, Ag and Au, the sheet resistance of the conventional capacitive-type touch panels will be larger than 1KΩ/square and the capacitance of the conventional capacitive-type touch panels from one peripheral end to an opposite peripheral end will be larger than 400 pF (pico-farad) when the capacitive-type touch panel has dimensions larger than 7×7 inches, which can result in relatively poor identification of coordinates of a location touched by the user, which, in turn, limits production of larger sizes of the capacitive-type touch panels.

SUMMARY OF THE INVENTION

[0009] An object of the present invention is to provide a capacitive-type touch panel that can overcome the aforesaid drawbacks associated with the prior art.

[0010] According to this invention, there is provided a capacitive-type touch panel that comprises: a transparent substrate; a plurality of first conductors disposed on the transparent substrate; a plurality of second conductors disposed on the transparent substrate, intersecting insulatively with the first conductors, and cooperating with the first conductors to form a matrix of capacitive regions when a current is applied to the first and second conductors; and a controller connected electrically to the first and second conductors for detecting the capacitance of each of the capacitive regions. Each of the first conductors is intersected and divided by the second conductors into a series of first electrode sections. Each of the second conductors is intersected and divided by the first conductors into a series of second electrode sections. Each of the first and second electrode sections of the first and second conductors has a fine conductor line-constructed structure which is constructed from a fine line-shaped conductor.

BRIEF DESCRIPTION OF THE DRAWING

[0011] Other features and advantages of the present invention will become apparent in the following detailed description of the preferred embodiments of this invention, with reference to the accompanying drawings, in which:

[0012] FIG. **1** is a fragmentary schematic view of a conventional capacitive-type touch panel;

[0013] FIG. **2** is a partly exploded schematic view of another conventional capacitive-type touch panel;

[0014] FIG. **3** is a cutaway perspective view of the first preferred embodiment of a capacitive-type touch panel for mounting to a display according to this invention;

[0015] FIG. **4** is a fragmentary schematic view of the first preferred embodiment according to this invention;

[0016] FIG. **5** is a fragmentary perspective view of the first preferred embodiment;

[0017] FIG. **6** is a fragmentary perspective view of the second preferred embodiment of the capacitive-type touch panel according to this invention;

[0018] FIG. **7** is a fragmentary schematic view of the third preferred embodiment of the capacitive-type touch panel according to this invention;

[0019] FIG. **8** is a fragmentary perspective view of the third preferred embodiment;

[0020] FIG. **9** is a fragmentary schematic view of the fourth preferred embodiment of the capacitive-type touch panel according to this invention;

[0021] FIG. **10** is a fragmentary perspective view of the fourth preferred embodiment;

[0022] FIG. **11** is a fragmentary sectional view taken along line XI-XI of FIG. **9**;

[0023] FIG. **12** is a fragmentary perspective view of the fifth preferred embodiment of the capacitive-type touch panel according to this invention;

[0024] FIG. **13** is a fragmentary schematic view of the sixth preferred embodiment of the capacitive-type touch panel according to this invention;

[0025] FIG. **14** is a fragmentary partly sectional cutaway perspective view of the sixth preferred embodiment;

[0026] FIG. **15** is a fragmentary sectional view of the sixth preferred embodiment;

[0027] FIG. **16** is a fragmentary, exploded perspective view of the seventh preferred embodiment of the capacitive-type touch panel according to this invention; and

[0028] FIG. **17** is a fragmentary, exploded perspective view of the eighth preferred embodiment of the capacitive-type touch panel according to this invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0029] FIGS. **3** to **5** illustrate the first preferred embodiment of a capacitive-type touch panel for a liquid crystal display **80**