respective switching elements SW (B). Due to such a constitution, it is possible to realize the collective erasing of the whole screen.

EMBODIMENT 7

[0211] **FIG. 15** is a diagram showing another embodiment of the liquid crystal display device according to the present invention.

[0212] This liquid crystal display device is configured such that, on an observation-side surface of a liquid crystal display panel LPNL, a touch panel TPNL is arranged such that the touch panel TPNL covers at least the liquid crystal display part AR.

[0213] The touch panel TPNL is constituted such that, when a location on the surface thereof is pushed with a pen or the like, for example, positional information PD which locates such a pushed portion is outputted, and various manipulations are reflected on the display of the liquid crystal display panel LPNL based on the positional information.

[0214] The touch panel TPNL may be constituted, for example, such that, on a surface thereof, a plurality of first signal lines, which extend in the x direction and are arranged in parallel in the y direction, and a plurality of second signal lines, which extend in the y direction and are arranged in parallel in the x direction, are formed in the usually insulated manner, wherein, when a portion of the touch panel TPNL is pushed, a signal line constituting the first signal line and a signal line constituting the second signal line at that position are short-circuited, and the short-circuiting is inputted together with the positional information.

[0215] Further, when the liquid crystal display panel LPNL is used in the above-mentioned liquid crystal display device, and when the pressure is applied to the liquid crystal display part AR, a "dark spot" is generated at the location where the pressure is applied.

[0216] This embodiment is provided for preventing the "dark spot" which is generated on the liquid crystal display panel LPNL when the touch panel TPNL is pushed with a pen or the like and the pressure is transmitted to the liquid crystal display panel LPNL.

[0217] That is, as shown in **FIG. 15**, this embodiment is characterized in that the control circuit TCON detects the positional information PD from the touch panel TPNL, which is pushed with a pen or the like and, thereafter, the control circuit TCON replaces the video signal SG supplied to the pixel corresponding to the position with a modified video signal VLP, which is a voltage of equal to or less than 20% of the maximum voltage based on the positional information.

[0218] Due to such a constitution, as shown in **FIG. 16A**, **FIG. 16B** and **FIG. 16C**, although a dark spot STN is generated temporarily at the portion of the touch panel TPNL which is pushed with the pen or the like, the dark spot STN disappears thereafter, and the touch panel TPNL recovers to the normal screen.

[0219] **FIG. 16A** shows a state in which the touch panel TPNL is touched with a pen, **FIG. 16B** shows a state in which the modified video signal, which is set to a value equal to or less than 20% of the maximum voltage, is displayed in a rectangular shape, for example, in the touched region, and **FIG. 16C** indicates a state in which the dark spot STN disappears due to the display of the modified video signal VLP and the display returns to a normal mode.

[0220] Although liquid crystal display devices which are provided with a touch panels on whole the surface of the liquid crystal display device are widely known, a point which is shared by these liquid crystal display devices in common is that they require an operation to push the touch panel using a pen or a finger. As a result, as one example, a change of conductive state or a change of capacitance is generated between the above-mentioned electrodes constituted in a matrix array, and this change is detected by a detection circuit provided around the touch panel, whereby the touched position on the screen is specified.

[0221] However, due to such a pushing operation, pressure is applied to the liquid crystal display panel, and a memory image is generated. The liquid crystal display device equipped with a touch panel is a display device which inherently requires a pushing operation. However, the degree of the pushing force applied to the touch panel depends on individual users, and, hence, it is difficult to estimate the pressure applied to the liquid crystal display panel. Accordingly, to mount the touch panel on a vertical orientation type liquid crystal display device and to always provide a stable display, a constitution which can eliminate the above-mentioned memory property becomes necessary.

[0222] Here, by constituting at least one of the above-mentioned respective embodiments as a touch panel attached liquid crystal display device, it is possible to obtain a liquid crystal display device which exhibits a stable display, while adopting the vertical orientation type.

[0223] Then, in the touch panel method, the positional information of the portion to which the pressure is applied is specified and the memory images are generated only in the touched region, and, hence, it is sufficient to apply the voltage of equal to or less than 20% of the maximum voltage only to the touched region.

[0224] In this case, it is sufficient to set the image data at the region corresponding to the address and in the vicinity thereof to the voltage of equal to or less than 20% of the maximum voltage, and, hence, the data can be replaced using the control circuit TCON, whereby the liquid crystal display device can have a simple constitution.

[0225] In a simplified mode, the white gray scale mode is adopted for a normally white display, and the black gray scale is adopted for a normally black display.

[0226] Here, it is needless to say that the replacement of video signals may be performed continuously when the positional information from the touch panel TPNL is added.

EMBODIMENT 8

[0227] **FIGS. 17A** to **17**C are diagrams relating to another embodiment of the liquid crystal device according to the present invention.

[0228] The constitution which makes this embodiment different from the embodiment shown in **FIG. 16** lies in the fact that the "dark spot" is erased within a time at least equal to or more than 0.1 seconds after the touch panel TPNL is pushed with a pen or the like. That is, when the touch panel