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(54) **LIQUID CRYSTAL DISPLAY**

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(57) **ABSTRACT**

A liquid crystal display includes a first substrate and a second substrate which face opposite to each other, a thin film transistor disposed on the first substrate, a pixel electrode connected to the thin film transistor, a first light blocking member disposed on the pixel electrode, and a cover layer disposed on the first light blocking member and covering the first light blocking member.

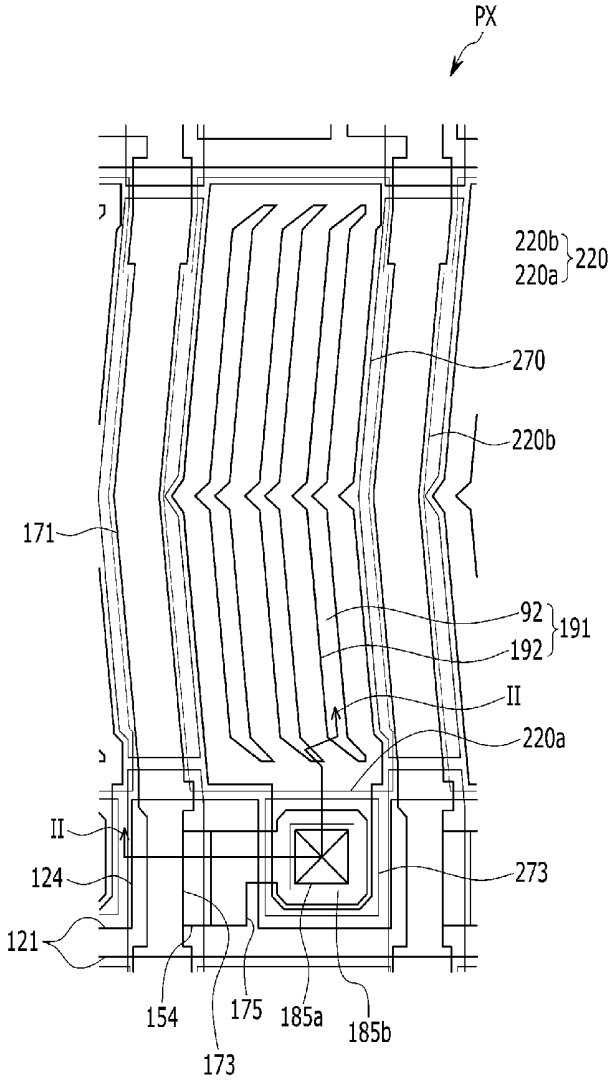


FIG. 1

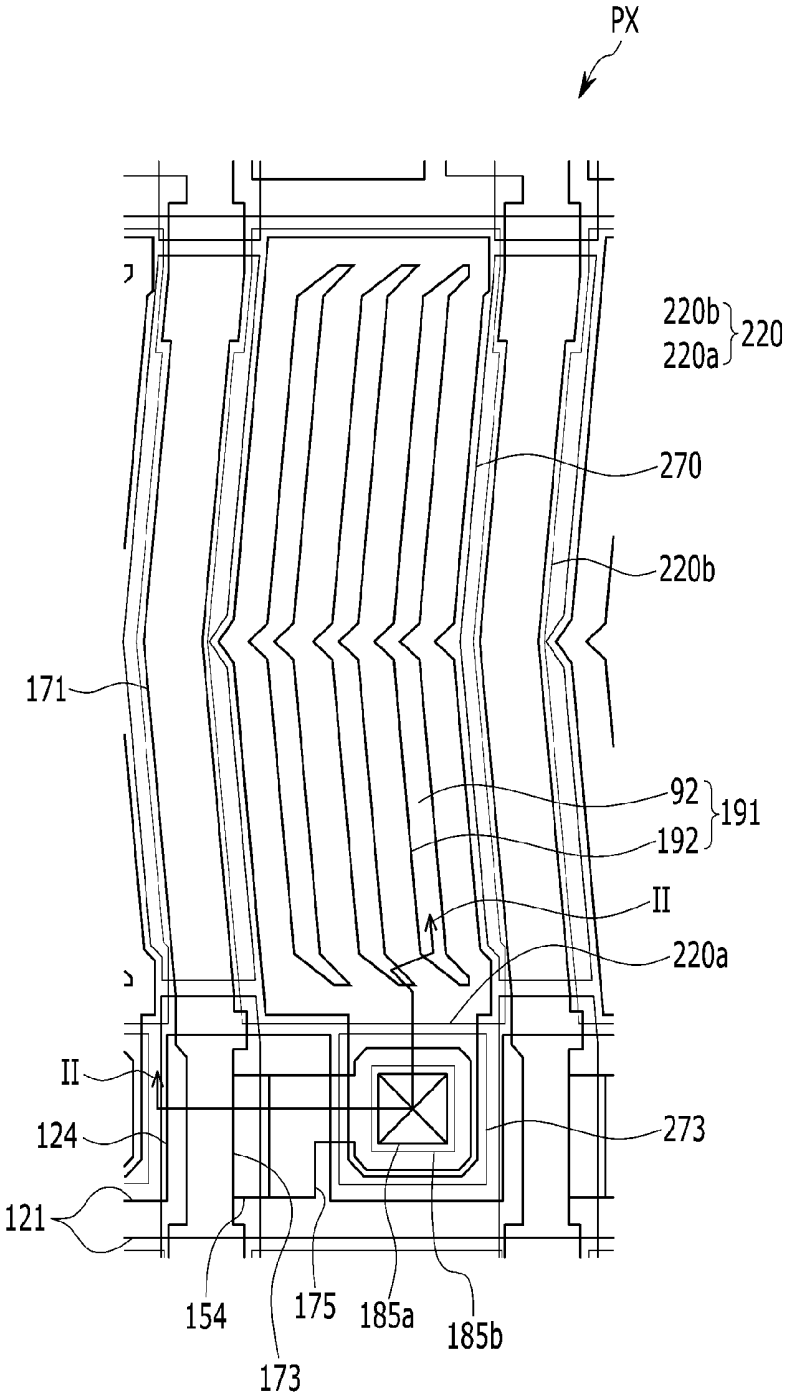

PX
220b
220a
220
270
220b
171
92
192
191
II
220a
II
124
273
121
154
175
185a
185b
173

FIG. 2

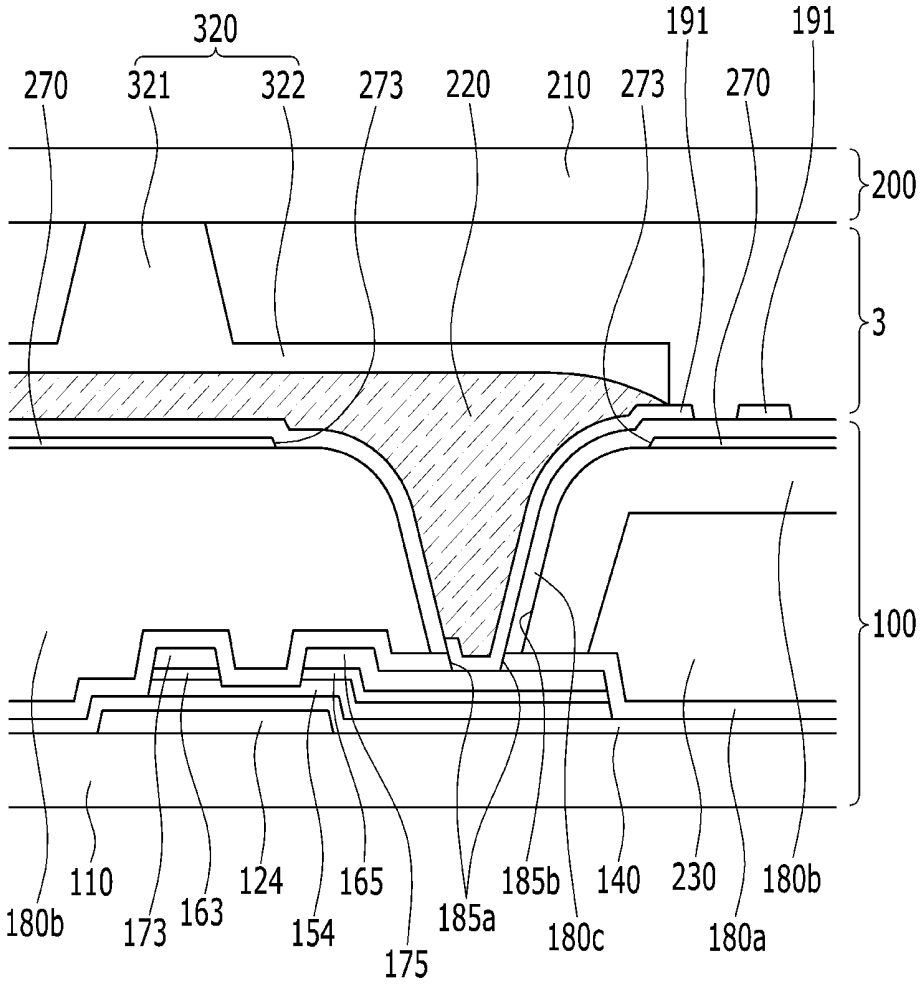

320
191
191
270
321
322
273
220
210
273
270
200
3
100
180b
110
173
163
124
154
165
175
185a
185b
180c
140
230
180a
180b

FIG. 3

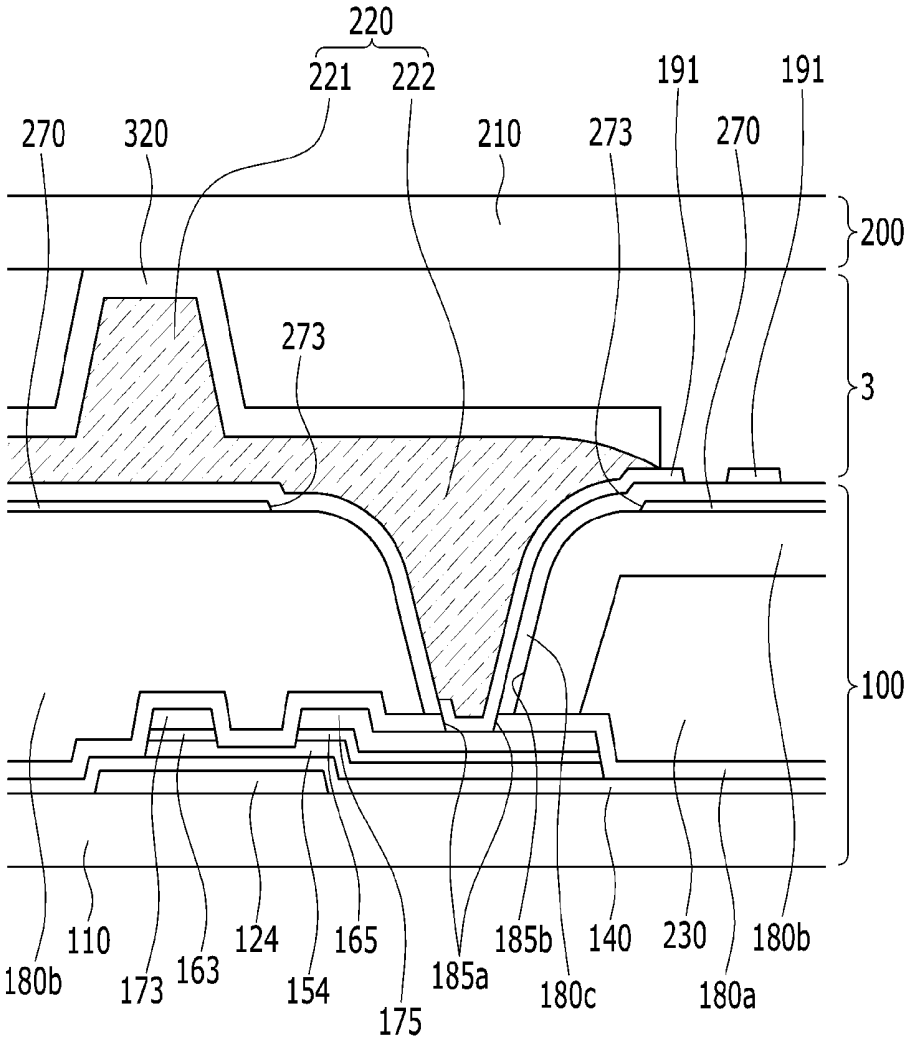

220
221
222
191
191
270
320
210
273
270
200
273
3
100
180b
110
173
163
124
154
165
175
185a
185b
180c
140
230
180a
180b

FIG. 4

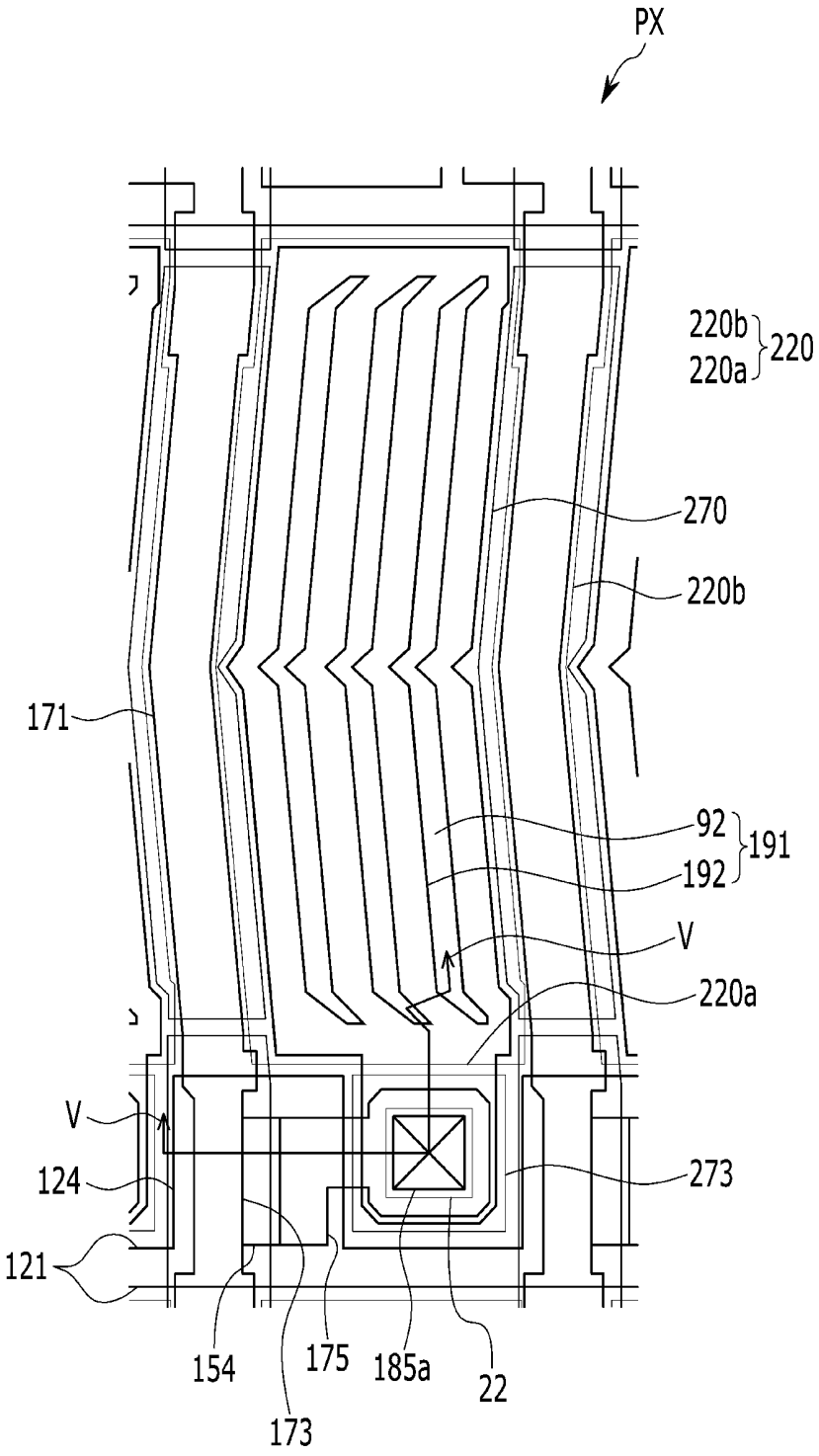

PX
220b
220a
220
270
220b
171
92
191
192
V
220a
V
124
273
121
154
175
185a
22
173

FIG. 5

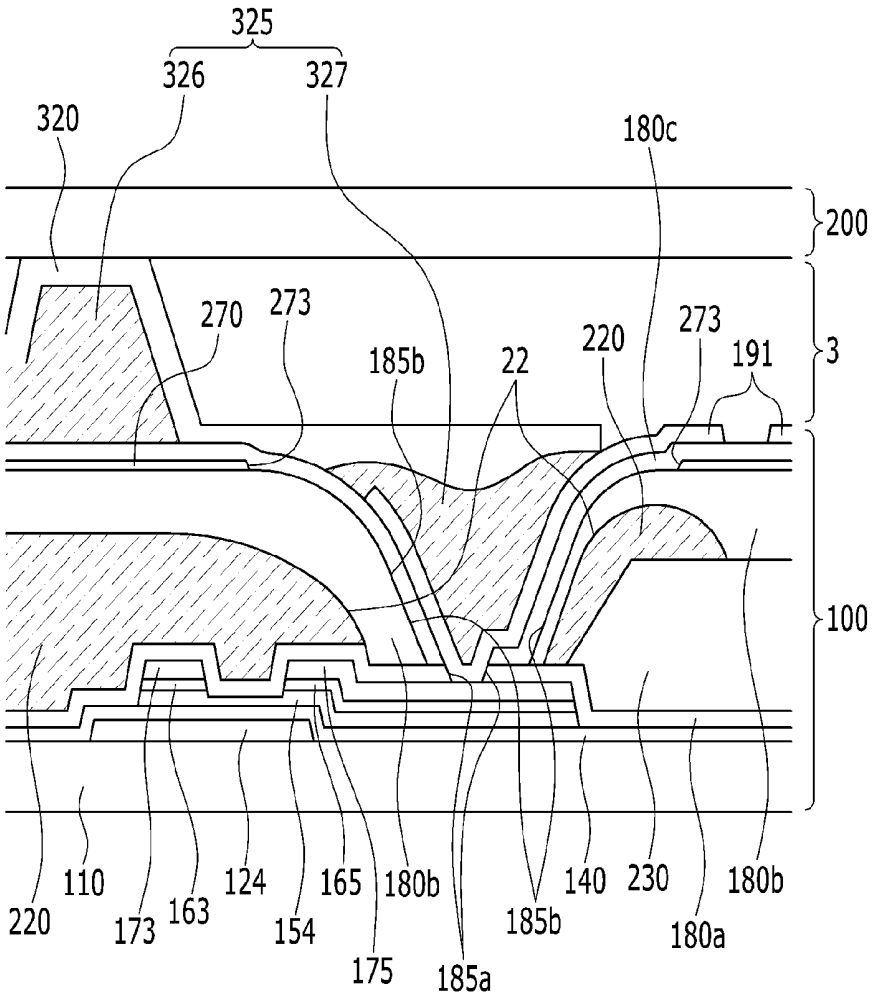

325
326
327
320
180c
200
270
273
185b
22
220
273
191
3
100
220
110
173
163
124
154
165
175
180b
185a
185b
140
230
180a
180b

FIG. 6

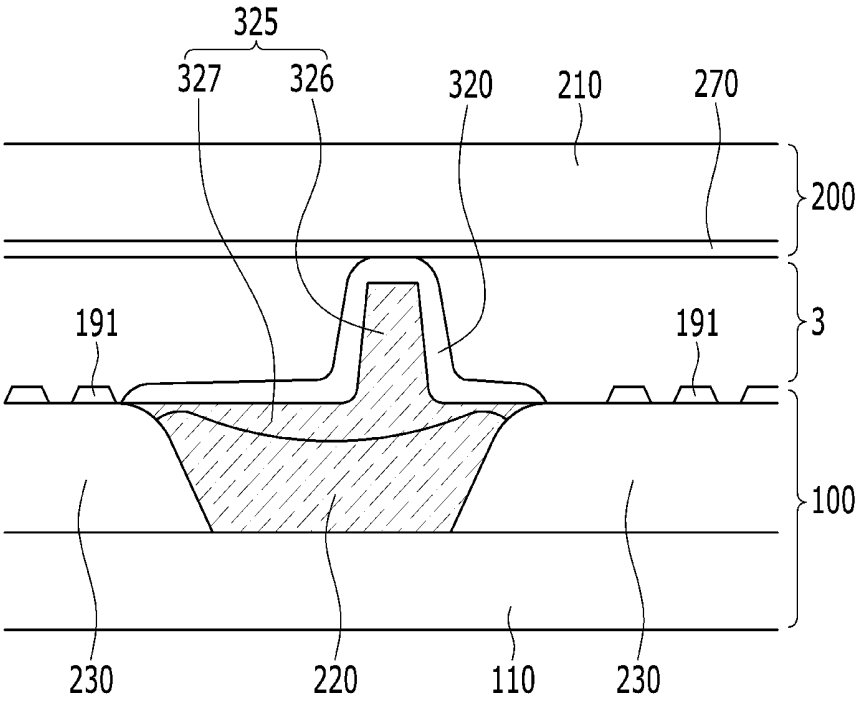


FIG. 7

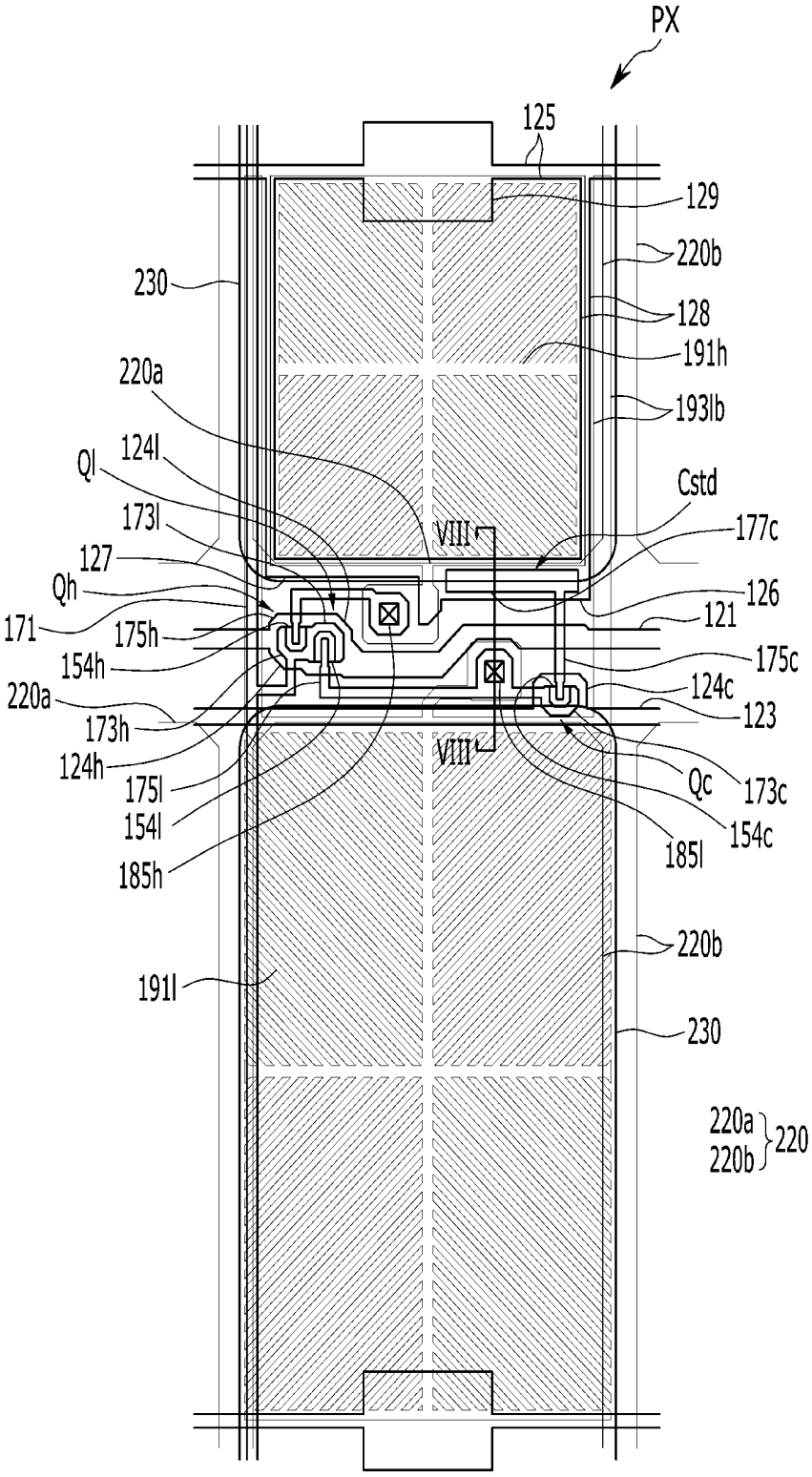
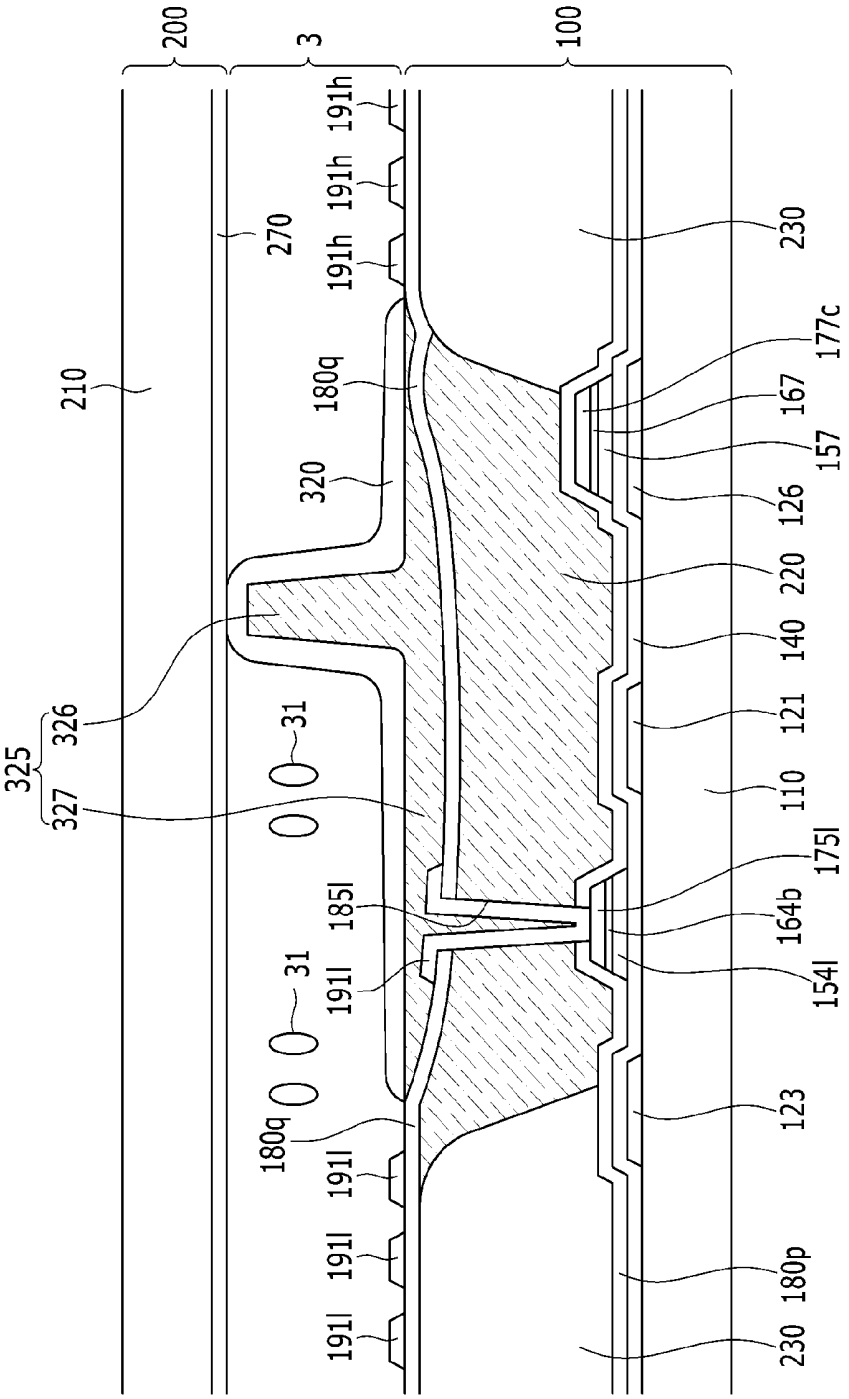

PX
125
129
220b
230
128
191h
220a
193lb
124l
Ql
Cstd
173l
VIII
177c
127
Qh
126
171
175h
121
154h
175c
220a
124c
173h
123
124h
VIII
Qc
173c
175l
154l
154c
185h
185l
220b
191l
230
220a
220b
220

FIG. 8


200
3
100
191h
191h
191h
270
230
210
180q
177c
167
157
320
126
220
140
326
31
121
325
327
110
175l
185l
164b
31
191l
154l
180q
123
191l
191l
180p
191l
230

LIQUID CRYSTAL DISPLAY

[0001] This application claims priority to Korean Patent Application No. 10-2013-0084334 filed on Jul. 17, 2013, and all the benefits accruing therefrom under 35 U.S.C. §119, the entire contents of which are incorporated herein by reference.

BACKGROUND

[0002] (1) Field

[0003] The invention relates to a liquid crystal display, and more particularly, to a liquid crystal display in which a light blocking member and a thin film transistor are positioned on the same substrate.

[0004] (2) Description of the Related Art

[0005] A liquid crystal display ("LCD") device which is currently one of the most common types of flat panel displays, typically includes two sheets of panels with field generating electrodes and a liquid crystal layer interposed therebetween. The LCD rearranges liquid crystal molecules of the liquid crystal layer by applying a voltage to the field generating electrodes to control an amount of transmitted light, thereby displaying a desired image.

[0006] The field generating electrodes may be provided in two panels facing each other, and two field generating electrodes may be positioned on one panel. A pixel electrode receiving a data voltage of the field generating electrodes and a plurality of thin film transistors ("TFTs") are arranged in a matrix form on one panel of the two panels facing each other, and color filters expressing primary colors such as red, green and blue, for example, and a light blocking member capable of effectively preventing light leakage between pixels may be disposed on the other panel.

[0007] However, in such an LCD, since the pixel electrode and the TFT, and the color filter or the light blocking member are disposed on the different panels, it is difficult to perform exact alignment between the pixel electrode and the color filter or between the pixel electrode and the light blocking member. As a result, an alignment error may occur.

[0008] In order to solve the alignment error, a structure in which the light blocking member is formed on the same panel as the pixel electrode and the TFT is provided, and in this case, the color filter may also be formed on the same panel as the pixel electrode. As such, by forming the light blocking member on the panel with the pixel electrode and the TFT together, a high aperture ratio and high transmittance of the LCD may be achieved.

SUMMARY

[0009] However, in the structure in which the light blocking member is formed on the same panel as the pixel electrode and the thin film transistor ("TFT"), an impurity is injected into the liquid crystal layer from the light blocking member, and as result, an after image is generated and reliability of the liquid crystal display ("LCD") may be deteriorated.

[0010] Therefore, the invention has been made in an effort to provide an LCD having advantages of removing an afterimage of the LCD and enhancing reliability by effectively preventing an impurity from flowing into a liquid crystal layer from a light blocking member, in the case where the light blocking member is disposed on the same panel as a pixel electrode and a TFT.

[0011] An exemplary embodiment of the invention provides an LCD including a first substrate and a second substrate facing each other; a TFT disposed on the first substrate; a pixel electrode connected to the TFT; a first light blocking member disposed on the pixel electrode; and a cover layer disposed on the first light blocking member and covering the first light blocking member.

[0012] The first light blocking member may include a pigment component, and the cover layer may not include the pigment component.

[0013] The cover layer may include at least one of a transparent organic insulating material and a transparent inorganic insulating material.

[0014] The cover layer may further include a spacer maintaining a separation distance between the first substrate and the second substrate.

[0015] The LCD may further include a first passivation layer disposed between the TFT and the pixel electrode, in which a contact hole may be defined in the first passivation layer to expose a drain electrode of the TFT, and the first light blocking member may include a portion covering the contact hole.

[0016] The LCD may further include a color filter disposed between the TFT and the pixel electrode.

[0017] A thickness of the cover layer may be equal to or greater than about 1 micrometer (μm).

[0018] The first light blocking member may include a spacer maintaining a separation distance between the first substrate and the second substrate.

[0019] The LCD may further include a second light blocking member disposed between the TFT and the pixel electrode.

[0020] A boundary of an opening defined in the second light blocking member may be wider than the contact hole.

[0021] The first light blocking member may further include a spacer maintaining a separation distance between the first substrate and the second substrate.

[0022] The LCD may further include a color filter disposed between the TFT and the pixel electrode.

[0023] The cover layer may include a portion covering a separated area between the portion of the first light blocking member covering the contact hole and the spacer.

[0024] The first light blocking member may be disposed on the second light blocking member.

[0025] The LCD may further include a color filter disposed between the TFT and the pixel electrode, in which the second light blocking member may include a portion having a smaller height than that of the color filter.

[0026] According to the exemplary embodiment of the invention, it is possible to remove an afterimage of the LCD and enhance reliability by effectively preventing an impurity from flowing into a liquid crystal layer from a light blocking member, in an LCD where the light blocking member is disposed on the same panel as a pixel electrode and a TFT.

BRIEF DESCRIPTION OF THE DRAWINGS

[0027] The above and other aspects, advantages and features of this disclosure will become more apparent by describing in further detail exemplary embodiments thereof with reference to the accompanying drawings, in which:

[0028] FIG. **1** is a plan view for an exemplary embodiment of one pixel of a liquid crystal display ("LCD") according to the invention.

[0029] FIG. **2** is an exemplary embodiment of a cross-sectional view of the LCD of FIG. **1** taken along line II-II.

[0030] FIG. **3** is another exemplary embodiment of a cross-sectional view of the LCD of FIG. **1** taken along line II-II.

[0031] FIG. **4** is a plan view of an exemplary embodiment of one pixel of an LCD according to the invention.

[0032] FIG. **5** is an exemplary embodiment of a cross-sectional view of the LCD of FIG. **4** taken along line V-V.

[0033] FIG. **6** is a cross-sectional view illustrating an exemplary embodiment of an LCD according to the invention.

[0034] FIG. **7** is a plan view of an exemplary embodiment of one pixel of an LCD according to the invention.

[0035] FIG. **8** is an exemplary embodiment of a cross-sectional view of the LCD of FIG. **7** taken along line VIII-VIII.

DETAILED DESCRIPTION

[0036] The invention will be described more fully hereinafter with reference to the accompanying drawings, in which exemplary embodiments of the invention are shown. As those skilled in the art would realize, the described exemplary embodiments may be modified in various different ways, all without departing from the spirit or scope of the invention.

[0037] In the drawings, the thickness of layers, films, panels, regions, etc., are exaggerated for clarity. Like reference numerals designate like elements throughout the specification. It will be understood that when an element such as a layer, film, region, or substrate is referred to as being "on" another element, it can be directly on the other element or intervening elements may also be present. In contrast, when an element is referred to as being "directly on" another element, there are no intervening elements present.

[0038] It will be understood that, although the terms "first," "second," "third" etc. may be used herein to describe various elements, components, regions, layers and/or sections, these elements, components, regions, layers and/or sections should not be limited by these terms. These terms are only used to distinguish one element, component, region, layer or section from another element, component, region, layer or section. Thus, "a first element," "component," "region," "layer" or "section" discussed below could be termed a second element, component, region, layer or section without departing from the teachings herein.

[0039] The terminology used herein is for the purpose of describing particular embodiments only and is not intended to be limiting. As used herein, the singular forms "a," "an," and "the" are intended to include the plural forms, including "at least one," unless the content clearly indicates otherwise. "Or" means "and/or." As used herein, the term "and/or" includes any and all combinations of one or more of the associated listed items. It will be further understood that the terms "comprises" and/or "comprising," or "includes" and/or "including" when used in this specification, specify the presence of stated features, regions, integers, steps, operations, elements, and/or components, but do not preclude the presence or addition of one or more other features, regions, integers, steps, operations, elements, components, and/or groups thereof.

[0040] Furthermore, relative terms, such as "lower" or "bottom" and "upper" or "top," may be used herein to describe one element's relationship to another element as illustrated in the Figures. It will be understood that relative terms are intended to encompass different orientations of the device in addition to the orientation depicted in the Figures. For example, if the device in one of the figures is turned over, elements described as being on the "lower" side of other elements would then be oriented on "upper" sides of the other elements. The exemplary term "lower," can therefore, encompasses both an orientation of "lower" and "upper," depending on the particular orientation of the figure. Similarly, if the device in one of the figures is turned over, elements described as "below" or "beneath" other elements would then be oriented "above" the other elements. The exemplary terms "below" or "beneath" can, therefore, encompass both an orientation of above and below.

[0041] About" or "approximately" as used herein is inclusive of the stated value and means within an acceptable range of deviation for the particular value as determined by one of ordinary skill in the art, considering the measurement in question and the error associated with measurement of the particular quantity (i.e., the limitations of the measurement system). For example, "about" can mean within one or more standard deviations, or within ±30%, 20%, 10%, 5% of the stated value.

[0042] Unless otherwise defined, all terms (including technical and scientific terms) used herein have the same meaning as commonly understood by one of ordinary skill in the art to which this disclosure belongs. It will be further understood that terms, such as those defined in commonly used dictionaries, should be interpreted as having a meaning that is consistent with their meaning in the context of the relevant art and the present disclosure, and will not be interpreted in an idealized or overly formal sense unless expressly so defined herein.

[0043] Exemplary embodiments are described herein with reference to cross section illustrations that are schematic illustrations of idealized embodiments. As such, variations from the shapes of the illustrations as a result, for example, of manufacturing techniques and/or tolerances, are to be expected. Thus, embodiments described herein should not be construed as limited to the particular shapes of regions as illustrated herein but are to include deviations in shapes that result, for example, from manufacturing. For example, a region illustrated or described as flat may, typically, have rough and/or nonlinear features. Moreover, sharp angles that are illustrated may be rounded. Thus, the regions illustrated in the figures are schematic in nature and their shapes are not intended to illustrate the precise shape of a region and are not intended to limit the scope of the present claims.

[0044] Hereinafter, a liquid crystal display ("LCD") according to an exemplary embodiment of the invention will be described in detail with reference to the accompanying drawings.

[0045] First, an LCD according to an exemplary embodiment of the invention will be described with reference to FIGS. **1** and **2**.

[0046] FIG. **1** is a layout view illustrating an LCD according to an exemplary embodiment of the invention, and FIG. **2** is a cross-sectional view of an exemplary embodiment of the LCD of FIG. **1** taken along line II-II.

[0047] Referring to FIGS. **1** and **2**, an LCD device according to an exemplary embodiment of the invention includes a lower panel **100** and an upper panel **200** facing each other, and a liquid crystal layer **3** interposed therebetween.

[0048] In an exemplary embodiment, the upper panel **200** includes an insulating substrate **210** including transparent glass or plastic.

[0049] Next, in the lower panel **100**, a gate conductor including a plurality of gate lines **121** is disposed on the insulation substrate **110** including transparent glass or plastic.

[0050] The gate line **121** transfers a gate signal and may extend in a substantially horizontal direction. The gate line

121 includes a gate electrode **124**. In an exemplary embodiment, the gate line **121** may include aluminum-based metal such as aluminum (Al) or an aluminum alloy, silver-based metal such as silver (Ag) or a silver alloy, copper-based metal such as copper (Cu) or a copper alloy, molybdenum-based metal such as molybdenum (Mo) or a molybdenum alloy, chromium (Cr), tantalum (Ta) and titanium (Ti). However, in another exemplary embodiment, the gate line **121** may have a multilayered structure including at least two conductive layers having different physical properties.

[0051] A gate insulating layer **140** including silicon nitride (SiNx) or silicon oxide (SiOx) is disposed on the gate conductor. In an exemplary embodiment, the gate insulating layer **140** may have a multilayered structure including at least two insulating layers having different physical properties.

[0052] A semiconductor **154** is disposed on the gate insulating layer **140**. In an exemplary embodiment, the semiconductor **154** may include amorphous silicon, polysilicon and an oxide semiconductor.

[0053] Ohmic contacts **163** and **165** are disposed on the semiconductor **154**. In an exemplary embodiment, the ohmic contacts **163** and **165** may include a material such as n+ hydrogenated amorphous silicon in which n-type impurity such as phosphorus is doped at a high concentration or silicide. The ohmic contacts **163** and **165** may be disposed on the semiconductor **154** as a pair. In the case where the semiconductor **154** is the oxide semiconductor, the ohmic contacts **163** and **165** may be omitted.

[0054] A data conductor including a data line **171** including a source electrode **173** and a drain electrode **175** is disposed on the ohmic contacts **163** and **165** and the gate insulating layer **140**.

[0055] The data line **171** transfers a data signal and extends in a substantially vertical direction to cross the gate line **121**.

[0056] The data line **171** may be curved at predetermined intervals in order to improve transmittance. In an exemplary embodiment, as illustrated in FIG. **1**, each data line **171** may be curved at a portion corresponding to a horizontal center line (not illustrated) of one pixel PX, for example. In this case, an angle between a curved portion of the data lines **171** and the vertical direction may be approximately 5 degrees to approximately 7 degrees, but is not limited thereto. Further, the data line **171** may be further curved at least once around the horizontal center line, and in this case, an angle between the data line **171** around the horizontal center line and the vertical direction may be approximately 5 degrees to 7 degrees, but is not limited thereto.

[0057] The data line **171** includes the source electrode **173**. According to the exemplary embodiment illustrated in FIG. **1**, the source electrode **173** does not protrude from the data line **171**, and may be disposed on a same line with the data line **171**.

[0058] The drain electrode **175** faces the source electrode **173**. In an exemplary embodiment, the drain electrode **175** may include a rod-shaped portion extending in substantially parallel with the source electrode **173** and an extension which is opposite thereto.

[0059] The data conductor may include refractory metal such as molybdenum, chromium, tantalum, and titanium or an alloy thereof, and may have a multilayered structure including a refractory metal layer (not illustrated) and a low resistive conductive layer (not illustrated). In an exemplary embodiment, the multilayered structure may include a double layer including a chromium or molybdenum (alloy) lower layer and an aluminum (alloy) upper layer, and a triple layer including a molybdenum (alloy) lower layer, an aluminum (alloy) intermediate layer and a molybdenum (alloy) upper layer. However, the invention is not limited thereto, and the data line **171** and the drain electrode **175** may include various metals or conductors in addition to the metals.

[0060] The gate electrode **124**, the source electrode **173** and the drain electrode **175** are included in one thin film transistor ("TFT") together with the semiconductor **154**, and a channel of the TFT is disposed in the semiconductor **154** between the source electrode **173** and the drain electrode **175**.

[0061] In the exemplary embodiment, the TFT includes the source electrode **173** disposed on the same line with the data line **171** and the drain electrode **175** extending in substantially parallel with the data line **171**. As a result, a width of the TFT may be increased while an area of the data conductor is not increased, thereby further increases an aperture ratio of the LCD.

[0062] A first passivation layer **180***a* is disposed on the data conductor, the gate insulating layer **140** and an exposed portion of the semiconductor **154**. The first passivation layer **180***a* may include an organic insulating material or an inorganic insulating material.

[0063] The color filter **230** may be disposed on the first passivation layer **180***a*. The color filter **230** may uniquely display one of the primary colors. In an exemplary embodiment, the primary colors may include three primary colors such as red, green and blue, three primary colors such as yellow, cyan and magenta or four primary colors. According to another exemplary embodiment of the invention, the color filter **230** may further include a color filter displaying a mixed color of the primary colors or white in addition to the primary colors. Each color filter **230** may be provided to be elongated along a pixel column or a pixel row.

[0064] A second passivation layer **180***b* is disposed on the color filter **230**. The second passivation layer **180***b* may include an insulating layer or an organic insulator, and may effectively prevent the color filter **230** from being exposed, as an overcoat for the color filter **230**, and provide a substantially flat surface. The second passivation layer **180***b* may effectively prevent an impurity such as a pigment of the color filter **230** from flowing into the liquid crystal layer **3**.

[0065] An opening **185***b* may be defined in a region of the second passivation layer **180***b* which corresponds to a part of the drain electrode **175**.

[0066] In another exemplary embodiment, the second passivation layer **180***b* may be omitted.

[0067] A common electrode **270** may be disposed on the second passivation layer **180***b*. The common electrode **270** may be disposed on an entire surface of the insulation substrate **110** with a plate as a planar shape. The common electrodes **270** disposed at adjacent pixels PX are connected to each other to transfer a common voltage having a predetermined magnitude. The common electrode **270** may include a transparent conductive material such as indium tin oxide ("ITO") or indium zinc oxide ("IZO").

[0068] An opening **273** may be defined in a region of the common electrode **270** which corresponds to a part of the drain electrode **175**.

[0069] A third passivation layer **180***c* may be disposed on the common electrode **270**. A third passivation layer **180***c* may include an organic insulating material or an inorganic insulating material. In an exemplary embodiment, the third passivation layer **180***c* may have a substantially flat surface.

[0070] A contact hole **185***a* exposing the drain electrode **175** is defined in the first passivation layer **180***a* and the third passivation layer **180***c*. As illustrated in the drawing, the contact hole **185***a* may be defined in the opening **185***b* of the second passivation layer **180***b*, and an outer boundary of the contact hole **185***a* and an outer boundary of the opening **185***b* may substantially coincide with each other. Further, the contact hole **185***a* is defined in the opening **273** of the common electrode **270**. That is, the opening **273** of the common electrode **270** may be wider than the contact hole **185***a*.

[0071] A pixel electrode **191** is disposed on the third passivation layer **180***c*. The pixel electrode **191** includes a plurality of branch electrodes **192**, a connection part (not illustrated) connecting ends of the branch electrodes **192**, and a protrusion (not illustrated) for connection with another layer. A slit **92** in which a portion of the electrodes is omitted, is defined between the adjacent branch electrodes **192** of the pixel electrode **191**.

[0072] The branch electrodes **192** of the pixel electrode **191** may extend to be substantially parallel to the data line **171**. The plurality of branch electrodes **192** of the pixel electrode **191** may be tilted to provide an oblique angle with a vertical direction, and may be curved in a horizontal center line (not illustrated) of the pixel electrode **191**. Accordingly, the pixel electrode **191** may be divided into a plurality of domains having different tilt directions of the branch electrodes **192** based on the horizontal center line of each pixel PX. In an exemplary embodiment, upper branch electrodes **192** may extend in an upper right direction based on the horizontal center line, and lower branch electrodes **192** may extend in a lower right direction, for example.

[0073] The protrusion of the pixel electrode **191** is physically and electrically connected with the drain electrode **175** through the contact hole **185***a* of the first passivation layer **180***a* and the third passivation layer **180***c* to receive a voltage from the drain electrode **175**.

[0074] In an exemplary embodiment, the pixel electrode **191** may include a transparent conductive material such as ITO or IZO.

[0075] According to another exemplary embodiment of the invention, a laminated position of the pixel electrode **191** and the common electrode **270** may be changed. That is, the pixel electrode **191** may be disposed on the second passivation layer **180***b*, the third passivation layer **180***c* may be disposed on the pixel electrode **191**, and the common electrode **270** may be disposed on the third passivation layer **180***c*. In this case, the contact hole **185***a* may not be defined in the third passivation layer **180***c*, and the opening **273** may not be defined in the common electrode **270**. Further, the pixel electrode **191** may have a planer shape which fills most of the pixel PX area, and the common electrode **270** may include a plurality of branch electrodes (not illustrated) overlapped with the pixel electrode **191**.

[0076] The pixel electrode **191** according to another exemplary embodiment of the invention is disposed on the lower panel **100**, and the common electrode **270** may be disposed on the upper panel **200**. In addition, the structure and the layout of the pixel electrode **191** and the common electrode **270** may be modified.

[0077] A light blocking member **220** is disposed on the pixel electrode **191**. The light blocking member **220** is also referred to as a black matrix, and blocks light leakage between the pixels PX. The light blocking member **220** may include a pigment such as black carbon, and may include a photosensitive organic material.

[0078] The light blocking member **220** may include a portion disposed between substantially adjacent color filters **230**. The light blocking member **220** may include a first light blocking part **220***a* covering the gate line **121** and extended to be substantially parallel to the gate line **121**, and a second light blocking part **220***b* extended to be substantially parallel to the data line **171**.

[0079] The first light blocking part **220***a* includes a portion covering a TFT, and a portion covering the contact hole **185***a* exposing the drain electrode **175**. Accordingly, the light blocking member **220** fills up a large step around the contact hole **185***a* to planarize a surface. Further, the first light blocking part **220***a* covering the contact hole **185***a* may effectively prevent light leakage around the contact hole **185***a*.

[0080] In an exemplary embodiment, any one of the first light blocking part **220***a* and the second light blocking part **220***b* may be omitted.

[0081] Like the exemplary embodiment of the invention, the color filter **230** and the light blocking member **220** are disposed on the lower panel **100** together with the TFT. As a result, alignment between the light blocking member **220** and the color filter **230** and the pixel electrode **191** and the TFT may be easily adjusted, thereby effectively reduces an alignment error. Accordingly, it is possible to effectively prevent light leakage or deterioration of an aperture ratio of the LCD due to misalignment between the constituent elements and enhance transmittance.

[0082] A transparent cover layer **320** is disposed on the light blocking member **220**.

[0083] The cover layer **320** covers the light blocking member **220** to effectively prevent a pigment component such as a halogen element as an impurity from flowing or diffusing into the liquid crystal layer **3** from the light blocking member **220**. Accordingly, it is possible to effectively prevent an afterimage due to the impurity flowing into the liquid crystal layer **3** and enhance reliability of the LCD. To this end, the cover layer **320** may cover an entire surface of the exposed light blocking member **220**.

[0084] The cover layer **320** does not include a pigment component, but may include a material without a reliability issue, for example, a transparent organic insulating material such as acrylate or a transparent inorganic insulating material. In the case where the cover layer **320** includes an organic insulating material, the cover layer **320** may include an organic insulating material having photosensitivity.

[0085] Referring to FIG. **2**, the cover layer **320** may include a spacer **321** and a cover **322**. The spacer **321** may maintain a separation distance between the lower panel **100** and the upper panel **200**, and is also referred to as a spacer member. The cover **322** has a thickness smaller than that of the spacer **321** and may cover most of the light blocking member **220**. As such, the cover layer **320** including the portions having different thicknesses may be provided by using one optical mask. In this case, the optical mask may include a light transmitting region transmitting light, a non-light transmitting region blocking the light and a half-tone region transmitting only a part of the light, and the half-tone region may correspond to the cover **322**.

[0086] In an exemplary embodiment, the thickness of the cover **322** of the cover layer **320** may be equal to or greater than about 1 micrometer (μm), for example, but is not limited thereto.

[0087] Although not illustrated, an alignment layer is coated on the pixel electrode **191** and the third passivation layer **180***c*, and the alignment layer may be a horizontal alignment layer. The alignment layer may be rubbed in a predetermined direction. However, according to another exemplary embodiment of the invention, the alignment layer includes a photoreactive material to be photo-aligned.

[0088] The liquid crystal layer **3** includes liquid crystal molecules (not illustrated) having dielectric anisotropy. The liquid crystal molecules may be aligned so that long axes thereof are substantially parallel to the panels **100** and **200** without applying an electric field to the liquid crystal layer **3**, and in this case, the liquid crystal molecules may have positive dielectric anisotropy. The liquid crystal molecule **31** may be a nematic liquid crystal molecule of which a long-axial direction is spirally twisted up to the upper panel **200** from the lower panel **100**. According to another exemplary embodiment of the invention, the liquid crystal molecules may be aligned so that long axes thereof are vertical to the panels **100** and **200** without applying the electric field to the liquid crystal layer **3**, and the liquid crystal molecules may have negative dielectric anisotropy. In this case, the layout and the structure of the pixel electrode **191** and the common electrode **270** may be accordingly modified unlike the exemplary embodiment illustrated in FIGS. **1** and **2**.

[0089] The pixel electrode **191** may receive a data voltage from the TFT, and the common electrode **270** may receive a common voltage. Then, the pixel electrode **191** and the common electrode **270** as two field generating electrodes generate an electric field in the liquid crystal layer **3**. As a result, the liquid crystal molecules of the liquid crystal layer **3** disposed between the two electrodes **191** and **270** are re-arranged. Polarization of light passing through the liquid crystal layer **3** varies according to the re-arranged liquid crystal molecules, and an image at desired luminance may be displayed. The branch electrodes **192** of the pixel electrode **191** according to the exemplary embodiment illustrated in FIGS. **1** and **2** provide a fringe field in the liquid crystal layer **3** together with the common electrode **270** to determine alignment directions of the liquid crystal molecules. Accordingly, like the exemplary embodiment of the invention, when the branch electrodes **192** included in one pixel electrode **191** have different directional slopes, tilt directions of the liquid crystal molecules **31** are various. As a result, a reference viewing angle of the LCD may be enlarged.

[0090] Then, an LCD according to an exemplary embodiment of the invention will be described with reference to FIG. **3** together with the drawings described above. FIG. **3** is another exemplary embodiment of a cross-sectional view of the LCD of FIG. **1** taken along line II-II.

[0091] Referring to FIG. **3**, the LCD according to the exemplary embodiment is almost the same as the exemplary embodiment illustrated in FIGS. **1** and **2** described above, but the light blocking member **220** and the cover layer **320** may be different.

[0092] The light blocking member **220** may include portions having different thicknesses. In detail, the light blocking member **220** according to an exemplary embodiment of the invention may include a spacer **221** and a main light blocking part **222**. The spacer **221** may maintain a separation distance between the lower panel **100** and the upper panel **200**. The main light blocking part **222** may have a smaller thickness than the spacer **221**. The main light blocking member **222** may include a first light blocking part **220***a* covering the gate line **121** and extended to be substantially parallel to the gate line **121**, and a second light blocking part **220***b* covering the data line **171** and extended to be substantially parallel to the data line **171**. The first light blocking part **220***a* includes a portion covering a TFT, and a portion covering the contact hole **185***a* exposing the drain electrode **175**. Accordingly, the light blocking member **220** fills up a large step around the contact hole **185***a* to planarize a surface.

[0093] An upper surface of the main light blocking part **222** where the spacer **221** is not disposed may be substantially flat.

[0094] The light blocking member **220** may include a pigment such as black carbon, and may include a photosensitive organic material.

[0095] As such, the light blocking member **220** including the portions having different thicknesses may be provided by using one optical mask. In this case, the optical mask may include a light transmitting region transmitting light, a non-light transmitting region blocking the light and a half-tone region transmitting only a part of the light, and the half-tone region may correspond to the main light blocking part **222**.

[0096] A transparent cover layer **320** is disposed on the light blocking member **220**. The cover layer **320** covers the light blocking member **220** to effectively prevent a pigment component such as a halogen element as an impurity from flowing or diffusing into the liquid crystal layer **3** from the light blocking member **220**. Accordingly, it is possible to effectively prevent an afterimage due to the impurity flowing into the liquid crystal layer **3** and enhance reliability of the LCD. To this end, the cover layer **320** may cover an entire surface of the exposed light blocking member **220**.

[0097] The cover layer **320** does not include a pigment component, but may include a material without a reliability issue, for example, a transparent organic insulating material such as acrylate or a transparent inorganic insulating material. In the case where the cover layer **320** includes an organic insulating material, the cover layer **320** may include an organic insulating material having photosensitivity.

[0098] In an exemplary embodiment, the thickness of the cover layer **320** may be equal to or greater than about 1 μm, for example, but is not limited thereto.

[0099] Next, an LCD according to an exemplary embodiment of the invention will be described with reference to FIGS. **4** and **5**. The same constituent elements as the exemplary embodiment described above with reference to FIGS. **1** to **3** designate the same reference numerals, and a duplicated description is omitted, but differences will be mainly described.

[0100] FIG. **4** is a layout view illustrating one pixel of an LCD according to an exemplary embodiment of the invention, and FIG. **5** is an exemplary embodiment of a cross-sectional view of the LCD of FIG. **4** taken along line V-V.

[0101] Referring to FIGS. **4** and **5**, the LCD according to the exemplary embodiment of the invention includes a lower panel **100** and an upper panel **200** facing each other, and a liquid crystal layer **3** interposed therebetween.

[0102] In the lower panel **100**, a gate conductor including a plurality of gate lines **121** is disposed on an insulation substrate **110**. The gate line **121** may include a gate electrode **124**. A gate insulating layer **140** is disposed on a gate conductor, and the semiconductor **154** may be disposed on the gate insulating layer **140**. Ohmic contacts **163** and **165** may be disposed on the semiconductor **154**. A data conductor including a data line **171** including a source electrode **173** and a drain electrode **175** is disposed on the ohmic contacts **163** and

165 and the gate insulating layer 140. A first passivation layer 180*a* may be disposed on the data conductor, the gate insulating layer 140 and an exposed portion of the semiconductor 154.

[0103] A color filter 230 and a light blocking member 220 may be disposed on the first passivation layer 180*a*.

[0104] The color filter 230 may uniquely display one of the primary colors. Each color filter 230 may be provided to be elongated along a pixel column or a pixel row.

[0105] The light blocking member 220 may block light leakage between the pixels PX. The light blocking member 220 may include a pigment such as black carbon, and may include a photosensitive organic material. The light blocking member 220 may include a portion disposed between the substantially adjacent color filters 230. The light blocking member 220 may include a first light blocking part 220*a* covering the gate line 121 and extended to be substantially parallel to the gate line 121, and a second light blocking part 220*b* covering the data line 171 and extended to be substantially parallel to the data line 171.

[0106] The first light blocking part 220*a* includes a portion covering a TFT, and an opening 22 defined in a region corresponding to a part of the drain electrode 175.

[0107] Any one of the first light blocking part 220*a* and the second light blocking part 220*b* may be omitted.

[0108] A second insulating layer 180*b* may be disposed on the color filter 230 and the light blocking member 220. The second passivation layer 180*b* may include an inorganic insulating layer or an organic insulating layer, and may effectively prevent the color filter 230 and the light blocking member 220 from being exposed, as an overcoat for the color filter 230 and the light blocking member 220, and provide a substantially flat surface. The second passivation layer 180*b* may effectively prevent an impurity such as a pigment of the color filter 230 and the light blocking member 220 from flowing into the liquid crystal layer 3.

[0109] An opening 185*b* may be defined in a region of the second passivation layer 180*b* corresponding to a part of the drain electrode 175. The opening 185*b* of the second passivation layer 180*b* may be defined in the opening 22 of the light blocking member 220.

[0110] In another exemplary embodiment, the second passivation layer 180*b* may be omitted.

[0111] A common electrode 270 may be disposed on the second passivation layer 180*b*. The common electrode 270 may be disposed on an entire surface of the substrate 110 with a plate as a planar shape. The common electrodes 270 disposed at adjacent pixels PX are connected to each other to transfer a common voltage having a predetermined magnitude.

[0112] An opening 273 may be defined in a region of the common electrode 270 corresponding to a part of the drain electrode 175. In the exemplary embodiment illustrated in FIGS. 4 and 5, the opening 273 of the common electrode 270 is larger than the opening 22 of the light blocking member 220 to cover the opening 22. However, the invention is not limited thereto, and the opening 273 of the common electrode 270 may be smaller than the opening 22 of the light blocking member 220, and an outer boundary of the opening 273 of the common electrode 270 may be at least partially overlapped with an outer boundary of the opening 22 of the light blocking member 220.

[0113] A third passivation layer 180*c* may be disposed on the common electrode 270.

[0114] A contact hole 185*a* exposing the drain electrode 175 is defined in the first passivation layer 180*a* and the third passivation layer 180*c*. As illustrated in the drawing, the contact hole 185*a* may be defined in the opening 185*b* of the second passivation layer 180*b*, and an outer boundary of the contact hole 185*a* and an outer boundary of the opening 185*b* may substantially coincide with each other. Further, the contact hole 185*a* is defined in the opening 273 of the common electrode 270 and the opening 22 of the light blocking member 220. That is, the opening 273 of the common electrode 270 and the opening 22 of the light blocking member 220 may be wider than the contact hole 185*a*, respectively.

[0115] The pixel electrode 191 is disposed on the third passivation layer 180*c*. The pixel electrode 191 may include a plurality of branch electrodes 192 overlapped with the common electrode 270. A slit 92 where the electrodes are removed is defined between the adjacent branch electrodes 192.

[0116] The pixel electrode 191 may be physically and electrically connected with the drain electrode 175 through the contact hole 185*a* of the first passivation layer 180*a* and the third passivation layer 180*c* to receive a voltage from the drain electrode 175.

[0117] According to another exemplary embodiment of the invention, a laminated position of the pixel electrode 191 and the common electrode 270 may be changed. In another exemplary embodiment, the pixel electrode 191 is disposed on the lower panel 100, and the common electrode 270 may be disposed on the upper panel 200. In addition, the structure and the layout of the pixel electrode 191 and the common electrode 270 may be various.

[0118] A plurality of sub light blocking members (also referred to as "colored members") is disposed on the pixel electrode 191.

[0119] The sub light blocking member 325 may include an auxiliary light blocking part 327 which is disposed at a place corresponding to the contact hole 185*a* to cover the contact hole 185*a*. The auxiliary light blocking part 327 fills up a large step around the contact hole 185*a* to planarize a surface. Further, since the light blocking member 220 is removed around the contact hole 185*a* to provide the opening 22, light leakage may occur around the contact hole 185*a*. However, according to an exemplary embodiment of the invention, the auxiliary light blocking part 327 of the sub light blocking member 325 is provided to be overlapped with the opening 22 of the light blocking member 220 to effectively prevent light leakage around the contact hole 185*a*.

[0120] The sub light blocking member 325 may further include a spacer 326 which may maintain a separation distance between the lower panel 100 and the upper panel 200. The spacer 326 and the auxiliary light blocking part 327 may be separated from each other or connected to each other.

[0121] The sub light blocking member 325 may include a pigment such as black carbon, and include a photosensitive organic material.

[0122] The spacer 326 of the sub light blocking member 325 and the auxiliary light blocking part 327 may be provided in the same process by using one optical mask.

[0123] A transparent cover layer 320 is positioned on the sub light blocking member 325.

[0124] The cover layer 320 covers the sub light blocking member 325 to effectively prevent a pigment component such as a halogen element as an impurity from flowing or diffusing into the liquid crystal layer 3 from the sub light blocking member 325. Accordingly, it is possible to effectively prevent

an afterimage due to the impurity flowing into the liquid crystal layer **3** and enhance reliability of the LCD. To this end, the cover layer **320** may cover an entire surface of the exposed sub light blocking member **325**.

[0125] As illustrated in FIG. **5**, the cover layer **320** may cover the adjacent spacer **325** and auxiliary light blocking part **327** and a separation portion therebetween together. However, in another exemplary embodiment, the cover layer **320**, the cover layer **320** may cover only the spacer **326** and the auxiliary light blocking part **327**, respectively.

[0126] The cover layer **320** does not include a pigment component, but may include a material without a reliability issue, for example, a transparent organic insulating material such as acrylate or a transparent inorganic insulating material. In the case where the cover layer **320** includes an organic insulating material, the cover layer **320** may include an organic insulating material having photosensitivity.

[0127] In an exemplary embodiment, the thickness of the cover layer **320** may be equal to or greater than about 1 μm, for example, but is not limited thereto.

[0128] Like the exemplary embodiment of FIGS. **1** to **3**, the color filter **230**, the light blocking member **220** and the sub light blocking member **325** are disposed on the lower panel **100** together with the TFT. As a result, alignment between the light blocking member **220** and the color filter **230** and the pixel electrode **191** and the TFT may be easily adjusted, thereby effectively reduces an alignment error. Accordingly, it is possible to effectively prevent light leakage or deterioration of an aperture ratio of the LCD due to misalignment between the constituent elements and enhance transmittance.

[0129] Since other descriptions are the same as those of the exemplary embodiment described above with reference to FIGS. **1** to **3**, herein, a detailed description is omitted.

[0130] Then, an LCD according to an exemplary embodiment of the invention will be described with reference to FIG. **6**. The same constituent elements as the exemplary embodiments described above designate the same reference numerals, and the duplicated description is omitted, but differences will be mainly described.

[0131] FIG. **6** is a cross-sectional view of an LCD according to an exemplary embodiment of the invention.

[0132] The LCD according to an exemplary embodiment of the invention includes a lower panel **100** and an upper panel **200** facing each other, and a liquid crystal layer **3** interposed therebetween.

[0133] The lower panel **100** includes an insulation substrate **110**, a color filer **230** disposed on the insulation substrate **110**, a light blocking member **220** disposed on the insulation substrate **110** and disposed between the color filters **230**, and a pixel electrode **191** disposed on the color filter **230** and the light blocking member **220**.

[0134] In an exemplary embodiment, a height of a part of the light blocking member **220** may be smaller than a height of the color filter **230**, but is not limited thereto, and a height of an upper surface of the light blocking member **220** may be substantially uniform.

[0135] A sub light blocking member **325** may be further disposed on the light blocking member **220**. The sub light blocking member **325** may include an auxiliary light blocking part **327**, and further include a spacer **326**. In this case, the spacer **326** and the auxiliary light blocking part **327** may be disposed on the same layer and connected to each other. In the case where a height of an upper surface of the light blocking member **220** is smaller than that of the color filter **230**, a step of the light blocking member **220** is compensated by the sub light blocking member **325**, and as a result, a distance between the lower panel **100** and the upper panel **200** may be uniformized.

[0136] A transparent cover layer **320** is disposed on the sub light blocking member **325**.

[0137] The cover layer **320** covers the sub light blocking member **325** to effectively prevent a pigment component such as a halogen element as an impurity from flowing or diffusing into the liquid crystal layer **3** from the sub light blocking member **325**. Accordingly, it is possible to effectively prevent an afterimage due to the impurity flowing into the liquid crystal layer **3** and enhance reliability of the LCD. To this end, the cover layer **320** may cover an entire surface of the exposed sub light blocking member **325**.

[0138] The cover layer **320** does not include a pigment component, but may include a material without a reliability issue, for example, a transparent organic insulating material such as acrylate or a transparent inorganic insulating material. In the case where the cover layer **320** includes an organic insulating material, the cover layer **320** may include an organic insulating material having photosensitivity.

[0139] According to another exemplary embodiment of the invention, any one of the light blocking member **220** and the sub light blocking member **325** may be omitted.

[0140] The upper panel **200** may include a common electrode **270** disposed on an insulation substrate **210**.

[0141] Then, an LCD according to an exemplary embodiment of the invention will be described with reference to FIGS. **7** and **8** in addition to FIG. **6** described above.

[0142] FIG. **7** is a layout view illustrating one pixel of an LCD according to an exemplary embodiment of the invention, and FIG. **8** is an exemplary embodiment of a cross-sectional view of the LCD of FIG. **7** taken along line VIII-VIII.

[0143] The LCD according to the exemplary embodiment of the invention includes a lower panel **100** and an upper panel **200** facing each other, and a liquid crystal layer **3** interposed between the two panels **100** and **200**.

[0144] First, in the lower panel **100**, a plurality of gate conductors including a plurality of gate lines **121**, a plurality of step-down gate lines **123** and a plurality of storage electrode lines **125** is disposed on an insulation substrate **110**. The gate line **121** and the step-down gate line **123** extend in a substantially horizontal direction to transfer gate signals. The gate line **121** includes a first gate electrode **124***h* and a second gate electrode **1241** protruding upward and downward, and the step-down gate line **123** includes a third gate electrode **124***c* protruding upward. The first gate electrode **124***h* and the second gate electrode **1241** are connected with each other to provide one protrusion. The storage electrode line **125** extends in a substantially horizontal direction to transfer a predetermined voltage such as a common voltage. The storage electrode line **125** includes storage electrodes **129** protruding upward and downward, a pair of vertical portions **128** extending downward to be substantially vertical to the gate line **121**, and a horizontal portion **127** connecting ends of the pair of vertical portions **128** with each other. The horizontal portion **127** includes a capacitor electrode **126** extended downward.

[0145] A gate insulating layer **140** is disposed on the gate conductor.

[0146] A plurality of semiconductor stripes (not illustrated) is disposed on the gate insulating layer **140**. The semiconduc-

tor stripes extend in a substantially vertical direction, and include first and second semiconductors **154***h* and **154***l* extending toward the first and second gate electrodes **124***h* and **1241** and connected with each other, and a third semiconductor **154***c* connected with the second semiconductor **154***l*. The third semiconductor **154***c* is extended to provide a fourth semiconductor **157**.

[0147] A plurality of ohmic contacts **164***b* and **167** may be disposed on the semiconductor.

[0148] Data conductors including a plurality of data lines **171**, a plurality of first drain electrodes **175***h*, a plurality of second drain electrodes **175***l*, and a plurality of third drain electrodes **175***c* are disposed on the ohmic contacts **164***b* and **167**.

[0149] The data line **171** transfers a data signal and extends in a substantially vertical direction to cross the gate line **121** and the step-down gate line **123**. Each data line **171** includes a first source electrode **173***h* and a second source electrode **1731** which extend toward the first gate electrode **124***h* and the second gate electrode **1241**.

[0150] A first drain electrode **175***h*, a second drain electrode **175***l*, and a third drain electrode **175***c* include one wide end portion and the other rod-shaped end portion, respectively. The rod-shaped end portions of the first drain electrode **175***h* and the second drain electrode **175***l* are partially surrounded by the first source electrode **173***h* and the second source electrode **1731**. One wide end portion of the second drain electrode **175***l* is again extended to provide a third source electrode **173***c* which is bent in a 'U'-lettered shape. An extension **177***c* of the third drain electrode **175***c* is overlapped with the capacitor electrode **126** to provide a step-down capacitor Cstd, and the rod-shaped end portion is partially surrounded by the third source electrode **173***c*.

[0151] The first/second/third gate electrodes **124***h*/**124***l*/**124***c*, the first/second/third source electrodes **173***h*/**173***l*/**173***c*, and the first/second/third drain electrodes **175***h*/**175***l*/**175***c* provide first/second/third TFTs Qh/Ql/Qc together with the first/second/third semiconductor islands **154***h*/**154***l*/**154***c*, respectively.

[0152] A lower passivation layer **180***p* which may include an inorganic insulator such as silicon nitride or silicon oxide is disposed on the data conductor and the exposed portion of the semiconductors **154***h*, **154***l*, and **154***c*.

[0153] The color filter **230** and the light blocking member **220** are disposed on the lower passivation layer **180***p*.

[0154] The color filters **230** are disposed in most of the regions except for a place where the first TFT Qh, the second TFT Ql, and the third TFT Qc are disposed.

[0155] The light blocking member **220** includes a first light blocking part **220***a* and a second light blocking part **220***b*. The first light blocking part **220***a* may cover the gate line **121** and the step-down gate line **123**, and may cover a region where the first TFT Qh, the second TFT Ql and the third TFT Qc are disposed. The second light blocking part **220***b* may extend along the data line **171**.

[0156] In an exemplary embodiment, a height of a part of the light blocking member **220** may be smaller than a height of the color filter **230**, but the invention is not limited thereto.

[0157] An upper passivation layer **180***q* may be disposed on the color filter **230** and the light blocking member **220**. The upper passivation layer **180***q* may effectively prevent the color filter **230** and the light blocking member **220** from being lifted, and effectively prevent contamination of the liquid crystal layer **3** by an organic material such as a solvent flowing from the color filter **230** and the light blocking member **220**.

[0158] A plurality of first contact holes **185***h* and a plurality of second contact holes **185***l*, which expose the wide end portion of the first drain electrode **175***h* and the wide end portion of the second drain electrode **175***l*, respectively, may be defined in the lower passivation layer **180***p*, the light blocking member **220** and the upper passivation layer **180***q*.

[0159] A first subpixel electrode **191***h* and a second subpixel electrode **1911** are disposed on the upper passivation layer **180***q*.

[0160] The first subpixel electrode **191***h* and the second subpixel electrode **1911** of one pixel PX are separated from each other with the gate lines **121** and **123** therebetween, and disposed above and below the pixel area based on the gate lines **121** and **123** to be adjacent to each other in a column direction. Each of the first subpixel electrode **191***h* and the second subpixel electrode **1911** may be shaped entirely as a rectangle. Each of the first subpixel electrode **191***h* and the second subpixel electrode **1911** may include a cross stem including a horizontal stem and a vertical stem substantially perpendicular to the horizontal stem, and a plurality of minute branches.

[0161] The second subpixel electrode **1911** may further include a protrusion **1931***b* extending to be adjacent to both edges of the first subpixel electrode **191***h*. The protrusion **1931***b* extends along the data line **171** to effectively prevent capacitive coupling between the data line **171** and the first subpixel electrode **191***h*.

[0162] The first subpixel electrode **191***h* and the second subpixel electrode **1911** receive data voltages from the first drain electrode **175***h* and the second drain electrode **175***l* through the first contact hole **185***h* and the second contact hole **185***l*, respectively. The first subpixel electrode **191***h* and the second subpixel electrode **1911** to which the data voltages are applied generate an electric field in the liquid crystal layer **3** together with the common electrode **270** of the upper panel **200** to determine directions of the liquid crystal molecules of the liquid crystal layer **3** between the two electrodes **191** and **270**.

[0163] Sides of the minute branches of the first subpixel electrode **191***h* and the second subpixel electrode **1911** distort the electric field to make horizontal components which determine tilt directions of the liquid crystal molecules **31**. Since each of the first subpixel electrode **191***h* and the second subpixel electrode **1911** includes four sub regions having different longitudinal directions of the minute branches, the tilt directions of the liquid crystal molecules **31** are approximately four, and as a result, a reference viewing angle of the LCD may be increased.

[0164] The first subpixel electrode **191***h* and the common electrode **270** provide a first liquid crystal capacitor together with the liquid crystal layer **3** therebetween, and the second subpixel electrode **1911** and the common electrode **270** provide a second liquid crystal capacitor together with the liquid crystal layer **3** therebetween. As a result, even after the first and second TFTs Qh and Ql are turned off, the applied voltage is maintained.

[0165] The first and second subpixel electrodes **191***h* and **1911** are overlapped with the storage electrode line **125** in addition to the storage electrode **129** to provide the first and second storage capacitors, and the first and second storage

capacitors reinforce a voltage storage capacity of the first and second liquid crystal capacitors, respectively.

[0166] The capacitor electrode **126** and the expansion **177***c* of the third drain electrode **175***c* are overlapped with the gate insulating layer **140** to provide the step-down capacitor Cstd.

[0167] A sub light blocking member **325** may be disposed on the upper passivation layer **180***q*. The sub light blocking member **325** may include an auxiliary light blocking part **327**, and further include a spacer **326**. In this case, the spacer **326** and the auxiliary light blocking part **327** may be disposed on the same layer and connected to each other. The auxiliary light blocking part **327** is disposed on a region with the light blocking member **220**. In the case where a height of an upper surface of the light blocking member **220** is smaller than that of the color filter **230**, a step of the light blocking member **220** is compensated by the sub light blocking member **325**, and as a result, a distance between the lower panel **100** and the upper panel **200** may be uniformized, and a function of effectively preventing light leakage of the light blocking member **220** may be reinforced.

[0168] A transparent cover layer **320** is disposed on the sub light blocking member **325**.

[0169] The cover layer **320** covers the sub light blocking member **325** to effectively prevent a pigment component such as a halogen element as an impurity from flowing or diffusing into the liquid crystal layer **3** from the sub light blocking member **325**. Accordingly, it is possible to effectively prevent an afterimage due to the impurity flowing into the liquid crystal layer **3** and enhance reliability of the LCD. To this end, the cover layer **320** may cover an entire surface of the exposed sub light blocking member **325**.

[0170] In another exemplary embodiment, any one of the light blocking member **220** and the sub light blocking member **325** may be omitted.

[0171] On the first and second subpixel electrodes **191***h* and **1911**, the exposed upper passivation layer **180***q* and the cover layer **320**, an alignment layer (not illustrated) is disposed, and the alignment layer may be a vertical alignment ("VA") layer.

[0172] In the upper panel **200**, a common electrode **270** is disposed on an insulation substrate **210**. An alignment layer (not illustrated) is disposed on the common electrode **270** and may be a VA layer.

[0173] Polarizers (not illustrated) may be attached to outer sides of the two panels **100** and **200**, and transmissive axes of the two polarizers are substantially perpendicular to each other, and one transmissive axis thereof may be substantially parallel to the gate line **121**.

[0174] The liquid crystal layer **3** has negative dielectric anisotropy, and the liquid crystal molecules **31** of the liquid crystal layer **3** may be aligned so that long axes thereof are vertical to the surfaces of the two panels **100** and **200** without applying the electric field.

[0175] While this invention has been described in connection with what is presently considered to be practical exemplary embodiments, it is to be understood that the invention is not limited to the disclosed exemplary embodiments, but, on the contrary, is intended to cover various modifications and equivalent arrangements included within the spirit and scope of the appended claims.

What is claimed is:

1. A liquid crystal display, comprising:
a first substrate and a second substrate which face each other;
a thin film transistor disposed on the first substrate;
a pixel electrode connected to the thin film transistor;
a first light blocking member disposed on the pixel electrode; and
a cover layer disposed on the first light blocking member and covering the first light blocking member.

2. The liquid crystal display of claim **1**, wherein:
the first light blocking member includes a pigment component, and the cover layer does not include the pigment component.

3. The liquid crystal display of claim **2**, wherein:
the cover layer includes at least one of a transparent organic insulating material and a transparent inorganic insulating material.

4. The liquid crystal display of claim **3**, wherein:
the cover layer further includes a spacer which maintains a separation distance between the first substrate and the second substrate.

5. The liquid crystal display of claim **4**, further comprising:
a first passivation layer disposed between the thin film transistor and the pixel electrode,
wherein
a contact hole is defined in the first passivation layer and the contact hole exposes a drain electrode of the thin film transistor, and
the first light blocking member further includes a portion covering the contact hole.

6. The liquid crystal display of claim **5**, further comprising:
a color filter disposed between the thin film transistor and the pixel electrode.

7. The liquid crystal display of claim **6**, wherein:
a thickness of the cover layer is equal to or greater than about 1 micrometer.

8. The liquid crystal display of claim **3**, wherein:
the first light blocking member further includes a spacer which maintains a separation distance between the first substrate and the second substrate.

9. The liquid crystal display of claim **8**, further comprising:
a first passivation layer disposed between the thin film transistor and the pixel electrode,
wherein:
a contact hole is defined in the first passivation layer, and the contact hole exposes a drain electrode of the thin film transistor, and
the first light blocking member further includes a portion covering the contact hole.

10. The liquid crystal display of claim **9**, further comprising:
a color filter disposed between the thin film transistor and the pixel electrode.

11. The liquid crystal display of claim **10**, wherein:
a thickness of the cover layer is equal to or greater than about 1 micrometer.

12. The liquid crystal display of claim **3**, further comprising:
a first passivation layer disposed between the thin film transistor and the pixel electrode,
wherein
a contact hole is defined in the first passivation layer, and the contact hole exposes a drain electrode of the thin film transistor, and
the first light blocking member further includes a portion covering the contact hole.

13. The liquid crystal display of claim **12**, further comprising:

a second light blocking member disposed between the thin film transistor and the pixel electrode.

14. The liquid crystal display of claim **13**, wherein:

an opening is defined in the second light blocking member, and a boundary of the opening is wider than that of the contact hole.

15. The liquid crystal display of claim **14**, wherein:

the first light blocking member further includes a spacer which maintains a separation distance between the first substrate and the second substrate.

16. The liquid crystal display of claim **15**, further comprising:

a color filter disposed between the thin film transistor and the pixel electrode.

17. The liquid crystal display of claim **16**, wherein:

the cover layer includes a portion covering a separated area between the spacer and the portion of the first light blocking member covering the contact hole.

18. The liquid crystal display of claim **16**, wherein:

a thickness of the cover layer is equal to greater than about 1 micrometer.

19. The liquid crystal display of claim **13**, wherein:

the first light blocking member is disposed on the second light blocking member.

20. The liquid crystal display of claim **19**, further comprising:

a color filter disposed between the thin film transistor and the pixel electrode,

wherein the second light blocking member includes a portion having a smaller height than that of the color filter.

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专利名称(译)	液晶显示器		
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[标]申请(专利权)人(译)	三星显示有限公司		
申请(专利权)人(译)	三星DISPLAY CO.，LTD.		
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摘要(译)

液晶显示器包括彼此相对的第一基板和第二基板，设置在第一基板上的薄膜晶体管，连接到薄膜晶体管的像素电极，设置在像素电极上的第一光阻挡构件，覆盖层设置在第一光阻挡构件上并覆盖第一光阻挡构件。