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(54) ARRAY SUBSTRATE, LIQUID CRYSTAL DISPLAY PANEL AND DISPLAY DEVICE

ARRAYSUBSTRAT, FLÜSSIGKRISTALLTAFEL UND ANZEIGEVORRICHTUNG

SUBSTRAT DE RÉSEAU, PANNEAU D'AFFICHAGE À CRISTAUX LIQUIDES ET DISPOSITIF D'AFFICHAGE

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Description

TECHNICAL FIELD

[0001] Embodiments of the present disclosure relate to an array substrate, a liquid crystal display panel and a display device.

BACKGROUND

[0002] A liquid crystal display panel mainly consists of an array substrate, an opposed substrate and liquid crystal molecules located between the array substrate and the opposed substrate. In a production process, after respective film layers on the array substrate and the opposed substrate are fabricated, the array substrate and the opposed substrate are cell-assembled, and then polarizers are attached to upper and lower surfaces of the liquid crystal display panel, respectively, and finally a backlight module is further arranged on a side of the array substrate of the liquid crystal display panel, to form a display panel.

[0003] It can be seen that, the above production process of forming a liquid crystal display panel is relatively complicated, and it is necessary to paste polarizers after cell-assembling, which is not conducive to improving production efficiency. In addition, it is necessary to provide film attaching machines for attaching polarizers respectively, which will also increase production cost. Finally, the polarizers attached to outer side of the display panel have certain thickness, which will limit overall thickness of the resulted liquid crystal display panel, so thus disadvantageous for development of lighter and thinner devices. US20090283768A1 discloses an array substrate of TFT-LCD and a method for manufacturing the same. The array substrate includes: gate lines, data lines, pixel electrodes and TFTs formed on a substrate; and a grid graph formed on each of the pixel electrode to make each of the pixel electrodes be simultaneously a built-in polarizer and change natural lights into linear polarized lights. The method for manufacturing an array substrate includes: forming a graph including gate electrodes and gate lines on a substrate; depositing continuously a gate insulating layer, a semiconductor layer and a doped semiconductor layer, and forming graphs of semiconductor layers and doped semiconductor layers above the gate electrodes; forming graphs of source electrodes, drain electrodes, data lines and pixel electrodes, in which a grid graph formed on each of the pixel electrode to make each of the pixel electrodes be simultaneously a built-in polarizer and change natural lights into linear polarized lights.; In the present invention, there is no need to attach polarizer of absorption type to the array substrate after being disposed with the color filter substrate as a cell, thereby reducing the production cost of the TFT-LCD, and which is propitious to reduce the thickness of the TFT-LCD and increase the power utilization efficiency greatly of LCD. US20060061519A1 discloses a small transparent display with a silicon active backplane on a transparent substrate, an array of pixel transparent electrodes on top of and controlled by the silicon active backplane, a transparent common plate, a liquid crystal material between alignment layers on the backplane and common plate, and a polarizer fabricated on the silicon active backplane. The polarizer corrects for depolarization of light passing through the transparent substrate and the silicon active backplane to improve the contrast of the display.

SUMMARY

[0004] Embodiments of the present disclosure relate to an array substrate, a liquid crystal display panel and a display device, so as to thin a display panel, reduce production cost and simplify production process.

[0005] At least one embodiment of the present disclosure provides an array substrate, comprising: a base substrate; a data line and a gate line intersecting with each other on the base substrate, a plurality of pixel regions defined by the data line and the gate line on the array substrate and arranged in array, and a wire grid polarizing film arranged in each of the pixel regions and configured for changing natural light passing therethrough into linearly polarized light; wherein, the wire grid polarizing film in each of the pixel regions has a grating structure, wherein in each of the pixel regions, a first part of the wire grid polarizing film functions as a pixel electrode of an interdigital structure, and a second part of the wire grid polarizing film functions as a common electrode of the interdigital structure, the first part of the wire grid polarizing film functioning as the pixel electrode is electrically connected with a drain electrode of a thin film transistor located on an intersection of the data line and the gate line.

[0006] For example, the grating structure consists of metal wires arranged linearly.

[0007] For example, the grating structure has a grating pitch less than half of a minimum wavelength of visible light.

[0008] For example, the grating pitch is 60nm-100nm.

[0009] For example, the wire grid polarizing film and the data line or the gate line are arranged on a same layer and insulated from each other.

[0010] For example, the drain electrode and the data line are arranged on a same layer.

[0011] For example, the common electrode is arranged above a film layer of the data line.

[0012] For example, in each of the pixel regions, a transparent conductive metal oxide layer is arranged on the wire grid polarizing film.

[0013] For example, in each of the pixel regions, the transparent conductive metal oxide layer and the wire grid polarizing film are same in pattern.

[0014] An embodiment of the present disclosure further provides a liquid crystal display panel, comprising: an array substrate and an opposed substrate arranged oppositely, and a liquid crystal layer filled between the

array substrate and the opposed substrate; wherein, the array substrate is the array substrate provided by the embodiments of the present disclosure.

[0015] For example, an upper polarizer is arranged on a side of the opposed substrate away from the array substrate; for example, an extending direction of the grating structure of the wire grid polarizing film and a transmission axis direction of the upper polarizer are parallel to each other.

[0016] An embodiment of the present disclosure further provides a display device, comprising any liquid crystal display panel provided by the embodiments of the present disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] In order to clearly illustrate the technical solution of the embodiments of the disclosure, the drawings of the embodiments will be briefly described in the following; it is obvious that the described drawings are only related to some embodiments of the disclosure and thus are not limitative of the disclosure.

FIG. 1 is a top view of an array substrate provided by an embodiment of the disclosure;

FIG. 2a to FIG. 2d are structural schematic diagrams of Example I, respectively;

FIG. 3a and FIG. 3b are structural schematic diagrams of Embodiment II, respectively;

FIG. 4 is a structural schematic diagram of Example III;

FIG. 5 is a structural schematic diagram of a liquid crystal panel provided by an embodiment of the disclosure.

DETAILED DESCRIPTION

[0018] In order to make objects, technical details and advantages of the embodiments of the disclosure apparent, the technical solutions of the embodiment will be described in a clearly and fully understandable way in connection with the drawings related to the embodiments of the disclosure. It is obvious that the described embodiments are just a part but not all of the embodiments of the disclosure. Based on the described embodiments herein, those skilled in the art can obtain other embodiment(s), without any inventive work, which should be within the scope of the disclosure.

[0019] The embodying modes for an array substrate, a liquid crystal display panel and a display device provided by the embodiments of the present disclosure are described in detail hereinafter in conjunction with the accompanying drawings.

[0020] Sizes and shapes of respective film layers and regions in the accompanying drawings do not reflect true proportions of the array substrate, but are only intended to illustrate content of the embodiments of the present disclosure.

[0021] FIG. 1 is a top view of an array substrate provided by an embodiment of the disclosure, and the array substrate comprises a base substrate 001 and a data line 002 and a gate line 003 intersecting with each other on the base substrate 001; on the array substrate, a plurality of pixel regions arranged in array are defined by the data line 002 and the gate line 003. FIG. 1 only shows respective parts in one pixel region; and in the respective pixel regions, a wire grid polarizing film 004 is further arranged for changing natural light pass therethrough to linearly polarized light.

[0022] The wire grid polarizing film 004 in the respective pixel regions has a grating structure.

[0023] For example, the wire grid polarizing film 004 usually adopts a grating structure consisting of metal wires arranged linearly; along an extending direction of the metal wires, free electrons can be driven by an electric field to consume electric energy, while an electric field perpendicular to the metal wires will not be absorbed. Therefore, light components perpendicular to the direction of the metal wires are transmitted, while the light components parallel to the metal wires are absorbed, and finally natural light becomes linearly polarized light after passing through the wire grid polarizing film 004. Thus, a wire grid polarizing film fabricated in respective pixel regions in an array substrate, instead of a polarizer attached on an outer side of the array substrate, can be used for changing natural light pass therethrough into linearly polarized light. When ensuring normal display of the liquid crystal display panel, the embodiment of the present disclosure can form a wire grid polarizing film which plays a role of polarizer in a fabrication process of an array substrate, and therefore, a separate process of attaching a polarizer after cell-assembling is omitted, which can improve production efficiency, save production cost, and be conducive to thinning the display panel.

[0024] In general, a wavelength of visible light is between 400nm-800nm; in order to ensure that the wire grid polarizing film 004 can polarizing natural light, a grating pitch *a* in a grating structure should be less than half of a minimum wavelength of visible light. For example, the grating pitch *a* of the wire grid polarizing film 004 is set to be less than 200nm. For example, in order to make the wire grid polarizing film 004 better change natural light pass therethrough into linearly polarized light, the grating pitch *a* may be set between 60nm -100nm.

[0025] For example, the grating structure of the wire grid polarizing film 004 in the array substrate provided by the embodiment of the present disclosure can be formed by processes of coating a photoresist, exposing and developing, etching and so on. For example, exposure and development can be completed by a laser interference exposure method. That is, laser with a specific wavelength is used for irradiating photoresist from two directions of angle θ to form interference fringes for exposing. A concave-convex grid structure with various intervals in the wavelength range of the used laser can be obtained by changing θ, i.e., a grating structure is formed.

Of course, the grating structure of the wire grid polarizing film 004 can also be formed by nanoimprint, which is not described in detail here.

[0026] For example, since in the array substrate provided by the embodiment of the present disclosure, the wire grid polarizing film 004 serving as a polarizer is usually made of metal material, and, the wire grid polarizing film 004 arranged in respective pixel regions often overlaps with effective display regions of the respective pixel regions. Therefore, the wire grid polarizing film 004 does not overlap with the data line 002 or the gate line 003. In actual operation, the wire grid polarizing film 004 may be set to be arranged on a same layer as the data line 002 or the gate line 003 and insulated from each other, so the wire grid polarizing film 004 can be fabricated without adding an additional patterning process to the original fabrication process of the array substrate, to save production cost and improve production efficiency.

[0027] On this basis, the wire grid polarizing film 004 in the array substrate provided by the embodiment of the present disclosure can be further function as a pixel electrode and a common electrode. The multiplex function of the wire grid polarizing film 004 is described by a few specific embodiments hereinafter.

Example I

[0028] In an array substrate as shown in FIG. 2a and FIG. 2b, a pixel electrode are the same as a wire grid polarizing film. For example, the wire grid polarizing film 004 in the respective pixel regions also functions as the pixel electrode, which is electrically connected with a drain electrode 005 of a thin film transistor located on an intersection of the gate line 003 and the data line 002, and the drain electrode 005 is usually arranged on the same layer as the data line 002.

[0029] For example, in the case that the wire grid polarizing film 004 is arranged on the same layer as the data line 002, as shown in FIG. 2a, because the wire grid polarizing film 004 serving as a pixel electrode is fabricated on the same layer as the drain electrode 005 of the thin film transistor, the wire grid polarizing film 004 and the drain electrode 005 can be directly electrically connected. In the case that the wire grid polarizing film 004 is arranged on the same layer as the gate line 003, as shown in FIG. 2b, because the wire grid polarizing film 004 serving as a pixel electrode is fabricated on the same layer as the gate electrode 006 of the thin film transistor which is not on the same layer as the drain electrode 005, the wire grid polarizing film 004 and the drain electrode 005 can be electrically connected through a via hole.

[0030] For example, during the fabrication of the array substrates with the structures shown in FIG. 2a and FIG. 2b, the wire grid polarizing film 004 serving as the pixel electrode is formed along with the formation of the data line 002 or the gate line 003, which can omit a separate pixel electrode commonly formed on the drain electrode. Thus, the numbers of used masks and the fabrication processes can be reduced.

[0031] Further, in FIG. 2a and FIG. 2b, ADS mode array substrate is taken as an example. Thus, a common electrode 007 is further arranged above a film layer of the data line 002, and the common electrode 007 is connected with a common electrode line 008 through a via hole, and the common electrode line 008 is usually arranged on the same layer as the gate line 003. If the wire grid polarizing film 004 is made of easily oxidized metal such as Al, the common electrode 007 arranged above can prevent the wire grid polarizing film 004 from being oxidized. Thus, it is not necessary to separately arrange a protective layer to protect the wire grid polarizing film 004 in the ADS mode array substrate. However, in TN mode array substrate, if the wire grid polarizing film serving as a pixel electrode and the data line are arranged on the same layer, no common electrode protects the wire grid polarizing film 004 which is easily oxidized. Therefore, in order to better prevent the fabricated wire grid polarizing film 004 from being oxidized, for example, in respective pixel regions, as shown in FIG. 2c, a transparent conductive metal oxide layer 009, e.g., an ITO film layer, is arranged on the wire grid polarizing film 004. Further, since the transparent conductive metal oxide layers 009 arranged on the wire grid polarizing films 004 in different pixel regions need to be separated from each other, it is inevitable to pattern the added transparent conductive metal oxide layer 009, which will add a production process for the array substrate. In order to avoid the additional production process for the array substrate, for example, in the respective pixel regions, the transparent conductive metal oxide layer 009 and the wire grid polarizing film 004 are set to be consistent in pattern, as shown in FIG. 2d. In this way, by one patterning process, the patterns of the transparent conductive metal oxide layer 009 and the wire grid polarizing film 004 can be formed at the same time, without increasing the number of used masks.

Embodiment II

[0032] In an IPS mode array substrate of the embodiment, as shown in FIG. 3a and FIG. 3b, a pixel electrode and a common electrode are the same as a wire grid polarizing film. For example, in each pixel unit of the IPS mode array substrate, a pixel electrode and a common electrode are interdigitated and arranged on the same layer. Therefore, in the respective pixel regions, the wire grid polarizing film 004 also functions as the pixel electrode and the common electrode of interdigital structure; the wire grid polarizing film 004 functioning as the pixel electrode is electrically connected with a drain electrode 005 of a thin film transistor located on an intersection of the data line 002 and the gate line 003, and the drain electrode 005 and the data line 002 are arranged on the same layer.

[0033] For example, in the case that the wire grid polarizing film 004 is arranged on the same layer as the

data line 002, as shown in FIG. 3a, because the wire grid polarizing film 004 serving as the pixel electrode and the common electrode is fabricated on the same layer as the drain electrode 005 of the thin film transistor, part *a* of the wire grid polarizing film 004 serving as the pixel electrode can be directly electrically connected with the drain electrode 005, and part *b* of the wire grid polarizing film 004 serving as the common electrode can be connected with a common electrode line 008 through a via hole, and the common electrode line 008 is arranged on the same layer as the gate line 003 and the gate electrode 006. In the case that the wire grid polarizing film 004 is arranged on the same layer as the gate line 003, as shown in FIG. 3b, because the wire grid polarizing film 004 serving as the pixel electrode and the common electrode is fabricated on the same layer as the gate electrode 006 of the thin film transistor, part *a* of the wire grid polarizing film 004 serving as the pixel electrode is electrically connected with the drain electrode 005 through a via hole, and part *b* of the wire grid polarizing film 004 serving as the common electrode is directly connected with the common electrode line 008, and the common electrode line 008 is arranged on the same layer as the gate line 003 and the gate electrode 006.

[0034] For example, during fabrication of the IPS mode array substrate as shown in FIG. 3a and FIG. 3b, the wire grid polarizing film 004 serving as the pixel electrode and the common electrode is formed along with the formation of the data line 002 or the gate line 003, which can omit a pixel electrode and a common electrode separately formed on the drain electrode. Thus, the numbers of used masks and the fabrication processes can be reduced.

[0035] Further, in the case that the wire grid polarizing film 004 serving as the pixel electrode and the common electrode is arranged on the same layer as the data line 002, no protection is provided above the wire grid polarizing film 004 which is easily oxidized. Therefore, in order to better prevent the fabricated wire grid polarizing film 004 from being oxidized, for example, a conductive oxide layer may also be added in the same manner used in Embodiment I. That is, in respective pixel regions, a transparent conductive metal oxide layer, e.g., an ITO film layer, is arranged on the wire grid polarizing film 004. Similarly, in order to avoid an additional production process for the array substrate, for example, in the respective pixel regions, the transparent conductive metal oxide layer and the wire grid polarizing film 004 are set to be consistent in pattern.

Example III

[0036] In an array substrate as shown in FIG. 4, a common electrode and a wire grid polarizing film are the same. For example, the wire grid polarizing film 004 and the gate line 003 are arranged on a same layer, and the wire grid polarizing film 004 also functions as a common electrode in the respective pixel regions.

[0037] For example, during the fabrication of the ADS mode array substrate as shown in FIG. 4, the wire grid polarizing film 004 serving as the common electrode is formed along with the formation of the gate line 003 and the gate electrode 006, which can omit a common electrode separately formed on the drain electrode. Thus, the numbers of used masks and the fabrication processes can be reduced.

Example IV

[0038] A wire grid polarizing film can be connected with a pixel electrode, or can be connected with a common electrode line as a part of a storage capacitor.

[0039] For example, in the case that pixel electrodes is separately arranged in respective pixel regions, the wire grid polarizing films 004 can be electrically connected with the pixel electrodes in the respective pixel regions, to form a part of a storage capacitor, so as to increase storage capacitance and improve display resolution; alternatively, in the case that a common electrode line and a gate line are arranged on a same layer and extended in a same direction in an array substrate, the wire grid polarizing films 004 can be electrically connected with the common electrode lines in the respective pixel regions, to form a part of a storage capacitor, so as to increase storage capacitance and improve display resolution.

[0040] The embodiment of the disclosure further provides a liquid crystal display panel, as shown in FIG. 5, comprising an opposed substrate 100 and an array substrate 200 opposite to each other, and a liquid crystal layer 300 filled in between the array substrate 200 and the opposed substrate 100.

[0041] The array substrate 200 is any array substrate provided by the embodiment of the present disclosure.

[0042] For example, the opposed substrate 100 is a color filter substrate, including a color filter unit corresponding to a pixel region on the array substrate 200, and further including a black matrix and so on.

[0043] For example, an upper polarizer 400 is arranged on a side of the opposed substrate 100 away from the array substrate 200.

[0044] For example, an extending direction of a grating structure of a wire grid polarizing film 004 in the array substrate 200 and a transmission axis direction of the upper polarizer 400 are parallel to each other. That is, in the array substrate 200, linearly polarized light passing through the wire grid polarizing film 004 and the linearly polarized light passing through the upper polarizer 400 are perpendicular to each other in polarization direction.

[0045] In addition, in the liquid crystal display panel provided by the embodiment of the present disclosure, as shown in FIG. 5, further comprising a backlight module arranged on an outer side of the array substrate. The backlight module includes a LED lamp component 500, a reflecting plate 600 and a light guiding plate 700. Of course, The backlight module can also include other components, which is not defined here.

[0046] The embodiment of the present disclosure further provides a display device, comprising any one of the liquid crystal display panels provided by the embodiments of the present disclosure. The display device can be any product or part having a display function, such as mobile phone, a watch, a tablet computer, a television, a monitor, a laptop, a digital photo frame and a navigator. For implementation of the display device, the embodiments of the above-described liquid crystal display panel can be referred to, and repeated parts will not be illustrated here.

[0047] The array substrate, the liquid crystal display panel and the display device provided by the embodiments of the present disclosure, the wire grid polarizing film in respective pixel regions of the array substrate is adopted to replace a polarizer attached on an outer side of the array substrate. The grating structure has a grating pitch less than half of the minimum wavelength of visible light is used in the wire grid polarizing films in respective pixel regions, to changing natural light passing therethrough into linearly polarized light. In the embodiments of the present disclosure, the wire grid polarizing film which plays a role of polarizer can be formed during the fabrication of the array substrate, without affecting normal display of the liquid crystal display panel. Therefore, a process of separately attaching a polarizer after cell-assembling is omitted, which can improve production efficiency, save production cost, and be conducive to thinning the display panel.

[0048] The foregoing embodiments merely are exemplary embodiments of the disclosure, and not intended to define the scope of the disclosure.The scope of protection is defined by the claims.

[0049] The present application claims priority of Chinese Patent Application No. 201410642435.6 filed on November 7, 2014.

Claims

1. An array substrate (200), comprising:

a base substrate (001);
a data line (002) and a gate line (003) intersecting with each other on the base substrate (001),
a plurality of pixel regions defined by the data line (002) and the gate line (003) on the array substrate (200) and arranged in array, and
a wire grid polarizing film (004) arranged in each of the pixel regions and configured for changing natural light passing therethrough into linearly polarized light; wherein,
the wire grid polarizing film (004) in each of the pixel regions has a grating structure,
characterized in that, in each of the pixel regions, a first part (a) of the wire grid polarizing film (004) functions as a pixel electrode of an interdigital structure, and a second part (b) of the wire grid polarizing film (004) functions as a common electrode (007) of the interdigital structure, the first part (a) of the wire grid polarizing film (004) functioning as the pixel electrode is electrically connected with a drain electrode (005) of a thin film transistor located on an intersection of the data line (002) and the gate line (003).

2. The array substrate (200) according to claim 1, wherein, the grating structure consists of metal wires arranged linearly.

3. The array substrate (200) according to claim 1 or 2, wherein, the grating structure has a grating pitch less than half of a minimum wavelength of visible light.

4. The array substrate (200) according to any one of claims 1 to 3, wherein, the grating pitch is 60nm-100nm.

5. The array substrate (200) according to any one of claims 1 to 4, wherein the wire grid polarizing film (004) and the data line (002) or the gate line (003) are arranged on a same layer and insulated from each other.

6. The array substrate (200) according to claim 1, wherein, the drain electrode (005) and the data line (002) are arranged on a same layer.

7. The array substrate (200) according to claim 1, wherein, the common electrode (007) is arranged above a film layer of the data line (002).

8. The array substrate (200) according to claim 1, wherein, in each of the pixel regions, a transparent conductive metal oxide layer (009) is arranged on the wire grid polarizing film (004).

9. The array substrate (200) according to claim 8, wherein, in each of the pixel regions, the transparent conductive metal oxide layer (009) and the wire grid polarizing film (004) are same in pattern.

10. A liquid crystal display panel, comprising: an array substrate (200) and an opposed substrate (100) arranged oppositely, and a liquid crystal layer (300) filled between the array substrate (200) and the opposed substrate (100); **characterized in that**,
the array substrate (200) is the array substrate (200) according to any one of claims 1 to 9.

11. The liquid crystal display panel according to claim 10, wherein, an upper polarizer (400) is arranged on a side of the opposed substrate (100) away from the array substrate (200).

12. The liquid crystal display panel according to claim 11, wherein, an extending direction of the grating structure of the wire grid polarizing film (004) and a transmission axis direction of the upper polarizer (400) are parallel to each other.

13. A display device, **characterized in** comprising the liquid crystal display panel according to any one of claims 10 to 12.

Patentansprüche

1. Array-Substrat (200), umfassend:

ein Basissubstrat (001);
eine Datenleitung (002) und eine Gate-Leitung (003), die sich auf dem Basissubstrat (001) schneiden, eine Mehrzahl von Pixelregionen, die mittels der Datenleitung (002) und der Gate-Leitung (003) auf dem Array-Substrat (200) definiert ist und als Array angeordnet ist, und einen Drahtgitterpolarisationsfilm (004), angeordnet in jeder der Pixelregionen und konfiguriert zur Änderung von hindurchgehendem natürlichem Licht in linear polarisiertes Licht; wobei
der Drahtgitterpolarisationsfilm (004) in jeder der Pixelregionen eine Gitterstruktur aufweist,
dadurch gekennzeichnet, dass in jeder der Pixelregionen ein erster Teil (a) des Drahtgitterpolarisationsfilms (004) als eine Pixelelektrode einer interdigitalen Struktur funktioniert und ein zweiter Teil (b) des Drahtgitterpolarisationsfilms (004) als eine Gemeinsame Elektrode (007) der interdigitalen Struktur funktioniert, wobei der erste Teil (a) des Drahtgitterpolarisationsfilms (004), der als Pixelelektrode funktioniert, elektrisch mit einer Drain-Elektrode (005) eines Dünnschichttransistors, der auf einer Schnittstelle der Datenleitung (002) und der Gate-Leitung (003) lokalisiert ist, verbunden ist.

2. Array-Substrat (200) gemäß Anspruch 1, wobei die Gitterstruktur aus linear angeordneten Metalldrähten besteht.

3. Array-Substrat (200) gemäß Anspruch 1 oder 2, wobei die Gitterstruktur einen Gitterabstand von weniger als der Hälfte einer minimalen Wellenlänge von sichtbarem Licht aufweist.

4. Array-Substrat (200) gemäß einem der Ansprüche 1 bis 3, wobei der Gitterabstand 60nm-100nm beträgt.

5. Array-Substrat (200) gemäß einem der Ansprüche 1 bis 4, wobei der Drahtgitterpolarisationsfilm (004) und die Datenleitung (002) oder die Gate-Leitung (003) in einer gleichen Schicht angeordnet und voneinander isoliert sind.

6. Array-Substrat (200) gemäß Anspruch 1, wobei die Drain-Elektrode (005) und die Datenleitung (002) in einer gleichen Schicht angeordnet sind.

7. Array-Substrat (200) gemäß Anspruch 1, wobei die Gemeinsame Elektrode (007) über einer Filmlage der Datenleitung (002) angeordnet ist.

8. Array-Substrat (200) gemäß Anspruch 1, wobei in jeder der Pixelregionen eine transparente leitfähige Metalloxidschicht (009) auf dem Drahtgitterpolarisationsfilm (004) angeordnet ist.

9. Array-Substrat (200) gemäß Anspruch 8, wobei in jeder der Pixelregionen die transparente leitfähige Metalloxidschicht (009) und der Drahtgitterpolarisationsfilm (004) im Muster gleich sind.

10. Flüssigkristallanzeigetafel, umfassend: ein Array-Substrat (200) und ein gegenüberliegendes Substrat (100), das gegenüberliegend angeordnet ist, und eine Flüssigkristallschicht (300), die zwischen das Array-Substrat (200) und das gegenüberliegende Substrat (100) gefüllt ist; **dadurch gekennzeichnet, dass**
das Array-Substrat (200) das Array-Substrat (200) gemäß einem der Ansprüche 1 bis 9 ist.

11. Flüssigkristallanzeigetafel gemäß Anspruch 10, wobei ein oberer Polarisator (400) auf einer von dem Array-Substrat (200) entfernten Seite des gegenüberliegenden Substrates (100) angeordnet ist.

12. Flüssigkristallanzeigetafel gemäß Anspruch 11, wobei eine Erstreckungsrichtung der Gitterstruktur des Drahtgitterpolarisationsfilms (004) und eine Sendeachsenrichtung des oberen Polarisators (400) parallel zueinander sind.

13. Anzeigevorrichtung, **dadurch gekennzeichnet, dass** sie die Flüssigkristallanzeigetafel gemäß einem der Ansprüche 10 bis 12 aufweist.

Revendications

1. Un substrat de réseau (200), comprenant :

un substrat de base (001) ;
une ligne de données (002) et une ligne de grille (003) se croisant l'une l'autre sur le substrat de base (001), une pluralité de régions de pixels définies par la ligne de données (002) et la ligne de grille (003) sur le substrat de réseau (200) et disposées en réseau, et

un film polarisant à grille métallique (004) agencé dans chacune des régions de pixels et configuré pour changer la lumière naturelle qui le traverse en lumière polarisée linéairement ; dans lequel,
le film polarisant de grille métallique (004) dans chacune des régions de pixels a une structure de réseau,
caractérisé en ce que, dans chacune des régions de pixels, une première partie (a) du film polarisant à grille métallique (004) fonctionne en tant qu'électrode de pixel(s) d'une structure interdigitée, et une deuxième partie (b) du film polarisant à grille métallique (004) fonctionne en tant qu'électrode commune (007) de la structure interdigitée, la première partie (a) du film polarisant à grille métallique (004) fonctionnant en tant qu'électrode de pixel(s) est électriquement connectée à une électrode de drain (005) d'un transistor en couche mince situé sur une intersection de la ligne de données (002) et de la ligne de grille (003).

2. Le substrat de réseau (200) selon la revendication 1, dans lequel la structure de réseau est constituée de fils métalliques agencés linéairement.

3. Le substrat de réseau (200) selon la revendication 1 ou 2, dans lequel la structure de réseau présente un pas de réseau inférieur à la moitié d'une longueur d'onde minimale de la lumière visible.

4. Le substrat de réseau (200) selon l'une quelconque des revendications 1 à 3, dans lequel le pas de réseau est de 60 nm à 100 nm.

5. Le substrat de réseau (200) selon l'une quelconque des revendications 1 à 4, dans lequel le film polarisant à grille métallique (004) et la ligne de données (002) ou la ligne de grille (003) sont agencés sur une même couche et isolés l'un de l'autre.

6. Le substrat de réseau (200) selon la revendication 1, dans lequel l'électrode de drain (005) et la ligne de données (002) sont disposées sur une même couche.

7. Le substrat de réseau (200) selon la revendication 1, dans lequel l'électrode commune (007) est agencée au-dessus d'une couche de film de la ligne de données (002).

8. Le substrat de réseau (200) selon la revendication 1, dans lequel, dans chacune des régions de pixels, une couche d'oxyde métallique conductrice transparente (009) est disposée sur le film polarisant à grille métallique (004).

9. Le substrat de réseau (200) selon la revendication 8, dans lequel, dans chacune des régions de pixels, la couche d'oxyde métallique conductrice transparente (009) et le film polarisant à grille métallique (004) ont le même motif.

10. Un panneau d'affichage à cristaux liquides, comprenant : un substrat de réseau (200) et un substrat opposé (100) agencés en vis-à-vis, et une couche de cristaux liquides (300) remplie entre le substrat de réseau (200) et le substrat opposé (100) ; **caractérisé en ce que**,
le substrat de réseau (200) est le substrat de réseau (200) selon l'une quelconque des revendications 1 à 9.

11. Le panneau d'affichage à cristaux liquides selon la revendication 10, dans lequel un polariseur supérieur (400) est disposé sur un côté du substrat opposé (100) qui est éloigné du substrat de réseau (200) .

12. Le panneau d'affichage à cristaux liquides selon la revendication 11, dans lequel une direction d'extension de la structure de réseau du film polarisant à grille métallique (004) et une direction d'axe de transmission du polariseur supérieur (400) sont parallèles entre elles.

13. Un dispositif d'affichage, **caractérisé en ce qu'**il comprend le panneau d'affichage à cristaux liquides selon l'une quelconque des revendications 10 à 12.

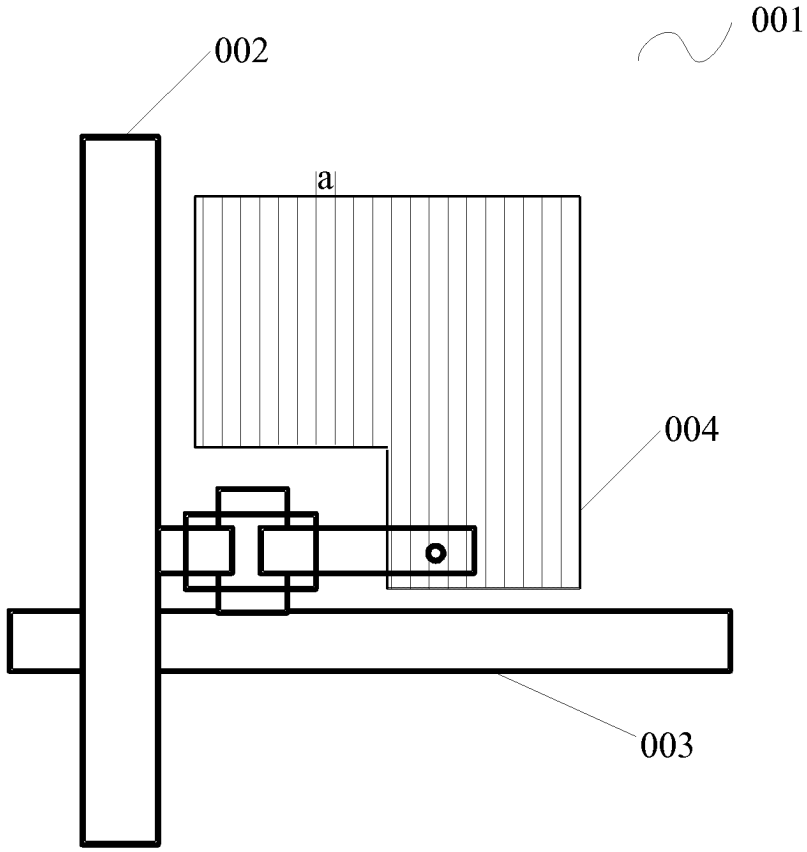

FIG. 1

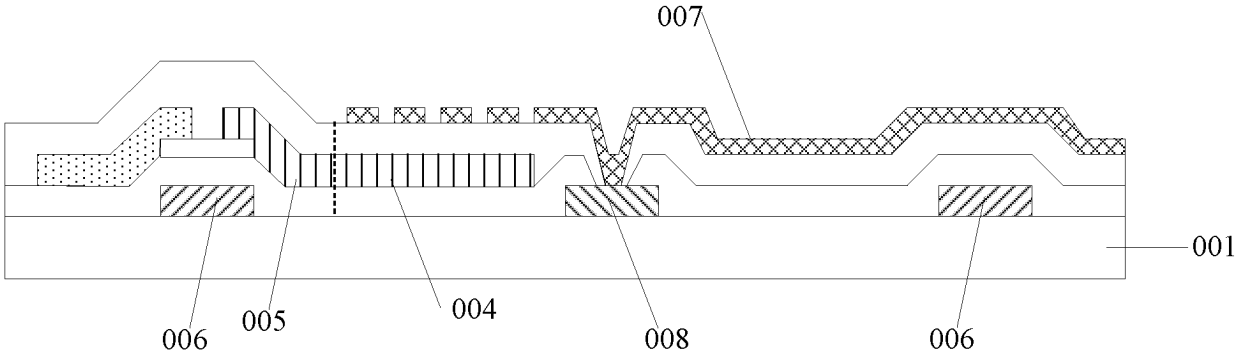

FIG. 2a

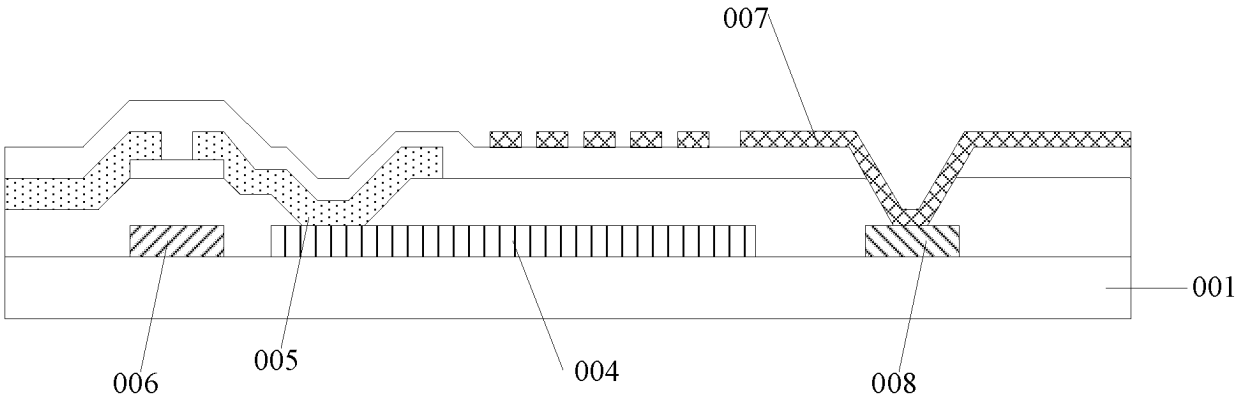

FIG. 2b

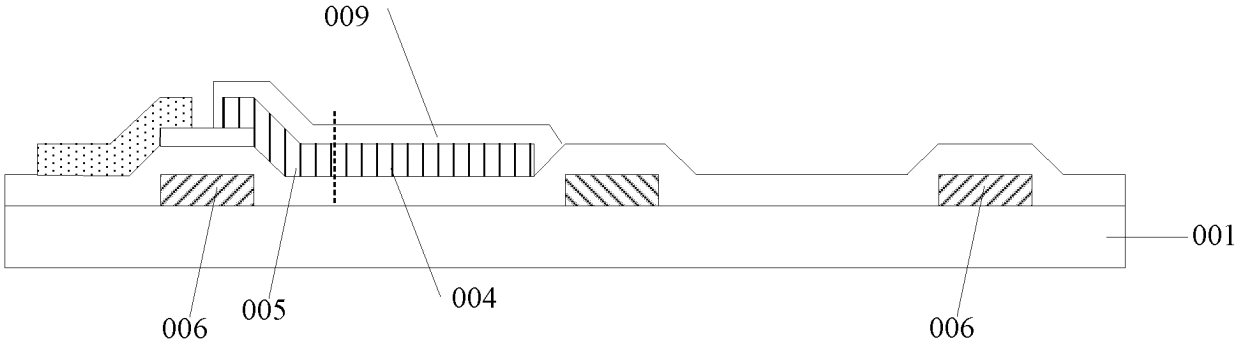

FIG. 2c

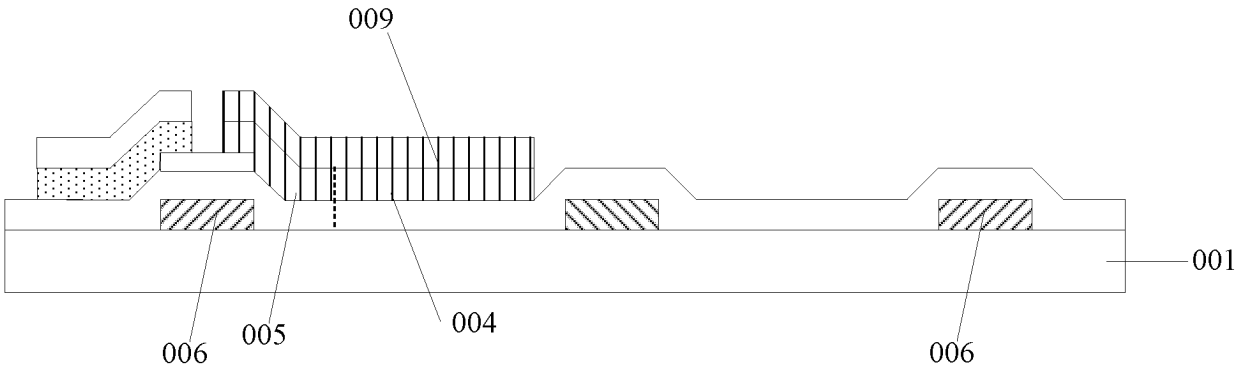

FIG. 2d

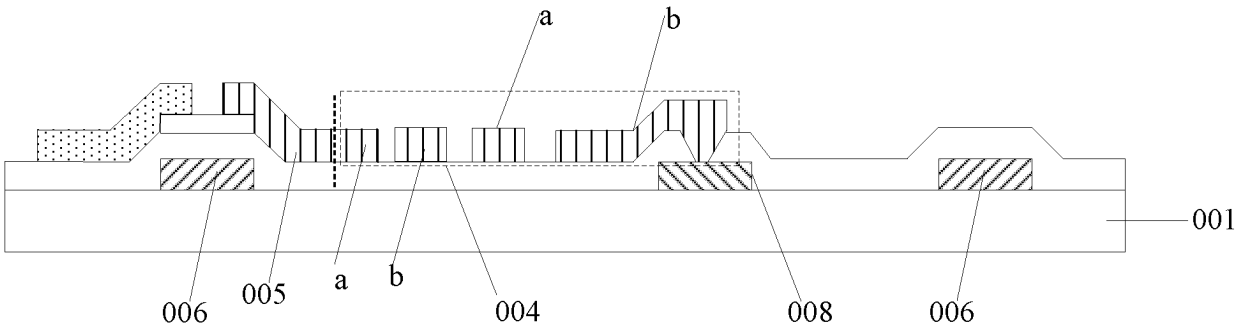

FIG. 3a

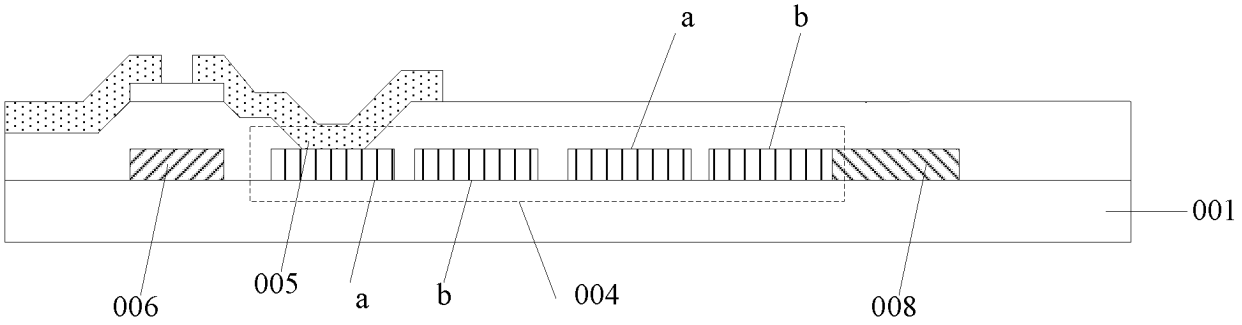

FIG. 3b

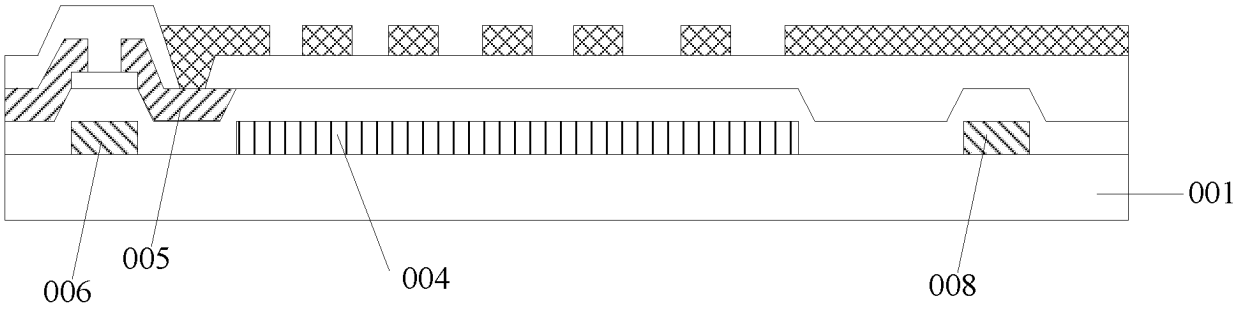

FIG. 4

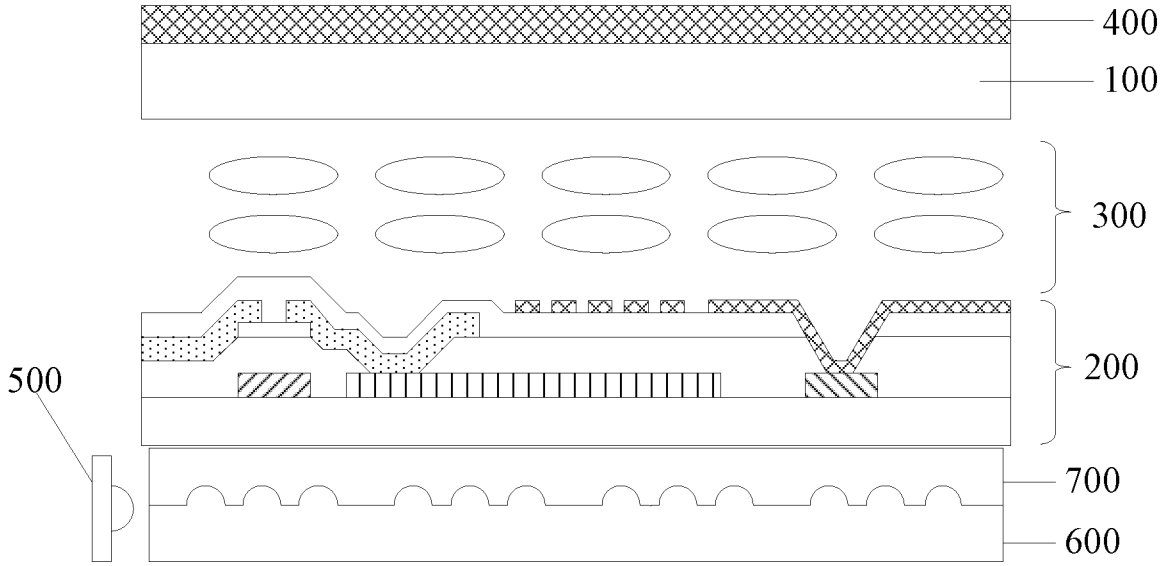

FIG. 5

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 20090283768 A1 **[0003]**
- US 20060061519 A1 **[0003]**
- CN 201410642435 **[0049]**

专利名称(译)	阵列基板，液晶显示面板和显示装置		
公开(公告)号	EP3217213B1	公开(公告)日	2019-06-05
申请号	EP2015790436	申请日	2015-03-18
[标]申请(专利权)人(译)	京东方科技集团股份有限公司		
申请(专利权)人(译)	京东方科技集团股份有限公司.		
当前申请(专利权)人(译)	京东方科技集团股份有限公司.		
[标]发明人	LI WENBO		
发明人	LI, WENBO		
IPC分类号	G02F1/1335 G02F1/1362 G02F1/1343		
CPC分类号	G02F1/133528 G02F1/133514 G02F1/1341 G02F1/134363 G02F1/13439 G02F1/136213 G02F1/136286 G02F1/1368 G02F2001/133548 G02F2001/133565 G02F2001/136295 G02F2201/121 G02F2201/123		
优先权	201410642435.6 2014-11-07 CN		
其他公开文献	EP3217213A4 EP3217213A1		
外部链接	Espacenet		

摘要(译)

提供一种阵列基板，液晶显示面板和显示装置。阵列基板包括：基础基板（001），数据线（002）和栅极线（003），在基础基板（001）上相互交叉，多个像素区域由数据线（002）定义栅极线（003）位于阵列基板上并排列成阵列，线栅偏振膜（004）设置在各个像素区域中，用于将通过其中的自然光变为线偏振光;其中，各个像素区域中的线栅偏振膜（004）具有光栅结构，因此线栅偏振膜起到偏振器的作用，因此，省略了在单元组装后单独安装偏振器的工艺，其中可以提高生产效率，节省生产成本，有利于显示面板的薄化。

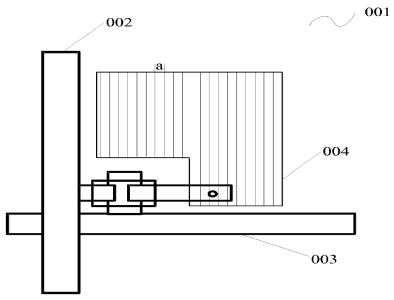

FIG. 1

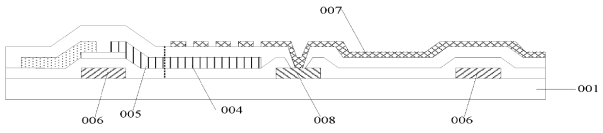

FIG. 2a