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(54) **PIXEL UNIT AND LIQUID CRYSTAL DISPLAY PANEL**

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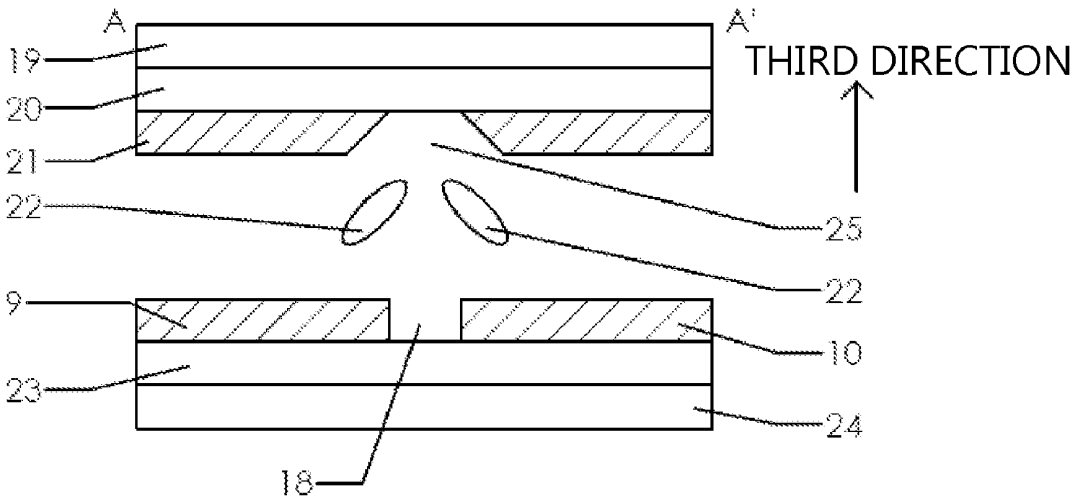
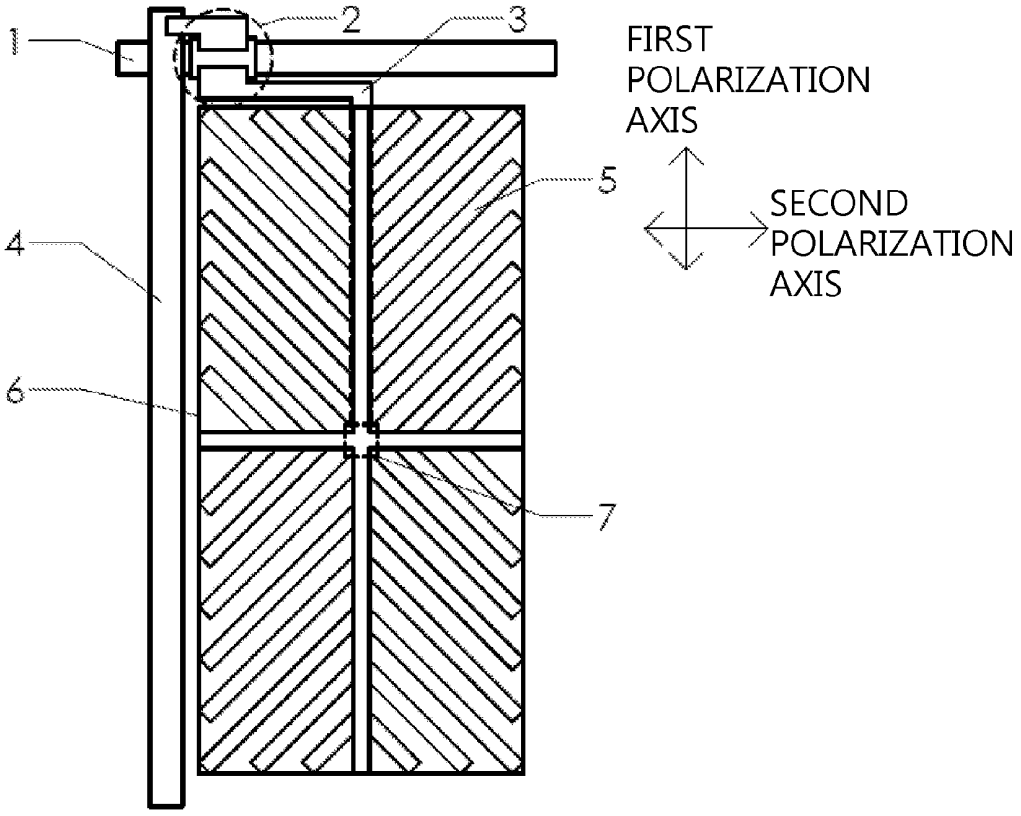
(57) **ABSTRACT**

The present invention discloses a pixel unit and has: a gate line; a source line; a drain line; an active element electrically connected to the gate line, the source line and the drain line; a pixel electrode including a main trunk and multiple stripped electrodes, and the main trunk is electrically connected to the drain line, the main trunk has a first predetermined angle with respect to a first polarization axis or a second polarization axis, and the main trunk at least has two segments, an end of each of the strip electrodes is connected to the main trunk and each of the strip electrodes has a second predetermined angle with respect to the main trunk. The present invention further discloses a liquid crystal display panel.

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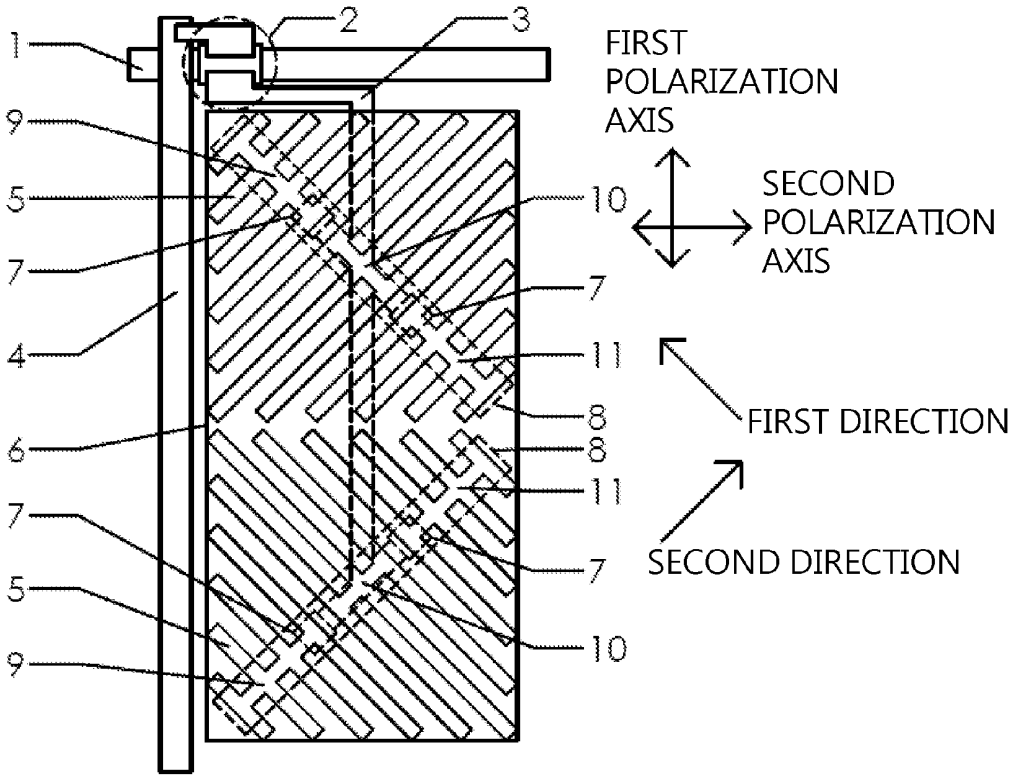
FIRST
POLARIZATION
AXIS
SECOND
POLARIZATION
AXIS

FIG. 1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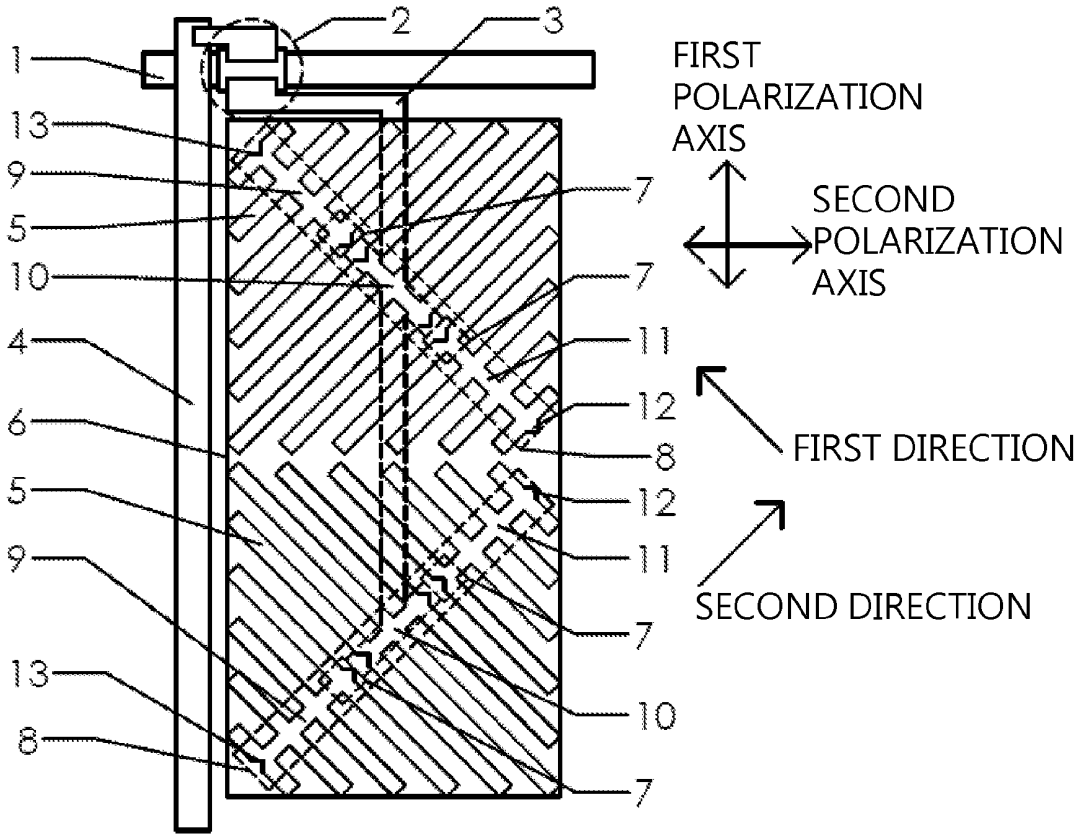
FIRST POLARIZATION AXIS
SECOND POLARIZATION AXIS
FIRST DIRECTION
SECOND DIRECTION

FIG. 2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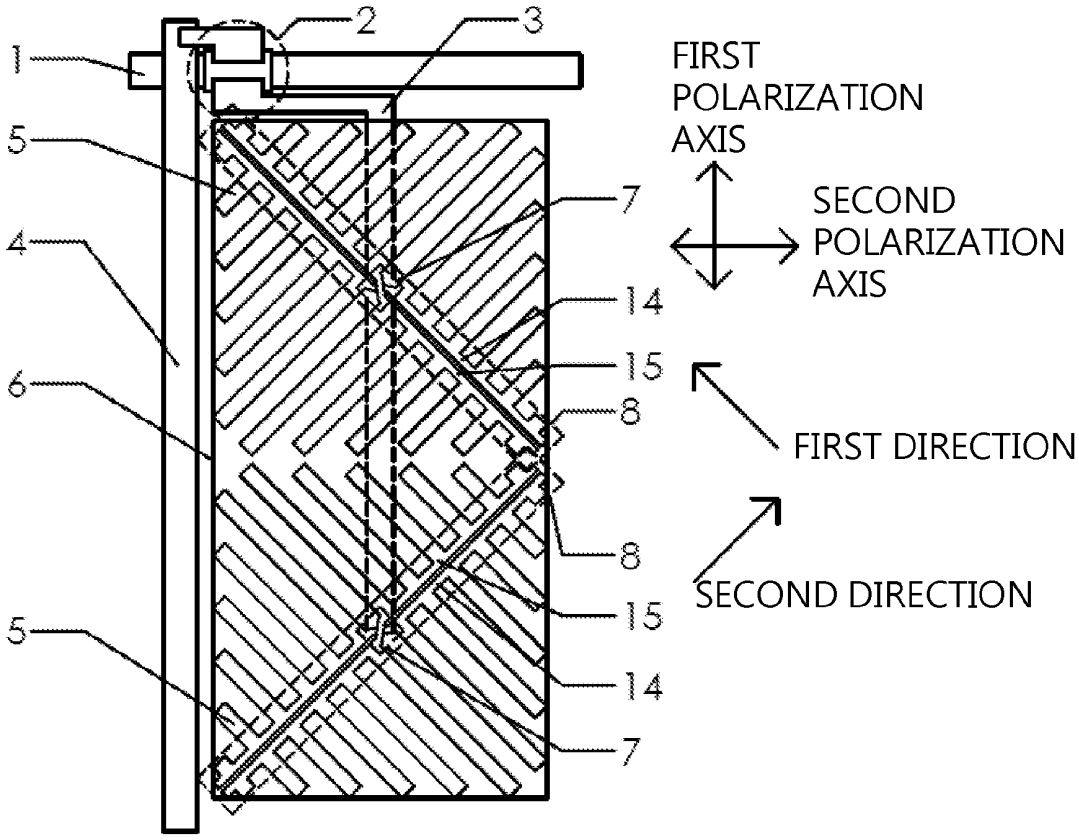
FIRST POLARIZATION AXIS
SECOND POLARIZATION AXIS
FIRST DIRECTION
SECOND DIRECTION

FIG. 3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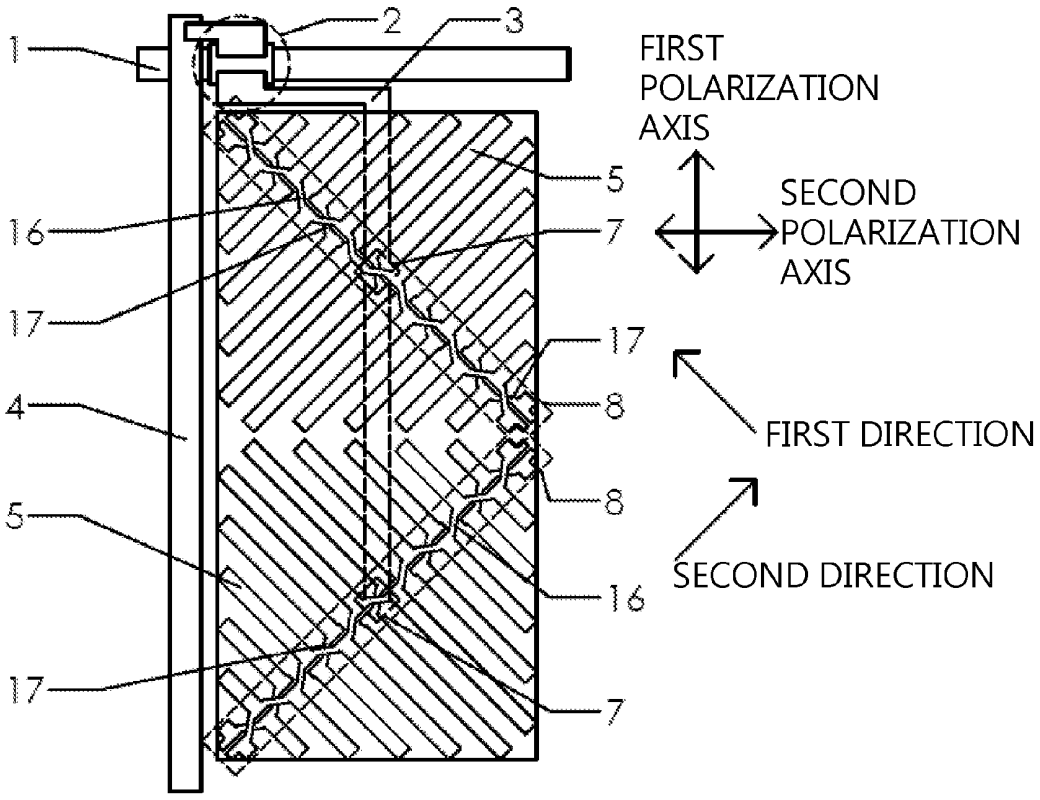
FIRST POLARIZATION AXIS
SECOND POLARIZATION AXIS
FIRST DIRECTION
SECOND DIRECTION

FIG. 4


1
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FIRST POLARIZATION AXIS
5
SECOND POLARIZATION AXIS
16
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17
17
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8
FIRST DIRECTION
8
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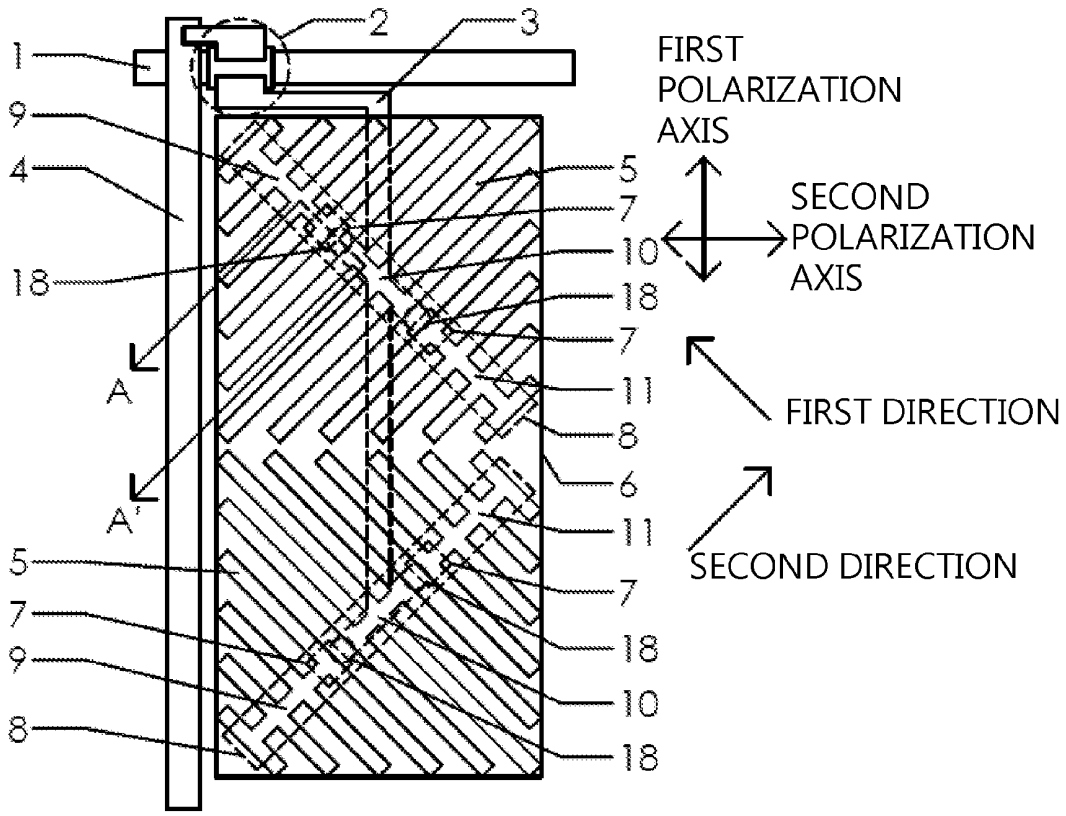
SECOND DIRECTION
16
17
7

FIG. 5


1
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A
A'
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8
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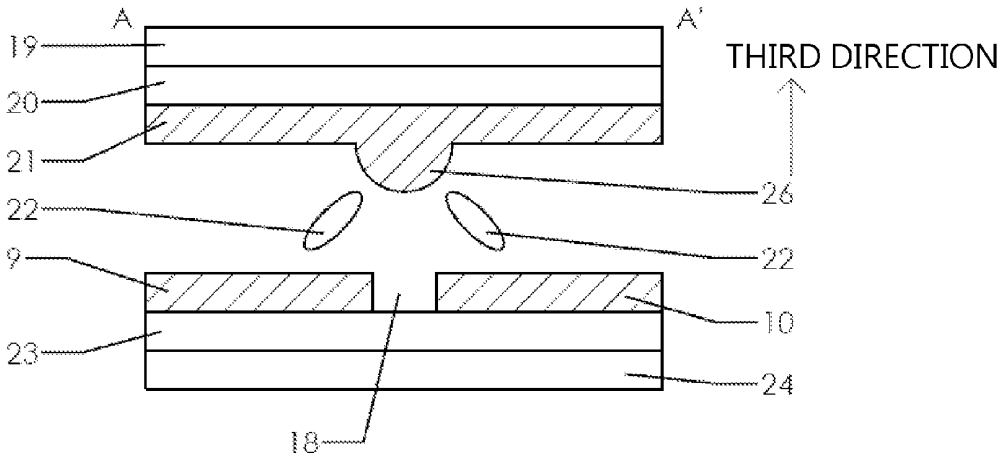
18
FIRST POLARIZATION AXIS
SECOND POLARIZATION AXIS
FIRST DIRECTION
SECOND DIRECTION

FIG. 6


A
A'
THIRD DIRECTION
19
20
21
26
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22
9
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23
24
18

FIG. 7

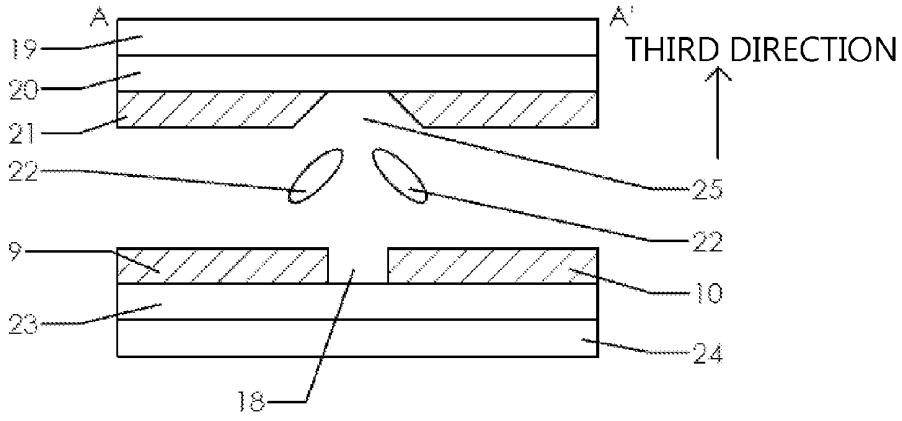
A
A'
THIRD DIRECTION
19
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FIG. 8

PIXEL UNIT AND LIQUID CRYSTAL DISPLAY PANEL

FIELD OF THE INVENTION

[0001] The present invention relates to a liquid crystal display device, and more particularly to a pixel unit of a display device; the present invention further relates to a display panel, and especially a liquid crystal display panel.

BACKGROUND OF THE INVENTION

[0002] A pixel area of a conventional liquid crystal panel generally uses a cross-shaped transparent conductive electrode as a main trunk, and a strip electrode has an angle of 45 degrees in inspect with the main trunk, and the cross-shaped main trunk is parallel with or perpendicular to a first polarization direction and a second polarization direction. As shown in FIG. **1**, because of a twisting effect of liquid crystal, a cross-shaped dark area corresponding to the main trunk will occur in the pixel area and affect a display effect of the liquid crystal panel.

[0003] Besides, the twisting direction of liquid crystal is continuously changing, electric fields produced in a middle area and in a side area of the main trunk of the pixel electrode are different from each other, if the main trunk of the pixel electrode is too wide or too long, or the voltage applied on the pixel electrode is not enough, liquid crystal in a center area of the main trunk of the pixel electrode will not twist with an enough angle, and thereby leads to occurrence of an apparent dark area on an area that the main trunk corresponds to, and it reduces transmittance and affects display effect of the liquid crystal panel.

[0004] Hence, it is necessary to provide a pixel unit and a liquid crystal display panel to overcome the problems existing in the conventional technology.

SUMMARY OF THE INVENTION

[0005] An object of the invention is to provide a pixel unit which has a main trunk that corresponds to an area without apparent dark zone, even no dark zone, so as to increase transmittance of liquid crystal display panel and improve the display effect of the liquid crystal display panel.

[0006] In order to solve the foregoing problem, the present invention provides a pixel unit comprising: a gate line; a source line; a drain line; an active element electrically connected to the gate line, the source line and the drain line; a pixel electrode including a main trunk and multiple strip electrodes; the main trunk is electrically connected to the drain line; the main trunk has a first predetermined angle with respect to a first polarization axis or a second polarization axis; and the main trunk at least has two segments; an end of each of the strip electrodes is connected to the main trunk; and each of the strip electrodes has a second predetermined angle with respect to the main trunk; the first predetermined angle is ranged from 5 to 85 degrees, and the second predetermined angle is ranged from 5 to 175 degrees; the main trunk at least has two segments along a first direction, and an end of each of the segments has a protrusion or an indent, and the first direction is parallel to a line along which one of the segments of the main trunk is oriented; or the main trunk at least has two segments along a second direction, and the two segments are crossed with each other, and the main trunk has a gap between the two segments, and the second direction is perpendicular with a line along which one of the segments of the main trunk is oriented.

[0007] In the pixel unit of the present invention, the first predetermined angle is 45 degrees.

[0008] In the pixel unit of the present invention, the second predetermined angle is 90 degrees.

[0009] Another object of the invention is to provide a pixel unit which has a main trunk that corresponds to an area without apparent dark zone, even no dark zone, so as to increase transmittance of liquid crystal display panel and improve the display effect of the liquid crystal display panel.

[0010] In order to solve the foregoing problem, the present invention provides a pixel unit comprising: a gate line; a source line; a drain line; an active element electrically connected to the gate line, the source line and the drain line; a pixel electrode including a main trunk and multiple strip electrodes; the main trunk is electrically connected to the drain line; the main trunk has a first predetermined angle with respect to a first polarization axis or a second polarization axis; and the main trunk at least has two segments; an end of each of the strip electrodes is connected to the main trunk; and each of the strip electrodes has a second predetermined angle with respect to the main trunk.

[0011] In the pixel unit of the present invention, the first predetermined angle is ranged from 5 to 85 degrees, and the second predetermined angle is ranged from 5 to 175 degrees.

[0012] In the pixel unit of the present invention, the main trunk at least has two segments along a first direction, and the first direction is parallel to a line along which one of the segments of the main trunk is oriented; or the main trunk at least has two segments along a second direction, and the two segments are crossed with each other, and the second direction is perpendicular with a line along which one of the segments of the main trunk is oriented.

[0013] In the pixel unit of the present invention, the main trunk at least has two segments along a first direction, and an end of each of the segments has a protrusion or an indent.

[0014] In the pixel unit of the present invention, the main trunk at least has two segments along the second direction, and the two segments are crossed with each other, and the main trunk has a gap between the two segments.

[0015] Another object of the invention is to provide a liquid crystal display panel which has a main trunk that corresponds to an area without apparent dark zone, even no dark zone, so as to increase transmittance of liquid crystal display panel and improve the display effect of the liquid crystal display panel.

[0016] In order to solve the foregoing problem, the present invention provides a liquid crystal display panel comprising: a first substrate having multiple pixel units mounted thereon; a second substrate having a common electrode and a color filter mounted thereon, and the common electrode faces the pixel electrodes on the first substrate, and the color filter is disposed between the second substrate and the common electrode; a liquid crystal layer mounted between the pixel electrodes of the first substrate and the common electrode of the second substrate; each of the pixel unit has: a gate line; a source line; a drain line; an active element electrically connected to the gate line, the source line and the drain line; a pixel electrode including a main trunk and multiple strip electrodes; the main trunk is electrically connected to the drain line; the main trunk has a first predetermined angle with respect to a first polarization axis or a second polarization axis; and the main trunk at least has two segments; an end of each of the strip electrodes is connected to the main trunk; and each of the strip electrodes has a second predetermined angle with respect to the main trunk.

[0017] In the liquid crystal display panel of the present invention, the first predetermined angle is ranged from 5 to 85 degrees, and the second predetermined angle is ranged from 5 to 175 degrees.

[0018] In the liquid crystal display panel of the present invention, the main trunk at least has two segments along a first direction, and the first direction is parallel to a line along which one of the segments of the main trunk is oriented; or the main trunk at least has two segments along a second direction, and the two segments are crossed with each other, and the second direction is perpendicular with a line along which one of the segments of the main trunk is oriented.

[0019] In the liquid crystal display panel of the present invention, the main trunk at least has two segments along a first direction, and an end of each of the segments has a protrusion or an indent.

[0020] In the liquid crystal display panel of the present invention, the protrusion or the indent at least has two lateral surfaces forming an angle of 135 degrees or 45 degrees there.

[0021] Compared with the conventional technology, the present invention reduces dark areas in the area that the main trunk corresponds to, and thereby increases transmittance of liquid crystal display panel and improves the display effect of the liquid crystal display panel.

[0022] In order to make the contents of the present invention to be easily understood, below, the preferred embodiments of the present invention are described in detail in cooperation with accompanying drawings as follows:

DESCRIPTION OF THE DRAWINGS

[0023] FIG. **1** is a top view of a pixel unit of a liquid crystal display panel in accordance with the prior art;

[0024] FIG. **2** is a top view of a first preferred embodiment of a pixel unit in accordance with the present invention;

[0025] FIG. **3** is a top view of a second embodiment of the pixel unit in accordance with the present invention;

[0026] FIG. **4** is a top view of a third embodiment of the pixel unit in accordance with the present invention;

[0027] FIG. **5** is a top view of a fourth embodiment of the pixel unit in accordance with the present invention;

[0028] FIG. **6** is a top view of a first preferred embodiment of a liquid crystal display panel in accordance with the present invention;

[0029] FIG. **7** is a scheme view in cross-section along the line A-A' in FIG. **6** according to a preferred embodiment; and

[0030] FIG. **8** is a scheme view in cross-section along the line A-A' in FIG. **6** according to another preferred embodiment.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0031] The foregoing objects, features and advantages adopted by the present invention can be best understood by referring to the following detailed description of the preferred embodiments and the accompanying drawings. Furthermore, the directional terms described in the present invention, such as upper, lower, front, rear, left, right, inner, outer, side and etc., are only directions referring to the accompanying drawings, so that the used directional terms are used to describe and understand the present invention, but the present invention is not limited thereto.

[0032] In the drawings, units with similar structure are labeled with the same reference number.

[0033] With reference to FIG. **2**, FIG. **2** is a top view of a first preferred embodiment of a pixel unit in accordance with the present invention. In FIG. **2**, the pixel unit of the present invention comprises an active element **2**, a source line **4**, a gate line **1**, a drain line **3** and a pixel electrode **6**, wherein the pixel electrode **6** includes a main trunk **8** and multiple strip electrodes **5**, the active element **2** is electrically source line **4** and the gate line **1**, and the active element **2** is also electrically connected to the drain line **3**, and the drain line **3** is electrically connected to the main trunk **8** through a contact hole **7**. The main trunk **8** has a first predetermined angle with respect to a first polarization axis, and the angle is ranged from 5 to 85 degrees. Preferably, the first predetermined angle is 45 degrees. The strip electrodes **5** are electrically connected to the main trunk **8**, and each of the strip electrodes **5** has a second predetermined angle with respect to the main trunk **8**, and the second predetermined angle is ranged from 5 to 175 degrees. Preferably, the second predetermined angle is 90 degrees. In this embodiment, the main trunk **8** is divided into three segments along a first direction: a first segment **9**, a second segment **10** and a third segment **11**. In this embodiment, the first segment **9**, the second segment **10** and the third segment **11** are collinear, and certainly the first segment **9**, the second segment **10** and the third segment **11** may not be collinear, even not parallel. The drain line **3** is electrically connected to the first segment **9**, the second segment **10** and the third segment **11** of the main trunk **8** through the contact hole **7**. In this embodiment, an advantage of dividing the main trunks **8** along the first direction is that the main trunk **8** is prevented from being too long along in length along the first direction and thereby forming a dark area corresponding to the main trunk **8**, therefore transmittance of the liquid crystal panel can be increased.

[0034] With reference to FIG. **3**, FIG. **3** is a top view of a second preferred embodiment of the pixel unit in accordance with the present invention. This embodiment is similar to the first preferred embodiment, the main trunk **8** is divided into three segments along the first direction, an end of the first segment **9** close to the second segment **10** has a protrusion **12** mounted thereon, and the other end of the first segment **9** has an indent **13** mounted thereon. An end of the second segment **10** close to the first segment **9** has an indent mounted thereon, an end of the second segment **10** close to the third segment **11** has a protrusion **12** mounted thereon, and the other end of the third segment **121** has an protrusion **12** mounted thereon. The drain line **3** is electrically connected to the first segment **9**, the second segment **10** and the third segment **11** of the main trunk **8** through the contact hole **7**. The advantage of respectively mounting the protrusion **12** and the indent **13** on the first segment **9** and the second segment **9** is to enhance the contribution that the electric field produced by the pixel electrode provides for tilting liquid crystal molecules.

[0035] With reference to FIG. **4**, FIG. **4** is a top view of a third embodiment of the pixel unit in accordance with the present invention. In this embodiment, the pixel unit comprises a source line **4**, a gate line **1**, an active element **2**, a drain line **3** and a pixel electrode **6**, wherein the pixel electrode **6** includes a main trunk **8** and multiple strip electrodes **5**. The main trunk **8** is divided into two segments along a second direction: a fourth segment **14** and a fifth segment **15**. An end of each of the strip electrodes **5** is electrically connected to the fourth segment **14** or the fifth segment **15**. Each of the strip electrodes **5** has a second predetermined angle with respect to one segment of the main trunk **8**, and the second predetermined angle is ranged from 5 to 175 degrees, and preferably, the second predetermined angle is 90 degrees. The main trunk **8** has a first predetermined angle with respect to a first polarization axis, and the first predetermined angle is ranged from 5 to 85 degrees. Preferably the first predetermined angle is 45 degrees. The drain line **3** is connected to the fourth segment **14** and the fifth segment **15** of the main trunk **8** through the contact hole **7**. The fourth segment **14** and the fifth segment **15** are crossed with each other, and there is a gap between the fourth segment **14** and the fifth segment **15**. In this embodi-

ment, since the main trunk **8** is divided into the fourth segment **14** and the fifth segment **15**, the main trunk **8** is prevented from being too wide in width along the second direction and forming a dark area, thereby transmittance of liquid crystal panel is increased. In the liquid crystal panel of the present invention, a protrusion **26** or a recess **25** may be mounted on a common electrode **21** in a position corresponding to the gap between the fourth segment **14** and the fifth segment **15**, as shown in FIG. **6** and FIG. **7** or FIG. **6** and FIG. **8**.

[0036] With reference to FIG. **5**, FIG. **5** is a top view of a fourth embodiment of the pixel unit in accordance with the present invention. In FIG. **5**, the pixel unit of the present invention includes a source line **4**, a gate line **1**, a drain line **3**, an active element **2** and a pixel electrode **6**. The active element **2** is electrically connected to the source line **4**, the gate line **1** and the drain line **3**. The drain line is electrically connected to the pixel electrode **6**. The pixel electrode **6** has a main trunk **8** and multiple strip electrodes **5**. The main trunk **8** has a first predetermined angle with respect to a first polarization axis. The first predetermined angle is ranged from 5 to 85 degrees. Preferably, the first predetermined angle is 45 degrees. An end of each of the strip electrodes **5** is connected to the main trunk **8**, and each of the strip electrodes **5** has a second predetermined angle with respect to the main trunk **8**, and the second predetermined angle is ranged from 5 to 175 degrees. Preferably, the second predetermined angle is 90 degrees. In this embodiment, the main trunk has segments along a first direction and a second direction. To be more specifically, the main trunk **8** has a sixth segment **16** and multiple seventh segments **17**, and the sixth segment **16** and seventh segments **17** are crossed with each other. There is a gap between the sixth segment **16** and each seventh segment **17**. The seventh segments **17** are arranged on the sixth segment **16** in a linear-array manner. The drain line **3** is electrically connected to the sixth segment **16** through the contact hole **7**, and the sixth segment **16** is connected to the seven segments **17**. In this embodiment, dividing the main trunk **8** into a sixth segment **16** and multiple seventh segment **17** prevents the main trunk **8** from being too long in length along the first direction and too wide in width along the second direction and thereby forming a dark area, therefore the transmittance of liquid crystal panel is increased. In the liquid crystal display panel of the present invention, a protrusion **26** or a recess **25** may be mounted on a common electrode **21** in a position corresponding to the gap between the sixth segment **16** and the seventh segments **17**, as shown in FIG. **6** and FIG. **7** or FIG. **6** and FIG. **8**.

[0037] With reference to FIG. **6** and FIG. **7**, FIG. **6** is a top view of a first preferred embodiment of a liquid crystal display panel in accordance with the present invention, and FIG. **7** is a scheme view of a preferred embodiment in cross-section along the line A-A' in FIG. **6**. In the liquid crystal panel of the present invention, a first substrate **24** has multiple pixel units, wherein each of the pixel units comprises a gate line **1**, a source line **4**, a drain line **3**, an active element **5** and a pixel electrode **6**. To be more specifically, along a third direction, the first substrate **24** has an insulation layer **23** and a pixel electrode **6** respectively mounted thereon (first segment **9** and second segment **10**), along an opposite direction to the third direction, a second substrate **19** has a color filter **20** and a common electrode **21** respectively mounted thereon, wherein the first substrate **24** and the second substrate **19** are mounted parallelly with each other, and the second substrate **19** is mounted above the first substrate **24** along the third direction, and there is a liquid crystal layer **22** mounted between the pixel electrode **6** and the common electrode **21**. The active element **2** is electrically connected to the source line **4**, the gate line **1** and the drain line **3**. The drain line **3** is electrically connected to the pixel electrode **6** through the contact hole **7**. The pixel electrode **6** includes a main trunk **8** and multiple strip electrodes **5**. The main trunk **8** has a first predetermined angle with respect to a first polarization axis, and the first predetermined angle is ranged from 5 degrees to 85 degrees. An end of each of the strip electrodes **5** is connected to the main trunk **8**. Each of the strip electrodes **5** has a second predetermined angle with respect to the main trunk **8**, and the second predetermined angle is ranged from 5 degrees to 175 degrees. Preferably, the second predetermined angle is 90 degrees. The main trunk **8** is divided into three segments along the first direction: a first segment **9**, a second segment **10** and a third segment **11**. There are gaps between the first segment **9** and the second segment **10** and between the second segment **10** and the third segment **11**. The common electrode **21** has a protrusion **26** on a position **18** corresponding to the gap. Specifically, in this embodiment, the protrusion **26** is a hemispherical body. Certainly, the protrusion **26** may be in other shapes, for example, a side of the protrusion **26** at least includes two surfaces respectively having a 45-degree angle and a 135-degree angle with respect to a plane surface where the common electrode **21** is disposed on. In this embodiment, since the common electrode **21** has protrusions **26** mounted on positions corresponding to the gaps between the first segment **9** and the second segment **10** and the gaps between the second segment **10** and the third segment **11**, under the premise of obtaining the same effect of liquid crystal tilting, the voltage for being applied to the pixel electrode **6** in this embodiment is relatively smaller than the voltage while no protrusion **26** is mounted.

[0038] With reference to FIG. **8**, FIG. **8** is a scheme view in cross-section along the line A-A' in FIG. **6** according to another preferred embodiment. In FIG. **8**, the first substrate **24**, the insulation layer **23**, the pixel electrode **6** (the first segment **9** and the second segment **10**), the liquid crystal layer **22**, the common electrode **21**, the color filter **20** and the second substrate **19** are mounted orderly along the third direction. The main trunk **8** has a gap between the first segment **9** and the second segment **10**, on a position **18** corresponding to the gap, the common electrode **21** has a recess **25**, and the recess **25** has an opening facing a direction opposite to the third direction. Preferably, a cross-section of the recess **25** is an isosceles trapezoid, and each of the two legs of the isosceles trapezoid forms a 135-degree angle with respect to a plane surface where the common electrode **21** is disposed, it also means the recess at least has two side surfaces having a 135-degree angle or a 45-degree angle with respect to the plane surface where the common electrode **21** is disposed. The advantage of the foregoing means is to make the pixel electrode **6** to produce the most appropriate electric field for the liquid crystal molecules **22** to tilt under the premise of applying smallest voltage to the pixel electrode **6**.

[0039] The present invention has been described with a preferred embodiment thereof and it is understood that many changes and modifications to the described embodiment can be carried out without departing from the scope and the spirit of the invention that is intended to be limited only by the appended claims.

What is claimed is:

1. A pixel unit, characterized in that: comprises:

a gate line;

a source line;

a drain line;

an active element electrically connected to the gate line, the source line and the drain line;

a pixel electrode including a main trunk and multiple strip electrodes; the main trunk is electrically connected to the drain line; the main trunk has a first predetermined angle with respect to a first polarization axis or a second polarization axis; and the main trunk at least has two segments; an end of each of the strip electrodes is connected to the main trunk; and each of the strip electrodes has a second predetermined angle with respect to the main trunk;

the first predetermined angle is ranged from 5 to 85 degrees, and the second predetermined angle is ranged from 5 to 175 degrees;

the main trunk at least has two segments along a first direction, and an end of each of the segments has a protrusion or an indent, and the first direction is parallel to a line along which one of the segments of the main trunk is oriented; or

the main trunk at least has two segments along a second direction, and the two segments are crossed with each other, and the main trunk has a gap between the two segments, and the second direction is perpendicular with a line along which one of the segments of the main trunk is oriented.

2. The pixel unit as claimed in claim **1**, characterized in that: the first predetermined angle is 45 degrees.

3. The pixel unit as claimed in claim **1**, characterized in that: the second predetermined angle is 90 degrees.

4. A pixel unit, characterized in that: comprises:

a gate line;

a source line;

a drain line;

an active element electrically connected to the gate line, the source line and the drain line;

a pixel electrode including a main trunk and multiple strip electrodes; the main trunk is electrically connected to the drain line; the main trunk has a first predetermined angle with respect to a first polarization axis or a second polarization axis; and the main trunk at least has two segments; an end of each of the strip electrodes is connected to the main trunk; and each of the strip electrodes has a second predetermined angle with respect to the main trunk.

5. The pixel unit as claimed in claim **4**, characterized in that: the first predetermined angle is ranged from 5 to 85 degrees, and the second predetermined angle is ranged from 5 to 175 degrees.

6. The pixel unit as claimed in claim **4**, characterized in that: the main trunk at least has two segments along a first direction, and the first direction is parallel to a line along which one of the segments of the main trunk is oriented; or

the main trunk at least has two segments along a second direction, and the two segments are crossed with each other, and the second direction is perpendicular with a line along which one of the segments of the main trunk is oriented.

7. The pixel unit as claimed in claim **6**, characterized in that: the main trunk at least has two segments along a first direction, and an end of each of the segments has a protrusion or an indent.

8. The pixel unit as claimed in claim **6**, characterized in that: the main trunk at least has two segments along the second direction, and the two segments are crossed with each other, and the main trunk has a gap between the two segments.

9. A liquid crystal display panel, characterized in that: comprises:

a first substrate having multiple pixel units mounted thereon;

a second substrate having a common electrode and a color filter mounted thereon, and the common electrode faces the pixel electrodes on the first substrate, and the color filter is disposed between the second substrate and the common electrode;

a liquid crystal layer mounted between the pixel electrodes of the first substrate and the common electrode of the second substrate;

each of the pixel unit has:

a gate line;

a source line;

a drain line;

an active element electrically connected to the gate line, the source line and the drain line;

a pixel electrode including a main trunk and multiple strip electrodes; the main trunk is electrically connected to the drain line; the main trunk has a first predetermined angle with respect to a first polarization axis or a second polarization axis; and the main trunk at least has two segments; an end of each of the strip electrodes is connected to the main trunk; and each of the strip electrodes has a second predetermined angle with respect to the main trunk.

10. The liquid crystal display panel as claimed in claim **9**, characterized in that:

the first predetermined angle is ranged from 5 to 85 degrees, and the second predetermined angle is ranged from 5 to 175 degrees.

11. The liquid crystal display panel as claimed in claim **9**, characterized in that: the main trunk at least has two segments along a first direction, and the first direction is parallel to a line along which one of the segments of the main trunk is oriented; or

the main trunk at least has two segments along a second direction, and the two segments are crossed with each other, and the second direction is perpendicular with a line along which one of the segments of the main trunk is oriented.

12. The liquid crystal display panel as claimed in claim **11**, characterized in that: the main trunk at least has two segments along a first direction, and an end of each of the segments has a protrusion or an indent.

13. The liquid crystal display panel as claimed in claim **12**, characterized in that: the protrusion or the indent at least has two lateral surfaces forming an angle of 135 degrees or 45 degrees there.

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专利名称(译)	像素单元和液晶显示面板		
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摘要(译)

本发明公开了一种像素单元，具有：栅极线;源线;排水管;有源元件，电连接到栅极线，源极线和漏极线;像素电极包括主干和多个剥离电极，主干电连接到漏极线，主干相对于第一偏振轴或第二偏振轴具有第一预定角度，主干在至少具有两个区段，每个条形电极的一端连接到主干线，并且每个条形电极相对于主干线具有第二预定角度。本发明还公开了一种液晶显示面板。