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(19) **United States**(12) **Patent Application Publication****Moon et al.**(10) **Pub. No.: US 2005/0243242 A1**(43) **Pub. Date:****Nov. 3, 2005**(54) **LIQUID CRYSTAL DISPLAY DEVICE****Publication Classification**

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ABSTRACT(73) Assignee: **LG.PHILIPS LCD CO. LTD.**(21) Appl. No.: **11/020,172**(22) Filed: **Dec. 27, 2004**(30) **Foreign Application Priority Data**

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A liquid crystal display device (LCD) includes a liquid crystal panel displaying an image; a transparent plate disposed on the liquid crystal panel; a support member supporting the liquid crystal panel; and a fixing member disposed on the transparent plate, the fixing member coupled with the support member to fix the liquid crystal panel and the transparent plate in place, and to protect the liquid crystal panel and the transparent plate.

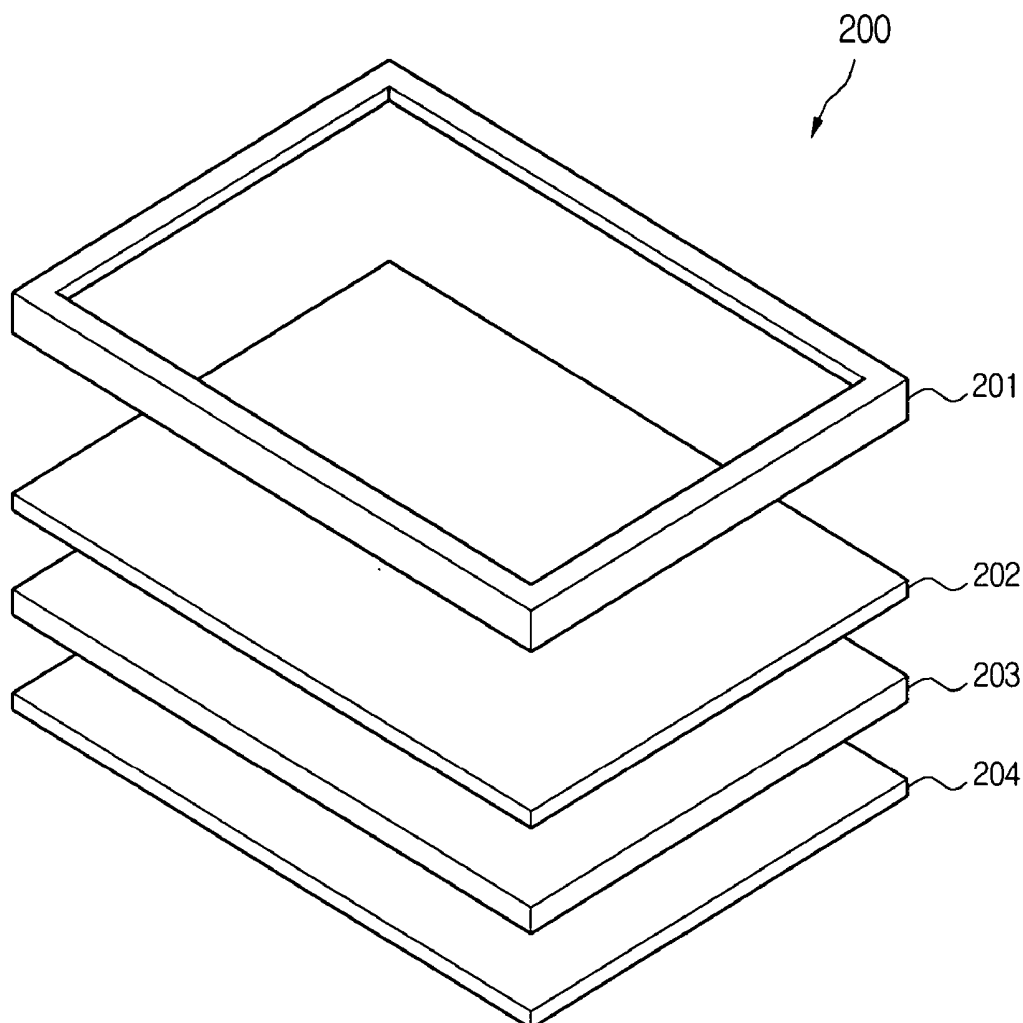


Fig.1
Related Art

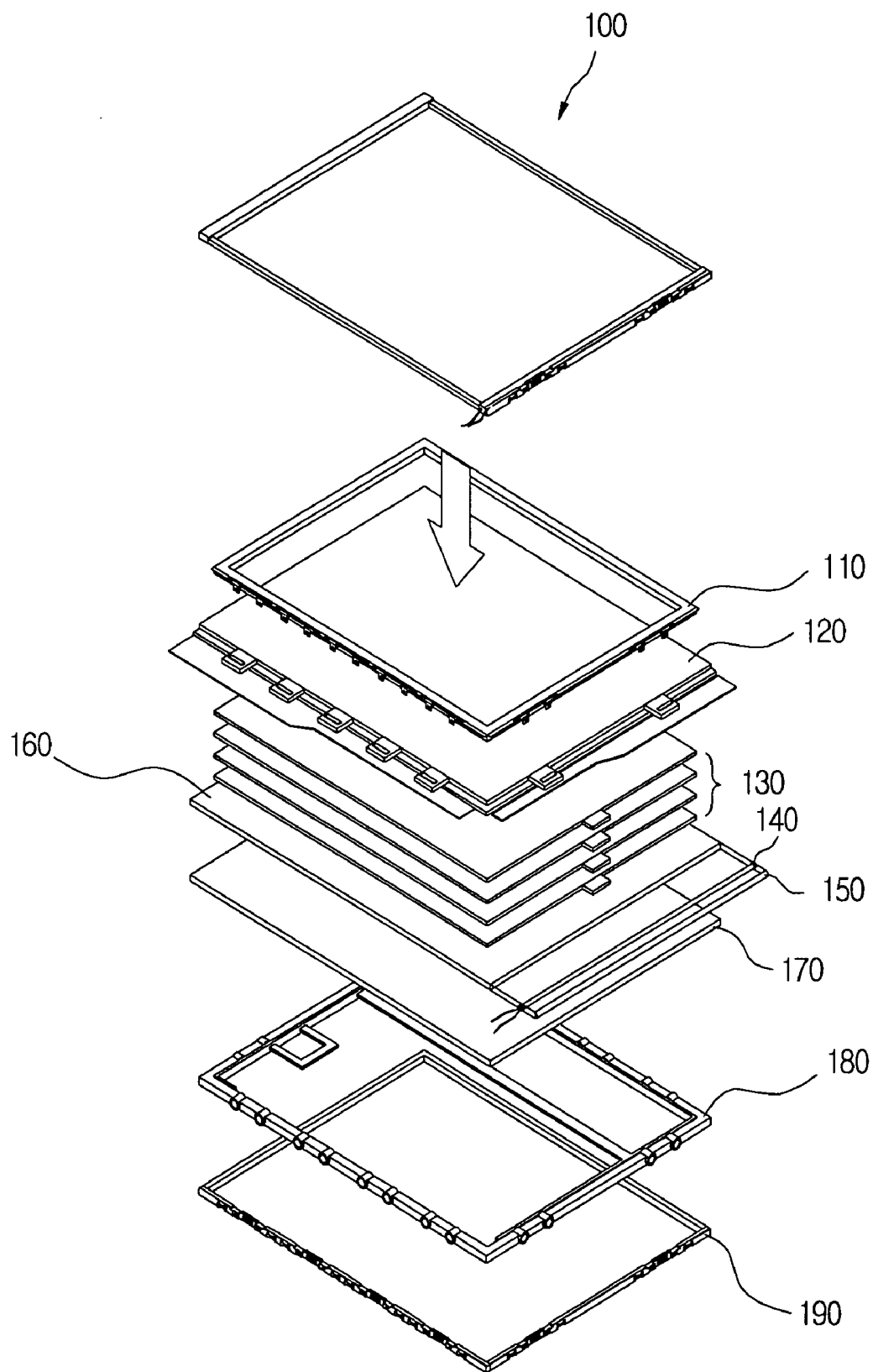


Fig.2

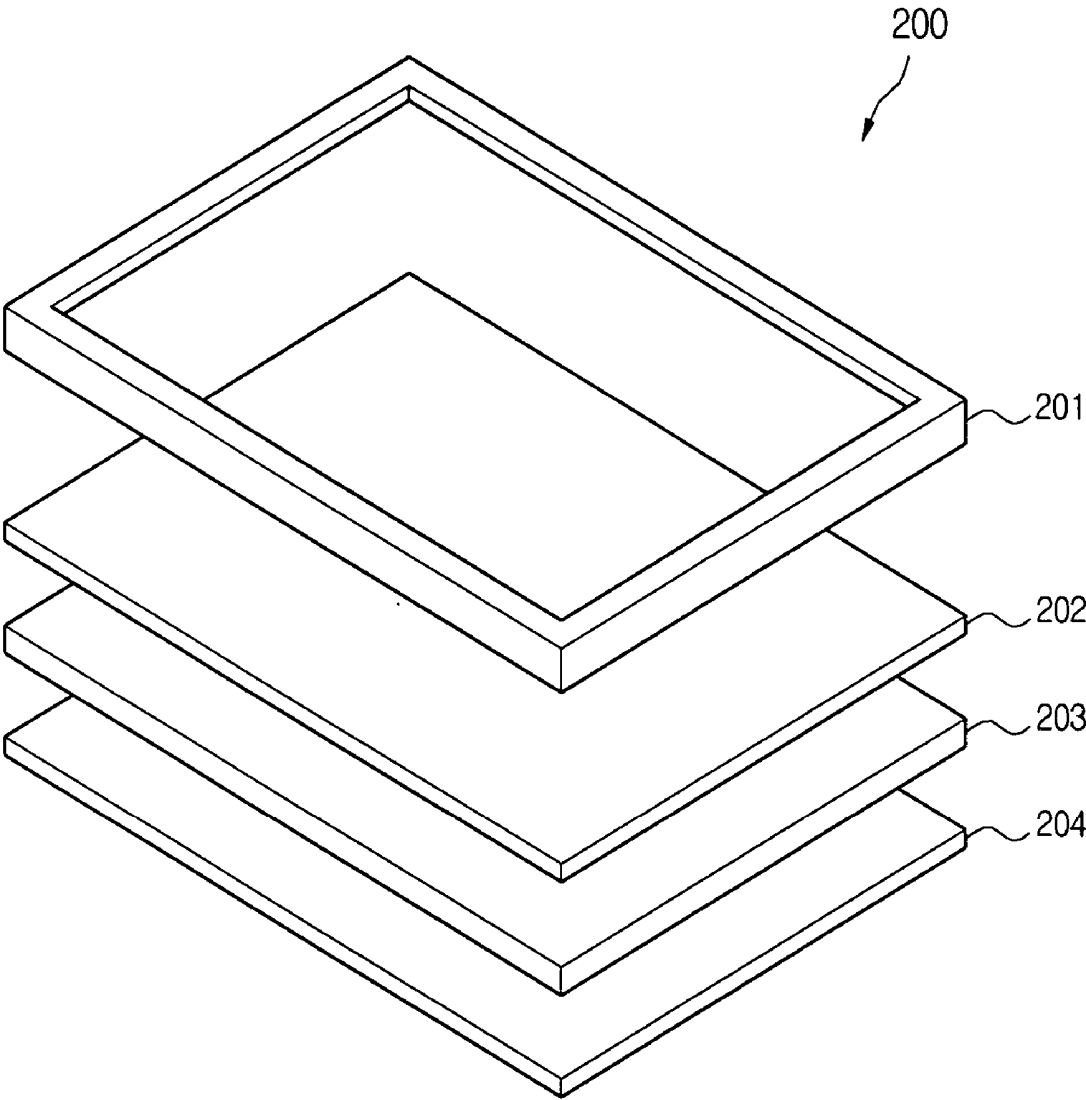


Fig.3

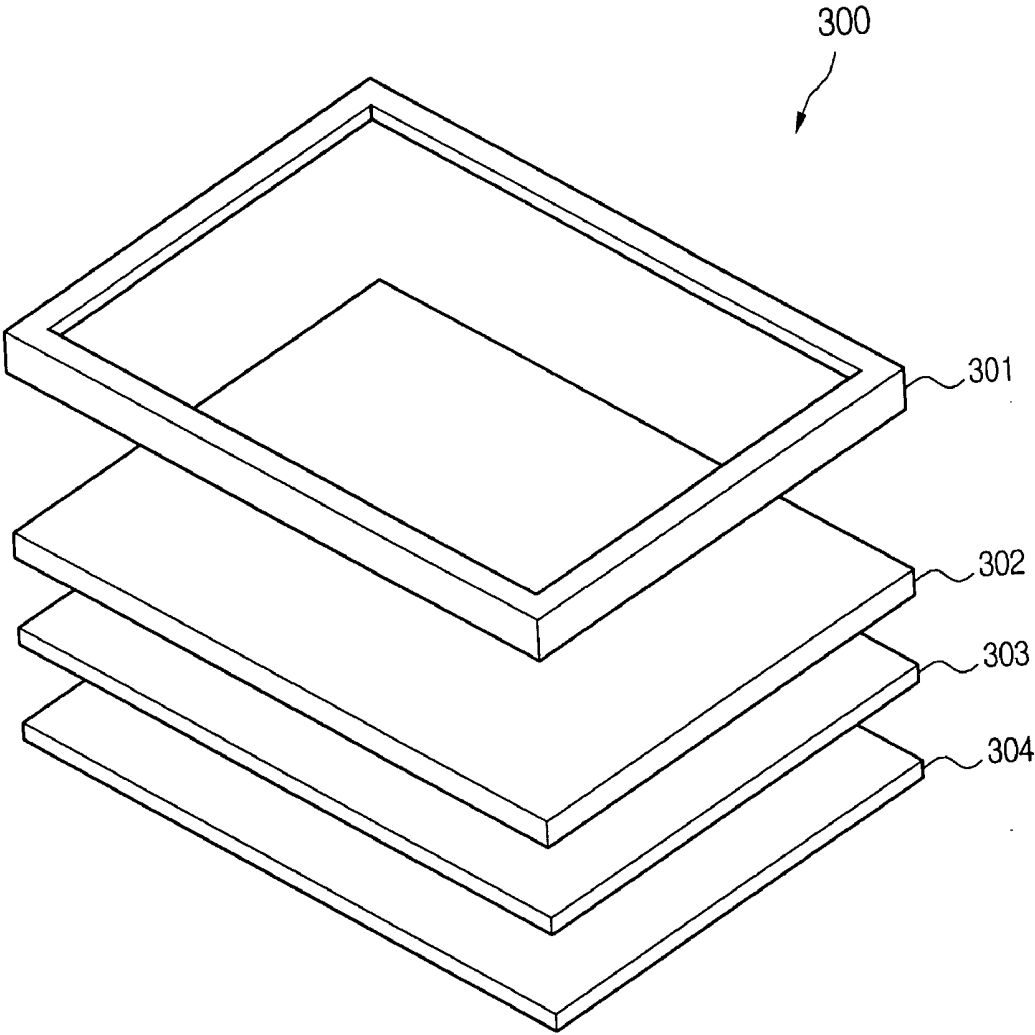
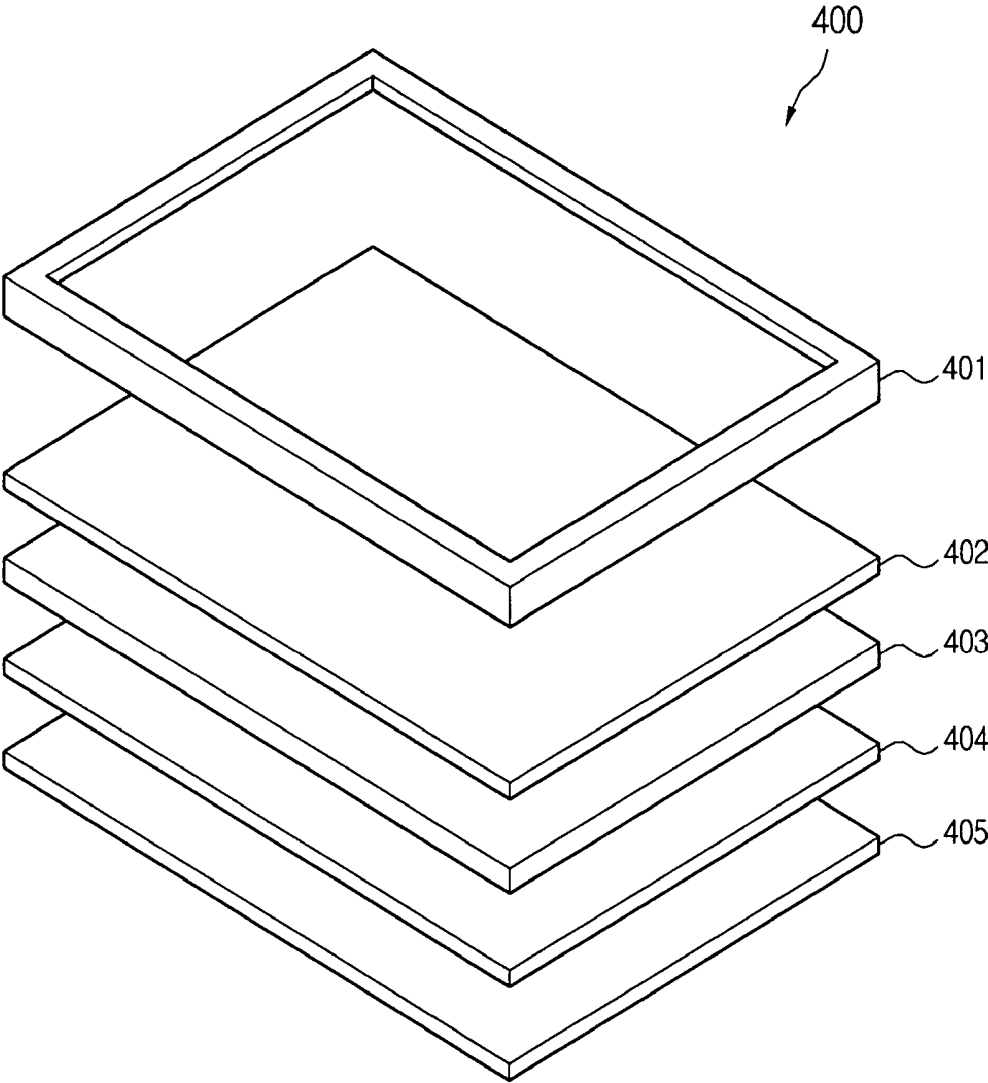


Fig.4



LIQUID CRYSTAL DISPLAY DEVICE

[0001] The present invention claims the benefit of Korean patent Application No. **2004-0030383** filed in Korea on Apr. 30, 2004, which is hereby incorporated by reference.

BACKGROUND OF THE INVENTION

[0002] 1. FIELD OF THE INVENTION

[0003] The present invention relates to a liquid crystal display device, and more particularly, to a liquid crystal display device adapted to prevent deformation due to a bending stress.

[0004] 2. DISCUSSION OF THE RELATED ART

[0005] Among the image display devices for displaying image data on screens, a related art cathode ray tube (CRT) has been most widely used. However, because of its size and weight, the related art CRT is inconvenient to use.

[0006] Accordingly, slim flat-panel display devices have developed. In spite of a large display areas, the flat-panel display devices are slim in size and can fit in most places. For these reasons, the related art CRT has been actively replaced with flat-panel display devices. Specifically, among the flat-panel display devices, a liquid crystal display device (LCD) has been widely accepted because of the high quality resolution while displaying an image. Especially, in displaying the moving pictures, the LCD has a response time as fast as the related art CRT.

[0007] The LCD is driven by an optical anisotropy and polarization of liquid crystal material. Since the liquid crystal molecules are thin and long in size, direction of liquid crystal material arrangement is controlled by applying an electric field to the liquid crystal material having directionality and polarity. Accordingly, when the alignment direction is controlled, the optical anisotropy of the liquid crystal material causes the light to be transmitted or blocked depending on the arrangement direction of the liquid crystal material. In this manner, the color and image are displayed.

[0008] An active matrix LCD (AMLCD) includes active elements arranged in pixels having a matrix configuration. The AMLCD controls the operation of the pixels using the switching characteristic of the active elements, thereby implementing the memory function through the electro-optic effect. Meanwhile, the LCD is a passive display device that does not have its own light source. Therefore, the LCD requires a lamp, a light guide plate, a sheet and other suitable parts.

[0009] **FIG. 1** is an exploded perspective view of a related art LCD. Referring to **FIG. 1**, a backlight assembly supplies light to a liquid crystal panel **120**.

[0010] An edge type backlight assembly includes a light source **140** for emitting light, a reflection plate **170** for reflecting the light emitted from the light source **140** in upward, a light guide plate **160** for guiding the reflected light, and a diffusion plate **130** for diffusing the guided light. Also, the backlight assembly further includes a lamp housing **150** for supporting the light source **140** and reflecting the emitted light toward the light guide plate **160**. The LCD **100** further includes a top case **110**, a main support **180** and a bottom cover **190**, which protect and support the liquid crystal panel **120**.

[0011] Although an edge type backlight assembly is described herein, a direct type backlight assembly having a plurality of light sources disposed underneath the liquid crystal panel is also widely accepted. Recently, large-sized LCD models of **60** inches or more have been developed. As the size of the LCD increases, the following problems arise.

[0012] The liquid crystal panel of increased-size leads to an extra stress being applied to the liquid crystal panel. This stress is produced by deformation of the liquid crystal panel due to bending and interference between mechanical parts (for example, the top case, the main support, the bottom cover, and other relevant parts). As the stress is applied to the liquid crystal panel, touch brightness non-uniformity occurs in the LCD and light leakage occurs around the edge portion.

SUMMARY OF THE INVENTION

[0013] Accordingly, the present invention is directed to a liquid crystal display device (LCD) that substantially obviates one or more of the problems due to limitations and disadvantages of the related art.

[0014] An object of the present invention is to provide an LCD capable of maintaining an image quality.

[0015] Additional features and advantages of the invention will be set forth in the description which follows, and in part will become apparent from the description, or may be learned by practice of the invention. The objectives and other advantages of the invention will be realized and attained by the structure particularly pointed out in the written description and claims hereof as well as the appended drawings. To achieve these and other advantages and in accordance with the purpose of the present invention, as embodied and broadly described, an LCD includes a liquid crystal panel displaying an image; a transparent plate disposed on the liquid crystal panel; a support member supporting the liquid crystal panel; and a fixing member disposed on the transparent plate, the fixing member coupled with the support member to fix the liquid crystal panel and the transparent plate in place, and to protect the liquid crystal panel and the transparent plate.

[0016] In another aspect, the LCD includes a liquid crystal panel displaying an image; a transparent plate disposed underneath the liquid crystal panel; a support member disposed underneath the transparent plate to support the transparent plate and the liquid crystal panel; and a fixing member disposed on the liquid crystal panel, the fixing member coupled with the support member to fix the liquid crystal panel and the transparent plate in place, and to protect the liquid crystal panel and the transparent plate.

[0017] In another aspect, the LCD includes a liquid crystal panel displaying an image; a first transparent plate disposed on the liquid crystal panel; a second transparent plate disposed underneath the liquid crystal panel; a support member disposed underneath the second transparent plate to support the second transparent plate and the liquid crystal panel; and a fixing member disposed on the first transparent plate, the fixing member coupled with the support member to fix the liquid crystal panel and the first and second transparent plates in place, and to protect the liquid crystal panel and the first and second transparent plates.

[0018] It is to be understood that both the foregoing general description and the following detailed description

are exemplary and explanatory and are intended to provide further explanation of the invention as claimed.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] The accompanying drawings, which are included to provide a further understanding of the invention and are incorporated in and constitute a part of this application, illustrate embodiments of the invention and together with the description serve to explain the principles of the invention. In the drawings:

[0020] **FIG. 1** is an exploded perspective view of a related art LCD;

[0021] **FIG. 2** is a conceptual view illustrating a structure of an LCD according to a first exemplary embodiment of the present invention;

[0022] **FIG. 3** is a conceptual view illustrating a structure of an LCD according to a second exemplary embodiment of the present invention; and

[0023] **FIG. 4** is a conceptual view illustrating a structure of an LCD according to a third exemplary embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0024] Reference will now be made in detail to the preferred embodiments of the present invention, examples of which are illustrated in the accompanying drawings.

[0025] The present invention provides an LCD that improves a picture quality by preventing a liquid crystal panel from deformation of the panel due to a bending stress. The preferred embodiments of the present invention will now be described in detail with reference to the accompanying drawings.

[0026] **FIG. 2** is a conceptual view illustrating a structure of an LCD according to a first exemplary embodiment of the present invention.

[0027] Referring to **FIG. 2**, an LCD **200** according to a first exemplary embodiment of the present invention includes a liquid crystal panel **203** displaying an image and a transparent plate **202** disposed on the liquid crystal panel **203**. The LCD **200** further includes a support member **204** and a fixing member **201**. The support member **204** supports the liquid crystal panel **202**. The fixing member **201** is disposed on the transparent member **204** and coupled to the support member **204**, such that the liquid crystal panel **203** and the transparent plate **202** are fixed in place and protected.

[0028] The fixing member **201** may be in a form of a top case or in the other form, and the support member **204** may be in a form of a main support, a bottom cover or in the other form. The fixing member **201** and the support member **204** can be modified in various manners, depending on the selection of the elements of the LCD. In addition, the fixing member **201** and the support member **204** can be modified depending on the presence or shape of a backlight assembly.

[0029] Although not shown, the LCD **200** may further include a backlight assembly for supplying light to the liquid crystal panel **203**. Furthermore, the backlight assembly may employ a direct type backlight assembly or an edge type

backlight assembly. The backlight assembly is disposed underneath the liquid crystal panel **203**.

[0030] Furthermore, the liquid crystal panel **203** includes a liquid crystal layer interposed between a first substrate and a second substrate. Polarizers may be attached to an upper portion of the first substrate and a lower portion of the second substrate. In general, a color filter layer and a common electrode are formed on the first substrate, and a switching element and a pixel electrode are formed on the second substrate. The liquid crystal panel **203** can be formed using a color filter on TFT (COT) structure or a TFT on color filter (TOC) structure.

[0031] The liquid crystal panel **203** can be implemented in various types, including a reflective type, a transmissive type, and a semi-transmissive type. In addition, the liquid crystal panel **203** is further implemented in various modes, including a Twisted Nematic (TN) mode, an In Plane Switching (IPS) mode and a Vertical Alignment (VA) mode.

[0032] Meanwhile, the LCD **200** of the present invention includes that the transparent plate **202** is disposed on the liquid crystal panel **203**. The transparent plate **202** protects the liquid crystal panel **203** and prevents the liquid crystal panel **203** from being directly exposed to an outside. At this time, since the transparent plate **202** is formed of material having a predetermined hardness, the liquid crystal panel **203** is prevented from being deformed due to its own weight or an external pressure.

[0033] According to the present invention, since the liquid crystal panel **203** is prevented from being deformed due to its own weight or an external force, it is possible to prevent the occurrence of touch brightness non-uniformity in the liquid crystal panel. The touch brightness non-uniformity is defined that an initial black state becomes un-uniform due to an unbalanced panel weight distribution when an external force is applied to the liquid crystal panel in a black mode.

[0034] As the size of the liquid crystal panel **203** increases, it is more difficult to control the touch brightness non-uniformity. However, the present invention targets to solve the above problem by providing the transparent plate **202** on the liquid crystal panel **203**. Specifically, the present invention is effective in an LCD having an increased-size liquid crystal panel of 60 inches or more.

[0035] Also, the present invention is more effective when implemented in an LCD having an IPS mode liquid crystal panel, compared with an LCD having a VA mode liquid crystal panel. This results from the characteristic of the IPS mode using a horizontal electric field. The IPS mode liquid crystal panel has a tendency that it is affected more by the deformation due to a bending stress.

[0036] According to the present invention, the transparent plate **202** having the predetermined hardness is disposed between the liquid crystal panel **203** and the fixing member **201**, thereby preventing the deformation of liquid crystal panel **203** by the bending stress. Consequently, light leakage around the edge portion can be reduced. The light leakage is defined that light leaks toward a periphery of the liquid crystal panel **203** due to the deformation of the liquid crystal panel **203** by the bending stress.

[0037] Furthermore, the present invention improves an amount of liquid crystal material margin used during the

manufacturing process of the liquid crystal panel. In designing a cell, the amount of liquid crystal material is determined by cell gaps given consideration to an electro optic property, shapes of a TFT array, and a color filter array inside the liquid crystal panel. An “amount of liquid crystal” period satisfying the design condition, is called “amount of liquid crystal” margin.

[0038] Meanwhile, in the case of an increased-size liquid crystal panel, if the amount of the liquid crystal increases to prevent the touch brightness non-uniformity, the “amount of liquid crystal” margin decreases. However, the present invention can solve the touch brightness non-uniformity using the transparent plate. Accordingly, it is possible to extend the “amount of liquid crystal” period that satisfies the design condition.

[0039] FIG. 3 is a conceptual view illustrating a structure of an LCD according to a second exemplary embodiment of the present invention.

[0040] Referring to FIG. 3, an LCD 300 according to a second exemplary embodiment of the present invention includes a liquid crystal panel 302 displaying an image and a transparent plate 303 disposed underneath the liquid crystal panel 302. The LCD 300 further includes a support member 304 and a fixing member 301. The support member 304 is disposed underneath the transparent plate 303 and supports both the transparent plate 303 and the liquid crystal panel 302. Furthermore, the fixing member 301 is disposed on the liquid crystal panel 302. The fixing member 301 is coupled to the support member 304, such that the liquid crystal panel 302 and the transparent plate 303 are fixed in place and protected.

[0041] The fixing member 301 may be in a form of a top case or in the other form, and the support member 304 may be in a form of a main support, a bottom cover or in the other form. The fixing member 301 and the support member 304 are adapted to be modified in various manners, depending on the selection of the elements of the LCD. Furthermore, the fixing member 301 and the support member 304 are adapted to be modified depending on the presence or shape of a backlight assembly.

[0042] Although not shown, the LCD 300 may further include a backlight assembly for supplying light to the liquid crystal panel 302. In addition, the backlight assembly may employ either a direct type backlight assembly or an edge type backlight assembly. The backlight assembly is disposed underneath the liquid crystal panel 302.

[0043] Although not shown, the liquid crystal panel 302 includes a liquid crystal layer interposed between a first substrate and a second substrate. Polarizers may be attached to an upper portion of the first substrate and a lower portion of the second substrate. In general, a color filter layer and a common electrode are formed on the first substrate, and a switching element and a pixel electrode are formed on the second substrate. The liquid crystal panel 302 can be by either a color filter on TFT (COT) structure or a TFT on color filter (TOC) structure.

[0044] The liquid crystal panel 302 is adapted to be implemented in various types, including a reflective type, a transmissive type and a semi-transmissive type. Furthermore, the liquid crystal panel 302 is adapted to be imple-

mented in various modes, including a Twisted Nematic (TN) mode, an In Plane Switching (IPS) mode and a Vertical Alignment (VA) mode.

[0045] Meanwhile, the LCD 300 of the present invention is characterized in that the transparent plate 303 is disposed underneath the liquid crystal panel 302. The transparent plate 303 removes a mechanical gap between the support member 304 and the liquid crystal panel 302. At this time, since the transparent plate 303 is formed of material having a predetermined hardness, the liquid crystal panel 302 is prevented from being deformed due to its own weight or a pressure applied by the mechanical gap between the support member 304 and the liquid crystal panel 302. Accordingly, the occurrence of touch brightness non-uniformity in the liquid crystal panel can be prevented.

[0046] As the size of the liquid crystal panel 302 increases, it becomes more difficult to control the touch brightness non-uniformity. However, the present invention manages the above problem by providing the transparent plate 303 disposed underneath the liquid crystal panel 302. Specifically, the present invention is effective when implemented in an LCD having an increased-size liquid crystal panel of 60 inches or more.

[0047] The present invention further provides better control over the touch brightness non-uniformity in an LCD having an IPS mode liquid crystal panel as compared with an LCD having a VA mode liquid crystal panel. This results from the electrical characteristic of the IPS mode using a horizontal electric field, because the IPS mode liquid crystal panel is affected more by the deformation due to bending stress.

[0048] According to the present invention, the transparent plate 303 having the predetermined hardness is disposed between the liquid crystal panel 302 and the support member 304, thereby preventing the liquid crystal panel 302 from deformation due to bending stress. Consequently, light leakage around the edge portion can be reduced.

[0049] Further, the present invention improves an amount of liquid crystal used during the manufacturing process of the liquid crystal panel. In designing a cell, the amount of liquid crystal material is determined by cell gaps given consideration to an electro optic property, shapes of a TFT array, and a color filter array inside the liquid crystal panel. An “amount of liquid crystal” period satisfying the design condition, is called an “amount of liquid crystal” margin.

[0050] Meanwhile, with an increased-size liquid crystal panel, if the amount of the liquid crystal material increases to control the touch brightness non-uniformity, the “amount of liquid crystal” margin decreases. However, the present invention can manage the touch brightness non-uniformity by the transparent plate. Accordingly, it is possible to extend the “amount of liquid crystal” period satisfying the design condition.

[0051] FIG. 4 is a conceptual view illustrating a structure of an LCD according to a third exemplary embodiment of the present invention.

[0052] Referring to FIG. 4, an LCD 400 according to a third exemplary embodiment of the present invention includes a liquid crystal panel 403 displaying an image, a first transparent plate 402 disposed on the liquid crystal

panel 403, and a second transparent plate 404 disposed underneath the liquid crystal panel 403. The LCD 400 further includes a support member 405 and a fixing member 401.

[0053] The support member 405 is disposed underneath the second transparent plate 404 and supports the second transparent plate 404 and the liquid crystal panel 403. The fixing member 401 is disposed on the first transparent plate 402. The fixing member 401 is coupled to the support member 405 such that the liquid crystal panel 403 and the first and second transparent plates 402 and 404 are fixed in place and protected.

[0054] The fixing member 401 may be in a form of a top case or in the other form, and the support member 405 may be in a form of a main support, a bottom cover or in the other form.

[0055] The fixing member 401 and the support member 405 are adapted to be modified in various manners, depending on the selection of the elements of the LCD. Also, the fixing member 401 and the support member 405 are adapted to be modified depending on the presence or shape of a backlight assembly.

[0056] Although not shown, the LCD 400 may further include a backlight assembly for supplying light to the liquid crystal panel 403. The backlight assembly may employ either a direct type backlight assembly or an edge type backlight assembly. The selected backlight assembly is disposed underneath the liquid crystal panel 403.

[0057] Although not shown, the liquid crystal panel 403 includes a liquid crystal layer interposed between a first substrate and a second substrate. Polarizers may be attached to an upper portion of the first substrate and a lower portion of the second substrate. In general, a color filter layer and a common electrode are formed on the first substrate, and a switching element and a pixel electrode are formed on the second substrate. The liquid crystal panel 403 can be formed by either a color filter on TFT (COT) structure or a TFT on color filter (TOC) structure.

[0058] The liquid crystal panel 403 is adapted to be implemented in various types, including a reflective type, a transmissive type, and a semi-transmissive type. Furthermore, the liquid crystal panel 403 is adapted to be implemented in various modes, including a Twisted Nematic (TN) mode, an In Plane Switching (IPS) mode and a Vertical Alignment (VA) mode.

[0059] Meanwhile, the LCD 400 of the present invention includes that the first and second transparent plates 402 and 404 are respectively disposed on and underneath the liquid crystal panel 403. The first transparent plate 402 protects the liquid crystal panel 403 and prevents the liquid crystal panel 403 from being directly exposed to an outside. At this time, since the first transparent plate 402 is formed of material having a predetermined hardness, the liquid crystal panel 403 is prevented from being deformed due to its own weight or an external pressure.

[0060] In addition, the second transparent plate 404 removes a mechanical gap between the support member 405 and the liquid crystal panel 403. Accordingly, the liquid crystal panel 403 is prevented from deformation due to its

own weight or a pressure applied by the mechanical gap between the support member 405 and the liquid crystal panel 403.

[0061] The present invention provides more stable protection for the liquid crystal panel 403 from deformation. Accordingly, it is possible to prevent the occurrence of touch brightness non-uniformity in the liquid crystal panel.

[0062] As the size of the liquid crystal panel 403 increases, it becomes more difficult to control the touch brightness non-uniformity. However, the present invention can manage the above problem by providing the first and second transparent plates 402 and 404 on and underneath the liquid crystal panel 403. Specifically, the present invention is effective when implemented in an LCD having an increased-size liquid crystal panel of 60 inches or more.

[0063] In addition the present invention further provides better control over the touch brightness non-uniformity LCD having an ISP mode liquid crystal panel, compared with an LCD having a VA mode liquid crystal panel. This results from the electrical characteristic of the IPS mode using horizontal electric field, because the IPS mode liquid crystal panel is affected more by the deformation due to the bending stress.

[0064] According to the present invention, the first transparent plate 402 having the predetermined hardness is disposed between the liquid crystal panel 403 and the fixing member 401, and the second transparent plate 404 having the predetermined hardness is disposed between the liquid crystal panel 403 and the support member 405, thereby preventing the liquid crystal panel 403 from being deformed. Consequently, light leakage around the edge portion can be reduced.

[0065] Furthermore, the present invention can improve an amount of liquid crystal material margin used during the process of manufacturing the liquid crystal panel. In designing a cell, an amount of liquid material crystal is determined by cell gaps given consideration to an electro optic property, shapes of a TFT array, and a color filter array inside the liquid crystal panel. An "amount of liquid crystal" period of a region, which can satisfy the design condition, is called an "amount of liquid crystal" margin.

[0066] Meanwhile, in the case of an increased-size liquid crystal panel, if the amount of the liquid crystal increases to control the touch brightness non-uniformity, the "amount of liquid crystal" margin decreases. However, the present invention can manage the touch brightness non-uniformity using the transparent plate. Accordingly, it is possible to extend the "amount of liquid crystal" period satisfying the design condition.

[0067] As described above, the LCD according to the present invention improves the image quality by preventing the deformation of the liquid crystal panel due to the bending stress. In addition, the LCD according to the present invention reduces the touch brightness non-uniformity, thereby preventing the light leakage around the edge portion. Moreover, the LCD according to the present invention extends the "amount of liquid crystal" period.

[0068] It will be apparent to those skilled in the art that various modifications and variations can be made in the liquid crystal display device (LCD) of the present invention,

without departing from the spirit or scope of the invention. Thus, it is intended that the present invention cover the modifications and variations of this invention provided they come within the scope of the appended claims and their equivalents.

What is claimed is:

1. A liquid crystal display device (LCD), comprising:
 - a liquid crystal panel displaying an image;
 - a transparent plate disposed on the liquid crystal panel;
 - a support member supporting the liquid crystal panel; and
 - a fixing member disposed on the transparent plate, the fixing member coupled with the support member to fix the liquid crystal panel and the transparent plate in place, and to protect the liquid crystal panel and the transparent plate.
2. The LCD according to claim 1, wherein the liquid crystal panel includes at least one of a TN (Twisted Nematic) mode, an IPS (In Plane Switching) mode and a VA (Vertical Alignment) mode.
3. The LCD according to claim 1, further comprising a backlight assembly disposed underneath the liquid crystal panel to supply light to the liquid crystal panel.
4. The LCD according to claim 3, wherein the backlight assembly is a direct type backlight assembly.
5. The LCD according to claim 3, wherein the backlight assembly is an edge type backlight assembly.
6. The LCD according to claim 1, wherein the liquid crystal panel includes:
 - a first substrate;
 - a second substrate spaced apart from the first substrate by a predetermined distance;
 - a liquid crystal layer disposed between the first substrate and the second substrate;
 - a first polarizer disposed on the first substrate; and
 - a second polarizer disposed underneath the second substrate.
7. An LCD, comprising:
 - a liquid crystal panel displaying an image;
 - a transparent plate disposed underneath the liquid crystal panel;
 - a support member disposed underneath the transparent plate to support the transparent plate and the liquid crystal panel; and
 - a fixing member disposed on the liquid crystal panel, the fixing member coupled with the support member to fix the liquid crystal panel and the transparent plate in place, and to protect the liquid crystal panel and the transparent plate.
8. The LCD according to claim 7, wherein the liquid crystal panel includes at least one of a TN (Twisted Nematic) mode, an IPS (In Plane Switching) mode and a VA (Vertical Alignment) mode.

9. The LCD according to claim 7, further comprising a backlight assembly disposed underneath the liquid crystal panel to supply light to the liquid crystal panel.

10. The LCD according to claim 9, wherein the backlight assembly is a direct type backlight assembly.

11. The LCD according to claim 9, wherein the backlight assembly is an edge type backlight assembly.

12. The LCD according to claim 7, wherein the liquid crystal panel includes:

- a first substrate;
- a second substrate spaced apart from the first substrate by a predetermined distance;
- a liquid crystal layer disposed between the first substrate and the second substrate;
- a first polarizer disposed on the first substrate; and
- a second polarizer disposed underneath the second substrate.

13. An LCD, comprising:

- a liquid crystal panel displaying an image;
- a first transparent plate disposed on the liquid crystal panel;
- a second transparent plate disposed underneath the liquid crystal panel;
- a support member disposed underneath the second transparent plate to support the second transparent plate and the liquid crystal panel; and
- a fixing member disposed on the first transparent plate, the fixing member coupled with the support member to fix the liquid crystal panel and the first and second transparent plates in place, and to protect the liquid crystal panel and the first and second transparent plates.

14. The LCD according to claim 13, wherein the liquid crystal panel includes at least one of a TN (Twisted Nematic) mode, an IPS (In Plane Switching) mode and a VA (Vertical Alignment) mode.

15. The LCD according to claim 13, further comprising a backlight assembly disposed underneath the liquid crystal panel to supply light to the liquid crystal panel.

16. The LCD according to claim 15, wherein the backlight assembly is a direct type backlight assembly.

17. The LCD according to claim 15, wherein the backlight assembly is an edge type backlight assembly.

18. The LCD according to claim 13, wherein the liquid crystal panel includes:

- a first substrate;
- a second substrate spaced apart from the first substrate by a predetermined distance;
- a liquid crystal layer disposed between the first substrate and the second substrate;
- a first polarizer disposed on the first substrate; and
- a second polarizer disposed underneath the second substrate.

* * * * *

专利名称(译)	液晶显示装置		
公开(公告)号	US20050243242A1	公开(公告)日	2005-11-03
申请号	US11/020172	申请日	2004-12-27
[标]申请(专利权)人(译)	乐金显示有限公司		
申请(专利权)人(译)	LG.PHILIPS LCD CO.LTD.		
当前申请(专利权)人(译)	LG DISPLAY CO. , LTD.		
[标]发明人	MOON HONG MAN LEE SU WOONG PAIK SANG YOON		
发明人	MOON, HONG-MAN LEE, SU-WOONG PAIK, SANG-YOON		
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优先权	1020040030383 2004-04-30 KR		
外部链接	Espacenet USPTO		

摘要(译)

液晶显示装置 (LCD) 包括显示图像的液晶面板;透明板设置在液晶面板上;支撑液晶面板的支撑构件;固定构件设置在透明板上, 固定构件与支撑构件连接, 以将液晶面板和透明板固定就位, 并保护液晶面板和透明板。

