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(54) **Backlight assembly and liquid crystal display having the same**

Rückbeleuchtungsvorrichtung und Flüssigkristallanzeige damit

Ensemble de rétroéclairage et affichage à cristaux liquides doté de celui-ci

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Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates to a backlight assembly and a liquid crystal display having the same, and more particularly, to a backlight assembly, in which a light source and a receiving member are fastened to each other using a simplified fastening configuration, and a liquid crystal display having the backlight assembly.

[0002] The related backlight assembly includes a light source unit having a circuit board, and a light source mounted on the circuit board. The backlight assembly also includes a receiving container on which the light source unit is disposed, and a first fastening unit for fastening the light source unit to the receiving container. The first fastening unit includes a first fastening hole formed in the circuit board, and a protrusion which is formed on the receiving container and is inserted into the first fastening hole to be fastened thereto. The circuit board includes a first side on which the light source is mounted and a second side facing the receiving container.

2. Description of the Related Art

[0003] Such a backlight assembly is known from US 2006/0279946 A1

[0004] A backlight assembly using a light emitting diode ("LED") as a light source for a liquid crystal display has been developed. The backlight assembly using an LED may have various features, such as low power consumption, lightweight, and a slim shape as compared with conventional backlight assemblies using a cold cathode fluorescent lamp ("CCFL"). Generally, such a light source has been fastened to a chassis using a plurality of screws. However, such a fastening scheme results in an increase in manufacturing process time and material cost.

BRIEF SUMMARY OF THE INVENTION

[0005] Aspects of the present invention include a backlight assembly, in which a light source and a receiving member are fastened to each other using a simplified fastening configuration, and a liquid crystal display having the backlight assembly.

[0006] According to one aspect of the present invention, there is provided a backlight assembly, wherein an upper portion of the protrusion is disposed on the first side.

[0007] The protrusion may be formed integrally with the receiving container.

[0008] The receiving container may include a base plate and a sidewall bent from the base plate.

[0009] The protrusion of the first fastening unit may be formed on the sidewall of the receiving container.

[0010] In another exemplary embodiment of the present invention, the backlight assembly may further include a second fastening unit for fastening the light source unit to the receiving container.

5 **[0011]** The second fastening unit may include a second fastening hole formed in the circuit board, a third fastening hole formed in the sidewall of the receiving container, and a fastening member inserted into the second hole and the third hole to be fastened thereto.

10 **[0012]** The second fastening holes may be formed at both ends of the circuit board, and the third fastening holes may be formed in the sidewall of the receiving container corresponding to positions of the second fastening holes.

15 **[0013]** The second fastening unit may include a second fastening hole formed in the circuit board and a hook formed on the sidewall of the receiving container.

[0014] The second fastening unit may include a fixing unit which is extended and bent from one end of the sidewall of the receiving container.

20 **[0015]** In another exemplary embodiment of the present invention, the protrusion of the first fastening unit may be formed on the base plate of the receiving container.

25 **[0016]** In yet another exemplary embodiment of the present invention, the backlight assembly may further include a second fastening unit for fastening the light source to the receiving container.

30 **[0017]** The second fastening unit may include a second fastening hole formed in the circuit board, a third fastening hole formed in the base plate of the receiving container, and a fastening member inserted into the second fastening hole and the third fastening hole to be fastened thereto.

35 **[0018]** The second fastening unit may include a second fastening hole formed in the circuit board, and a hook formed on the base plate of the receiving container.

[0019] The light source unit may include a plurality of circuit boards spaced apart from each other, each of the circuit boards formed in the shape of a bar.

40 **[0020]** The circuit board may be formed corresponding to the shape of the base plate.

[0021] The light source unit may include a plurality of substrates spaced apart from each other, each of the substrates formed in the shape of a bar. The second fastening holes may be formed at both ends of the substrates, respectively, and the third fastening holes may be formed in the sidewall of the receiving container corresponding to positions of the second fastening holes.

50 **[0022]** The circuit board may be formed corresponding to a shape of the base plate, the second fastening holes may be formed in at least one end of the circuit board, and the third fastening holes may be formed in the base plate of the receiving container corresponding to positions of the second fastening hole.

55 **[0023]** According to another aspect of the present invention, there is provided a liquid crystal display including the backlight assembly and a liquid crystal display panel

disposed on the backlight assembly to display an image.

BRIEF DESCRIPTION OF THE DRAWINGS

[0024] The above and other aspects, features, and advantages of the present invention will become more apparent by describing in detail exemplary embodiments thereof with reference to the attached drawings in which:

FIG 1 is an exploded perspective view of a backlight assembly according to a first exemplary embodiment of the present invention;

FIG 2 is an enlarged view of a protrusion shown in FIG 1;

FIGS. 3A and 3B are perspective and plan views, respectively, showing an assembled state of the backlight assembly shown in FIG 1;

FIG 4 is an exploded perspective view of a backlight assembly according to a second exemplary embodiment of the present invention;

FIGS. 5A and 6A are exploded perspective views of modifications of the second exemplary embodiment of the present invention, respectively, and FIGS. 5B and 6B are perspective views showing assembled states thereof, respectively;

FIG 7 is an exploded perspective view of a liquid crystal display including the backlight assembly shown in FIG 4;

FIG. 8 is an exploded perspective view of a liquid crystal display including a backlight assembly according to a third exemplary embodiment of the present invention;

FIG. 9 is a plan view showing an assembled state of the backlight assembly according to the third exemplary embodiment of the present invention;

FIG 10 is a plan view of a backlight assembly according to a fourth exemplary embodiment of the present invention;

FIG 11 is a plan view of a backlight assembly according to a fifth exemplary embodiment of the present invention; and

FIG 12 is an exploded perspective view of a liquid crystal display having a backlight assembly according to a sixth exemplary embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0025] Hereinafter, exemplary embodiments of the present invention will be described in detail with reference to the accompanying drawings. The present invention may, however, be embodied in many different forms and should not be construed as limited to the exemplary embodiments set forth herein. Rather, these exemplary embodiments are provided so that this disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art. In the drawings, the size and relative sizes of layers and regions may be

exaggerated for clarity.

[0026] It will be understood that when an element or layer is referred to as being "on," "connected to" or "coupled to" another element or layer, it can be directly on, connected or coupled to the other element or layer or intervening elements or layers may be present. In contrast, when an element is referred to as being "directly on," "directly connected to" or "directly coupled to" another element or layer, there are no intervening elements or layers present. Like numbers refer to like elements throughout. As used herein, the term "and/or" includes any and all combinations of one or more of the associated listed items.

[0027] It will be understood that, although the terms first, second, third etc. may be used herein to describe various elements, components, regions, layers and/or sections, these elements, components, regions, layers and/or sections should not be limited by these terms. These terms are only used to distinguish one element, component, region, layer or section from another element, component, region, layer or section. Thus, a first element, component, region, layer or section discussed below could be termed a second element, component, region, layer or section without departing from the teachings of the present invention.

[0028] Spatially relative terms, such as "beneath," "below," "lower," "above," "upper" and the like, may be used herein for ease of description to describe one element or feature's relationship to another element(s) or feature(s) as illustrated in the figures. It will be understood that the spatially relative terms are intended to encompass different orientations of the device in use or operation in addition to the orientation depicted in the figures. For example, if the device in the figures is turned over, elements described as "below" or "lower" other elements or features would then be oriented "above" or "upper" relative to the other elements or features. Thus, the exemplary term "below" can encompass both an orientation of above and below. The device may be otherwise oriented (rotated 90 degrees or at other orientations) and the spatially relative descriptors used herein interpreted accordingly.

[0029] The terminology used herein is for the purpose of describing particular embodiments only and is not intended to be limiting of the invention. As used herein, the singular forms "a," "an" and "the" are intended to include the plural forms as well, unless the context clearly indicates otherwise. It will be further understood that the terms "comprises" and/or "comprising," when used in this specification, specify the presence of stated features, integers, steps, operations, elements, and/or components, but do not preclude the presence or addition of one or more other features, integers, steps, operations, elements, components, and/or groups thereof.

[0030] Unless otherwise defined, all terms (including technical and scientific terms) used herein have the same meaning as commonly understood by one of ordinary skill in the art to which this invention belongs. It will be

further understood that terms, such as those defined in commonly used dictionaries, should be interpreted as having a meaning that is consistent with their meaning in the context of the relevant art and will not be interpreted in an idealized or overly formal sense unless expressly so defined herein.

[0031] FIG 1 is an exploded perspective view of a backlight assembly according to a first exemplary embodiment of the present invention, and FIG 2 is an enlarged view of a protrusion shown in FIG 1. FIGS. 3A and 3B are perspective and plan views showing an assembled state of the backlight assembly shown in FIG 1, respectively.

[0032] Referring to FIGS. 1 to 3B, the backlight assembly includes a light source unit 400, a bottom chassis 900 and a first fastening unit 610.

[0033] The light source unit 400 includes a circuit board 410 and light emitting diodes 450 mounted on the circuit board 410. The bottom chassis 900 includes a base plate 910 and sidewalls 920 bent from the base plate 910, and has a receiving space defined therein. The light source unit 400 is disposed on and fastened to one of the sidewalls 920 of the bottom chassis 900 by means of the first fastening unit 610. The first fastening unit 610 includes first fastening holes 430 formed in the circuit board 410 and protrusions 930 formed on the sidewall 920 of the bottom chassis 900, so that the protrusions 930 can be inserted into the first fastening holes 430 to be fastened thereto. The protrusions 930 may be formed integrally with the bottom chassis 900.

[0034] A printed circuit board on which a circuit pattern is formed may be used as the circuit board 410 of the light source unit 400. The printed circuit board may be one of various printed circuit boards, such as a flexible printed circuit board ("FPCB"), a rigid printed circuit board or a metal printed circuit board. Further, the circuit board 410 may be formed in a rectangular shape, e.g., a bar shape. That is, the circuit board 410 may be configured to have a shape corresponding to that of the sidewall 920 of the bottom chassis 900.

[0035] The light emitting diodes 450 mounted on the circuit board 410 include red R, green G and blue B light emitting diodes, which are combined to make white light. However, a method of making the white light is not limited thereto.

[0036] The first fastening holes 430 are formed in regions of the circuit board 410 to which the light emitting diodes 450 are not mounted, and the protrusions 930 are formed to protrude from the sidewall 920 of the bottom chassis 900 toward the receiving space therein. The protrusions 930 may be formed corresponding to the size and shape of the first fastening holes 430, respectively. Accordingly, the protrusions 930 are inserted into the first fastening holes 430 and fastened thereto, so that the circuit board 410 of the light source unit 400 is fixed to the sidewall 920 of the bottom chassis 900. In an exemplary embodiment, the protrusions 930 and the first fastening holes 430 are formed in a rectangular or square

shape. However, the shape of the first fastening unit 610 is not limited thereto, but may be changed variously.

[0037] Although the light source unit 400 is disposed only on the longer upper sidewall among the sidewalls 920 of the bottom chassis 900 in the present embodiment, the present invention is not limited thereto. For example, the light source unit 400 may be disposed on two or more sidewalls, or on a shorter sidewall as well as the longer sidewall.

[0038] FIG. 4 is an exploded perspective view of a backlight assembly according to a second exemplary embodiment of the present invention. The second embodiment of the present invention further includes a second fastening unit, as compared to the first exemplary embodiment. Some of the elements of the second exemplary embodiment are substantially similar to those of the first exemplary embodiment. To this extent, the following description will be focused on the differences.

[0039] Referring to FIG. 4, the backlight assembly according to the second exemplary embodiment includes a light source unit 400, a bottom chassis 900, a first fastening unit 610 and a second fastening unit 620.

[0040] The light source unit 400 includes a circuit board 410 and light emitting diodes 450 mounted on the circuit board 410. The bottom chassis 900 includes a base plate 910 and sidewalls 920 bent from the base plate 910, and has a receiving space defined therein. Light emitting diodes for emitting white light using a phosphor may be used as the light emitting diodes 450 mounted on the circuit board 410.

[0041] The light source unit 400 is disposed on and fastened to a sidewalls 920 of the bottom chassis 900 by means of the first fastening unit 610, and the fastening force between the light source unit 400 and the sidewall 920 is reinforced by means of the second fastening unit 620.

[0042] The first fastening unit 610 includes first fastening holes 430 formed in the circuit board 410 and protrusions 930 formed on the sidewall 920 of the bottom chassis 900, so that the protrusions 930 may be inserted into the first fastening holes 430 to be fastened thereto, respectively. The protrusions 930 may be formed integrally with the bottom chassis 900.

[0043] The second fastening unit 620 includes second fastening holes 440 formed in the circuit board 410, third fastening holes 940 formed in the sidewall 920 of the bottom chassis 900, and fastening members 480 inserted into the second fastening holes 440 and the third fastening holes 940 and fastened thereto, respectively. The second fastening unit 620 reinforces the fastening force for preventing the light source unit 400 fixed on the bottom chassis 900 by means of the first fastening unit 610 from being detached by an external shock.

[0044] The second fastening holes 440 are formed at both ends of the circuit board 410 to which the light emitting diodes 450 are not mounted, and the third fastening holes 940 are formed at both ends of the sidewall 920 of the bottom chassis 900 corresponding to positions of the

second fastening holes 440. Screws may be used as the fastening members 480, but the present invention is not limited thereto. In addition, the components of the second fastening unit 620 may be formed at both ends of the circuit board 410 and the sidewall 920, respectively. However, the position and number of the components of the second fastening unit 620 are not limited thereto, but may be variously changed. Referring to FIGS. 5A to 6B, a variety of modifications of the second fastening unit 620 will be described below.

[0045] FIGS. 5A and 6A are exploded perspective views showing modifications of the second exemplary embodiment of the present invention, and FIGS. 5B and 6B are perspective views showing assembled states thereof, respectively.

[0046] Referring to FIGS. 5A and 5B, a second fastening unit 620 includes second fastening holes 440 formed in a circuit board 410, and hooks 950 formed on a sidewall 920 of a bottom chassis 900. The hooks 950 are inserted into and pass through the second fastening holes 440, whereby the circuit board 410 can be fixed on the sidewall 920 of the bottom chassis 900.

[0047] Referring to FIGS. 6A and 6B, a second fastening unit 620 includes fixing units 960, each of which extends inward from one end of a sidewall 920 of a bottom chassis 900 and includes a bent portion that extends downward toward the base plate 910. In other words, one end of each fixing unit 960 is formed to face a base plate 910 of the bottom chassis 900, while the other end of the fixing unit 960 is formed to face the sidewall 920 of the bottom chassis 900. The first end of the fixing unit 960 may be disposed perpendicular to the second end of the fixing unit 960. The circuit board 410 is disposed in a space defined between the fixing units 960 and the sidewall of the bottom chassis 900, so that the circuit board 410 can be primarily fixed by means of the first fastening unit 610 and secondarily fixed by means of the second fastening unit 620, i.e., the fixing units 960.

[0048] FIG 7 is an exploded perspective view showing a liquid crystal display having the backlight assembly shown in FIG 4.

[0049] Referring to FIG 7, the liquid crystal display includes a liquid crystal display panel 100, driving circuit units 220 and 240, a top chassis 300, and the backlight assembly for providing a light to the liquid crystal display panel 100. The backlight assembly includes the light source unit 400, a light guide plate 500, a reflecting plate 550, a plurality of optical sheets 700, a mold frame 800 and the bottom chassis 900.

[0050] The liquid crystal display panel 100 includes a color filter substrate 110, a thin-film transistor ("TFT") substrate 120, and a liquid crystal layer (not shown) which is interposed between the color filter substrate 110 and the TFT substrate 120, thereby serving to display an image.

[0051] The driving circuit units 220 and 240 are connected to the liquid crystal display panel 100, and include a gate side printed circuit board 224, which is mounted

with a control integrated circuit ("IC") and applies a predetermined gate signal to a gate line of the TFT substrate 120, a data side printed circuit board 244, which is mounted with a control IC and applies a predetermined gate signal to a data line of the TFT substrate 120, a gate side flexible printed circuit board 222 for connecting the TFT substrate 120 to the gate side printed circuit board 224, and a data side flexible printed circuit board 242 for connecting the TFT substrate 120 to the data side printed circuit board 244. The gate side and data side printed circuit boards 224 and 244 are respectively connected to the gate side and data side flexible printed circuit boards 222 and 242 in order to apply a gate driving signal and an external image signal. The gate side and data side printed circuit boards 224 and 244 may be integrated to be formed into a single printed circuit board. Further, a driving IC (not shown) is installed to the flexible printed circuit boards 222 and 242, so that Red, Green and Blue (RGB) signals generated from the gate side and data side printed circuit boards 224 and 244, power and the like are transferred to the liquid crystal display panel 100.

[0052] The light source unit 400 includes the circuit board 410 and the light emitting diodes 450 mounted on the circuit board 410. The bottom chassis 900 includes the base plate 910 and the sidewalls 920 bent from the base plate 910, and has the receiving space defined therein.

[0053] The light source unit 400 is disposed on and fastened to the sidewall 920 of the bottom chassis 900 by means of the first fastening unit 610, and the fastening force between the light source unit 400 and the sidewall 920 is reinforced by means of the second fastening unit 620.

[0054] The reflecting plate 550, the light guide plate 500, a diffusion plate 720 and a prism sheet 710 are sequentially disposed and received in the receiving space of the bottom chassis 900.

[0055] The light source unit 400 is disposed on one side of the light guide plate 500. The light emitted from the light source unit 400 is converted to a surface light source by the light guide plate 500, and then emitted towards the liquid crystal display panel 100. Although a flat-plate type light guide plate is employed in the embodiment of the present invention, the present invention is not limited thereto. That is, a wedge type light guide plate may be used. The mold frame 800 is fastened to the bottom chassis 900 and serves to support the liquid crystal display panel 100.

[0056] FIG 8 is an exploded perspective view showing a liquid crystal display including a backlight assembly according to a third exemplary embodiment of the present invention, FIG 9 is a plan view showing an assembled state of the backlight assembly according to the third exemplary embodiment of the present invention, FIG 10 is a plan view of a backlight assembly according to a fourth exemplary embodiment of the present invention, and FIG 11 is a plan view showing a backlight assembly according to a fifth exemplary embodiment of the

present invention.

[0057] The third to fifth exemplary embodiments of the present invention are examples in which the fastening configurations according to the first or second exemplary embodiment are employed to a direct type backlight assembly, and the following description will be focused on the differences.

[0058] Referring to FIGS. 8 and 9, a liquid crystal display includes a liquid crystal display panel 100, driving circuit units 220 and 240, a top chassis 300 and a backlight assembly for providing light to the liquid crystal display panel 100. The backlight assembly includes light source units 400, first fastening units 610, a plurality of optical sheets 700, a mold frame 800, and a bottom chassis 900.

[0059] Each of the light source units 400 includes a circuit board 410 and light emitting diodes 450 mounted on the circuit board 410. The bottom chassis 900 includes a base plate 910 and sidewalls 920 bent from the base plate 910, and has a receiving space defined therein.

[0060] The light source units 400 are disposed on and fastened to the base plate 910 of the bottom chassis 900 by means of the first fastening units 610. Each of the first fastening units 610 includes first fastening holes 430 formed in the circuit board 410 and protrusions 930 formed on the base plate 910 of the bottom chassis 900, so that the protrusions 930 can be inserted into the first fastening holes 430 to be fastened thereto. The protrusions 930 may be formed integrally with the bottom chassis 900.

[0061] The plurality of circuit boards 410, each of which is formed in the shape of a bar, are spaced apart from each other and disposed in a first direction, i.e., in parallel direction to the longer sidewalls (an abscissa direction). Alternatively, the plurality of circuit boards 410, each of which is also formed in the shape of a bar, are spaced apart from each other and disposed in a second direction, i.e., in a parallel direction to the shorter sidewalls (an ordinate direction) (see FIG. 11).

[0062] Referring to FIG. 10, a backlight assembly includes light source units 400, a bottom chassis 900, first fastening units 610, and second fastening units 620.

[0063] Each of the light source units 400 is disposed to be fastened to a base plate 910 of the bottom chassis 900 by means of the first fastening unit 610, and the fastening force between the light source unit 400 and the base plate 910 is reinforced by means of the second fastening unit 620.

[0064] The first fastening unit 610 includes first fastening holes 430 formed in a circuit board 410 and protrusions 930 formed on the base plate 910 of the bottom chassis 900, so that the protrusions 930 can be inserted into the first fastening holes 430 to be fastened thereto. The protrusions 930 may be formed integrally with the bottom chassis 900.

[0065] Each of the second fastening units 620 includes second fastening holes (not shown) formed in the circuit board 410, third fastening holes (not shown) formed in

the base plate 910 of the bottom chassis 900, and fastening members 480 inserted into the second fastening holes and the third fastening holes and fastened thereto, respectively. The second fastening unit 620 reinforces the fastening force for preventing the light source unit 400 fixed on the bottom chassis 900 by means of the first fastening unit 610 from being detached by an external shock. The second fastening unit 620 may be formed in alternative shapes instead of the illustrated embodiment.

[0066] FIG 12 is an exploded perspective view showing a liquid crystal display having a backlight assembly according to a sixth exemplary embodiment of the present invention.

[0067] Referring to FIG 12, the liquid crystal display includes a liquid crystal display panel 100, driving circuit units 220 and 240, a top chassis 300, and a backlight assembly for providing light to the liquid crystal display panel 100. The backlight assembly includes a light source unit 400, a first fastening unit 610, a second fastening unit 620, a plurality of optical sheets 700, a mold frame 800, and a bottom chassis 900.

[0068] The light source unit 400 includes a circuit board 410 and light emitting diodes 450 mounted on the circuit board 410. The bottom chassis 900 includes a base plate 910 and sidewalls 920 bent from the base plate 910, and has a receiving space defined therein.

[0069] The light source unit 400 is disposed on and fastened to the base plate 910 of the bottom chassis 900 by means of the first fastening unit 610 and the second fastening unit 620. The circuit board 410 is formed corresponding to the base plate 910, and the light emitting diodes 450 are mounted on the circuit board 410 in a matrix form. The components of the first fastening unit 610 are formed in the middle region of the circuit board 410 and the base plate 910. The position and number of the components of the first fastening unit 610 may be variously changed. Further, the second fastening holes 440 of the second fastening unit 620 are formed at the ends of the circuit board 410, while the third fastening holes 940 are formed in the base plate 910 of the bottom chassis 900 corresponding to the positions of the second fastening holes 440, respectively.

[0070] According to the present invention, a light source unit can be fastened to a chassis without an additional fastening member or using a minimum number of fastening members, whereby the assembly process can be simplified and the manufacturing process time can also be shortened. As a result, the manufacturing cost for a backlight assembly and a liquid crystal display having the same can be reduced.

The above descriptions are merely exemplary embodiments of a backlight assembly and a liquid crystal display having the same according to the present invention, so that the present invention is not limited thereto. The true scope of the present invention should be defined to the extent that those skilled in the art can make various modifications and changes thereto without departing from the scope of the invention, as defined by the appended

claims.

Claims

1. A backlight assembly, comprising:

a light source unit (400) comprising a circuit board (410) and a light source (450) mounted on the circuit board (410);
a receiving container on which the light source unit (400) is disposed; and
a first fastening unit (610) for fastening the light source unit (400) to the receiving container, wherein the first fastening unit (610) comprises:

a first fastening hole (430) formed in the circuit board (410); and
a protrusion (930) formed inwardly on the receiving container, the protrusion (930) inserted into the first fastening hole (430) to be fastened thereto, and
wherein the circuit board (410) includes a first side on which the light source (450) is mounted and a second side facing the receiving container;
characterized in that
an upper portion of the protrusion (930) is disposed on the first side.

2. The backlight assembly as claimed in claim 1, wherein the protrusion (930) is formed integrally with the receiving container.

3. The backlight assembly as claimed in claim 1, wherein the receiving container comprises a base plate (910) and a sidewall (920) bent from the base plate (910).

4. The backlight assembly as claimed in claim 3, wherein the protrusion (930) of the first fastening unit (610) is formed on the sidewall (920) of the receiving container.

5. The backlight assembly as claimed in claim 4, further comprising a second fastening unit (620) for fastening the light source unit (400) to the receiving container.

6. The backlight assembly as claimed in claim 5, wherein the second fastening unit (620) comprises:

a second fastening hole (440) formed in the circuit board (410);
a third fastening hole (940) formed in the sidewall (920) of the receiving container; and
a fastening member (480) inserted into the second hole (440) and the third hole (940) to be

fastened thereto.

7. The backlight assembly as claimed in claim 6, wherein the second fastening hole (440) is formed in each of both ends of the circuit board (410), and the third fastening hole (940) is formed in the sidewall (920) of the receiving container corresponding to positions of the second fastening holes (440).

8. The backlight assembly as claimed in claim 5, wherein the second fastening unit (620) comprises:

a second fastening hole (440) formed in the circuit board (410); and
a hook (950) formed on the sidewall (920) of the receiving container.

9. The backlight assembly as claimed in claim 5, wherein the second fastening unit (620) comprises a fixing unit (960) which is extended and bent from one end of the sidewall (920) of the receiving container.

10. The backlight assembly as claimed in claim 3, wherein the protrusion (930) of the first fastening unit (610) is formed on the base plate (910) of the receiving container.

11. The backlight assembly as claimed in claim 10, further comprising a second fastening unit (620) for fastening the light source (450) to the receiving container.

12. The backlight assembly as claimed in claim 11, wherein the second fastening unit (620) comprises:

a second fastening hole (440) formed in the circuit board (410);
a third fastening hole (940) formed in the base plate (910) of the receiving container; and
a fastening member (480) inserted into the second fastening hole (440) and the third fastening hole (940) to be fastened thereto.

13. The backlight assembly as claimed in claim 11, wherein the second fastening unit (620) comprises:

a second fastening hole (440) formed in the circuit board (410); and
a hook (950) formed on the base plate (910) of the receiving container.

14. The backlight assembly as claimed in claim 10, wherein the light source unit (400) includes a plurality of circuit boards (410) spaced apart from each other, each of the circuit boards (410) being formed in the shape of a bar.

15. The backlight assembly as claimed in claim 10,

wherein the circuit board (410) is formed corresponding to the shape of the base plate (910).

16. The backlight assembly as claimed in claim 12, wherein the circuit board (410) includes a plurality of substrates spaced apart from each other, each of the substrates being formed in the shape of a bar, the second fastening hole (440) is formed at both ends of the substrates, respectively, and the third fastening hole (940) is formed in the sidewall (920) of the receiving container corresponding to positions of the second fastening holes (440).
17. The backlight assembly as claimed in claim 12, wherein the circuit board (410) is formed corresponding to the shape of the base plate (910), the second fastening hole (440) is formed in at least one end of the circuit board (410), and the third fastening hole (940) is formed in the base plate (910) of the receiving container corresponding to positions of the second fastening hole (440).

18. A liquid crystal display, comprising:

a backlight assembly according to any of the claims 1, 2 or 5; and
a liquid crystal display panel (100) disposed on the backlight assembly to display an image.

Patentansprüche

1. Rückleuchteinheit, umfassend:

eine Lichtquelleneinheit (400), umfassend eine Schaltplatte (410) und eine Lichtquelle (450), die auf der Schaltplatte (410) montiert ist;
einen Aufnahmebehälter, an dem die Lichtquelleneinheit (400) angeordnet ist; und
eine erste Befestigungseinheit (610), um die Lichtquelleneinheit (400) an dem Aufnahmebehälter zu befestigen;
wobei die erste Befestigungseinheit (610) Folgendes umfasst:

ein erstes Befestigungsloch (430), das in der Schaltplatte (410) gebildet ist; und
einen Vorsprung (930), der innen am Aufnahmebehälter gebildet ist, wobei der Vorsprung (930) in das erste Befestigungsloch (430) eingefügt wird, um darin befestigt zu werden; und
wobei die Schaltplatte (410) Folgendes umfasst: eine erste Seite, an der die Lichtquelle (450) montiert ist, und eine zweite Seite, die dem Aufnahmebehälter zugewandt ist,
dadurch gekennzeichnet, dass
ein oberer Teil des Vorsprungs (930) an der

ersten Seite angeordnet ist.

2. Rückleuchteinheit nach Anspruch 1, wobei der Vorsprung (930) einstückig mit dem Aufnahmebehälter gebildet ist.
3. Rückleuchteinheit nach Anspruch 1, wobei der Aufnahmebehälter eine Grundplatte (910) und eine Seitenwand (920) umfasst, die ausgehend von der Grundplatte (910) umgebogen ist.
4. Rückleuchteinheit nach Anspruch 3, wobei der Vorsprung (930) der ersten Befestigungseinheit (610) an der Seitenwand (920) des Aufnahmebehälters gebildet ist.
5. Rückleuchteinheit nach Anspruch 4, ferner umfassend eine zweite Befestigungseinheit (620), um die Lichtquelleneinheit (400) am Aufnahmebehälter zu befestigen.
6. Rückleuchteinheit nach Anspruch 5, wobei die zweite Befestigungseinheit (620) folgende umfasst:
ein zweites Befestigungsloch (440), das in der Schaltplatte (410) gebildet ist;
ein drittes Befestigungsloch (940), das in der Seitenwand (920) des Aufnahmebehälters gebildet ist; und
ein Befestigungselement (480), das in das zweite Loch (440) und das dritte Loch (940) eingefügt wird, um darin befestigt zu werden.
7. Rückleuchteinheit nach Anspruch 6, wobei das zweite Befestigungsloch (440) in jedem der beiden Enden der Schaltplatte (410) gebildet ist und wobei das dritte Befestigungsloch (940) in der Seitenwand (920) des Aufnahmebehälters entsprechend den Positionen der zweiten Befestigungslöcher (440) gebildet ist.
8. Rückleuchteinheit nach Anspruch 5, wobei die zweite Befestigungseinheit (620) folgende umfasst:
ein zweites Befestigungsloch (440), das in der Schaltplatte (410) gebildet ist; und
einen Haken (950), der an der Seitenwand (920) des Aufnahmebehälters gebildet ist.
9. Rückleuchteinheit nach Anspruch 5, wobei die zweite Befestigungseinheit (620) eine Fixiereinheit (960) umfasst, die sich ausgehend von einem Ende der Seitenwand (920) des Aufnahmebehälters erstreckt und umgebogen ist.
10. Rückleuchteinheit nach Anspruch 3, wobei der Vorsprung (930) der ersten Befestigungseinheit (610) an der Grundplatte (910) des Aufnahmebehälters

gebildet ist.

11. Rückleuchteinheit nach Anspruch 10, ferner umfassend eine zweite Befestigungseinheit (620), um die Lichtquelle (450) am Aufnahmebehälter zu befestigen. 5
12. Rückleuchteinheit nach Anspruch 11, wobei die zweite Befestigungseinheit (620) folgende umfasst:
- ein zweites Befestigungsloch (440), das in der Schaltplatte (410) gebildet ist;
ein drittes Befestigungsloch (940), das in der Grundplatte (910) des Aufnahmebehälters gebildet ist; und
ein Befestigungselement (480), das in das zweite Befestigungsloch (440) und das dritte Befestigungsloch (940) eingefügt wird, um darin befestigt zu werden.
13. Rückleuchteinheit nach Anspruch 11, wobei die zweite Befestigungseinheit (620) folgende umfasst:
- ein zweites Befestigungsloch (440), das in der Schaltplatte (410) gebildet ist; und
einen Haken (950), der an der Grundplatte (910) des Aufnahmebehälters gebildet ist.
14. Rückleuchteinheit nach Anspruch 10, wobei die Lichtquelleneinheit (400) eine Vielzahl von Schaltplatten (410) umfasst, die voneinander beabstandet sind, wobei jede der Schaltplatten (410) in der Form eines Stabs ausgebildet ist. 30
15. Rückleuchteinheit nach Anspruch 10, wobei die Schaltplatte (410) entsprechend der Form der Grundplatte (910) ausgebildet ist. 35
16. Rückleuchteinheit nach Anspruch 12, wobei die Schaltplatte (410) eine Vielzahl von Substraten umfasst, die voneinander beabstandet sind, wobei jedes der Substrate in der Form eines Stabs ausgebildet ist, wobei das zweite Befestigungsloch (440) jeweils an beiden Enden der Substrate gebildet ist und wobei das dritte Befestigungsloch (940) in der Seitenwand (920) des Aufnahmebehälters entsprechend den Positionen der zweiten Befestigungslöcher (440) gebildet ist. 40 45
17. Rückleuchteinheit nach Anspruch 12, wobei die Schaltplatte (410) entsprechend der Form der Grundplatte (910) gebildet ist, wobei das zweite Befestigungsloch (440) in wenigstens einem Ende der Schaltplatte (410) gebildet ist und wobei das dritte Befestigungsloch (940) in der Grundplatte (910) des Aufnahmebehälters entsprechend den Positionen des zweiten Befestigungslochs (440) gebildet ist. 50 55

18. Flüssigkristallanzeige, umfassend:

eine Rückleuchteinheit nach einem der Ansprüche 1, 2 oder 5; und
eine Flüssigkristallanzeigetafel (100), die auf der Rückleuchteinheit angeordnet ist, um ein Bild anzuzeigen.

10 Revendications

1. Un assemblage de rétroéclairage, comprenant :

Une unité de source de lumière (400) comprenant une carte de circuit imprimé (410) et une source de lumière (450) montée sur la carte de circuit imprimé (410) ;

Un container de réception sur lequel l'unité de source de lumière (400) est disposée ; et

Une première unité de fixation (610) pour fixer l'unité de source de lumière (400) au container de réception

Où la première unité de fixation (610) comprend :

Un premier trou de fixation (430) formé dans la carte de circuit imprimé (410) ; et

Une protubérance (930) formée vers l'intérieur sur le container de réception, la protubérance (930) est insérée dans le premier trou de fixation (430) pour y être fixée, Et

Où la carte de circuit imprimé (410) inclut un premier côté sur lequel la source de lumière (450) est montée et un deuxième côté faisant face au container de réception ;

Caractérisé en ce que

Une portion supérieure de la protubérance (930) est disposée sur le premier côté.

2. L'assemblage de rétroéclairage tel que revendiqué dans la revendication 1, où la protubérance (930) est formée intégralement avec le container de réception.

3. L'assemblage de rétroéclairage tel que revendiqué dans la revendication 1, où le container de réception comprend une plaque de base (910) et une paroi latérale (920) pliée à partir de la plaque de base (910).

4. L'assemblage de rétroéclairage tel que revendiqué dans la revendication 3, où la protubérance (930) de la première unité de fixation (610) est formée sur la paroi latérale (920) du container de réception.

5. L'assemblage de rétroéclairage tel que revendiqué dans la revendication 4, comprenant de plus une

- deuxième unité de fixation (620) pour fixer l'unité de source de lumière (400) au container de réception.
6. L'assemblage de rétroéclairage tel que revendiqué dans la revendication 5, où la deuxième unité de fixation (620) comprend :
- Un deuxième trou de fixation (440) formé dans la carte de circuit imprimé (410) ;
Un troisième trou de fixation (940) formé dans la paroi latérale (920) du container de réception ;
et
Un dispositif de fixation (480) inséré dans le deuxième trou (440) et le troisième trou (940) à y fixer.
7. L'assemblage de rétroéclairage tel que revendiqué dans la revendication 6, où le deuxième trou de fixation (440) est formé dans chacune des deux extrémités de la carte de circuit imprimé (410), et le troisième trou de fixation (940) est formé dans la paroi latérale (920) du container de réception correspondant à des positions des deuxième trous de fixation (440).
8. L'assemblage de rétroéclairage tel que revendiqué dans la revendication 5, où la deuxième unité de fixation (620) comprend :
- Un deuxième trou de fixation (440) formé dans la carte de circuit imprimé (410) ; et
Un crochet (950) formé sur la paroi latérale (920) du container de réception.
9. L'assemblage de rétroéclairage tel que revendiqué dans la revendication 5, où la deuxième unité de fixation (620) comprend une unité de fixation (960) qui est étendue et pliée à partir d'une extrémité de la paroi latérale (920) du container de réception.
10. L'assemblage de rétroéclairage tel que revendiqué dans la revendication 3, où la protubérance (930) de la première unité de fixation (610) est formée sur la plaque de base (910) du container de réception.
11. L'assemblage de rétroéclairage tel que revendiqué dans la revendication 10, comprenant de plus une deuxième unité de fixation (620) pour fixer la source de lumière (450) au container de réception.
12. L'assemblage de rétroéclairage tel que revendiqué dans la revendication 11, où la deuxième unité de fixation (620) comprend :
- Un deuxième trou de fixation (440) formé dans la carte de circuit imprimé (410) ;
Un troisième trou de fixation (940) formé dans la plaque de base (910) du container de
- réception ; et
Un dispositif de fixation (480) inséré dans le deuxième trou de fixation (440) et le troisième trou de fixation (940) à y fixer.
13. L'assemblage de rétroéclairage tel que revendiqué dans la revendication 11, où la deuxième unité de fixation (620) comprend :
- Un deuxième trou de fixation (440) formé dans la carte de circuit imprimé (410) ; et
Un crochet (950) formé sur la plaque de base (910) du container de réception.
14. L'assemblage de rétroéclairage tel que revendiqué dans la revendication 10, où l'unité de source de lumière (400) inclut une pluralité des cartes de circuit imprimé (410) espacées les unes des autres, chacune des cartes de circuit imprimé (410) étant formée en forme de barre.
15. L'assemblage de rétroéclairage tel que revendiqué dans la revendication 10, où la carte de circuit imprimé (410) est formée correspondant à la forme de la plaque de base (910).
16. L'assemblage de rétroéclairage tel que revendiqué dans la revendication 12, où la carte de circuit imprimé (410) inclut une pluralité de substrats espacés les uns des autres, chacun des substrats étant formé en forme de barre, le deuxième trou de fixation (440) est formé aux deux extrémités des substrats, respectivement, et le troisième trou de fixation (940) est formé dans la paroi latérale (920) du container de réception correspondant à des positions des deuxième trous de fixation (440).
17. L'assemblage de rétroéclairage tel que revendiqué dans la revendication 12, où la carte de circuit imprimé (410) est formée correspondant à la forme de la plaque de base (910), le deuxième trou de fixation (440) est formé dans au moins une extrémité de la carte de circuit imprimé (410), et le troisième trou de fixation (940) est formé dans la plaque de base (910) du container de réception correspondant à des positions du deuxième trou de fixation (440).
18. Un écran à cristaux liquides, comprenant :
- Un assemblage de rétroéclairage selon l'une des revendications 1, 2 ou 5 ; et
Un panneau d'écran à cristaux liquides (100) disposé sur l'assemblage de rétroéclairage pour afficher une image.

FIG. 1

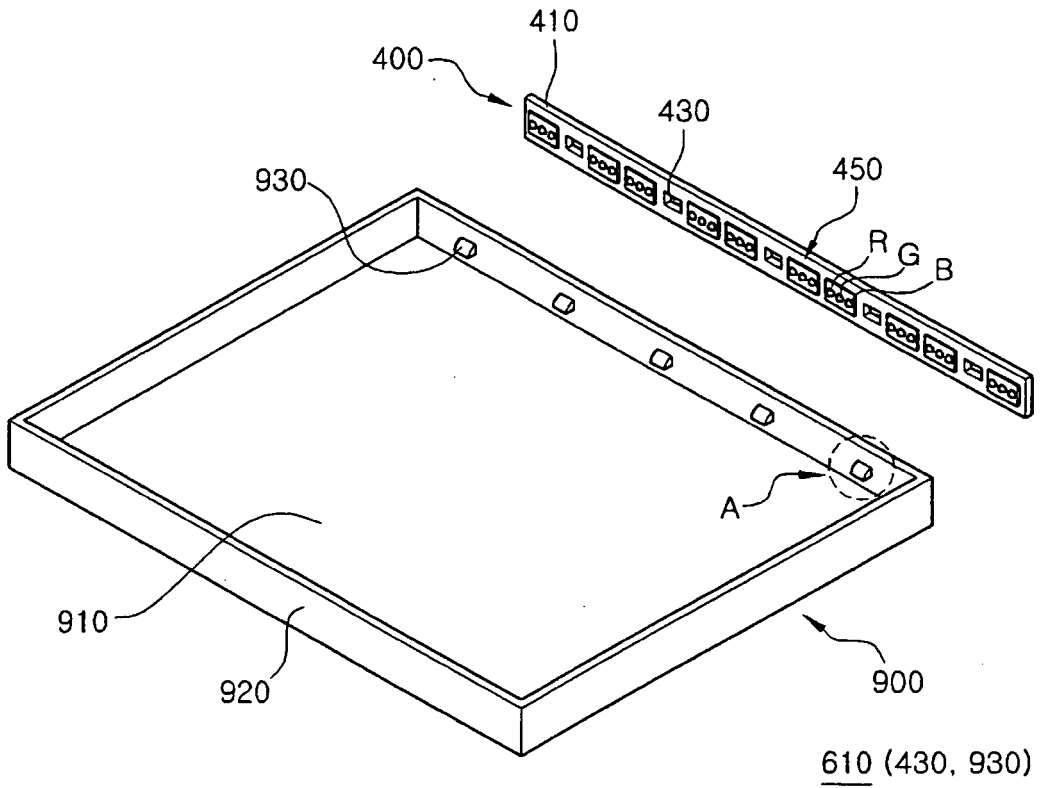


FIG. 2

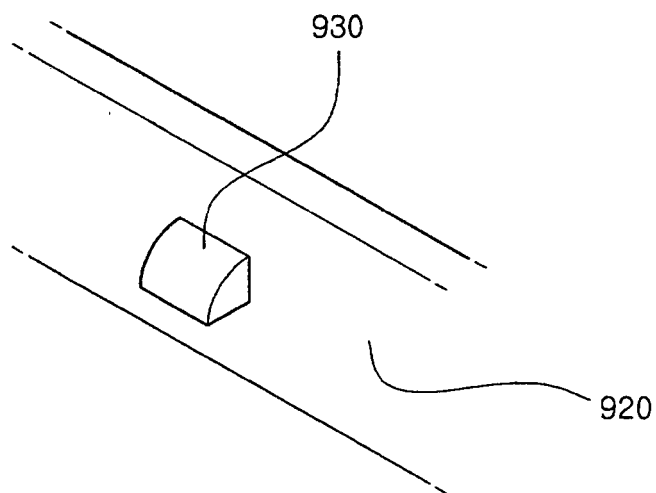


FIG. 3A

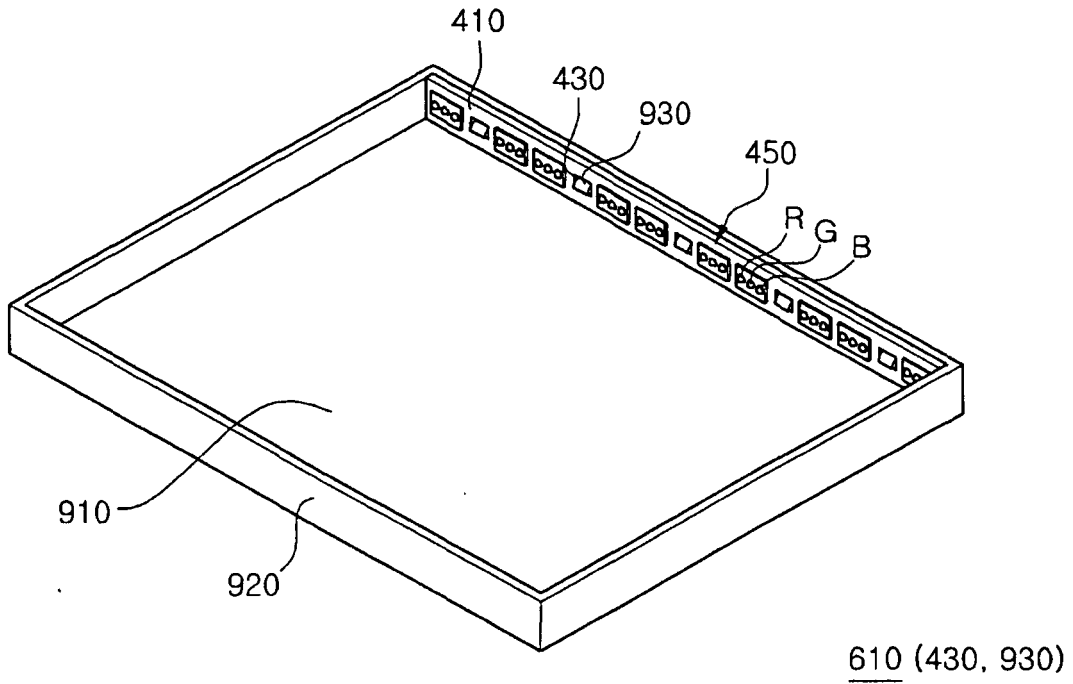


FIG. 3B

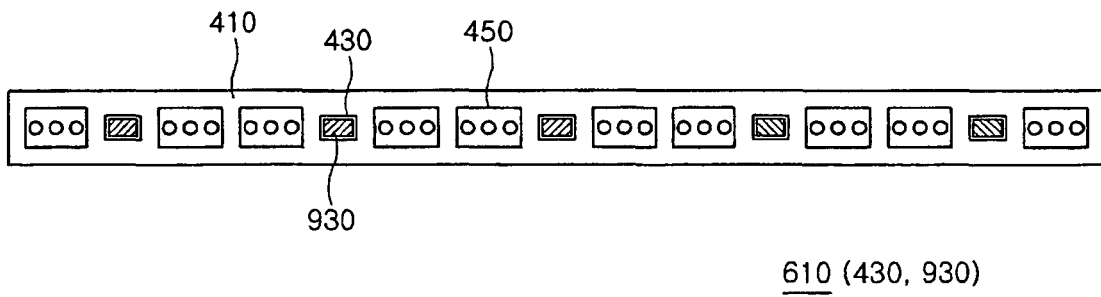
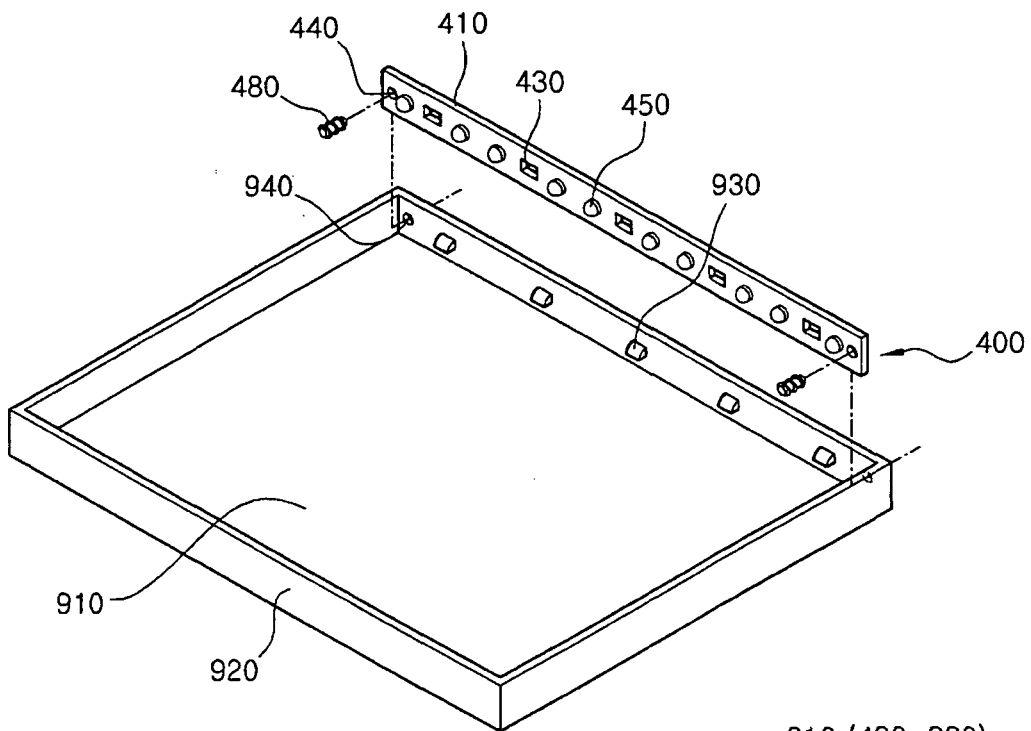


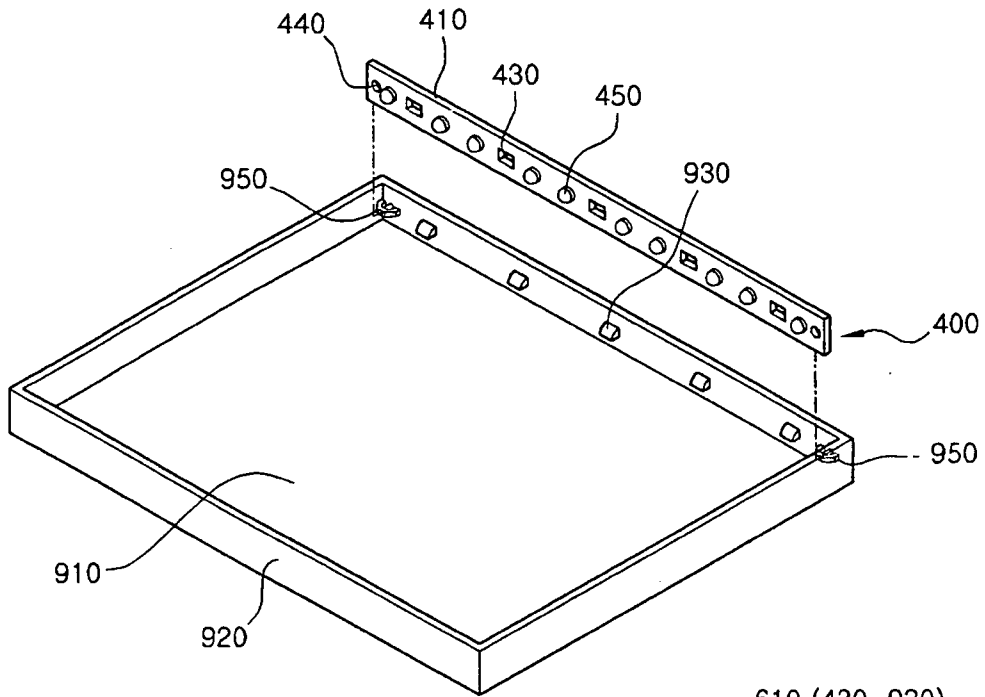
FIG. 4



610 (430, 930)

620 (440, 480, 940)

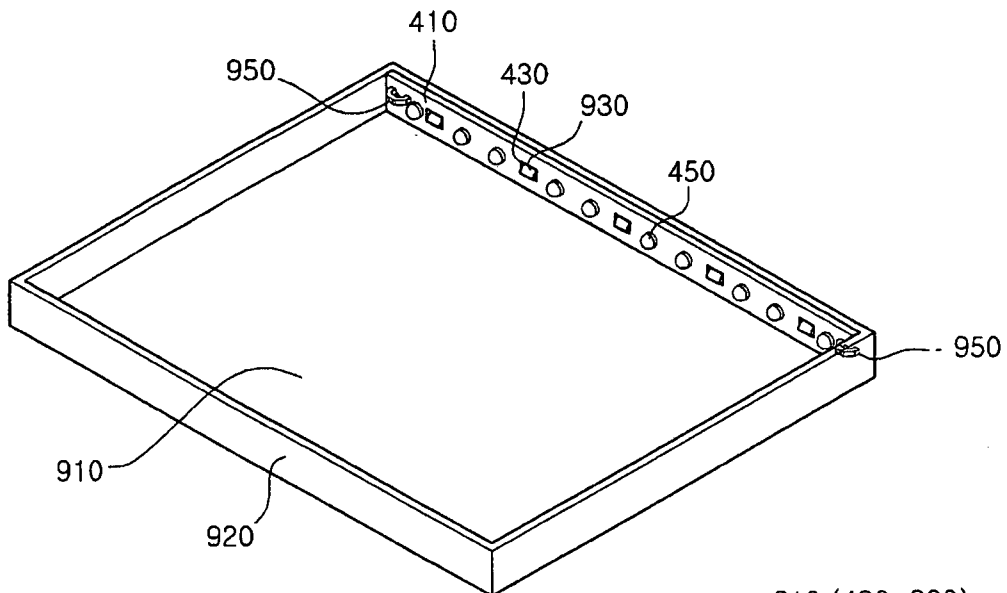
FIG. 5A



610 (430, 930)

620 (440, 950)

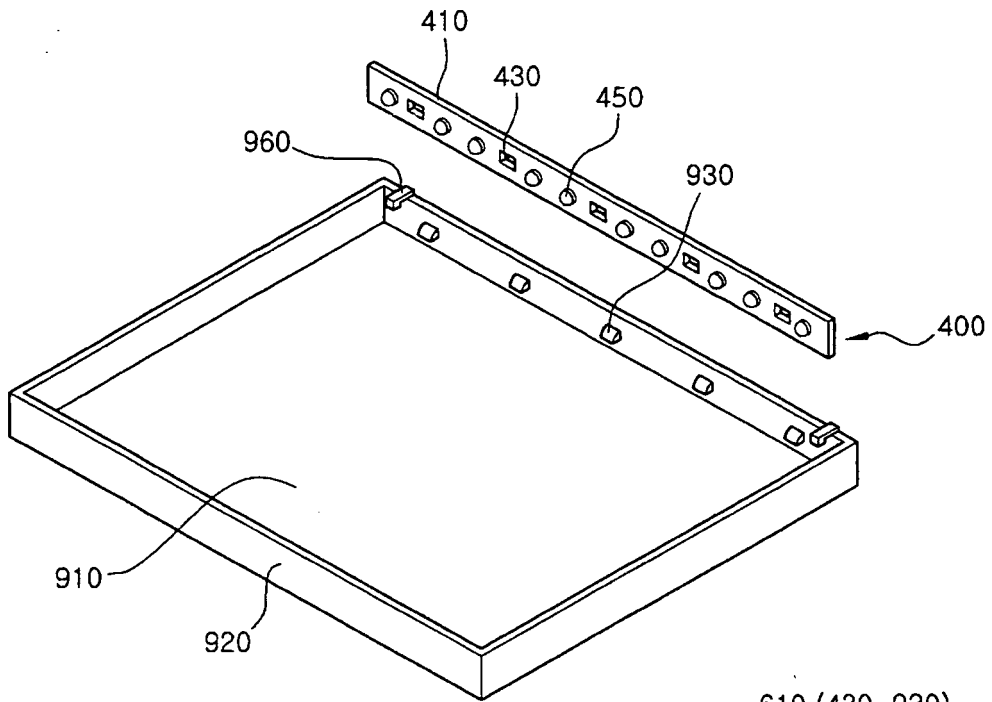
FIG. 5B



610 (430, 930)

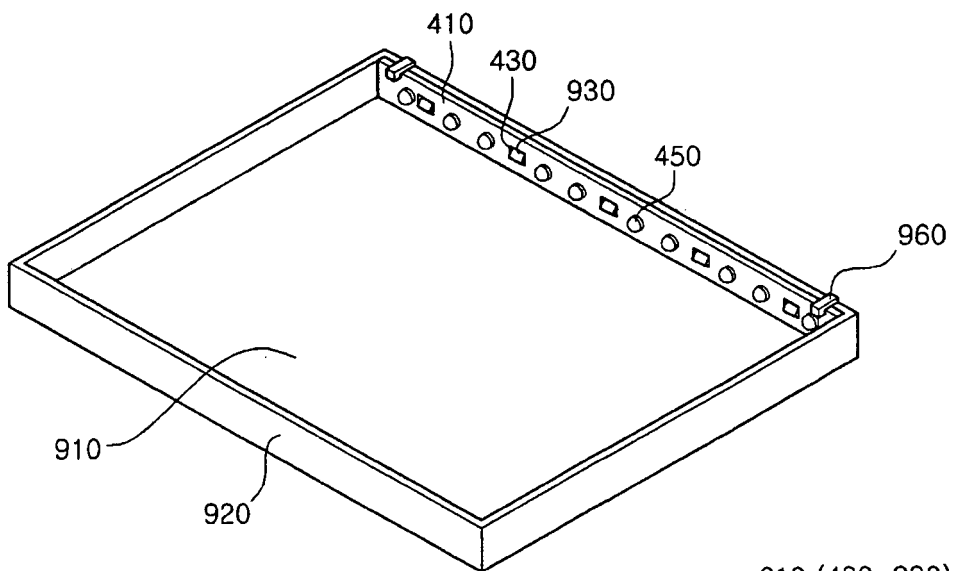
620 (440, 950)

FIG. 6A



610 (430, 930)
620 (960)

FIG. 6B



610 (430, 930)
620 (960)

FIG 7

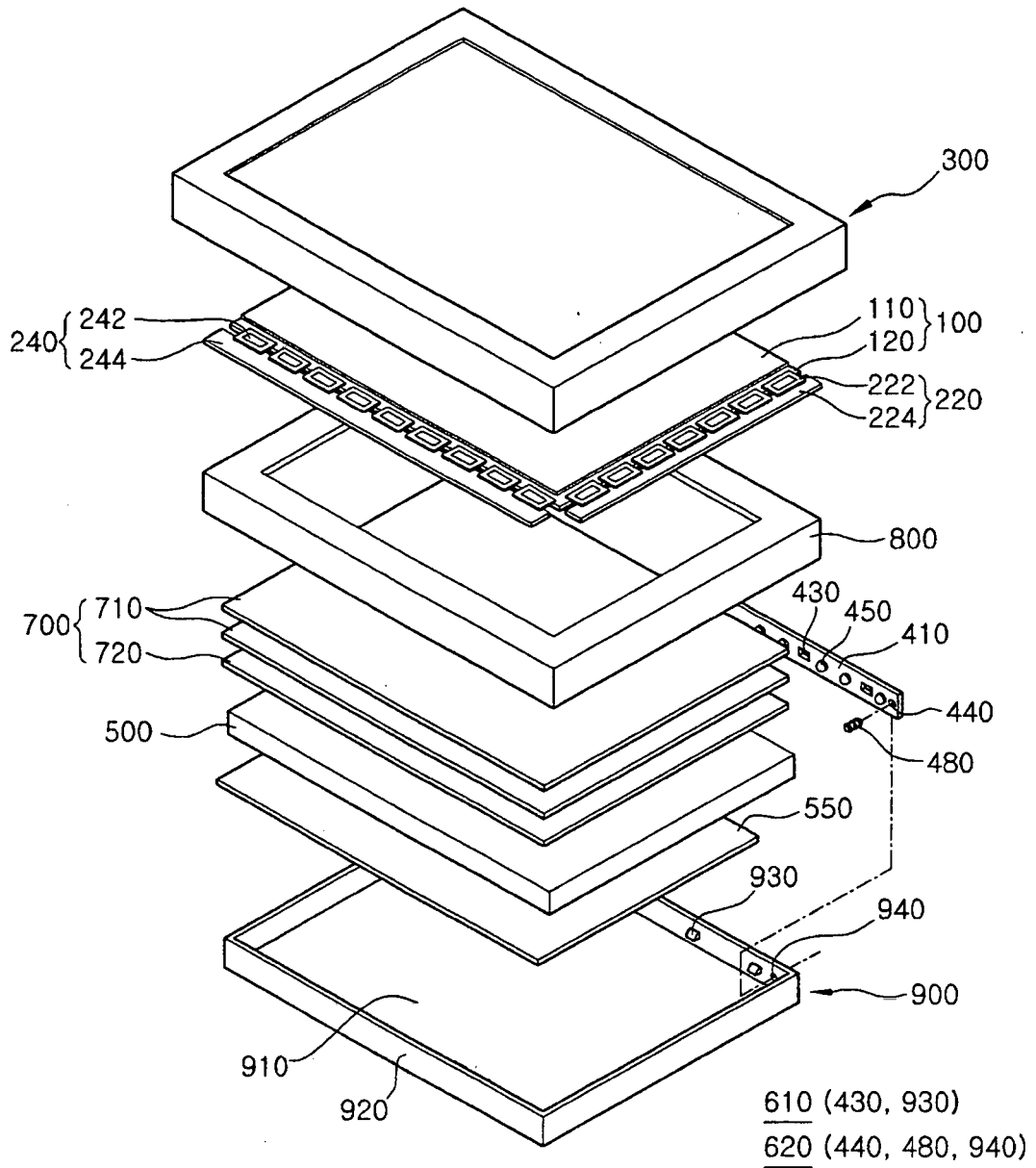


FIG. 8

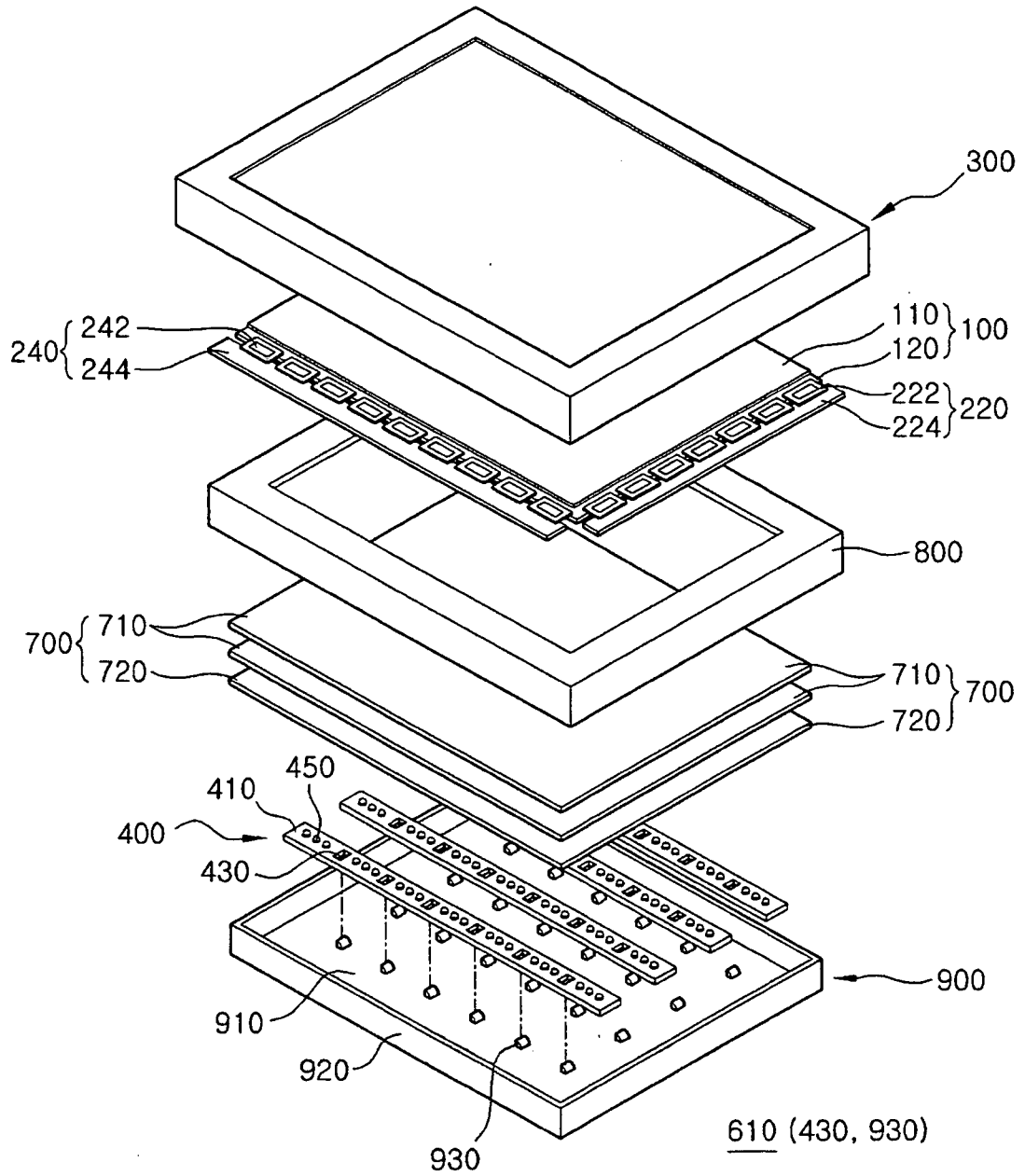


FIG. 9

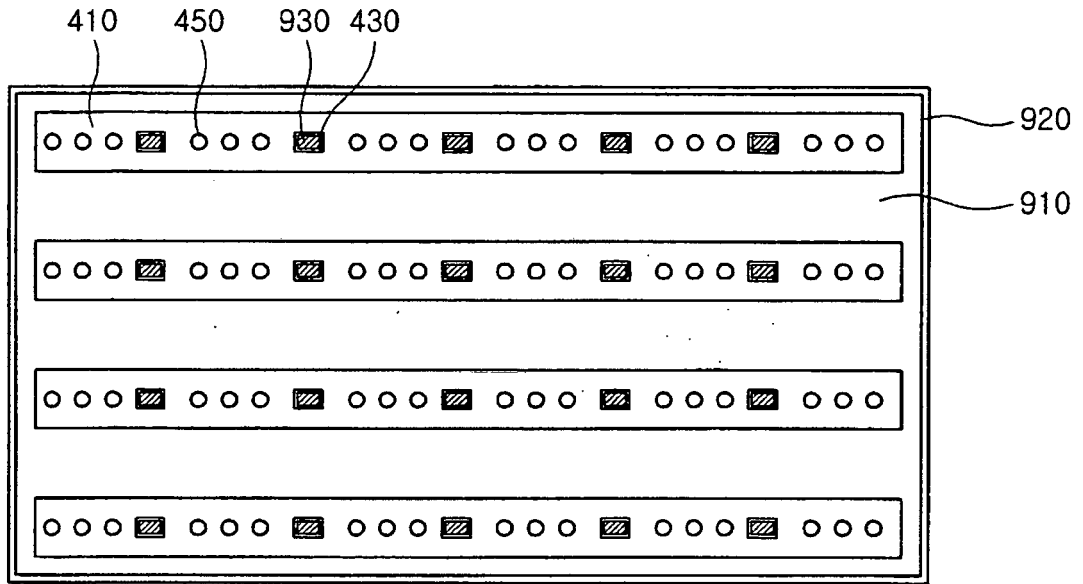


FIG. 10

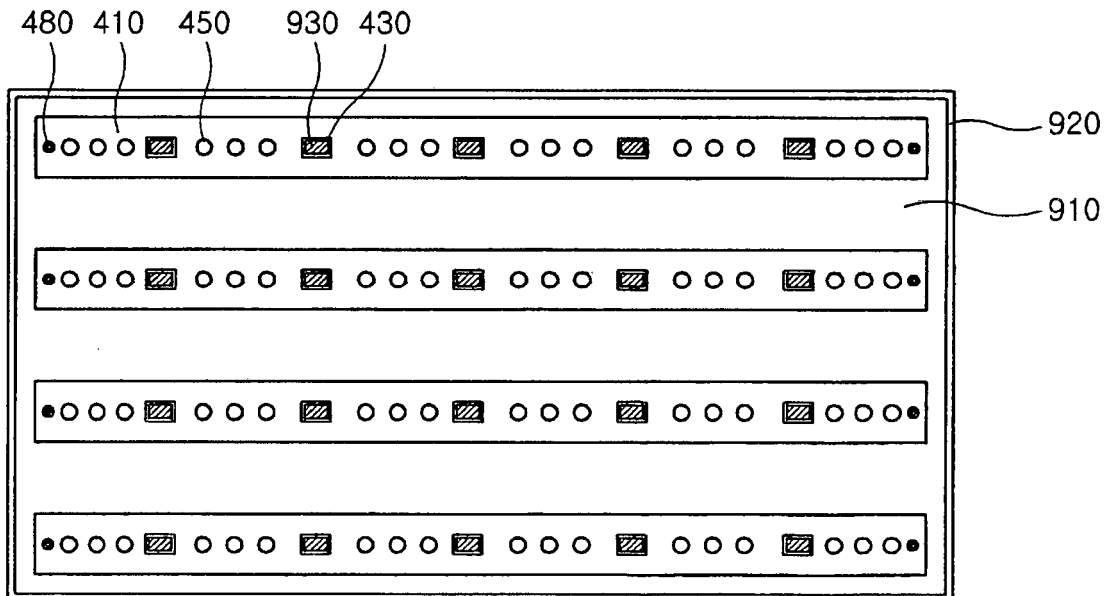


FIG. 11

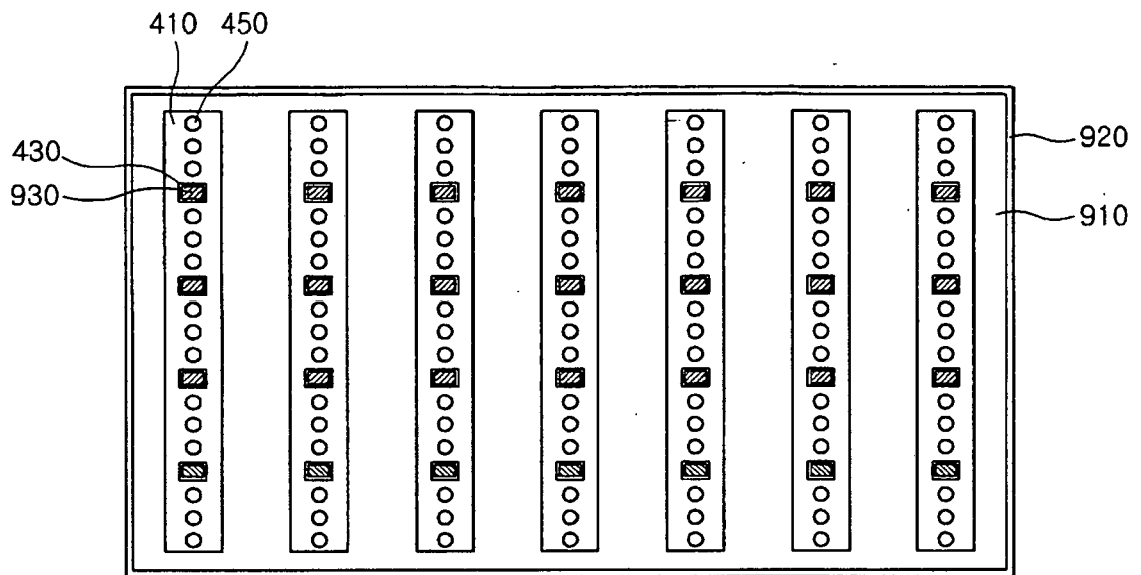
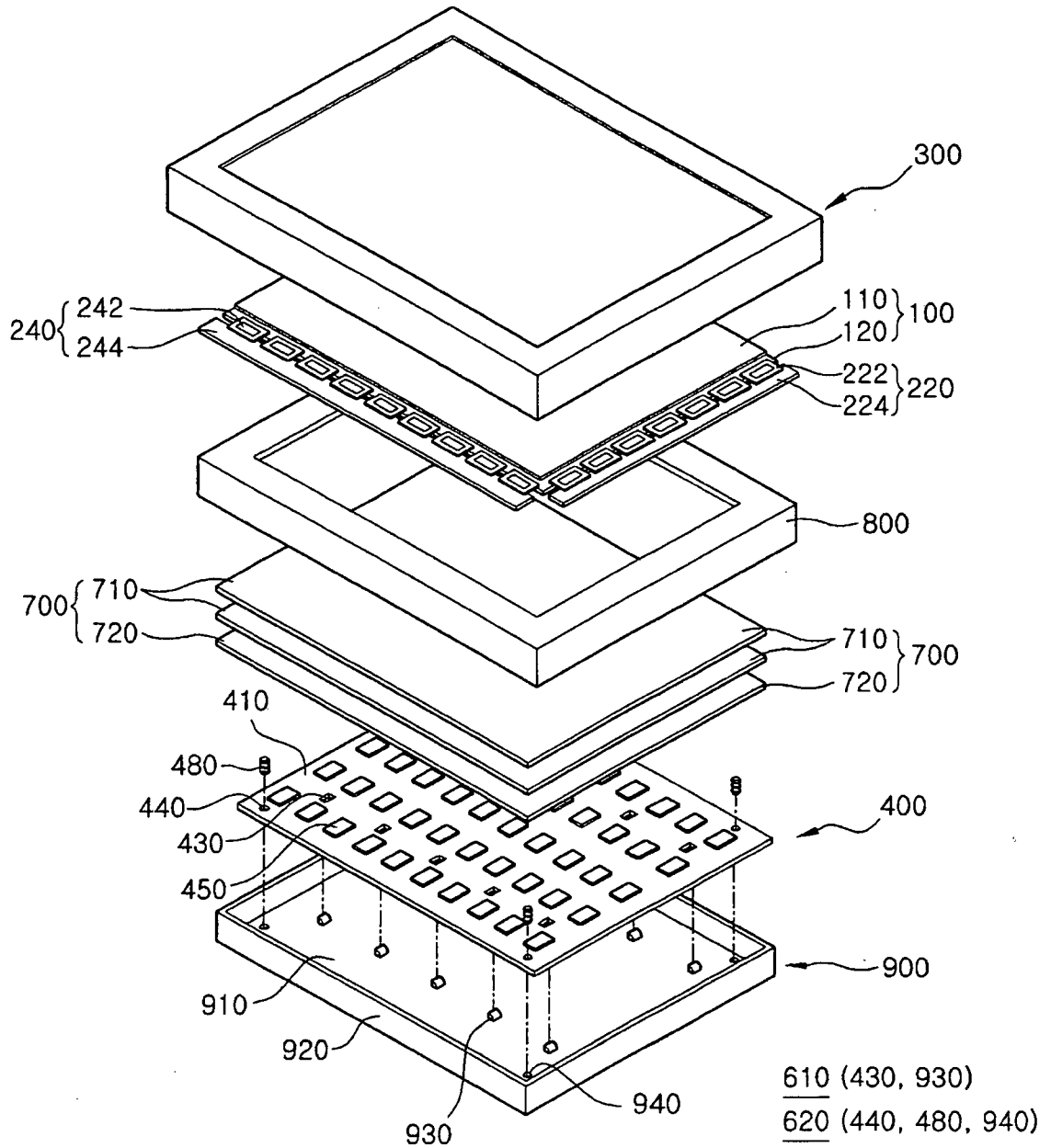


FIG 12



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 20060279946 A1 [0003]

专利名称(译)	背光组件和具有该背光组件的液晶显示器		
公开(公告)号	EP1956422B1	公开(公告)日	2014-09-24
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[标]申请(专利权)人(译)	三星电子株式会社		
申请(专利权)人(译)	SAMSUNG ELECTRONICS CO. , LTD.		
当前申请(专利权)人(译)	三星DISPLAY CO. , LTD.		
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外部链接	Espacenet		

摘要(译)

提供一种背光组件和具有该背光组件的液晶显示器。背光组件包括：光源单元，包括电路板和安装在电路板上的发光二极管；底板，光源设置在底盘上；以及第一紧固单元，用于将光源紧固到底盘。第一紧固单元包括形成在电路板中的第一紧固孔，以及形成在底座上的突起。突起插入第一紧固孔中以紧固到第一紧固孔。

