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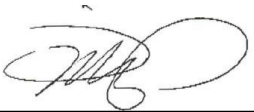
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CN 112786807 B

I certify under penalty of perjury that the foregoing is true and correct.

Executed this 15th day of June 2026 in Contra Costa County of the State of California.

By: 

Alex N. Jo
Member, ATA



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(56) References Cited

CN 111599272 A, Aug. 28, 2020

CN 111599272 A, Aug. 28, 2020

CN 110534544 A, Dec. 3, 2019

CN 110277435 A, Sep. 24, 2019

CN 108877514 A, Nov. 23, 2018

CN 112198981 A, Jan. 8, 2021

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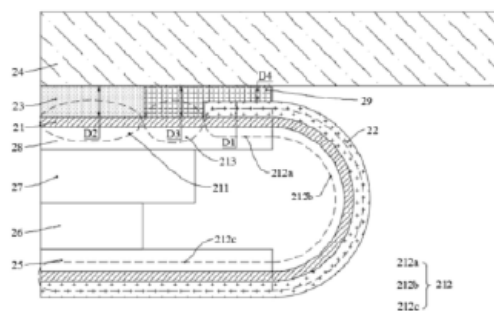
Claims – 2 sheets; Description – 6 sheets; Drawings – 5 sheets

(54) Title of the Invention

FLEXIBLE DISPLAY DEVICE AND FABRICATION
METHOD THEREFOR

(57) Abstract

The present invention discloses a flexible display device and a fabrication method therefor. The flexible display device comprises: a flexible display panel comprising a first region, a second region adjacent to a side of the first region, and a third region between the first region and the second region; an optically clear adhesive layer disposed on a side of the first region of the flexible display panel; a cover glass disposed on the optically clear adhesive layer; a protective adhesive layer disposed on an outer surface of the second region of the flexible display panel and on a same side as the optically clear adhesive layer; and an auxiliary adhesive layer completely covering a surface of the third region proximate to a side of the cover glass. By providing the auxiliary adhesive layer to fill gaps in the present invention, the cover glass and the flexible display panel can be supported, and the flexible display panel can be prevented from undergoing significant deformation, thereby reducing a risk of damage, and improving the product quality and reliability of the flexible display device.



1. A flexible display device, comprising:

a flexible display panel comprising a first region, a second region adjacent to a side of the first region, and a third region between the first region and the second region;

an optically clear adhesive layer disposed on a side of the first region of the flexible display panel;

a cover glass disposed on the optically clear adhesive layer;

a protective adhesive layer disposed on an outer surface of the second region of the flexible display panel and on a same side as the optically clear adhesive layer; and

an auxiliary adhesive layer disposed at the third region and at a portion of the second region proximate to the third region, completely covering a surface of the third region proximate to a side of the cover glass, and directly contacting the cover glass;

wherein the auxiliary adhesive layer is doped with support particles, and a material strength of the support particles is greater than a material strength of the auxiliary adhesive layer.

2. The flexible display device of claim 1, wherein the second region comprises a transition portion connected to the third region, a bent portion connected to a side of the transition portion away from the third region, and an extension connected to a side of the bent portion away from the transition portion and located on a back side of the first region.

3. The flexible display device of claim 2, wherein at least part of the protective adhesive layer is disposed in a same layer as the optically clear adhesive layer, and a thickness of the optically clear adhesive layer is greater than a thickness of the protective adhesive layer.

4. The flexible display device of claim 3, wherein the auxiliary adhesive layer comprises a first auxiliary adhesive layer located on a surface of a side of the third region proximate to the cover glass, and a second auxiliary adhesive layer located on a surface of the protective adhesive layer above the transition portion of the second region.

5. The flexible display device of claim 4, wherein the auxiliary adhesive layer bonds the third region of the flexible display panel to the cover glass and bonds the protective adhesive layer to the cover glass, respectively; a thickness of the first auxiliary adhesive layer is equal to the thickness of the optically clear adhesive layer; and a sum of a thickness of the second auxiliary adhesive layer and the thickness of the protective adhesive layer is equal to the thickness of the optically clear adhesive layer.

6. The flexible display device of claim 1, wherein the auxiliary adhesive layer comprises at least one of a pressure-sensitive adhesive layer, a photocurable adhesive layer, an acrylic adhesive layer, and a polyurethane adhesive layer.

7. A fabrication method for a flexible display device, comprising the following steps:

providing a flexible display panel comprising a first region, a second region, and a third region;

fabricating an optically clear adhesive layer on the first region of the flexible display panel;

fabricating a protective adhesive layer on the second region of the flexible display panel;

providing a cover glass, and fabricating an auxiliary adhesive layer on a portion of the cover glass corresponding to the third region of the flexible display panel; and

laminating the flexible display panel with the cover glass, the auxiliary adhesive layer being disposed at the third region and at a portion of the second region proximate to the third region, completely covering a surface of the third region proximate to a side of the cover glass, and directly contacting the cover glass, wherein the auxiliary adhesive layer is doped with support particles, and a material strength of the support particles is greater than a material strength of the auxiliary adhesive layer.

8. The fabrication method of claim 7, wherein the second region comprises a transition portion, a bent portion, and an extension; and the fabricating an auxiliary adhesive layer comprises: laminating a first auxiliary adhesive layer onto a portion of the cover glass corresponding to the third region and laminating a second auxiliary adhesive layer onto a portion of the cover glass corresponding to the transition portion of the second region, the first auxiliary adhesive layer and the second auxiliary adhesive layer both being pressure-sensitive adhesive layers, and a thickness of the first auxiliary adhesive layer being greater than a thickness of the second auxiliary adhesive layer.

9. The fabrication method of claim 7, wherein the second region comprises a transition portion, a bent portion, and an extension; and the fabricating an auxiliary adhesive layer comprises: applying an auxiliary adhesive onto a portion of the cover glass corresponding to the third region, the auxiliary adhesive being a sol-state photocurable adhesive, and when laminating the flexible display panel with the cover glass, the auxiliary adhesive filling a gap between the third region and the cover glass and flowing to extend above the transition portion of the second region; and curing the auxiliary adhesive by ultraviolet irradiation to form the auxiliary adhesive layer.

FLEXIBLE DISPLAY DEVICE AND FABRICATION METHOD THEREFOR

Technical Field

[0001] The present invention relates to the field of display technology, and in particular, to a flexible display device and a fabrication method therefor.

Background Art

[0002] With the development of organic light-emitting diode (OLED) display technology, flexible OLED technology has gradually matured. Rollable OLED display modules, as modules of a new display technology, will be the direction of innovation and development for global panel and module manufacturers in the future. Flexible screens, as an important application technology of OLED photocurable adhesives, have seen significant development in recent years.

[0003] Compared with traditional screens, flexible screens have significant advantages, such as being thinner and lighter in volume, and their stack-up generally comprising a cover glass (CG), an optically clear adhesive layer (OCA) layer, a polarizer (Pol) layer, a display panel, a backplane (BP) layer, a composite material, and the like. Among these, the CG layer and the OCA layer are fully laminated. To further reduce the thickness and cost of OLED modules, development has begun to move toward a technology without a polarizer layer. FIG. 1 is a schematic structural diagram of a flexible display device in the prior art. As shown in FIG. 1, the flexible display device comprises a display panel 11, a photocurable adhesive layer 12, an optically clear adhesive layer 13, a cover glass 14, a first backplane layer 15, a support layer 16, a heat-dissipating composite layer 17, and a second backplane layer 18. However, the absence of a polarizer layer presents the following problems. FIG. 2 is a top view of a flexible display device in the prior art (the cover glass is not shown). As shown in FIG. 2, the optically clear adhesive 13 has certain tolerances during lamination, and there is a certain gap between the optically clear adhesive 13 and the photocurable adhesive layer 12, making this area very fragile. The display panel will be acted upon by a certain external force during Pad-Bending (flipping the bent area of the terminal area to the back side of the display panel), and the gap area is prone to damage, leading to scrap.

[0004] In conclusion, in the prior art, due to certain tolerances in optically clear adhesive lamination, there is a gap between the cover glass and the display panel. When the display panel undergoes bending, the technical problems of easy damage and poor product reliability will arise.

Summary of the Invention

[0005] Embodiments of the present invention provide a flexible display device and a fabrication method for a flexible display device to solve the technical problems of easy damage and poor product reliability in the prior art that arise when a display panel undergoes bending because there is a gap between a cover glass and the display panel due to certain tolerances in optically clear adhesive lamination.

[0006] To solve the above problems, in a first aspect, the present invention provides a flexible display device, comprising:

[0007] a flexible display panel comprising a first region, a second region adjacent to a side of the first region, and a third region between the first region and the second region;

[0008] an optically clear adhesive layer disposed on a side of the first region of the flexible display panel;

[0009] a cover glass disposed on the optically clear adhesive layer;

[00010] a protective adhesive layer disposed on an outer surface of the second region of the flexible display panel and on a same side as the optically clear adhesive layer; and

[00011] an auxiliary adhesive layer completely covering a surface of the third region proximate to a side of the cover glass.

[00012] In some embodiments of the present invention, the second region comprises a transition portion connected to the third region, a bent portion connected to a side of the transition portion away from the third region, and an extension connected to a side of the bent portion away from the transition portion and located on a back side of the first region.

[00013] In some embodiments of the present invention, at least part of the protective adhesive layer is disposed in a same layer as the optically clear adhesive layer, and a thickness of the optically clear adhesive layer is greater than a thickness of the protective adhesive layer.

[00014] In some embodiments of the present invention, the auxiliary adhesive layer comprises a first auxiliary adhesive layer located on a surface of a side of the third region proximate to the cover glass, and a second auxiliary adhesive layer located on a surface of the protective adhesive layer above the transition portion of the second region.

[00015] In some embodiments of the present invention, the auxiliary adhesive layer bonds the third region of the flexible display panel to the cover glass and bonds the protective adhesive layer to the cover glass, respectively; a thickness of the first auxiliary adhesive layer is equal to the thickness of the optically clear adhesive layer; and a sum of a thickness of the second auxiliary adhesive layer and the thickness of the protective adhesive layer is equal to the thickness of the optically clear adhesive layer.

[00016] In some embodiments of the present invention, the auxiliary adhesive layer is an organic transparent material, comprising at least one of a pressure-sensitive adhesive layer, a photocurable adhesive layer, an acrylic adhesive layer, and a polyurethane adhesive layer.

[00017] In some embodiments of the present invention, the flexible display device further comprises support particles that are doped in the auxiliary adhesive layer, and a material strength of the support particles is greater than a material strength of the auxiliary adhesive layer.

[00018] In a second aspect, the present invention provides a fabrication method for a flexible display device. The fabrication method is used for fabricating the flexible display device of the first aspect, and comprises the following steps:

[00019] providing a flexible display panel comprising a first region, a second region, and a third region;

[00020] fabricating an optically clear adhesive layer on the first region of the flexible display panel;

[00021] fabricating a protective adhesive layer on the second region of the flexible display panel;

[00022] providing a cover glass, and fabricating an auxiliary adhesive layer on a portion of the cover glass corresponding to the third region of the flexible display panel; and

[00023] laminating the flexible display panel with the cover glass.

[00024] In some embodiments of the present invention, the second region comprises a transition portion, a bent portion, and an extension; and the fabricating an auxiliary adhesive layer comprises: laminating a first auxiliary adhesive layer onto a portion of the cover glass corresponding to the third region and laminating a second auxiliary adhesive layer onto a portion of the cover glass corresponding to the transition portion of the second region, the first auxiliary adhesive layer and the second auxiliary adhesive layer both being pressure-sensitive adhesive layers, and a thickness of the first auxiliary adhesive layer being greater than a thickness of the second auxiliary adhesive layer.

[00025] In some embodiments of the present invention, the fabricating an auxiliary adhesive layer comprises: applying an auxiliary adhesive onto a portion of the cover glass corresponding to the third region, the auxiliary adhesive being a sol-state photocurable adhesive, and when laminating the flexible display panel with the cover glass, the auxiliary adhesive filling a gap between the third region and the cover glass and flowing to extend above the transition portion of the second region; and curing the auxiliary adhesive by ultraviolet irradiation to form the auxiliary adhesive layer.

[00026] Compared with existing flexible display devices and fabrication methods for a flexible display device, in the present invention, the auxiliary adhesive layer is provided on the surface of the third region of the flexible display panel proximate to a side of the cover glass to fill the gap between the optically clear adhesive layer and the protective adhesive layer. Since the auxiliary adhesive layer possesses a certain mechanical strength after lamination or curing, it strengthens the bonding strength between the cover glass and the flexible display panel, while also providing support for the cover glass and the flexible display panel, thereby preventing the flexible display panel from undergoing significant deformation at the gap under an external force. Thus, the risk of damage to the flexible display panel is reduced, and the product quality and reliability of the flexible display device are improved.

Description of the Drawings

[00027] To more clearly illustrate technical solutions in embodiments of the present invention, the drawings to be used in the description of the embodiments are briefly introduced below. It is apparent that the drawings as described below merely illustrate some embodiments of the present invention, and a person having ordinary skill in the art may, without any inventive effort, obtain additional drawings according to these drawings.

- [00028] FIG. 1 is a schematic structural diagram of a flexible display device in the prior art;
- [00029] FIG. 2 is a top view of a flexible display device in the prior art;
- [00030] FIG. 3 is a schematic structural diagram of a flexible display device according to an embodiment of the present invention;
- [00031] FIG. 4 is a flowchart of a fabrication method according to an embodiment of the present invention;
- [00032] FIG. 5 is a top view of a flexible display device according to an embodiment of the present invention; and
- [00033] FIG. 6 is a top view of a flexible display device according to another embodiment of the present invention.

Detailed Description of the Embodiments

[00034] The technical solutions in the embodiments of the present invention will be clearly and completely described below in combination with the drawings in the embodiments of the present invention. It is apparent that the described embodiments are only part of the embodiments of the present invention, not all the embodiments. Based on the embodiments in the present invention, all other embodiments obtained by a person having ordinary skill in the art without involving creative effort shall fall within the scope of protection of the present invention.

[00035] In the description of the present invention, it is to be understood that the terms "center," "longitudinal," "transverse," "length," "width," "thickness," "up," "down," "front," "back," "left," "right," "vertical," "horizontal," "top," "bottom," "inside," "outside," "clockwise," "counterclockwise," etc. indicate orientations or position relationships that are based on the orientations or position relationships as shown in the drawings, and are only intended to facilitate description of the present invention and to simplify the description, instead of indicating or implying that a device or an element indicated must have a specific orientation or be constructed and operated in a specific orientation, and thus cannot be understood as limiting the present invention. Furthermore, the terms "first" and "second" are used for descriptive purposes only and are not to be construed as indicating or implying relative importance or implicitly specifying the number of technical features indicated. Thus, features defined by "first" and "second" may explicitly or implicitly include one or more of such features. In the description of the present invention, "a plurality of" means at least two or more than two, unless otherwise explicitly specified. In the present application, the term "exemplary" is used to mean "serving as an example, instance, or illustration". Any embodiment described as "exemplary" in the present application is not necessarily to be construed as preferred or advantageous over other embodiments. The following description is provided to enable any person having ordinary skill in the art to make and use the present invention. In the following description, details are set forth for explanatory purposes. It should be understood that a person having ordinary skill in the art may recognize that the present invention may be implemented without using these specific details. In other instances, well-known structures and processes are not elaborated in detail to avoid unnecessary details obscuring the description of the present invention. Therefore, the present invention is not intended to be limited to the embodiments shown, but is to be accorded the widest scope consistent with the principles and features disclosed in the present application.

[00036] In the prior art, due to certain tolerances in attachment using an optically clear adhesive, there is a gap between the cover glass and the display panel. When the display panel undergoes bending, the technical problems of easy damage and poor product reliability may arise.

[00037] Based on this, embodiments of the present invention provide a flexible display device and a fabrication method for a flexible display device. The following provides detailed descriptions separately.

[00038] First, an embodiment of the present invention provides a flexible display device. FIG. 3 is a schematic structural diagram of a flexible display device according to an embodiment of the present invention. As shown in FIG. 3, the flexible display device comprises: a flexible display panel 21 comprising a first region 211, a second region 212 adjacent to a side of the first region 211, and a third region 213 between the first region 211 and the second region 212; an optically clear adhesive layer 23 disposed on a side of the first region 211 of the flexible display panel 21; a cover glass 24 disposed on the optically clear adhesive layer 23; a protective adhesive layer 22 disposed on an outer surface of the second region 212 of the flexible display panel 21 and on the same side as the optically clear adhesive layer 23; and an auxiliary adhesive layer 29 completely covering a surface of the third region 213 proximate to a side of the cover glass 24.

[00039] Compared with existing flexible display devices and fabrication methods for a flexible display device, in the present invention, the auxiliary adhesive layer 29 is provided on the surface of the third region 213 of the flexible display panel 21 proximate to a side of the cover glass 24 to fill the gap between the optically clear adhesive layer 23 and the protective adhesive layer 22. Since the auxiliary adhesive layer 29 possesses a certain mechanical strength after lamination or curing, it strengthens the bonding strength between the cover glass 24 and the flexible display panel 21, while also providing support for the cover glass 24 and the flexible display panel 21, thereby preventing the flexible display panel 21 from undergoing significant deformation at the gap under an external force. Thus, the risk of damage to the flexible display panel 21 is reduced, and the product quality and reliability of the flexible display device are improved.

[00040] Based on the above embodiment, the second region 212 comprises a transition portion 212a connected to the third region 213, a bent portion 212b connected to a side of the transition portion 212a away from the third region 213, and an extension 212c connected to a side of the bent portion 212b away from the transition portion 212a and located on a back side of the first region 211. In this embodiment, the flexible display device is applicable to a Pad-Bending structure. By providing the auxiliary adhesive layer 29, stress on the flexible display panel 21 during bending is alleviated. Further, the material of the auxiliary adhesive layer 29 may be selected as an organic light-transmitting material, thereby further dispersing the stress acting on the auxiliary adhesive layer 29 and improving the reliability of the flexible display device.

[00041] Generally, the first region 211 of the flexible display panel 21 is a display area, and a portion of the cover glass 24 corresponding to the first region 211 is a light-transmitting area. The second region 212 and the third region 213 of the flexible display panel 21 may be display areas or non-display areas. Portions of the cover glass 24 corresponding to the second region 212 and the third region 213 may be light-transmitting areas or non-light-transmitting areas. For example, in existing products, the bottom bezel is usually a non-light-transmitting area, while the bezels on the other three sides are usually light-transmitting areas. This is merely an example description and is not specifically limiting.

[00042] In an embodiment of the present invention, at least part of the protective adhesive layer 22 is disposed in the same layer as the optically clear adhesive layer 23, and the thickness D2 of the optically clear adhesive layer 23 is greater than the thickness D1 of the protective adhesive layer 22. In this embodiment, not only is there a gap between the flexible display panel 21 and the cover glass 24 on the third region 213, but there is also a gap between the cover glass 24 and the protective adhesive layer 22 on the transition portion 212a of the second region 212. During subsequent optimization design, not only can the auxiliary adhesive layer 29 be made to cover the third region 213, but also the gap above the transition portion 212a can be improved. In a specific embodiment, the auxiliary adhesive layer 29 is further optimized. The auxiliary adhesive layer 29 comprises a first auxiliary adhesive layer 291 located on a surface of a side of the third region 213 proximate to the cover glass 24, and a second auxiliary adhesive layer 292 located on a surface of the protective adhesive layer 22 above the transition portion 212a of the second region 212. Compared with the above embodiments, in this embodiment, not only is the first auxiliary adhesive layer 291 provided, but the second auxiliary adhesive layer 292 is additionally provided, so that the gap between the cover glass 24 and the protective adhesive layer 22 is also improved, and the reliability of the flexible display device is further enhanced.

[00043] It will be appreciated that this embodiment addresses the case where the thickness D1 of the protective adhesive layer 22 is less than the thickness D2 of the optically clear adhesive layer. In some other embodiments, the thickness D1 of the protective adhesive layer 22 is equal to the thickness D2 of the optically clear adhesive layer, and there is no need to provide the second auxiliary adhesive layer 292 to ensure that there is no gap between the cover glass 24 and the protective adhesive layer 22. Similarly, when the thickness D1 of the protective adhesive layer 22 is greater than the thickness D2 of the optically clear adhesive layer 23, the protective adhesive layer 22 directly contacts the cover glass 24, and there is a gap between the optically clear adhesive layer 23 and the cover glass 24. The second auxiliary adhesive layer 292 may also be disposed between the cover glass 24 and the optically clear adhesive layer 23 to fill the aforementioned gap and bond the cover glass 24 and the optically clear adhesive layer 23. The thickness D1 of the protective adhesive layer 22 and the thickness D2 of the optically clear adhesive layer 23 mentioned here both refer to thicknesses extending from the first region 211, the third region 213, and the transition portion 212a of the second region 212 of the flexible display panel 21 towards a side of the cover glass 24. The protective adhesive layer 22 located at the bent portion 212b and the extension 212c of the second region 212 is not considered here as it is not in the same layer as the optically clear adhesive layer 23.

[00044] Providing the auxiliary adhesive layer 29 with any thickness above the third region 213 and the transition portion 212a, thereby reducing the gap, already has an improving effect. In a preferred embodiment, the auxiliary adhesive layer 29 bonds the third region 213 of the flexible display panel 21 to the cover glass 24 and bonds the protective adhesive layer 22 to the cover glass 24, respectively. The thickness D3 of the first auxiliary adhesive layer 291 is equal to the thickness D2 of the optically clear adhesive layer, and a sum of the thickness D4 of the second auxiliary adhesive layer 292 and the thickness D1 of the protective adhesive layer 22 is equal to the thickness D2 of the optically clear adhesive layer 23. In this case, in the present embodiment, gaps between the flexible display panel 21 and the cover glass 24 and between the optically clear adhesive layer 23 and the cover glass 24 are all filled. The optically clear adhesive layer 23/the auxiliary adhesive layer 29/the protective adhesive layer 22 closely laminates the cover glass 24 with the flexible display panel 21. Thus, gaps inside the film layers are completely eliminated. When the flexible display device is acted upon by stress, the stress will not concentrate at a certain gap to create a hidden danger.

[00045] Preferably, the auxiliary adhesive layer 29 is an organic transparent material, comprising at least one of a pressure-sensitive adhesive layer, a photocurable adhesive layer, an acrylic adhesive layer, and a polyurethane adhesive layer. In one embodiment, the auxiliary adhesive layer 29 is a double-sided pressure-sensitive adhesive tape having a pressure-sensitive adhesive coated on one side of a base material before lamination. The double-sided pressure-sensitive adhesive tape is attached to the cover glass 24, and then bonded to the flexible display panel 21 after the base material is peeled off. In another embodiment, the auxiliary adhesive layer 29 is a liquid ultraviolet-curable adhesive before lamination.

[00046] To further enhance the support strength of the auxiliary adhesive layer 29, the flexible display device 29 further comprises support particles that are doped in the auxiliary adhesive layer 29, and the material strength of the support particles is greater than the material strength of the auxiliary adhesive layer 29. In some embodiments, the support particles are uniformly dispersed in the auxiliary adhesive layer 29. In some other embodiments, stress analysis is performed on the flexible display device, and a lot of support particles are distributed at locations where the applied stress is relatively concentrated. If a material of the support particles is a non-light-transmitting material, the support particles need to be distributed within an orthographic projection of a black matrix to avoid affecting an aperture ratio of the flexible display device.

[00047] The flexible display device 29 further comprises a first backplane layer 25, a support layer 26, a composite heat dissipation layer 27, and a second backplane layer 28 that are sequentially stacked from bottom to top. The first backplane layer 25, the support layer 26, the composite heat dissipation layer 27, and the second backplane layer 28 are all disposed between the first region 211 and the extension 212c of the flexible display panel 21.

[00048] To better implement the flexible display device in the embodiments of the present invention, based on the flexible display device, a fabrication method for a flexible display device is further provided in an embodiment of the present invention. The fabrication method is used for fabricating the flexible display device as described in the above embodiments. By adopting the fabrication method described in the following embodiments, the performance of the flexible display device is further improved.

[00049] As shown in FIG. 4, FIG. 4 is a flowchart of a fabrication method for a flexible display device according to an embodiment of the present invention. The fabrication method comprises the following steps:

[00050] S1, providing a flexible display panel 21 comprising a first region 211, a second region 212, and a third region 213;

[00051] S2, fabricating an optically clear adhesive layer 23 on the first region 211 of the flexible display panel 21;

[00052] S3, fabricating a protective adhesive layer 22 on the second region 212 of the flexible display panel 21;

[00053] S4, providing a cover glass 24, and fabricating an auxiliary adhesive layer 29 on a portion of the cover glass 24 corresponding to the third region 213 of the flexible display panel 21; and

[00054] S5, laminating the flexible display panel 21 with the cover glass 29.

[00055] In a specific embodiment of the present invention, the second region 212 comprises a transition portion 212a, a bent portion 212b, and an extension 212c. In step S4, preparing the auxiliary adhesive layer 29 comprises: laminating a first auxiliary adhesive layer 291 onto a portion of the cover glass 24 corresponding to the third region 213 and laminating a second auxiliary adhesive layer 292 onto a portion of the same corresponding to the transition portion 212b of the second region 212. The first auxiliary adhesive layer 291 and the second auxiliary adhesive layer 292 are both pressure-sensitive adhesive layers, and the thickness D3 of the first auxiliary adhesive layer 291 is greater than the thickness D4 of the second auxiliary adhesive layer 292. As shown in FIG. 5, FIG. 5 is a top view of a flexible display device according to an embodiment of the present invention. The first auxiliary adhesive layer 291 and the second auxiliary adhesive layer 292 are separately laminated onto the cover glass 24. The widths of the first auxiliary adhesive layer 291 and the second auxiliary adhesive layer 292 may be the same or different, depending on actual production requirements.

[00056] In another specific embodiment of the present invention, the second region 212 comprises a transition portion 212a, a bent portion 212b, and an extension 212c. In step S4, preparing the auxiliary adhesive layer 29 comprises: applying the auxiliary adhesive 29 to a portion of the cover glass 24 corresponding to the third region 213, the auxiliary adhesive 29 being a sol-state photocurable adhesive, and when the flexible display panel 21 is laminated with the cover glass 24, the auxiliary adhesive 29 filling a gap between the third region 213 and the cover glass 24 and flowing to extend above the transition portion 212a of the second region 212; and curing the auxiliary adhesive 29 by ultraviolet irradiation to form the auxiliary adhesive layer 29. As shown in FIG. 6, FIG. 6 is a top view of a flexible display device according to another embodiment of the present invention. The sol-state auxiliary adhesive 29 is applied to the portion of the cover glass 24 corresponding to the third region 213. The auxiliary adhesive 29 has a certain fluidity but cannot drip prematurely during lamination. Under pressure extrusion during the lamination process, the auxiliary adhesive 29 fills the gap between the third region 213 and the cover glass 24 and flows to extend above the transition portion 212a to fill the gap between the cover glass 24 and the protective adhesive layer 22. After curing, the auxiliary adhesive layer 29 is formed. In this embodiment, the first auxiliary adhesive layer 291 and the second auxiliary adhesive layer 292 are not strictly distinguished. They are made of the same material and fabricated simultaneously, and connected to each other as an integral whole.

[00057] In the above embodiments, descriptions of the embodiments have their own emphases. For parts not described in detail in a certain embodiment, reference may be made to the detailed descriptions for other embodiments above, which will not be repeated here. In specific implementation, each of the above units or structures may be implemented as an independent entity, or may be combined arbitrarily as one or several entities. For specific implementation of each of the above units, structures, or operations, reference may be made to the preceding method embodiments, which will not be repeated here.

[00058] The embodiments of the present invention have been described in detail above. Specific examples are used herein to illustrate the principles and implementations of the present invention. The descriptions of the above embodiments are only intended to help understand the method and core ideas of the present invention. Meanwhile, for a person having ordinary skill in the art, based on the ideas of the present invention, there will be changes in specific implementations and application scopes. In summary, the content of this specification should not be construed as limiting the present invention.

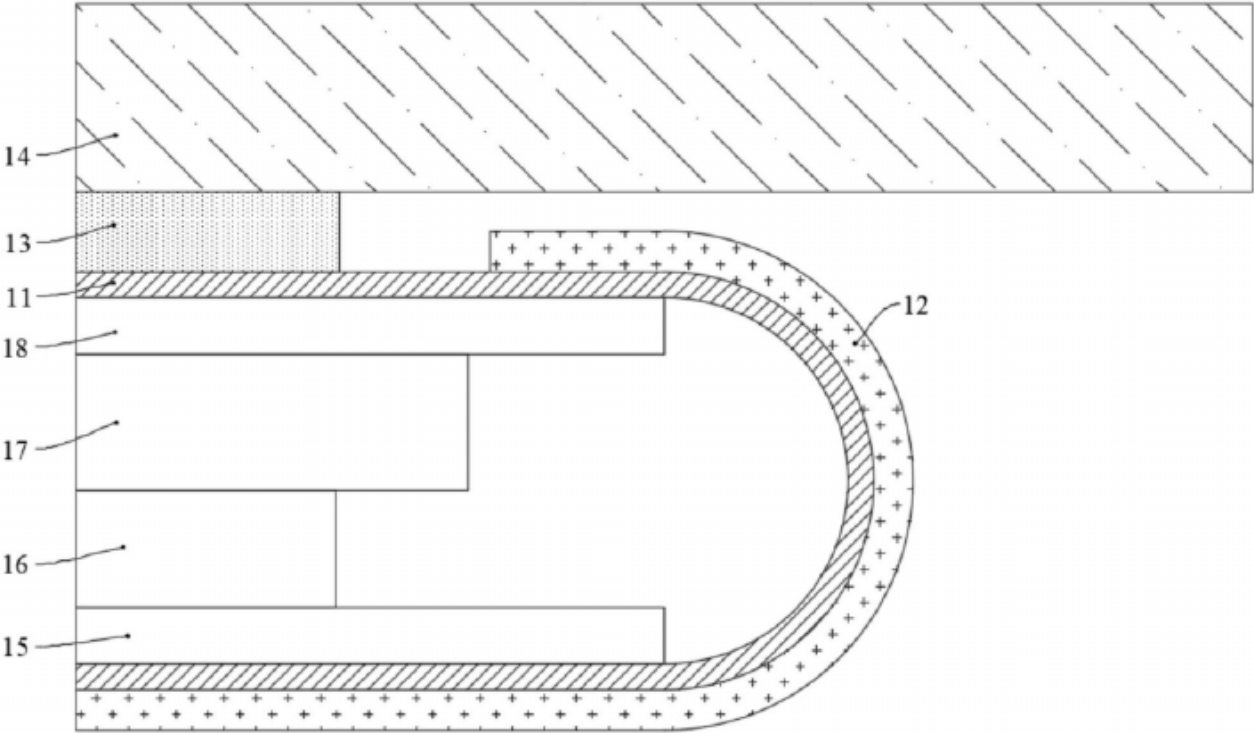


FIG. 1

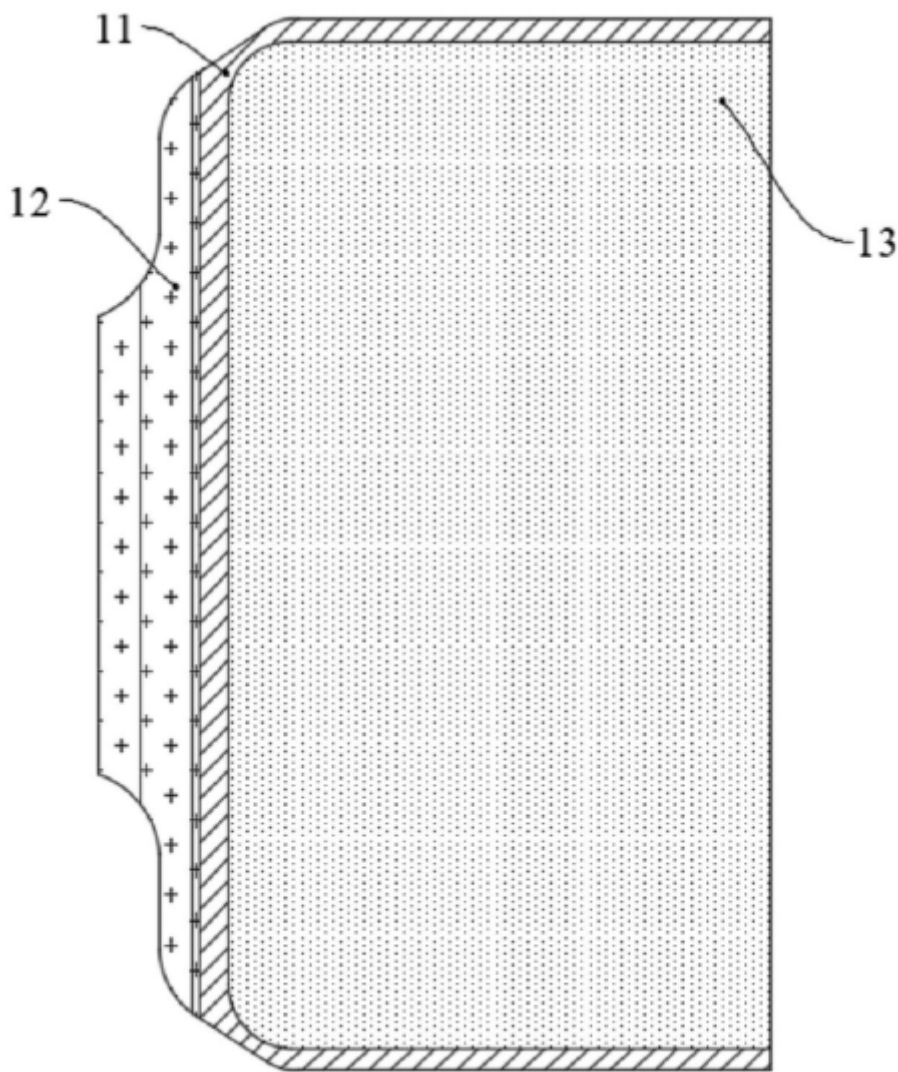


FIG. 2

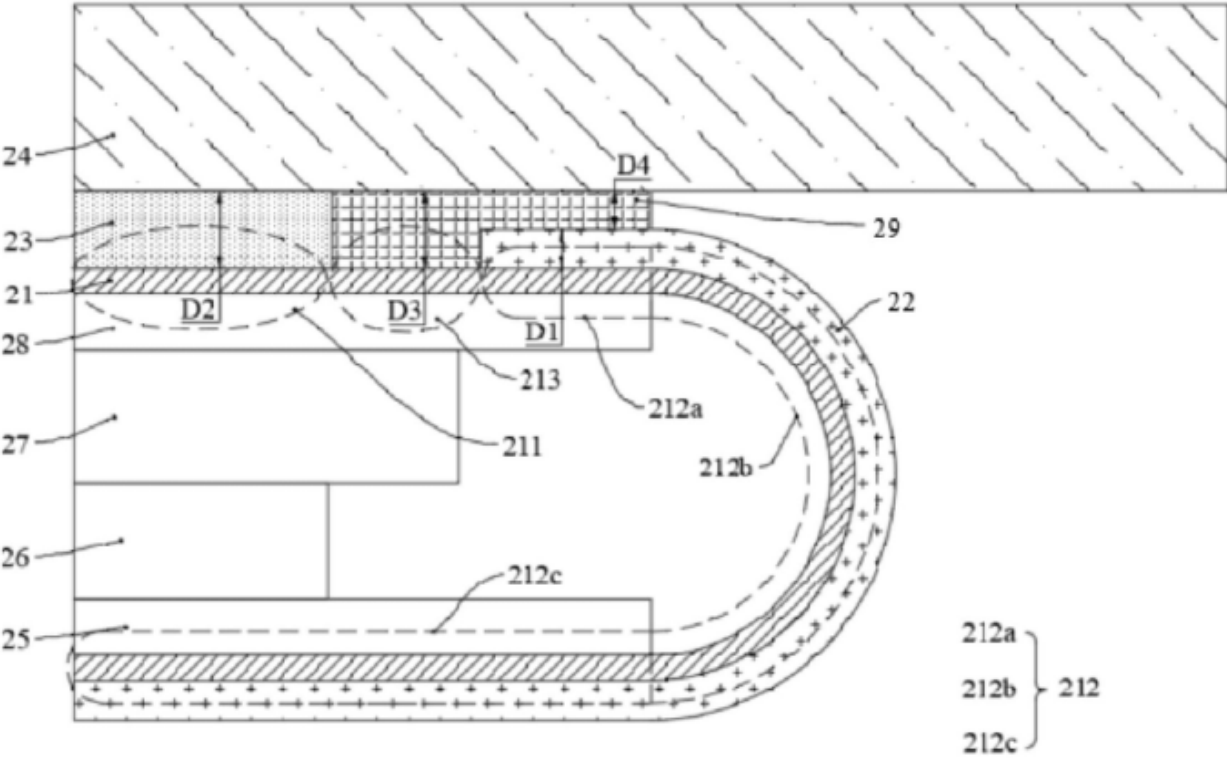


FIG. 3

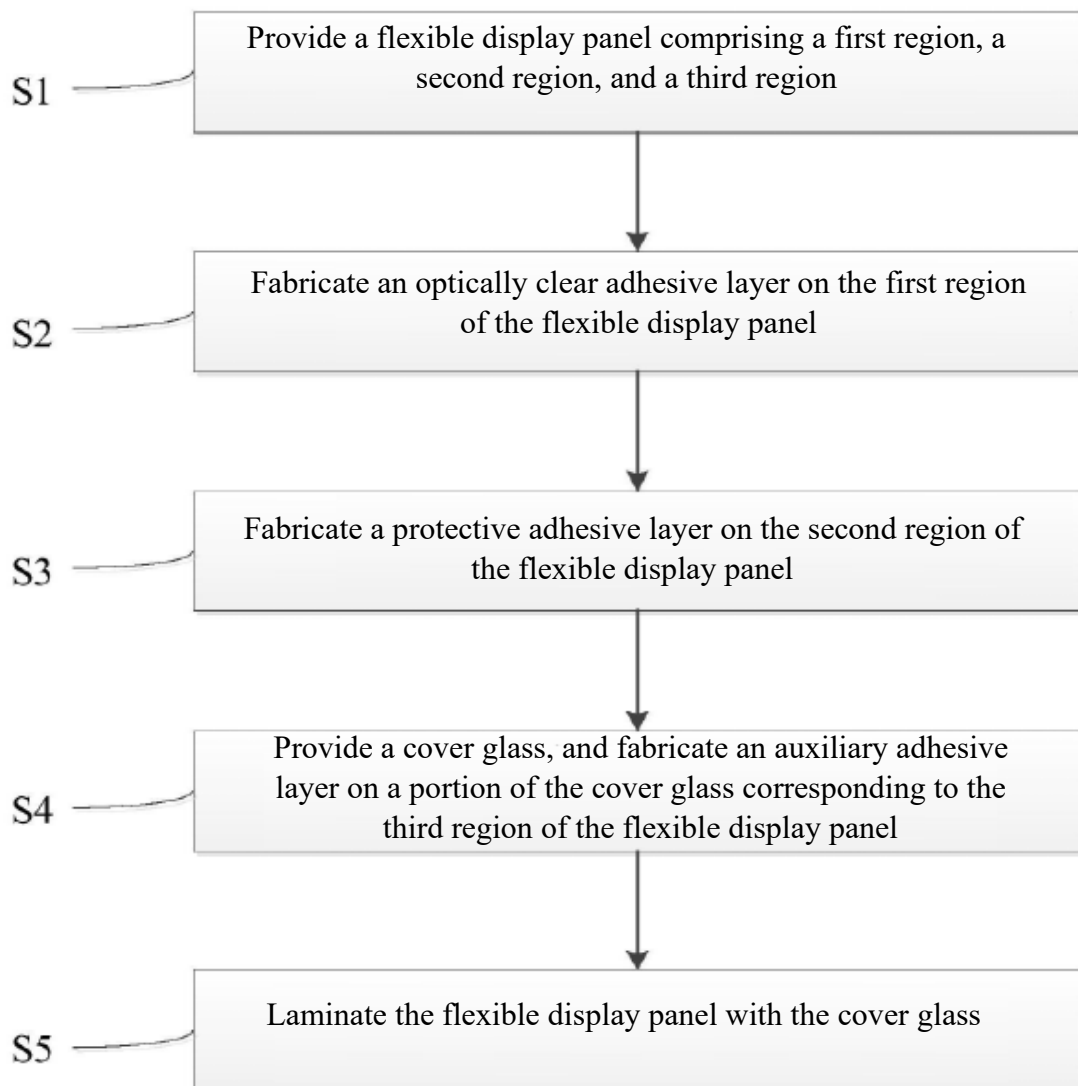


FIG. 4



FIG. 5



FIG. 6