lateral side of the display 400 (the second direction, e.g., the -y direction in the drawings). In various embodiments, the protective member 420 may be disposed to surround an outer surface (also referred to as an outer peripheral surface or an outer circumferential surface) 430c of the bending portion 430.

[81] In various embodiments, the protective member 420 may include a first resin 421 (e.g., an epoxy resin portion). For example, the protective member 420 may be formed by molding the first resin 421 in an uncured state with respect to side portions 431a of the bending portion 430 and curing the molded first resin. The protective member 420 including the molded first resin 421 may be referred to by a term such as "molding" or "molded portion."

[82] In various embodiments, the display 400 may include a buffer region 440. The buffer region 440 may be positioned on an inner side of the bending portion 430. In various embodiments, the buffer region 440 may include an air gap region 441. A region that is not filled with a material such as resin (e.g., the first resin 421) may be present at the inner side of the bending portion 430. For example, the inner side of the bending portion 430 may be entirely or partially left empty so that an air layer or an air cell is formed.

[83] FIG. 5A is a cross-sectional view of the display 400 according to various embodiments of the disclosure.

[84] FIG. 5B is a cross-sectional view of a display 40 according to a comparative example.

[85] Referring to FIG. 5A, when a force or impact F1 is applied from the outside to the side surface of the display 400 according to the disclosure, the buffer region 440 positioned at the inner side of the bending portion 430 may absorb the impact F1. For example, the air gap region 441 of the buffer region 440 may provide a space in

which the bending portion 430 may be deformed S1 by the impact F1. Accordingly, damage to the bending portion 430 may be prevented and/or reduced.

[86] Referring to FIG. 5B, in the display 40 according to a comparative example, an inner side of a bending portion 43 may be filled with resin. For example, in a resin molding process for forming a protective member 42, resin may be filled into the inner side of the bending portion 43 and cured. According to the comparative example, when a force or impact F1 is applied to the side surface of the display 40, a reaction force F2 generated by the resin filled in the inner side of the bending portion 43 may occur, and deformation of the bending portion 43 for absorbing the impact F1 may be restricted. Accordingly, a risk of damage to the bending portion 43 due to the impact may increase.

[87] FIG. 6A is a rear view of the display 400 according to various embodiments.

[88] FIG. 6B is a perspective view illustrating a blocking member of the display 400 according to various embodiments.

[89] FIG. 6C is a rear view of the display 400 according to various embodiments.

[90] FIG. 6D is an enlarged view illustrating the display 400 according to various embodiments.

[91] FIG. 6A illustrates the display 400 in a state in which the protective member 420 of FIG. 6C is removed.

[92] FIG. 6B is an enlarged view of portion A of FIG. 6A, and FIG. 6D is an enlarged view of portion B of FIG. 6A.

[93] Referring to FIGS. 6A to 6C, in various embodiments, the display 400 may include a dam. In various embodiments, the blocking member 450 may be positioned at a side end 431a of the bending portion 430 with respect to the width direction of the bending portion 430 (e.g., the x direction and/or the -x direction in the drawings). In various embodiments, the blocking member 450 may include a first

blocking member 450a disposed at one of opposite side ends 431a of the bending portion 430 and a second blocking member 450b disposed at the other side end 431a. In various embodiments, the blocking member 450 may be disposed at one of the opposite side ends 431a of the bending portion 430. The blocking member 450 may fully or partially close the internal space of the bending portion 430 at the side end 431a of the bending portion 430. For example, with respect to the side end 431a of the bending portion 430 in an open state as illustrated in (1) of FIG. 6B, the side end 431a of the bending portion 430 may be closed when the blocking member 450 is positioned as illustrated in (2) of FIG. 6B.

[94] As the bending portion 430 is bent from the second direction (e.g., the -y direction) toward a direction opposite to the first direction (e.g., the -z direction) and enters the rear surface portion 402 of the display 400, each side end 431a of the bending portion 430 in a third direction (e.g., the x direction or the -x direction) may be in an open state, and thus uncured first resin 421 may flow into the inner side of the bending portion 430 during molding of the first resin 421. Accordingly, as the blocking member 450 closes the side end 431a of the bending portion 430, inflow of the first resin 421 into the bending portion 430 may be prevented or reduced. Because the blocking member 450 blocks a flow of resin, the blocking member 450 may be referred to as a dam.

[95] In various embodiments, the blocking member 450 may be formed at the side end 431a of the bending portion 430 by applying a viscous resin. The viscous resin may include, for example, an adhesive seal 451 (also referred to as a bond seal) including a material such as silicone and/or synthetic rubber. For example, the blocking member 450 may be formed of the same material as an adhesive seal 407 used to seal other components of the display 400 during manufacture of the display 400. That is, during manufacture of the display 400, the application operation of the

blocking member 450 may be performed collectively and simultaneously with the application operation of the adhesive seal 407.

[96] Referring to FIG. 6C, in a state in which the blocking member 450 is formed, the protective member 420 may be formed by molding the first resin 421 on an outer side of the bending portion 430 so as to at least partially cover the blocking member 450, as illustrated in FIG. 6C. In this case, during molding of the first resin 421, the blocking member 450 may prevent or reduce inflow of the first resin 421 into the inner side of the bending portion 430 through opposite ends of the bending portion 430.

[97] Referring to FIG. 6D, in various embodiments, the bending portion 430 may include a margin portion 433. The margin portion 433 may be a region of the bending portion 430 that is adjacent to the side end 431a and in which no conductive pattern 432 is formed. For example, the conductive pattern 432 may not be formed in a region extending inward by a predetermined distance W1 from an edge of the bending portion 430 in the width direction.

[98] In various embodiments, the blocking member 450 may not overlap the bending portion 430 by more than a predetermined distance W1. That is, the blocking member 450 may not be positioned to overlap the conductive pattern 432 of the bending portion 430. If the blocking member 450 overlaps the conductive pattern 432, various stresses applied from the outside may be transmitted to the conductive pattern 432 through the blocking member 450, thereby causing damage and/or detachment of the conductive pattern 432 and thus increasing a risk of failure of the display 400.

[99] In various embodiments, the width W1 of the margin portion 433 may be configured so that the blocking member 450 does not overlap the conductive pattern 432. For example, the predetermined distance W1 between an edge of the bending

to FIG. 7D, the bracket 460 may be positioned on a region of the rear surface portion 402 of the display 400 to be covered by the bracket 460, and the adhesive seal 451 may be applied along a periphery of the bracket 460.

[108] In various embodiments, the bracket 460 may be disposed adjacent to a side end 431a of the bending portion 430. For example, the bracket 460 may be positioned such that a portion of the adhesive seal 451 applied around the bracket 460 closes the side end 431a of the bending portion 430. Accordingly, the adhesive seal 451 may simultaneously perform a function of attaching the bracket 460 and a function of closing the side end 431a of the bending portion 430.

[109] FIG. 8A is a cross-sectional view illustrating the display 400 according to various embodiments.

[110] FIG. 8B is a plan view and a perspective view illustrating the display 400 according to various embodiments.

[111] The cross-section of FIG. 8A is taken along line D-D of FIG. 8B.

[112] Referring to FIG. 8A, the buffer region 440 may include a second resin 442. For example, the second resin 442 may at least partially fill the air gap region 441. The second resin 442 may include a material having higher flexibility than the first resin 421. For example, the second resin 442 may include a material such as thermoplastic polyurethane (TPU), thermoplastic polyolefin (TPO), and/or silicone, which has a lower elastic modulus than epoxy resin. In some embodiments, the second resin 442 may include various foamed polymer materials. The second resin 442 may be fully or partially filled in an inner space of the bending portion 430. Because the second resin 442 has higher flexibility than the first resin 421, the second resin 442 may absorb an impact transmitted to the bending portion 430 through the first resin 421 from the outside, thereby preventing or reducing damage occurring in the bending portion 430.

[113] Referring to FIG. 8B, the display 400 may include the blocking member 450. The blocking member 450 may be positioned at one of the opposite side ends 431a of the bending portion 430 in the width direction (e.g., the x-axis direction) of the bending portion 430 (e.g., a side end 431a in the x direction or a side end 431a in the -x direction). The blocking member 450 may close one of the opposite side ends 431a of the bending portion 430. For a detailed configuration of the blocking member 450, the description made with reference to FIGS. 6A to 6C may be referred to, insofar as it does not contradict this embodiment.

[114] The display 400 according to various embodiments may be manufactured such that one of the opposite side ends 431a of the bending portion 430 is closed by the blocking member 450, and the second resin 442 is injected (R2) through an opening formed at another one of the opposite side ends 431a.

[115] FIG. 9A is a cross-sectional view of a display 400 according to various embodiments.

[116] FIG. 9B is a view illustrating an operation of manufacturing the display 400 according to various embodiments of the disclosure.

[117] Referring to FIG. 9A, a buffer region 440 may include a buffer member 443. For example, the buffer member 443 may be positioned in an air gap region 441. In various embodiments, the buffer member 443 may be attached to an inner surface of the bending portion 430 at an inner side of the bending portion 430. The buffer member 443 may include, for example, various polymer materials having a lower elastic modulus than the first resin 421, such as elastomers including silicone, TPU, TPO, FKM (fluoro rubber), and/or polyisoprene. In addition, the buffer member 443 may include various foamed polymer materials such as PE foam, PU

[129] In various embodiments, the adhesive seal 451 may be applied along an outer periphery of the bracket 460 so as to fix the bracket 460 to the bending portion 430.

[130] In various embodiments, the display 400 may include a second resin 442 at least partially filling the air gap region 441 and having a lower elastic modulus than the first resin 421.

[131] According to various embodiments, the display 400 may include a blocking member 450 positioned at one of opposite side ends 431a of the bending portion 430 in the width direction of the bending portion 430.

[132] The second resin 442 may be injected into an inner space of the air gap region 441 through another one of the opposite side ends 431a at which the blocking member 450 is not disposed.

[133] In various embodiments, the display 400 may include a buffer member 443 attached to an inner surface of the bending portion 430.

[134] In various embodiments, the buffer member 443 may have a beam shape extending in the width direction of the bending portion 430.

[135] According to various embodiments of the disclosure, the display 400 may be configured to display visual information in a first direction, and may include a panel layer 411 including a bending portion 430 and a flat portion 430a extending from the bending portion 430, and a back layer 415 positioned in a direction opposite to the first direction with respect to the panel layer 411. The bending portion 430 may be bent such that the flat portion 430a is positioned in the direction opposite to the first direction with respect to the back layer 415. The display 400 may further include a protective member 420 including a first resin 421 positioned on a surface of the bending portion 430 oriented in the second direction. The display 400 may further include an air gap region 441 positioned between a surface of the back layer oriented in the second direction and the bending portion 430.

[136] In various embodiments, the display 400 may further include a blocking member 450 disposed at a side end 431a of the bending portion 430 in the width direction of the bending portion 430 to at least partially close the air gap region 441.

[137] In various embodiments, the bending portion 430 may include a margin portion 433, in which no conductive pattern 432 is disposed, extending by a predetermined distance from the side end 431a in the width direction. The predetermined distance may be equal to or greater than 50% of the width of the blocking member 450.

[138] In various embodiments, the blocking member 450 may include an adhesive seal 451 applied to the bending portion 430.

[139] In various embodiments, the display 400 may further include a bracket 460 disposed to partially cover a position adjacent to the side end 431a of the bending portion 430.

[140] In various embodiments, the adhesive seal 451 may be applied along an outer periphery of the bracket 460 so as to fix the bracket 460 to the bending portion 430.

[141] In various embodiments, the display 400 may further include a second resin 442 at least partially filling the air gap region 441 and having a lower elastic modulus than the first resin 421.

[142] According to various embodiments, the display 400 may include a blocking member 450 positioned at one of opposite side ends 431a of the bending portion 430 in the width direction of the bending portion 430, and the second resin 442 may be injected into an inner space of the air gap region 441 through another one of the opposite side ends 431a.

[143] According to various embodiments, the display 400 may include a buffer member 443 attached to the bending portion 430 on an inner surface of the air gap region 441.

【CLAIMS】

【Claim 1】

An electronic device comprising:

a transparent cover layer (202); and

a display (400) disposed below the transparent cover layer (202),

wherein the display (400) includes:

a back layer (415) positioned below the transparent cover layer (202),

a panel layer (411) including a first flat portion (430a) disposed below the back layer, a second flat portion (430b) disposed between the transparent cover layer and the back layer, and a bending portion (430) extended between the first flat portion and the second flat portion (430b), an air gap (441) formed in a space surrounded by a side surface of the back layer (415) and an inner surface of the bending portion (430), and

a protective member (420) disposed to cover at least one portion of an outer surface (430c) of the bending portion (430).

【Claim 2】

The electronic device of claim 1, further comprising at least one blocking member (450) disposed at at least one side end (431a) of the bending portion (430) such that the air gap (441) is at least partially blocked by the at least one blocking member.

【Claim 3】

The electronic device of claim 2, wherein the at least one blocking member (450) includes a first blocking member (450a) disposed at one side end of the bending portion (430) and a second blocking member (450b) disposed at another side end of the bending portion (430).

【Claim 4】

The electronic device of claim 2, wherein the at least one blocking member (450) includes a bond seal (451) applied to the at least one side end (431a) of the bending portion (430).

【Claim 5】

The electronic device of claim 1, wherein the protective member (420) includes a molded resin (421).

【Claim 6】

The electronic device of claim 1, wherein the protective member (420) is disposed to cover the at least one portion of the outer surface (430c) of the bending portion (430) and at least one portion of the first flat portion (430a).

【Claim 7】

The electronic device of claim 1, wherein the protective member (420) is positioned in a region surrounded by a rear surface of the transparent cover layer (202), a side surface frame (218) and an inner frame (2181a).

【Claim 8】

The electronic device of claim 1, wherein the protective member (420) is in contact with a side surface of the back layer (415).

【Claim 9】

The electronic device of claim 1, wherein the display includes a bracket (460) disposed to at least partially cover the first flat portion (430a).

【Claim 10】

The electronic device of claim 9, wherein the bracket (460) at least partially covers the bending portion (430) and the first flat portion (430a), and has an open inner space (460a).

【Claim 11】

The electronic device of claim 10, wherein the bracket (460) is attached to a rear surface portion (402) of the display (400) by an adhesive seal (451) applied to a periphery of the bracket (460).

【Claim 12】

The electronic device of claim 11, wherein the bracket (460) is disposed adjacent to the at least one side end (431a) of the bending portion (430) such that a portion of the adhesive seal (451) closes the at least one side end (431a) of the bending portion (430).

【Claim 13】

The electronic device of claim 1, further comprising a buffer region (440) positioned on an inner side of the bending portion (430), wherein the buffer region (440) is filled with at least one of air and resin (442).

【Claim 14】

The electronic device of claim 13, wherein the resin (442) comprises at least one of thermoplastic polyurethane (TPU), thermoplastic polyolefin (TPO) and silicone.

【Claim 15】

The electronic device of claim 1, further comprising a buffer region (440) positioned on an inner side of the bending portion (430) and a buffer member (443) attached to the inner side of the bending portion (430).

【Claim 16】

The electronic device of claim 15, wherein the buffer member (443) comprises a first layer (443a) and a second layer (443b) having different materials and rigidities.

【Claim 17】

An electronic device comprising:

a transparent cover layer (202); and

a display (400) disposed below the transparent cover layer (202) and comprising:

a back layer (415);

a panel layer (411) comprising:

a first flat portion (430a) disposed below the back layer (415);

a second flat portion (430b) disposed between the transparent cover layer (202) and the back layer (415); and

a bending portion (430) extended between the first flat portion (430a) and the second flat portion (430b), with a buffer region (440) formed by a side surface of the back layer (415) and an inner surface of the bending portion (430) and at least partially filled by one of air, a resin (442) and a buffer member (443); and

a protective member (420) disposed to cover at least one portion of an outer surface of the bending portion (430).

【Claim 18】

The electronic device of claim 17, wherein the buffer region (440) comprises an air gap (441) filled by air, and

wherein the electronic device further comprises at least one blocking member (450) disposed at at least one side end (431a) of the bending portion (430) such that the air gap (441) is at least partially blocked by the at least one blocking member.

【Claim 19】

A display of an electronic device, the display comprising:

a back layer (415);

a panel layer (411) comprising:

a first flat portion (430a) disposed below the back layer (415);

a second flat portion (430b) disposed on the back layer (415); and

a bending portion (430) extended between the first flat portion (430a) and the second flat portion (430b), with a buffer region (440) formed by a side surface of the back layer (415) and an inner surface of the bending portion (430) and at least partially filled by one of air, a resin (442) and a buffer member (443); and

a protective member (420) disposed to cover at least one portion of an outer surface of the bending portion (430).

【Claim 20】

The display of claim 19, wherein the buffer region (440) comprises an air gap (441) filled by air, and

wherein the display further comprises at least one blocking member (450) disposed at at least one side end (431a) of the bending portion (430) such that the air gap (441) is at least partially blocked by the at least one blocking member.