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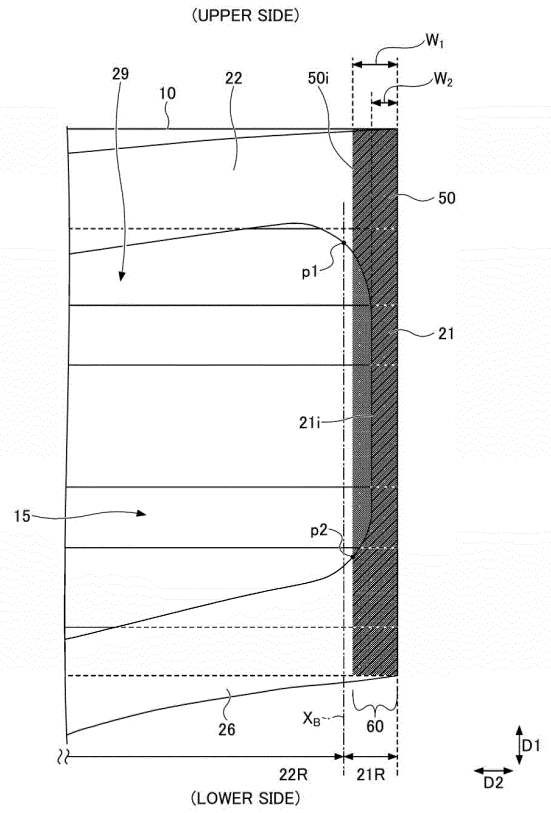
(54) **MASK AND METHOD FOR MANUFACTURING MASK**

(57) A mask includes a mask body, and a pair of sheet-shaped annular ear hook portions. The pair of sheet-shaped annular ear hook portions include fixed portions that are fixed to end portions of the mask body in a lateral direction thereof and extend in a vertical direction thereof. The fixed portions are joined on an outer face of the mask body at joined regions extending in the vertical direction. At least part of inner peripheral edges of the fixed portions are included in the joined regions.

FIG.4



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Description

[Technical Field]

[0001] The present invention relates to a mask, and a method for producing a mask.

[Background Art]

[0002] A known configuration of a mask to be worn on the face includes: a mask body that at least partially covers the face of a wearer, and a pair of ear hook portions each bonded to the mask body; i.e., a pair of members that can keep the mask body at a wearing position by being hung around the ears of the wearer.

[0003] In recent years, in order to reduce the burden on the ears during the wearing of a mask, it has been studied to use sheet-shaped ear hook portions rather than string-shaped ones. For example, PTL 1 describes a mask including a first annular ear hook portion and a second annular ear hook portion that are formed from one or a plurality of sheet pieces. In the described mask, the first annular ear hook portion and the second annular ear hook portion are respectively joined with one face of a mask body at a first joined portion and a second joined portion that are formed in the form of a line along a second direction (vertical direction). Upon use of this mask, the first ear hook portion and the second ear hook portion are respectively opened outward in a first direction (lateral direction). At this time, the first ear hook portion is turned over in the lateral direction at the first joined portion and the second ear hook portion is turned over in the lateral direction at the second joined portion.

[Citation List]

[Patent Literature]

[0004] [PTL 1] Japanese Patent No. 5436262

[Summary of Invention]

[Technical Problem]

[0005] In the configuration described in PTL 1, when both the ear hook portions are turned over outward in the lateral direction upon use of the mask, the vertical direction-extending portions (the base portions in PTL 1) of the rings of the ear hook portions (the vertical direction-extending portions being fixed to the end portions of the mask body in the lateral direction) are folded at the boundaries that are the joined portions along the vertical direction. At this time, the lateral direction outer portion from the joined portion remains joined with the mask body, but the lateral direction inner portion from the joined portion is folded and turned over. Here, when the ear hook portion is joined on the outer face of the mask body (the surface of the mask body that is opposite to a face-facing surface of the mask body), the folded-over portion of the base portion of the ear hook portion may not contour the mask body and may rise so as to be apart from the mask body, in accordance with the position of the joined portion, the material of the ear hook portion, and the way of the wearing of the mask. Such an outward risen part of the ear hook portion from the mask body may disturb behaviors of a wearer during the wearing of the mask, and also degrade the outer appearance.

[0006] In one aspect of the present invention in view of the foregoing, it is an object to provide a mask in which a sheet-shaped ear hook portion does not readily rise from a mask body.

[Solution to Problem]

[0007] One aspect of the present invention is a mask including a mask body, and a pair of sheet-shaped annular ear hook portions. The pair of sheet-shaped annular ear hook portions each include a fixed portion that is fixed to an end portion of the mask body in a lateral direction thereof and extends in a vertical direction thereof. The fixed portion is joined on an outer face of the mask body at a joined region extending in the vertical direction. At least part of an inner peripheral edge of the fixed portion is included in the joined region.

[Advantageous Effects of Invention]

[0008] According to one aspect of the present invention, it is possible to provide a mask in which a sheet-shaped ear hook portion does not readily rise from a mask body upon putting the mask on.

[Brief Description of Drawings]

[0009]

[FIG. 1] FIG. 1 is a plan view of a mask according to a first embodiment of the present invention, as viewed from an outer face side.

[FIG. 2] FIG. 2 is a plan view of the mask as illustrated in FIG. 1, as viewed from an inner face side (face side).

[FIG. 3] FIG. 3 is a plan view of a state where the ear hook portion as illustrated in FIG. 1 is opened laterally.

[FIG. 4] FIG. 4 is an enlarged view of the joined region in the mask as illustrated in FIG. 1.

[FIG. 5] FIG. 5 illustrates what a conventional mask is like.

[FIG. 6] FIG. 6 is a partial view of a state where an ear hook portion of a conventional mask is opened laterally.

[FIG. 7] FIG. 7 is a plan view of a mask according to a second embodiment of the present invention, as viewed from an outer face side.

[FIG. 8] FIG. 8 is a plan view of annular ear hook

portions as illustrated in FIG. 7.

[FIG. 9] FIG. 9 is a partial view of a state where the ear hook portion as illustrated in FIG. 7 is opened laterally.

[FIG. 10] FIG. 10 is a view for describing a part of a step of a method for producing a mask according to one embodiment of the present invention.

[Description of Embodiments]

[0010] Hereinafter, embodiments of the present invention will be described with reference to the drawings. Note that, unless otherwise specified, the same or corresponding components across the drawings are given the same symbols, and the description thereof may be omitted.

<First embodiment>

(Basic configuration of mask)

[0011] One embodiment of the present invention may be a mask that is capable of covering the face of a wearer, and more specifically at least the nose and mouth of the wearer. The mask according to the present embodiment may have functions of preventing foreign matter from reaching the face and preventing scattering of droplets from the wearer. This mask is also called a hygiene mask or surgical mask. The mask may be disposable, or reusable by, for example, washing the mask.

[0012] FIG. 1 is a plan view of a mask 1 according to the first embodiment. FIG. 1 is a view of the mask 1 as viewed from an outer side thereof (or an outer face side thereof); i.e., from a face that is not facing towards the face upon being worn, but is exposed to the outer side thereof. Also, FIG. 2 is a plan view of the mask as viewed from an inner side (a face that is towards the face).

[0013] As illustrated in FIG. 1, the mask 1 according to the present embodiment includes: a mask body 10 disposed at the front of the face of a wearer upon putting the mask 1 on and capable of mainly covering the nose and mouth of the wearer; and a pair of sheet-shaped annular ear hook portions 20a and 20a joined with the mask body 10 at joined regions 50 and 50. The mask 1 and the mask body 10 extend in an up-and-down direction (vertical direction) D1 corresponding to an up-and-down direction of the face of a wearer upon putting the mask 1 on and in a left-and-right direction (lateral direction) D2 corresponding to a left-and-right direction of the face of a wearer upon putting the mask 1 on. The vertical direction D1 is orthogonal to the lateral direction D2.

[0014] The mask body 10 as illustrated in FIG. 1 and FIG. 2 has a rectangular shape in the plan view thereof, the rectangular shape having a longer side in the lateral direction D2. However, the shape of the mask body 10 in the plan view thereof is not limited to the illustrated shape. Also, as illustrated in FIG. 1 and FIG. 2, the mask body 10 has a pleated structure 15 made of a plurality of pleats that are juxtaposed in the vertical direction D1. The pleats of the pleated structure 15 are formed by folding a sheet for the mask body 10 at fold lines along the lateral direction D2. In a state where the plurality of pleats are formed, both end portions of the mask body 10 in the lateral direction D2 are fixed through, for example, heat sealing. Therefore, upon use of the mask 1, it is possible to open, in the vertical direction D1, the pleats of the pleated structure 15 near a middle portion of the mask 1 in the lateral direction D2. Thereby, the middle portion of the mask body 10 in the lateral direction D2 can be deformed and specifically curved so as to project towards the outer face side of the mask 1 both in the vertical direction D1 and in the lateral direction D2 and fit to the three-dimensional shape of the face. The pleated structure 15 is not particularly limited to any specific structure, and may be a publicly known structure formed in a mask body. However, as illustrated in FIG. 1 and FIG. 2, when box pleats are formed at a middle portion in the vertical direction D1, the middle portion of the mask body 10 in the vertical direction D1 is readily projected in a direction away from the face upon putting the mask on, which is preferable.

[0015] The mask body 10 may have a multi-layered structure in which a plurality of layers are laminated on top of one another. For example, the mask body 10 may have a structure including at least three layers: an outer layer, an inner layer, and an intermediate layer therebetween. The intermediate layer has an enhanced function of capturing foreign matter (e.g., dust, pollens, bacteria, and virus particles). Each of the layers forming the mask body 10 preferably contains a fiber-containing layer such as nonwoven fabric, woven fabric, or knit fabric, and more preferably contains nonwoven fabric. Examples of the nonwoven fabric include spunbonded nonwoven fabric, spunlace nonwoven fabric, meltblown nonwoven fabric, air-through nonwoven fabric, and point bond nonwoven fabric. Also, the intermediate layer preferably uses meltblown nonwoven fabric that can contain thin fibers. The fiber of the fiber-containing layer is preferably a resin fiber. Examples of the resin of the resin fiber include polyethylene, polypropylene, polyethylene terephthalate, and nylon. The basis weight of the outer layer or the inner layer may be from 10 through 50 g/m^2. The basis weight of the intermediate layer having a high ability to capture foreign matter is preferably from 10 through 100 g/m^2, and more preferably from 15 through 50 g/m^2.

[0016] Upon putting the mask on, each of the pair of annular ear hook portions 20a and 20a has a shape as to be hung around the wearer's ear, with the wearer's ear being put in the ring of the ear hook portion 20a; i.e., a middle opening 29 of the annular ear hook portion 20a. As illustrated in FIG. 1 and FIG. 2, the pair of annular ear hook portions 20a and 20a are not formed in the form of a string or thread but in a sheet shape. By the pair of annular ear hook portions 20a and 20a being made in the sheet shape, when a wearer has the ear hook portion 20a hung around his or her ear upon putting the mask on, the ear hook portion 20a can make surface contact

with the back of the ear or the back face of the earlobe. This makes it possible to reduce the burden on the ear. Thus, it is possible to reduce discomfort even in the long-term use.

[0017] In the embodiment as illustrated in FIG. 1 and FIG. 2, the pair of annular ear hook portions 20a and 20a are formed as a single sheet shape in which the pair of ear hook portions 20a and 20a are bonded in a separable manner at a middle portion in the lateral direction D2; i.e., as an ear hook portion sheet 20. Here, the single sheet refers to a form of one sheet that is continuous. This one sheet may be a single layer, or a laminated body of a plurality of layers that are laminated on top of one another. When the pair of annular ear hook portions 20a and 20a are in the single sheet shape, it is possible to simultaneously determine the positions of the annular ear hook portions 20a and 20a during the production. This makes the production of the mask easier. However, in the present embodiment, the pair of annular ear hook portions 20a and 20a are not necessarily bonded together.

[0018] When the pair of annular ear hook portions 20a and 20a are formed as the ear hook portion sheet 20, the ear hook portion sheet 20 may be configured so that the ear hook portion sheet 20 can be torn at a predetermined position to form a pair of separated annular ear hook portions 20a and 20a. In the embodiment of FIG. 1, the pair of annular ear hook portions 20a and 20a are bonded at a bond portion 28. No particular limitation is imposed on the bonding manner of the bond portion 28. However, it is preferable that the bond thereof be separable by being pulled apart with normal amount of force by a user. For example, as illustrated in FIG. 1, the bond portion 28 may be formed as a perforated line. Alternatively, the bond portion 28 may be formed by reducing the thickness of the sheet or by other means so as to embrittle the boundary between the pair of annular ear hook portions 20a and 20a, and make the boundary subjectable to stress. Also, the bond portion 28 may be formed so as to be cut by a user with a tool such as scissors.

[0019] The annular ear hook portions 20a and 20a (or the ear hook portion sheet 20) may be formed from a material having stretchability, specifically a material having stretchability in at least the lateral direction. When the annular ear hook portions 20a and 20a have stretchability, a user can easily pull the annular ear hook portions 20a and 20a to the back of the ear and then hang the ear hook portions 20a and 20a around the ears, upon putting the mask on. Also, during the wearing of the mask, the mask body 10 can be fitted to the face by tensile stress occurring in the ear hook portions 20a and 20a.

[0020] The ear hook portion 20a may be a single-layered sheet made of a material having stretchability, or a multi-layered sheet of a plurality of layers that include a layer made of a stretchable material and are laminated on top of one another. The stretchable material may be stretchable nonwoven fabric, a stretchable film, or a thread- or string-form stretchable member such as a rubber thread. The stretchable nonwoven fabric includes stretchable fibers. When the stretchable nonwoven fabric is included, the nonwoven fabric may develop the stretchability by, for example, the material itself of the fibers having the stretchability, or the fibers being crimped fibers. Alternatively, the stretchability may be developed by a predetermined physical structure, for example, recesses and projections in the surface thereof. Specific examples of the stretchable nonwoven fabric include stretchable air-through nonwoven fabric, stretchable spunbonded nonwoven fabric, stretchable spunlace nonwoven fabric, stretchable needle-punched nonwoven fabric, and stretchable chemical bond nonwoven fabric. The basis weight of the nonwoven fabric used may be from 5 through 50 g/m^2, and more preferably from 8 through 35 g/m^2.

[0021] When the annular ear hook portion 20a is made of a multi-layered sheet of a plurality of layers of nonwoven fabric that are laminated on top of one another, for example, the ear hook portion 20a may be a structure of spunbonded nonwoven fabric/meltblown nonwoven fabric/spunbonded nonwoven fabric. The stretchable nonwoven fabric can be used for at least one layer thereof. When the annular ear hook portion 20a is made of a multi-layered sheet including a stretchable film, the ear hook portion 20a is, for example, a structure of nonwoven fabric/stretchable film or a structure of nonwoven fabric/stretchable film/nonwoven fabric (e.g., a structure of spunbonded nonwoven fabric/stretchable film/spunbonded nonwoven fabric, or a structure of air-through nonwoven fabric/stretchable film/air-through nonwoven fabric). In the case of a sheet of two layers that are laminated on top of each other and include a stretchable layer, the other layer can be laminated and fixed at intervals on the stretchable layer being stretched, followed by loosening and returning to the natural state, to obtain a sheet for the annular ear hook portion 20a. Also, in the case of a sheet of three layers that are laminated on top of one another, the layers that are to sandwich the intermediate layer can be laminated and fixed at intervals on both faces of the intermediate layer being stretched, followed by loosening and returning to the natural state, to obtain a sheet for the annular ear hook portion 20a.

[0022] Of the above structures, the structure using the stretchable film, especially the structure including the stretchable film and nonwoven fabric on both faces thereof is preferable because this structure is readily produced and high stretchability is obtained. Examples of the material of the stretchable film include polyolefins such as polyethylene and polypropylene; and polyurethanes. The stretchability of the stretchable film is preferably from 3.5 through 4.0 in terms of the maximum stretch rate (the stretch rate at the time of tensile break) as measured by a tensile tester. Also, the stretchable film may have the function of passing moisture therethrough. When the stretchable film is used, nonwoven fabric can be joined, through, for example, ultrasonic welding, at intervals on

the stretchable film being stretched by a predetermined number of times the natural length thereof, followed by loosening and returning to the natural state, to obtain a sheet for the annular ear hook portion 20a. By the stretchable film being loosened, non-joined portions of the nonwoven fabric rise. Thus, the resulting sheet has a large number of wrinkles that extend along a direction almost orthogonal to the stretch direction.

[0023] Note that, the sheet for the annular ear hook portion 20a may be formed by sandwiching a rubber string being stretched between nonwoven fabric materials each having low or no stretchability. Also, the above materials may be pasted together via stretchable or non-stretchable hot-melt nonwoven fabric (nonwoven fabric that can adhere to other members via fibers thereof being softened or melted by application of heat).

[0024] The basis weight of the annular ear hook portion 20a (the ear hook portion sheet 20) may be from 20 through 150 g/m^2. Also, the thickness of the ear hook portion 20a may be from 100 through 3,000 μm.

(Use of mask)

[0025] When the mask 1 according to the present embodiment is to be used for the first time, a user opens the annular ear hook portions 20a and 20a laterally in the lateral direction D2 before putting the mask 1 on. As described above, when the pair of annular ear hook portions 20a and 20a are bonded together in a separable manner, the user tears the bond before spreading out to separate the annular ear hook portions 20a and 20a from each other.

[0026] FIG. 3 illustrates a right-hand portion of a state where the annular ear hook portions 20a and 20a of the mask 1 of FIG. 1 are spread out. After the annular ear hook portion 20a is spread out outward in the lateral direction D2, the annular ear hook portion 20a is turned over, and the face of the annular ear hook portion 20a having previously faced the mask body 10 is exposed. Then, the outer face of the mask body 10 is almost entirely exposed.

[0027] As illustrated in FIG. 1 to FIG. 3, in the present embodiment, the pair of annular ear hook portions 20a and 20a are disposed on the outer face of the mask body 10. Therefore, when separating and opening the pair of annular ear hook portions 20a and 20a outward in the lateral direction D2, it is possible to reduce or eliminate possibility of touching the inner face of the mask body 10. From a hygienic viewpoint, the above structure is preferable.

[0028] The mask 1 according to the present embodiment can be used, for example, in the following manner. Specifically, in a state where the mask 1 is placed with the outer face of the mask body 10 facing upward, a user grasps and opens the pair of annular ear hook portions 20a and 20a with his or her hands outward in the lateral direction D2. Then, the user moves the mask 1 to the face of another person (wearer) while grasping the pair of annular ear hook portions 20a and 20a. After applying the mask body 10 at a desired position on the face of that another person, the user can hang the pair of annular ear hook portions 20a and 20a around the ears of the another person without changing the way of holding the mask 1. Therefore, the mask 1 according to the present embodiment can be suitably used for those who cannot readily put a mask on by themselves, such as children and the sick.

[0029] Note that, the pair of annular ear hook portions 20a and 20a may be provided with pinch portions 25 and 25 (FIG. 1). A user can pinch the pinch portions 25 and 25 when separating and opening the pair of annular ear hook portions 20a and 20a outward in the lateral direction D2. The pinch portions 25 and 25 preferably project from the edge of the mask body 10 in the plan view thereof, preferably from the bottom end of the mask 1 (or the bottom end of the mask body 10). In this case, a user can pinch the pinch portions 25 and 25 with his or her hands without or substantially without touching the mask body 10 itself; i.e., both the outer face and the inner face of the mask body 10. Thereby, the user can separate and spread out the pair of annular ear hook portions 20a and 20a without or substantially without touching the mask body 10. Therefore, even in a situation where a user cannot sufficiently take care of hygiene of his or her hands and fingers, the user can put the mask 1 on or can have another person put the mask 1 on under good hygienic conditions.

[0030] Also, by the pinch portion 25 of the annular ear hook portion 20a, the user can readily adjust the annular ear hook portion 20a with the pinch portion 25 upon or after hanging the annular ear hook portion 20a around the ear of the wearer. Specifically, with the pinch portion 25, it is possible to make a positional adjustment by shifting the ear hook portion 20a in a circumferential direction of the annular ear hook portion 20a relative to the ear, or to adjust the degree of tension of the annular ear hook portion 20a by pulling the annular ear hook portion 20a backward or loosening the annular ear hook portion 20a.

[0031] Moreover, in the present embodiment, the pair of annular ear hook portions 20a and 20a are joined with both the lateral portions of the outer face of the mask body (FIG. 1 and FIG. 2). Thus, during the wearing of the mask 1; i.e., in a state where the annular ear hook portions 20a and 20a are opened laterally and hung around the ears, both the lateral portions of the mask body 10 are pushed towards the face from the outer face side by the ear hook portion 20a. Thereby, it is possible to reduce gaps between the mask body 10 and the face at both the lateral portions of the mask body 10, and to improve the functions as a mask, such as the function of blocking foreign matter and the function of preventing scattering of droplets from a wearer. Also, since the annular ear hook portion 20a is not joined on the inner face side (face side) of both the lateral portions of the body, the annular ear hook portion 20a does not directly contact the face of the wearer at both the lateral portions of the mask body

10 during the wearing of the mask 1, and discomfort is reduced.

(Shape of annular ear hook portion)

[0032] As illustrated in FIG. 1, the shape of the ring of the annular ear hook portion 20a may be generally a tetragon (preferably a rectangle). Alternatively, the shape thereof may be a shape in which the inner peripheral edge or the outer peripheral edge of the annular ear hook portion 20a has four points at which the radius of curvature is a local minimum. Nonetheless, the shape of the annular ear hook portion 20a may be, for example, a polygon other than a tetragon, a circle, or an ellipse. Also, as long as the ear hook portion 20a is annular, recesses and projections may be formed in the inner peripheral edge and/or the outer peripheral edge of the ear hook portion 20a. For example, the outline of the inner peripheral edge and/or the outer peripheral edge may be a wavy shape.

[0033] The annular ear hook portion 20a may include a fixed portion 21 and a free portion 22. The fixed portion 21 is fixed to the end portion in the lateral direction D2 of the outer face of the mask body 10 and extends along the vertical direction D1. The free portion 22 is a portion that extends from the fixed portion 21 to a central portion in the lateral direction D2 and is other than the fixed portion 21. The free portion 22 is not joined with the mask body 10. When the annular ear hook portions 20a and 20a are opened outward in the lateral direction D2 upon putting the mask 1 on, the entirety of the free portion 22 is opened outward in the lateral direction D2 and turned over. The free portion 22 has a shape of letter C, or a shape that is open outward in the lateral direction D2.

[0034] As in the present example, in which the annular ear hook portion 20a is generally a tetragon, the fixed portion 21 may correspond to one side of the tetragon, while the free portion 22 may correspond to a portion that forms the other three sides of the tetragon. More specifically, the free portion 22 may include an ear backward arrangement portion 24, an upper-side extending portion 23, and a lower-side extending portion 26. The ear backward arrangement portion 24 is disposed at the back of the ear of the wearer upon putting the mask 1 on and extends in the vertical direction D1. The upper-side extending portion 23 connects the fixed portion 21 and the ear backward arrangement portion 24 at an upper side of the mask 1 and extends in a nearly straight line. The lower-side extending portion 26 connects the fixed portion 21 and the ear backward arrangement portion 24 at a lower side of the mask 1 and extends in a nearly straight line.

[0035] Note that, in the present example, the fixed portion 21 can be a portion ranging in the lateral direction D2 from a boundary line outward to the outer-end edge in the lateral direction D2 of the annular ear hook portion 20a. The boundary line is a parallel line to the vertical direction D1, the parallel line passing through a point located the closer to the central portion in the lateral direction D2; i.e., point p1 or point p2 (in the present example, point p1). Here, the point p1 is a point at which the radius of curvature of the inner peripheral edge of the annular ear hook portion 20a is the minimum at an upper side (a side where the fixed portion 21 is connected to the upper-side extending portion 23). The point p2 is a point at which the radius of curvature of the inner peripheral edge of the annular ear hook portion 20a is the minimum at a lower side (a side where the fixed portion 21 is connected to the lower-side extending portion 26) (FIG. 4). FIG. 4 is an enlarged view of a right-hand joined region 50 and a portion in the vicinity thereof in FIG. 1. FIG. 4 illustrates an example of a range 21R of the fixed portion 21 and a range 22R of the free portion 22, as viewed in the lateral direction D2. In the illustrated example, the boundary line between the fixed portion 21 and the free portion 22 is a parallel line X_B to the vertical direction D1, the parallel line X_B passing through the point p1 at which the radius of curvature of the inner peripheral edge of the annular ear hook portion 20a is the minimum at the upper side.

(Joined region)

[0036] As described above, in the present embodiment, the pair of sheet-shaped annular ear hook portions 20a and 20a (or the ear hook portion sheet 20) is superposed on the outer face of the mask body 10 and respectively joined with both end portions thereof in the lateral direction D2 at the joined regions 50 and 50. The joined regions 50 and 50 may be, for example, formed by means for fusing at least the surfaces of the materials of the ear hook portion 20a and the mask body 10 and fusion-bonding the opposing faces of the ear hook portion 20a and the mask body 10 together (fusion-bonding means), such as heat sealing or ultrasonic sealing. Alternatively, the joined regions 50 and 50 may be also formed by an adhesive or by other mechanical bonding means without fusing the material. When the materials of the ear hook portion 20a and the mask body 10 are a thermoplastic resin, heat sealing is preferably used because the ear hook portion 20a and the mask body 10 are readily fusion-bonded and can be more reliably joined together.

[0037] When the joined region 50 is formed by the fusion-bonding means, a region subjected to a fusion-bonding treatment by the fusion-bonding means; i.e., a fusion-bonding treated region 60, may match the joined region 50, but does not necessarily match the joined region 50. For example, as illustrated in FIG. 1 and FIG. 4, the fusion-bonding treated region 60 (indicated in gray) may be formed in a wider range than the joined region 50 (indicated in oblique lines) between the mask body 10 and the fixed portion 21. In other words, the fusion-bonding treated region 60 may include, as illustrated in FIG. 1 and FIG. 4, not only a region where the fixed portion 21 and the mask body 10 that are superposed on top of each other have been treated, but also a region where only the mask body 10 has been subjected to the

fusion-bonding treatment. For example, in an inner portion in the lateral direction D2 of a main portion where an inner peripheral edge 21i of the fixed portion 21 extends in a nearly straight line, only the mask body 10 may be subjected to the fusion-bonding treatment.

[0038] As illustrated in FIG. 1 and FIG. 4, in the present embodiment, at least part of the inner peripheral edge 21i of the fixed portion 21 of the annular ear hook portion 20a is included in the joined region 50. In other words, at least part of the inner peripheral edge 21i of the fixed portion 21 is overlapped with the fusion-bonding treated region 60 in the plan view thereof (i.e., the at least part thereof is located in the fusion-bonding treated region 60 or overlapped with the edge of the fusion-bonding treated region 60). In other words, the inner peripheral edge 21i of the fixed portion 21 passes through the fusion-bonding treated region 60 or the inner peripheral edge of the annular ear hook portion 20a passes through the fusion-bonding treated region 60. With this configuration, the fixed portion 21 is reliably fixed to the mask body 10 in a range thereof extending to the inner peripheral edge 21i. Thus, upon putting the mask on, it is possible to prevent a portion near the inner peripheral edge 21i of the fixed portion 21 from rising from the mask body 10.

[0039] The above effect will be described below in more detail. To do this, a plan view of a conventional mask 1' is given in FIG. 5. FIG. 5 corresponds to FIG. 1 and is a view of the mask 1' as viewed from the outer face side of the mask body 10. A basic configuration of the mask 1' is similar to that of the mask 1 as illustrated in FIG. 1. However, the configuration of the joined regions 50' and 50' in the mask 1' is different from that of the joined regions 50 and 50 in the mask 1.

[0040] As illustrated in FIG. 5, in the conventional mask 1' as well, the joined region 50' is formed along the vertical direction D1 at the end portion of the mask body 10 in the lateral direction D2. However, the inner peripheral edge 21i of the fixed portion 21 is not included in the joined region 50'. Also, the fusion-bonding treated region 60 does not overlap the inner peripheral edge 21i of the fixed portion 21, nor does it overlap the inner peripheral edge of the annular ear hook portion 20a.

[0041] FIG. 6 is a partial view of a state where the annular ear hook portions 20a and 20a of the mask 1' (FIG. 5) are opened outward in the lateral direction D2. FIG. 6 corresponds to FIG. 3. As illustrated in FIG. 6, in the mask 1', after the annular ear hook portion 20a is opened outward in the lateral direction D2, the fixed portion 21 is turned over at the inner edge of the joined region 50' in the lateral direction D2. Here, a portion of the fixed portion 21 further inward than the joined region 50' in the lateral direction D2 is not joined with the mask body 10. Thus, the inner portion thereof does not contour the face of the mask body 10 upon putting the mask 1' on. This portion tends to rise away from the mask body 10 to become a risen part fr.

[0042] Meanwhile, according to the present embodiment where at least part of the inner peripheral edge 21i of the fixed portion 21 is included in the joined region 50 (FIG. 1 to FIG. 4), when the annular ear hook portions 20a and 20a are opened outward in the lateral direction D2 upon putting the mask 1 on, since at least part of the inner peripheral edge 21i of the fixed portion 21 is joined with the mask body 10, the risen part fr, which is formed in the conventional configuration (FIG. 6), is not easily formed or is not formed (FIG. 3). By the risen part being prevented from forming, when an object passes around the face of the wearer, such passage of the object is not disturbed. For example, when additional protective means (e.g., a face shield) is worn during the wearing of the mask 1, it is possible to prevent a projecting part of the protective means from being hung on the risen part, and thereby to prevent damage to the mask or the protective means. Also, as illustrated in FIG. 3, when the mask 1 being worn is observed, it is visually recognizable that rather than the annular ear hook portions 20a and 20a extending as an annular shape, the upper-side extending portion 23 and the lower-side extending portion 26 each independently extend at upper and lower sides directly from the mask body 10. Therefore, the outer appearance of the mask 1 being worn becomes simpler, which is aesthetically preferable.

[0043] Note that, in order to suppress rising of the fixed portion 21 and obtain good outer appearance as described above, it would be possible to employ a configuration in which the fixed portion 21 is not continuous in the vertical direction D1; i.e., an ear hook portion that is not annular but has a shape of letter C, or a shape that is open outward in the lateral direction D2. However, as in the present embodiment, by the fixed portion 21 extending along the vertical direction D1, it is possible to form the joined region 50 (or the fusion-bonding treated region 60) that is continuous along the vertical direction D1. This makes it possible to increase the joined strength between the mask body 10 and the ear hook portion. Therefore, according to the present embodiment, it is possible to suppress rising of the fixed portion 21 and obtain a firm mask that is hard to break.

[0044] Also, a range in which the inner peripheral edge 21i of the fixed portion 21 is included in the joined region 50, or a range in which the inner peripheral edge 21i of the fixed portion 21 overlaps the fusion-bonding treated region 60 may be 60% or more and more preferably 80% or more, by total length in the vertical direction D1 of the fixed portion 21, as viewed in the vertical direction D1. Thereby, the above effect of suppressing rising of the fixed portion 21 further increases. Moreover, as illustrated, when the inner peripheral edge of the main portion of the fixed portion 21 (the portion where the inner peripheral edge 21i extends in a nearly straight line along the vertical direction D1) is included in the joined region 50 or when the inner peripheral edge of the main portion of the fixed portion 21 is included in the fusion-bonding treated region 60, rising of the fixed portion 21 becomes harder to form.

[0045] As illustrated in FIG. 1 to FIG. 4, it is preferable

that the joined region 50 be formed along the vertical direction D1, and preferably formed continuously from the upper end to the lower end of the ear hook portion 20a in the vertical direction D1. Also, the joined region 50 may be formed as a line along the vertical direction D1, but from the viewpoint of increasing adhesion strength, the joined region 50 preferably has a width to some degree. Accordingly, it is preferable that the fusion-bonding treated region 60 also be formed along the vertical direction D1, and preferably formed continuously from the upper end to the lower end of the ear hook portion 20a in the vertical direction D1. Also, the fusion-bonding treated region 60 preferably has a width to some degree.

[0046] A width W_1 of the fusion-bonding treated region 60 (FIG. 4) may be preferably from 3 through 15 mm, and more preferably from 4 through 12 mm. The width W_1 of the fusion-bonding treated region 60 may not be constant in the vertical direction D1. However, the fusion-bonding treated region 60 that is constant in width is preferable from the viewpoint of easiness in production. Note that, when the width of the fusion-bonding treated region 60 is not constant, the value of the above width W_1 may be an average value.

[0047] The minimum width W_2 of the fixed portion 21 (FIG. 4) may also be preferably from 3 through 15 mm, and more preferably from 4 through 12 mm. When the width of the fixed portion 21 fluctuates, the above value is an average value. Also, the minimum width W_2 of the fixed portion 21 may be a width of the main portion (the portion where the inner peripheral edge extends in a nearly straight line along the vertical direction D1).

[0048] Moreover, the minimum width W_2 of the fixed portion 21 may be from 50 through 100% of the width W_1 of the fusion-bonding treated region 60. By adjusting a value of $W_2/W_1 \times 100$ to be in the above range, it is possible to maintain good adhesion strength between the mask body 10 and the fixed portion 21. When the value of $W_2/W_1 \times 100$ is adjusted to be 98% or lower and preferably 95% or lower, the fusion-bonding treated region 60 can exceed the inner peripheral edge 21i of the fixed portion 21 inward in the lateral direction D2. This makes it possible to more reliably join the inner peripheral edge 21i of the fixed portion 21 with the mask body 10. Also, even when misalignment between the mask body 10 and the annular ear hook portion 20a occurs during production, an error of such misalignment can be absorbed. Note that, as illustrated in FIG. 1 and FIG. 4, the fusion-bonding treated region 60 preferably extends to the edge of the mask body 10 in the lateral direction D2.

[0049] The annular ear hook portion 20a and the mask body 10 may be joined together continuously in the whole joined region 50 by, for example, fusion-bonding. Alternatively, the joined region 50 may include: joined small portions where the annular ear hook portion 20a and the mask body 10 are microscopically joined together; and non-joined small portions where the annular ear hook portion 20a and the mask body 10 are not microscopically joined together. Like in the latter case, according to the joined region 50 including the joined small portions and the non-joined small portions, it is possible to ensure a balance between flexibility and adhesion strength, which is preferable. The above joined small portions may be sparsely located in the form of dots in the joined region 50. The shape of one dot may be a circle, an ellipse, a polygon such as a tetragon, or another shape such as a heart shape or a star shape. Also, the joined small portions may be formed as a plurality of lines that extend in the vertical direction D1 or the lateral direction D2, a lattice, a cross hatch, etc. Microscopically, the joined small portions preferably overlap the inner peripheral edge 21i of the fixed portion 21.

<Second embodiment>

[0050] FIG. 7 illustrates a mask 101 according to the second embodiment of the present invention. FIG. 7 is a view of the mask 101 as viewed from an outer side thereof (or an outer face side thereof); i.e., from a face that is not facing towards the face upon being worn, but is exposed to the outer side thereof. A basic structure of the mask 101 according to the second embodiment is similar to that of the mask 1 according to the first embodiment (FIG. 1). The mask 101 includes a mask body 110 and a pair of sheet-shaped annular ear hook portions 120a and 120a. However, in the present embodiment, the shape and the like of the annular ear hook portions 120a and 120a (ear hook portion sheet 120) being used are different from those of the mask 1 according to the first embodiment (FIG. 1).

[0051] Similar to the mask 1 according to the first embodiment (FIG. 1), the pair of sheet-shaped annular ear hook portions 120a and 120a in the present embodiment each have a tetragonal ring shape. The annular ear hook portion 120a includes a fixed portion 121 and a free portion 122. The fixed portion 121 is fixed to the end portion of the mask body 110 in the lateral direction D2 and extends along the vertical direction D1. The free portion 122 is a portion that is other than the fixed portion 121. When the annular ear hook portion 120a is spread out outward in the lateral direction D2, the entirety of the free portion 122 is turned over. The free portion 122 may include an ear backward arrangement portion 124, an upper-side extending portion 123, and a lower-side extending portion 126. The ear backward arrangement portion 124 is disposed at the back of the ear of the wearer upon putting the mask 101 on and extends in the vertical direction D1. The upper-side extending portion 123 connects the fixed portion 121 and the ear backward arrangement portion 124 at an upper side of the mask 101 and extends in a nearly straight line. The lower-side extending portion 126 connects the fixed portion 121 and the ear backward arrangement portion 124 at a lower side of the mask 101 and extends in a nearly straight line. The upper-side extending portion 123 is a portion that extends to a central portion in the lateral direction D2 from the fixed

portion 121. The lower-side extending portion 126 is a portion that extends to a central portion in the lateral direction D2 from the fixed portion 121. The fixed portion 121, the ear backward arrangement portion 124, the upper-side extending portion 123, and the lower-side extending portion 126 are portions that correspond to respective sides of the tetragonal ring of the annular ear hook portion 120a.

[0052] In the present embodiment as well, the fixed portion 121 is joined on the outer face of the mask body 110 at the joined region 150 extending in the vertical direction D1. However, in the present embodiment, the joined region 150 and the fusion-bonding treated region 160 are the same. That is, the joined region 150 does not exceed the fusion-bonding treated region 160. In other words, the fusion-bonding treatment has been applied to a portion where the mask body 110 and the fixed portion 121 are superposed on top of each other, there being no portion where only the mask body 110 has been subjected to the fusion-bonding treatment. This makes it possible to suppress the mask body 110 from becoming harder by the fusion-bonding treatment.

[0053] The inner peripheral edge 121i of the fixed portion 121 is also included in the joined region 150. In the illustrated example, the entirety of the inner peripheral edge 121i of the fixed portion 121 is included in the joined region 150. Since the joined region 150 and the fusion-bonding treated region 160 are the same, the inner peripheral edge 121i of the fixed portion 121 entirely overlaps the edge of the fusion-bonding treated region 160. With this structure, the mask 101 according to the second embodiment also has similar effects to those described in the first embodiment. Specifically, the fixed portion 121 is reliably fixed to the mask body 110 in a range thereof extending to the inner peripheral edge 121i, which makes it possible to prevent a portion near the inner peripheral edge 121i of the fixed portion 121 from rising from the mask body 110 upon putting the mask on.

[0054] Note that, in FIG. 7, the joined region 150 is described in more detail. As illustrated in FIG. 7, the joined region 150 is, microscopically, formed from a plurality of joined small portions 150a and 150a that are spaced from each other, the plurality of joined small portions 150a and 150a being formed by joining (fusion-bonding) the annular ear hook portion 120a and the mask body 110 together. The illustrated joined small portions 150a, 150a, ... have a shape of a square in the plan view thereof. The total of areas of the joined small portions 150a, 150a, ... may be 50% or more relative to the area of the joined region 150. Also, the lateral direction D2-inner ends of the joined small portions 150a and 150a that are located the innermost in the lateral direction D2 overlap the inner peripheral edge 121i of the fixed portion 121.

[0055] FIG. 7 also illustrates upper-side embossed portions 141 formed at an upper side of the mask body 110, and lower-side embossed portions 142 formed at an upper side thereof. The upper-side embossed portions 141 are for fixing a turned-over portion at an upper side of the mask body 110. The lower-side embossed portions 142 are for fixing a turned-over portion at a lower side of the mask body 110. The upper-side embossed portions 141 and the lower-side embossed portions 142 are both formed as heat-fusion-bonded small portions arranged at intervals in the lateral direction D2, and as a whole, are lines extending in the lateral direction D2. The upper-side embossed portions 141 are formed in the form of two straight lines that are aligned in the vertical direction D1. A nose fit wire 145 having an elongated plate shape may be embedded in a region between the two straight lines of the embossed portions. The nose fit wire 145 is formed from a material that can deform to contour the shape of the nose upon putting the mask on and can maintain the deformed state. The lower-side embossed portions 142 are also formed in the form of two straight lines that are aligned in the vertical direction D1.

[0056] Also, the mask body 110 may be provided with a mark 118 by embossing, printing, sewing, etc. The mark 118 allows for distinction between the outer face and the inner face of the mask body 110. The mark 118 may be any form as long as a user can identify the mark 118 visually. The mark 118 may be a letter, as illustrated in FIG. 7, a number, a symbol, a figure, a logo, etc.

[0057] Referring to FIG. 8 that illustrates only the pair of annular ear hook portions 120a and 120a (ear hook portion sheet 120) of the mask 101 as illustrated in FIG. 7, the shape of the annular ear hook portion 120a in the present embodiment will be described in more detail.

[0058] As described above, the annular ear hook portion 120a includes: a fixed portion (extending in the vertical direction D1) 121 fixed to the mask body 110; an ear backward arrangement portion (extending nearly in the vertical direction D1) 124 that is mainly disposed at the back of the ear of a wearer upon putting the mask on; an upper-side extending portion 123 that connects the fixed portion 121 and the ear backward arrangement portion 124 together at an upper side; and a lower-side extending portion 126 that connects the fixed portion 121 and the ear backward arrangement portion 124 together at a lower side. Here, the upper-side extending portion 123 and the lower-side extending portion 126 extend from the fixed portion 121 towards a central portion in the lateral direction D2. The upper-side extending portion 123 is not formed in parallel to the lateral direction D2 (not orthogonal to the vertical direction D1) but instead is formed so as to incline towards the lower side as being closer to the central portion in the lateral direction D2. In other words, an angle of less than 90° is formed at a lower side (a side closer to a central portion in the vertical direction D1) between the extending direction of the upper-side extending portion 123 and the vertical direction D1. Also, the lower-side extending portion 126 is not formed in parallel to the lateral direction D2 (not orthogonal to the vertical direction D1) but instead is formed so as to incline towards the lower side as being closer to the central portion in the lateral direction D2. In other words, an angle

of more than 90° is formed at an upper side (a side closer to a central portion in the vertical direction D1) between the extending direction of the lower-side extending portion 126 and the vertical direction D1.

[0059] In the embodiment as illustrated in FIG. 8, the above extending direction of the upper-side extending portion 123 can be a direction of a center line X_U in a portion of the upper-side extending portion 123 where the inner peripheral edge and the outer peripheral edge are both straight lines. The center line X_U is a line passing through the center of the width of the upper-side extending portion 123. Alternatively, the above extending direction may be a direction of a straight-line portion of the inner peripheral edge 123i of the upper-side extending portion 123, or a direction of a straight-line portion of the outer peripheral edge 123o of the upper-side extending portion 123. Moreover, the above extending direction of the lower-side extending portion 126 can be a direction of a center line X_L in a portion of the lower-side extending portion 126 where the inner peripheral edge and the outer peripheral edge are both straight lines. The center line X_L is a line passing through the center of the width of the lower-side extending portion 126. Alternatively, the above extending direction may be a direction of a straight-line portion of the inner peripheral edge 126i of the lower-side extending portion 126, or a direction of a straight-line portion of the outer peripheral edge 126o of the lower-side extending portion 126.

[0060] FIG. 8 illustrates: angle αc formed at a lower side between the center line X_U in the upper-side extending portion 123 and the vertical direction D1; angle αo formed at a lower side between the direction of the straight-line portion of the outer peripheral edge 123o and the vertical direction D1; and angle αi formed at a lower side between the direction of the straight-line portion of the inner peripheral edge 123i and the vertical direction D1. In the present embodiment, one or more of the angles αc, αo, and αi are less than 90°, and may be preferably less than 85°, more preferably less than 80°, and further preferably 79° or less, and may be preferably 65° or more, more preferably 70° or more, and further preferably 75° or more. Note that, the angle αo may be larger than the angle αi (i.e., $\alpha o > \alpha i$ may be established).

[0061] Also, FIG. 8 illustrates angle βc formed at an upper side between the center line X_L in the lower-side extending portion 126 and the vertical direction D1; angle βo formed at an upper side between the direction of the straight-line portion of the outer peripheral edge 126o and the vertical direction D1; and angle βi formed at an upper side between the direction of the straight-line portion of the inner peripheral edge 126i and the vertical direction D1. In the present embodiment, one or more of the angles βc, βo, and βi are more than 90°, and may be preferably 93° or more, more preferably 95° or more, and further preferably 98° or more, and may be preferably 115° or less, more preferably 110° or less, and further preferably 105° or less. Note that, the angle βo may be smaller than the angle βi (i.e., $\beta o < \beta i$ may be established).

[0062] The angle formed at an upper side between the extending direction of the lower-side extending portion 126 and the vertical direction D1 is preferably larger than the angle formed at a lower side between the extending direction of the upper-side extending portion 123 and the vertical direction D1. For example, the angle βc in the lower-side extending portion 126 may be larger than the angle αc in the upper-side extending portion 123 ($\beta c > \alpha c$).

[0063] FIG. 9 partially illustrates a state where the annular ear hook portion 120a is opened outward in the lateral direction D2. In FIG. 9, only the right-hand part of the mask 101 of FIG. 7 is illustrated. As illustrated, the upper-side extending portion 123 and the lower-side extending portion 126 extend towards a lower side as being farther from the mask body 110 even in a state where the annular ear hook portion 120a is opened outward in the lateral direction D2. Here, upon putting the mask on, as viewed in the up-and-down direction (vertical direction D1) of the face, the ears are often positioned slightly above the mask body 110. Therefore, upon putting the mask 101 on, the ear backward arrangement portion 124 is positioned upward relative to the mask body 110. As a result, the upper-side extending portion 123 and the lower-side extending portion 126 are pulled diagonally upward (in the directions of arrows A1 and A2). Then, the bases of the upper-side extending portion 123 and the lower-side extending portion 126; i.e., portions near the boundaries with the joined region 150 (the fusion-bonding treated region 160) are rotated slightly upward (in the directions of arrows B1 and B2) to cause distortion. In the present embodiment, the annular ear hook portion 120a is joined on the outer face of the mask body 110, and the mask body 110 is pressed in a direction towards the face by the annular ear hook portion 120a. Thus, the above distortion at the bases of the upper-side extending portion 123 and the lower-side extending portion 126 is likely to be towards the face, and both the upper-side extending portion 123 and the lower-side extending portion 126 easily press the mask body 110. This makes it possible to closely adhere the mask body 110 to the face.

<Method for producing mask>

[0064] Another embodiment of the present invention may be a method for producing a mask. As an example, FIG. 10 schematically illustrates a part of a step in the production of the mask 1 according to the first embodiment. In FIG. 10, detailed structures of the mask 1 (e.g., pleats of the mask body) are not illustrated. As illustrated in FIG. 10, an elongated mask body band 10A to be the mask body 1 later is fed from, for example, a roller, and conveyed in a conveyance direction Dt. In addition, an elongated annular ear hook portion band 20A to be the pair of sheet-shaped annular ear hook portions 20a and 20a (or the ear hook portion sheet 20) later is superposed on the outer face of the mask body band 10A, and conveyed in the conveyance direction Dt.

[0065] The annular ear hook portion band 20A is

formed such that a plurality of ear hook portion sheets 20 are continuous in the lateral direction D2. In other words, in the annular ear hook portion band 20A, a plurality of annular ear hook portions are disposed so that the fixed portion 21 of one annular ear hook portion contacts the fixed portion 21 of another annular ear hook portion that is next to the one annular ear hook portion. In this manner, a continuous portion of the fixed portions 21 next to each other is formed, and the continuous portion contributes to shape retention of the annular ear hook portion band 20A. This makes it possible to prevent deformation and misalignment due to, for example, meandering of the annular ear hook portion band 20A during conveyance.

[0066] The mask body band 10A and the annular ear hook portion band 20A that are superposed on top of each other can be subjected to the fusion-bonding treatment at the above continuous portion of the annular ear hook portion band 20A (the portion where the fixed portions 21 next to each other are continuous). This can form a continuous fusion-bonding treated region 60A and a continuous joined region 50A. In this case, the fusion-bonding is performed so that at least part of the inner peripheral edge 21i of the fixed portion 21 is included in the continuous joined region 50A. In this fusion-bonding treatment as well, deformation (distortion) of the annular ear hook portion band 20A and misalignment thereof relative to the mask body band 10A can be prevented. This is because the annular ear hook portion 20a has the fixed portion 21 that continuously extends in the vertical direction D1 (FIG. 1), and the annular ear hook portion band 20A has the continuous portion of the fixed portions next to each other, the continuous portion continuously extending in a direction orthogonal to the conveyance direction Dt (FIG. 10). The fusion-bonding treatment forms a joined body of the mask body band 10A and the annular ear hook portion band 20A that are joined together. After the joined body has been formed, the joined body can be cut along a cutting line CL so that the fixed portions next to each other are separated, to thereby obtain the mask 1.

[0067] Note that, the mask 101 according to the second embodiment can be similarly produced by the production method described with reference to FIG. 10.

[0068] Hereinafter, specific aspects of the present invention will be described.

(Supplementary Note 1)

[0069] An aspect according to Supplementary Note 1 is a mask including: a mask body; and a pair of sheet-shaped annular ear hook portions, the pair of sheet-shaped annular ear hook portions each including a fixed portion that is fixed to an end portion of the mask body in a lateral direction thereof and extends in a vertical direction thereof, the fixed portion being joined on an outer face of the mask body at a joined region extending in the vertical direction, and at least part of an inner peripheral edge of the fixed portion being included in the joined region.

[0070] According to the aspect according to the Supplementary Note 1, at least part of the inner peripheral edges of the fixed portions of the annular ear hook portions (the portions that are fixed to the end portions of the mask body in the lateral direction and extend in the vertical direction) is included in the joined regions between the annular ear hook portions and the mask body. Therefore, upon use of the mask, it is possible to reduce or eliminate turned-over portions of the fixed portion when the annular ear hook portions are opened outward in the lateral direction. Thereby, the fixed portions of the annular ear hook portions can be prevented from rising from the mask body during the wearing of the mask. Thus, it is possible to reduce possibility of disturbing behaviors of a wearer during the wearing of the mask. For example, when additional protective means (e.g., a face shield) is worn during the wearing of the mask, it is possible to reduce a possibility that the ear hook portions are hung on parts of the protective means. Also, the outer appearance of the mask being worn becomes better.

[0071] Note that, in order to prevent the turned-over portions of the fixed portions from rising from the mask body during the wearing of the mask, it is conceivable to use an ear hook portion not having the fixed portion extending in the vertical direction; e.g., a non-annular ear hook portion that is opened outward in the lateral direction in a shape of letter C. However, such a non-annular ear hook portion and the mask body are fixed only at the upper end and the lower end of an end portion of the mask body in the lateral direction. A joined region therebetween extending in the vertical direction cannot be formed, and the bonding strength between the ear hook portion and the mask body is reduced. As a result, for example, when the ear hook portion is strongly pulled, the ear hook portion is likely to be removed from the mask body. Meanwhile, in the present embodiment, since the annular ear hook portion includes the fixed portion extending in the vertical direction and the fixed portion is joined with the mask body at the joined region extending in the vertical direction, the bonding strength between the ear hook portion and the mask body is better maintained. Therefore, according to the present embodiment, it is possible to prevent the fixed portion from rising outward from the mask body upon putting the mask on, and to provide a hard-to-break mask including the ear hook portion and the mask body that are firmly bonded together.

(Supplementary Note 2)

[0072] In an aspect according to Supplementary Note 2, a range in which the inner peripheral edge of the fixed portion is included in the joined region is 60% or more, by length in the vertical direction of the fixed portion.

[0073] According to the aspect according to the Supplementary Note 2, since a larger portion of the inner

peripheral edge of the fixed portion is included in the joined region, it is possible to more reliably obtain the above effect of preventing rising of the ear hook portion from the mask body.

(Supplementary Note 3)

[0074] In an aspect according to Supplementary Note 3, a maximum width of the joined region is from 3 through 15 mm.

[0075] According to the aspect according to the Supplementary Note 3, it is possible to increase the bonding strength between the ear hook portion and the mask body and also maintain flexibility of both end portions of the mask in the lateral direction.

(Supplementary Note 4)

[0076] In an aspect according to Supplementary Note 4, the joined region is included in a fusion-bonding treated region that is subjected to a fusion-bonding treatment, and a minimum width of the fixed portion in the lateral direction is from 50 through 100% of a width of the fusion-bonding treated region in the lateral direction.

[0077] According to the aspect according to the Supplementary Note 4, it is possible to increase the bonding strength between the ear hook portion and the mask body and also maintain flexibility of both end portions of the mask in the lateral direction.

(Supplementary Note 5)

[0078] In an aspect according to Supplementary Note 5, the annular ear hook portion includes an upper-side extending portion that extends at an upper side from the fixed portion in the lateral direction and a lower-side extending portion that extends at a lower side from the fixed portion in the lateral direction, a lower-side angle formed between an extending direction of the upper-side extending portion and the vertical direction is less than 90°, and an upper-side angle formed between an extending direction of the lower-side extending portion and the vertical direction is more than 90°.

[0079] According to the aspect according to the Supplementary Note 5, it is possible to provide a mask that can more closely adhere the mask body to the face.

(Supplementary Note 6)

[0080] In an aspect according to Supplementary Note 6, in a method for producing a mask including a mask body and a pair of sheet-shaped annular ear hook portions, the method includes: providing an elongated mask body band to be the mask body and an elongated annular ear hook portion band to be the pair of sheet-shaped annular ear hook portions, where the annular ear hook portion band includes a continuous portion including a fixed portion of one annular ear hook portion and a fixed portion of another annular ear hook portion, the fixed portions being next to each other and continuous in a lateral direction of the mask body; superposing the annular ear hook portion band on an outer face of the mask body band; joining the continuous portion of the annular ear hook portion band with the mask body band at a continuous joined region so that at least part of an inner peripheral edge of the fixed portion is included in the continuous joined region, to thereby obtain a joined body; and cutting the joined body so that the fixed portion of the one annular ear hook portion and the fixed portion of the another annular ear hook portion next to the one annular ear hook portion are separated, to thereby obtain the mask.

[0081] According to the aspect according to the Supplementary Note 6, it is possible to provide a mask having the effect given by one of the aspects according to the Supplementary Note 1 to the Supplementary Note 5. It is also possible to provide a method for producing a mask, whereby the method does not easily involve misalignment of the ear hook portion relative to the mask body.

[0082] The present application claims priority to Japanese Patent Application No. 2021-056560, filed on March 30, 2021, the contents of which are incorporated herein by reference in their entirety.

[Description of the Reference Numeral]

[0083]

1	mask
1'	conventional mask
10	mask body
10A	mask body band
15	pleat
20	ear hook portion sheet
20A	annular ear hook portion band
20a	annular ear hook portion
21	fixed portion
21i	inner peripheral edge of fixed portion
22	free portion
23	upper-side extending portion
24	ear backward arrangement portion
25	pinch portion
26	lower-side extending portion
28	separable fixed portion
29	opening
50	joined region
50A	continuous joined region
60	fusion-bonding treated region
60A	continuous fusion-bonding treated region
D1	vertical direction (up-and-down direction)
D2	lateral direction (left-and-right direction)
Dt	conveyance direction
fr	rising of fixed portion

Claims

1. A mask, comprising:

   a mask body; and
   a pair of sheet-shaped annular ear hook portions,
   the pair of sheet-shaped annular ear hook portions each including a fixed portion that is fixed to an end portion of the mask body in a lateral direction thereof and extends in a vertical direction thereof, the fixed portion being joined on an outer face of the mask body at a joined region extending in the vertical direction, and
   at least part of an inner peripheral edge of the fixed portion being included in the joined region.

2. The mask according to claim 1, wherein a range in which the inner peripheral edge of the fixed portion is included in the joined region is 60% or more, by length in the vertical direction of the fixed portion.

3. The mask according to claim 1 or 2, wherein a maximum width of the joined region is from 3 through 15 mm.

4. The mask according to any one of claims 1 to 3, wherein:

   the joined region is included in a fusion-bonding treated region that is subjected to a fusion-bonding treatment; and
   a minimum width of the fixed portion in the lateral direction is from 50 through 100% of a width of the fusion-bonding treated region in the lateral direction.

5. The mask according to any one of claims 1 to 4, wherein:

   the annular ear hook portion includes an upper-side extending portion that extends at an upper side from the fixed portion in the lateral direction and a lower-side extending portion that extends at a lower side from the fixed portion in the lateral direction;
   a lower-side angle formed between an extending direction of the upper-side extending portion and the vertical direction is less than 90°; and
   an upper-side angle formed between an extending direction of the lower-side extending portion and the vertical direction is more than 90°.

6. A method for producing a mask including a mask body and a pair of sheet-shaped annular ear hook portions, the method comprising:

   providing an elongated mask body band to be the mask body and an elongated annular ear hook portion band to be the pair of sheet-shaped annular ear hook portions, where the annular ear hook portion band includes a continuous portion including a fixed portion of one annular ear hook portion and a fixed portion of another annular ear hook portion, the fixed portions being next to each other and continuous in a lateral direction of the mask body;
   superposing the annular ear hook portion band on an outer face of the mask body band;
   joining the continuous portion of the annular ear hook portion band with the mask body band at a continuous joined region so that at least part of an inner peripheral edge of the fixed portion is included in the continuous joined region, to thereby obtain a joined body; and
   cutting the joined body so that the fixed portion of the one annular ear hook portion and the fixed portion of the another annular ear hook portion next to the one annular ear hook portion are separated, to thereby obtain the mask.

FIG.1

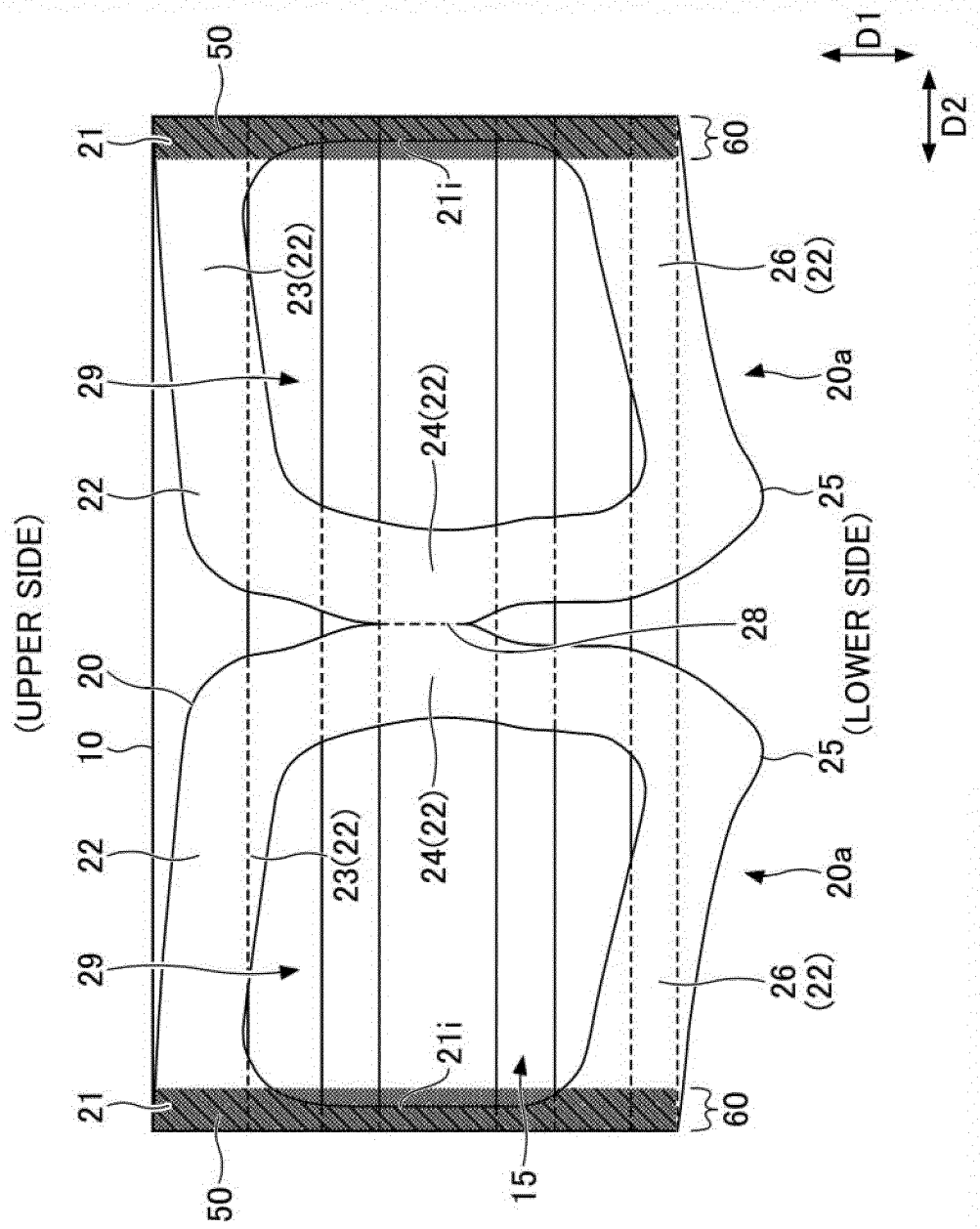

1
50
21
21i
60
D1
D2
23(22)
26
(22)
29
24(22)
20a
22
25
(UPPER SIDE)
28
(LOWER SIDE)
20
10
25
22
23(22)
24(22)
20a
29
26
(22)
21i
21
60
50
15

FIG.2

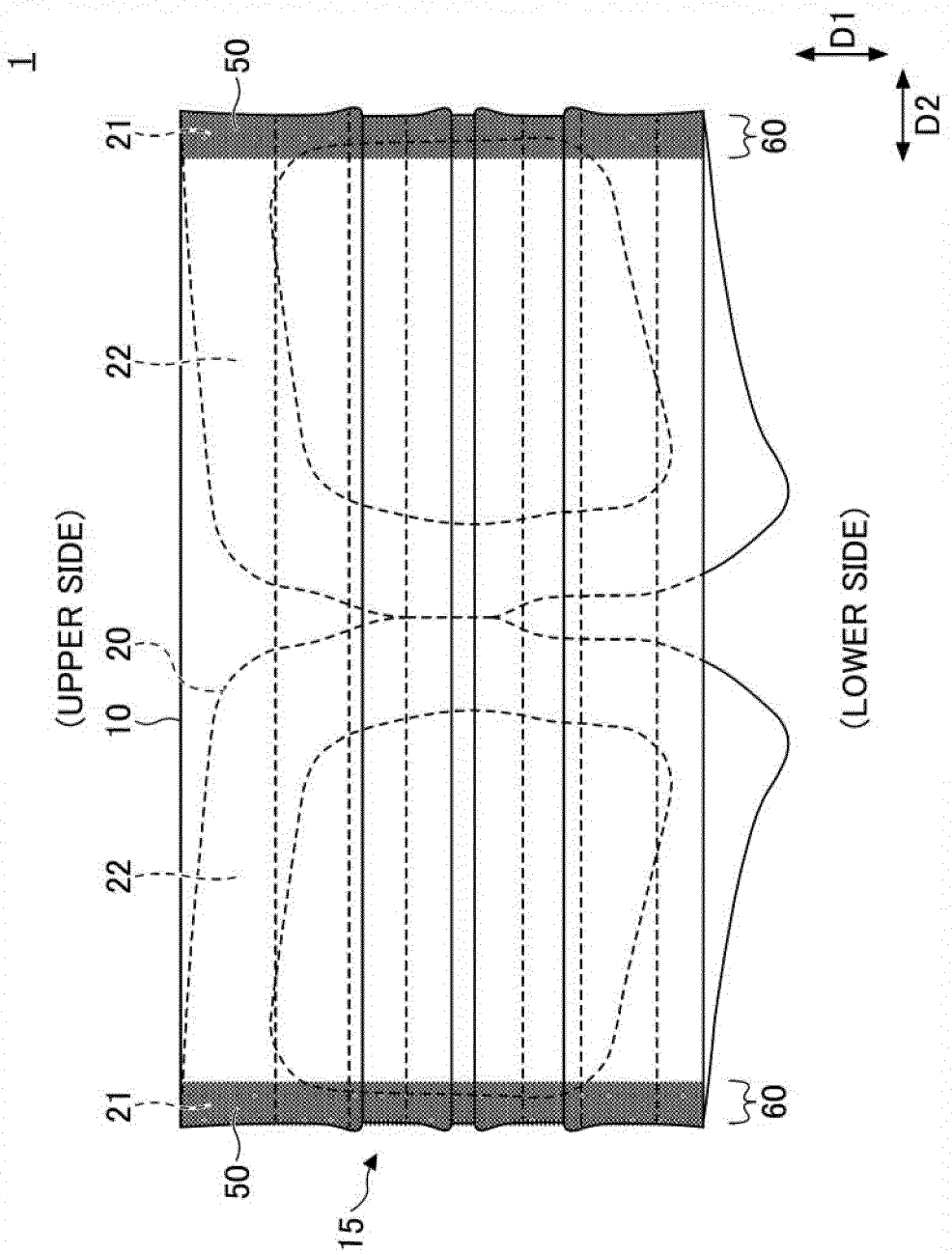


FIG.3

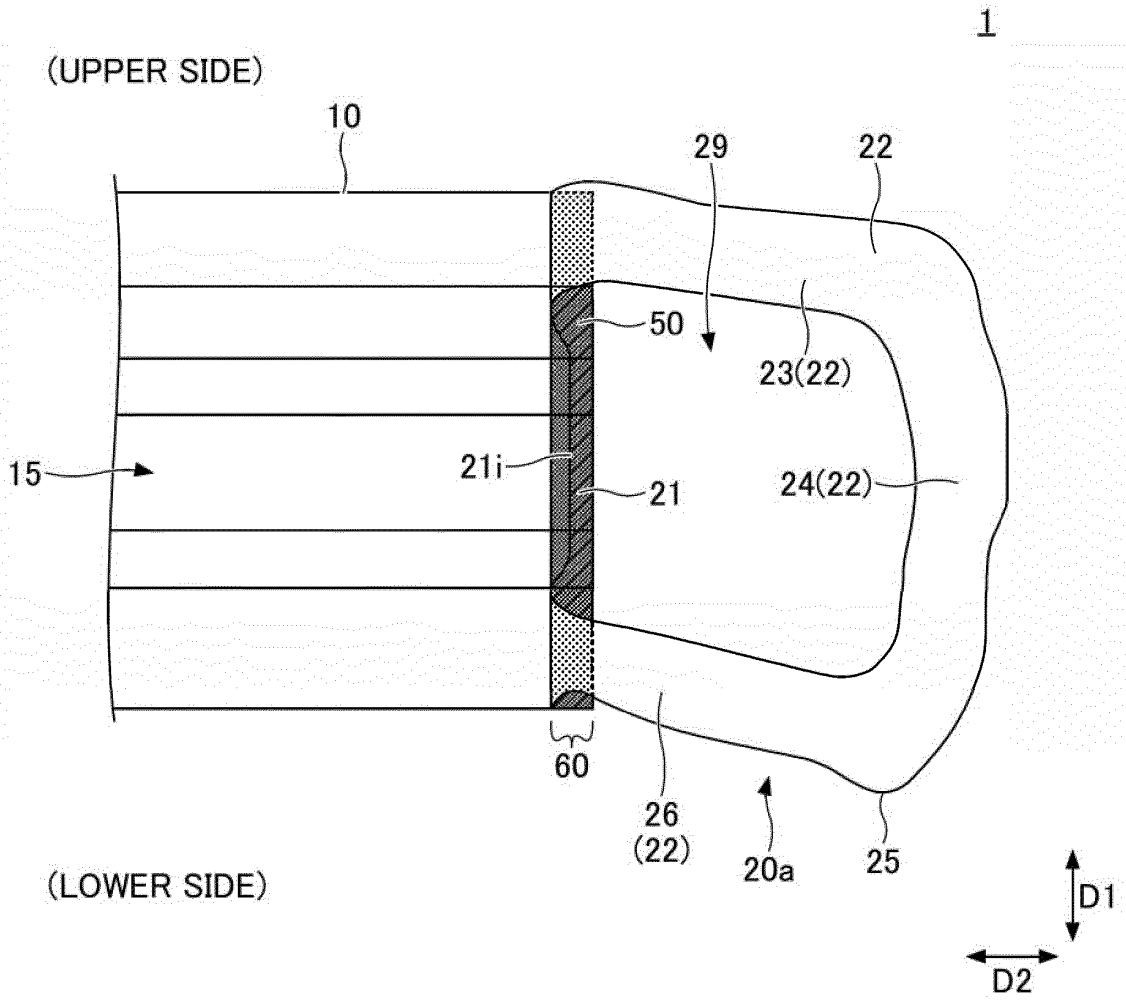

1
(UPPER SIDE)
10
29
22
50
23(22)
15
21i
21
24(22)
60
26
(22)
20a
25
(LOWER SIDE)
D1
D2

FIG.4

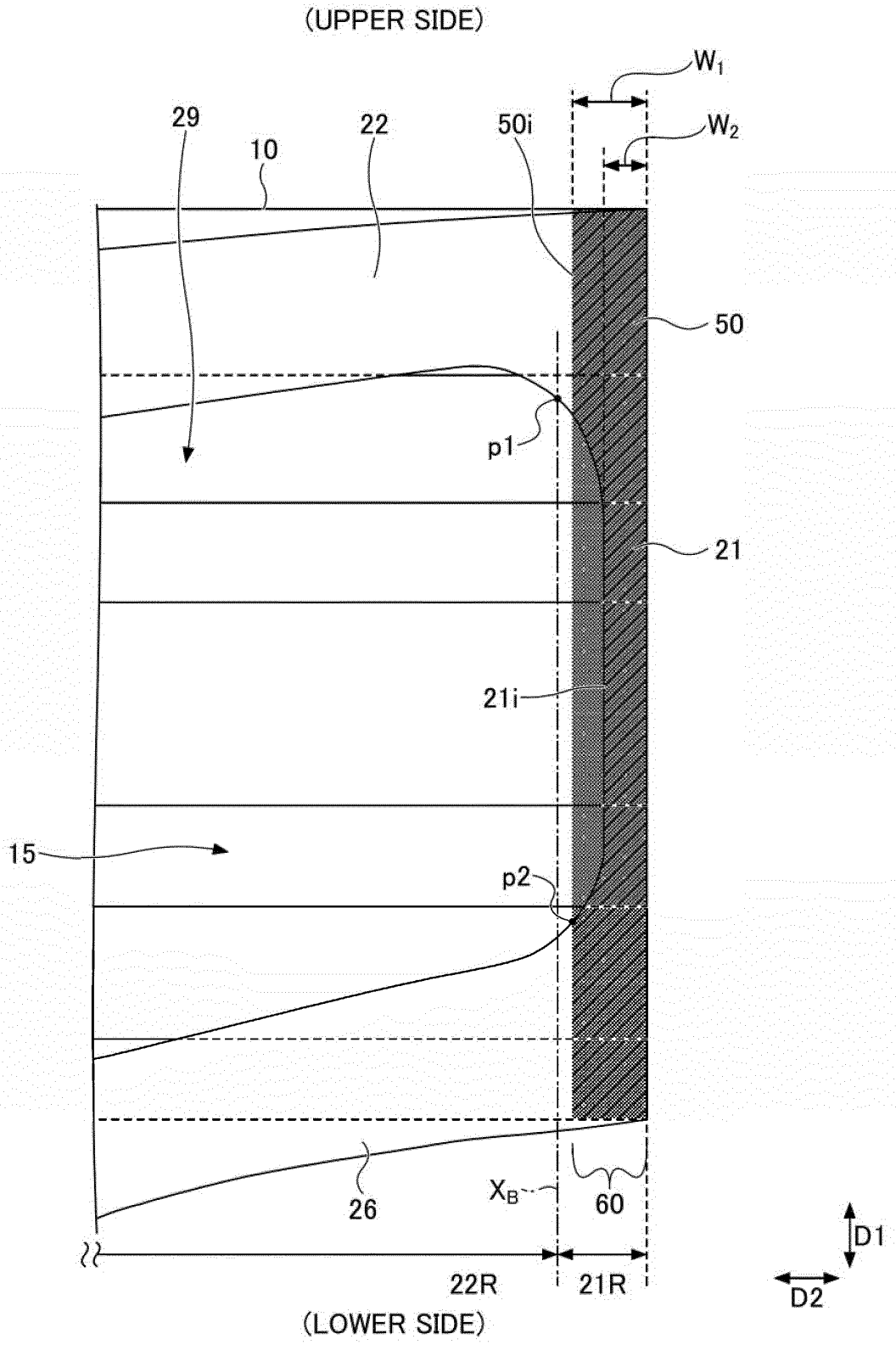

(UPPER SIDE)
W1
W2
29
10
22
50i
50
p1
21
21i
15
p2
26
XB
60
22R
21R
D1
D2
(LOWER SIDE)

FIG.5

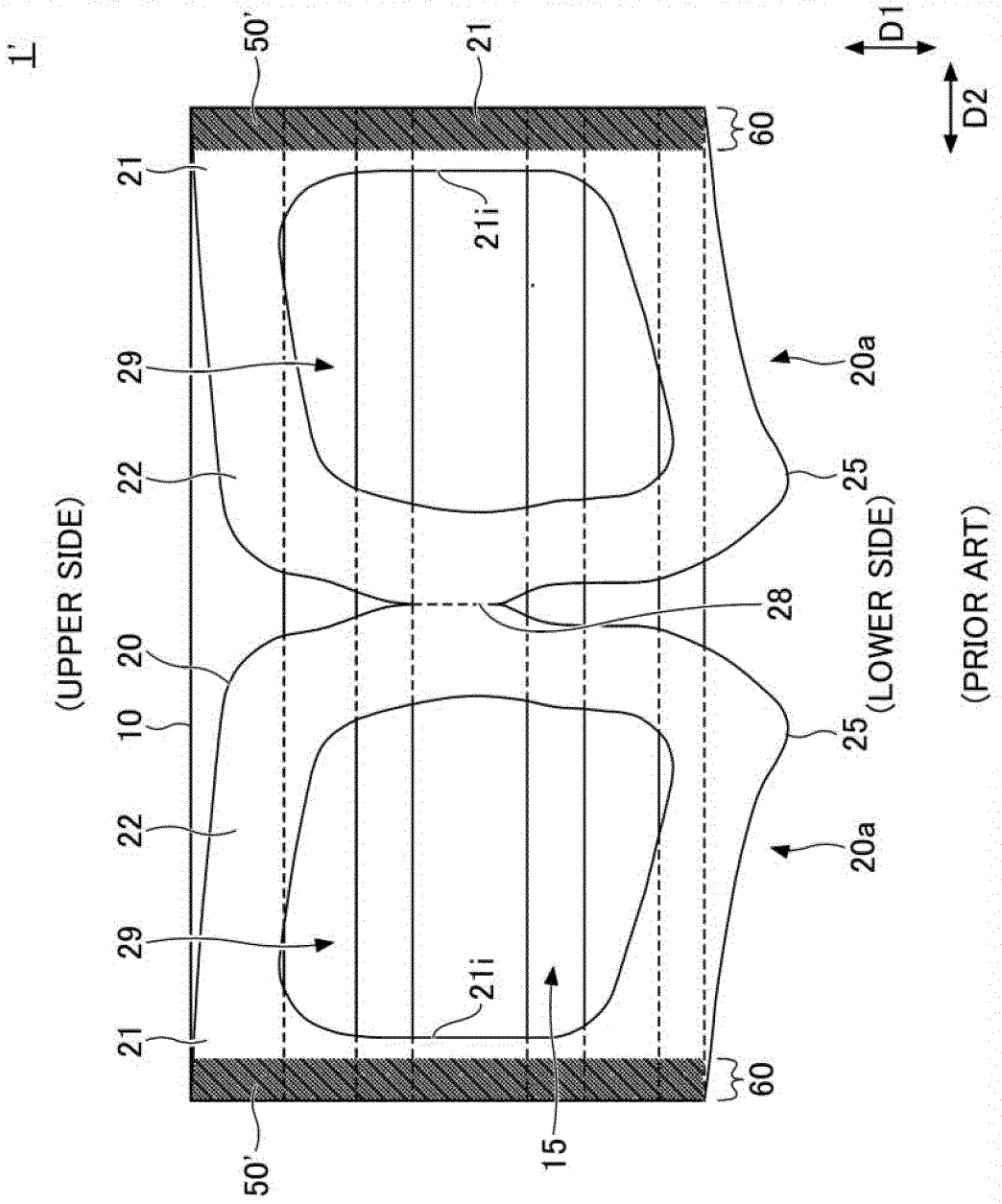
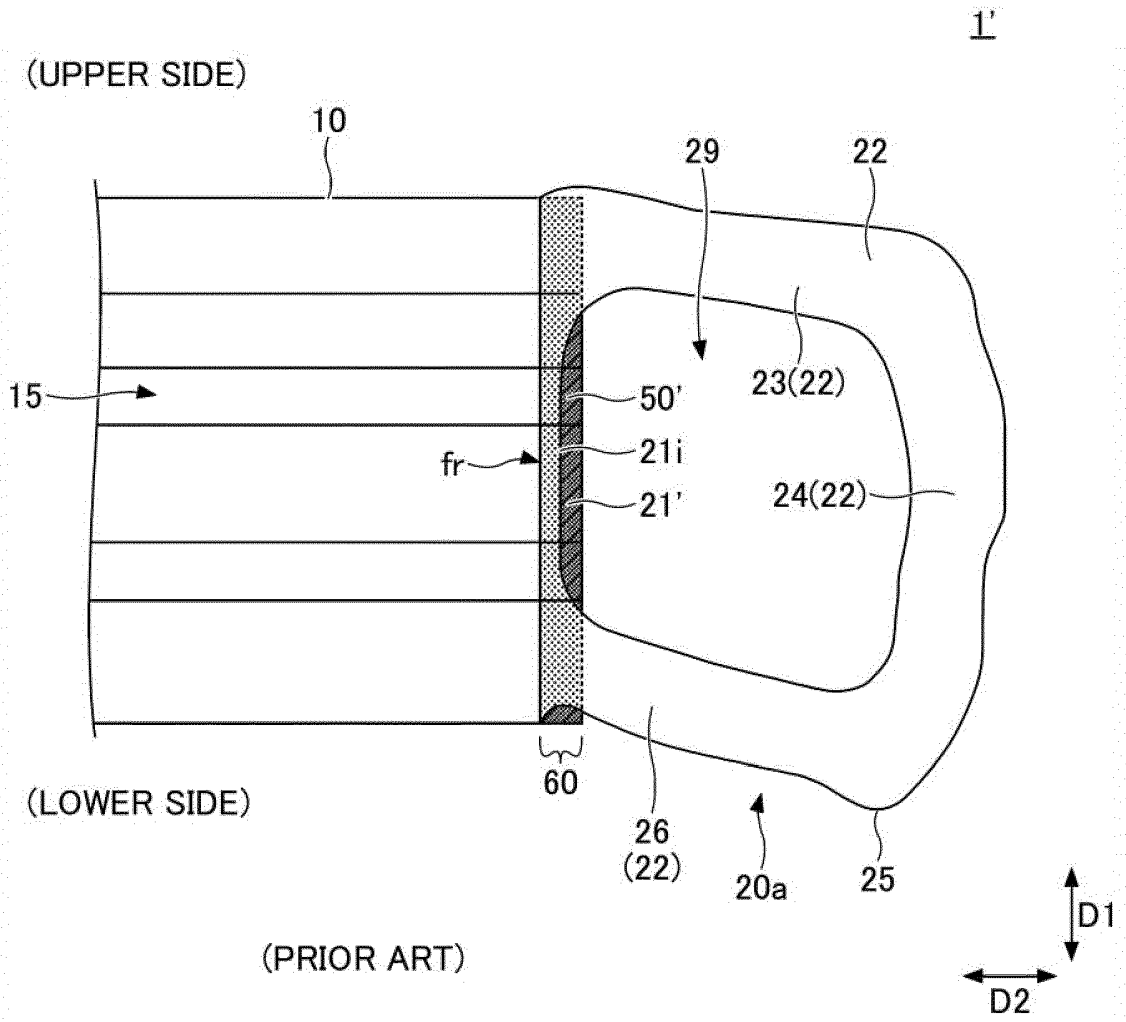

1'
50'
21
60
D1
D2
21
21i
29
20a
22
25
28
20
10
(UPPER SIDE)
(LOWER SIDE)
(PRIOR ART)
22
25
29
20a
21i
21
60
50'
15

FIG.6



(PRIOR ART)

FIG.7

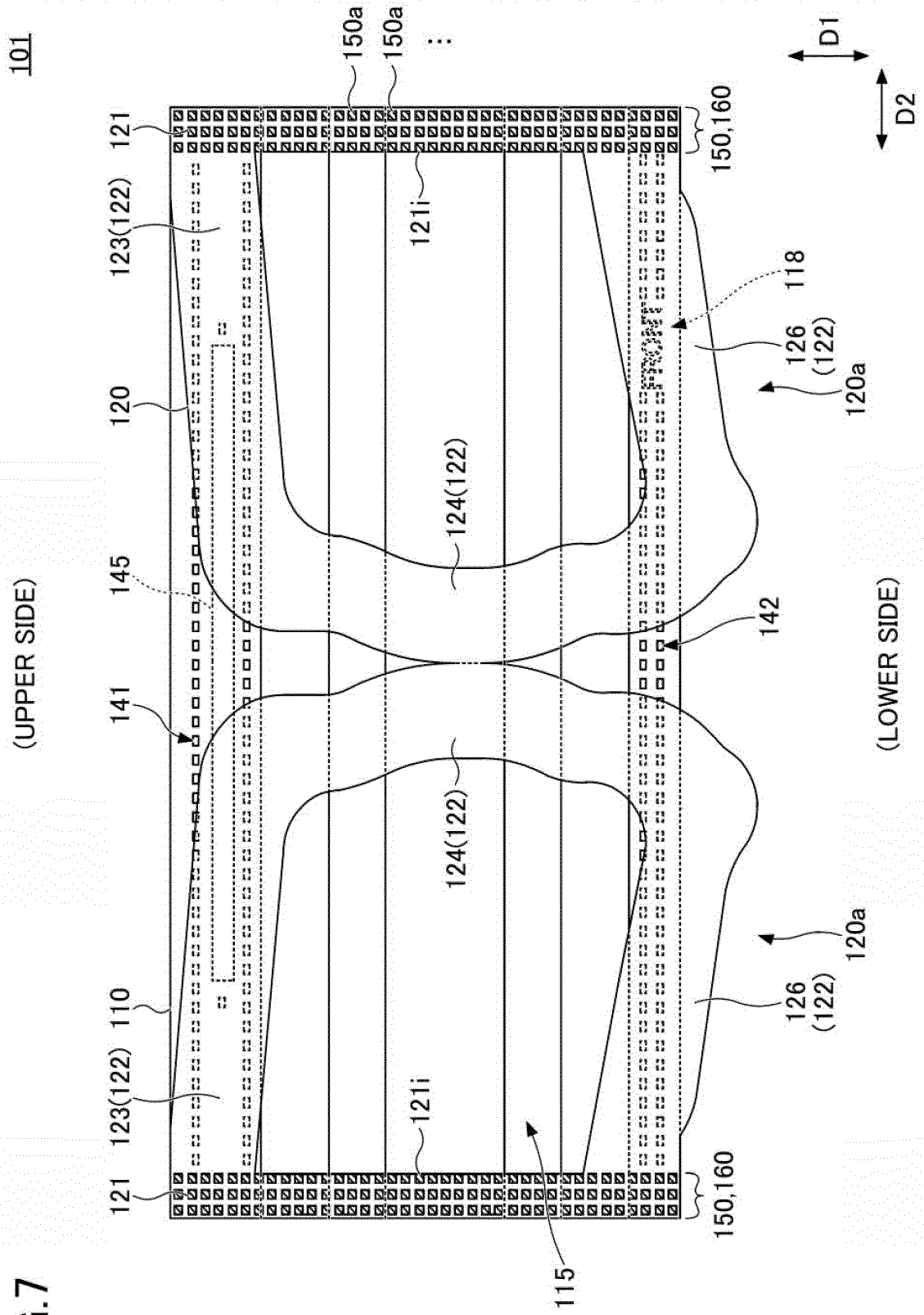

101
(UPPER SIDE)
(LOWER SIDE)
D1
D2
150a
150a
121
123(122)
120
145
141
110
123(122)
121
121i
124(122)
124(122)
121i
150,160
150,160
118
126
(122)
120a
142
126
(122)
120a
115

FIG.8

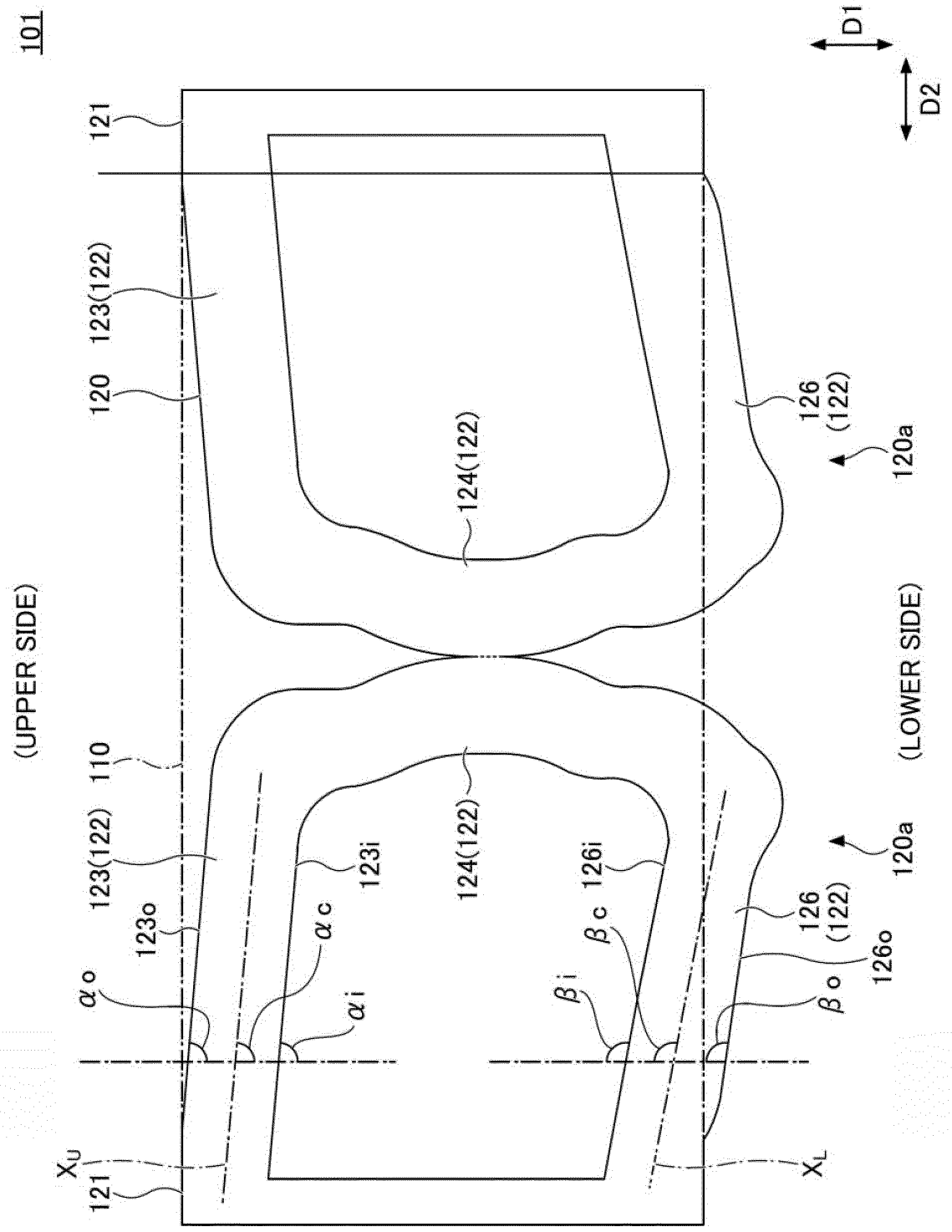

101
D1
D2
121
123(122)
120
124(122)
126
(122)
120a
(UPPER SIDE)
(LOWER SIDE)
110
123i
123o
αo
αc
αi
βi
βc
βo
126i
126o
X_U
X_L

FIG.9

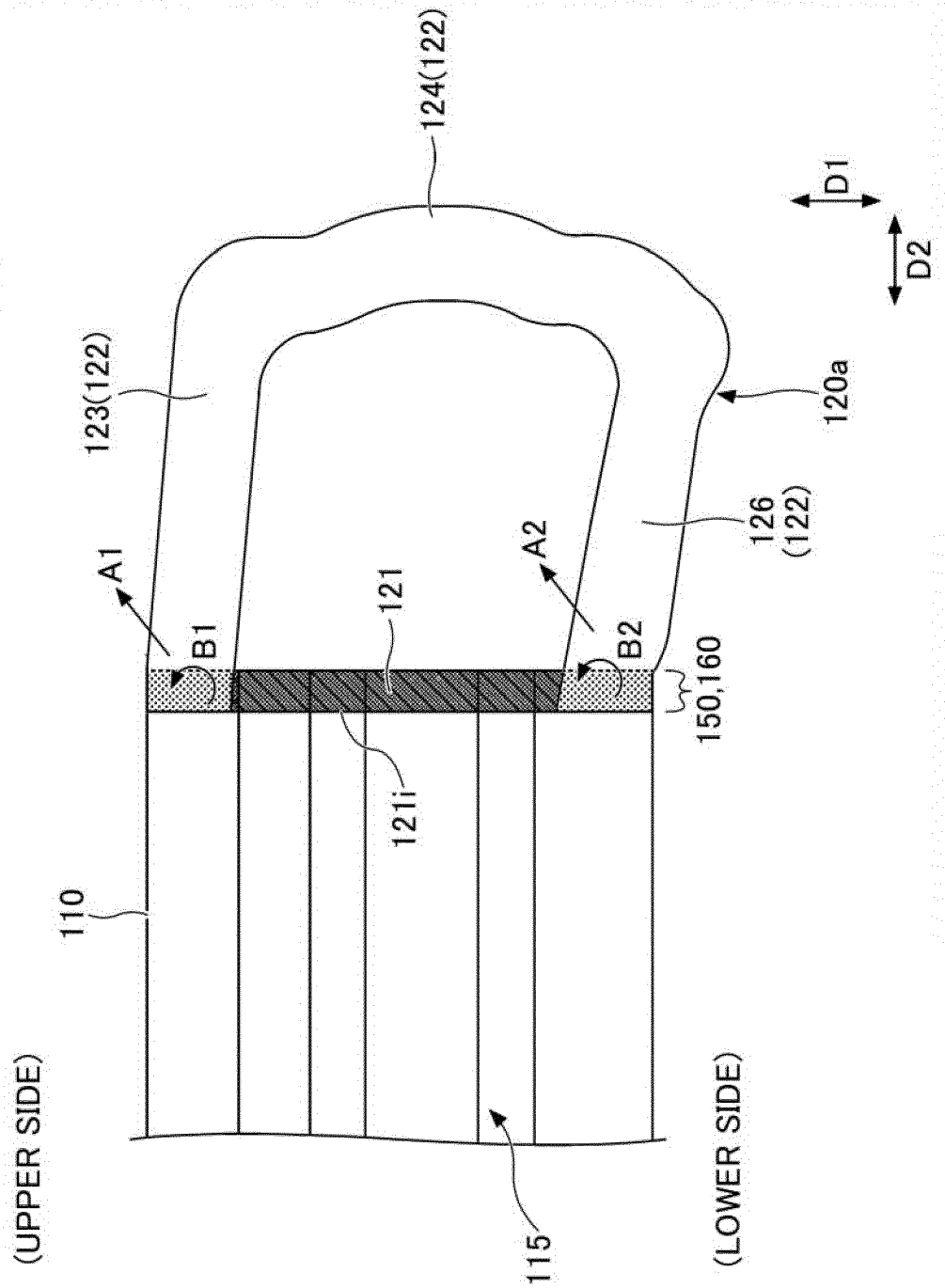
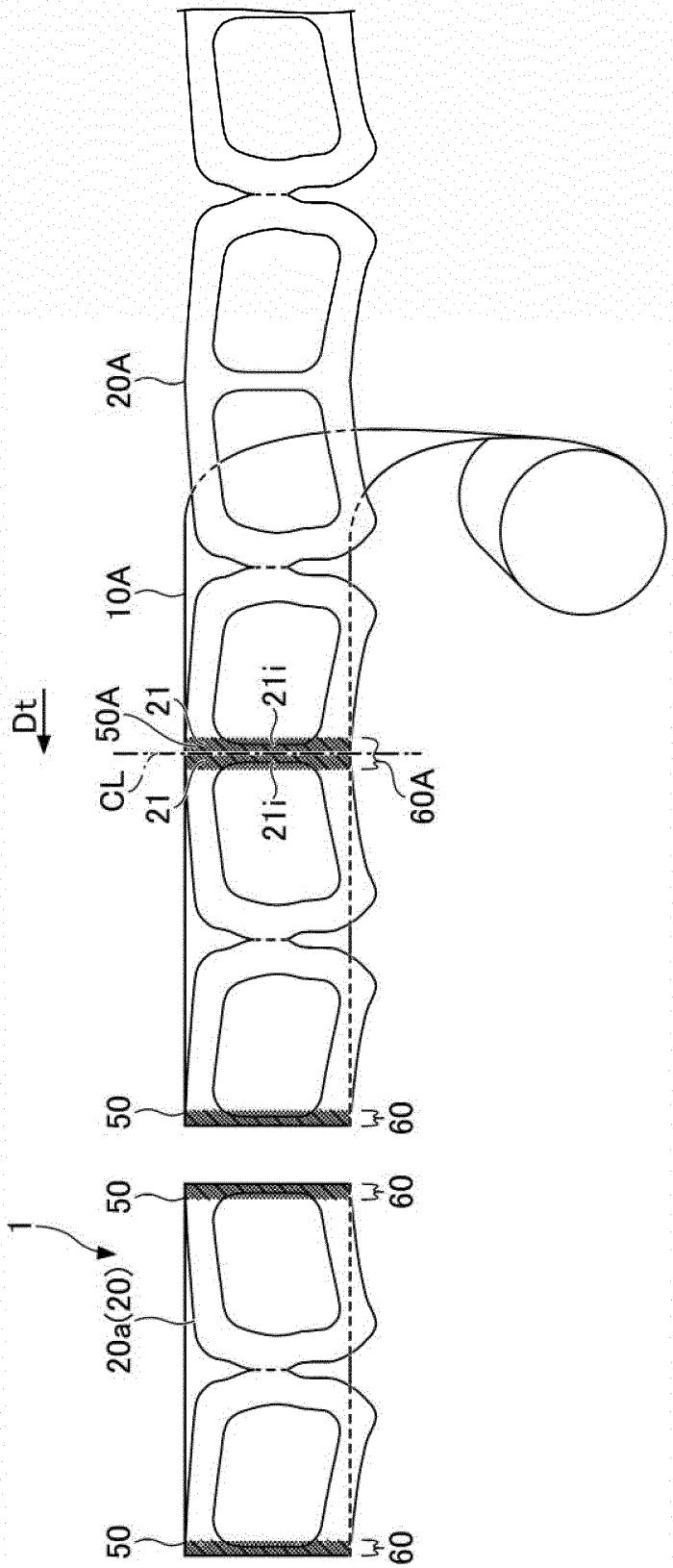

101
124(122)
D1
D2
123(122)
120a
126
(122)
A1
B1
121
A2
B2
150,160
121i
110
(UPPER SIDE)
(LOWER SIDE)
115

FIG.10



INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2022/005151

A. CLASSIFICATION OF SUBJECT MATTER

A62B 18/02(2006.01)i; ***A41D 13/11***(2006.01)i
FI: A41D13/11 H; A62B18/02 C

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A62B18/02; A41D13/11

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Published examined utility model applications of Japan 1922-1996
Published unexamined utility model applications of Japan 1971-2022
Registered utility model specifications of Japan 1996-2022
Published registered utility model applications of Japan 1994-2022

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 2016-137119 A (SHIROBATO KK) 04 August 2016 (2016-08-04) paragraphs [0015]-[0029], fig. 5-9	1-2, 6
Y		1-6
Y	JP 3213582 U (TAIWAN COMFORT CHAMP MANUFACTURING CO LTD) 16 November 2017 (2017-11-16) paragraphs [0008]-[0022], fig. 1-12	1-6
Y	JP 2011-167419 A (UNICHARM CORPORATION) 01 September 2011 (2011-09-01) paragraphs [0014]-[0032], fig. 1-10	1-6
A	JP 2013-31469 A (UNICHARM CORPORATION) 14 February 2013 (2013-02-14)	1-6

☐ Further documents are listed in the continuation of Box C. ☑ See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
13 April 2022	**26 April 2022**

Name and mailing address of the ISA/JP	Authorized officer
Japan Patent Office (ISA/JP) **3-4-3 Kasumigaseki, Chiyoda-ku, Tokyo 100-8915** **Japan**	Telephone No.

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/JP2022/005151

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
JP 2016-137119 A	04 August 2016	(Family: none)	
JP 3213582 U	16 November 2017	KR 20-0488303 Y1	
JP 2011-167419 A	01 September 2011	US 2013/0047995 A1 paragraphs [0045]-[0105], fig. 1-10	
JP 2013-31469 A	14 February 2013	CN 103635233 A	

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REFERENCES CITED IN THE DESCRIPTION

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- JP 2021056560 A **[0082]**