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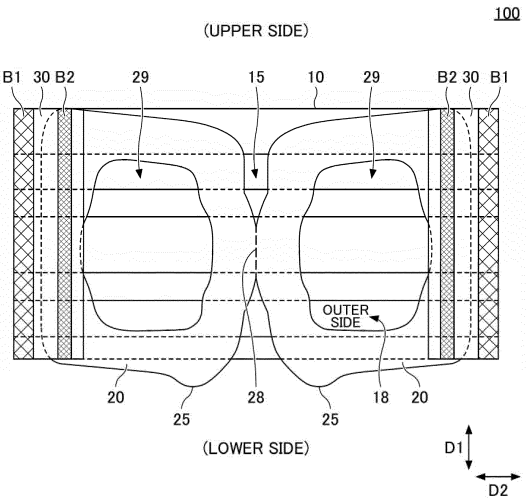
(54) **MASK**

(57) A mask that includes a mask body and ear materials, constituting a pair, coupled to the mask body, wherein in a state before start of use, the ear materials, constituting the pair, are separably coupled with each other, and provided on an outer surface side of the mask body, each of the ear materials, constituting the pair, is provided with a tab portion protruding from an edge of the mask body in a plan view, and at the start of use, the ear materials, constituting the pair, are separated from each other by pinching and pulling the tab portion.

FIG.1



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Description

TECHNICAL FIELD

[0001] The present invention relates to a mask.

BACKGROUND OF THE INVENTION

[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 ear materials (or ear hooks), constituting a pair, each being coupled to the mask body, i.e., a pair of members that can be hung on the ears of the wearer in order to hold the mask body at a predetermined position.

[0003] In recent years, the composition of the mask has been studied in various ways not only from the viewpoint of improving the function of the mask and improving the fit, but also from the viewpoint of ease of handling in manufacturing. For example, PTL 1 discloses a mask that includes a mask body portion and ear hook portions connected to the mask body portion, wherein the ear hook portions are connected to respective end portion areas, and the ear hook portions connected to the respective end portion areas of the body are configured to be accommodated within the outer shape of the mask body in a plan view of the mask, and the mask includes a connection portion that connects the ear hook portions to each other within the outer shape of the mask body.

RELATED-ART DOCUMENT

Patent Literature

[0004] PTL 1: Japanese Patent No. 5762803

SUMMARY OF THE INVENTION

Problems to be Solved by the Invention

[0005] When the mask disclosed in PTL 1 is used, the two ear hook portions connected by the connection portion need to be separated from each other and opened sideways before putting on the mask, and the user usually holds and pulls the two ear hook portions with his/her right and left hands. In this case, in order to hold the ear hook portion, it is necessary to insert a finger between the ear hook portion and the body, hold the ear hook portion between a finger and another finger, and lift the ear hook portion. For example, the thumb is inserted between the ear hook portion and the body, another finger is put on the ear hook portion, and the ear hook portion is held between the thumb and the another finger and lifted. Therefore, it is difficult to perform the operation of separating the ear hook portions without touching the body. Therefore, in a situation where hand hygiene cannot be sufficiently maintained, there is a possibility that hygiene of the mask may be impaired when the ear hook portions (or the ear materials) of the mask are separated and opened sideways before putting on the mask.

[0006] In view of the above, it is an object of one aspect of the present invention to provide a mask that can be worn in a good sanitary condition.

Means for Solving the Problem

[0007] One aspect of the present invention is a mask that includes a mask body and ear materials, constituting a pair, coupled to the mask body, wherein in a state before start of use, the ear materials, constituting the pair, are separably coupled with each other, and provided on an outer surface side of the mask body, each of the ear materials, constituting the pair, is provided with a tab portion protruding from an edge of the mask body in a plan view, and at the start of use, the ear materials, constituting the pair, are separated from each other by pinching and pulling the tab portion.

Effects of the Invention

[0008] According to one aspect of the present invention, a mask that can be worn in a good sanitary condition can be provided.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009]

FIG. 1 is a plan view of a mask according to an embodiment of the present invention as seen from the outside.

FIG. 2 is a plan view of the mask illustrated in FIG. 1 as seen from the inside (face side).

FIG. 3 is a view for explaining an example of use of the mask illustrated in FIG. 1.

FIG. 4 is a cross-sectional view taken along line I-I of FIG. 3.

FIG. 5 is a plan view of the mask illustrated in FIG. 3 after the ear materials, constituting the pair, are opened sideways.

FIG. 6 is a cross-sectional view taken along line II-II of FIG. 5.

FIG. 7 is an enlarged plan view of the ear materials.

FIG. 8 is a view illustrating a modified embodiment of tab portions of the ear materials.

FIG. 9 is a view illustrating a modified embodiment of the ear materials.

FIG. 10 is an enlarged plan view and a cross-sectional view of a portion provided with an auxiliary material in a state before start of use of the mask according to a modified embodiment of the present embodiment.

FIG. 11 is an enlarged plan view and a cross-sectional view of a portion provided with an auxiliary material after the ear materials are opened sideways.

DETAILED DESCRIPTION OF THE INVENTION

[0010] Hereinafter, embodiments of the present invention are described in detail with reference to the drawings. In each of the drawings, unless otherwise explained, the same or corresponding components may be denoted with the same reference numerals and the description thereof may be omitted. The drawings are schematic for helping understanding of the invention.

(Basic Configuration of Mask)

[0011] A mask according to an embodiment of the present invention may be a mask capable of covering the face of a wearer, more specifically, covering at least the nose and the mouth of a wearer. The mask according to this embodiment can have a function of preventing foreign matter from reaching the face and preventing droplets generated by the wearer from being scattered, and is also referred to as a sanitary mask or surgical mask. The mask may be disposable or reusable by washing.

[0012] FIG. 1 is a plan view of a mask 100 according to the present embodiment. FIG. 1 is a view of the mask as seen from the outside, i.e., from the side exposed to the outside and facing away from the face when the mask 100 is worn. FIG. 2 is a plan view of the mask as seen from the inside (face side).

[0013] As illustrated in FIG. 1, the mask 100 according to the present embodiment includes: a mask body 10 which is disposed in front of the face of the wearer when the mask is worn and can mainly cover the nose and mouth of the wearer; and ear materials 20, 20, constituting the pair, coupled to the mask body 10. The mask body 10 has a vertical direction D1 corresponding to the height direction of the wearer's face when wearing the mask and a horizontal direction D2 orthogonal to the vertical direction D1. In the form of FIG. 1, the mask body 10 has a rectangular shape in a plan view having long sides in the horizontal direction D2, but the shape of the mask body 10 in a plan view is not limited to the shape as illustrated in the drawings.

[0014] As illustrated in FIGs. 1 and 2, the mask body 10 has a pleated structure 15 formed by multiple pleats arranged side by side in the vertical direction D1. The pleats of the pleated structure 15 are formed by folding a sheet constituting the body 10 at fold lines along the horizontal direction D2. In a state in which multiple pleats are formed, the side portions (the ends in the horizontal direction D2) of the mask body 10 are joined and fixed. Therefore, when the mask 100 is used, the pleats of the pleated structure 15 are extended in the vertical direction D1, so that the center in the horizontal direction D2 is curved so as to protrude toward the outer surface side of the mask 100, and can be deformed into a shape adapted to the three-dimensional shape of the face. The specific configuration of the pleated structure 15 is not particularly limited and may be a conventional configuration used for a mask body.

[0015] As illustrated in FIGs. 1 and 2, the ear materials 20, 20, constituting the pair, are disposed on the outer surface side of the body 10. As illustrated in FIG. 1, each ear member 20 may be in an annular shape (or in a closed belt shape) in a plan view, or may have a shape that includes an annulus. When being worn, the ear materials 20 can be hung on the ears by allowing the ears of the wearer to enter the inside of the ring of each ear material 20, i.e., an opening 29 at the center of each ear material 20. In the examples illustrated in FIGs. 1 and 2, the ear materials 20 are formed of a rectangular annular sheet as a whole. Since the ear materials 20 are in a form of a sheet, when the ear materials 20 are hung on the ears while being worn, the ear materials can be brought into contact with the rear portions of the ears by surface contact, which reduces discomfort and pain.

[0016] The ear materials 20, 20, constituting the pair, may be configured as a continuous sheet separably coupled to each other at the center in the horizontal direction D2. The type of coupling at a separable coupling portion 28 between the ear materials 20, 20 constituting the pair is not particularly limited, but is preferably separable by pulling with a usual force of the user. For example, it may be formed as perforations as illustrated in FIG. 1. The coupling portion 28 may also be formed by reducing the thickness of the sheet or by other means to weaken the border between the ear materials 20, 20 constituting the pair or to increase stress. Alternatively, the ear materials 20, 20 constituting the pair may be formed independently of each other, slightly overlapping at the center in the horizontal direction D2, and separably coupled by an adhesive, heat sealing, or the like to form the coupling portion 28.

[0017] The mask body 10 may have a multilayer structure formed by laminating multiple layers. For example, the structure may include at least three layers sandwiched between an outer layer and an inner layer of an intermediate layer having an enhanced function of collecting foreign matter (dust, pollen, bacteria, viruses, and the like). Each layer constituting the body 10 preferably includes a fiber-containing layer such as a nonwoven fabric, a woven fabric, a knitted fabric, and the like, and more preferably includes a nonwoven fabric. Examples of the nonwoven fabric include a spunbond nonwoven fabric, a spunlace nonwoven fabric, a meltblown nonwoven fabric, an air-through nonwoven fabric, a point bond nonwoven fabric, and the like. A meltblown nonwoven fabric which can contain fine fibers is preferably used for the intermediate layer. The fibers constituting the fiber-containing layer are preferably resin fibers, and the resin types of the resin fibers include polyethylene, polypropylene, polyethylene terephthalate, nylon, and the like. The basis weight of the outer and inner layers may be 10 to 50 g/m^2, preferably 15 to 50 g/m^2. The basis weight of the intermediate layer having a high foreign matter collecting property is preferably 10 to 100 g/m^2 and more preferably 15 to 50 g/m^2.

[0018] The ear materials 20 may be formed of a material having stretchability, preferably a material having higher stretchability than the body 10. The ear material 20 may have stretchability at least in the horizontal direction D2, and may have stretchability in both the vertical direction D1 and the horizontal direction D2. The stretchability in the vertical direction D1 and the stretchability in the horizontal direction D2 may be the same or different from each other. When the stretchability in the vertical direction D1 is different from the stretchability in the horizontal direction D2, it is preferable that the stretchability in the horizontal direction D2 is higher than the stretchability in the vertical direction D1. When worn, the ear materials 20 are hung on the ears of the wearer, and are pulled mainly in the horizontal direction D2. Therefore, by having stretchability at least in the horizontal direction D2, the body 10 can be better positioned and fixed in the front of the face, and the load of the ear materials 20 applied to the ears can be reduced.

[0019] The ear material 20 may include a stretchable fiber-containing sheet and/or may include a stretchable or elastic film. The fiber-containing sheet includes a nonwoven fabric, a woven fabric, a knitted fabric, and the like, and among these, a nonwoven fabric is preferably used because of its good touch and breathability. Examples of nonwoven fabric include an air-through nonwoven fabric, a spunbond nonwoven fabric, a spunlace nonwoven fabric, a needle punch nonwoven fabric, a chemical bond nonwoven fabric, and the like. The fibers contained in the nonwoven fabric are preferably resin fibers, and the resin types of the resin fibers include polyethylene, polypropylene, polyethylene terephthalate, nylon, and the like.

[0020] For example, the ear materials 20 may contain a single layer of the above stretchable fiber-containing sheet or stretchable film, or may be constituted by laminating multiple layers of the above stretchable fiber-containing sheets and/or stretchable films by laminating the fiber-containing sheets and the stretchable films. The fiber-containing sheet or film having stretchability may be combined with a sheet having no stretchability. The fiber-containing sheet or film having stretchability can be sandwiched and bonded with non-stretchable sheets in a stretched state. When the fiber-containing sheet has stretchability, the stretchability may be exhibited by the stretchable fibers contained in the fiber-containing sheet, for example, by the material of the fibers having stretchability or the fibers being crimped fibers. Alternatively, the stretchability may be exhibited by a predetermined physical structure, for example, by having irregularities on the surface. Furthermore, the ear materials 20 may be formed by sandwiching a thread-like rubber with a fiber-containing sheet having stretchability or not having stretchability. When the stretchability of the fiber-containing sheet is low or is not provided, the fiber-containing sheets may be attached to both sides while the thread-like rubber is stretched.

[0021] Specifically, the ear materials 20 may be made of a single-layer nonwoven fabric such as a stretchable air-through nonwoven fabric, a stretchable spunbond nonwoven fabric, a stretchable spunlace nonwoven fabric, a stretchable needle punch nonwoven fabric, a stretchable chemical bond nonwoven fabric, or the like. In addition, a material including multiple layers of nonwoven fabric such as spunbond/melt blown/spunbond may be used. Furthermore, a laminated sheet such as a nonwoven fabric/stretchable film or a nonwoven fabric/stretchable film/nonwoven fabric (for example, spunbond/stretchable film/spunbond, air-through/stretchable film/air-through, and the like) can be used. When the ear materials 20 are made of multiple layers, the layers may be bonded to each other with a stretchable or non-stretchable hot-melt nonwoven fabric (a nonwoven fabric whose fibers are softened or melted by heating and that can be bonded to other members). The basis weight of the ear materials 20 may be 20 to 150 g/m^2. The ear materials 20 may have a thickness of 100 to 3,000 um.

[0022] The ear materials 20, 20, constituting the pair, are coupled to respective side portions (end portions in the horizontal direction D2) of the outer surface of the body 10. Specifically, the outer portions of the ear materials 20, 20, constituting the pair, in the horizontal direction D2 are coupled to the body 10, and the other portions are not coupled to the body 10. When the mask 100 according to the present embodiment starts to be used, before the mask 100 is worn, the separable coupling between the ear materials 20, 20 constituting the pair is released to separate the ear materials 20, 20 from each other (also referred to as separation operation), and the portions of the ear materials 20, 20 which are not coupled to the body 10 are opened sideways in the horizontal direction D2 (also referred to as an expansion operation).

(Separation and expansion operation of ear material)

[0023] FIG. 3 illustrates a state in which the mask 100 illustrated in FIG. 1 is about to be used. FIG. 4 is a cross-sectional view taken along line I-I of FIG. 3. At the start of use, the user can pull the ear materials 20, 20 constituting the pair in the opposite directions by pinching or holding them with their respective hands as illustrated in FIG. 3. As a result, the separable coupling portion 28 can be first uncoupled. If the coupling portion 28 includes perforations formed along the border line between the ear materials 20, 20 constituting the pair, the perforations can be broken to separate the ear materials 20, 20 along the border line. Thereafter, the user can open the ear materials 20, 20 constituting the pair outward in the horizontal direction D2 toward the sides indicated by the arrows in FIGs. 3 and 4 while holding them.

[0024] FIG. 5 illustrates a state in which the ear materials 20, 20 constituting the pair are opened outward in the horizontal direction D2 from the state illustrated in FIG. 3. FIG. 6 is a cross-sectional view taken along line II-II of FIG. 5. As illustrated in FIGs. 5 and 6, when the ear materials 20, 20 constituting the pair are opened, the

ear materials 20, 20 are turned over, i.e., the surface of the ear materials 20, 20 facing the body 10 in the state before start of use is exposed. The ear materials 20, 20 are mainly disposed on the outer sides in the horizontal direction D2 of the body 10, and the entire outer surface of the body 10 is exposed. This operation of separating and expanding the ear materials is performed for preparation prior to wearing the mask 100. Specifically, the user can either put the mask 100 on himself/herself or allow another person to put it on after the ear materials are separated and expanded to the state illustrated in FIGs. 5 and 6.

[0025] While the mask 100 is worn, i.e., while the ear materials 20, 20 are opened sideways and hung on the ears, the ear materials 20, 20 are pulled toward the ears of the wearer, and accordingly, connection portions of the ear materials 20, 20 with the body 10 are pressed toward the face of the wearer. In the present embodiment, since the ear materials 20, 20 constituting the pair are connected to both sides of the outer surface of the body 10, while the mask 100 is worn, portions of the ear materials 20 are disposed on the outer sides of both sides of the body 10 (FIG. 6), i.e., both sides of the body 10 are disposed between the ear materials 20 and the face of the wearer, so that both sides of the body 10 are pressed against the face by the ear materials 20. Thereby, the gap between the body 10 and the face can be reduced at both sides of the mask body 10, and the function of the mask, for example, the function of blocking foreign matter, the function of preventing droplets generated by the wearer from being scattered, and the like, can be improved. In addition, the ear materials 20 are not arranged on the inner sides of both side portions (face side) of the body, and the ear materials 20 do not come into contact with the face of the wearer at both side portions of the body 10 while being worn, so that a better fit can be obtained.

[0026] The body 10 may be formed with a mark 18 that allows the outer and inner surfaces of the body 10 to be distinguished from each other by embossing, printing, sewing, or the like. The form of the mark 18 is not limited as long as it can be visually recognized by the user. As illustrated in FIG. 1, the mark 18 may be letters, numbers, a symbol, a figure, a logo, or the like.

(Ear materials and tab portions)

[0027] The ear materials 20, 20, constituting the pair, are provided with tab portions 25, 25 which the user can hold when the ear materials 20, 20 constituting the pair are separated from each other and opened outward in the horizontal direction D2. The tab portions 25, 25 protrude from the edges of the body 10 in a plan view, and the user can perform the above-described operation of separating the ear materials 20, 20 constituting the pair from each other and expanding them sideways by holding the tab portions 25, 25.

[0028] The tab portions 25, 25 protrude from the edge of the body 10 in a plan view, so that the user can pinch or hold the ear materials 20, 20 constituting the pair at a position away from the body 10. Thus, the separation and/or expansion operation of the ear materials can be performed without touching the body 10, or the area where the user touches the body 10 can be reduced. Thus, the user can pinch the tab portions 25, 25 without touching the body or without appreciably touching the body 10 in the preparation stage before putting on the mask. Likewise, the ear materials 20, 20 constituting the pair can be separated and expanded without touching the body 10 or without appreciably touching the body. Thus, even in a situation where the user cannot give sufficient consideration to hand hygiene, the mask 100 in good hygiene condition can be prepared.

[0029] Furthermore, since the ear material 20 has the tab portions 25, 25, the user can easily adjust the ear materials 20 by holding the tab portions 25, 2 when or after the ear materials 20 are hung on the ears of the wearer. Specifically, the tab portions 25, 25 are held and the ear materials 20 are shifted in the circumferential direction of the ear materials 20 relative to the ears to adjust the positions, and the tension of the ear materials 20 can be adjusted by pulling the ear materials 20 toward the rear side and loosening it.

[0030] In the mask 100 according to the present embodiment, the ear materials 20, 20 constituting the pair are disposed on the outer surface side of the body 10. Specifically, the tab portions 25, 25 pinched by the user are also disposed on the outer surface side of the body 10. Depending on the circumstances in which the mask 100 is used and/or the operation of the user, the user's hand may touch the mask body 10 when pinching the tab portions 25, 25, but the user's hand may still be limited to the outer surface of the mask body 10. As described above, according to the present embodiment, the contact between the hand and the inner surface (the surface facing the face of the wearer when the wearer wears the mask), which is particularly required to maintain hygiene, can be eliminated or reduced, and therefore the hygiene of the mask can be ensured even if the user's hand touches the mask 100 in the preparation stage before putting on the mask.

[0031] FIG. 7 illustrates an enlarged plan view of one of the ear materials 20 of the mask 100. As described above, the ear material 20 is provided with the tab portion 25 protruding from the edge of the body 10 in a plan view. The size or the like of the tab portion 25 is not particularly limited as long as the user can pinch it with his or her fingers. However, the maximum length a in the vertical direction D1 of the portion of the tab portion 25 protruding from the edge of the body 10 is preferably 5 to 15 mm, more preferably 8 to 15 mm. In the example illustrated in FIG. 7, the length a is a length in the vertical direction D1 from the edge of the body 10 to a vertex 25s of the protruding portion of the tab portion 25. When the length a is within the above range, it is easy for the user to pinch the tab portion 25, to reliably lift the ear material 20 and

to separate the ear materials 20, 20 from each other, it does not hinder wearing the mask 100, and discomfort which the tab portion 25 can give by coming into contact with the face or the ears while being worn can be reduced.

[0032] The protruding portion of the tab portion 25 protruding from the edge of the body 10 in a plan view may have a protruding shape in a direction away from the body 10. In this case, the outline of the protruding portion of the tab portion 25 may be curved or straight. However, when the outline is curved, the angular portion is reduced, so that the tab portion 25 is less likely to break, and discomfort does not occur appreciably when a hand or a face comes into contact with the edge of the tab portion 25 when handling the mask 100 (this includes separating and expanding the ear materials 20, 20 and wearing the mask 100).

[0033] If the outline of the protruding portion of the tab portion 25 is curved, the radius of curvature at the vertex 25s of the protruding portion may be 5 to 20 mm. When the radius of curvature is in the above range, the shape of the tab portion 25 becomes such a shape that the user can easily pinch it with fingers.

[0034] The position of the tab portion 25 is not particularly limited, and a length (in the example of FIG. 7, the length in the horizontal direction D2 up to the vertex 25s of the protruding portion of the tab portion 25) b in the horizontal direction D2 from the edge of the mask 100 in the horizontal direction D2 to the position where the tab portion 25 most protrudes is preferably 45 to 90%, and more preferably 65 to 80% with respect to a length c of 1/2 of the length in the horizontal direction D2 of the entire mask 100. In a case where the above-described length b is set to 45% or more with respect to the length c, the tab portion 25 is prevented from being too away from the separable coupling portion 28 between the ear materials 20, 20, and the ear materials 20, 20 are prevented from failing to be smoothly separated and expanded. In a case where the above-described length b is set to 90% or less with respect to the length c, both hands do not come too close to each other and interfere with each other, when the left and right tab portions 25, 25 are pinched by both hands.

[0035] In some cases, the outline of the most protruding portion of the tab portion 25 does not have a vertex 25s and includes a portion parallel to the edge of the body 10, i.e., includes a portion having a constant distance from the edge of the body 10 (forms illustrated in FIGs. 8 (a) and 9 described later). In this case, the length b is defined as a length from the edge of the mask 100 in the horizontal direction D2 to the center in the horizontal direction D2 of a portion parallel to the edge of the body 10 (a portion whose distance from the edge of the body 10 is constant).

[0036] The tab portion 25 may project from the lower end of the body 10 or may project from the upper end in a plan view. Furthermore, a tab portion projecting from the lower end of the body 10 may be provided on the lower side of the ear material 20, and another tab portion projecting from the upper end of the body 10 may be provided on the upper side of the ear material 20. However, as illustrated in FIG. 7, when the tab portion 25 projects from the lower end of the body 10 in a plan view, the user can separate and expand the ear materials 20, 20 by natural operation. For example, when the user prepares to wear the mask 100, the mask 100 can be placed on a horizontal plane in front of the user's body so that its vertical direction D1 is in the height direction of the human body and its horizontal direction D2 is in the lateral direction of the human body. Therefore, when the user naturally extends both hands toward the tab portions 25, 25 of the ear materials 20, 20 with the back of the hand facing upward, the user can pinch the tab portions 25, 25 without changing the form (orientation) of the hand, such that the thumbs are placed under the tab portions and the other fingers are placed above the tab portion (FIG. 3).

[0037] Furthermore, due to the structure of the human body, it is easy to move (open) both arms sideways from the center in front of the human body. Therefore, the user can easily pull and separate the ear materials 20, 20 in opposite directions to each other after pinching the tab portions 25, 25 protruding from the lower end of the body 10 as described above, and expand the ear materials outward in the horizontal direction D2. In this case, it is not necessary to change the way of pinching (change the form or orientation of the hand) from the state where the tab portions 25, 25 are pinched.

[0038] When the user opens, outward in the horizontal direction D2, the tab portions 25, 25 of the ear materials 20, 20, respectively, constituting the pair as described above by holding the tab portions 25, 25 and then lifting the mask 100 as described above, for example, the outer surface of the mask 100 faces the user opening the ear materials 20, 20, and the inner surface of the mask 100 (surface on face side) faces the side away from the user. Therefore, the mask 100 according to the present embodiment is suitable for being worn by another wearer. Specifically, after the user opens, outward in the horizontal direction D2, the ear materials 20, 20 constituting the pair (FIGs. 5 and 6), the mask 100 is moved to the face of another wearer while the ear materials 20, 20 constituting the pair are held, and the mask body 10 is arranged at a desired position of the wearer's face, and at this occasion, the ear materials 20, 20 constituting the pair can be hung on the ears of the wearer while the way of holding the mask 100 is not changed. Therefore, the mask 100 according to the present embodiment can be suitably used when the mask is worn by a person who has difficulty wearing the mask by himself or herself, such as a child or a sick person.

[0039] As illustrated in FIG. 7, the ring of the ear material 20 may include an adhesive portion 22 that is bonded to the mask body 10 and extends along the vertical direction D1, a hook portion 24 that is disposed behind the ear when worn, an upper transition portion 23 that transitions from the adhesive portion to the hook portion

24 on the upper side, and a lower transition portion 26 that transitions from the adhesive portion 22 to the hook portion 24 on the lower side. In the example illustrated in FIG. 7, the ear material 20 has a rectangular annular shape as described above, and more specifically, the adhesive portion 22 and the hook portion 24 extend along the vertical direction as a whole, and the upper transition portion 23 and the lower transition portion 26 extend along the horizontal direction as a whole. The tab portion 25 may be formed in the lower transition portion 26 or in a connection portion between the hook portion 24 and the lower transition portion 26.

(Modified embodiment)

[0040] FIG. 8 illustrates a modified embodiment of the tab portion 25. The shape of the tab portion 25 is not particularly limited as long as the tab portion protrudes from the edge of the body 10 and the user can pinch the tab portion, and as long as the tab portion is formed so as not to inhibit the stretch of the ear material when worn. The tab portion 25 may have a shape such that the inclination of the tangential line of the outline continuously changes as illustrated in FIG. 7, or may have a shape including a portion where the inclination of the tangential line of the outline does not change as illustrated in FIG. 8 (a). Specifically, the shape may include a portion having a constant distance from the edge of the body 10, or may include a substantially quadrilateral shape. The ring of the ear material 20 may include an adhesive portion 22 that is bonded to the mask body 10 and extends along the vertical direction D1, a hook portion 24 that is disposed behind the ear when worn, an upper transition portion 23 that transitions from the adhesive portion to the hook portion 24 on the upper side, and a lower transition portion 26 that transitions from the adhesive portion 22 to the hook portion 24 on the lower side.

[0041] Furthermore, as illustrated in FIG. 8 (b), the tab portion 25 may be provided with a highly rigid portion 25r having increased rigidity so that the user can easily pinch the tab portion. The highly rigid portion 25r can be formed by additionally applying a resin, applying an embossing process, or sticking a highly rigid material. Furthermore, as illustrated in FIG. 8 (c), a mark 25c having a color different from that of the ear material 20 may be provided on the tab portion 25 so that the user can recognize the tab portion 25. The mark 25c may be formed by printing or by sticking a sheet having a small area.

[0042] Furthermore, FIG. 9 illustrates a modified embodiment of the ear materials 20, 20 constituting the pair. In the example illustrated in FIG. 9, as in the example illustrated in FIG. 17, each ring of the ear material 20 may have an adhesive portion 22 that is bonded to the mask body 10 and extends along the vertical direction D1, a hook portion 24 that is disposed behind the ear when worn, an upper transition portion 23 that transitions from the adhesive portion to the hook portion 24 on the upper side, and a lower transition portion 26 that transitions from the adhesive portion 22 to the hook portion 24 on the lower side. The tab portions 25, 25 are provided in the lower transition portion 26. However, in the example illustrated in FIG. 9, as compared with the example illustrated in FIG. 7, the tab portions 25, 25 are located away from the center, in the horizontal direction D2, of the ear materials 20, 20 constituting the pair (or the center of the mask 100 in the horizontal direction D2). In other words, the tab portion 25 is located near the center of one of the ear materials 20 in the horizontal direction D2.

[0043] In the example illustrated in FIG. 9, the shape of the ear materials 20, 20 as a whole is also different from the example illustrated in FIG. 1 or the like. In the example illustrated in FIG. 9, the ear materials 20, 0 are each formed of an annular sheet having an opening 29. However, each ear material 20 is not in a rectangular annular shape, and is rounded as compared with the example illustrated in FIG. 1 and the like. Specifically, the upper transition portion 23, the hook portion 24, and the lower transition portion 26 are formed in an arc shape. In the ear material 20 having such a shape including an arc, the tab portion 25 is located near the center of the ear material 20 in the horizontal direction D2, and therefore, the impression of a soft appearance due to the overall rounded shape is not obstructed.

[0044] As illustrated in the example of FIG. 9, in order to improve the visual impression when the ear materials 20, 20 each have a more rounded shape, a length (in this example, the length in the horizontal direction D2 up to the center of the position in the horizontal direction D2 where the tab portion 25 most protrudes) b in the horizontal direction D2 from the edge of the mask 100 in the horizontal direction D2 to the position where the tab portion 25 most protrudes is preferably 55 to 65% with respect to a length c of 1/2 of the length in the horizontal direction D2 of the entire mask 100.

(Auxiliary materials)

[0045] In the mask 100 illustrated in FIGs. 1 and 2, the ear materials 20, 20 constituting the pair are coupled to both sides of the body 10 via auxiliary materials 30, 30, respectively. The auxiliary materials 30, 30 need not be provided.

[0046] FIG. 10 is an enlarged view of a portion of the mask 100 where the auxiliary material 30 is provided. FIG. 10 (a) is a partial plan view, and FIG. 10 (b) is a cross-sectional view taken along line III-III of FIG. 10 (a). FIG. 11 illustrates a view after the ear material 20 is opened outward in the horizontal direction D2 from the state illustrated in FIG. 10. FIG. 10 (a) is a partial plan view, and FIG. 10 (b) is a cross-sectional view taken along line IV-IV of FIG. 10 (a). In the examples of FIGs. 10 and 11, the body 10, the ear material 20, and the auxiliary material 30 are arranged in this order. In FIGs. 10 and 11, the pleated structure 15 (FIG. 1 and the like) of the mask body 10 is not illustrated.

[0047] The auxiliary materials 30 are interposed be-

tween the body 10 and the ear materials 20 so that the body 10 and the ear materials 20 are directly coupled. Specifically, the body 10 and the auxiliary material 30 are coupled at a first coupling portion B1, and the ear material 20 and the auxiliary material 30 are coupled at a second coupling portion B2, so that the body 10 and the ear material 20 are not directly joined. For example, the first coupling portion B1 and the second coupling portion B2 can be formed by means of coupling the opposing surfaces of the members by applying pressure and/or heat, such as heat sealing, ultrasonic sealing, non-heating embossing, and the like. Among them, it is preferable to use heat sealing because reliable bonding is possible.

[0048] When the coupling portions are formed by heat sealing or the like, the coupling portions may include multiple welded portions. The welded portions may be continuous or discontinuous in the vertical direction D1 and/or the horizontal direction D2 at the coupling portions. The shapes of the welded portions of the coupling portion are not particularly limited as long as the coupling portions capable of sufficiently maintaining the strength can be formed. The welded portions may be formed in a shape of which a width is narrower than the length, i.e., in a linear shape (linear or curved shape), or in a point shape (shape visible as a point) . Specifically, the shapes of the welded portions in a plan view may be any shape, such as a quadrilateral shape such as a rectangular shape or a rhombic shape, a polygonal shape other than the quadrilateral shape, a circular shape, an elliptic shape, or the like.

[0049] As described above, the body 10 has a function of blocking the entry of foreign matter and preventing droplets generated by the wearer from being scattered, while the ear materials 20 have a function of holding the body 10 by being hung on the ears of the wearer when the wearer wears the ear materials 20. Therefore, the body 10 and the ear materials 20 are usually made of different materials, and the ear materials 20 are preferably made of a material having relatively high stretchability. Therefore, in the conventional structure in which the body 10 and the ear materials 20 are directly coupled, when a force is applied to the mask 100 by pulling the ear materials 20 and the like, the body 10 cannot follow the stretch of the ear materials 20, and the coupling cannot be maintained, and there is a possibility that both are detached from each other.

[0050] In contrast, in the present embodiment, the first coupling portion B1, which is the coupling portion between the body 10 and the auxiliary material 30, and the second coupling portion B2, which is the coupling portion between the ear material 20 and the auxiliary material 30, can be formed separately. Specifically, with the first coupling portion B1 and the second coupling portion B2, the force relating to the bonding is dispersed, and the ear materials 20 are not likely to be detached. Furthermore, the respective bonding portions can be formed in a form suitable for the characteristics of the two members to be directly coupled. Furthermore, as the material of the auxiliary material 30, a material capable of optimizing both of the coupling to the body 10 and the coupling to the ear material 20 can be selected. Thus, the indirect coupling between the body 10 and the ear materials 20 is less likely to be broken, and as a result, the mask that is less likely to break even when a force is applied can be obtained.

[0051] As described above, before the mask 100 according to the present embodiment is worn, the ear materials 20, 20 are separated from each other and opened sideways by pinching and pulling the tab portions 25, 25 provided on the ear materials 20, 20, respectively, constituting the pair. When the ear materials 20, 20 are separated and expanded, a large force is easily applied to the mask 100. However, according to the present embodiment, even in the separation and expansion operation of the ear materials 20, 20 at the start of use, the ear materials are less likely to be detached from the body 10, and a process of putting on the mask 100 can be started in a good condition.

[0052] The auxiliary materials 30 may be made of a non-stretchable material or a material with a low stretchability, and is preferably made of a material having certain stretchability. The auxiliary materials 30 may be made of a material of which the shape can be irreversibly deformed when a force is applied. The auxiliary materials 30 may include a stretchable nonwoven fabric of the same type as the ear materials 20 explained above, but the stretchability of the auxiliary material 30 is preferably smaller than that of the ear material 20 at least in the horizontal direction D2. The stretchability of the auxiliary material 30 is preferably greater than that of the body 10 at least in the horizontal direction D2.

[0053] When the auxiliary materials 30 having stretchability are provided, the difference between the stretch of the body 10 and the stretch of the auxiliary materials 30, and the difference between the stretch of the ear materials 20 and the stretch of the auxiliary materials 30 can be reduced even when the ear materials 20 are pulled. Therefore, the first coupling portion B1 between the body 10 and the auxiliary material 30 and the second coupling portion B2 between the ear material 20 and the auxiliary material 30 are less likely to break, and as a result, the indirect coupling between the body 10 and the ear materials 20 is less likely to break. The basis weight of the auxiliary material 30 may be 5 to 100 g/m^2. The thickness of the auxiliary material 30 may be 100 to 1,000 μm.

[0054] As illustrated in FIGs. 10 and 11, the auxiliary material 30 may be a sheet-shaped member extending along the vertical direction D1 of the mask 100. The length of the auxiliary material 30 in the vertical direction D1 is preferably the same as the length of the mask 100 in the vertical direction D1 (the length of the body 10 in the vertical direction D1), but may be shorter than the length of the mask 100 in the vertical direction D1. Furthermore, on one side (on either the right or left side) of the mask 100 in the horizontal direction D2, an outer end 31 of the auxiliary material 30 in the horizontal direction

D2 may be, in the horizontal direction D2, inside or outside an outer end 11 of the body 10 in the horizontal direction D2, but is preferably aligned with the outer end 11 of the body 10 in the horizontal direction D2 as illustrated in FIGs. 10 (a) and (b).

[0055] The length (width) W of the auxiliary material 30 in the horizontal direction D2 is preferably 15 to 35 mm, depending on the size and configuration of the entire mask 100 and the sizes, shapes, and materials of the body 10 and the ear materials 20. When the length in the horizontal direction D2 is within the above range, the areas of the first coupling portion B1 and the second coupling portion B2 can be sufficiently secured, while the auxiliary materials 30 do not interfere with the separation/expansion operation and/or the process of putting on the mask 100 at the start of use, and do not interfere with the functions of the body 10 and the ear materials 20.

[0056] As illustrated in FIG. 10, the auxiliary materials 30 are disposed on the outer surface side of the body 10. Therefore, even when the mask 100 is worn, the auxiliary materials 30 are unlikely to come into contact with the face of the wearer, and a good fit achieved by the mask 100 according to the present embodiment is not hindered.

[0057] Furthermore, as described above, the ear material 20 according to the present embodiment may function to press both sides of the body 10 toward the face of the wearer, while the auxiliary materials 30 disposed on the outer surface side of the body 10 may also function to press, integrally with the ear materials 20, the body 10 toward the face at least partially. Thus, the gap between the face and both sides of the body 10 can be further reduced, and the function of the mask 100 can be improved.

[0058] Hereinafter, specific aspects of the present invention are supplementarily explained below.

(Supplementary Note 1)

[0059] An aspect according to the Supplementary Note 1 is a mask that includes a mask body and ear materials, constituting a pair, coupled to the mask body, wherein in a state before start of use, the ear materials, constituting the pair, are separably coupled with each other, and provided on an outer surface side of the mask body, each of the ear materials, constituting the pair, is provided with a tab portion protruding from an edge of the mask body in a plan view, and at the start of use, the ear materials, constituting the pair, are separated from each other by pinching and pulling the tab portion.

[0060] According to the above-described aspect according to the Supplementary Note 1, the ear materials, constituting the pair, are provided with tab portions protruding from an edge of the mask body in a plan view. Therefore, the user can pinch or hold the ear materials at a position away from the body. Thereby, an operation (separation operation) for separating the ear materials, constituting the pair, from each other, which is performed before the mask is worn, can be performed without touching the body or without appreciably touching the body. Furthermore, an operation (expansion operation) of opening the separated ear material sideways (outwardly in the horizontal direction) can be performed without touching the body or without appreciably touching the body. Thus, the hygiene of the mask is not impaired in the preparation stage before the mask is worn, and the wearer can wear the mask in which the good hygiene condition is maintained.

[0061] When the separation operation and the expansion operation are performed, the hand may slightly touch the body depending on the operation of the user. In contrast, in the present embodiment, since the ear materials constituting the pair are arranged on the outer surface side of the body, even if the user's hand touches the body, the user's hand touches the outer surface of the body, and the user's hand is less likely to touch the inner surface. The inner surface of the mask (the surface facing the face of the wearer when wearing the mask) is a surface on which the sanitary condition is particularly desired to be maintained, and therefore, at least the contact between the inner surface and the hand is eliminated or reduced, so that the sanitary condition of the mask can be effectively maintained even if the hand touches the body in the separation operation and the expansion operation.

(Supplementary Note 2)

[0062] In an aspect according to the Supplementary Note 2, the mask has a vertical direction corresponding to a height direction of a wearer's face and a horizontal direction orthogonal to the vertical direction, and the tab portion is provided on a lower side of each of the ear materials, constituting the pair.

[0063] According to the above-described aspect according to the Supplementary Note 2, the tab portions are provided on the lower side of the ear materials, and therefore, the user can pinch the tab portions by natural operation without excessive force. For example, when the mask is placed on a table and the like so that its horizontal direction is in the lateral direction of the human body and its upward and downward directions are in the forward and backward directions of the human body, and the user naturally extends both hands toward the tab portions of the ear materials, the user can pinch the tab portions without changing the form (orientation) of the hand, such that the thumbs are placed on the back surface side of the tab portions (the inner surface side of the ear materials or the side facing the body) and the other fingers are placed on the front surface side of the tab portion (the outer surface side of the ear materials).

(Supplementary Note 3)

[0064] In an aspect according to the Supplementary Note 3, a length in a horizontal direction from the edge

of the mask in a horizontal direction to a position of the tab portion that is most protruding is 45 to 90% with respect to 1/2 of the length in the horizontal direction of the mask.

[0065] According to the above-described aspect according to the Supplementary Note 3, the position of the tab portion that is most protruding is at a predetermined position in the horizontal direction with respect to the mask. Therefore, the right and left hands can pinch the tab portions without interfering with each other's operation, and a large force and complicated operation are not required when the ear materials are lifted and separated from each other and opened sideways.

(Supplementary Note 4)

[0066] In an aspect according to the Supplementary Note 4, a maximum length, in a vertical direction, of a portion of the tab portion protruding from an edge of the mask body is 5 to 15 mm.

[0067] According to the above-described aspect according to the Supplementary Note 4, the portion of the tab portion protruding has a predetermined length from an edge of the body, and therefore, a sufficient area for the user to pinch the tab portion can be secured.

(Supplementary Note 5)

[0068] In an aspect according to the Supplementary Note 5, the tab portion has a curved outline.

[0069] According to the above-described aspect according to the Supplementary Note 5, the portion protruding from the body is less likely to break. In addition, it is possible to reduce discomfort when the outline of the tab portion comes into contact with the hand at the time of a separation/expansion operation before putting on the mask or when the ear materials are hung on the ear while the mask is worn.

(Supplementary Note 6)

[0070] In an aspect according to the Supplementary Note 6, the mask further includes auxiliary materials provided on an outer surface side of the mask body, wherein the ear materials, constituting the pair, are coupled to sides of the mask body via the auxiliary materials.

[0071] According to the above-described aspect according to the Supplementary Note 6, the ear materials, constituting the pair, are coupled to the mask body via the auxiliary materials, and therefore, the mask can be constructed without directly coupling the ear materials and the body. For this reason, the coupling portion between the body and the auxiliary material and the coupling portion between the ear material and the auxiliary material can be formed separately. Specifically, the respective coupling portions can be formed separately in forms that are suitable for the materials of the two members to be directly coupled. Thus, an unbreakable indirect coupling can be formed between the ear materials and the body without damaging the function of the members and the fit, and the robust mask with good fit can be obtained.

[0072] This application claims the priority to Basic Application No. 2020-094368 filed with the Japan Patent Office on May 29, 2020, the entire contents of which are incorporated herein by reference.

DESCRIPTION OF THE REFERENCE NUMERALS

[0073]

10	mask body
11	outer end of mask body in horizontal direction
15	pleated structure
20	ear material
21	outer end of ear material in horizontal direction
22	adhesive portion
23	upper transition portion
24	hook portion
25	tab portion
25s	vertex of protruding portion of tab portion
25c	mark
25r	highly rigid portion
26	lower transition portion
28	separable coupling portion
30	auxiliary material
31	outer end of auxiliary material in horizontal direction
100	mask
B1	first coupling portion
B2	second coupling portion

Claims

1. A mask comprising:

a mask body; and
ear materials, constituting a pair, coupled to the mask body,
wherein in a state before start of use, the ear materials, constituting the pair, are separably coupled with each other, and provided on an outer surface side of the mask body,
each of the ear materials, constituting the pair, is provided with a tab portion protruding from an edge of the mask body in a plan view, and
at the start of use, the ear materials, constituting the pair, are separated from each other by pinching and pulling the tab portion.

2. The mask according to claim 1, wherein the mask has a vertical direction corresponding to a height direction of a wearer's face and a horizontal direction orthogonal to the vertical direction, and
the tab portion is provided on a lower side of each

of the ear materials, constituting the pair.

3. The mask according to claim 1 or 2, wherein a length in a horizontal direction from the edge of the mask in a horizontal direction to a position of the tab portion that is most protruding is 45 to 90% with respect to 1/2 of the length in the horizontal direction of the mask.

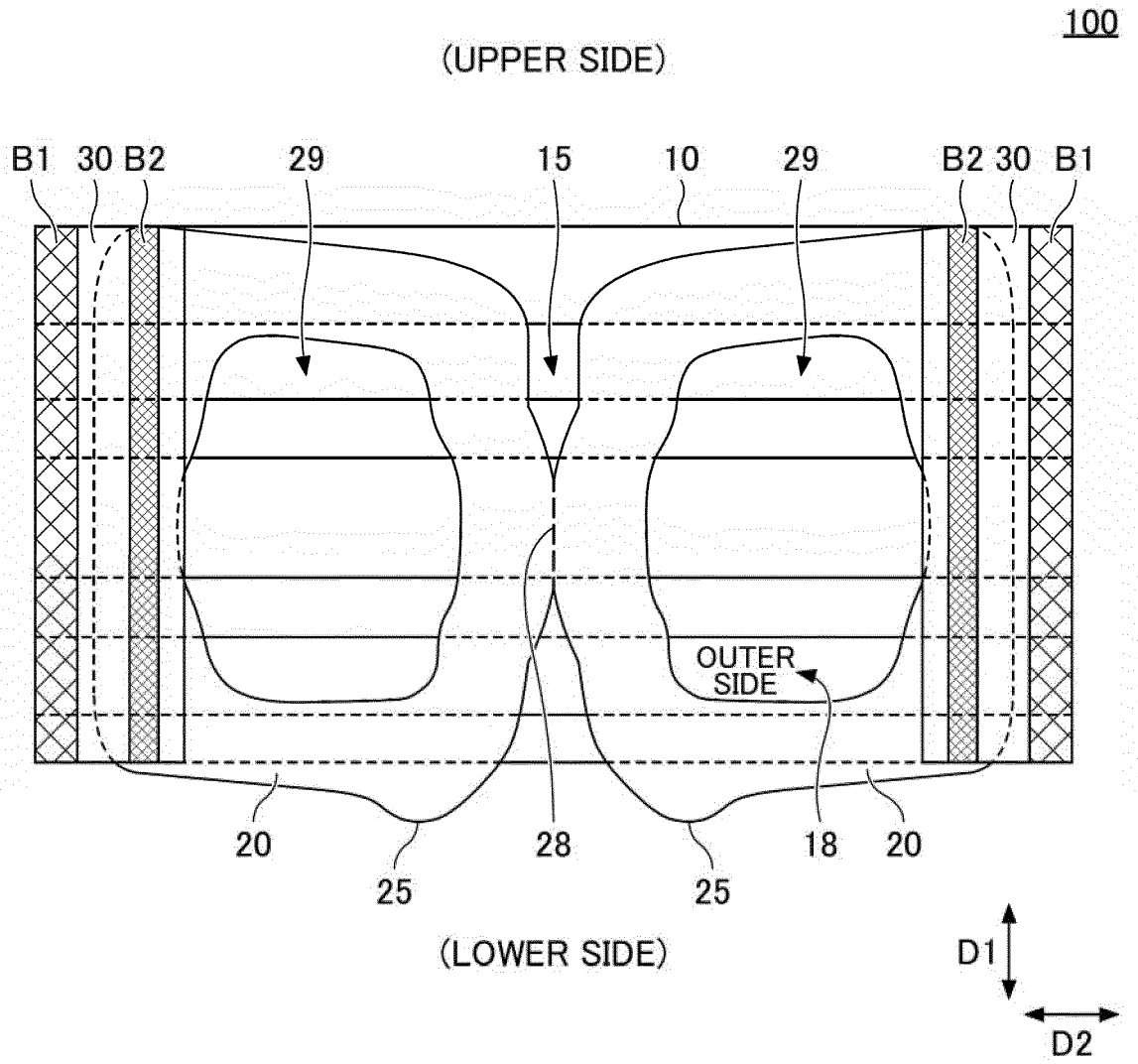
4. The mask according to any one of claims 1 to 3, wherein a maximum length, in a vertical direction, of a portion of the tab portion protruding from an edge of the mask body is 5 to 15 mm.

5. The mask according to any one of claims 1 to 4, wherein the tab portion has a curved outline.

6. The mask according to any one of claims 1 to 5, further comprising:

auxiliary materials provided on an outer surface side of the mask body,
wherein the ear materials, constituting the pair, are coupled to sides of the mask body via the auxiliary materials.

FIG.1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B1
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B2
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10
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B1
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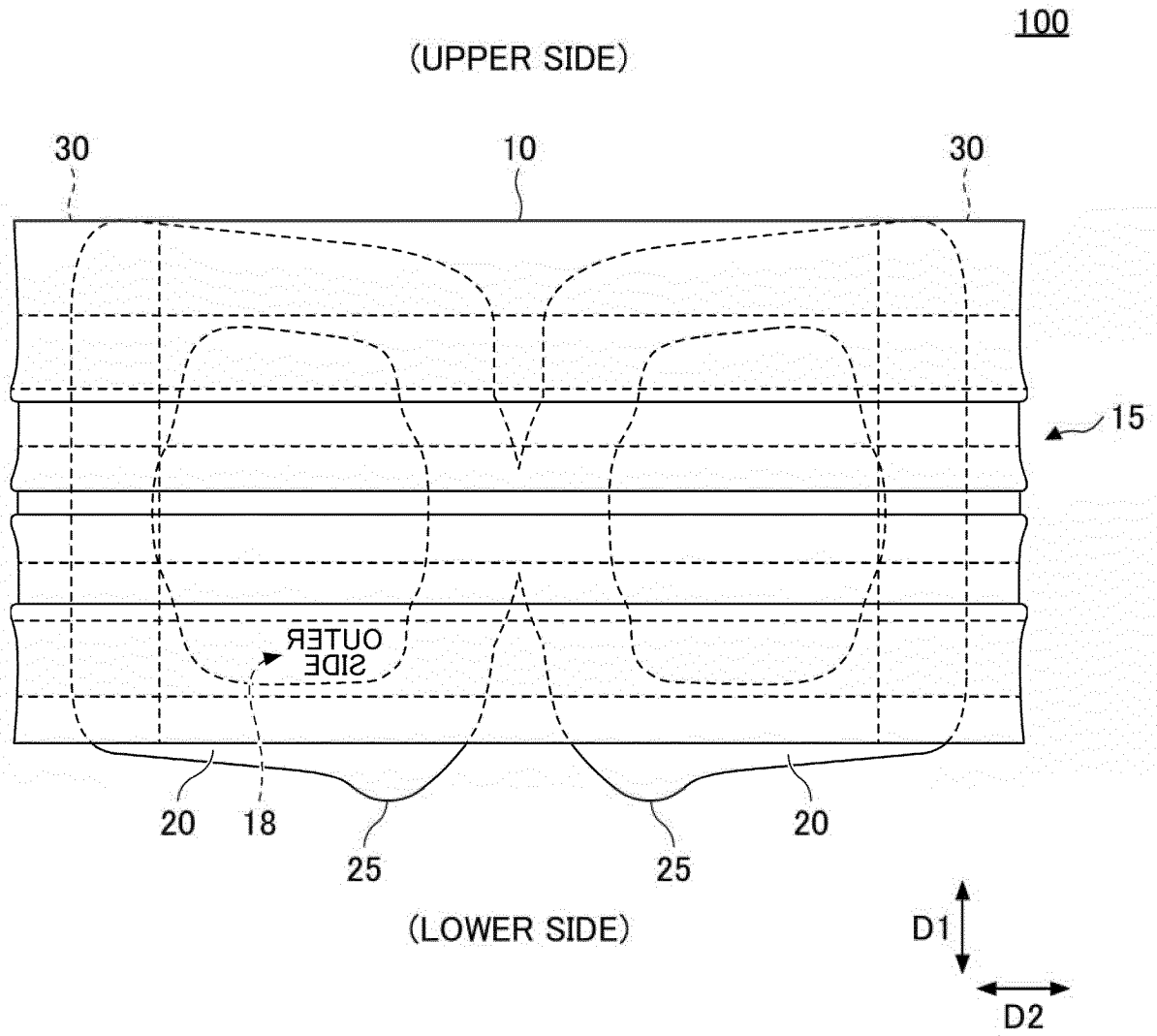
18
20
(LOWER SIDE)
D1
D2

FIG.2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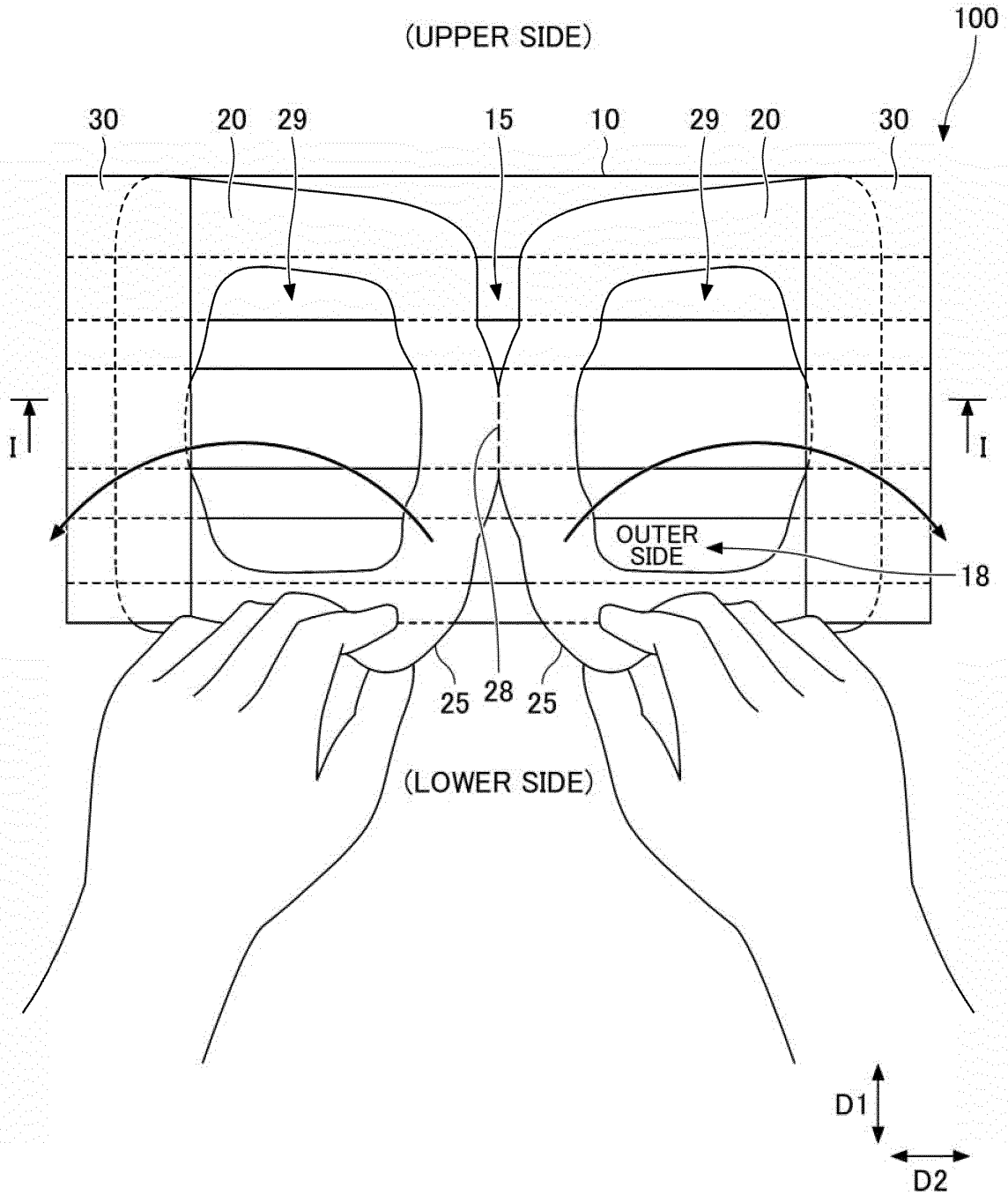
D1
D2

FIG.3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I
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OUTER SIDE
18
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(LOWER SIDE)
D1
D2

FIG.4

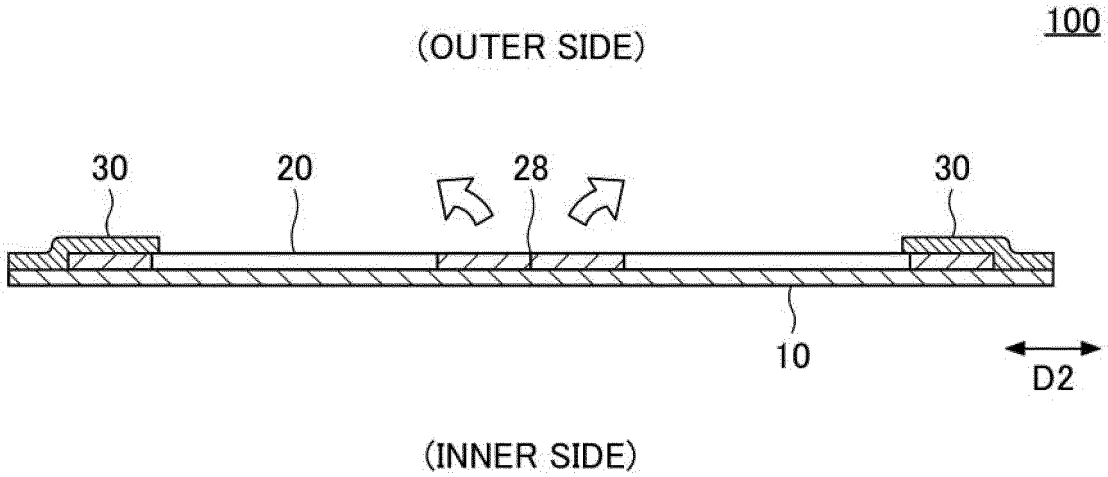
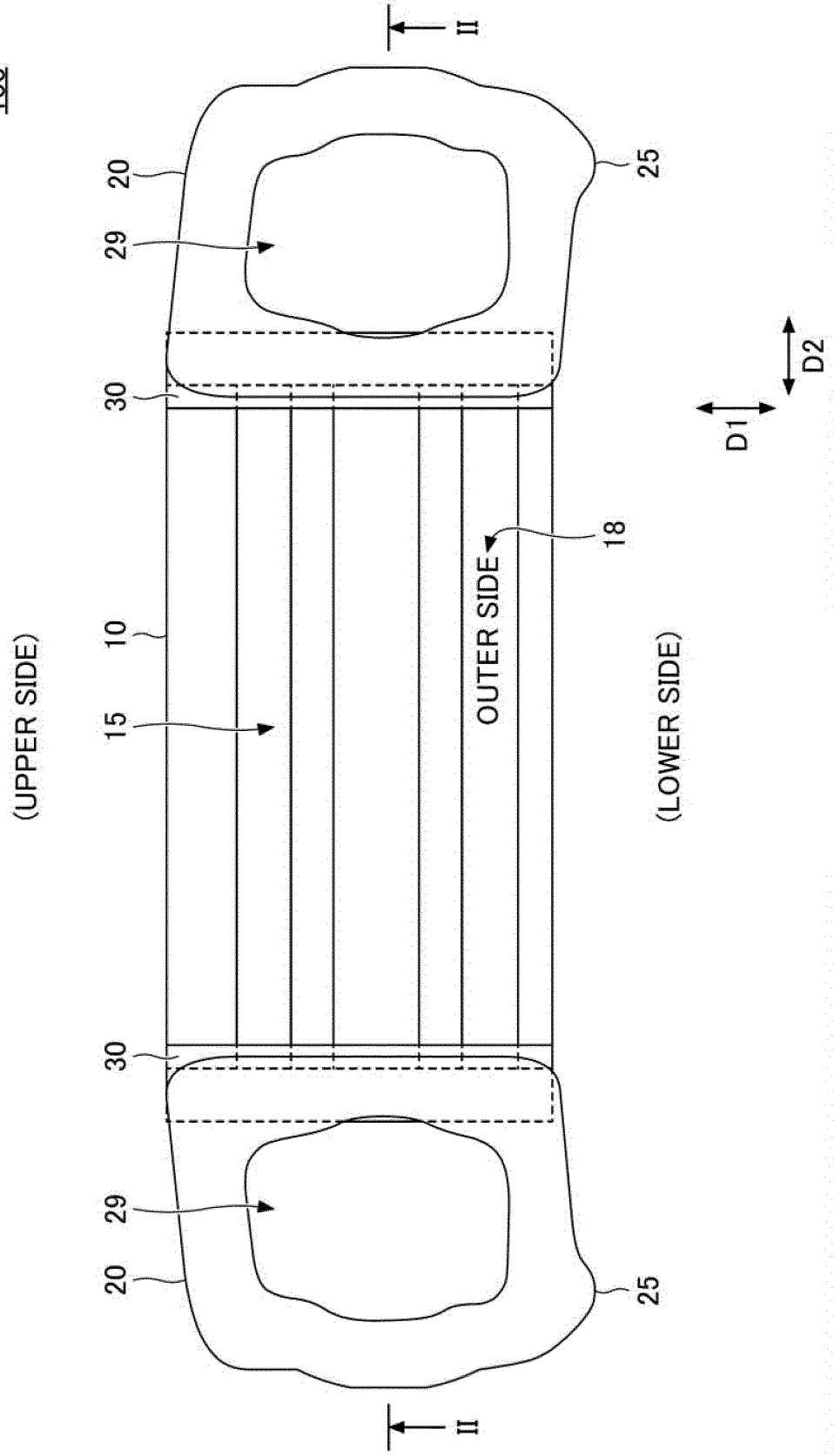


FIG.5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29
30
25
D2
D1
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(LOWER SIDE)
30
29
20
25
II

FIG.6

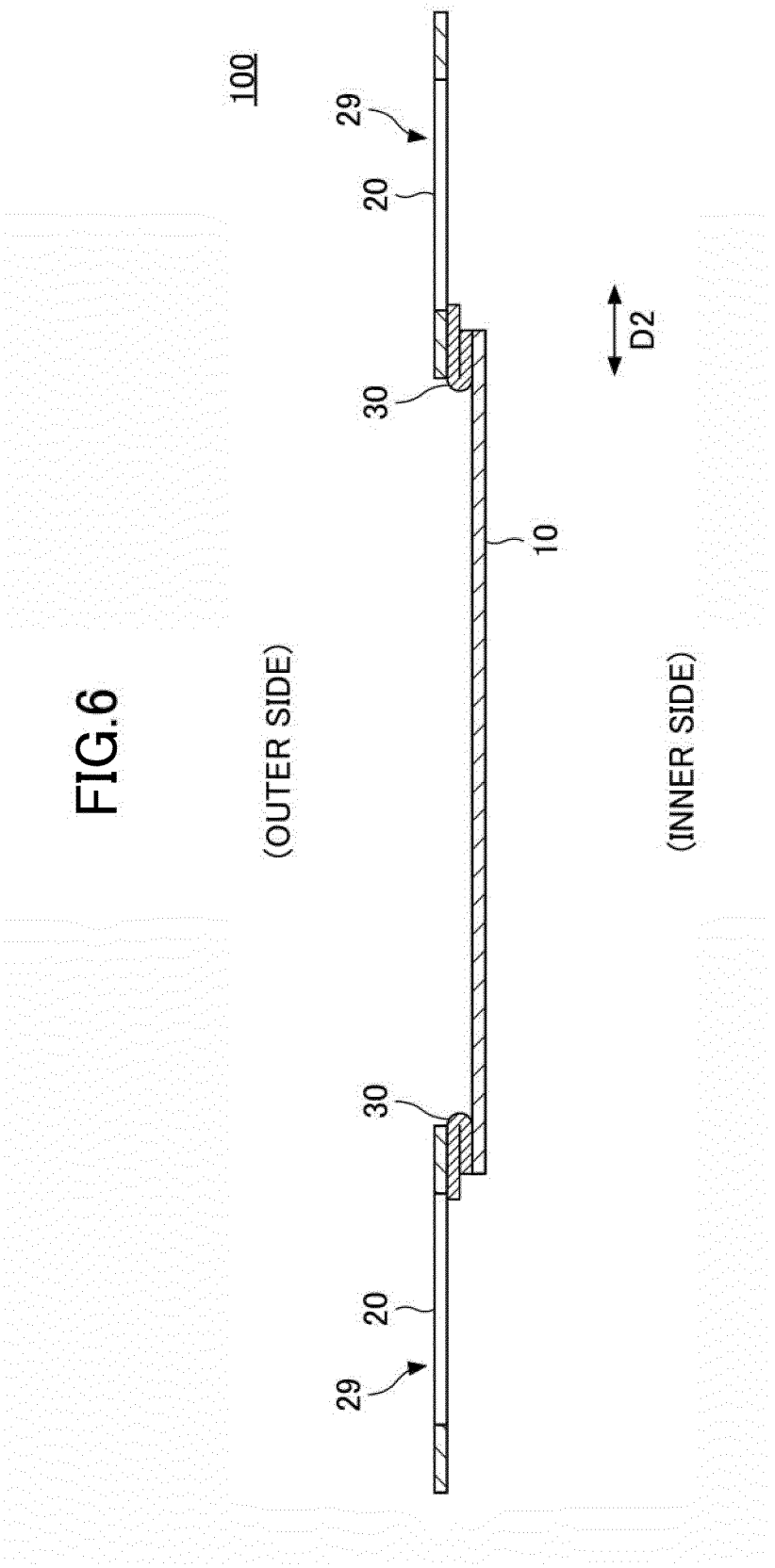


FIG.7

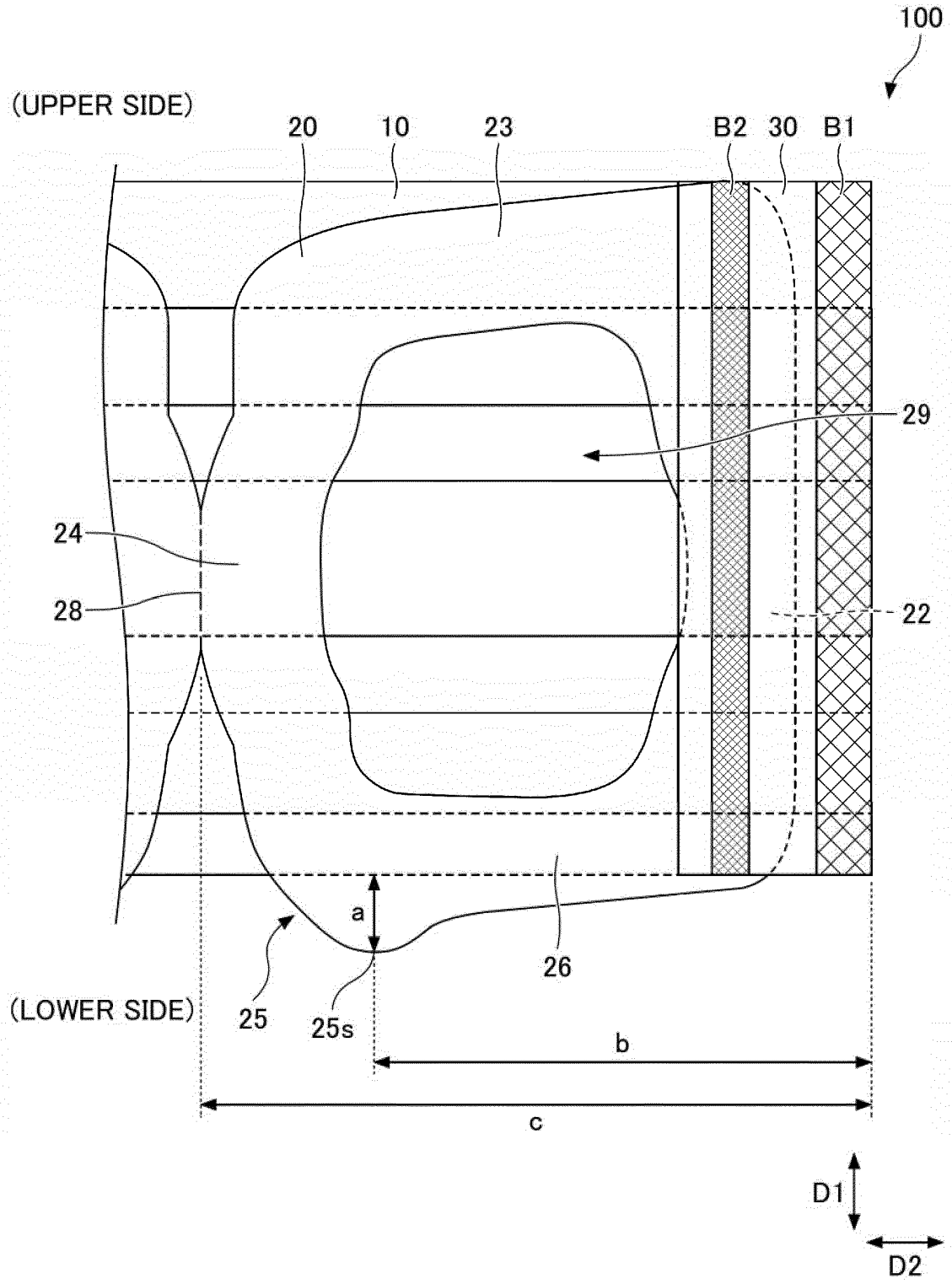

100
(UPPER SIDE)
20
10
23
B2
30
B1
29
24
28
22
a
26
(LOWER SIDE)
25
25s
b
c
D1
D2

FIG.8

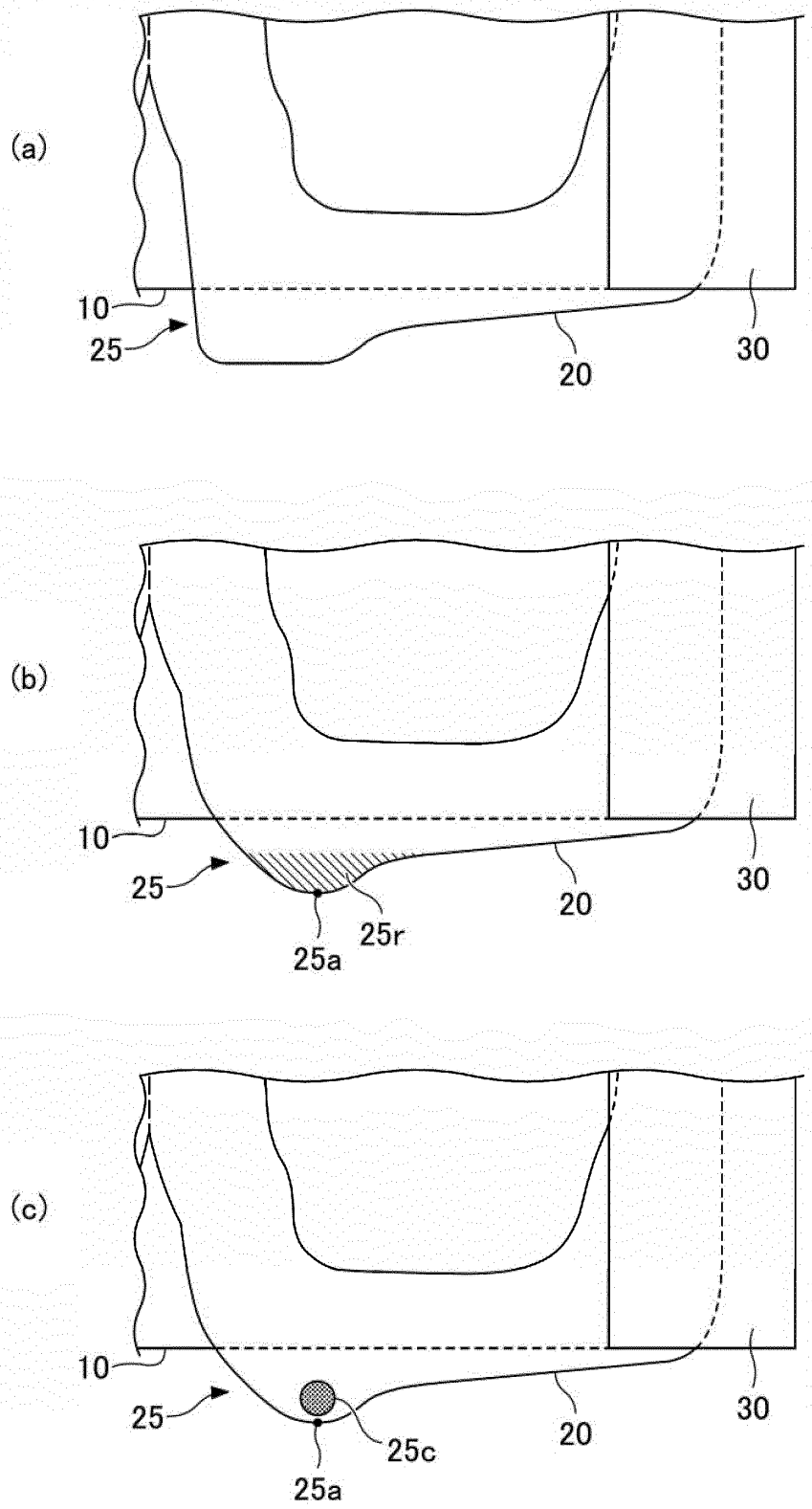
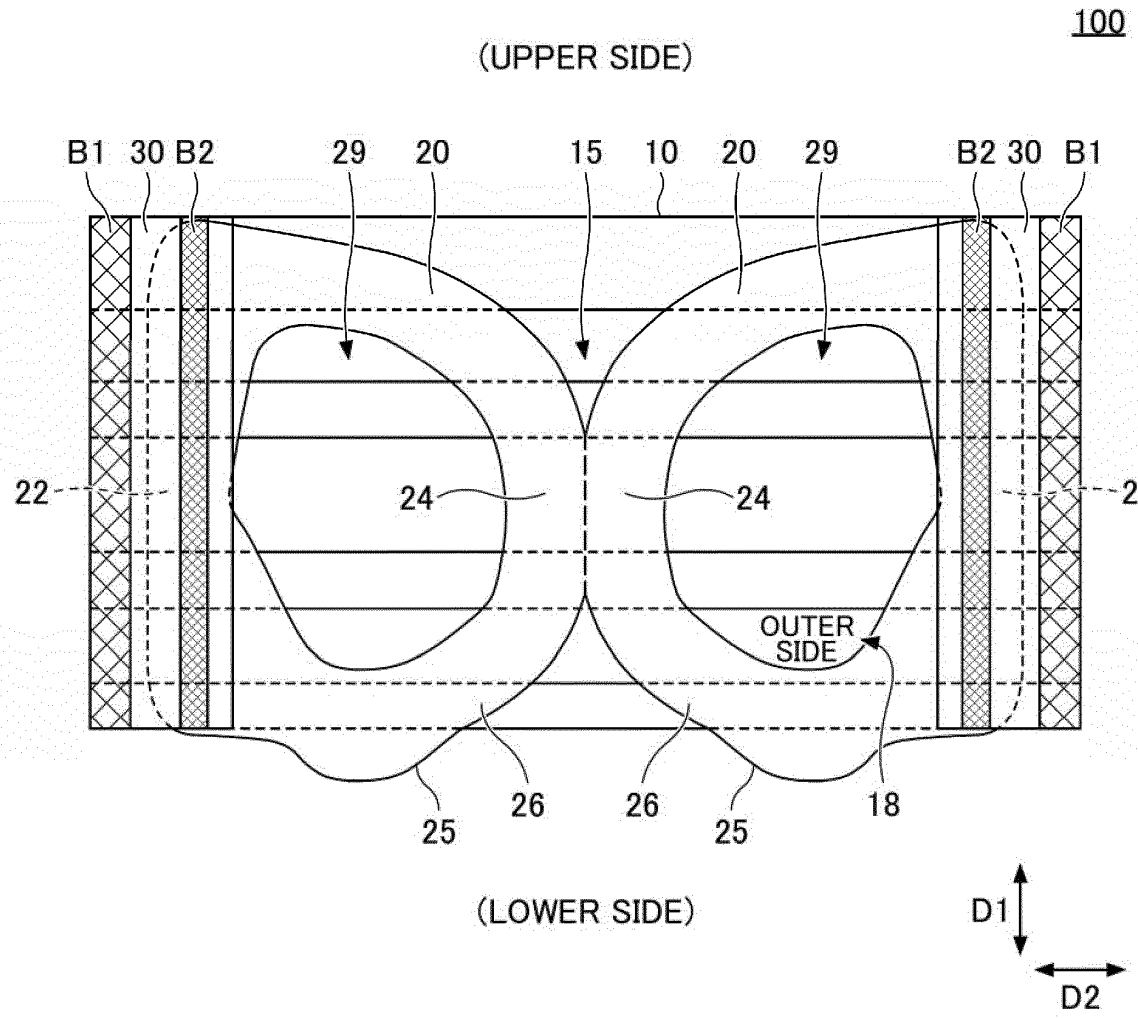


FIG.9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B1
30
B2
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15
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20
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B2
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B1
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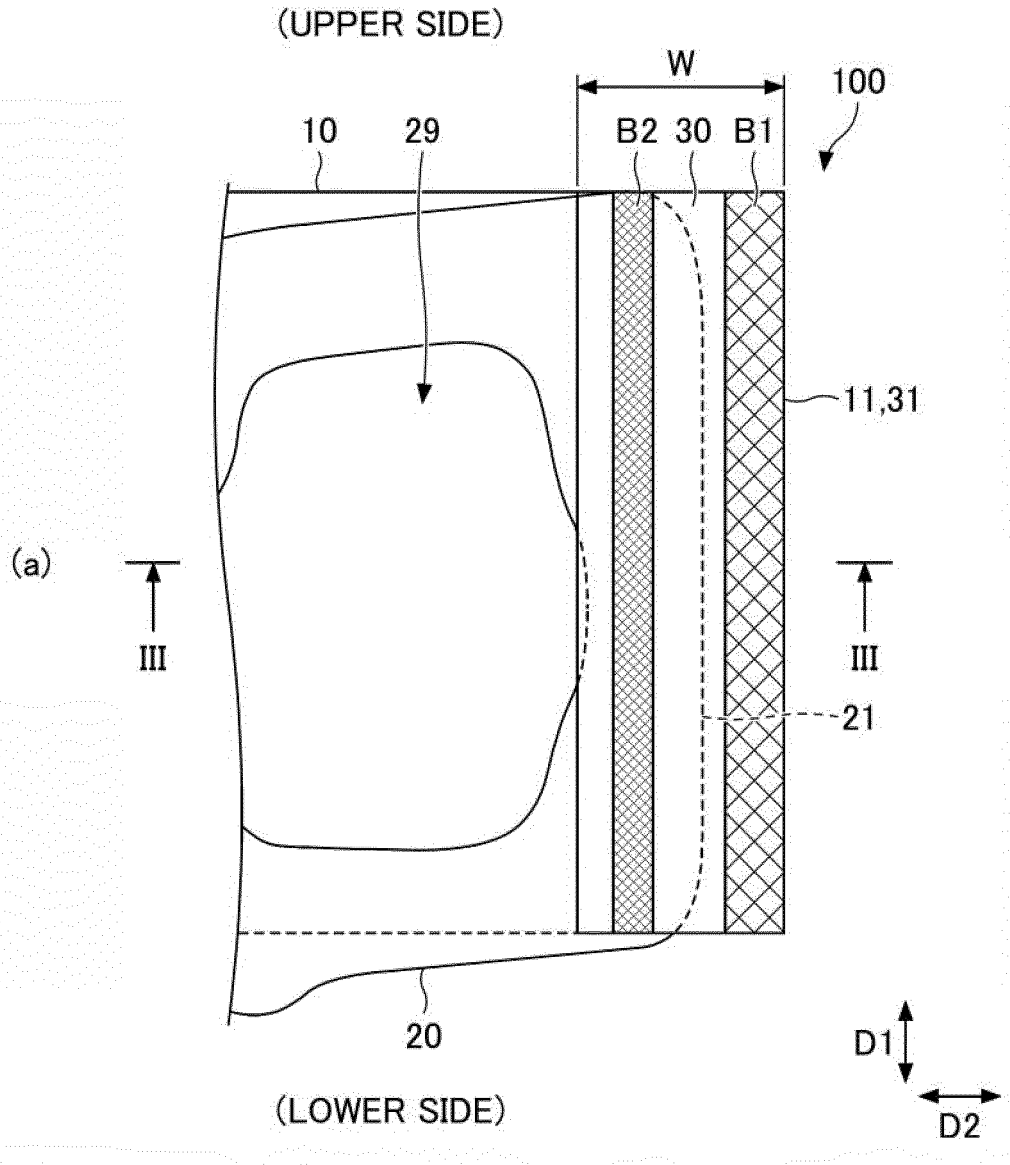
OUTER SIDE
25
26
26
25
18
(LOWER SIDE)
D1
D2

FIG.10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10
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B2
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B1
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III
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20
D1
(LOWER SIDE)
D2
29
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(OUTER SIDE)
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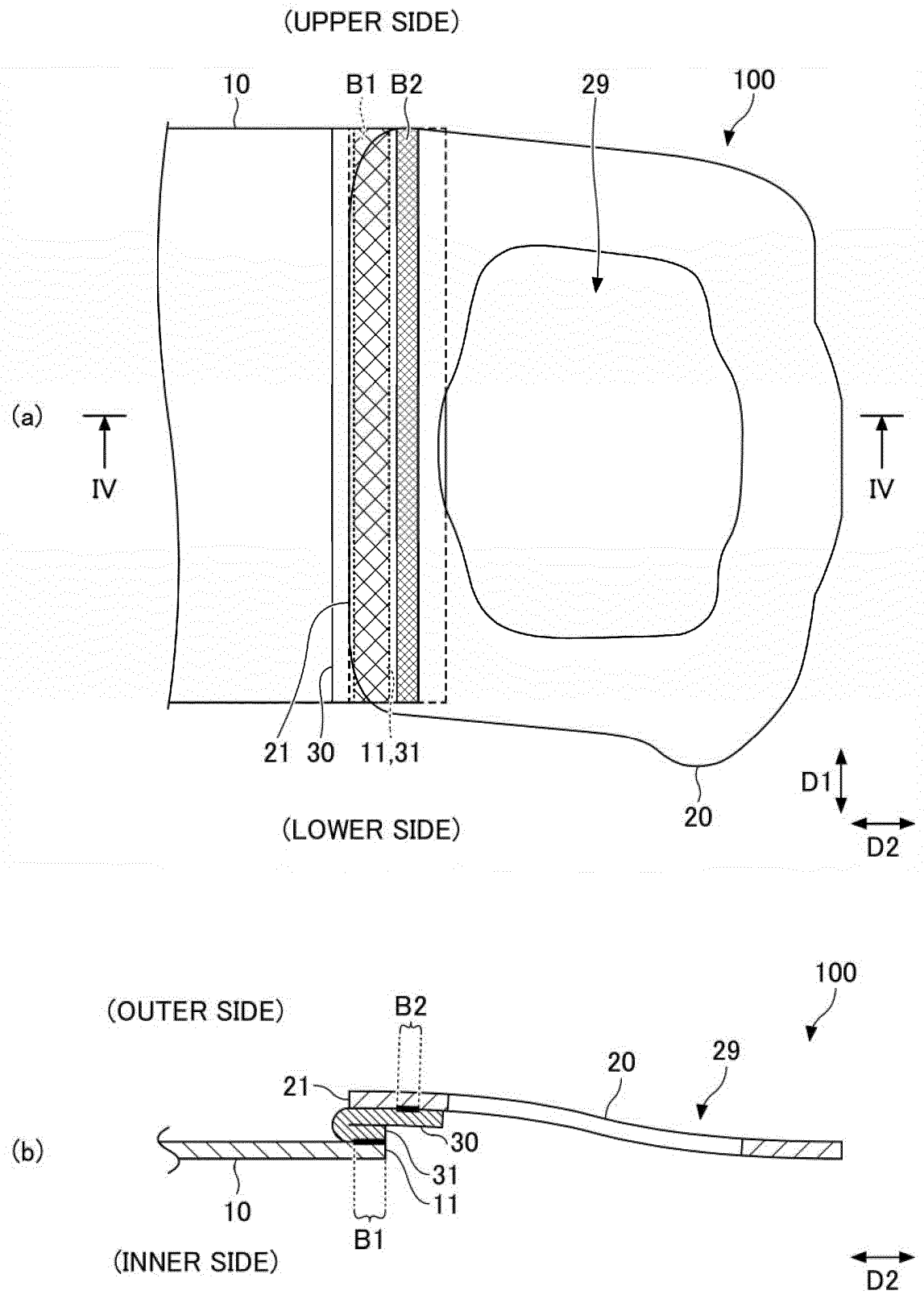
31
(b)
11
10
(INNER SIDE)
B2
B1
D2

FIG.11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(a)
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D1
D2
(LOWER SIDE)
100
(OUTER SIDE)
B2
20
29
21
(b)
30
31
11
10
B1
(INNER SIDE)
D2

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2021/018437

A. CLASSIFICATION OF SUBJECT MATTER
Int.Cl. A62B18/02(2006.01)i, A41D13/11(2006.01)i
FI: A41D13/11H, A62B18/02C

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)
Int.Cl. 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	1971-2021
Registered utility model specifications of Japan	1996-2021
Published registered utility model applications of Japan	1994-2021

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 Y	JP 2013-31469 A (UNI CHARM CORPORATION) 14 February 2013 (2013-02-14), paragraphs [0015]-[0094], fig. 1-12	1-5 6
Y	JP 2006-34408 A (UNITY KK) 09 February 2006 (2006-02-09), paragraphs [0012]-[0024], fig. 1-4	6
A	JP 2017-48486 A (UNI CHARM CORPORATION) 09 March 2017 (2017-03-09), entire text, all drawings	1-6

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

* Special categories of cited documents:
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"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
18 June 2021	06 July 2021

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

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/JP2021/018437

JP 2013-31469 A	14 February 2013	WO 2013/002226 A1 CN 103635233 A KR 10-2014-0038428 A
JP 2006-34408 A	09 February 2006	(Family: none)
JP 2017-48486 A	09 March 2017	WO 2017/038210 A1 KR 10-2018-0050678 A CN 108135299 A

Form PCT/ISA/210 (patent family annex) (January 2015)

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 5762803 B **[0004]**
- JP 2020094368 A **[0072]**