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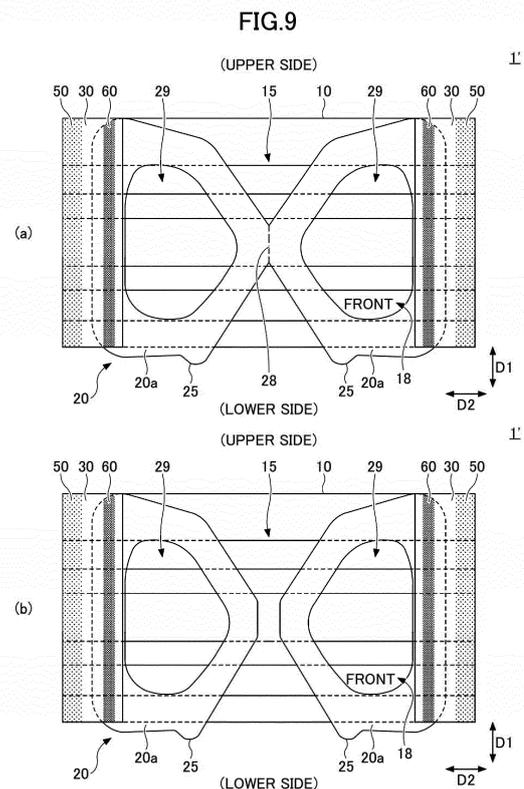
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(54) **METHOD FOR PRODUCING EAR HOOK MEMBER FOR MASK, APPARATUS FOR PRODUCING EAR HOOK MEMBER FOR MASK, METHOD FOR PRODUCING MASK, AND MASK**

(57) A method for producing an ear hook member for a mask includes: stretching a stretchable member so that tension occurs in a predetermined direction; superposing a non-stretchable surface material on at least one face of the stretchable member, with the tension being maintained; joining the stretchable member and the surface material together to obtain a joined body; loosening the joined body in the predetermined direction to be in a predetermined loose state where the tension is reduced; and punching the joined body in the predetermined loose state into a predetermined shape.



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Description

[Technical Field]

[0001] The present invention relates to a method for producing an ear hook member for a mask, an apparatus for producing an ear hook member for a mask, a method for producing a mask, and 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 be hung around the ears of the wearer in order to keep the mask body at a wearing position.

[0003] Conventionally, ear hook members (ear hook portions) used for masks are often in the form of a string. However, sheet-shaped ear hook members have been studied in order to reduce the burden on the ears. For example, a mask described in PTL 1 includes a single sheet-shaped ear hook sheet including ear hook portions that extend on the same plane, with both the ear hook portions being coupled to each other at a coupling portion.

[0004] Moreover, in recent years, there has been a growing demand for masks and it has gotten to the point where masks are now used by various users regardless of age and gender. In view thereof, there has been a demand for producing ear hook members having various structures that can accommodate, for example, the sizes of users' faces, shapes, and desired types of comfort during use.

[Citation List]

[Patent Literature]

[0005] [PTL 1] Japanese Patent No. 5762803

[Summary of Invention]

[Technical Problem]

[0006] The mask described in PTL 1 uses, as an ear hook sheet, a nonwoven fabric sheet that is stretchable more in a direction crossing an elongated extending direction than in the elongated extending direction. On the production line, an ear hook sheet band is conveyed in an elongated direction, punching is performed, and the punched products are joined with mask bodies. However, changing designs of the ear hook member (e.g., size and shape) in this method leads to changing the punching die itself, which is costly and laborious. As a result, ear hook portions having various structures cannot be readily produced. Therefore, there is a demand for a mask production method where design changes can be easily per-

formed.

[0007] In one aspect of the present invention in view of the foregoing, it is an object to provide a method for producing an ear hook member for a mask where design changes can be easily performed.

[Solution to Problem]

[0008] One aspect of the present invention is a method for producing an ear hook member for a mask. The method includes: stretching a stretchable member so that tension occurs in a predetermined direction; superposing a non-stretchable surface material on at least one face of the stretchable member, with the tension being maintained; joining the stretchable member and the surface material together to obtain a joined body; loosening the joined body in the predetermined direction to be in a predetermined loose state where the tension is reduced; and punching the joined body in the predetermined loose state into a predetermined shape.

[Advantageous Effects of Invention]

[0009] According to one aspect of the present invention, it is possible to provide a method for producing an ear hook member for a mask where design changes can be easily performed.

[Brief Description of Drawings]

[0010]

[FIG. 1] FIG. 1 is a plan view of a mask according to one embodiment of the present invention.

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

[FIG. 3] FIG. 3 is a cross-sectional view as taken along line I-I of FIG. 1.

[FIG. 4] FIG. 4 is a plan view of a mask in which a pair of ear hook portions are opened laterally.

[FIG. 5] FIG. 5 is a cross-sectional view as taken along line II-II of FIG. 4.

[FIG. 6] FIG. 6 is a cross-sectional view of an ear hook portion sheet.

[FIG. 7] FIG. 7 is a schematic explanatory view of production of a mask.

[FIG. 8] FIG. 8 is an explanatory view of loosening means.

[FIG. 9] FIG. 9 is one example of a mask that is produced by a mask production apparatus illustrated in FIG. 7.

[FIG. 10] FIG. 10 is a plan view of a mask not including an auxiliary material.

[Description of Embodiments]

[0011] 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. Also, the drawings are schematic ones for helping in understanding the invention.

[0012] One embodiment of the present invention relates to an ear hook portion for a mask. Another embodiment of the present invention relates to a mask including such an ear hook portion for a mask. In the following, first, a basic configuration of the mask in the present embodiment will be described.

(Basic configuration of mask)

[0013] The mask in the present embodiment 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 can 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 of the present embodiment is suitably used as a disposable mask, but may be used as a reusable mask by, for example, washing the mask.

[0014] FIG. 1 is a plan view of a mask 1. FIG. 1 is a view of the mask 1 from the outer face side thereof; i.e., the side on which the mask 1 is not facing towards the face upon being worn, and is exposed to the outside. FIG. 2 is a plan view of the mask from the inner face side thereof (face side). FIG. 3 is a cross-sectional view as taken along line I-I of FIG. 1.

[0015] 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 ear hook portions 20a and 20a bonded to the mask body 10. The mask body 10 extends in a vertical direction D1 corresponding to an up-and-down direction of the face of a wearer upon putting on it and in a lateral direction D2 orthogonal to the vertical direction D1 (the lateral direction D2 corresponds to a left-and-right direction of the face of a wearer upon putting on it). In the embodiment of FIG. 1, the mask body 10 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.

[0016] 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 can be formed by folding a sheet for the mask body 10 twice or more at fold lines along the lateral direction D2. In a state where the plurality of pleats are formed, the lateral portions (the end portions in the lateral direction D2) of the mask body 10 are fixed. Therefore, upon use of the mask 1, by opening the pleats of the pleated structure 15 in the vertical

direction D1, a central portion in the lateral direction D2 can be deformed and specifically curved so as to project towards the outer face side of the mask 1 and contour 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.

[0017] As illustrated in FIG. 1 and FIG. 2, the pair of ear hook portions 20a and 20a are disposed on the outer face of the mask body 10. As illustrated in FIG. 1, the ear hook portion 20a may be annular (or be a closed annular band) in the plan view, or may have a shape containing a ring. Upon putting on the mask, the ear hook portion 20a can 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 central opening 29 of the ear hook portion 20a.

[0018] The pair of ear hook portions 20a and 20a may be formed as a single sheet-shaped ear hook member (ear hook portion sheet) 20, in which the ear hook portions 20a and 20a are bonded together in a separable manner at a central portion in the lateral direction D2. In the present specification, "sheet-shaped" or "sheet" refers to a shape in which the length and width thereof are larger than the thickness thereof and that extends or can extend in one flat plane. Therefore, the pair of ear hook portions 20a and 20a in the present embodiment are different from the ear hook portion in the form of a string or thread. By the pair of ear hook portions 20a and 20a being made as the ear hook portion sheet 20, when a wearer has the ear hook portion 20a hung around his or her ear upon putting on the mask, the ear hook portion 20a can make surface contact with the back face of the earlobe. This makes it possible to reduce the burden on the ear and the portion around the ear, to thereby reduce discomfort and pain.

[0019] No particular limitation is imposed on the bonding manner of the separable bond portion 28 between the pair of ear hook portions 20a and 20a. 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, discontinuous notches (cuts) may be provided to form a perforated line. Rather than the perforated line, 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 ear hook portions 20a and 20a, and make the boundary subjectable to stress.

[0020] 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/m², and preferably from 15 through 50 g/m². The basis weight of the intermediate layer having a high ability to capture foreign matter is preferably from 10 through 100 g/m², and more preferably from 15 through 50 g/m².

[0021] The pair of ear hook portions 20a and 20a are bonded to the lateral portions of the outer face of the mask body 10 (the end portions in the lateral direction D2). In other words, the pair of ear hook portions 20a and 20a are respectively joined with the outer end portions in the lateral direction D2 of the mask body 10, while the pair of ear hook portions 20a and 20a are not joined with the mask body 10 at any other portions. Note that, in the embodiment of FIG. 1, the pair of ear hook portions 20a and 20a are respectively bonded to both lateral portions of the mask body 10 via the auxiliary materials 30 and 30. The auxiliary materials 30 and 30 may be a sheet-shaped member that extends along the vertical direction D1 of the mask 1. The auxiliary materials 30 and 30 are respectively joined, at outer joined portions 50 and 50, with both end portions of the mask body 10 in the lateral direction D2. Also, the auxiliary materials 30 and 30 are joined, at inner joined portions 60 and 60, with both end portions of the ear hook portion sheet 20 in the lateral direction D2. An optimal way of bonding can be selected for the outer joined portion 50 between the auxiliary material 30 and the mask body 10 and for the inner joined portion 60 between the auxiliary material 30 and the ear hook portion sheet 20. With this structure, it is possible to obtain the mask 1 that is firmer than a mask including the ear hook portion sheet 20 and the mask body 10 that are directly joined together. The auxiliary material 30 may be stretchable but is preferably less stretchable than the ear hook portion sheet 20.

[0022] When the mask 1 according to the present embodiment is to be used for the first time, the mask 1 according to the present embodiment, a user tears the separable bond portion 28 between the pair of ear hook portions 20a and 20a before putting on the mask 1, to thereby separate the ear hook portions 20a and 20a from each other. Then, the user opens the non-joined portions of the ear hook portions 20a and 20a of the mask body 10 laterally in the lateral direction D2. Such separation and spreading out, and configurations relevant to these operations will be described below.

(Separation and spreading out of the ear hook portions)

[0023] When using the mask illustrated in FIG. 1, a

user pinches and grasps the pair of ear hook portions 20a and 20a with his or her hands, and can pull the ear hook portions 20a and 20a in opposite directions. Thereby, first, the user can tear the bond of the separable bond portion 28. Subsequently, the user can open the pair of ear hook portions 20a and 20a outward (laterally) in the lateral direction D2 while grasping the ear hook portions 20a and 20a.

[0024] FIG. 4 is a view of the mask 1 of FIG. 1, in which the pair of ear hook portions 20a and 20a are spread out laterally. FIG. 5 is a cross-sectional view as taken along line II-II of FIG. 4. As illustrated in FIG. 4 and FIG. 5, when the pair of ear hook portions 20a and 20a are opened, the ear hook portions 20a and 20a are turned over, and the faces thereof having previously faced the mask body 10 are exposed. Also, the outer face of the mask body 10 is almost entirely exposed.

[0025] The pair of ear hook portions 20a and 20a may be disposed on the outer face side of the mask body 10 or may be disposed on the inner face side thereof. However, as illustrated in FIGS. 1 to 5, the pair of ear hook portions 20a and 20a are preferably disposed on the outer face side of the mask 1. With the structure in which the pair of ear hook portions 20a and 20a are disposed on the outer face side of the mask body 10, it is possible to reduce or eliminate possibility of touching the inner face of the mask body 10 when separating and opening the pair of ear hook portions 20a and 20a outward in the lateral direction D2. From a hygienic viewpoint, the above structure is preferable.

[0026] 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 ear hook portions 20a and 20a with his or her hands outward in the lateral direction D2. Then, the user can move the mask 1 to the face of another person (wearer) while grasping the pair of ear hook portions 20a and 20a. After applying the mask body 10 at a desired position on the face of the other person, the user can hang the pair of ear hook portions 20a and 20a around the ears of the other 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 on a mask by themselves, such as children and the sick.

[0027] Moreover, as illustrated in FIG. 1, the pair of ear hook portions 20a and 20a may be provided with pinch portions 25 and 25. A user can pinch the pinch portions 25 and 25 when separating and opening the pair of ear hook portions 20a and 20a outward in the lateral direction D2. Preferably, the pinch portions 25 and 25 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). By the pinch portions 25 and 25 projecting from the edge of the mask body 10, 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. Then, the user can separate and spread out the pair of 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 on or can have another person put on the mask 1 under good hygienic conditions. Note that, when the pinch portion 25 projects from the edge of the mask body 10, the maximum length of the projected portion in the vertical direction D1 is preferably from 5 through 20 mm and more preferably from 8 through 15 mm.

[0028] Also, by the pinch portions 25 and 25 of the ear hook portion 20a, the user can readily adjust the ear hook portions with the pinch portions 25 and 25 upon or after hanging the ear hook portion 20a around the ear of the wearer. Specifically, with the pinch portions 25 and 25, it is possible to make a positional adjustment by shifting the ear hook portion 20a in a circumferential direction of the ear hook portion 20a relative to the ear, or to adjust the degree of tension of the ear hook portion 20a by pulling the ear hook portion 20a backward or loosening the ear hook portion 20a.

[0029] In the present embodiment, the pair of ear hook portions 20a and 20a are bonded to both the lateral portions of the outer face of the mask body 10 (e.g., FIG. 1 and FIG. 3 to FIG. 5) rather than the inner face (the face on the face side) thereof. Thus, during wearing of the mask 1; i.e., in a state where the 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 ear hook portion 20a is not disposed on the inner face side (face side) of both the lateral portions of the body, the ear hook portion 20a does not directly contact the face of the wearer at both the lateral portions of the mask body 10 during wearing of the mask 1, and discomfort is reduced.

[0030] Note that, the mask body 10 may be provided with a mark 18 by embossing, printing, sewing, etc. The mark 18 allows for distinction between the outer face and the inner face of the mask body 10. The mark 18 may be any form as long as a user can identify the inner or outer face thereof visually or by sense of touch. As illustrated in, for example, FIG. 1, the mark 18 may be a letter, a number, a symbol, a figure, a logo, etc.

(Ear hook member)

[0031] The ear hook member (ear hook portion sheet) 20 or the ear hook portions 20a and 20a in the present embodiment have stretchability or elasticity in at least

the lateral direction D2. FIG. 6 is a partially enlarged cross-sectional view of the ear hook portion sheet 20. FIG. 6(a) illustrates a state where no external force is applied to the ear hook portion sheet 20 (natural state), and FIG. 6(b) illustrates a state where the ear hook portion sheet 20 is pulled outward in the lateral direction D2.

[0032] As illustrated in FIG. 6, the ear hook portion sheet 20 may be a laminate sheet of a plurality of layers that are laminated on top of one another. In the example of FIG. 6, the ear hook portion sheet 20 includes a stretchable member 5, a first surface material 2, and a second surface material 3. The first surface material 2 is disposed on a first face that is one face of the stretchable member 5 and the second surface material 3 is disposed on a second face that is opposite to the first face. Both the surface materials may be non-stretchable. The stretchable member 5 and the first and second surface materials 2 and 3 are joined together at joined portions 4, 4, ... that are disposed apart from each other. The ear hook portion sheet 20 may be a combination of the stretchable member 5 and a non-stretchable surface material that is disposed only one face of the stretchable member 5. In terms of texture, however, the surface materials are preferably disposed on both the faces. Production of the ear hook portion sheet 20 will be described below in more detail. Briefly, the non-stretchable surface material is disposed on the stretchable member 5 that is stretched, and the non-stretchable surface material and the stretched stretchable member 5 are joined together at joined portions 4, 4, Then, the stretch of the stretchable member 5 is released (the stretchable member 5 is loosened). Therefore, in a state where no external force is applied to the ear hook portion sheet 20, pleats are formed in the surface materials (the first surface material 2 and the second surface material 3) (FIG. 6(a)). Note that, the direction in which the stretchable member 5 is to be stretched may be a direction containing a component in the lateral direction D2 when the stretching force is decomposed, with the lateral direction D2 being preferable.

[0033] The stretchability of the ear hook portion 20a is mainly attributed to the ear hook portion 20a including the stretchable member 5. Note that, "stretchability" of the stretchable member 5 is a property of being stretchable in at least one direction by applying a tensile force and returning to the original length (natural length) by releasing the applied tensile force (in a state where no external force is applied).

[0034] In the example of FIG. 6, as the stretchable member 5, a stretchable film is used. Specifically, the stretchable member 5 is a molded continuous film that has an almost uniform thickness. However, instead of the stretchable film, it may be possible to use: a thread-form stretchable assembly of a plurality of thread-form stretchable bodies (or thread-form elastic bodies) such as rubber threads that are juxtaposed; or a stretchable hot-melt adhesive. The stretchable hot-melt adhesive may be disposed linearly or in plane. Of these, the stretchable film is preferable because the stretchable film

can provide the ear hook member 20 with higher stretchability or extensibility than other stretchable members, such as the string-form stretchable bodies. Also, the stretchable film is easy to handle during production.

[0035] 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 times the natural length thereof in terms of the maximum stretch rate as measured by a tensile tester. Also, the stretchable film may have the function of passing moisture therethrough.

[0036] The surface material (or the first surface material 2 and/or the second surface material 3 when the surface material is provided on both faces of the stretchable member 5) is preferably a fiber assembly. Examples of the fiber assembly include nonwoven fabric, woven fabric, and knit fabric. Of these, the nonwoven fabric is preferable because the nonwoven fabric is favorable in texture and gas permeability and contributes to improvement in feelings during wearing of the mask 1. Examples of the nonwoven fabric include air-through nonwoven fabric, spunbonded nonwoven fabric, spunlace nonwoven fabric, needle-punched nonwoven fabric, and chemical bond nonwoven fabric. Of these, for example, the spunbonded nonwoven fabric, which does not become fluffy and has high strength, and the air-through nonwoven fabric, which is soft, can be appropriately selected. Also, the fiber contained in the nonwoven fabric is preferably a resin fiber. Examples of the resin of the resin fiber include polyethylene, polypropylene, polyethylene terephthalate, and nylon. When the surface material is nonwoven fabric, the basis weight of the nonwoven fabric may be from 5 through 50 g/m², and particularly preferably from 8 through 25 g/m². When the surface material is disposed on both faces of the stretchable member 5, the first surface material 2 and the second surface material 3 may be the same or different.

(Production method for ear hook member, and production apparatus)

[0037] One embodiment of the present invention relates to a method for producing an ear hook member for a mask. The method according to the present embodiment for producing the ear hook member for the mask includes (a) a stretching step of stretching a stretchable member so that tension occurs in a predetermined direction; (b) a disposing step of superposing a non-stretchable surface material on at least one face of the stretchable member, with the tension being maintained; (c) a joining step of joining the stretchable member and the surface material together to obtain a joined body; (d) a loosening step of loosening the joined body in the stretching predetermined direction to reduce the tension and be in a predetermined loose state; and (e) a punching step of punching the joined body in a loose state (the predetermined loose state) into a predetermined shape.

[0038] Also, one embodiment of the present invention

relates to an apparatus for producing an ear hook member for a mask. The apparatus according to the present embodiment for producing the ear hook member for the mask includes (A) stretching means for stretching a stretchable member so that tension occurs in a predetermined direction; (B) laminating means for superposing a non-stretchable surface material on at least one face of the stretchable member, with the tension being maintained; (C) joining means for joining the stretchable member and the surface material together to obtain a joined body; (D) loosening means for loosening the joined body in the stretching predetermined direction to reduce the tension and be in a predetermined loose state; and (E) punching means for punching the joined body in a loose state (the predetermined loose state) into a predetermined shape. The apparatus for producing the ear hook member for the mask may be configured as part of or independently of a mask production apparatus.

[0039] FIG. 7 is a schematic view of a mask production apparatus 300 including an apparatus 100 for producing an ear hook member for a mask, and an apparatus 200 for combining members of a mask. As illustrated in FIG. 7, the apparatus 100 for producing the ear hook member for the mask is disposed upstream in the mask production apparatus 300. The ear hook member for the mask produced by the apparatus 100 for producing the ear hook member for the mask is combined with the other members of the mask in the apparatus 200 for combining the members of the mask, to thereby obtain a mask as a final product.

[0040] The apparatus 100 for producing the ear hook member for the mask may include: stretchable member band supplying means 123 for supplying a stretchable member band 5A that is to be the stretchable member 5 later; first surface material band supplying means 121 for supplying a first surface material band 2A that is to be the first surface material 2 later; and second surface material band supplying means 122 for supplying a second surface material band 3A that is to be the second surface material 3 later. From the supplying means, elongated materials; i.e., the stretchable member band 5A, the first surface material band 2A, and the second surface material band 3A, are supplied to laminating means 130. In the laminating means 130, the first surface material band 2A is superposed on one face (first face) of the stretchable member band 5A and the second surface material band 3A is superposed on the other face (second face), to thereby form a laminated body (multi-layered structure) 6A. The laminated body 6A is conveyed in a conveyance direction Dt.

[0041] Here, the stretchable member band 5A is stretched in the conveyance direction Dt in stretching means 120, and conveyed with the stretchable member band 5A being stretched; i.e., with an external force (tensile force) being applied to the stretchable member band 5A in the conveyance direction Dt. In other words, in the stretchable member band 5A, stress against the external force (tensile stress) occurs. In the present specification,

both the tensile force and the tensile stress may be referred to as tension. As described above, while the stretchable member band 5A maintains a state where a first tension t_1 occurs (stretched state), the first surface material band 2A and the second surface material band 3A (which may be collectively referred to as a surface material band) are laminated on the stretchable member band 5A. Note that, the conveyance direction D_t is a direction corresponding to the lateral direction D_2 of the ear hook member (ear hook portion sheet) 20 to be obtained.

[0042] The first tension t_1 of the stretchable member band 5A, or the degree of stretch of the stretchable member band 5A, is controlled by the feed rate of the stretchable member band supplying means 123 and conveying means (not illustrated). For example, the stretchable member band 5A is preferably stretched so as to be from 1.5 through 4.0 times the natural length, and preferably from about 2.0 through 3.0 times. Meanwhile, the first surface material band 2A and the second surface material band 3A can be conveyed in a state where the bands have a natural length (unstretched state). By adjusting the first tension t_1 or the degree of stretch of the stretchable member band 5A, it is possible to readily change stretch properties of the ear hook member 20 (e.g., the maximum stretch length). Therefore, even without changing the material of the stretchable member 5 or the stretchable member band 5A and the material of the surface material or the surface material band, the ear hook member 20 having different stretch properties can be obtained, and the ear hook member 20 can be produced in accordance with various demands of users.

[0043] The laminated body 6A is conveyed to joining means 140, and the stretchable member band 5A and the first surface material band 2A are joined together and the stretchable member band 5A and the second surface material band 3A are joined together. This joining is performed by forming discontinuous joined portions 4, 4, ... over the entirety of the laminated body 6A. The joining in the joining means 140 is preferably achieved through ultrasonic welding, thermal welding, etc. A plurality of discontinuous joined portions 4, 4, ... can be formed, for example, in dots in the plan view. By joining between the layers of the laminated body 6A in the joining means 140, it is possible to obtain a joined body 8A (FIG. 6(b), and the enlarged view of portion III of FIG. 7).

[0044] The joined body 8A includes joined portions 4, 4, ... at intervals between the stretchable member band 5A and the first surface material band 2A and between the stretchable member band 5A and the second surface material band 3A, in a state where the first tension t_1 in the conveyance direction D_t occurs in the stretchable member band 5A (stretched state in the conveyance direction D_t). Note that, the reference diameter of one jointed portion 4 in the plan view may be from 0.2 through 1.0 mm. Also, the area of the joined portions 4, 4, ... in the plan view may be from 1.8 through 19.1% of the area of the sheet.

[0045] The joined body 8A is conveyed to a subsequent loosening means 160. In the loosening means 160, the tension in the conveyance direction D_t occurring in the stretchable member band 5A is reduced, and the stretchable member band 5A can be a predetermined loose state of having a second tension t_2 that is lower than the initial tension, the first tension t_1 . Here, as long as the second tension t_2 is lower than the first tension t_1 , the second tension t_2 may be any tension, and may be zero ($0 \leq t_2 < t_1$). In other words, the joined body 8A after passage through the loosening means 160 may be in a state where no tension occurs (natural state).

[0046] When the tension occurring in the stretchable member band 5A is reduced, the length of the stretchable member band 5A becomes shorter in the conveyance direction D_t . However, the first surface material band 2A and the second surface material band 3A are non-stretchable, and are just bonded at the joined portions 4, 4, ... that are disposed at intervals. Thus, the portions of the first surface material band 2A and the second surface material band 3A other than the joined portions 4, 4, ... do not follow the stretchable member band 5A, but instead loosen and go up or down from the surface of the stretchable member band 5A. Therefore, in the first surface material band 2A and the second surface material band 3A, an ear hook portion sheet band 20A is formed to extend in a direction orthogonal to the conveyance direction D_t and include a large number of small pleats arranged along the conveyance direction D_t . In other words, each of the first surface material band 2A and the second surface material band 3A disposed on the ear hook portion sheet band 20A includes successive recesses and projections along the conveyance direction D_t (FIG. 6(a), and the enlarged view of portion IV of FIG. 7).

[0047] No particular limitation is imposed on the degree of reduction in the tension by the loosening means 160 (the degree of loose of the joined body 8A) or an adjusting method for the second tension t_2 obtained by the loosening means 160. Examples of the adjusting method available include changing the press force between an upstream roller 161 and/or a downstream roller 162 included in the loosening means 160 that are configured as a roller pair, and changing the friction resistance between the upstream roller 161 and/or the downstream roller 162, and the joined body 8A. Alternatively, it is also possible to adjust the tension to be applied to the joined body 8A, at an upstream position before the joined body 8A enters the loosening means 160. However, in addition to the upstream roller 161 and the downstream roller 162 having main roles in conveyance in the loosening means 160, a tension adjusting member is preferably provided. As illustrated in FIG. 7, the tension adjusting member may be configured as, for example, a tension adjusting roller 165.

[0048] The tension adjusting roller 165 is a member that can change in the position thereof to adjust the distance over which the joined body 8A is conveyed. The

tension adjusting roller 165 may be movable in any direction relative to the conveyance direction Dt (in any direction relative to a plane direction of the joined body 8A). Also, the position of the tension adjusting roller 165 after movement may be fixable with, for example, a bolt. Relative to the other members in the loosening means 160, the tension adjusting roller 165 may be movable up and down (vertically to the plane direction of the joined body 8A) and/or left and right (parallelly to the plane direction of the joined body 8A and vertically to the conveyance direction Dt). Preferably, the tension adjusting roller 165 is movable at least up and down. By moving the tension adjusting roller 165 upward or downward, it is possible to push down or up the joined body 8A, and to readily lengthen or shorten the distance over which the joined body 8A is conveyed in the loosening means 160.

[0049] FIG. 8 is a schematic enlarged view of the loosening means 160 including the tension adjusting roller 165. The tension adjusting roller 165 is disposed between the upstream roller 161 and the downstream roller 162. In the state illustrated in FIG. 8(a), between the upstream roller 161 and the downstream roller 162, the joined body 8A is conveyed in the form of a flat plane (in the form of an almost straight line as viewed laterally). Meanwhile, in the state illustrated in FIG. 8(b), the tension adjusting roller 165 is at a lower position in the drawing. Therefore, between the upstream roller 161 and the downstream roller 162, the conveyance trajectory of the joined body 8A goes downward, and the distance over which the joined body 8A is conveyed becomes longer.

[0050] Conventionally, when the conveyance distance in the loosening means was short, loosening of the stretchable member in the loosening means did not sufficiently progress due to, for example, resistance from the surface material in some cases. Meanwhile, for example, as illustrated in FIG. 8(b), by lengthening the distance over which the joined body 8A is conveyed between the upstream roller 161 and the downstream roller 162, it is possible to ensure a sufficient time for the joined body 8A to loosen, commensurately with the extended distance. This makes it possible for loosening to progress. Also, the loosening step in the loosening means did not progress well in many cases, especially during high-speed operation. However, as in the present embodiment, adjusting the conveyance distance with the tension adjusting member can adjust the degree of progress of loosening. Thus, even when the apparatus is operated at a high speed, it is possible to adjust the tension t_2 after passage through the loosening means 160 to a desired tension (including the case in which $t_2=0$). The length of the conveyance distance that can be increased by the tension adjusting roller 165 can be determined in accordance with a desired loose state by considering, for example, the entire configuration of the loosening means 160 (the configuration of the upstream roller 161 and/or the downstream roller 162), the configuration of the conveying means for conveying the laminated body 6A and

the joined body 8A upstream of the loosening means 160, and the operation speed (the conveyance speed of the joined body 8A).

[0051] As described above, the tension adjusting roller provided in the loosening means 160 can change the position thereof to change the conveyance trajectory of the joined body 8A, and more specifically to change the conveyance trajectory thereof to a direction containing a component vertical to the plane direction of the joined body 8A. This can adjust the conveyance distance. Therefore, even if the area for the loosening means 160 to be placed is not made large (e.g., even without extending the interval between the upstream roller 161 and the downstream roller 162), it is possible, in a compact configuration, to readily change the conveyance distance of the joined body 8A, and hence readily adjust the degree of loosening of the joined body 8A. Then, it is possible to readily adjust the tension applied to the joined body 8A upon discharge from the loosening means 160 (or the tension occurring in the joined body 8A); i.e., the above-described second tension t_2 .

[0052] Note that, two or more of the above-described tension adjusting roller may be provided. Also, the tension adjusting member may be configured as belt conveying means, and operated with the belt face of the belt conveying means being in contact with the joined body 8A. In this case, changing the speed of the belt of the belt conveying means can change the resulting loose state of the joined body 8A. Such belt conveying means is particularly preferable when it is desired that the second tension t_2 be adjusted to zero; i.e., when it is desired that the stretchable member 5 included in the joined body 8A have the natural length. When the conveyance speed of a line is excessively high, the stretchable member 5 may not sufficiently be loosened in the loosening means 160. In this case, by adjusting, for example, the speed of the belt of the belt conveying means and the roughness of the belt face, it is possible to decrease the speed of the joined body 8A in the loosening means 160, and to sufficiently loosen the stretchable member 5. As described above, as in the present embodiment, when the loosening means 160 includes the tension adjusting member, a complicated configuration can be avoided, and the resulting loose state of the joined body 8A can be readily controlled.

[0053] Next, the obtained ear hook portion sheet band 20A (joined body 8A) is punched by punching means 180 into a predetermined shape; i.e., an individual ear hook portion sheet 20. Thereby, it is possible to obtain a plurality of ear hook portion sheets 20, 20, At this time, the ear hook portion sheet band 20A may remain in the predetermined loose state that is achieved in the loosening means 160. Therefore, for example, while maintaining the predetermined loose state achieved in the loosening means 160, the ear hook portion sheet band 20A may be conveyed to the punching means 180 and punched into a predetermined shape. In other words, the ear hook portion sheet band 20A may be punched while

maintaining the second tension t_2 made lower than the first tension t_1 .

[0054] Therefore, for example, in the case in which the second tension t_2 obtained after passage through the loosening means 160 is relatively high; i.e., in which the tension of the ear hook portion sheet band 20A is not considerably reduced, when punching is performed in the resulting loose state and the tension is removed from the ear hook portion sheet 20 after the punching step, the ear hook portion sheet 20 shrinks in the conveyance direction Dt (corresponding to the lateral direction D2 in the mask) and changes the shape and dimensions thereof. As a result, it is possible to obtain the ear hook member 20 having a smaller dimension in at least the lateral direction D2. Meanwhile, for example, in the case in which the second tension t_2 is zero; i.e., in which the ear hook portion sheet band 20A is loosened to a state where no tension is applied thereto (natural state), when punching is performed in the resulting loose state, the shape of the obtained ear hook portion sheet 20 becomes the same or almost the same as that immediately after the punching step. Therefore, by changing the loose state achieved in the loosening means 160, it is possible to produce the ear hook members 20 having different shapes and dimensions and hence different feelings in use, even if the same punching die is used. In other words, it is possible to readily change the design of the ear hook member 20.

[0055] The ear hook portion sheets 20, 20, ... obtained by the punching means 180 is conveyed to the apparatus 200 for combining the members of the mask. In the apparatus 200 for combining the members of the mask, the ear hook portion sheet 20 and the mask body 10 are combined together. Here, production of the mask 1 including auxiliary materials 30 and 30 (FIG. 1 to FIG. 5) will be described.

[0056] First, an auxiliary material band 30A is disposed on one face of the ear hook portion sheet 20 obtained by the apparatus 100 for producing the ear hook member for the mask. Subsequently, the ear hook portion sheet 20 and the auxiliary material band 30A can be joined together through, for example, heat sealing, to thereby form inner joined portions 60 and 60 (e.g., FIG. 1). Moreover, from mask body band supplying means 221, a mask body band 10A that is to be the mask body 10 later is supplied on the opposite side to the side where the auxiliary material band 30A is placed. Then, the auxiliary material band 30A and the mask body band 10A can be joined together through, for example, heat sealing, to thereby form outer joined portions 50 and 50 (e.g., FIG. 1).

[0057] After the ear hook portion sheet 20, the auxiliary material band 30A, and the mask body band 10A are combined together, the combined product can be cut, for example, in a cutting step by cutting means 190, to thereby obtain an individual mask 1. The cutting can also be performed at the same time as the joining between the ear hook portion sheet 20 and the mask body band 10A.

[0058] In the present embodiment, when the ear hook

portion sheet 20 is combined with the mask body band 10A, the ear hook portion sheet 20 can be joined with the mask body band 10A in a state where the tension in the lateral direction D2 occurs in the ear hook portion sheet 20. In order to achieve a state where the tension occurs in the ear hook portion sheet 20, the ear hook portion sheets 20, which are obtained through punching by the punching means 180 of the above-described apparatus 100 for producing the ear hook member for the mask, are respectively fixed at both end portions in the lateral direction D2 (both upstream and downstream in the conveyance direction Dt). Then, the ear hook portion sheets 20 are conveyed while being pulled from both the end portions thereof in the lateral direction D2 so as to become longer in the lateral direction D2. In this state, the ear hook portion sheet 20 can be superposed on and joined with the mask body band 10A (FIG. 7).

[0059] Therefore, for example, while maintaining the second tension t_2 achieved by reducing the tension in the loosening means 160 of the above-described apparatus 100 for producing the ear hook member for the mask, the ear hook portion sheet band 20A can be conveyed, and disposed on and joined with the mask body band 10A. Alternatively, while maintaining a third tension t_3 , occurring in the ear hook portion sheet 20, different from the second tension t_2 ; i.e., higher or lower than the second tension, the ear hook portion sheet 20 may be joined with the mask body band 10A.

[0060] FIG. 9 is a plan view of a mask 1' obtained by joining the ear hook portion sheet 20 with the mask body band 10A, in a state where the tension in the lateral direction D2 occurs in the ear hook portion sheet 20 as described above. FIG. 9(a) illustrates a state where the mask 1' is to be used for the first time. As illustrated in FIG. 9(a), the tension in the lateral direction D2 occurs in the ear hook portion sheet 20 of the mask 1' before the beginning of use. In this state, the separable bond portion 28 is separated at the beginning of use of the mask 1' and the pair of ear hook portions 20a and 20a are separated with the mask being placed on a flat plane. Then, as illustrated in FIG. 9(b), the dimension of the pair of ear hook portions 20a and 20a becomes smaller in the lateral direction D2, and the end portions of the pair of ear hook portions 20a and 20a at a central portion in the lateral direction D2 become apart. As a result, the ear hook portions 20a and 20a having relatively small dimensions as compared to the mask body 10 are formed.

[0061] For example, in the following manner, it is possible to confirm that the tension in the lateral direction D2 occurs in the ear hook member 20 of the mask before the beginning of use. Specifically, the mask is placed on a flat plane. In this state, the total length of the pair of ear hook portions 20a and 20a in the lateral direction D2 before the beginning of use (the length of the ear hook portion sheet 20 in the lateral direction D2) is compared to the total length of the pair of ear hook portions 20a and 20a in the lateral direction D2 after the pair of ear hook portions 20a and 20a are separated at the bond portion

28, to thereby confirm that the latter becomes smaller.

[0062] In the mask 1' as illustrated in FIG. 9, the above-described configuration is suitable for users who want to decrease the dimensions of the ear hook portions 20a and 20a to fit the ear hook portions 20a and 20a to their ears, although it is desired to maintain the dimensions of the mask body 10 to be large. In an attempt to produce a similar mask; i.e., a mask in which the dimension of the ear hook portions 20a and 20a in the lateral direction D2 is made small as compared to the dimension of the mask body 10 in the lateral direction D2, unless the mask production method according to the present embodiment is used, the position of the ear hook portion sheet 20 to be joined with the mask body 10 usually becomes closer to the center in the lateral direction D2. There is possibility that the entirety of the mask body 10 cannot be utilized during wearing of the mask 1'. As an alternative way that does not seek for the configuration of the ear hook portion sheet 20, the pair of ear hook portions 20a and 20a are separated and respectively joined with both the end portions of the mask body 10 in the lateral direction D2. In this case, the production process becomes complicated. Meanwhile, by using the mask production method according to the present embodiment, even if the dimensions of the ear hook portion sheet 20 are changed, a desired configuration can be achieved without or substantially without changing the position at which the ear hook portion sheet 20 and the mask body 10 are to be joined together.

[0063] Note that, the present embodiment can be a mask 1'' not including the auxiliary materials 30 and 30, differing from the mask 1 of FIG. 1. In this case, as illustrated in FIG. 10, it is possible to directly superpose the ear hook portion sheet 20 and the mask body band 10A on top of each other, and join the ear hook portion sheet 20 and the mask body 10 together at both the end portions of the ear hook portion sheet 20 in the lateral direction D2.

[0064] Hereinafter, specific aspects of the present invention will be described.

(Supplementary Note 1)

[0065] An aspect according to Supplementary Note 1 is a method for producing an ear hook member for a mask, the method including: stretching a stretchable member so that tension occurs in a predetermined direction; superposing a non-stretchable surface material on at least one face of the stretchable member, with the tension being maintained; joining the stretchable member and the surface material together to obtain a joined body; loosening the joined body in the predetermined direction to be in a predetermined loose state where the tension is reduced; and punching the joined body in the predetermined loose state into a predetermined shape.

[0066] In the aspect according to the Supplementary Note 1, the material of the ear hook member includes the stretchable member and the non-stretchable surface material on at least one face of the stretchable member. In

the production thereof, the stretchable member is stretched so as to have the tension in the predetermined direction, and with the tension being maintained, the surface material is superposed on and joined with the stretchable member. Therefore, by adjusting the tension occurring in the stretchable member (adjusting the degree of stretch of the stretchable member), it is possible to readily produce ear hook members having different stretch properties (maximum stretch length) without changing the material of the ear hook member; i.e., from the same material.

[0067] Moreover, in the present aspect, the joined body formed of the stretchable member and the surface material is loosened to be in the predetermined loose state, and the joined body in the predetermined loose state is punched into the predetermined shape. Therefore, by adjusting the loose state of the joined body upon punching (adjusting the degree of reduction in the tension of the stretchable member), it is possible to produce ear hook members having different configurations (e.g., shapes, dimensions, and feelings in use) without changing a punching die; i.e., with the same punching die.

(Supplementary Note 2)

[0068] In an aspect according to Supplementary Note 2, in the loosening, the predetermined loose state is adjusted by a tension adjusting member, and the tension adjusting member changes a conveyance trajectory of the joined body to a direction containing a component vertical to a plane direction of the joined body.

[0069] According to the aspect according to the Supplementary Note 2, a complicated procedure can be avoided and the loose state of the tension can be adjusted without any particular step.

(Supplementary Note 3)

[0070] In an aspect according to Supplementary Note 3, the tension adjusting member includes a roller configured to push the joined body down or up.

[0071] According to the aspect according to the Supplementary Note 3, it is possible to readily adjust the loose state of the joined body by a relatively simple member, a roller, serving as the tension adjusting member.

(Supplementary Note 4)

[0072] In an aspect according to Supplementary Note 4, the stretchable member includes a first face and a second face that is opposite to the first face, and the method includes: with the tension being maintained, superposing a first surface material on the first face and superposing a second surface material on the second face, and joining the stretchable member and the first surface material together and joining the stretchable member and the second surface material together.

[0073] According to the aspect according to the Sup-

plementary Note 4, since the surface materials are disposed on both the faces of the stretchable member, it is possible to produce an ear hook member that offers comfortable texture even when either face is touched.

(Supplementary Note 5)

[0074] An aspect according to Supplementary Note 5 is an apparatus for producing an ear hook member for a mask, the apparatus including: stretching means for stretching a stretchable member so that tension occurs in a predetermined direction; laminating means for superposing a non-stretchable surface material on at least one face of the stretchable member, with the tension being maintained; joining means for joining the stretchable member and the surface material together to obtain a joined body; loosening means for loosening the joined body in the predetermined direction to be in a predetermined loose state where the tension is reduced; and punching means for punching the joined body in the predetermined loose state into a predetermined shape.

[0075] According to the aspect according to the Supplementary Note 5, it is possible to obtain an apparatus for producing an ear hook member that exhibits similar effects to those of the aspect according to the Supplementary Note 1.

(Supplementary Note 6)

[0076] In an aspect according to Supplementary Note 6, an ear hook member for a mask is produced by the method for producing the ear hook member for the mask according to any one of claims 1 to 4, the ear hook member for the mask is an ear hook portion sheet including a pair of ear hook portions bonded together in a separable manner at a central portion in a lateral direction, and superposing the ear hook portion sheet on a mask body and joining the ear hook portion sheet with the mask body at both ends of the ear hook portion sheet in the lateral direction are included.

[0077] According to the aspect according to the Supplementary Note 6, it is possible to produce a mask that exhibits similar effects to those of the aspect according to any one of the Supplementary Note 1 to the Supplementary Note 4.

(Supplementary Note 7)

[0078] In an aspect according to Supplementary Note 7, the ear hook portion sheet is joined with the mask body, with tension occurring in the lateral direction.

[0079] According to the aspect according to the Supplementary Note 7, for example, when a mask including a mask body having a relatively large dimension in the lateral direction is produced using an ear hook portion sheet having the same dimension, it is possible to produce such a mask without changing the position at which the ear hook member (ear hook portion sheet) and the

mask body are to be joined together. For example, by joining the ear hook portion sheet with the mask body in a state where the ear hook portion sheet is pulled in the lateral direction in accordance with the dimension of the mask body in the lateral direction, it is possible to respectively join both end portions of the ear hook portion sheet in the lateral direction with both end portions of the mask body in the lateral direction. Also, it can be avoided to change the ear hook member (ear hook portion sheet) to a pair of ear hook portions that are separated from each other.

[0080] When the obtained mask is used, the pair of ear hook portions included in the ear hook portion sheet are separated from each other at a central portion in the lateral direction at the beginning of use. At this time, the tension having occurred in the ear hook member is lost. Thereby, the pair of ear hook members shrink in the lateral direction commensurately with the lost tension, and become apart from each other in the lateral direction. The dimension of the pair of ear hook portions in the lateral direction becomes smaller than that before the beginning of use. Therefore, it is possible to obtain a mask including an ear hook portion having a relatively small dimension in the lateral direction as compared to the dimension of the mask body in the lateral direction.

(Supplementary Note 8)

[0081] An aspect according to Supplementary Note 8 is a mask including: a mask body; and an ear hook portion sheet including a pair of ear hook portions, the pair of ear hook portions being joined with both end portions of the mask body in a lateral direction and being joined together in a separable manner at a central portion in the lateral direction, wherein tension in the lateral direction occurs in the ear hook portion sheet.

[0082] According to the aspect according to the Supplementary Note 8, it is possible to provide a mask that exhibits similar effects to those of the aspect according to the Supplementary Note 7.

(Supplementary Note 9)

[0083] An aspect according to Supplementary Note 9 is a mask including: a mask body; and an ear hook portion sheet including a pair of ear hook portions, the pair of ear hook portions being joined with both end portions of the mask body in a lateral direction and being joined together in a separable manner at a central portion in the lateral direction, wherein in response to the joined pair of ear hook portions being separated with the mask body being placed on a flat plane, separated end portions of the pair of ear hook portions become apart from each other.

[0084] According to the aspect according to the Supplementary Note 9, it is possible to provide a mask that exhibits similar effects to those of the aspect according to the Supplementary Note 7 or the Supplementary Note 8.

[0085] The present application claims priority to Japanese Patent Application No. 2021-26368, filed with the Japan Patent Office on February 22, 2021, the contents of which are incorporated herein by reference in their entirety.

[Description of the Reference Numeral]

[0086]

1 mask
 2 first surface material
 2A first surface material band
 3 second surface material
 3A second surface material band
 4 joined portion
 5 stretchable member (stretchable film)
 5A stretchable member band (stretchable film band)
 6A laminated body
 8A joined body
 10 mask body
 10A mask body band
 15 pleat
 20 ear hook portion sheet (ear hook member)
 20a ear hook portion
 20A ear hook portion sheet band
 28 separable bond portion
 29 opening
 30 auxiliary material
 30A auxiliary material band
 50 outer joined portion
 60 inner joined portion
 100 apparatus for producing an ear hook member for a mask
 121 first surface material band supplying means
 122 second surface material band supplying means
 123 stretchable member band supplying means
 130 laminating means
 140 joining means
 160 loosening means
 161 upstream roller
 162 downstream roller
 165 tension adjusting member (tension adjusting roller)
 180 punching means
 200 apparatus for combining members of a mask
 221 mask body band supplying means
 300 mask production apparatus
 D1 vertical direction of a mask
 D2 lateral direction of a mask
 Dt conveyance direction

Claims

1. A method for producing an ear hook member for a mask, the method comprising:

stretching a stretchable member so that tension occurs in a predetermined direction;
 superposing a non-stretchable surface material on at least one face of the stretchable member, with the tension being maintained;
 joining the stretchable member and the surface material together to obtain a joined body;
 loosening the joined body in the predetermined direction to be in a predetermined loose state where the tension is reduced; and
 punching the joined body in the predetermined loose state into a predetermined shape.

2. The method for producing the ear hook member for the mask according to claim 1, wherein in the loosening, the predetermined loose state is adjusted by a tension adjusting member, and the tension adjusting member changes a conveyance trajectory of the joined body to a direction containing a component vertical to a plane direction of the joined body.

3. The method for producing the ear hook member for the mask according to claim 2, wherein the tension adjusting member includes a roller configured to push the joined body down or up.

4. The method for producing the ear hook member for the mask according to any one of claims 1 to 3, wherein:

the stretchable member includes a first face and a second face that is opposite to the first face; and
 the method includes
 with the tension being maintained, superposing a first surface material on the first face and superposing a second surface material on the second face, and joining the stretchable member and the first surface material together and joining the stretchable member and the second surface material together.

5. An apparatus for producing an ear hook member for a mask, the apparatus comprising:

stretching means for stretching a stretchable member so that tension occurs in a predetermined direction;
 laminating means for superposing a non-stretchable surface material on at least one face of the stretchable member, with the tension being maintained;
 joining means for joining the stretchable member and the surface material together to obtain a joined body;
 loosening means for loosening the joined body in the predetermined direction to be in a predetermined loose state where the tension is re-

duced; and
 punching means for punching the joined body
 in the predetermined loose state into a prede-
 termined shape.

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- 6. A method for producing a mask, the method comprising:

producing an ear hook member for the mask by
 the method for producing the ear hook member
 for the mask according to any one of claims 1
 to 4, where the ear hook member for the mask
 is an ear hook portion sheet including a pair of
 ear hook portions bonded together in a separa-
 ble manner at a central portion in a lateral direc-
 tion; and
 superposing the ear hook portion sheet on a
 mask body and joining the ear hook portion
 sheet with the mask body at both ends of the
 ear hook portion sheet in the lateral direction.

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- 7. The method for producing the mask according to claim 6, wherein the ear hook portion sheet is joined with the mask body, with tension occurring in the lateral direction.

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- 8. A mask, comprising:

a mask body; and
 an ear hook portion sheet including a pair of ear
 hook portions, the pair of ear hook portions being
 joined with both end portions of the mask body
 in a lateral direction and being joined together
 in a separable manner at a central portion in the
 lateral direction,
 wherein tension in the lateral direction occurs in
 the ear hook portion sheet.

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- 9. A mask, comprising:

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a mask body; and
 an ear hook portion sheet including a pair of ear
 hook portions, the pair of ear hook portions being
 joined with both end portions of the mask body
 in a lateral direction and being joined together
 in a separable manner at a central portion in the
 lateral direction,
 wherein in response to the joined pair of ear hook
 portions being separated with the mask body
 being placed on a flat plane, separated end por-
 tions of the pair of ear hook portions become
 apart from each other.

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FIG.2

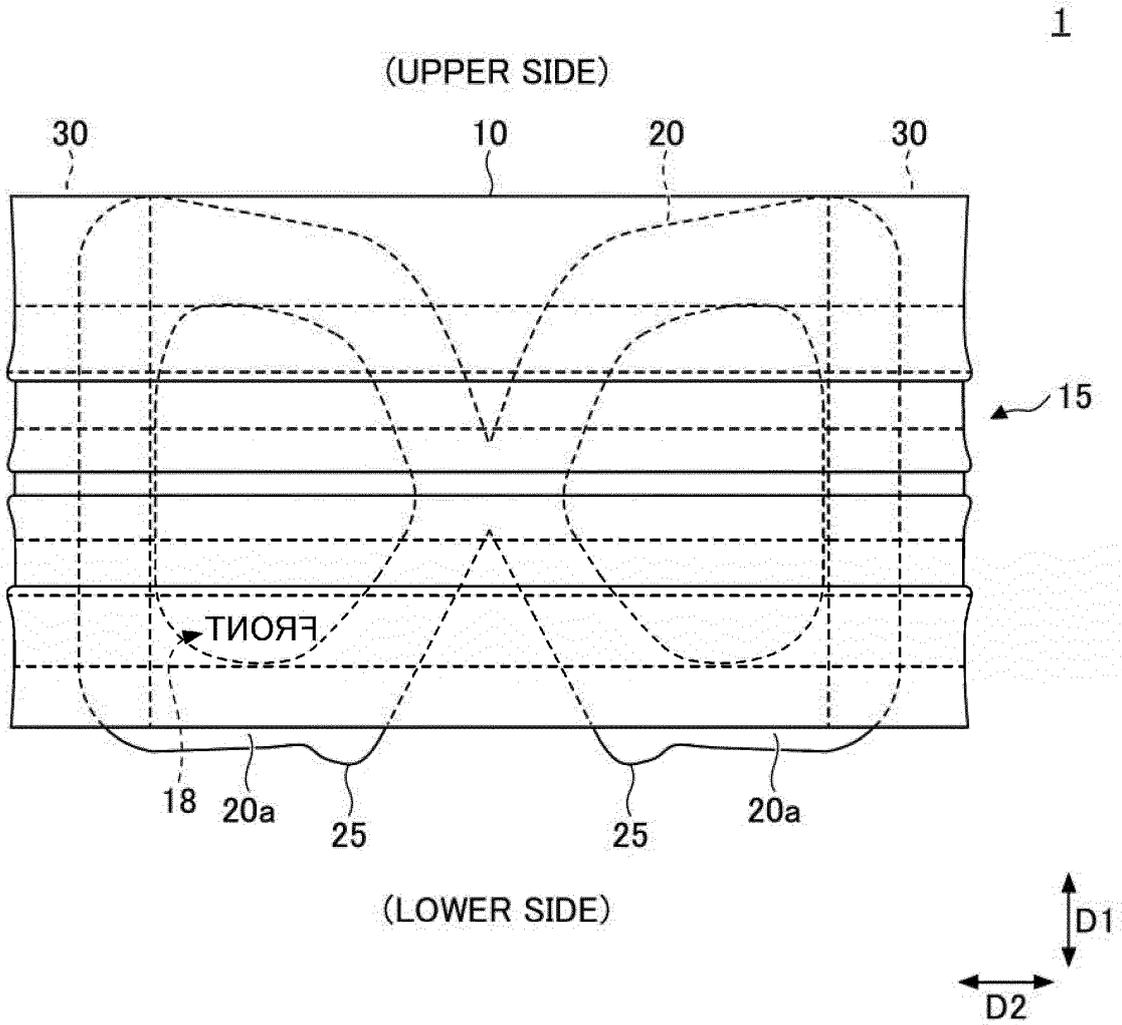


FIG.3

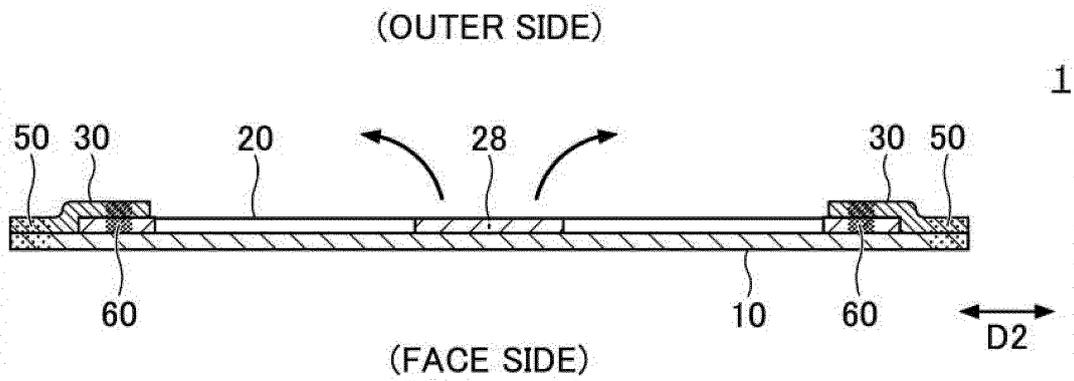
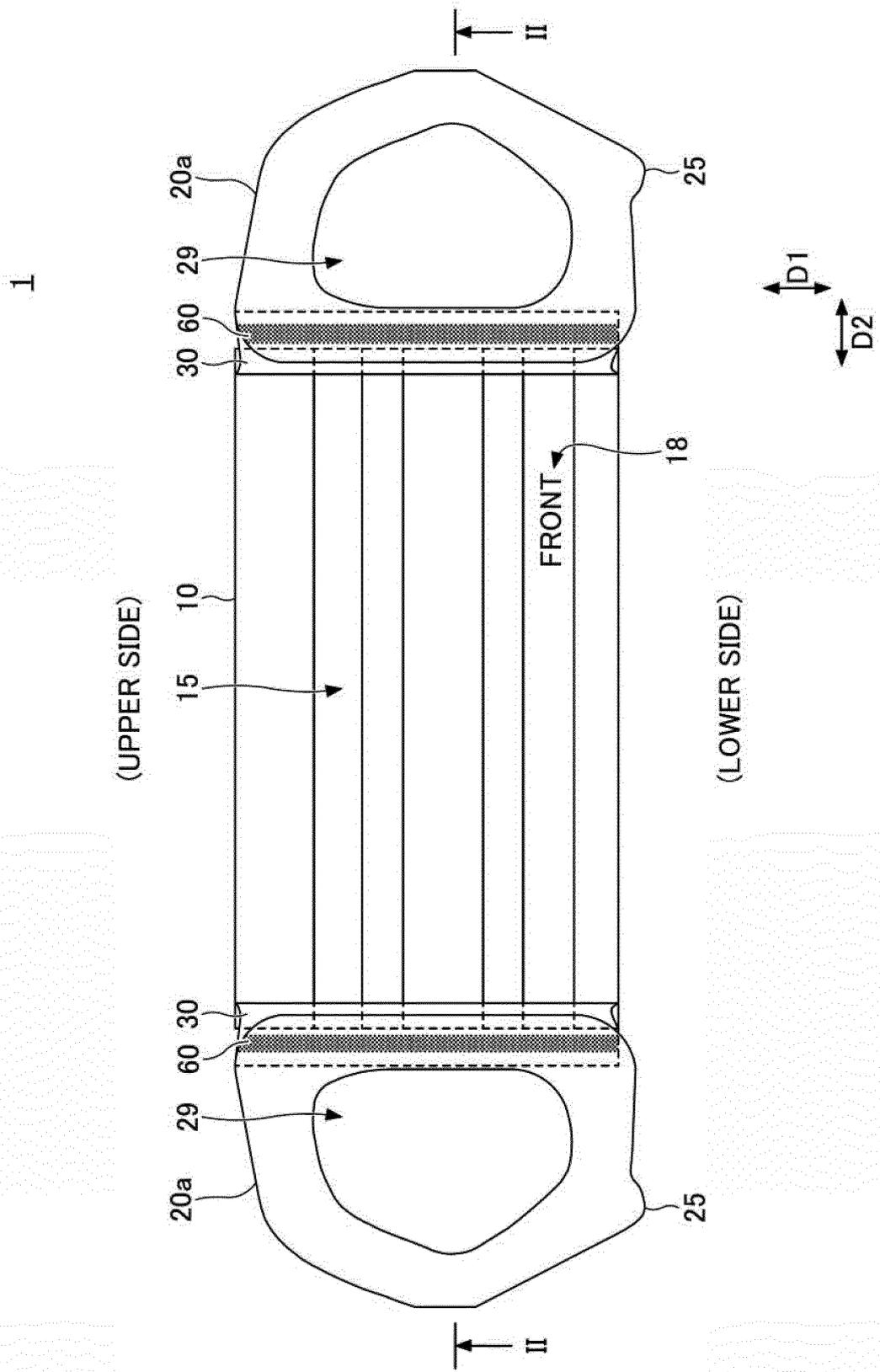


FIG.4



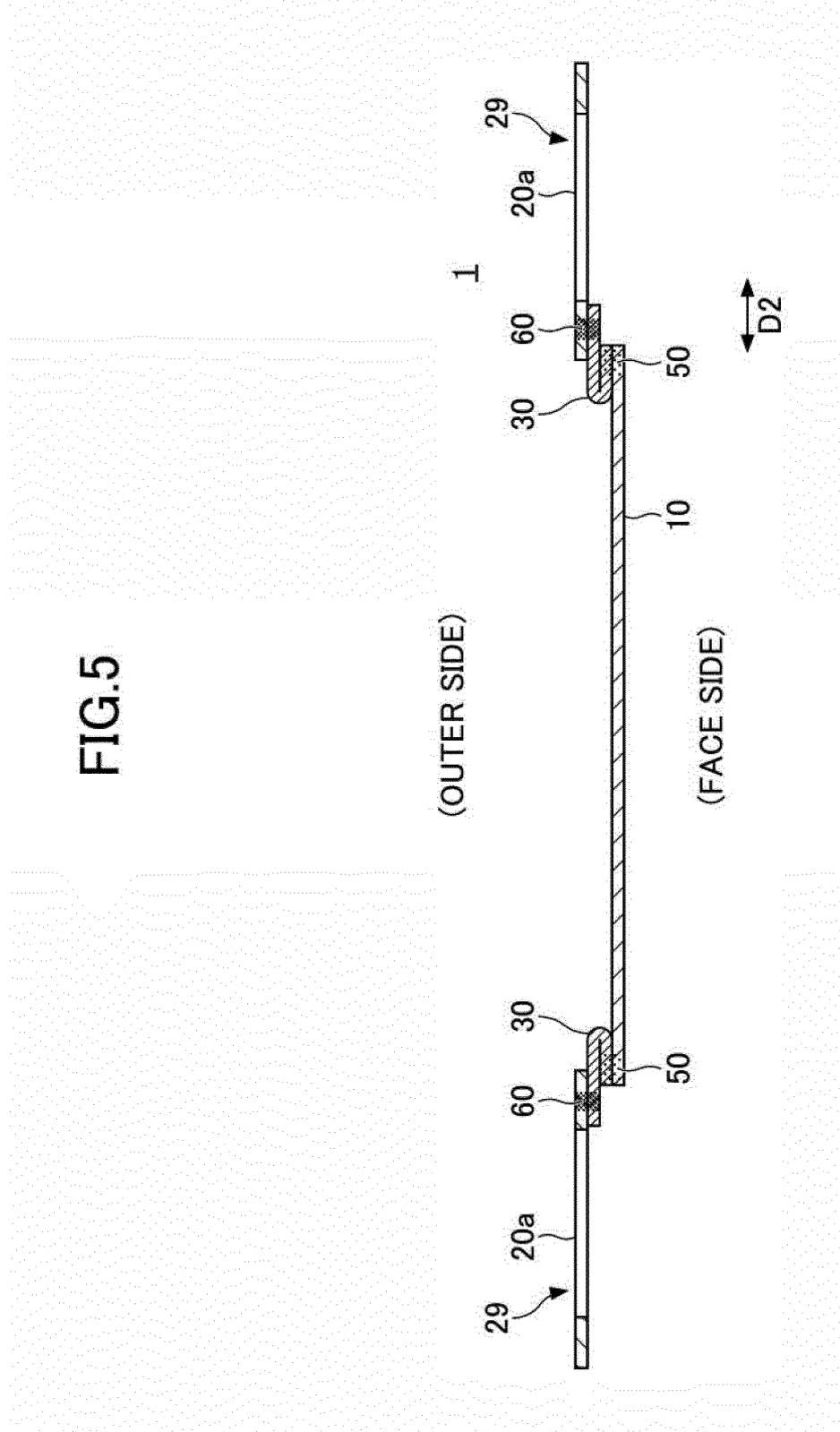
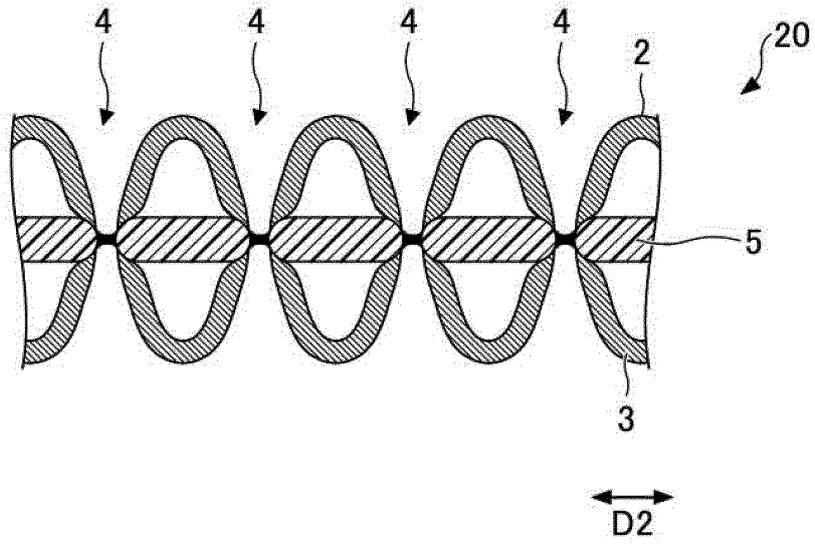


FIG.6

(a)



(b)

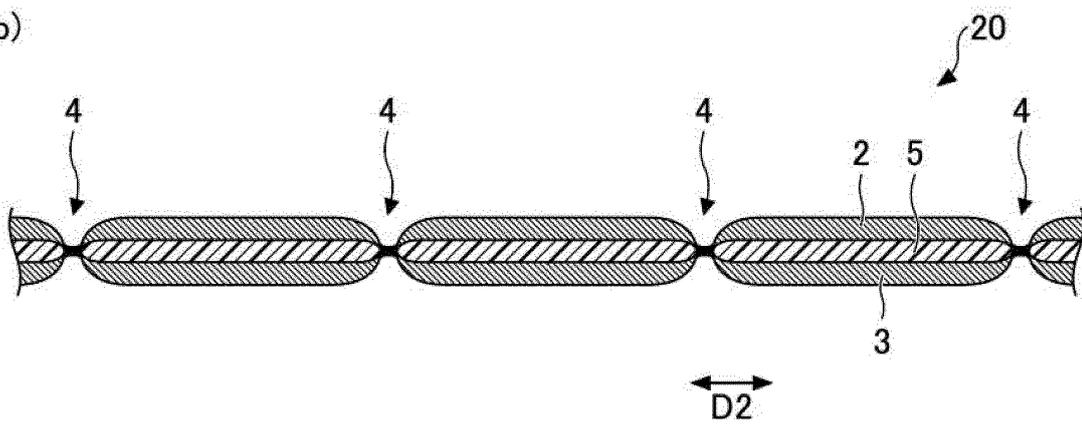


FIG. 7

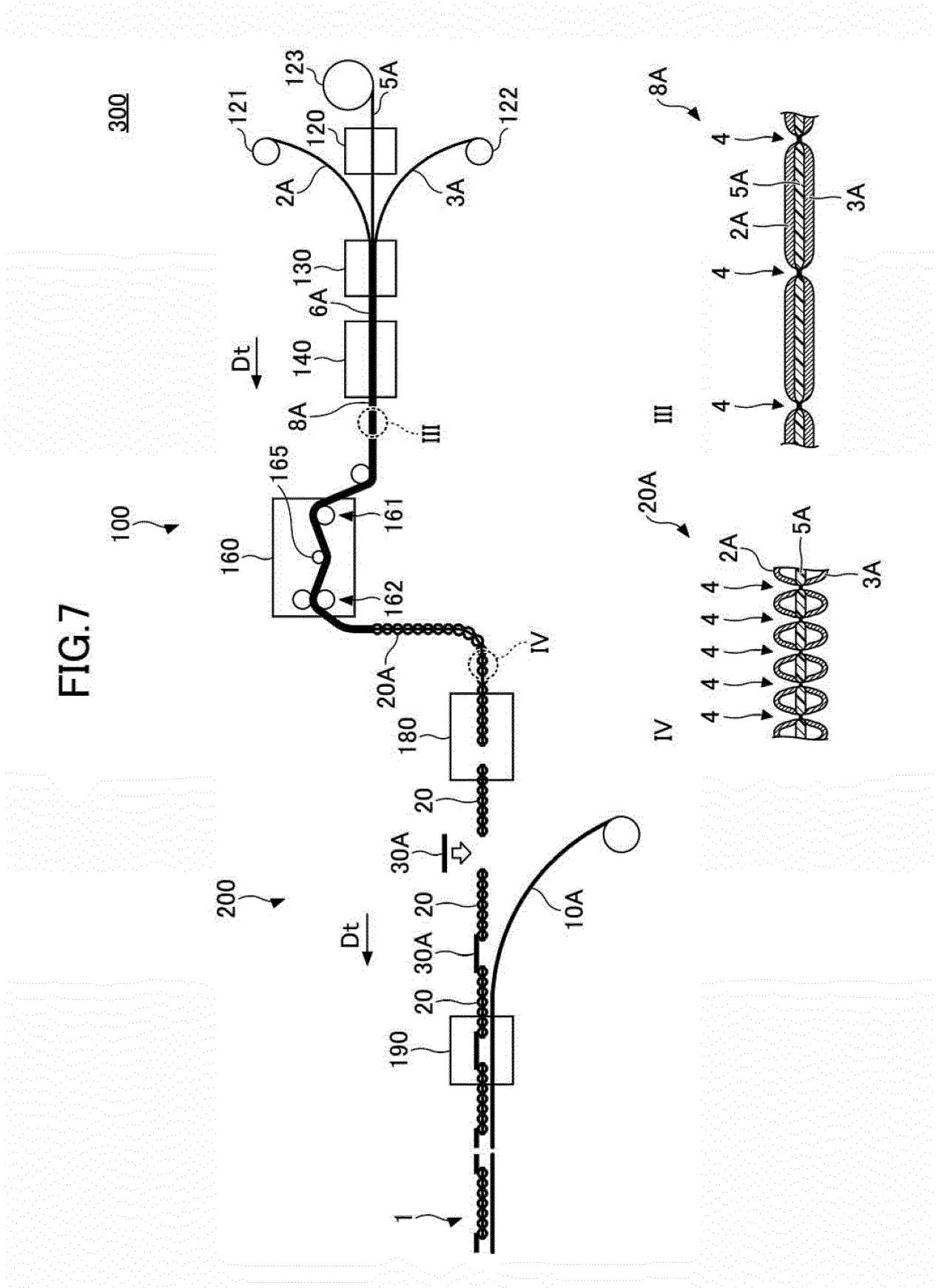


FIG.8

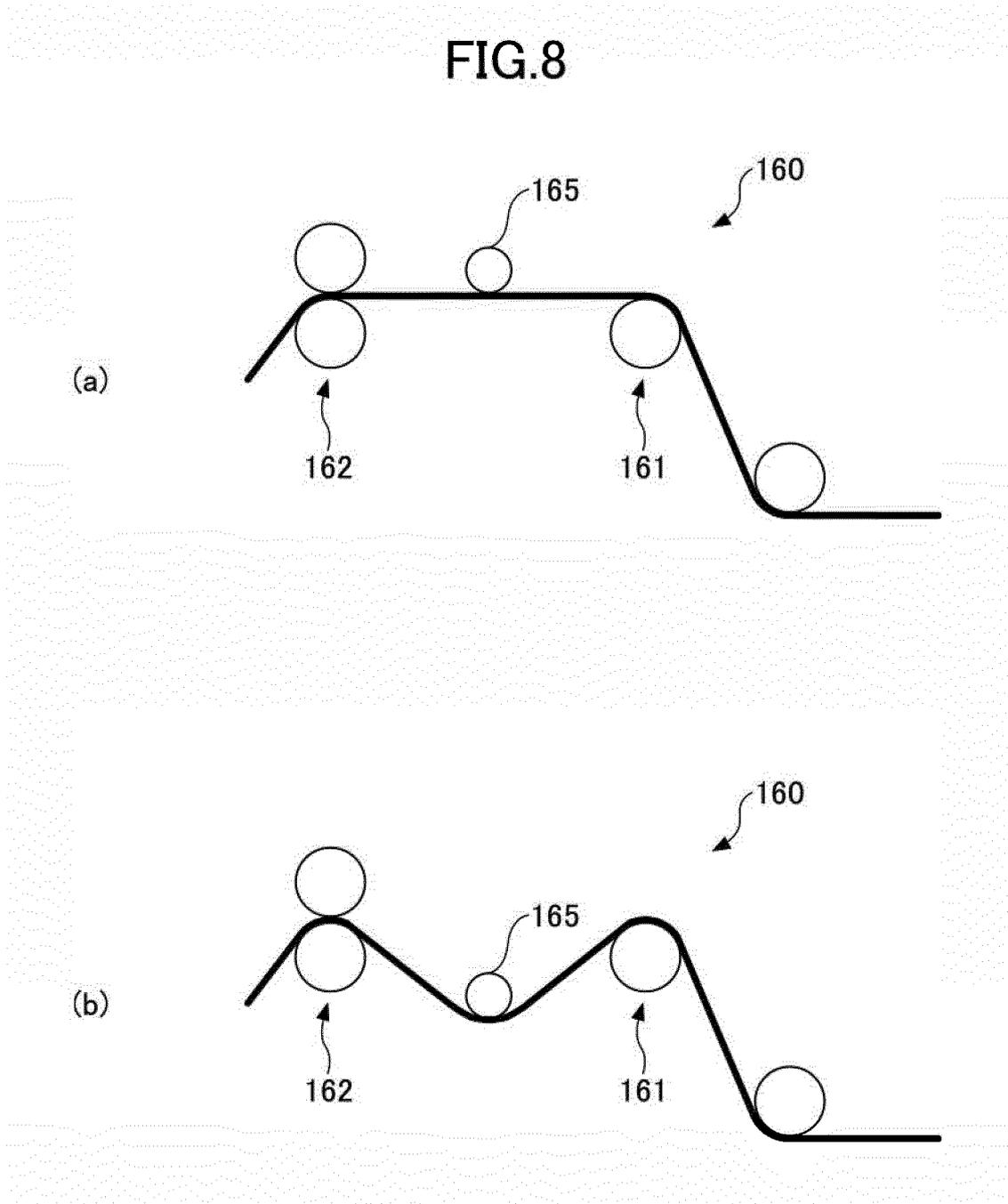
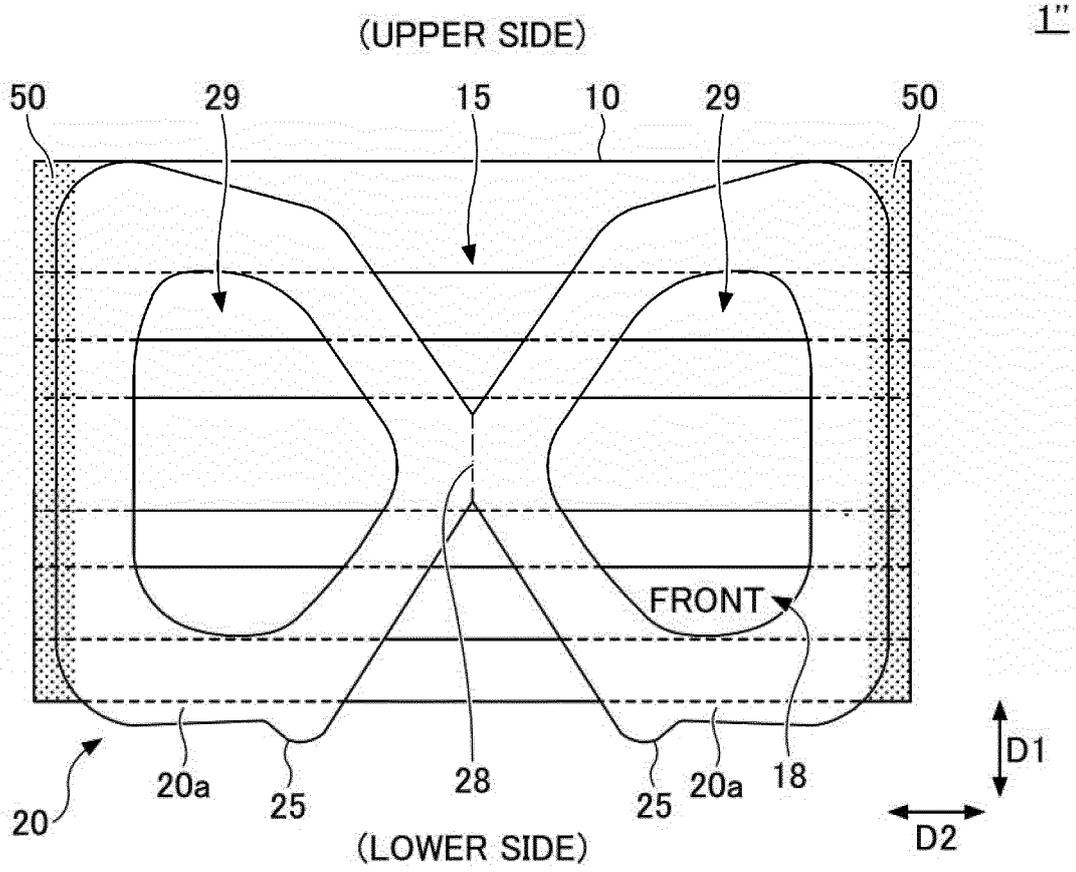


FIG.10



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2022/000119

5	A. CLASSIFICATION OF SUBJECT MATTER <i>A62B 18/02</i> (2006.01)i; <i>A41D 13/11</i> (2006.01)i FI: A41D13/11 H; A62B18/02 C According to International Patent Classification (IPC) or to both national classification and IPC																
10	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)																
15	C. DOCUMENTS CONSIDERED TO BE RELEVANT																
20	<table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>Y A</td> <td>KR 20-0492367 Y1 (JL, Han-Joon) 24 September 2020 (2020-09-24) paragraphs [0034], [0041]-[0052], fig. 2-5</td> <td>1, 4-7 2-3, 8-9</td> </tr> <tr> <td>Y A</td> <td>JP 2005-80859 A (KAO CORP) 31 March 2005 (2005-03-31) paragraphs [0028]-[0031], fig. 1-2</td> <td>1, 4-7 2-3, 8-9</td> </tr> <tr> <td>Y A</td> <td>JP 5762803 B2 (UNICHARM CORP) 12 August 2015 (2015-08-12) paragraphs [0024]-[0025], [0042]-[0054], fig. 2, 10-13</td> <td>1, 4-7 2-3, 8-9</td> </tr> <tr> <td>X Y A</td> <td>JP 3213582 U (TAIWAN COMFORT CHAMP MANUFACTURING CO LTD) 16 November 2017 (2017-11-16) paragraphs [0008]-[0019], fig. 1-8</td> <td>8-9 7 1-6</td> </tr> </tbody> </table>		Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	Y A	KR 20-0492367 Y1 (JL, Han-Joon) 24 September 2020 (2020-09-24) paragraphs [0034], [0041]-[0052], fig. 2-5	1, 4-7 2-3, 8-9	Y A	JP 2005-80859 A (KAO CORP) 31 March 2005 (2005-03-31) paragraphs [0028]-[0031], fig. 1-2	1, 4-7 2-3, 8-9	Y A	JP 5762803 B2 (UNICHARM CORP) 12 August 2015 (2015-08-12) paragraphs [0024]-[0025], [0042]-[0054], fig. 2, 10-13	1, 4-7 2-3, 8-9	X Y A	JP 3213582 U (TAIWAN COMFORT CHAMP MANUFACTURING CO LTD) 16 November 2017 (2017-11-16) paragraphs [0008]-[0019], fig. 1-8	8-9 7 1-6
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25	<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.																
30	<table border="0"> <tr> <td style="vertical-align: top;">40</td> <td>* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed</td> <td style="vertical-align: top;">45</td> <td>"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 "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family</td> </tr> </table>		40	* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed	45	"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 "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family											
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50	Date of the actual completion of the international search 25 February 2022	Date of mailing of the international search report 15 March 2022															
55	Name and mailing address of the ISA/JP Japan Patent Office (ISA/JP) 3-4-3 Kasumigaseki, Chiyoda-ku, Tokyo 100-8915 Japan	Authorized officer Telephone No.															

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/JP2022/000119

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REFERENCES CITED IN THE DESCRIPTION

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