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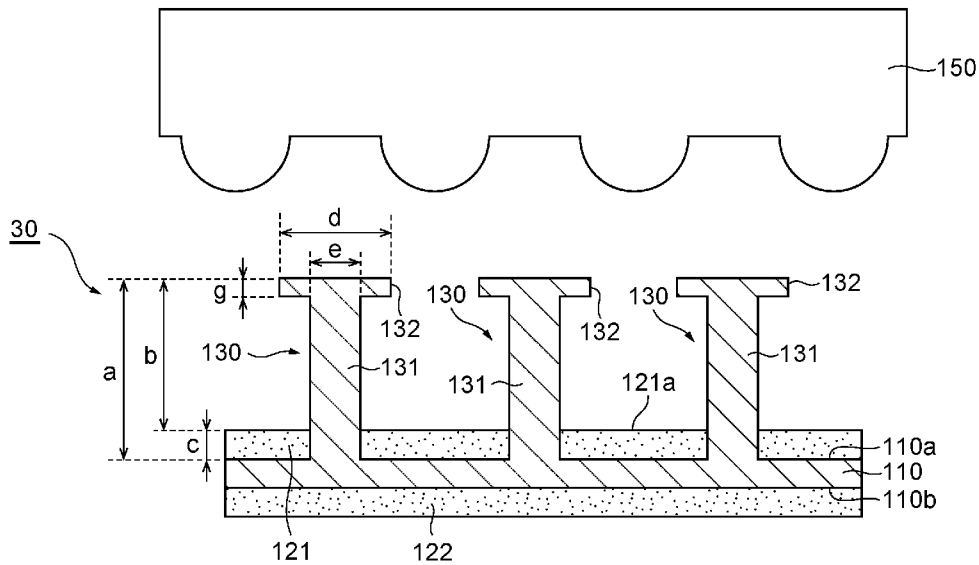


Fig. 4

(57) Abstract: A hook member 30 couples with a target object 150 by superposing a surface 110a side on which an adhesive layer 121 and projections 130 are formed with the target object 150 (back sheet 11 of a diaper 1). In a state in which the hook member 30 and the target object 150 are coupled, the adhesive layer 121 adheres to the target object 150, and a portion of a column section 131 and the engaging part 132 of the projection 130 penetrate into a gap of the target object. Here, a dimension b in the Z-axis direction between the tip end of the projection 130 and a surface 121a of the adhesive layer 121 is from 0.1 to 0.5 mm. By setting the projection 130 to this type of dimension, the projection 130 can engage with the target object 150 with sufficient engaging force even without interposing a loop member.



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## HOOK MEMBER AND ABSORBENT ARTICLE

### TECHNICAL FIELD

The present invention relates to a hook member and an absorbent article.

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### BACKGROUND ART

Conventionally, a hook for coupling a target object is used by superposing with the target object. The hook described in Patent Document 1 has a sheet base material on which an adhesive layer is formed. A plurality of projections projecting from the surface of the adhesive layer is formed on the sheet base material. The projections have, at a tip end of a column section, an engaging part extending in a direction orthogonal to a direction of extension of the column section. The hook engages with a target object at the engaging parts of the projections, and adheres to the target object through the adhesive layer to thereby couple with the target object.

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### CITATION LIST

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### SUMMARY OF INVENTION

Here, when the hook member couples with the target object, in some cases a loop member is provided on the surface of the target object. For example, a loop member may be provided on a back sheet of a diaper, and the hook member is then coupled to the loop member when a user puts on the diaper. In contrast thereto, in some cases it is required that the loop member of the target object be omitted, and the hook member be directly coupled to a member configuring the target object. In this case, for example, the hook member is coupled directly to a nonwoven fabric configuring a back sheet of a diaper. However, with the above-described invention of Patent Document 1, sufficient consideration was not given to the engaging force for a case in which the hook member is coupled directly to a back sheet or the like. Therefore, a demand exists for a hook member and absorbent article for which sufficient engaging force can be obtained when directly engaging the hook member to a member configuring a target object (also called hook to back sheet) without interposing a loop member.

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## SOLUTION TO PROBLEM

A hook member according to one aspect of the present invention couples with a target object by being superposed with the target object, the hook member including: a sheet base material having a pair of opposing surfaces; and an adhesive layer formed on at least one surface of the sheet base material; wherein a plurality of projections is formed on the sheet base material, the projections projecting from the one surface in a first direction intersecting the one surface, and being arranged mutually separated in a second direction in which the one surface expands; each of the projections includes: a column section extending in the first direction from the one surface, and projecting from a surface of the adhesive layer; and an engaging part projecting in the second direction from a tip end of the column section; and a dimension in the first direction between the tip end of the projection and the surface of the adhesive layer is from 0.1 to 0.5 mm.

The hook member according to one aspect couples with a target object by superposing the one surface side on which the adhesive layer and the projections are formed with the target object. In a state in which the hook member and the target object are coupled, the adhesive layer adheres to the target object, and a portion of the column section and the engaging part of the projection penetrate into a gap of the target object (stitching, threads or fibers and the like of the nonwoven fabric of the diaper). Here, a dimension in the first direction between the tip end of the projection and the surface of the adhesive layer is from 0.1 to 0.5 mm. By setting the projection to this type of dimension, the projections can engage with the target object with sufficient engaging force even without interposing a loop member. Through the above, sufficient engaging force can be obtained when directly coupling the hook member to a member configuring a target object.

With a hook member according to one aspect, the thickness of the adhesive layer may be 0.3 mm or less.

With a hook member according one aspect, a dimension in the first direction between the tip end of the projection and the one surface may be from 0.1 to 0.8 mm.

An absorbent article according to one aspect of the present invention includes: a back sheet, and a coupling part which couples with the back sheet by being superposed with the back sheet; wherein a hook member which couples directly with a member configuring the back sheet is provided at the coupling part; the hook member includes: a

sheet base material having a pair of opposing surfaces; and an adhesive layer formed on at least one surface of the sheet base material; a plurality of projections is formed on the sheet base material, the projections projecting from the one surface in a first direction intersecting the one surface, and being arranged mutually separated in a second direction  
5 in which the one surface expands; each of the projections includes: a column section extending in the first direction from the one surface, and projecting from a surface of the adhesive layer; and an engaging part projecting in the second direction from a tip end of the column section; and a dimension in the first direction between the tip end of the projection and the surface of the adhesive layer is from 0.1 to 0.5 mm.

10 According to the absorbent article of one aspect, an action and effect of the same intent as that of the above-described hook member can be obtained.

With an absorbent article according to one aspect, the thickness of the adhesive layer may be 0.3 mm or less.

15 With an absorbent article according one aspect, a dimension in the first direction between the tip end of the projection and the one surface may be from 0.1 to 0.8 mm.

### **ADVANTAGEOUS EFFECTS OF INVENTION**

According to one aspect of the present invention, a hook member and an absorbent article for which sufficient engaging force can be obtained when directly coupling the hook  
20 member to a member configuring a target object without interposing a loop member are provided.

### **BRIEF DESCRIPTION OF DRAWINGS**

FIG. 1 is a schematic view illustrating a diaper including a hook member according  
25 to one embodiment, in a state in which fasteners (engagements between the hook member and the back sheet) are opened.

FIG. 2 is a schematic view illustrating the diaper including a hook member according to one embodiment, in a state in which the fasteners are closed.

30 FIG. 3 is an enlarged perspective view of a portion of the hook member according to one embodiment.

FIG. 4 is a cross-sectional view illustrating a portion of the hook member according to one embodiment.

FIG. 5 is a table showing measurement results for examples and comparative examples.

FIG. 6 is a table showing measurement results for examples and comparative examples.

5 FIG. 7 is a picture of an absorbent pad with hook member according to one embodiment.

### DESCRIPTION OF EMBODIMENTS

Hereinafter, various embodiments of the present invention will be described in  
10 detail with reference to the attached drawings. Note that the same reference sign is assigned to same or corresponding portions in each of the drawings.

In the present embodiment, the absorbent article illustrated in FIGS. 1 and 2 is described. Note that in FIGS. 1 and 2, an open-type diaper is given as an example of an absorbent article, however; the absorbent article including a coupling part is not limited to  
15 the diapers illustrated in FIGS. 1 and 2. Other examples can include diapers of other configurations such as underpants type diapers, or pad type diapers, and sanitary napkins, sanitary napkins integrated in underwear, and other menstrual and sanitary absorbent articles.

A diaper 1 includes a sheet-shaped body portion 10 for covering a crotch part of a  
20 wearer from the abdominal side to the back side. In the present specification, the surface of the diaper 1 on the wearer's side is referred to as the 'inner surface', and the surface on the opposing side thereof is referred to as the 'outer surface'.

The body portion 10 includes a back sheet 11, a liquid permeable top sheet 12 laminated to the inner side of the back sheet 11, and a liquid absorbent polymer absorbent  
25 body 13 contained between the back sheet 11 and the top sheet 12. The back sheet 11 is typically configured from a laminate of a liquid impermeable film with a nonwoven fabric layer, and the liquid impermeable film is present on the polymer absorbent body 13 side, while the nonwoven fabric layer is present on the outer surface side of the body of the diaper 1. In other words, when the diaper 1 is worn, the top sheet 12 is disposed on the  
30 inner surface side of the body of the diaper 1 adjacent to the skin of the wearer or at a side close to the skin of the wearer, while the back sheet 11 (the nonwoven layer thereof) is disposed on the outer surface side of the body of the diaper 1 adjacent to the clothing or

the like of the wearer, or at a side close to the clothing and the like of the wearer. Here, as the nonwoven fabric layer used in the back sheet 11, a polyolefin, PET or other such nonwoven fabric produced by a spunbonding process or the like, and having a mass from 15 to 40 g/m<sup>2</sup>, and preferably from 25 to 35 g/m<sup>2</sup>, and a fiber density in a range from 0.06 to 0.1 g/cm<sup>3</sup>, and preferably from 0.07 to 0.09 g/cm<sup>3</sup> can be used, for example. In this case, the nonwoven fabric layer thereof can be used in fixing to the coupling part.

An abdominal side end part 10a includes an abdominal side side panel 16 extending along the width direction (transverse direction when worn) of the body portion 10. A back side end part 10b includes a back side side panel 17 extending along the width direction (transverse direction when worn) of the body portion 10. As illustrated in several of the drawings of the present specification, a wrap-around direction of the two types of side panels 16, and 17 is denoted by the reference sign L, and the direction that is orthogonal to the wrap-around direction L thereof is defined as the width direction W. The wrap-around direction L is synonymous with the projecting direction of the side panels 16, and 17.

A loop material or the like is not provided at the outer surface of the abdominal side end part 10a of the body portion 10, and the back sheet 11 is exposed. That is, the back sheet 11 configured of a nonwoven fabric or the like for which the hook can engage with the fibers is exposed at the position thereof.

A pair of coupling parts 20 that removably couple the abdominal side end part 10a and the back side end part 10b of the body portion 10 at the right and left of the waist of the wearer is provided at end parts of the back side side panel 17 in the wrap-around direction L through adhesion, sewing, welding, or the like. The coupling part 20 includes a base material 21, and a hook member 30 provided on the base material 21. The hook member 30 directly couples with a member configuring the back sheet 11. The hook member 30 is configured as a surface fastener. A surface fastener is a fastener that can be attached and detached at an optional range of a surface.

The base material 21 projects to the outside from the back side end part 10b along the width direction of the body portion 10, and when the diaper is worn, the base material 21 is the part that wraps around and couples with the abdominal side end part 10a. The base material 21 is flexible. In the present embodiment, the base material 21 assumes a shape that gradually narrows in the projection direction (wrap-around direction), but the

shape of the base material 21 is not limited thereto. For example, the base material 21 may be a rectangular shape, or at least a part of the outer edges of the base material 21 may be arc shaped.

5 The material of the base material 21 is appropriately selected from the perspective of flexibility of the base material 21 with respect to the area in which the coupling part is to be applied. For example, the base material 21 may be fabricated from a woven fabric, a nonwoven fabric, a plastic film, or a mixture thereof.

10 The hook member 30 is attached to the inner surface of the base material 21 through adhesion, sewing, welding, or the like. As illustrated in FIG. 1, in the present embodiment, the tip end of the base material 21 is not covered by the hook member 30, and the tip end thereof functions as a grip part 21a that can be easily gripped even when the hook member 30 is connected to the back sheet 11. The hook member 30 may be reasonably present to the tip end of the base material 21. In addition, the hook member 30 may cover the entire inner surface of the base material 21.

15 Next, the structure of the hook member 30 is described with reference to FIGS. 3 and 4. FIG. 3 is a perspective view illustrating a portion of the hook member 30 according to one embodiment. In addition, FIG. 4 is a cross-sectional view illustrating a portion of the hook member 30 according to one embodiment. Note that for the purpose of facilitating the explanation, an XYZ Cartesian coordinate system is also illustrated in  
20 FIGS. 3 and 4.

The hook member 30 couples with a target object 150 such as the above-described back sheet 11 by superposing with the target object 150. Through this, the hook member 30 can directly couple with the exposed back sheet 11 without providing a loop member or the like for the back sheet 11.

25 As illustrated in FIGS. 3 and 4, the hook member 30 includes a sheet base material 110, an adhesive layer 120, and a plurality of projections 130. In the present embodiment, the direction in which the projections 130 project is set as the Z-axis direction (first direction). In addition, a direction orthogonal to the Z-axis direction is set as the X-axis direction, and a direction orthogonal to the Z-axis direction and the X-axis direction is set  
30 as the Y-axis direction.

The sheet base material 110 assumes a roughly sheet shape, and has a first surface 110a and a second surface 110b mutually opposing in the Z-axis direction. This sheet base

material 110 extends in the planar direction of the X and Y axes (second direction). That is, the first surface 110a and the second surface 110b extend in the planar direction of the X and Y axes. Of these, a plurality of projections 130 are formed on the first surface 110a. The sheet base material 110 is formed, for example, from poly(ethylene terephthalate),  
5 nylon and other such polyamides, poly(styrene-acrylonitrile), poly(acrylonitrile-butadiene-styrene), polypropylene and other such polyolefins, plasticized vinyl chloride, polyesters and other such resin materials. The thickness of the sheet base material 110 is from 20  $\mu\text{m}$  to 500  $\mu\text{m}$ , or from 20  $\mu\text{m}$  to around 150  $\mu\text{m}$ .

An adhesive layer 121 is formed on the first surface 110a. A bonding layer 122 is  
10 formed on the second surface 110b. The adhesive layer 121 is provided so as to fill between the plurality of projections 130. The adhesive layer 121 and the bonding layer 122 are formed so as to cover roughly the entire surfaces of the surfaces 110a and 110b (excluding of course, the positions of the projections 130). Note that the adhesive layer 121 and the bonding layer 122 may be of different types of adhesives, and in some cases,  
15 the bonding layer 122 may be excluded. For example, the second surface 110b may be bonded to another member through fusing using ultrasonic waves or heat without the use of an adhesive. Moreover, a pressure-sensitive adhesive may be adhered to a side surface or top surface of the projections 130 depending on the production process and storage conditions. As the material of the adhesive layer 121, natural rubber/resin-based materials,  
20 synthetic rubber/resin-based materials, acrylate-based materials, silicone-based materials, or the like can be used.

The projections 130 project in the Z-axis direction (first direction) from the first surface 110a of the sheet base material 110. In addition, the projections 130 are arranged separated from each other in the XY plane direction (second direction) in which the first  
25 surface 110a extends. Note that the arrangement is not limited to a right angle lattice shape in the XY direction, and can be various arrangements such as, for example, an oblique lattice shape, a staggered shape, or a random shape in the XY direction. Poly(ethylene terephthalate), nylon, and other such polyamides, poly(styrene-acrylonitrile), poly(acrylonitrile-butadiene-styrene), polypropylene, and other such polyolefins,  
30 plasticized vinyl chloride, polyesters and the like can be used as the material of the projections 130. Note that the projections 130 may be configured of the same material as that of the sheet base material 110 or of a different material, and may be integrally formed

with the sheet base material 110. In addition, the density at which the projections 130 are arranged can be set, for example, to around a quantity from 500 to 5000, or from 800 to 4000 per square inch (25.4 mm by 25.4 mm).

5 The projections 130 project further to a front side in the Z-axis direction than a surface 121a of the front side in the Z-axis direction of the adhesive layer 121. Each projection 130 includes a column section 131 and an engaging part 132. The column section 131 is a portion which extends in the Z-axis direction from the sheet base material 110 and projects from the surface 121a of the adhesive layer 121. The shape of the column section 131 is not particularly limited, and may be formed in a cylindrical shape. The  
10 engaging part 132 is a portion which projects in the XY plane direction from a tip end 131a of the column section 131, and is inserted into the target object 150. Note that the shapes of the column section 131 and the engaging part 132 may be the same for all of the projections 130 in the hook member 30 (variation within a scope of manufacturing error is allowed), or the shapes may differ between some areas and other areas.

15 Next, the dimensional relationship of the hook member 30 is described with reference to FIG. 4. As illustrated in FIG. 4, a dimension a in the Z-axis direction between the tip end of the projection 130 and the first surface 110a may be from 0.1 to 0.8 mm. The dimension a is set to least 0.1 mm from the perspective of ensuring the engaging force. Furthermore, the dimension a is set to not greater than 0.8 mm from the perspective  
20 of suppressing a sense of discomfort (pain for example) when the hook member contacts a finger or the like.

A dimension b in the Z-axis direction between the tip end of the projection 130 and the surface 121a of the adhesive layer 121 may be from 0.1 to 0.5 mm. By setting the dimension b to 0.1 mm or greater, engaging with the target object 150 is better facilitated,  
25 and the function as a hook can be sufficiently exhibited. By setting the dimension b to 0.5 mm or less, the adhesive layer 121 and the target object 150 abut and are joined through the projections 130, and sufficient engaging force can be obtained.

A thickness dimension c of the adhesive layer 121 may be 0.3 mm or less. The dimension c is set to 0.3 mm or less to obtain balance between the perspectives with  
30 respect to the dimension a and the dimension b. The dimension c may be 5  $\mu\text{m}$  or greater. One reason for setting the dimension c to 5  $\mu\text{m}$  or greater is that such a dimension is a

thickness that makes it possible to exhibit the properties of the adhesive layer 121, and such a thickness provides manufacturing stability.

A dimension  $d$  of an outer diameter of the engaging part 132 of the protrusion 130 may be from 0.1 to 1.0 mm, or from 0.2 to 0.5 mm. By setting the dimension  $d$  to 0.2 mm or greater, after the engaging part 132 has penetrated into the fibers of the target object 150, the engaging part 132 more easily engages with the fibers. By setting the dimension  $d$  to 0.5 mm or less, the engaging part 132 more easily penetrates into the fibers of the target object 150.

A thickness dimension  $g$  of the engaging part 132 of the projection 130 may be from 0.01 to 0.2 mm, or from 0.03 to 0.15 mm. By setting the dimension  $g$  to 0.03 mm or greater, the engaging state with the fibers of the target object 150 can be maintained. By setting the dimension  $g$  to 0.15 mm or less, the engaging part 132 more easily penetrates into the fibers of the target object 150.

A dimension  $e$  of an outer diameter of the column section 131 of the protrusion 130 may be from 0.05 to 0.5 mm, or from 0.1 to 0.3 mm. By setting the dimension  $e$  to 0.1 mm or greater, the orientation of the projections 130 can be maintained. By setting the dimension  $e$  to 0.3 mm or less, the dimension between the peripheral edges of the engaging parts 132 can be ensured, and engaging between the fibers of the target object 150 and the engaging part 132 is facilitated.

Note that the various dimensions described above may be set, as appropriate, within the scope of the spirit of the invention according to various factors such as the size and density of the projections 130, the material and thickness of the adhesive, and the type of the target object. In addition, the heights of all of the projections 130 in the hook member 30 may be the same (variation within a scope of manufacturing error is allowed), or the heights may differ between some areas and other areas.

The various strengths of the hook member 30 having the above-described configuration are described. The 90° peel strength for a case in which the hook member 30 is coupled to the back sheet 11 of the diaper 1 may be 0.8 (N/25 mm) or greater, may be 1.0 (N/25 mm) or greater, may be 1.2 (N/25 mm or greater), or may be 1.4 (N/25 mm) or greater. Note that the 90° peel strength may be a value when measured by a below-described method.

The dynamic shear strength for a case in which the hook member 30 is coupled to the back sheet 11 of the diaper 1 may be  $10 \text{ N}/(25 \text{ mm} * 20 \text{ mm})$  or greater. Note that the dynamic shear strength may be a value when measured by a below-described method.

5 Next, the action and effect of the hook member 30 and diaper 1 according to the present embodiment are described.

The hook member 30 couples with the target object 150 (back sheet 11 of the diaper 1) by superposing the first surface 110a side on which the adhesive layer 121 and the projections 130 are formed with the target object 150. In a state in which the hook member 30 and the target object 150 are coupled, the adhesive layer 121 adheres to the target object 150, and a portion of the column section 131 and the engaging part 132 of the projection 130 penetrate into a gap of the target object (stitching, threads and fibers and the like of the nonwoven fabric of the diaper). Here, the dimension b in the Z-axis direction between the tip end of the projection 130 and the surface 121a of the adhesive layer 121 is from 0.1 to 0.5 mm. By setting the projection 130 to this type of dimension, the projection 130 can engage with the target object 150 with sufficient engaging force even without interposing a loop member. Through the above, a hook member is omitted from the back sheet 11 of the diaper 1, and sufficient engaging force can be obtained when directly coupling the hook member 30 to a member configuring the target object 150.

15 With respect to the hook member 30, the thickness dimension c of the adhesive layer 121 may be 0.3 mm or less. One reason for setting the dimension c to 0.3 mm or less is the ability to obtain balance between the above-described viewpoints with respect to the dimension a and the dimension b.

20 With respect to the hook member 30, the dimension a in the Z-axis direction between the tip end of the projection 130 and the first surface 110a may be from 0.1 to 0.8 mm. One reason for the dimension a being set to least 0.1 mm is the viewpoint of ensuring the engaging force. A reason that the dimension a is set to not greater than 0.8 mm is that such a dimension suppresses a sense of discomfort (pain for example) when the hook member contacts a finger or the like.

25 A diaper 1 according to the present embodiment includes: a back sheet 11, and a coupling part 20 which couples with the back sheet 11 by being superposed with the back sheet 11; wherein a hook member 30 which couples directly with a member configuring the back sheet 11 is provided at the coupling part 20; the hook member 30 includes: a

sheet base material 110 having a pair of opposing surfaces 110a, 110b; and an adhesive layer 121 formed on the first surface 110a of the sheet base material 110; a plurality of projections 130 is formed on the sheet base material 110, the projections 130 projecting from the first surface 110a in a Z-axis direction, and being arranged mutually separated in an XY-axes direction in which the first surface 110a expands; each of the projections 130 includes: a column section 131 extending in the Z-axis direction from the first surface 110a, and projecting from a surface 121a of the adhesive layer 121; and an engaging part 132 projecting in the XY-axes direction from a tip end of the column section 131; and a dimension in the Z-axis direction between the tip end of the projection 130 and the surface 121a of the adhesive layer 121 is from 0.1 to 0.5 mm.

According to the diaper 1 of the present embodiment, an action and effect of the same intent as that of the above-described hook member 30 can be obtained.

With a diaper 1 according to one aspect, the thickness dimension  $c$  of the adhesive layer may be 0.3 mm or less. One reason for setting the dimension  $c$  to 0.3 mm or less is the ability to obtain balance between the above-described viewpoints with respect to a and b.

With respect to the diaper 1 according to one aspect, the dimension  $a$  in the Z-axis direction between the tip end of the projection 130 and the first surface 110a may be from 0.1 to 0.8 mm. One reason for the dimension  $a$  being set to least 0.1 mm is the viewpoint of ensuring the engaging force. A reason that the dimension  $a$  is set to not greater than 0.8 mm is that such a dimension suppresses a sense of discomfort (pain for example) when the hook member contacts a finger or the like.

Examples of preferable embodiments of the present invention were described above, but the present invention can be modified within the scope of the spirit of the invention including modifications such as the size, material, and application location of the hook member, the affixing method, and the application. In addition, the shape of the engaging part of the projection can be changed as appropriate.

Moreover, in the product distribution channel, in some cases the product is distributed from a so-called upstream side company as a component not containing adhesive in the configuration of the projections 130 and sheet base material 110, and the adhesive layer 121 and the bonding layer 122 are added to form the final product such as a

diaper at a so-called downstream side company that produces diapers (or coupling parts for diapers) near the user.

#### Examples

5 Tests that were performed to evaluate the hook member according to one aspect of the present invention are described below.

The following type of hook member was prepared as an Example 1.

10 The density of projections of the hook member according to Example 1 was a quantity of 1600 per square inch. With respect to the hook member according to Example 1, the dimension a illustrated in FIG. 4 was 0.18 mm, the dimension b was 0.13 mm, the dimension c was 0.05 mm, the dimension d was 325 mm, the dimension e was 200 mm, and the dimension g was 60 mm. The material of the sheet base material and projections was polypropylene, and the material of the adhesive layer was synthetic rubber based. A hook member for which the adhesive layer was omitted from the hook member according to Example 1 was used as a Comparative Example 1.

15 The following type of hook member was prepared as an Example 2. With respect to the hook member according to Example 2, the dimension a illustrated in FIG. 4 was 0.23 mm, the dimension b was 0.18 mm, the dimension c was 0.05 mm, the dimension d was 420 mm, the dimension e was 200 mm, and the dimension g was 90 mm. The other conditions of the hook member according to Example 2 were the same as those of Example 1. A hook member for which the adhesive layer was omitted from the hook member according to Example 2 was used as a Comparative Example 2.

25 The following type of hook member was prepared as an Example 3. With respect to the hook member according to Example 3, the dimension a illustrated in FIG. 4 was 0.30 mm, the dimension b was 0.25 mm, the dimension c was 0.05 mm, the dimension d was 420 mm, the dimension e was 200 mm, and the dimension g was 60 mm. The other conditions of the fastener according to Example 3 were the same as those of Example 1. A hook member for which the adhesive layer was omitted from the hook member according to Example 3 was used as a Comparative Example 3.

30 The following type of hook member was prepared as an Example 4. With respect to the hook member according to Example 4, the dimension a illustrated in FIG. 4 was 0.36 mm, the dimension b was 0.31 mm, the dimension c was 0.05 mm, the dimension d was 365 mm, the dimension e was 200 mm, and the dimension g was 70 mm. The other

conditions of the hook member according to Example 4 were the same as those of Example 1. A hook member for which the adhesive layer was omitted from the hook member according to Example 4 was used as a Comparative Example 4.

5 The following type of hook member was prepared as an Example 5. With respect to the hook member according to Example 5, the dimension a illustrated in FIG. 4 was 0.43 mm, the dimension b was 0.39 mm, the dimension c was 0.04 mm, the dimension d was 235 mm, the dimension e was 200 mm, and the dimension g was 40 mm. The other conditions of the hook member according to Example 5 were the same as those of Example 1. A hook member for which the adhesive layer was omitted from the hook  
10 member according to Example 5 was used as a Comparative Example 5.

#### Evaluation Testing of 90° Peel Strength

This test measured the 90° peel strength when the hook member was coupled to the target object. In this test, a back sheet of a “Merries (registered trademark; from Kao Corporation)” M-size tape type diaper was used as the target object. Hook members  
15 according to each example and comparative example were directly coupled to a nonwoven fabric configuring the back sheet. The size of the sheet base material was 25 mm × 20 mm. One 25 mm side of each hook member was pulled and detached in a 90° direction at 300 mm/min, and the tensile strength at that time was measured. The test results are presented in FIGS. 5 and 6.

#### 20 Evaluation Testing of Dynamic Shear Strength

This test measured the dynamic shear strength when the hook member was coupled to the target object. In this test, a back sheet of a “Merries (registered trademark; from Kao Corporation)” M-size tape type diaper was used as the target object. Hook members  
25 according to each example and comparative example were directly coupled to a nonwoven fabric configuring the back sheet. The size of the sheet base material was 25 mm × 20 mm. Each hook member was pulled and sheared in a 180° direction (direction along the 25 mm side) at 30 mm/min, and the tensile strength at that time was measured. The test results are presented in FIGS. 5 and 6.

When samples differing by the presence or lack of an adhesive layer such as  
30 Example 1 and Comparative Example 1, and Example 2 and Comparative Example 2, were compared, in each case, the 90° peel strength was improved by the presence of an adhesive layer. The 90° peel strength is one issue in “hook to back sheet” applications, and

it is clear that this strength is improved. On the other hand, the dynamic shear strength, which is a strength of hook members, did not significantly deteriorate depending on the presence or lack of an adhesive layer. Therefore, the samples of the examples exhibited properties which are suited for “hook to back sheet” applications.

5           Moreover, for example, with regard to replaceable pads attached to the inner side of a diaper in a replaceable manner and to sanitary napkins attached inside underwear (referred to as absorbent pads as a generic term), if a hook member is used in the engaging part that engages with the diaper or underwear, it is possible that the engaging part can be used to prevent positional deviation of the absorbent pad when worn, and that the  
10           engaging part can be used to maintain a rolled up state of the absorbent pad when discarded. The absorbent pad has an absorbent surface material containing a superabsorbent polymer (SAP) at the side closest to the skin when worn, and this absorbent surface material is laminated with a back surface material containing a nonwoven fabric or film. As illustrated by the left side image of FIG. 7, a hook member 30  
15           is provided on the surface of the back surface material of the absorbent pad, and this hook member 30 contributes to engagement with a diaper or underwear. Furthermore, when discarded, as illustrated by the right side image of FIG. 7, when the absorbent pad is rolled up with the absorbent surface material on the inner circumferential side, the hook member 30 engages with the absorbent surface material, and thereby the rolled-up form is  
20           maintained, and the absorbent pad is easily discarded.

#### Reference Signs List

1:	Diaper (absorbent article)
20:	Coupling part
25 30:	Hook member
110:	Sheet base material
120, 121:	Adhesive layer
130:	Projection
131:	Column section
30 132:	Engaging part

What is Claimed is:

1. A hook member which couples with a target object by being superposed with the target object, the hook member comprising:
  - 5 a sheet base material having a pair of opposing surfaces; and
  - an adhesive layer formed on at least one surface of the sheet base material; wherein
  - a plurality of projections is formed on the sheet base material, the projections projecting from the one surface in a first direction intersecting the one surface, and being arranged mutually separated in a second direction in which the one surface expands;
  - 10 each of the projections comprises:
    - a column section extending in the first direction from the one surface, and projecting from a surface of the adhesive layer; and
    - an engaging part projecting in the second direction from a tip end of the column section; and
    - 15 a dimension in the first direction between the tip end of the projection and the surface of the adhesive layer is from 0.1 to 0.5 mm.
2. The hook member according to claim 1, wherein a thickness of the adhesive layer is 0.3 mm or less.
- 20 3. The hook member according to claim 1 or 2, wherein a dimension in the first direction between the tip end of the projection and the one surface is from 0.1 to 0.8 mm.
4. A diaper comprising a back sheet, and a coupling part which couples with the back sheet by being superposed with the back sheet; wherein
  - 25 a hook member which couples directly with a member configuring the back sheet is provided at the coupling part;
  - the hook member comprises:
    - a sheet base material having a pair of opposing surfaces; and
    - 30 an adhesive layer formed on at least one surface of the sheet base material;

a plurality of projections is formed on the sheet base material, the projections projecting from the one surface in a first direction intersecting the one surface, and being arranged mutually separated in a second direction in which the one surface expands;

each of the projections comprises:

5 a column section extending in the first direction from the one surface, and projecting from a surface of the adhesive layer; and

an engaging part projecting in the second direction from a tip end of the column section; and

10 a dimension in the first direction between the tip end of the projection and the surface of the adhesive layer is from 0.1 to 0.5 mm.

5. The diaper according to claim 4, wherein a thickness of the adhesive layer is 0.3 mm or less.

15 6. The diaper according to claim 4 or 5, wherein a dimension in the first direction between the tip end of the projection and the one surface is from 0.1 to 0.8 mm.

7. An absorbent pad in which an absorbent member for absorbing a liquid, and a back surface member are laminated; wherein

20 a hook member is provided at a back surface of the back surface member; the hook member comprises:

a sheet base material having a pair of opposing surfaces; and

an adhesive layer formed on at least one surface of the sheet base material;

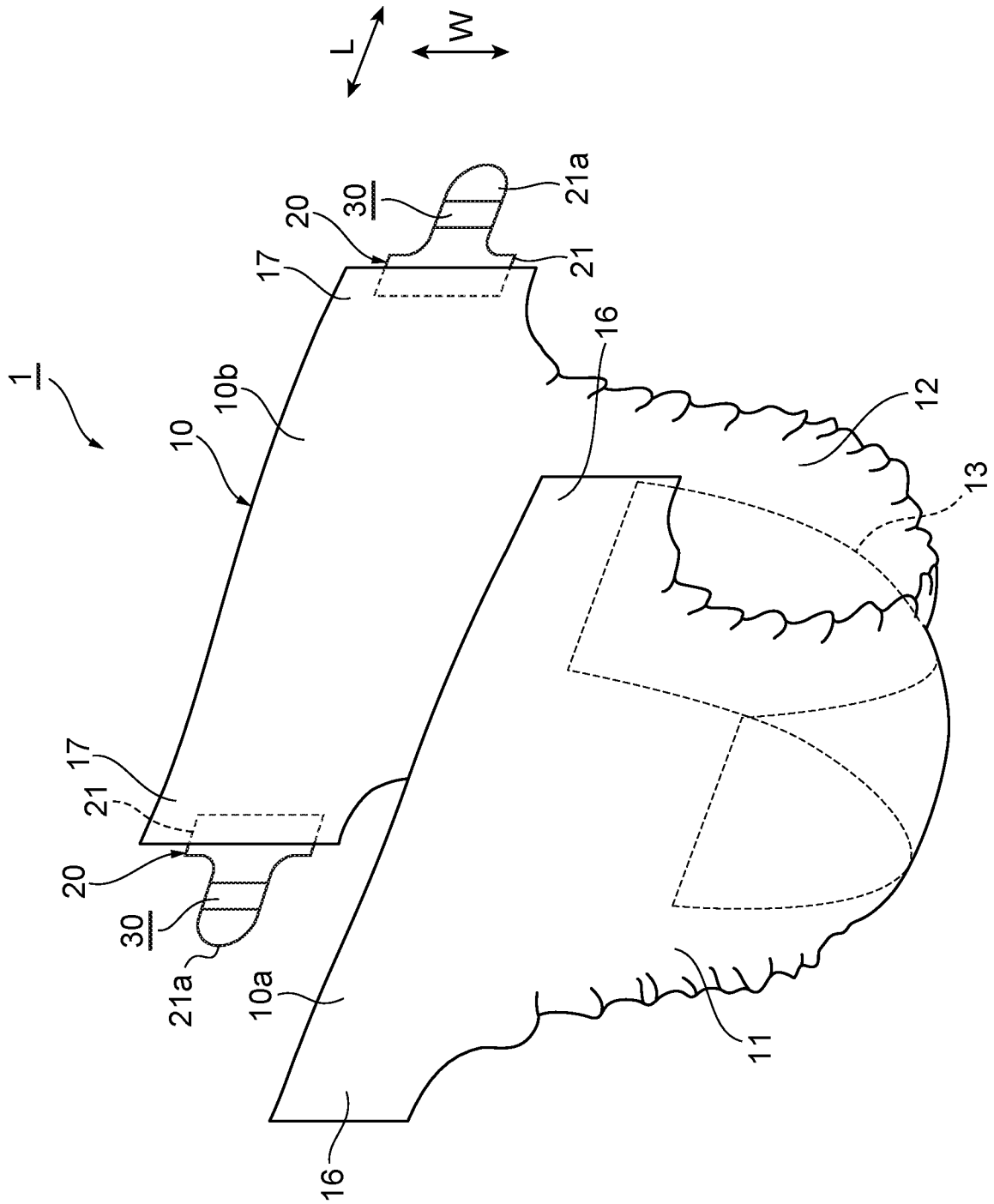
25 a plurality of projections is formed on the sheet base material, the projections projecting from the one surface in a first direction intersecting the one surface, and being arranged mutually separated in a second direction in which the one surface expands;

each of the projections comprises:

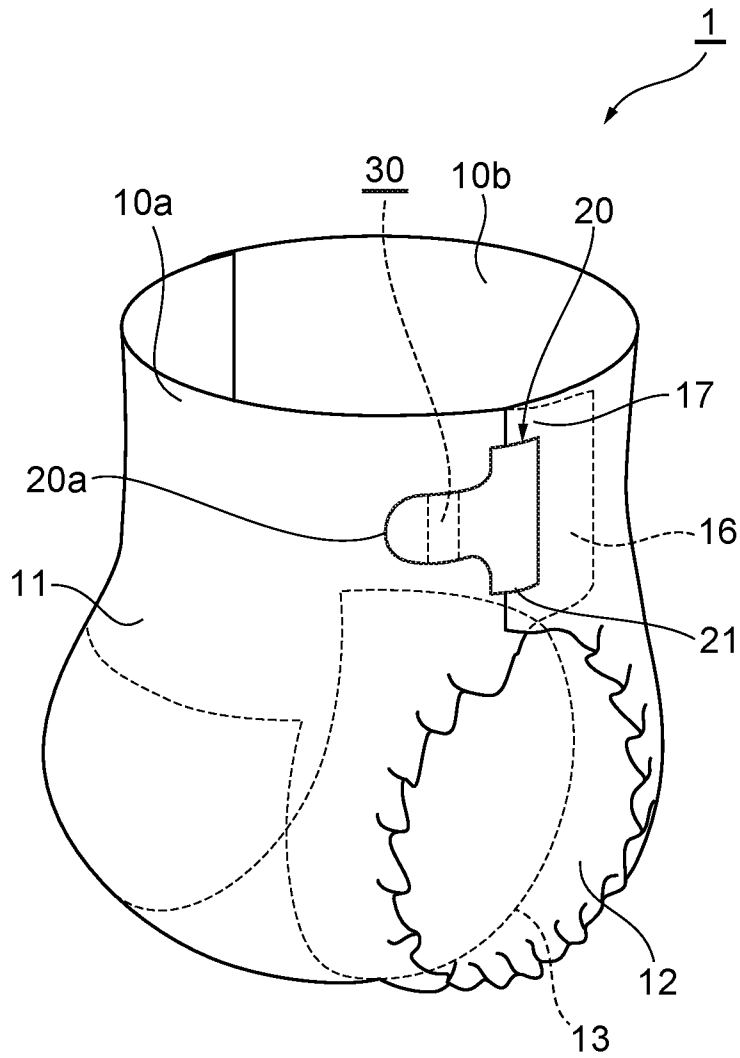
a column section extending in the first direction from the one surface, and projecting from a surface of the adhesive layer; and

30 an engaging part projecting in the second direction from a tip end of the column section; and

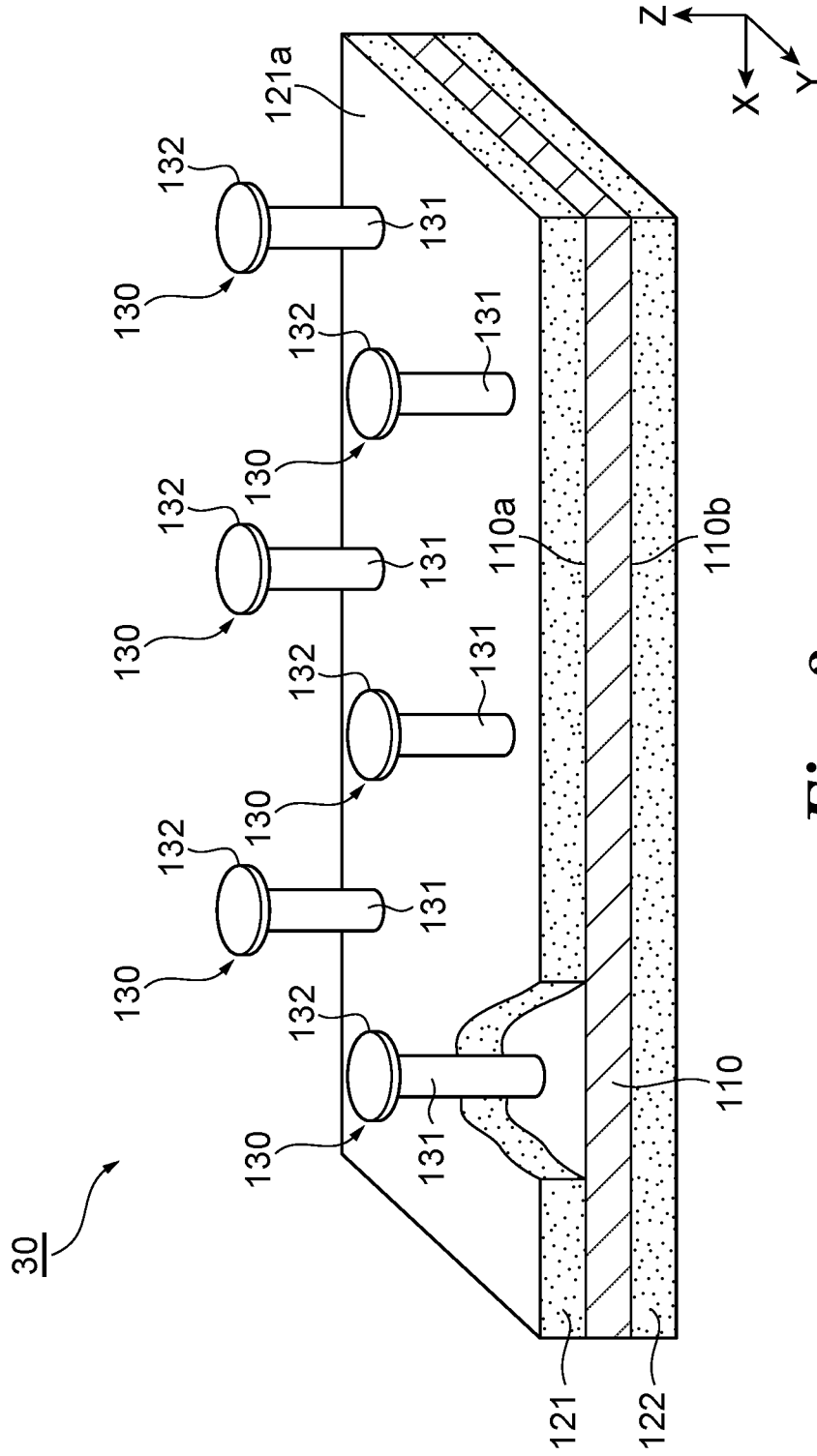
a dimension in the first direction between the tip end of the projection and the surface of the adhesive layer is from 0.1 to 0.5 mm.



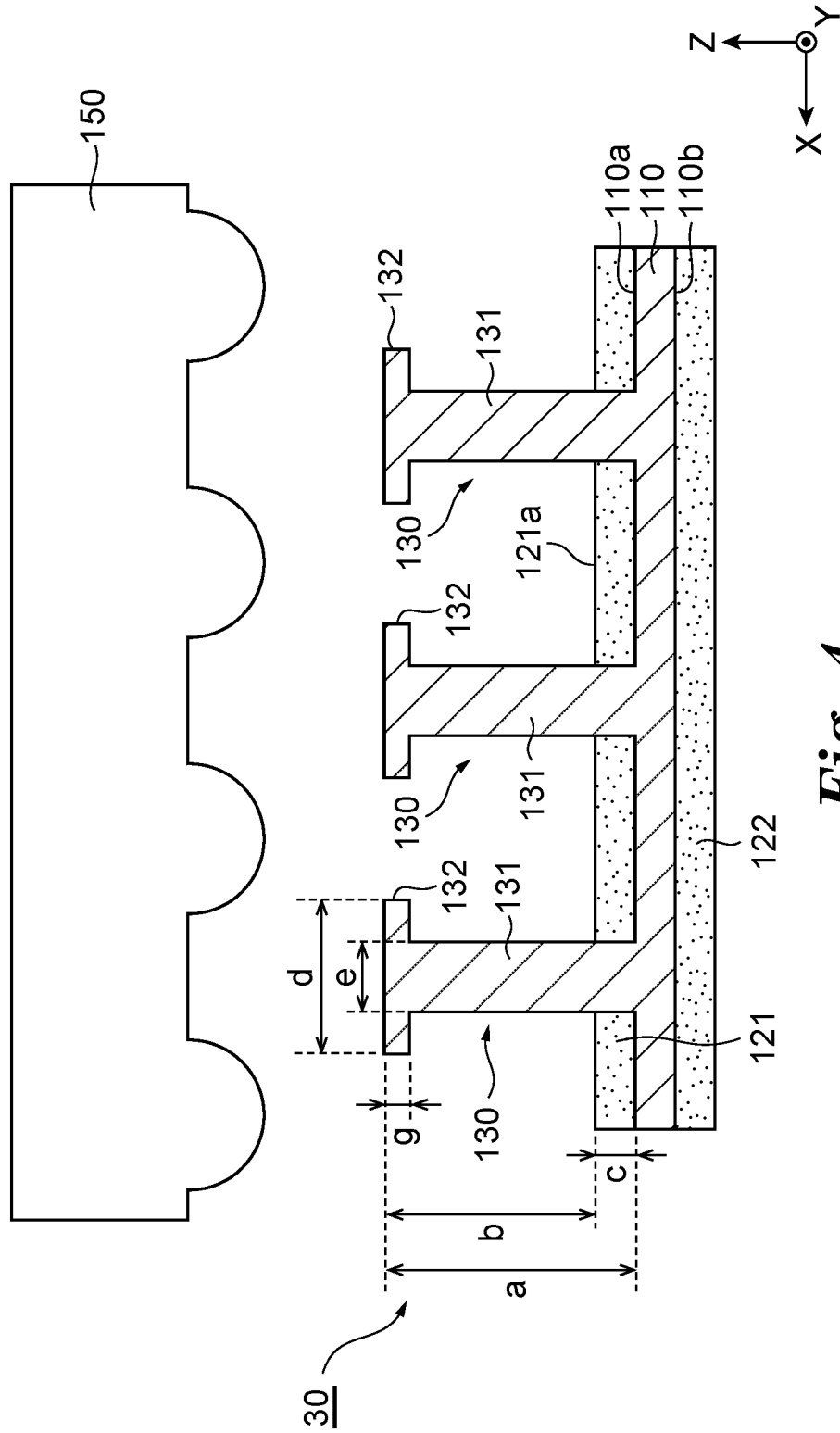
**Fig. 1**



**Fig. 2**



**Fig. 3**



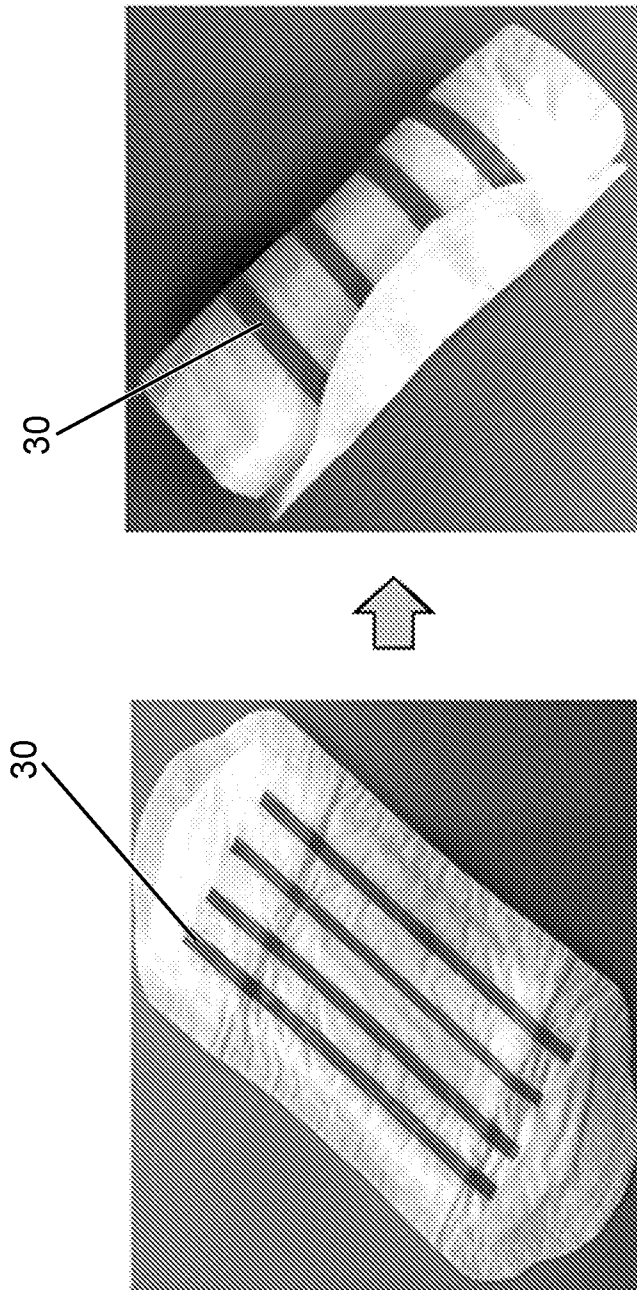
**Fig. 4**

	Comp. Ex. 1	Ex. 1	Comp. Ex. 2	Ex. 2	Comp. Ex. 3	Ex. 3	Comp. Ex. 4	Ex. 4	Comp. Ex. 5	Ex. 5
Dimension a (mm)	0.18		0.23		0.3		0.36		0.43	
Dimension c of adhesive layer (mm)	None	0.05	None	0.05	None	0.05	None	0.05	None	0.05
Dimension b (mm)	—	0.13	—	0.18	—	0.25	—	0.31	—	0.38
90° peel strength [N/25mm]	1.2	1.7	1.2	1.9	0.2	1.7	0.6	1.4	0.3	1.4
Dynamic shear strength [N/(25mm*20mm)]	21	19	20	18	14	43	17	23	23	18

**Fig. 5**

	Comparative Example 0	Example 0	Comparative Example 6	Example 6
Scale a (mm)		0.11	0.5	
Scale of adhesive layer c (mm)	-	0.05	-	0.05
Scale b (mm)	-	0.06	-	0.45
90° peel force [N/25mm]	0.43	0.95	0.012	0.12
Dynamic shear [N/25mm * 20mm]	8.9	11	1.5	3.8

**Fig. 6**



*Fig. 7*

# INTERNATIONAL SEARCH REPORT

International application No PCT/IB2018/056675
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<b>A. CLASSIFICATION OF SUBJECT MATTER</b> INV. A61F13/62      A44B18/00      A61F13/58      A61F13/56 ADD.				
According to International Patent Classification (IPC) or to both national classification and IPC				
<b>B. FIELDS SEARCHED</b>				
Minimum documentation searched (classification system followed by classification symbols) A61F A44B				
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched				
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) EPO-Internal, Sequence Search, WPI Data				
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>				
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.		
X	EP 0 393 953 A2 (MINNESOTA MINING & MFG [US]) 24 October 1990 (1990-10-24)	1-7		
Y	abstract page 2, line 43 - page 4, line 8 page 5, lines 1-10 example 7 figure 1 claims 1,10,11,12,15,16	1-7		
X	EP 0 894 448 A1 (MINNESOTA MINING & MFG [US]) 3 February 1999 (1999-02-03) cited in the application	1-6		
Y	abstract figure 2 paragraphs [0009], [0011], [0013], [0017] - [0019], [0023] - [0025] claims 1-7	1-7		
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<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.				
* Special categories of cited documents : <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none; vertical-align: top;">                     "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="width: 50%; border: none; vertical-align: top;">                     "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                      "&amp;" document member of the same patent family                 </td> </tr> </table>			"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	"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
"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	"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			
Date of the actual completion of the international search	Date of mailing of the international search report			
26 November 2018	03/12/2018			
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer  Schmitt-Humbert, C			

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International application No

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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