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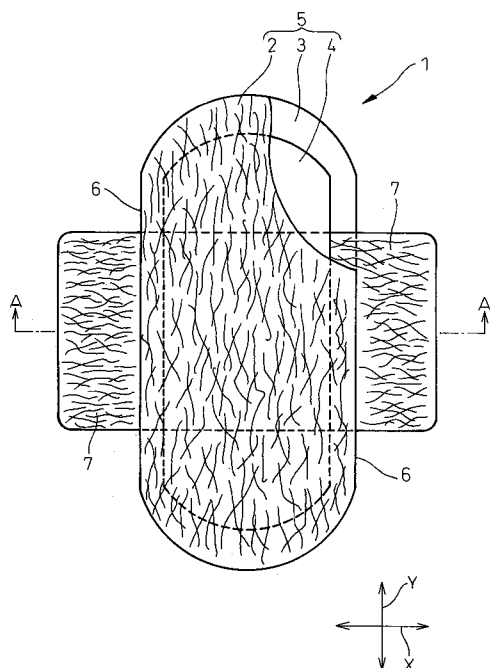
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(54) Title: ABSORBENT ARTICLE

Fig.1



(57) Abstract: In an absorbent article with wings, such as an incontinence pad or a sanitary napkin fixed to a crotch portion of an undergarment, the wings are allowed to have low basis weight, thereby reducing discomfort during wearing. The absorbent article comprises an absorbent main body and a pair of wings extending from both side edges of the absorbent main body. The absorbent main body comprises a fluid-permeable top sheet, a fluid-impermeable back sheet, and a fluid-retaining absorber. The top sheet and the wings are made of separate nonwoven fabrics. Fiber alignment in the top sheet is in a longitudinal direction, whereas fiber alignment in the wings is in a transverse direction. On a backside of the absorbent main body and a backside of each wing, are provided a plurality of streaks of fixing adhesive portions, respectively. Extension directions of the fixing adhesive portions coincide with the directions of the fiber alignments.



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DESCRIPTION

ABSORBENT ARTICLE

5 TECHNICAL FIELD

The present disclosure relates to an absorbent article.

BACKGROUND ART

10 In recent years, in order to absorb excreta such as menstruation and urine, many absorbent articles including sanitary napkins, panty liners, mild incontinence pads, and urine pads have been proposed. These absorbent articles often have wings on both sides in a transverse
15 direction of the article. Upon wearing of the absorbent article, the wings can be folded back onto the underside of a crotch portion of the undergarment so as to prevent the edges of the undergarment from being stained with excrement. In addition, normally the wings have an
20 adhering means for attaching the wings to the undergarment. By attaching the wings to the underside of the crotch portion of the undergarment, displacement of the absorbent article is limited, which allows for stable wearing. Generally, the wings are formed by bonding
25 together members forming a main body of the absorbent article, such as a back sheet and a top sheet, in regions that project laterally from the main body of the absorbent article. In the case of wings formed by bonding a back sheet to a top sheet, as a method for
30 producing the wings, there is a production method in which a laminate is formed by interposing an absorber between the back sheet and the top sheet, and an elliptic or sandglass-shaped main body portion and wings are cut out from the laminate. In this case, regarding the width
35 of a back sheet material and a top sheet material, it is necessary to use a larger sheet material. Then, after cutting, most of the remaining top and back sheet

materials become waste. Therefore, recently, from the viewpoint of reducing the amount of fabric used and the amount of trim, etc., a main body portion without wings in which an absorber is interposed between a top sheet and a back sheet is formed, whereas wing portions are formed by bonding a pair of wing pieces, which is obtained from an original fabric different from that of the top and back sheets, to both sides of the main body portion. However, such wing portions are more likely to separate from the main body portion. Therefore, various methods for fixing wing portions to a main body portion have been proposed.

For example, Japanese Patent No. 4372628 discloses an absorbent article obtained as follows: each wing piece is fixed to a skin contact sheet at a skin contact-side bonding portion and also fixed to an undergarment contact sheet at an undergarment contact-side bonding portion. A width of the skin contact-side bonding portion is smaller than a width of the undergarment contact-side bonding portion. An outermost end position of the skin contact-side bonding portion is located outboard of an outermost end position of the undergarment contact-side bonding portion.

Additionally, in Japanese Unexamined Patent Publication No. 2010-188142, in order to produce an absorbent article having wing-shaped flaps, a lateral flow system in which a longitudinal direction axis of the absorbent article is made orthogonal to a production line has been employed. When a normal arrangement and an upside-down reverse arrangement are alternately aligned in such a manner that absorbers are positioned on the same straight line without their lateral displacement from a production line direction, outlines of the wing-shaped flaps are determined such that posterior outlines of the wing-shaped flaps of normally arranged and reversely arranged absorbent articles coincide with each other.

SUMMARY OF INVENTION

TECHNICAL PROBLEM

The inventor(s) has recognized the following points.

5 Upon wearing of an absorbent article, the wearer holds the wings and then wraps them around the crotch portion of the undergarment. Accordingly, a significant load is imposed on the wing member. To prevent problems such as tearing and ripping from occurring upon wearing or during

10 use, the wing member is configured to have sufficient strength along with sufficient bonding strength between the wing member and the main body.

However, in Japanese Patent No. 4372628, when the wing pieces are formed, the wing pieces are cut off in

15 the same direction as a flow direction of an original fabric. Thus, as in a main body member, the wing member has fiber alignment in a longitudinal direction of the main body. In this case, it might be difficult to maintain the strength of the wing member against tension

20 upon wearing, and a wing member with high basis weight might be needed.

Increasing the strength of the wings by increasing the basis weight or increasing the bonding strength between the wings and the main body can prevent ripping

25 of the wings upon wearing. On the other hand, increased basis weight leads to increased stiffness of the wing members. In addition, when application of a heat seal or an adhesive agent is increased for more bonding strength, the interfaces between the wings and the main body may

30 cause wearing discomfort upon skin contact with the interface portions.

In Japanese Unexamined Patent Publication No. 2010-188142, the production line flow is orthogonal to the longitudinal direction of the product. Thus, the fiber

35 alignment of a nonwoven fabric in materials forming the product is orthogonal to the longitudinal direction of the product. When absorbing fluid, the absorbed fluid is

more likely to spread in bilateral directions rather than in the longitudinal direction due to the influence of fiber alignment of a top sheet. This may easily cause lateral fluid leakage, so that the absorption capacity of an absorber cannot be sufficiently utilized. The absorber itself may be made larger in volume with increased absorption capacity to prevent the lateral leakage, however, wearing discomfort may then occur. Particularly, unlike sanitary napkins which are intended to be used only during a menstrual period, mild incontinence pads are basically used at all times and intended to be worn for a longer time (approximately one pad per day) than sanitary napkins. Accordingly, wearing comfort is more necessary for mild incontinence pads than for sanitary napkins.

SOLUTION TO PROBLEM

An absorbent article in accordance with some embodiments comprises an absorbent main body and a pair of wings extending from both side edges of the absorbent main body. The absorbent main body comprises a fluid-permeable top sheet, a fluid-impermeable back sheet, and a fluid-retaining absorber interposed between the top sheet and the back sheet. The top sheet and the wings are made of separate nonwoven fabrics. Fiber alignment in the top sheet is in a longitudinal direction of the absorbent main body, whereas fiber alignment in the wings is in a transverse direction of the absorbent main body.

An absorbent article in accordance with some embodiments comprises an absorbent main body and a pair of wings extending from both side edges of the absorbent main body. The absorbent main body comprises a fluid-permeable top sheet, a fluid-impermeable back sheet, and a fluid-retaining absorber interposed between the top sheet and the back sheet. The wings are made of a nonwoven fabric. Fiber alignment in the wings is in a transverse direction of the absorbent main body.

ADVANTAGEOUS EFFECTS OF INVENTION

According to the present invention, there can be
obtained an absorbent article that allows for long hours
5 of comfortable use.

BRIEF DESCRIPTION OF DRAWINGS

Fig. 1 is a partially cut-away plan view of an
absorbent article according to some embodiments of the
10 present invention.

Fig. 2 is a bottom view of the absorbent article of
Fig. 1.

Fig. 3 is a schematic cross-sectional view taken
along line A-A of Figs. 1 and 2.

15 Fig. 4 is a plan view showing one example of a shape
of a wing.

DESCRIPTION OF EMBODIMENTS

Hereinafter, some embodiments of the present
20 invention will be described with reference to the
drawings, but the invention is not restricted to what is
shown in the drawings and/or details specifically
described below.

Fig. 1 is a partially cut-away plan view of an
25 absorbent article 1 according to some embodiments of the
present invention. Fig. 2 is a bottom view of the
absorbent article 1 of Fig. 1. Fig. 3 is a schematic
cross-sectional view taken along line A-A of Figs. 1 and
2. The absorbent article 1 includes an absorbent main
30 body 5 including a fluid-permeable top sheet 2, a fluid-
impermeable back sheet 3, and a fluid-retaining absorber
4 interposed between the sheets, and a pair of wings 7, 7
extending from both side edges 6, 6 of the absorbent main
body.

35 The top sheet 2 and the wings 7 are made of separate
nonwoven fabrics. Specifically, the top sheet 2 and the
wings 7 are independent members, rather than integral

parts of a one-piece member. The material forming the top sheet **2** is a nonwoven fabric and the material forming the wings **7** is also a nonwoven fabric. The nonwoven fabric forming the top sheet **2** may be the same kind as or
5 a different kind from that of the wings **7**.

Fiber alignment in the top sheet **2** is in a longitudinal direction Y of the absorbent main body **5**, whereas fiber alignment in the wings **7** is in a transverse direction X of the absorbent main body **5**.

10 Herein, the term "fiber alignment" means a fiber orientation direction as viewed on a nonwoven fabric surface. Herein, regarding a nonwoven fabric, the expression "fiber alignment is in a specific direction" means that fibers that form from 50% to 100% of a total
15 fiber weight of the nonwoven fabric have fiber alignment within a range of -45° to $+45^{\circ}$ with respect to the specific direction.

Thus, fiber alignment in the top sheet **2** is in the longitudinal direction Y of the absorbent main body **5**
20 when fibers that form 50% or more of a total fiber weight of the top sheet **2** have fiber alignment within a range of -45° to $+45^{\circ}$ with respect to the longitudinal direction Y of the absorbent main body **5**. Likewise, fiber alignment in the wings **7** is in the transverse direction X of the
25 absorbent main body **5** when fibers that form 50% or more of a total fiber weight of the wings **7** have fiber alignment within a range of -45° to $+45^{\circ}$ with respect to the transverse direction X of the absorbent main body **5**.

As a method for measuring fiber alignment of a
30 nonwoven fabric, there can be used a commonly used measurement method, which is, for example, a measurement method equivalent to a fiber alignment property test method using the zero-span tensile strength of TAPPI Standard T481. Additionally, as a quick and easy method,
35 fiber alignment may be measured using a tensile strength ratio (MD/CD) of a nonwoven fabric between a production

line direction (MD - machine direction) of the nonwoven fabric and an orthogonal direction (CD - cross direction) thereof. As specific procedures for the quick and easy measurement method, with an autograph testing machine (AGS-G100N) manufactured by SHIMADZU Corporation, test pieces having a length of 200 mm and a width of 50 mm are subjected to testing under conditions with a cross-head speed of 500 mm/min and an inter-chuck distance of 150 mm to obtain tensile strength from a maximum load under tension and also calculate a degree of elongation from elongation at the maximum load. When the tensile strength ratio (MD/CD) is larger than 1, the nonwoven fabric has fiber alignment in the MD direction.

A nonwoven fabric is produced by forming fibers into a sheet form to obtain a web and bonding or entangling the fibers within the web to form the non-woven fabric, with or without further finishing processes. When producing nonwoven fabric in an industrial scale, a continuous production apparatus is used to produce a long nonwoven fabric sheet. In that case, unless a special treatment is performed, fibers forming the nonwoven fabric tend to be aligned in the longitudinal direction of the long sheet, namely, the machine direction or production line direction MD in which the web or the sheet proceeds in the production apparatus. Accordingly, ordinary nonwoven fabrics industrially produced as long sheets have more than a little fiber alignment. In some embodiments of the present invention, when the top sheet **2** is cut from a nonwoven fabric, cutting is performed such that the fiber alignment in the nonwoven fabric forming the top sheet **2** is in the longitudinal direction of the absorbent main body **5**. On the other hand, when producing the wings **7** from a nonwoven fabric, cutting is performed such that the fiber alignment in the nonwoven fabric forming the wings **7** is in the transverse direction of the absorbent main body **5**. This makes the fiber alignment in the top sheet **2** orthogonal to the fiber

alignment in the wings 7.

Fluid tends to spread along fiber alignment. Thus, on the absorbent main body side, fluid spreads in the longitudinal direction and can be efficiently absorbed.

5 In addition, since the wings are provided as a separate member, lateral leakage is rarely induced on the top side. As a result, the absorbent main body does not need to have an extra absorbing function and thus can be thinner.

10 By arranging the fiber alignment in the nonwoven fabric forming the wings to be orthogonal to the longitudinal direction of the absorbent main body, the strength of the wings against tension upon wearing is increased. Therefore, to ensure the strength of the
15 wings, there is no need to use a high basis weight material for the wing member, perform lamination coating of the wing member, or the like. In other words, the wing member can be made of a low basis weight material or a highly air-permeable material.

20 As the wing member, a low basis weight member can be selected. Accordingly, a portion of the absorbent article wrapping around the undergarment in use can be made less stiff and uneven texture can be reduced, allowing for comfortable wearing even for long hours.

25 Additionally, using a highly air-permeable material for the wing member can also improve the air permeability of a portion where the absorbent main body and the wings overlap upon wearing. Thereby, a wet feeling can also be reduced.

30 Therefore, good absorption efficiency in the absorbent main body and a good fit feeling of the wings can be both satisfied.

Furthermore, a member forming the absorbent main body has fiber alignment in the longitudinal direction of
35 the absorbent main body, whereas the wing member has fiber alignment in the transverse direction of the absorbent main body. Accordingly, upon wearing of the

article, the wing member reacts against force imposed from the transverse direction at the crotch portion to allow twisting to be mostly prevented.

Furthermore, since the wing member is configured as a separate body from the absorbent main body, the bonding strength between the absorbent main body and the wing member is a consideration. Thus, when the fiber alignment in a nonwoven fabric forming the absorbent main body and bonded to the wings is made orthogonal to the fiber alignment in the nonwoven fabric forming the wings, a number of intersecting points of respective fibers is increased compared to parallel fiber alignment, thereby increasing the bonding strength therebetween. In other words, bonding conditions with orthogonal alignment can be set lower than with parallel alignment. As a result, since conditions for a bonding method (such as a heat seal or an adhesive agent) are mitigated, stiffening of the interface portion is avoidable. Thereby, discomfort at the crotch portion upon wearing is reduced, allowing for comfortable wearing even in long hours of use.

Preferably, on the backside of the absorbent article **1**, fixing adhesive portions **21** and **22** are provided by applying an adhesive agent for fixing the article to an undergarment. Preferably, the fixing adhesive portions are provided on both the backside of the absorbent main body **5** and the backsides of the wings **7**. The fixing adhesive portion **21** provided on the backside of the absorbent main body **5** may be a single portion or may be split into a plurality of portions. The fixing adhesive portion **22** provided on the backsides of the wings **7** may be a single portion or may be split into a plurality of portions. Preferably, as shown in Fig. 2, on the backside of the absorbent main body **5** a plurality of streaks of the fixing adhesive portions **21** is provided, and on the backsides of the wings **7** a plurality of streaks of the fixing adhesive portions **22** is provided. Preferably, an extension direction of the plurality of

streaks of the fixing adhesive portions **21** provided on the backside of the absorbent main body **5** coincides with the direction of the fiber alignment in the top sheet **2** (e.g., the longitudinal direction of the absorbent main body **5**), and an extension direction of the plurality of streaks of the fixing adhesive portions **22** provided on the backsides of the wings **7** coincides with the direction of the fiber alignment in the wings **7** (e.g., the transverse direction of the absorbent main body **5**). By making the extension directions of the plurality of streaks of the fixing adhesive portions coincident with the directions of the fiber alignments of the respective layers on which the fixing adhesive portions are provided, convexity is reduced. Thereby, when the fixing adhesive portions are formed by transfer coating, i.e., by transferring an adhesive on a release paper from the release paper to the backside of the wings, stable transfer can be achieved. This can prevent the fixing adhesive portions from remaining on the undergarment after use. In addition, the extension direction of the plurality of streaks of the fixing adhesive portions **21** provided on the backside of the absorbent main body **5** is arranged to coincide with the longitudinal direction of the absorbent article, and the extension direction of the plurality of streaks of the fixing adhesive portions **22** provided on the backsides of the wings **7** is arranged to coincide with the transverse direction of the absorbent article. Accordingly, upon wearing, the fixing adhesive portions **21** intersect with the fixing adhesive portions **22**. This stabilizes attachment to the undergarment, whereby displacement hardly occurs even over long hours of use.

There is no specific limitation on the number and size of the fixing adhesive portions as long as the intended fixation can be achieved. Preferably, the number of the fixing adhesive portions **21** provided on the backside of the absorbent main body **5** is 1 to 10, and

more preferably 2 to 8.

The width of a single one of the fixing adhesive portions **21** provided on the backside of the absorbent main body **5** is preferably 2 to 40 mm, and more preferably 5 to 20 mm.

The pitch of the fixing adhesive portions **21** (a distance between the center lines of adjacent two fixing adhesive portions) provided on the backside of the absorbent main body **5** is preferably 3 to 60 mm, and more preferably 8 to 30 mm.

The number of the fixing adhesive portions **22** provided on the backsides of the wings **7** is preferably 1 to 10, and more preferably 2 to 7.

The width of a single one of the fixing adhesive portions **22** provided on the backsides of the wings **7** is preferably 2 to 40 mm, and more preferably 5 to 20 mm.

The pitch of the fixing adhesive portions **22** (a distance between the centerlines of adjacent two fixing adhesive portions) provided on the backsides of the wings **7** is preferably 3 to 60 mm, and more preferably 8 to 30 mm.

For example, in one specific embodiment in which the absorbent article **1** has a shape as shown in Fig. 2; a size L_1 in the longitudinal direction Y of the absorbent main body **5** is 190 mm; a size W_1 in the transverse direction X of the absorbent main body **5** is 85 mm; a size L_2 in the longitudinal direction Y of the wings **7** is 80 mm; and a size W_2 in the transverse direction X of the wings **7** is 32.5 mm, by way of example the number of the fixing adhesive portions provided on the backside of the absorbent main body **5** is 5; the width of a single one of the fixing adhesive portions provided on the backside of the absorbent main body **5** is 5 mm; the pitch of the fixing adhesive portions provided on the backside of the absorbent main body **5** is 10 mm; the length of the fixing adhesive portions provided on the backside of the absorbent main body **5** is 135 mm; the number of the fixing

adhesive portions provided on the backside of each of the wings **7** is **7**; the width of a single one of the fixing adhesive portions provided on the backsides of the wings **7** is 5 mm; the pitch of the fixing adhesive portions provided on the backsides of the wings **7** is 10 mm; and the length of the fixing adhesive portions provided on the backsides of the wings **7** is 17.5 mm. This illustrates a specific example of one absorbent article and absorbent articles having different dimensions and different numbers, shapes and dimensions of fixing adhesive portions are also included in the present invention.

The pair of wings **7**, **7** may comprise a continuous one-piece member or discontinuously separate members. That is, the pair of wings may be made of a one-piece nonwoven fabric (namely, a single member) or separate nonwoven fabrics (namely, two members). Figs. 1 and 3 show an example in which the pair of wings is made of a one-piece nonwoven fabric. Preferably, the pair of wings is made of a one-piece nonwoven fabric. When the pair of wings is formed as separate members, a seal or an adhesive agent is applied for strong bonding so as to prevent the detachment of the wings from the absorbent main body. However, by using the pair of wings made of a one-piece nonwoven fabric, the seal or adhesive agent can be reduced, leading to improvement in feeling when wearing.

The top sheet **2** serves to pass a bodily fluid excretion, such as urine or menstrual blood, to an absorber **4** provided under the top sheet, as well as to retain the absorber **4** by sandwiching the absorber **4** between the top sheet **2** and the back sheet **3**. The top sheet **2** is made of a fluid-permeable nonwoven fabric. Although the nature of the nonwoven fabric is not specifically limited, air-through nonwoven fabrics, spun bond nonwoven fabrics, and SMS (spunbonded-meltblown-spunbonded) nonwoven fabrics are preferable in terms of

pleasant texture. Examples of fibers forming a nonwoven fabric include synthetic resin fibers such as polypropylene (PP), polyethylene (PE), and poly(ethylene terephthalate) (PET), and cellulose fibers such as rayon. Meanwhile, there can also be used biodegradable natural products such as poly(lactic acid), chitosan, and poly(alginic acid). In addition, many fluid-permeable holes may be formed and a silicone-based or fluorine-based water-repellent oil agent may be applied so that bodily fluid hardly adheres to the outer surface of the top sheet **2**.

The back sheet **3** serves to prevent external leakage of fluid, such as urine or menstrual blood, that has been absorbed into the absorber **4** and is made of a material that can prevent such a fluid from leaking out. Alternatively, with the back sheet made of a fluid-impermeable and air-permeable material, hot and humid air during wearing can be reduced, thereby allowing for the reduction of discomfort during wearing. Examples of such a material include fluid-impermeable films, air-permeable films, which are mainly made of polyethylene (PE), polypropylene (PP) or like, and composite sheets formed by laminating a fluid-impermeable film on one side of a nonwoven fabric such as a spunbonded nonwoven fabric. Preferably, hydrophobic nonwoven fabrics, water-impermeable plastic films, laminate sheets made of nonwoven fabrics and water-impermeable plastic films and the like can be used. Additionally, there may be used SMS nonwoven fabrics in which a highly water-resistant melt-blown nonwoven fabric is sandwiched by a highly strong spunbonded nonwoven fabric.

The nonwoven fabric used to form the wings **7** can be the same nonwoven fabric as that of the top sheet. In terms of pleasant texture and air permeability, desirably, the wings **7** are made of a water-repellent nonwoven fabric alone. As sheets with pleasant texture, air-through nonwoven fabrics, spunbonded nonwoven

fabrics, and SMS nonwoven fabrics can be mentioned. Among them, SMS nonwoven fabrics are preferable.

5 The nonwoven fabric forming the wings has a basis weight of preferably 15 to 40 g/m², and more preferably 20 to 35 g/m². If the basis weight is too small, while the strength is ensured, the fabric may be too thin to make the user to feel easy. Conversely, if the basis weight is too large, the fabric may become stiff, which makes wearing feeling uncomfortable.

10 Preferably, the absorber 4 serves to absorb and retain fluid such as urine or menstrual blood and has high volume, hardly loses its shape and is less of a chemical stimulant. An example of the absorber includes an absorber comprising fluff pulp or an air-laid nonwoven
15 fabric and a super-absorbent polymer (SAP). Chemical pulps, cellulose fibers, artificial cellulose fibers such as rayon and acetate, and the like can be used instead of fluff pulp. Preferably, an absorbent fiber such as pulp has a basis weight of 100 to 800 g/m² and an amount of the
20 super-absorbent polymer is 30 to 65 parts by weight based on 100 parts by weight of absorbent fiber. In a fluid-permeable material such as tissue covering a mixture in which an absorbent fiber and a super-absorbent polymer are entirely uniformly distributed, a preferable basis
25 weight of the material is 12 to 30 g/m². An example of the air-laid nonwoven fabric includes a nonwoven fabric in which pulp and a synthetic fiber are thermally fused together or fixedly bonded together by a binder. The super-absorbent polymer has a three-dimensional network
30 structure in which water-soluble macromolecules are appropriately cross-linked together, and absorbs water in the weight of 30 to 60 times as much as the weight of the super-absorbent polymer itself. However, the super-absorbent polymer is basically water-insoluble and does
35 not release once absorbed water even if more or less pressure is applied. Examples of the super-absorbent polymer include particulate or fibrous polymers based on

starch, acrylic acid, or amino acid. The shape and structure of the absorber can be changed as required, although an entire absorption amount of the absorber needs to correspond to a designed insertion amount and an intended purpose for use as the absorbent article. In addition, the size, absorption capacity and the like of the absorber will be changed according to its purpose.

The absorber **4** may be composed of two layers, which are an upper absorber layer and a lower absorber layer.

The upper absorber layer may be made of a hydrophilic sheet and a super-absorbent polymer. The hydrophilic sheet is a sheet having hydrophilic properties, which is made of a nonwoven fabric, a porous plastic sheet, or the like. In the case of a nonwoven fabric, a porous plastic sheet, or the like, hydrophilic treatment is performed as required. Examples of the nonwoven fabric to be used include spunlaced, spunbonded, thermobonded, meltblown, needlepunched, and air-through nonwoven fabrics.

Examples of material fiber forming the nonwoven fabric include polyolefin-based synthetic fibers such as polyethylene or polypropylene, polyester-based synthetic fibers, and polyamide-based synthetic fibers, as well as regenerated fibers such as rayon and cupra, and natural fibers such as cotton. The upper absorber layer is formed in a sheet form by distributing a super-absorbent polymer in a predetermined pattern on one side of a hydrophilic sheet, laminating another hydrophilic sheet thereon in a manner to sandwich the super-absorbent polymer, and bonding them by using a bonding means (such as a heat seal using hot-melt adhesive) at points where the super-absorbent polymer is not distributed. The super-absorbent polymer is preferably fixed to the hydrophilic sheet by an adhesive agent such as a hot-melt adhesive, although the polymer can be present as it is as a crushed substance, without being fixed, while being covered with the hydrophilic sheet. The hydrophilic sheet sandwiching the super-absorbent polymer may be

formed by folding back a single hydrophilic sheet and bonding together or by sandwiching a super-absorbent polymer between two hydrophilic sheets whose upper and lower sheets are the same or different and bonding them together. As a configuration of the upper absorber layer, an end portion and an edge of the hydrophilic sheet may be formed by folding them back toward the center of the sheet. Even if body pressure is excessively applied after absorption, folding them back eliminates a risk that the super-absorbent polymer becomes swollen and can burst out from the upper absorber layer, and folding back the end portion creates an effect of increasing the basis weight of a sheet material to further increase compression recovery properties. The lower absorber layer can be made of an absorbent material suitable for use as an absorber main body in absorbent articles such as incontinence pads, sanitary napkins, and disposable diapers. A typical absorbent material includes a mixture of an absorbent fiber and a super-absorbent polymer.

Bonding points between the wings **7** and the absorbent main body **5** are not specifically limited. For example, the wings **7** may be bonded by being sandwiched between the top sheet **2** and the back sheet **3** or may be bonded to the backside of the absorbent main body **5**, namely, to an exposed surface of the back sheet **3**. When the back sheet **3** includes a non-woven fabric to which the wings **7** are bonded, the non-woven fabric preferably has fiber alignment orthogonal to the fiber alignment in the nonwoven fabric forming the wings, thereby increasing the bonding strength. Preferably, as shown in Fig. 3, the wings **7** are bonded to a side of the back sheet opposing the top sheet. Since the bonding side is the side of the back sheet **3** opposing a skin surface, a side of the back sheet **3** facing the undergarment can be maintained in a smooth condition. Therefore, the fixing adhesive portion can be stably arranged on the back sheet **3**. Thus, the

fixing adhesive agent hardly transfers to the undergarment.

The shape of the wings is not specifically limited. Examples of the shape of the wings include a rectangle, a trapezoid, a reversed trapezoid, a semi-circle, a semi-ellipse, and a Ω shape. Among them, preferable is a shape in which roots of the wings are constricted. Herein, the roots of the wings refer to portions near side edges of the absorbent main body. Preferably, a size of the portion of the wing near the side edge of the absorbent main body in the longitudinal direction Y of the absorbent main body is smaller than a size of a portion of the wing distant from the side edge of the absorbent main body in the longitudinal direction Y of the absorbent main body. By forming the wings into such a shape, the wings can be wrapped around the crotch portion of the undergarment, with less deformation. As a result, no deflection occurs at wrapping portions, thus leading to the reduction of discomfort.

Fig. 4 shows one example of a wing whose root is constricted. The shape shown in Fig. 4 is formed by rounding off the corners of a figure obtained from two different-sized rectangles connected by an isosceles trapezoid. Although sizes of respective portions of the shape depend also on an entire size of the absorbent article, L_2 is preferably 30 to 100 mm, and more preferably 40 to 90 mm. L_3 is preferably 40 to 90% of L_2 , and more preferably 50 to 80% of L_2 .

W_2 is preferably 5 to 55 mm, and more preferably 20 to 40 mm. W_3 is preferably 10 to 60% of W_2 , and more preferably 20 to 50% of W_2 . W_4 is preferably 1 to 50% of W_2 , and more preferably 5 to 30% of W_2 . W_5 is preferably 30 to 80% of W_2 , and more preferably 40 to 70% of W_2 .

Radius of curvature R_1 is preferably 1 to 30 mm, and more preferably 2 to 15 mm. Radius of curvature R_2 is preferably 1 to 30 mm, and more preferably 2 to 15 mm. Radius of curvature R_3 is preferably 1 to 30 mm, and more

preferably 2 to 15 mm.

In a specific example of the wing shape as shown in Fig. 4, L_2 is 80 mm; L_3 is 55 mm; W_2 is 32.5 mm; W_3 is 10 mm; W_4 is 7 mm; W_5 is 15.5 mm; R_1 is 7.5 mm; R_2 is 7.5 mm; and R_3 is 5 mm.

The shape of the absorbent main body **5** is not specifically limited as long as it is a shape conforming to the shapes of the human body and/or undergarment, and may be rectangular, elliptic, gourd-like, or the like. Its total outline size is in one specific embodiment, in the longitudinal direction, preferably 100 to 500 mm and more preferably 150 to 350 mm, and in the transverse direction, preferably 30 to 200 mm and more preferably 40 to 180 mm.

The absorbent article can be manufactured by stacking a piece of a nonwoven fabric for the wings, an absorber, and a nonwoven fabric for the top sheet successively on a nonwoven fabric for the back sheet, wherein the piece of a nonwoven fabric for the wings is stacked such that fiber alignment in the wing may be in a transverse direction, and the nonwoven fabric for the top sheet is stacked such that fiber alignment in the top sheet may be in a longitudinal direction. The wings may be bonded to the back sheet via an adhesive, and the top sheet also may be bonded to the back sheet via an adhesive. The method for the absorbent article is not limited to the above method.

The present invention is also defined by way of the following non-limiting features U1 to U16, which are not specific to the detailed embodiments described above.

U1. An absorbent article, comprising:
an absorbent main body, and
a pair of wings extending from both side edges of the absorbent main body,
wherein

the absorbent main body comprises a fluid-permeable top sheet, a fluid-impermeable back sheet, and a fluid-retaining absorber interposed between the top sheet and the back sheet;

5 the top sheet and the wings are made of separate nonwoven fabrics; and

 fiber alignment in the top sheet is in a longitudinal direction of the absorbent main body, whereas fiber alignment in the wings is in a transverse
10 direction of the absorbent main body.

U2. The absorbent article according to U1, further comprising a plurality of streaks of fixing adhesive portions on a backside of the absorbent main body and a
15 backside of each wing, respectively,

 wherein

 an extension direction of the plurality of streaks of the fixing adhesive portions provided on the backside of the absorbent main body coincides with the direction
20 of the fiber alignment in the top sheet, and

 an extension direction of the plurality of streaks of the fixing adhesive portions provided on the backside of each wing coincides with the direction of the fiber alignment in the wing.

25

U3. The absorbent article according to U1, wherein the pair of wings is made of a one-piece nonwoven fabric.

U4. The absorbent article according to U1, wherein
30 the nonwoven fabric forming the wings has a basis weight of 15 to 40 g/m².

U5. The absorbent article according to U1, wherein
35 the wings are bonded to a side of the back sheet opposing the top sheet.

U6. The absorbent article according to U1, wherein

roots of the wings are constricted.

U7. The absorbent article according to U1, wherein the absorbent article is a mild incontinence pad.

5

U8. The absorbent article according to U1, further comprising a fixing adhesive portion on a backside of the absorbent main body and a backside of each wing, respectively,

10

wherein

an extension direction of the fixing adhesive portion on the backside of the absorbent main body coincides with the direction of the fiber alignment in the top sheet, and

15

an extension direction of the fixing adhesive portion on the backside of each wing coincides with the direction of the fiber alignment in the wing.

20

U9. An absorbent article, comprising:

an absorbent main body, and

a pair of wings extending from both side edges of the absorbent main body,

wherein

25

the absorbent main body comprises a fluid-permeable top sheet, a fluid-impermeable back sheet, and a fluid-retaining absorber interposed between the top sheet and the back sheet;

the wings are made of a nonwoven fabric; and

30

fiber alignment in the wings is in a transverse direction of the absorbent main body.

35

U10. The absorbent article according to U9, further comprising a fixing adhesive portion on a backside of the absorbent main body and a backside of each wing, respectively,

wherein an extension direction of the fixing adhesive portion on the backside of each wing coincides

with the direction of the fiber alignment in the wing.

U11. The absorbent article according to U10, wherein
an extension direction of the fixing adhesive portion on
the backside of the absorbent main body is in the
longitudinal direction of the absorbent main body.

U12. The absorbent article according to U10, wherein
the fixing adhesive portion on the backside of each wing
includes a plurality of streaks of fixing adhesive with
the extension direction coincident with the direction of
the fiber alignment in the wing.

U13. The absorbent article according to U9, wherein
the pair of wings is made of a one-piece nonwoven fabric.

U14. The absorbent article according to U9, wherein
the nonwoven fabric forming the wings has a basis weight
of 15 to 40 g/m².

U15. The absorbent article according to U9, wherein
the wings are bonded to a side of the back sheet opposing
the top sheet.

U16. The absorbent article according to U15, wherein
the side of the back sheet opposing the top sheet
includes a non-woven fabric having fiber alignment in a
longitudinal direction of the absorbent main body.

U17. The absorbent article according to U10, wherein
roots of the wings are constricted.

U18. The absorbent article according to U9, wherein
the absorbent article is a mild incontinence pad.

C1. An absorbent article comprising an absorbent
main body and a pair of wings extending from both side

edges of the absorbent main body, wherein the absorbent main body comprises a fluid-permeable top sheet, a fluid-impermeable back sheet, and a fluid-retaining absorber interposed between the top sheet and the back sheet, characterized in that the top sheet and the wings are made of separate nonwoven fabrics; and fiber alignment in the top sheet is in a longitudinal direction of the absorbent main body, whereas fiber alignment in the wings is in a transverse direction of the absorbent main body.

C2. The absorbent article according to C1, wherein the wings are configured as a separate body from the absorbent main body.

C3. The absorbent article according to C1, wherein, on a backside of the absorbent main body and a backside of each wing, respectively, are provided a plurality of streaks of fixing adhesive portions; and an extension direction of the plurality of streaks of the fixing adhesive portions provided on the backside of the absorbent main body coincides with the direction of the fiber alignment in the top sheet, whereas an extension direction of the plurality of streaks of the fixing adhesive portions provided on the backside of the wing coincides with the direction of the fiber alignment in the wing.

C4. The absorbent article according to C1 or C3, wherein the pair of wings is made of a one-piece nonwoven fabric.

C5. The absorbent article according to C1 or C3, wherein the pair of wings comprises discontinuously separate members.

C6. The absorbent article according to any one of C1 to C4, wherein the nonwoven fabric forming the wings

has a basis weight of 15 to 40 g/m².

5 C7. The absorbent article according to C6, wherein the nonwoven fabric forming the wings has a basis weight of 20 to 35 g/m².

10 C8. The absorbent article according to any one of C1 to C7, wherein the wings are bonded to a side of the back sheet opposing the top sheet.

C9. The absorbent article according to any one of C1 to C7, wherein the wings are bonded by being sandwiched between the top sheet and the back sheet.

15 C10. The absorbent article according to any one of C1 to C7, wherein the back sheet includes a non-woven fabric to which the wings are bonded, the non-woven fabric of the back sheet has fiber alignment orthogonal to the fiber alignment in the nonwoven fabric forming the
20 wings.

C11. The absorbent article according to any one of C1 to C8, wherein roots of the wings are constricted.

25 C12. The absorbent article according to any one of C1 to C11, wherein the absorbent article is a mild incontinence pad.

30 C13. A method for manufacturing an absorbent article, comprising a step for stacking a piece of a nonwoven fabric for a pair of wings, an absorber, and a nonwoven fabric for a top sheet successively on a nonwoven fabric for a back sheet, wherein the nonwoven fabric for the wings is stacked such that fiber alignment
35 in the wings is in a transverse direction of the absorbent article, and the nonwoven fabric for the top sheet is stacked such that fiber alignment in the top

sheet is in a longitudinal direction of the absorbent article.

INDUSTRIAL APPLICABILITY

5 The absorbent article according to some embodiments of the present invention can be used as an incontinence pad, a sanitary napkin, a panty liner, and the like, and in particular can be suitably used as a mild incontinence pad. Mild incontinence pads are often used for longer
10 hours compared to sanitary napkins and are thus configured based on long hours of use. The absorbent article in accordance with some embodiments of the present invention can be stably fixed to the undergarment for long hours, and therefore is particularly useful as a
15 mild incontinence pad.

 This application claims the benefit of Japanese Application No. 2011-020146 the entire disclosure of which is incorporated by reference herein.

20

REFERENCE SIGNS LIST

1. Absorbent article
2. Top sheet
3. Back sheet
- 25 4. Absorber
5. Absorbent main body
6. Side edge of absorbent main body
7. Wing

CLAIMS

1. An absorbent article comprising an absorbent main body and a pair of wings extending from both side edges of the absorbent main body, wherein the absorbent
5 main body comprises a fluid-permeable top sheet, a fluid-impermeable back sheet, and a fluid-retaining absorber interposed between the top sheet and the back sheet, characterized in that the top sheet and the wings are made of separate nonwoven fabrics; and fiber alignment in
10 the top sheet is in a longitudinal direction of the absorbent main body, whereas fiber alignment in the wings is in a transverse direction of the absorbent main body.

2. The absorbent article according to claim 1, wherein, on a backside of the absorbent main body and a
15 backside of each wing, respectively, are provided a plurality of streaks of fixing adhesive portions; and an extension direction of the plurality of streaks of the fixing adhesive portions provided on the backside of the absorbent main body coincides with the direction of the
20 fiber alignment in the top sheet, whereas an extension direction of the plurality of streaks of the fixing adhesive portions provided on the backside of the wing coincides with the direction of the fiber alignment in the wing.

25 3. The absorbent article according to claim 1 or 2, wherein the pair of wings is made of a one-piece nonwoven fabric.

4. The absorbent article according to any one of claims 1 to 3, wherein the nonwoven fabric forming the
30 wings has a basis weight of 15 to 40 g/m².

5. The absorbent article according to claim 4, wherein the nonwoven fabric forming the wings has a basis weight of 20 to 35 g/m².

6. The absorbent article according to any one of
35 claims 1 to 5, wherein the wings are bonded to a side of the back sheet opposing the top sheet.

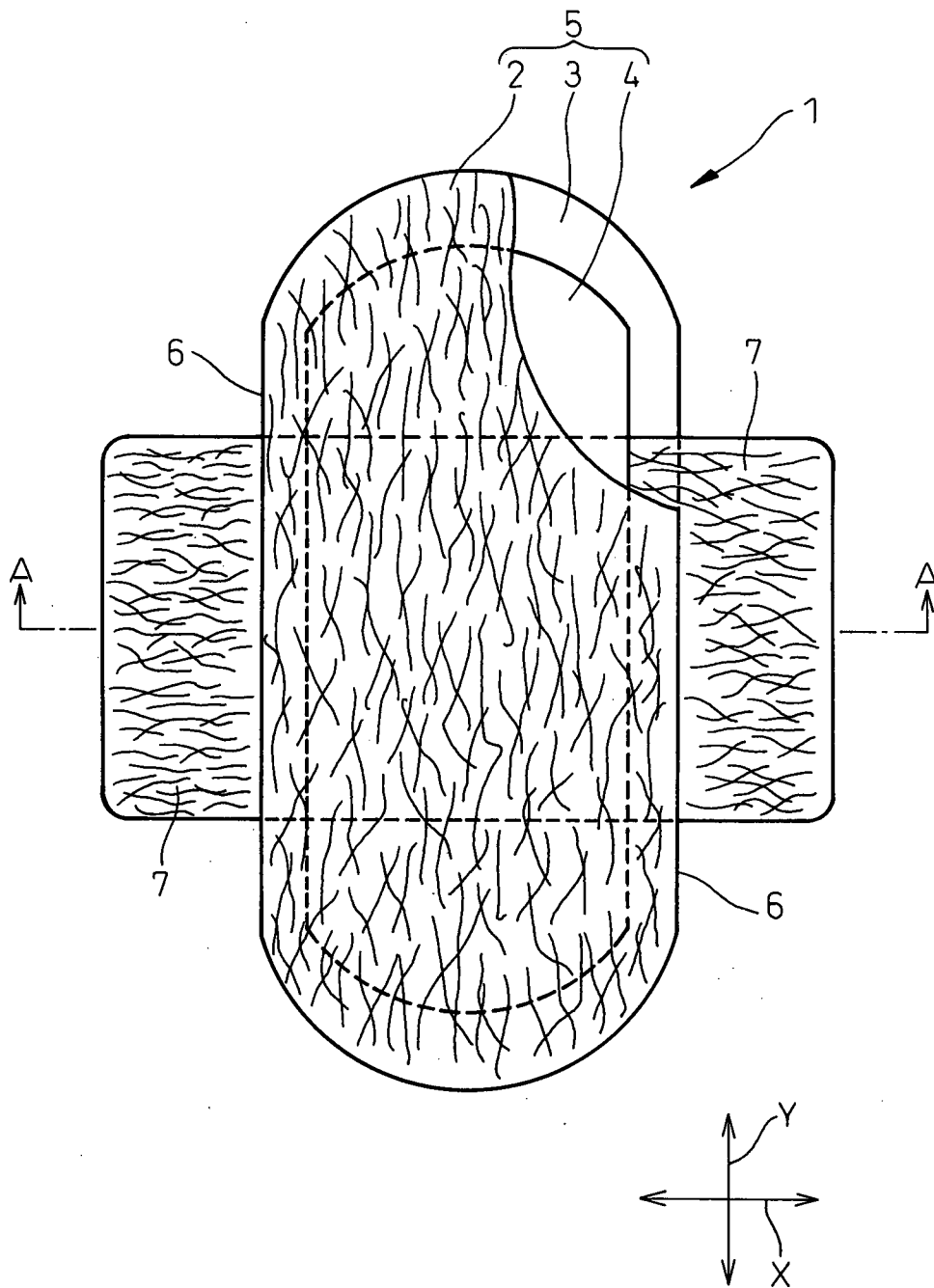
7. The absorbent article according to any one of

claims 1 to 6, wherein roots of the wings are constricted.

8. The absorbent article according to any one of claims 1 to 7, wherein the absorbent article is a mild
5 incontinence pad.

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Fig. 1



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Fig.2

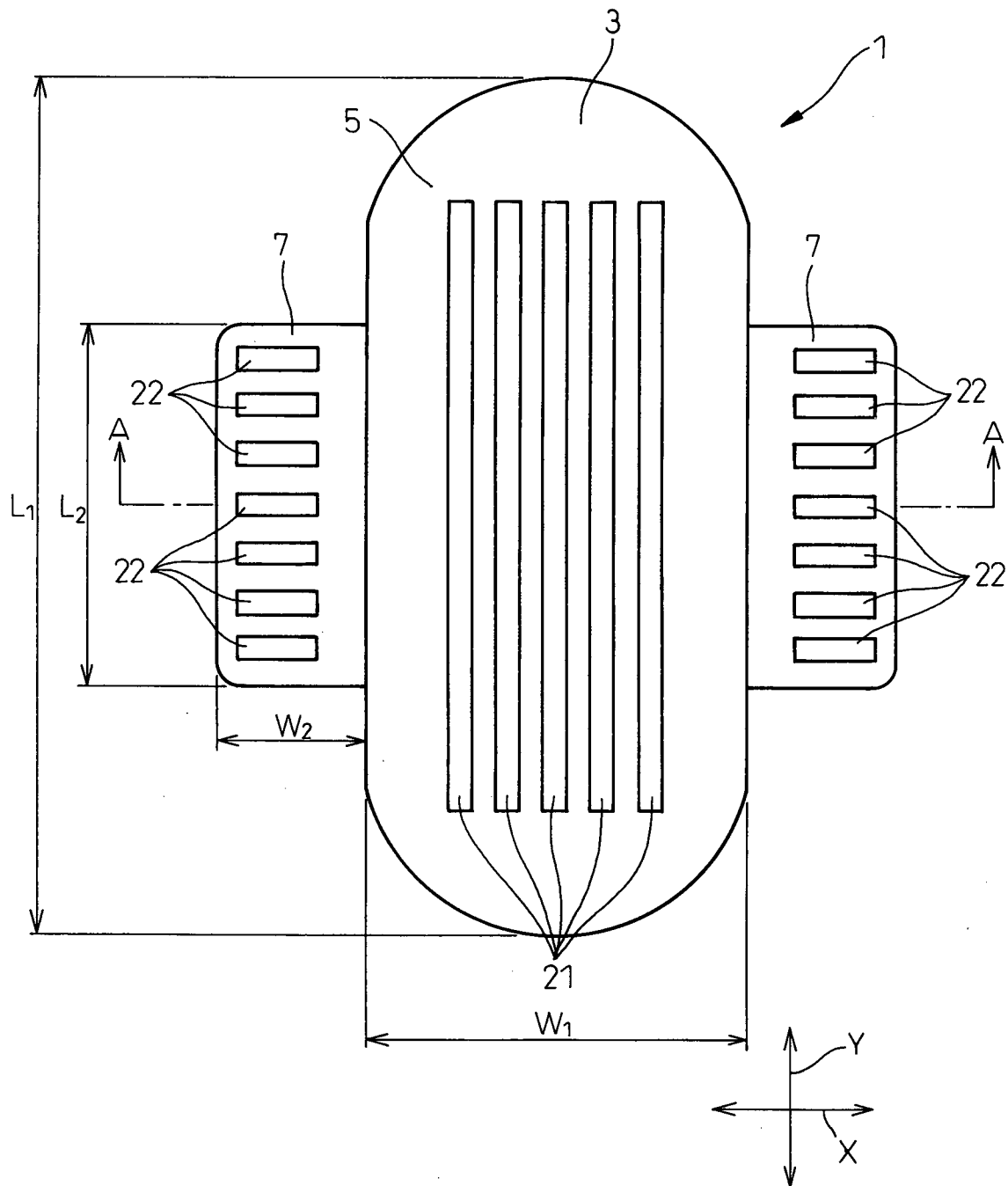
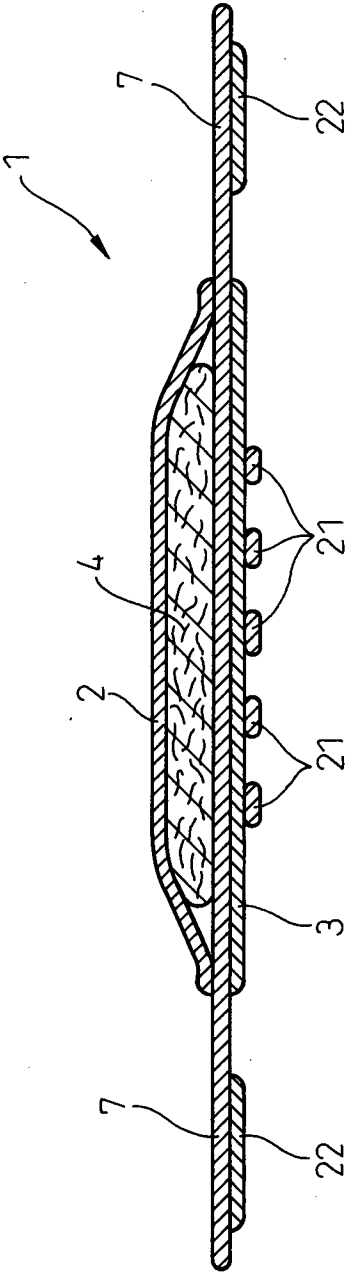
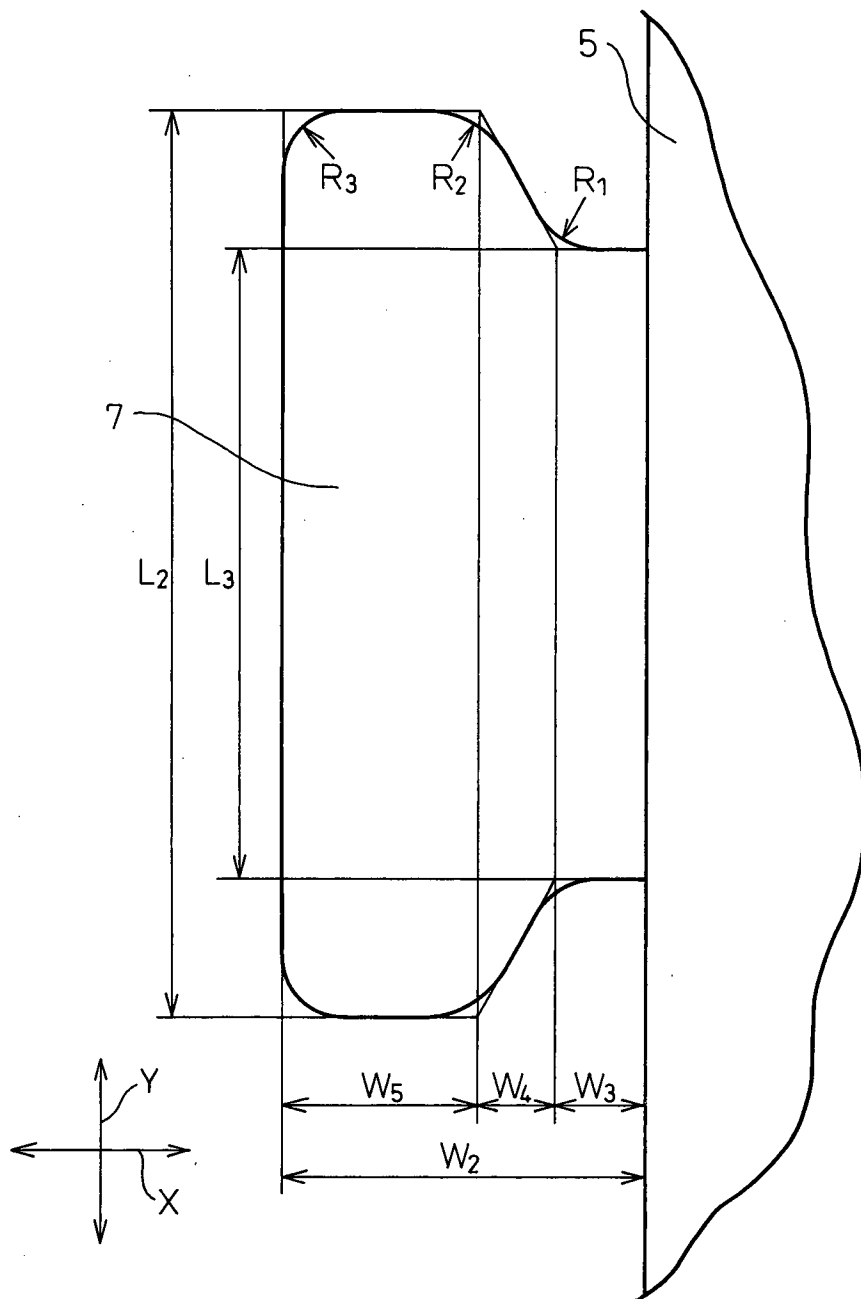


Fig.3



L_4/L_4

Fig.4



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2012/051908

A. CLASSIFICATION OF SUBJECT MATTER

Int.Cl. A61F13/15 (2006.01) i, A61F13/472 (2006.01) i, A61F13/511 (2006.01) i,
A61F13/56 (2006.01) i

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Int.Cl. A61F13/15, A61F13/472, A61F13/511, A61F13/56

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 1971-2012
Registered utility model specifications of Japan 1996-2012
Published registered utility model applications of Japan 1994-2012

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 2007-521932 A (THE PROCTER & GAMBLE COMPANY) 2007.08.09, Whole sentence & US 2005/0182378 A1 & EP 1771137 A & WO 2005/079723 A1 & CN 1917841 A	1 - 8
A	JP 4372628 B2 (Kao Corporation) 2009.11.25, Whole sentence & KR 10-2005-0008509 A & CN 1575786 A	1 - 8
A	JP 2010-188142 A (Daio Paper Corporation) 2010.09.02, Whole sentence (No Family)	1 - 8
A	WO 2008/146737 A1 (UNI-CHARM CORPORATION) 2008.12.04, Whole sentence & JP 2008-289658 A & US 2010/0174258 A1 & EP 2153810 A1 & CN 101677882 A	1 - 8

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

* Special categories of cited documents:

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considered to be of particular relevance

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"P" document published prior to the international filing date but later
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be considered novel or cannot be considered to involve an
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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

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