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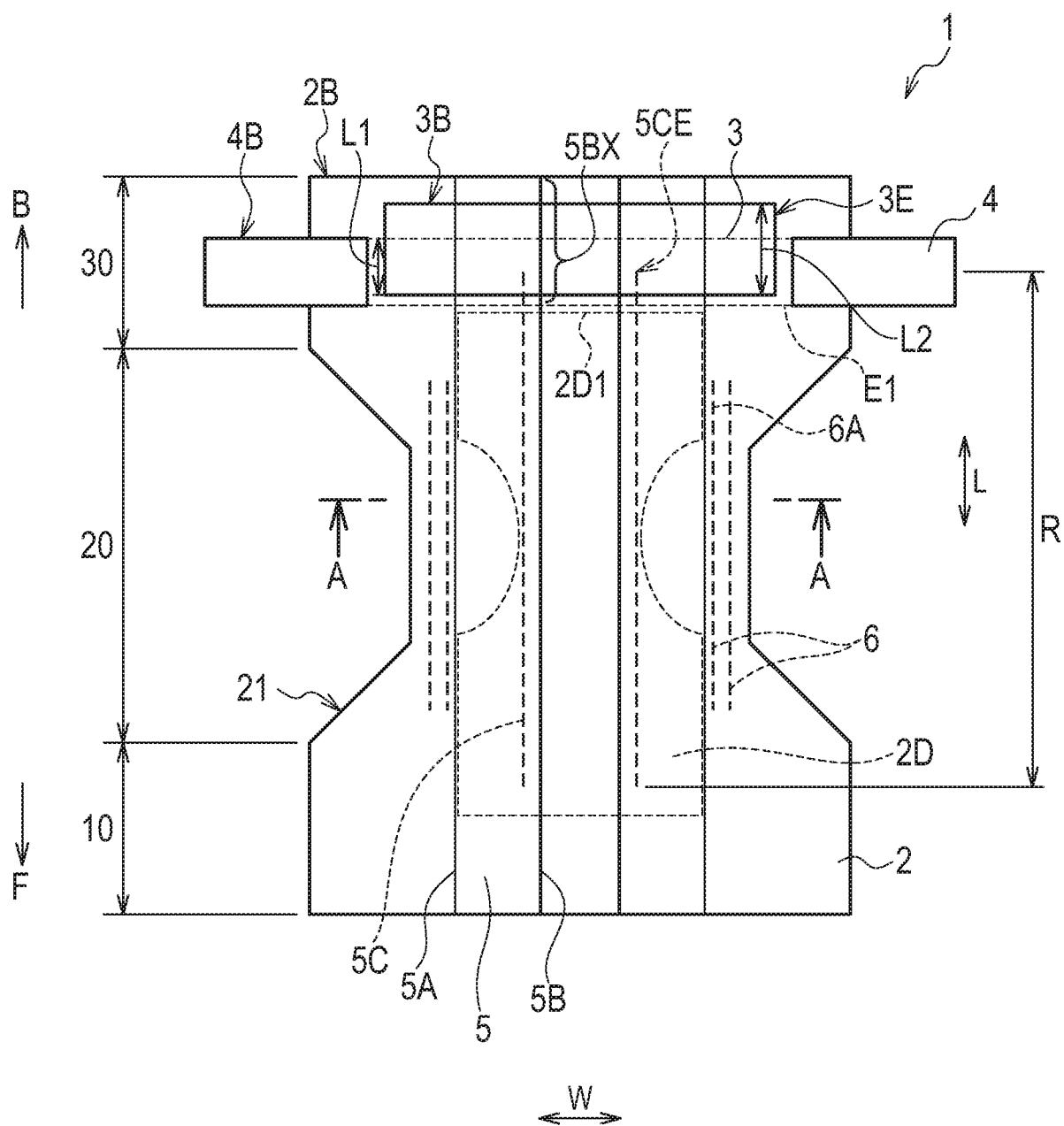
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ABSTRACT

In the disposable diaper 1 according to the embodiment, an end 4B of a dorsal side B of a fastening tape 4 is disposed at an ventral side F more significantly than an end 3B of a dorsal side B of a waist gather 3, and a range R in a product longitudinal direction L in which an elastic member 5C provided at a free end 5B of a respective one of leg standing gathers 5 has a stretching force is provided so as to overlap with the waist gather 3.

FIG. 1



Disposable Diaper

[0001] This application claims priority from Japanese Application No. 2013-272316 filed on 27 December 2013, the contents of which are to be taken as incorporated herein by this reference.

Technical Field

[0002] The present invention relates to a disposable diaper.

Background Art

[0003] Conventionally, there has been known a disposable diaper having: one pair of side flaps which are positioned outside of both side edges of an absorber and which extends in a longitudinal direction of a product; one pair of leakage preventing leg standing gathers which extend in a longitudinal direction of the product, and which are capable of standing up, in the vicinity of both side edges of the absorber; a first region which is spaced, by a required dimension outside of the product longitudinal direction, from an end edge of the absorber to at least one of a front waistband region and a back waistband region, and which extends in a widthwise direction of the product; a second region which extends in the widthwise direction of the product between the end edge of the absorber and the first region; and a third region in which the absorber is interposed (refer to Patent Literature 1).

Summary of Invention

[0004] However, the Applicant found the following problems as to the disposable diaper set forth above.

[0005] For example, in the disposable diaper described in Patent Literature 1, an end in the longitudinal direction of the product, which is positioned in the front

waistband region or the back waistband region of one pair of leg standing gathers, is secured in the first region in a state in which these gathers are fallen down to the inside in the widthwise direction of the product.

[0006] In the disposable diaper as mentioned above, in a case where an elastic member in a respective one of the leg standing gathers is not stretched so as to overlap in the first region as set forth above; in the first region as mentioned above a stretching force of stretching inside of the longitudinal direction of the product of the elastic member becomes insufficient; the first region cannot be pulled into the third region as mentioned above, owing to shrinkage of the leg standing gathers; and therefore, there has been a problem that rising up is prone to occur with a non-skin contact surface side at the time of wearing.

[0007] Also, in the disposable diaper as mentioned above, in a case where the elastic member in a respective one of the standing gathers is stretched so as to overlap in the first region as mentioned above, there has been a problem that the first region or the second region is prone to be folded along the widthwise direction of the product.

[0008] Accordingly, the present invention has been made in view of the problems described above, and it is intended to provide a disposable diaper which hardly rises up on the non-skin contact surface side, and which is hardly folded along the widthwise direction of the product, at the time of wearing.

[0009] A first aspect of the present invention, a disposable diaper having a product longitudinal direction and a product widthwise direction which are orthogonal to each other, the product longitudinal direction having a dorsal side and a ventral side, the disposable diaper having: a back waistband region positioned at the dorsal

side; a front waistband region positioned at the ventral side; a crotch region positioned between the front waistband region and the back waistband region; and an absorber main body, the absorber main body including: a topsheet, a backsheet and an absorber which is disposed between the topsheet and the backsheet, wherein, at the dorsal side, a first elastic member which is stretchable in the product widthwise direction is provided between the topsheet and the backsheet, the first elastic member is provided so as not to overlap with the absorber, a fastening member which extends in the product widthwise direction from the back waistband region is provided, at the absorber main body, one pair of stretchable leakage preventing walls which extend along the product longitudinal direction are provided, an end of the dorsal side of the fastening member is disposed at the ventral side more than an end of the dorsal side of the first elastic member, the leakage preventing walls each have: a fixed end which extends along the product longitudinal direction so as to be outer of the product widthwise direction than the absorber; and a free end which extends along the product longitudinal direction so as to be inner of the product widthwise direction than the fixed end, the free end is bonded with the topsheet in a region of the dorsal side more than at least an end of the dorsal side of the absorber, an area in the product longitudinal direction in which a second elastic member provided at the free end has a stretching force is provided so as to overlap with the first elastic member, and an entire region in which said area is overlapped with the first elastic member is disposed at the ventral side more than the end of the dorsal side of the fastening member.

[0010] As has been described above, according to the present invention, there can be provided a disposable diaper which hardly rises up at the non-skin contact surface side, and which is hardly folded in the widthwise direction of the product, at the time of wearing.

Brief Description of Drawings

- [0011] Fig. 1 is a plan view of a case in which a disposable diaper according to a first embodiment of the present invention is seen from a skin contact surface side.
- [0012] Fig. 2 is a sectional view taken along the line A-A in Fig. 1.
- [0013] Fig. 3 is a view for explaining a technical effect which is achieved by the disposable diaper according to the first embodiment of the present invention.
- [0014] Fig. 4 is a view for explaining one example of a method for measuring a rigidity of an absorber in the disposable diaper according to the first embodiment of the present invention.
- [0015] Fig. 5 is a view for explaining one example of a method for measuring a rigidity of an absorber in the disposable diaper according to the first embodiment of the present invention.
- [0016] Fig. 6 is a view for explaining a state in which a region between the absorber and a waist gather stands up in the disposable diaper according to the first embodiment of the present invention.

Description of Embodiments

- [0017] With reference to Fig. 1 to Fig. 6, an absorbent article 1 according to a first embodiment of the present invention will be described.
- [0018] It is noted that in the description of the drawings below, identical or similar symbols are assigned to identical or similar portions. However, it should be noted that the drawings are schematic and ratios of respective dimensions and the like are

different from actual ones.

[0019] Therefore, a specific dimension and the like should be determined in view of the following description. Moreover, among the drawings, the respective dimensional relations or ratios may differ.

[0020] Fig. 1 shows a plan view of a case in which a disposable diaper 1 according to the embodiment is seen from a skin contact surface side; Fig. 2 shows a sectional view taken along the line A-A in the plan view shown in Fig. 1; Fig. 3 shows a view for explaining an technical effect which is achieved by the disposable diaper according to the embodiment; Fig. 4 and Fig. 5 each show a view for explaining one example of the method for measuring rigidity of an absorber 2D in the disposable diaper 1 according to the embodiment; and Fig. 6 shows a view for explaining a state in which a region between the absorber 2D and a waist gather 3 stands up in the disposable diaper 1 according to the embodiment.

[0021] As shown in Fig. 1, the disposable diaper 1 according to the present embodiment has a product longitudinal direction L and a product widthwise direction W perpendicular to each other. Further, the disposable diaper 1 according to the present embodiment has a dorsal side B and a ventral side F in the product longitudinal direction L.

[0022] Also, as shown in Fig. 2, the disposable diaper 1 according to the embodiment has an absorber main body 2 which is provided with : a topsheet (a liquid-permeable sheet) 2A; a backsheet (a liquid-impermeable sheet) 2B; a side sheet 2C which is bonded with a skin contact surface side of the topsheet 11 and which extends from the topsheet 2A to the outside of the product widthwise direction W; and an absorber 2D which is disposed between the topsheet 2A and the

backsheet 2B.

[0023] Here, the disposable diaper 1 according to the embodiment, as shown in Fig. 1, may be a structure having an exterior body (a chassis) as an absorber main body 2 or may be a 3P (Piece) structure having the absorber main body, an ventral flap, and a dorsal side flap.

[0024] For example, the topsheet 2A is not particularly limited as long as the topsheet 2A is made of a sheet-like material, such as a non-woven fabric, a woven fabric, a perforated plastic sheet, and a mesh sheet, having a structure through which liquids pass. Examples of a fiber configuring these materials include a monofilament such as polyethylene (PE), polypropylene (PP), and polyethylene terephthalate (PET); a fiber obtained through graft polymerization of polyethylene and polypropylene; and a composite fiber having, for example, a core-clad structure. For example, the topsheet 2A is a point-bonding non-woven cloth or the like of 18 g/m² in basis weight.

[0025] The backsheet 2B is made of a liquid-impermeable and moisture-permeable film, or a liquid-impermeable and moisture-impermeable film. For example, the backsheet 2B is a non-ventilation film of 16 g/m² in basis weight.

[0026] In addition, as the side sheet 14, for example, an SMS non-woven cloth of 10 g/m² to 30 g/m² in basis weight can be employed.

[0027] The absorber 2D includes a core wrap and an absorbent core that absorbs a liquid. The absorbent core includes a hydrophilic fiber and a superabsorbent polymer. Examples of the hydrophilic fibers include cellulose such as ground pulp or cotton; regenerated cellulose such as rayon or fibril rayon;

semi-synthetic cellulose such as acetate or triacetate; particulate polymers; fibrous polymers; thermoplastic hydrophobic chemical fibers; or thermoplastic hydrophobic chemical fibers that have been subjected to hydrophilic treatment. These can be used singly or mixed. Among these examples, taking into consideration low cost and ease of making into an absorber, it is preferable to use the ground pulp. A material obtained by mixing a hydrophilic fiber with a polymer absorber may be used.

[0028] It is noted that the absorbent core is wrapped by the core wrap. For example, as the core wrap, various types of fibrous non-woven fabric or a tissue sheet having a permeability in at least a part of the skin contact surface side may be used, e.g., an air-through non-woven cloth, a spun bond non-woven cloth, an SMS non-woven cloth, and a tissue sheet having a basis weight of 10 to 30 g/m².

[0029] Here, as illustrated in Fig. 1, the absorber main body 2 has a front waistband region 10, a back waistband region 30, and the crotch region 20 positioned between the front waistband region 10 and the back waistband region 30.

[0030] The front waistband region 10 is assumed to be in contact with the stomach of the wearer, the crotch region 20 is assumed to be in contact with the crotch of the wearer, and the back waistband region 30 is assumed to be in contact with the back of the wearer.

[0031] In the disposable diaper 1 according to the embodiment, for example, as shown in Fig. 1, it may be that: the crotch region 20 is a region in which a leg-line opening unit 21 is formed at the absorber main body 2; the front waistband region 10 is a region which is present at the ventral side F more significantly than the crotch region 20; and the back waistband region 30 is a region which is present at the

dorsal side B more significantly than the crotch region 20.

[0032] In addition, in the disposable diaper 1 having the 3P structure, for example, it may be that: the front waistband region 10 is a region between an end of the dorsal side B and an end of an ventral side F of an ventral side flap; and the back waistband region 30 is a region between an end of the dorsal side B and an end of the ventral side F of a dorsal side flap.

[0033] As shown in Fig. 1, in the disposable diaper 1 according to the embodiment, in the back waistband region 30, a waist gather (or a first elastic member) 3 which is stretchable in the product widthwise direction W is provided between the topsheet 2A and the backsheet 2B.

[0034] As a material for the waist gather 3, there may be employed: a film stretching member such as a polyurethane film or a polystyrene film; or alternatively, a sheet-shaped stretching member or a stretchable non-woven cloth or the like which is composed of a styrene-based rubber, an olefin-based rubber, or an urethane-based rubber or the like and a non-woven cloth or paper or the like.

[0035] Here, in the waist gather 3, a film stretching member, a sheet-shaped stretching member, or a stretchable non-woven cloth or the like is employed in place of a material having a strong rigidity such as an urethane foam or a polystyrene foam, thereby making it possible to provide a disposable diaper 1 having a low rigidity, a good skin touch sense, and an excellent stretchability and a fitting property thereof.

[0036] For example, it is preferable that the stiffness in the product widthwise direction W of the waist gather 3 be 70 mm or less. According to the structure as

mentioned above, there can be attained an advantageous effect that the waist gather 3 is prone to rise up.

[0037] Here, the stiffness in the product widthwise direction W of the waist gather 3 can be measured by the following measurement method.

[0038] First, a test piece of 25 mm (a product longitudinal direction L) x 15 mm (a product widthwise direction W) is cut out from the waist gather 3.

[0039] Second, the test piece is sandwiched under a pressing plate of a cantilever (DAIEI KAGAKU SEIKI MFG/CAN-IMCA) with a top of the test piece being faced up, the test piece is caused to run in a direction of an inclined face (at a speed of 5 mm per second), and a movement distance is automatically measured.

[0040] Third, the test piece is sandwiched under a pressing plate of a cantilever (DAIEI KAGAKU SEIKI MFG/CAN-IMCA) with a bottom of the test piece being faced up, the test piece is caused to run in a direction of an inclined face (at a speed of 5 mm per second), and a movement distance is automatically measured.

[0041] Fourth, the stiffness (mm) is computed by the formula, i.e., ((a movement distance in a case where the top of the test piece is faced up) + (a movement distance in a case where the bottom of the test piece is faced up)) / 2.

[0042] In addition, as shown in Fig. 1, in the disposable diaper 1 according to the embodiment, a fastening tape (or a fastening member) 4 which extends from the back waistband region 30 in the product widthwise direction W is provided. Here, at a non-skin contact surface side of the front waistband region 10 of the absorber main body 2, a target tape which is capable of being engagingly fitted to the

fastening tape 4 may be provided (not shown).

[0043] For example, the fastening tape 4 is a male member of a so-called hook-and-loop fastener and the target tape is a female member thereof.

[0044] An engaging face having a projection group including a plurality of hook-shaped projections (referred to as hooks) is formed on the fastening tape 4. Examples of the material of the fastening tape 4 include PPSB (polypropylene spunbond non-woven fabric). It is preferable to use PPSB having a basis weight of 50 to 100 g/m², for example. It is preferable that a basis weight of the hooks is 50 to 100 g/m².

[0045] The target tape with which the fastening tape 4 is engaged is a non-woven fabric or a knitted fabric with which the hooks can engage. As a fiber material constituting the non-woven fabric, a composite fiber with a core-clad structure is used. Examples of a combination of a core component/a clad component for the fiber material include PP (polypropylene)/PE (polyethylene); PP/low-melting point PP; PET (polyethylene terephthalate)/low-melting point PET; or PET/PE. A fiber such as rayon, PET, PP, polyamide such as nylon, acrylic, urethane, and cotton may be mixed with the fiber material.

[0046] Further, as shown in Fig. 1, in the disposable diaper 1 according to the embodiment, at the absorber main body 2, one pair of leg standing gathers (which are also referred to as a leakage preventing wall, a solid gather, a leakage preventing cuff, or a leg side gather or the like) 5 which extend along the product longitudinal direction L are provided.

[0047] The leg standing gathers 5 each have: a fixed end 5A which extends along the product longitudinal direction L so as to be outer in the product widthwise direction W than the absorber 2D; and a free end 5B which extends in the product longitudinal direction L so as to be inner in the product widthwise direction than the fixed end 5A.

[0048] It is noted that, in the disposable diaper 1 according to the embodiment, at the absorber main body 2, one pair of leg gathers 6 are disposed so as to extend into the front waistband region 10 and the back waistband region 30 across the crotch region 20.

[0049] Here, the leg gathers 6 each are disposed so as to be outer in the product widthwise direction W than the fixed end 5A of a respective one of the leg standing gathers 5. For example, a respective one of one pair of the leg gathers 6 may be composed of two rubbers of 620 dtex. For example, the leg gathers 6 each may be composed of a yarn-shaped, string-shape, net-shaped, or flat-die shaped material such as a natural rubber, a synthetic rubber, or urethane or the like.

[0050] As shown in Fig. 1, in the disposable diaper 1 according to the embodiment, an end 4B of the dorsal side B of the fastening tape 4 is disposed at the ventral side F more significantly than an end 3B of the dorsal side B of the waist gather 3.

[0051] A range (an effective length range) R in the product longitudinal direction L in which an elastic member (or a second elastic member) 5C provided at the free end 5A of a respective one of the leg standing gathers 5 has a shrinking force is provided so as to arrive at a site leading up to the waist gather 3.

[0052] According to the structure as mentioned above, the elastic member 5 shrinks, whereby the leg standing gathers 5 each rise up to the inside of the product longitudinal direction L. At this juncture, as shown in Fig. 3, at the leg standing gathers 5, a stretching force F1 acts upon the inside of the product longitudinal direction L, owing to the shrinkage of the elastic member 5C.

[0053] Therefore, the elastic member 5C and the waist gather 3 are overlapped with each other in the product longitudinal direction L, whereby, at the waist gather 3 as well, a shrinking force to act upon the inside of the product longitudinal direction L takes place, and the waist gather 3 is prone to fall down to the inside of the product longitudinal direction L, thus making it possible to avoid a circumstance that rising up occurs at a non-skin contact surface side.

[0054] A stretching force F2 to act upon the outside of the product widthwise direction W in the waist gather 3 may be structured so as to be larger than the stretching force F1 to act upon the inside of the product longitudinal direction L by the elastic member 5C.

[0055] Specifically, the stretching force F2 to act upon the outside of the product widthwise direction W in the waist gather 3 may be structured so as to be larger than a total of the stretching force F1 to act upon the inside of the product longitudinal direction L by the elastic member 5C of a respective one of one pair of leg standing gathers 5.

[0056] According to the structure as mentioned above, in a state in which the disposable diaper 1 according to the embodiment is worn, as shown in Fig. 3, a force to act upon a lower direction with respect to the disposable diaper 1 by the elastic member 5C of a respective one of one pair of leg standing gathers 5 acts,

and the disposable diaper 1 is prone to be displaced downward.

[0057] On the other hand, when the disposable diaper 1 according to the embodiment is worn by a wearer, the fastening tape 4 is pulled to the outside of the product widthwise direction W that is a direction perpendicular to a direction in which the stretching force F1 acts, whereby, at the waist gather 3, the stretching force F2 acts upon the outside of the product widthwise direction W.

[0058] At this juncture, the stretching force F2 to act upon the outside of the product widthwise direction W in the waist gather 3 is made larger than the stretching force F1 to act upon the inside of the product longitudinal direction L by the elastic member 5C of a respective one of the leg standing gathers 5, whereby the stretching force F2 acts so as to oppose to a force to downward displace the disposable diaper 1 by the elastic member 5C, making it possible to avoid a circumstance that the disposable diaper 1 is displaced downward.

[0059] For example, the stretching force F1 as set forth above can be measured by the following measurement method.

[0060] First, an adhesive agent of a region 5BX in which the free end 5B of a respective one of the leg standing gathers 5 is fixed is stripped, and the leg standing gathers 5 are cut out from the disposable diaper 1.

[0061] Second, by employing a pulling testing instrument “Instron model”, a portion of 10 mm from an end of the outside of the product longitudinal direction L of a respective one of the leg standing gathers 5 having been cut out is pinched, and a cycle test is performed.

[0062] It is noted that, as a testing condition, a cycle mode is “2 cycles”, a pulling speed is “100 mm per minute”, an inversion distance is “93%”, and an expansion at the time of intermediate stretching is “82%”.

[0063] Third, as the stretching force F1 (unit: N) as set forth above, a maximum load (an inversion distance) of a second cycle and the forward and backward loads at an intermediate point are measured.

[0064] In addition, the stretching force F2 as set forth above can be measured by the following measurement method.

[0065] First, by employing a pulling testing instrument “Instron model”, a portion of 10 mm from an end of the outside of the product widthwise direction of the back waistband region 30 is pinched, and a cycle test is carried out.

[0066] It is noted that, as a testing condition, a cycle mode is “2 cycles”, a pulling speed is “100 mm per minute”, an inversion distance is “91.5%”, and an expansion at the time of intermediate stretching is “80%”.

[0067] Second, as the stretching force F2 (unit: N) as set forth above, a maximum load (an inversion distance) of a second cycle and the forward and backward loads at an intermediate point are measured.

[0068] A region in which the elastic member 5C and the waist gather 3 overlap with each other may be disposed at the ventral side F more significantly than the end 4B of the dorsal side B of the fastening tape 4.

[0069] That is, an end 5CE of the dorsal side B of the elastic member 5C may be disposed at the ventral side F more significantly than the end 4B of the dorsal side B of the fastening tape 4.

[0070] According to the structure as mentioned above, when the fastening tape 4 is pulled, a stretching force to act upon the outside of the product widthwise direction W stably acts upon a portion (L1) which overlaps with the waist gather 3 and thus the elastic member 5C is disposed within a range of that portion, thereby making it possible to prevent a circumstance that a range from the region in which the elastic member 5C and the waist gather 3 overlap with each other up to the end 2B of the dorsal side B is folded to the inside of the product widthwise direction W by the stretching force of the elastic member 5C.

[0071] A length L1 in the product longitudinal direction L of the region in which the fastening tape 4 and the waist gather 3 overlap with each other may be structured so as to be larger than a length which is 1/3 of a length L2 in the product longitudinal direction L of the waist gather 3 (further preferably, a length which is half of the length L2 in the product longitudinal direction L of the waist gather 3).

[0072] According to the structure as mentioned above, when the disposable diaper 1 is worn by a wearer, a stretching force which is produced by pulling the fastening tape 4 to the outside of the product widthwise direction W appropriately acts upon the waist gather 3, making it possible to prevent twisting of the end of the outside of the product widthwise direction W of the back waistband region 30.

[0073] Also, according to the structure as mentioned above, with respect to the waist gather 3, the stretching force F1 to act upon the inside of the product longitudinal direction L by the elastic member 5C and the stretching force F2 to act

upon the outside of the product widthwise direction W by the fastening tape 4 acts simultaneously, thereby making it possible to avoid an occurrence of either of folding of the outside of the product longitudinal direction L of the waist gather 3 and folding of the inside of the product widthwise direction W.

[0074] The waist gather 3 may be structured so as not to overlap with the absorber 2D. According to the structure as mentioned above, a stretching force to act upon the outside of the product widthwise direction W of the waist gather 3 is not weakened by the rigidity of the absorber 2D, and an essential stretching force which is owned by the waist gather 3 can be attained to the maximum.

[0075] In addition, the end 3B of the dorsal side B of the waist gather 3 may be structured so as to arrive at a site leading up to the end 2B of the dorsal side B of the absorber main body 2.

[0076] Alternatively, the end 3B of the dorsal side B of the waist gather 3 and the end 2B of the dorsal side B of the absorber main body 2 may be spaced from each other at predetermined intervals. For example, it is preferable that the predetermined intervals be 15 mm or less.

[0077] According to the structure as mentioned above, a distance between the end 3B of the dorsal side B of the waist gather 3 and the end 2B of the dorsal side B of the absorber main body 2 is made as short as possible, thereby making it possible to restrain generation in rigidity difference between the region between the end 3B of the dorsal side B of the waist gather 3 and the end 2B of the dorsal side B of the absorber main body 2 and the waist gather 3.

[0078] Also, the waist gather 3 may be structured so as to overlap with the fastening tape 4.

[0079] Alternatively, an end 3E of the outside of the product widthwise direction W of the waist gather 3 is provided so as to be disposed to be outer in product widthwise direction W than a leg gather 6A which is the innermost in product widthwise direction W.

[0080] According to the structure as mentioned above, as shown in Fig. 3, the stretching force F2 in the product widthwise direction W, that is generated when a wearing assistant pulls the fastening tape 4, is prone to be directly conveyed to the waist gather 3.

[0081] In addition, according to the structure as mentioned above, in the back waistband region 30, the waist gather 3 is provided so as to overlap on an extension line of the product longitudinal direction L of the leg gather 6, and thus, as shown in Fig. 3, a stretching force F3 for the leg gather 3 to shrink to the inside of the product longitudinal direction L acts upon an end 3E of the outside of the product widthwise direction W of the waist gather 6, making it possible to restrain a circumstance that the waist gather 6 is folded to the outside of the product widthwise direction W.

[0082] A region 5BX in which a free end 5B of a respective one of the leg standing gathers 5 is fixed may be structured so as to arrive at least a site leading up to an end 3F of the ventral side F of the waist gather 3 from the end 2B of the outside of the product longitudinal direction L of the absorber main body 2 in the back waistband region 30.

[0083] Here, it is preferable that the region 5BX in which the free end 5B of a respective one of the leg standing gathers 5 is fixed be provided so as to arrive at a site leading up to the region between the waist gather 3 in the product longitudinal direction L and the absorber 2D from the end 2B of the outside of the product longitudinal direction L of the absorber main body 2 in the back waistband region 30.

[0084] According to the structure as mentioned above, a certain degree of rigidity can be imparted to the waist gather 3 by the region 5BX and thus the waist gather 3 is prone to be shrunk in the product widthwise direction L by the stretching force F1 to act upon the inside of the product longitudinal direction L by the elastic member 5C, making it possible to avoid a circumstance that a wrinkle occurs with the waist gather 3.

[0085] It is preferable that a rigidity value of the absorber 2D be 0.050 N/cm or more.

[0086] For example, the rigidity of the absorber 2D as set forth above can be measured by the following measurement method.

[0087] First, a region in which the absorber 2D of the disposable diaper 1 is disposed is cut out; from the cut out region, the topsheet 2A and the backsheets 2B or the like are removed; and a state in which only the absorber 2D is present is established. The absorber 2D as mentioned above is taken as a sample.

[0088] Second, a thickness of the sample as mentioned above is measured by a thickness gauge “PEACOCK DIAL THICKNESS GAUGE No. CI352 of 50 mm in diameter and 3 g/cm² in load”.

[0089] Third, as shown in Fig. 4, in a stiffness testing instrument “Yasuda Seiki/Taber’s Stiffness”, the sample is pinched between grips, and the pinched sample is loosely tightened by screws on both sides to an extent such that the sample does not drop.

[0090] Fourth, as shown in Fig. 4, in the rigidity and softness testing instrument, a rotating device is rotated by setting a switch to the left and right, and “0” of the rotating device and “0” of a loading scale are aligned to each other.

[0091] Fifth, as shown in Fig. 4, in the stiffness testing instrument as mentioned above, a roller is tightened by screws at both ends of the roller at a distance (of the order of 0.5 mm) to an extent such that the roller almost comes into contact with the sample.

[0092] Sixth, as shown in Fig. 5, in the stiffness testing instrument as mentioned above, the switch is set to the right, and the rotating device is turned to the right, and further, at a time point at which a marked line of 15 degrees and an indicator of a pendulum are coincident with each other, the switch is restored to stop rotation of the rotating device, and the load scale of the right side is read.

[0093] Here, a top auxiliary weight is adjusted so that the load scale as mentioned above is within a range of 1.5 to 8.5.

[0094] Seventh, in the stiffness testing instrument as mentioned above, the switch is set to the left to turn the rotating device to the left, and at a time point at which the marked line of 15 degrees and the indicator of the pendulum are coincident with each other, the switch is restored to stop rotation of the rotating device, and the load scale of the left side is read.

[0095] Eighth, the stiffness (unit: N/cm) that is obtained by the following (formula 1) is taken as a rigidity value of the absorber 2D.

[0096] (Load scale of the right side + Load scale of the left side) / 2 x Numeric value of the top auxiliary weight / 1,000 x 9.807 ... (Formula 1)

It is noted that the waist gather 3 may be structured so as not to overlap with the absorber 2D.

[0097] In addition, the free end 5B of a respective one of the leg standing gathers 5 may be bonded with the topsheet 2A in a region of the dorsal side B more significantly than at least an end edge 2D1 of the dorsal side B of the absorber 2D (or an end edge of the ventral side F of the waist gather 3).

[0098] According to the structure as mentioned above, as shown in Fig. 6, a region between the absorber 2D and the waist gather 3 is risen up by the left standing gathers 5 and thus a pocket P1 is formed, thereby making it possible to prevent a leakage of bodily liquid from the dorsal side B of the disposable diaper 1.

[0099] In addition, according to the structure as mentioned above, the waist gather 3 and a respective one of the leg standing gathers 5 are bonded with each other by a hot melt type adhesive agent (HMA) and thus the rigidity of the waist gather 3 is increased, thereby making it possible to prevent a circumstance that the waist gather 3 is shrunk in the product longitudinal direction L by a stretching force which is exerted by the left standing gathers 5.

[0100] In so far as the disposable diaper 1 according to the embodiment is concerned, it is possible to eliminate the difficulty in wearing that is exerted by rising up of the back waistband region 30 at the time of wearing.

[0101] Also, in so far as the disposable diaper 1 according to the embodiment is concerned, by preventing folding or rising up of the back waistband region 30, the fitting property in the back waistband region 30 is enhanced, making it possible to prevent a leakage of bodily liquid from the back waistband region 30.

[0102] In addition, in so far as the disposable diaper 1 according to the embodiment is concerned, an end of the back waistband region 30 rises up, whereby a material hardly overlaps in duplex at a portion having risen up, making it possible to eliminate a trouble that a skin of a wearer is damaged.

[0103] Moreover, in so far as the disposable diaper 1 according to the embodiment is concerned, a pocket made of the waist bather 3, the absorber 2D, and the leg standing gathers 5 is formed, whereby loose and soft stool can be accommodated by the pocket as mentioned above, and a leakage of the loose and soft stool from the back waistband region 30 can be prevented.

[0104] In addition, in so far as the disposable diaper 1 according to the embodiment is concerned, the waist gather 3 is formed of a film stretching member, a sheet-shaped stretching member, or a stretchable nonwoven cloth or the like and thus a skin touch sense relative to a wearer is improved.

[0105] Further, in so far as the disposable diaper 1 according to the embodiment is concerned, in comparison with a case in which an urethane foam with a high rigidity is employed, a forward stretching stress at the time of stretching is lowered,

thus making it easy to wear the diaper, and a return stress is increased, thus making it easy to fit to a wearer's body.

[0106] As described above, the present invention has been described in detail by using the above-described embodiment. However, it is apparent to those skilled in the art that the present invention is not limited to the embodiment described in this description. The present invention can be modified and changed without departing from the gist and the scope of the present invention defined by the appended claims. Therefore, the description is aimed at illustration and explanation of the present invention, and does not have any meaning which limits the present invention.

[0107] This application is based on Japanese Patent Application No. 2013-272316 filed with the Japan Patent Office on December 27, 2013, the entire content of which is hereby incorporated by reference.

[0108] A reference herein to a patent document or other matter which is given as prior art is not to be taken as an admission that that document or matter was known or that the information it contains was part of the common general knowledge as at the priority date of any of the claims.

[0109] Where the terms "comprise", "comprises", "comprised" or "comprising" are used in this specification (including the claims) they are to be interpreted as specifying the presence of the stated features, integers, steps or components, but not precluding the presence of one or more other features, integers, steps or components, or group thereto.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A disposable diaper having a product longitudinal direction and a product widthwise direction which are orthogonal to each other, the product longitudinal direction having a dorsal side and a ventral side, the disposable diaper having: a back waistband region positioned at the dorsal side; a front waistband region positioned at the ventral side; a crotch region positioned between the front waistband region and the back waistband region; and an absorber main body, the absorber main body including: a topsheet, a backsheet and an absorber which is disposed between the topsheet and the backsheet, wherein,

at the dorsal side, a first elastic member which is stretchable in the product widthwise direction is provided between the topsheet and the backsheet,

the first elastic member is provided so as not to overlap with the absorber,

a fastening member which extends in the product widthwise direction from the back waistband region is provided,

at the absorber main body, one pair of stretchable leakage preventing walls which extend along the product longitudinal direction are provided,

an end of the dorsal side of the fastening member is disposed at the ventral side more than an end of the dorsal side of the first elastic member,

the leakage preventing walls each have:

a fixed end which extends along the product longitudinal direction so as to be outer of the product widthwise direction than the absorber; and

a free end which extends along the product longitudinal direction so as to be inner of the product widthwise direction than the fixed end,

the free end is bonded with the topsheet in a region of the dorsal side more than at least an end of the dorsal side of the absorber,

an area in the product longitudinal direction in which a second elastic member provided at the free end has a stretching force is provided so as to overlap

with the first elastic member, and

an entire region in which said area is overlapped with the first elastic member is disposed at the ventral side more than the end of the dorsal side of the fastening member.

2. The disposable diaper according to claim 1, wherein a stretching force to act upon an outside of the product widthwise direction in the first elastic member is larger than a stretching force to act upon an inside of the product longitudinal direction by the second elastic member.

3. The disposable diaper according to claim 1 or 2, wherein a length of a region in which the fastening member and the first elastic member overlap with each other is larger than 1/3 of a length of the first elastic member in the product longitudinal direction.

4. The disposable diaper according to any one of claims 1 to 3, wherein a region, in which a free end of a respective one of the leakage preventing walls, arrives at a site leading up to at least an end of the ventral side of the first elastic member from an end of an outside of the product longitudinal direction of the absorber main body at the dorsal side.

5. The disposable diaper according to any one of claims 1 to 4, wherein a rigidity value of the absorber is 0.050 N/cm or more.

FIG. 1

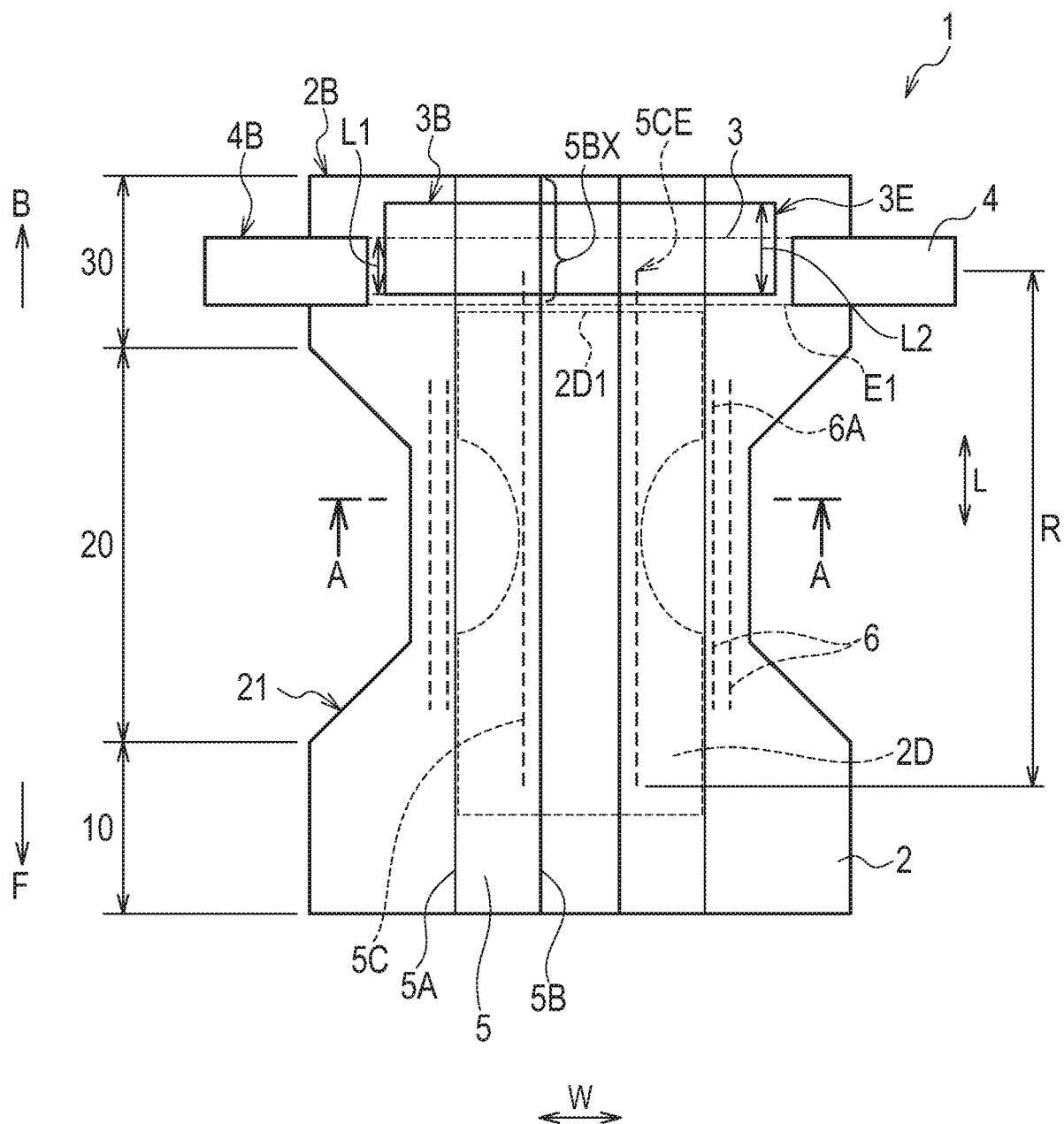


FIG. 2

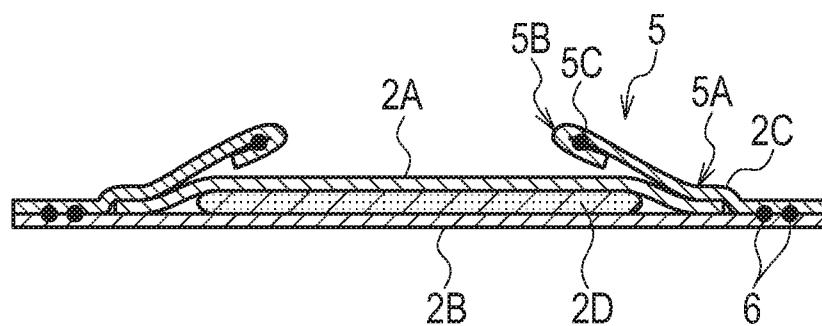


FIG. 3

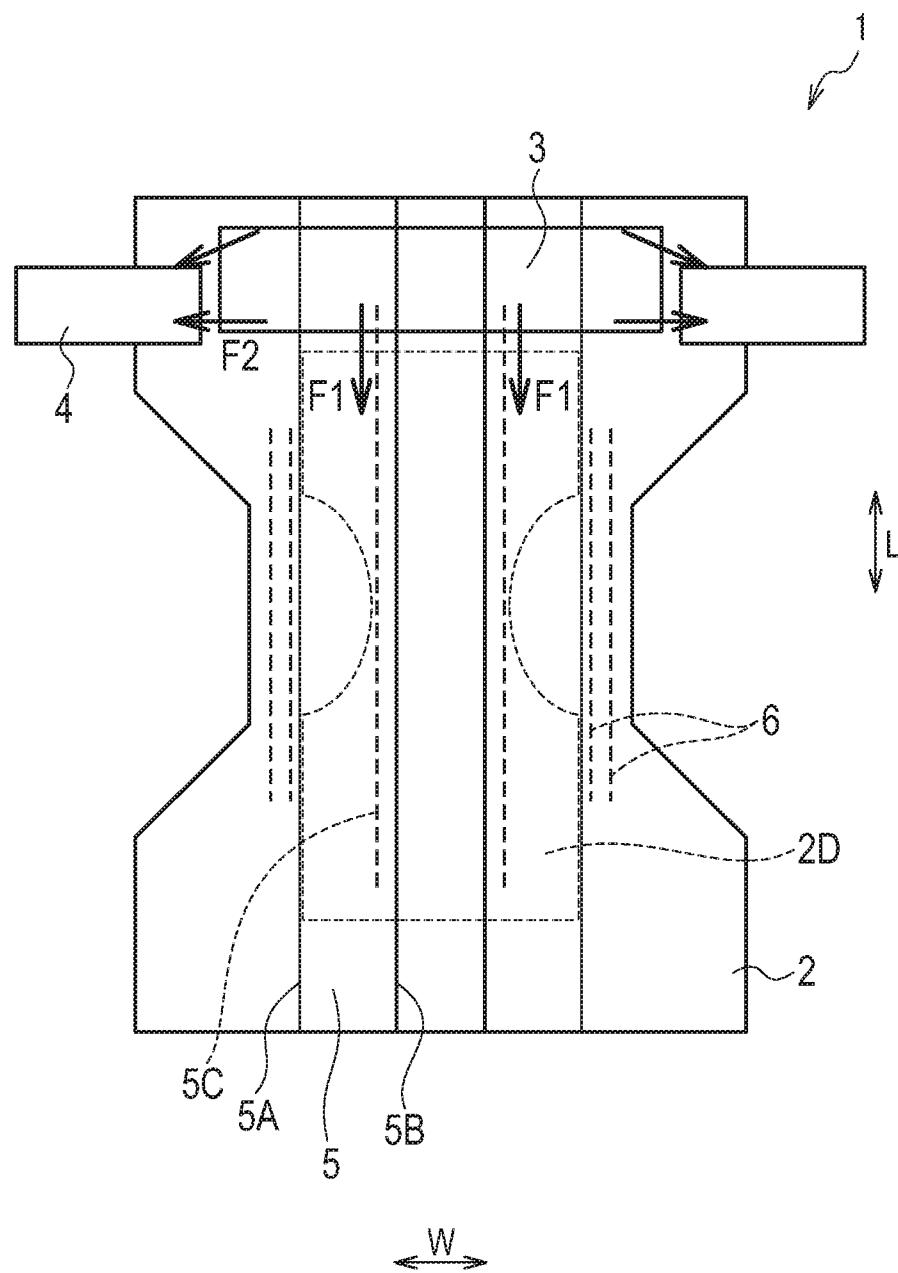


FIG. 4

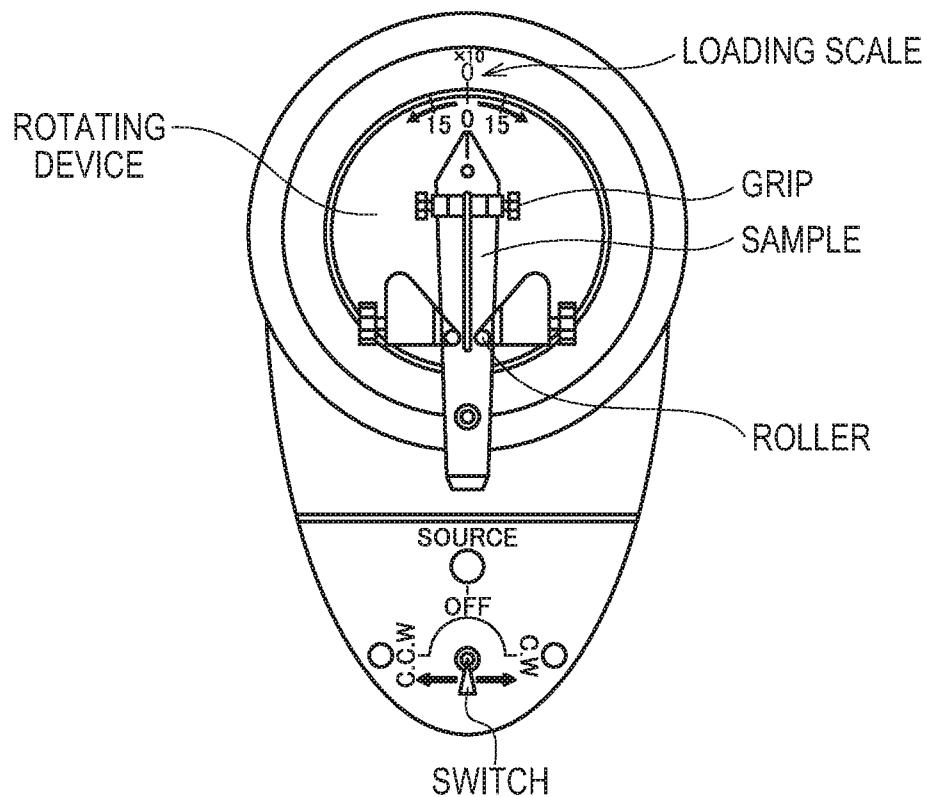


FIG. 5

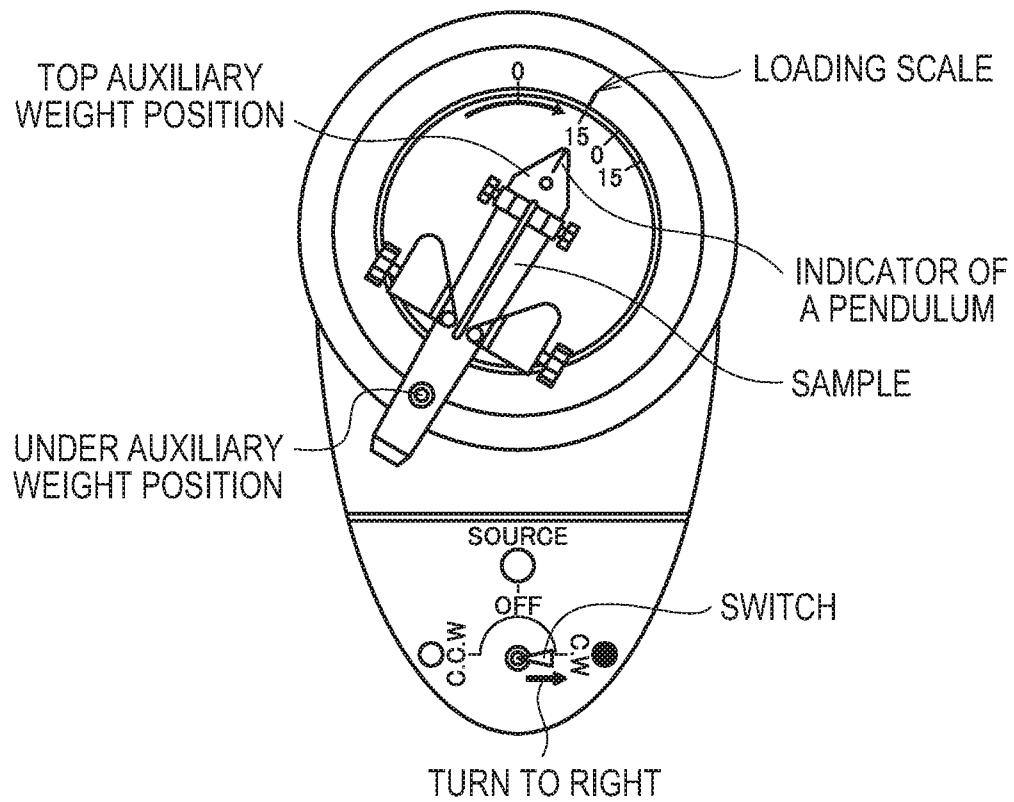


FIG. 6

