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DISPOSABLE GARMENT ✓

This invention relates to a disposable garment useful in various forms such as a disposable diaper, a diaper cover, training pants, sanitary shorts, and the like.

Japanese Patent Application Disclosure Gazette No. Hei4-28365 discloses a shorts type disposable garment comprising a longitudinally larger garment body and a pair of elastic bands extending longitudinally along side edges of the garment body. The bands are secured at their longitudinally opposite ends to the garment body in an extended state. An intermediate section of each band between the longitudinally opposite ends is adapted to function as an elastic waist band of the garment and not secured to the garment body so that a wearer of the garment may insert his or her each leg into an opening defined between the band and the garment body.

The known diaper is of a simplified construction and therefore its manufacturing cost can be sufficiently reduced to be put on the market at a rational price. However, the diaper is of shorts type which can not meet a wide range of needs unless various sized articles are offered. This is an important factor increasing the manufacturing cost.

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In view of the problem as has been described above, it is a principal object of the present invention to provide a disposable garment of a simplified construction adaptable for a wide range of body sizes of wearers.

The object set forth above is achieved, according to the present invention, by a disposable garment comprising a longitudinally larger garment body having an inner side intended to come in contact with a wearer's skin and outer side opposed to the upper side, the garment body extending across the wearer's crotch back and forth so as to fit the wearer's crotch, hip and belly, and a pair of bands respectively having longitudinally opposite ends bonded to the outer side of the garment body and extending in parallel to each other in the longitudinal direction of said garment body wherein said bands are elastically stretchable and contractable longitudinally of said garment body.

In such disposable garment, this invention is characterized by that said garment body has a pair of side edges extending in said longitudinal direction, a pair of ends extending in the transverse direction to intersect said side edges, a first imaginary center line dividing a length of said garment body in two and a second imaginary center line dividing a width of the garment body in two wherein said

garment is symmetrically arranged with respect to said second imaginary center line; and each of said bands having their longitudinally opposite ends bonded to said lower side of said garment body has an outer side edge extending adjacent the associated side edge of said garment body, an inner side edge extending adjacent said second center line and a pair of end bonding lines each obliquely extending from said inner side edge to said outer side edge toward said first center line wherein one of said end bonding lines (first bonding line) and a section of each band extending beyond said first bonding line in the longitudinal direction of said garment body are detachably bonded to the lower side of said garment body while the other of said end bonding lines (second bonding line) and a section of the band extending beyond said second bonding line in the longitudinal direction of said garment body are inseparably bonded to the lower side of said garment body.

According to one preferred embodiment of this invention, said band is detachably bonded to the lower side of said garment body also at its portion lying in the vicinity of said second bonding line and placed against the lower side of said garment body as said band is folded back along said second bonding line.

According to another preferred embodiment of this invention, said band is provided with a hook member making a part of a mechanical fastener while said lower side of said garment body is provided with a loop member making the other part of said mechanical fastener so that engagement and disengagement between these hook member and loop member allow said band to be detachably bonded to said lower side of said garment body.

According to still another preferred embodiment of this invention, said lower side of said garment body is formed by a liquid-impervious sheet and said upper side of said garment body is adapted to hold a body fluids absorbent pad member.

According to further another preferred embodiment of this invention, said garment body comprises a liquid-pervious topsheet, a liquid-impervious backsheet and a liquid-absorbent core disposed between these two sheets.

According to an additional preferred embodiment of this invention, said garment body is provided in the vicinity of its side edges with elastic members extending in said longitudinal direction in an extended state.

Fig. 1 is a partially broken perspective view showing a disposable diaper according to one preferred embodiment of

this invention as it is put on a wearer's body;

Fig. 2 is a plan view showing the disposable diaper partially cut away; and

Fig. 3 is a view similar to Fig. 2 showing a disposable diaper according to another preferred embodiment of this invention.

Details of a disposable garment according to the present invention will be more fully understood from the description given hereunder with reference to the accompanying drawings.

Fig. 1 is a perspective view showing a partially cut away disposable diaper 1 as a specific example of a disposable garment as it is put on a wearer's body. The diaper 1 comprises a diaper body 2 curved in a U-shape adapted to fit a wearer's hip and belly back and forth around the wearer's crotch and a pair of elastic bands 3 adapted to extend around the wearer's waist. The elastic bands 3 laterally extend from transversely opposite sides of a rear end 7 of the diaper body 2 (which are out of sight in Fig. 1), describing curves, and their distal ends 36 are fastened to a front end 6 of the diaper body 2. Referring to Fig. 1, one 3A of these bands 3 is shown to have its distal end 36

still not fastened to the front end 6 of the diaper body 2. The front end 6 of the diaper body 2 is formed on its rear surface with a target zone 11 by bonding thereto a loop member 10A making a part of a mechanical fastener which is well known under the several trade marks such as VELCRO. The band 3 is formed, on the other hand, on its distal end 36 with a first fastening region 12 by bonding thereto a hook member 10B making the other part of the mechanical fastener so that the first fastening region 12 may be detachably engaged with the target zone 11. By fastening the bands 3 to the diaper body 2 in this manner, a waist-opening 13 and a pair of leg-openings 14 are formed for this diaper 1.

The diaper body 2 comprises a liquid-pervious topsheet 16, a liquid-impervious backsheet 17 and a liquid-absorbent core 18 disposed between these two sheets 16, 17. In the vicinity of transversely opposite side edges 33 of the diaper body 2 which form the respective leg-openings 14, elastic members 19 extend toward the front and rear ends 6, 7 and secured thereto in an extended state. Contraction of these elastic members 19 formed a plurality of gathers 21 on the topsheet 16 and the backsheet 17.

The band 3 comprises a pair of sheets 22, 23 placed upon each other and a plurality of elastic members 24 are

secured in an extended state to the inner surface of at least one of these sheets. Contraction of these elastic members 24 forms a plurality of gathers 26 along the band 3. The distal end 36 of the band 3 is folded back onto its inner surface along a folding line 41 obliquely extending across a width of the band 3. The hook member 10B defining the first fastening region 12 is bonded to the surface of the distal end 36 destined to come in contact with the target zone 11. Adjacent the first fastening region 12 which has been folded along the folding line 41, a second hook member 10C is bonded to the surface to form a second fastening region 32. In this manner, the band 3 is fastened to the target zone 11 by means of the first fastening region 12 and/or the second fastening region 32.

Fig. 2 is a plan view showing a rear side of the partially cut away diaper 1 as the diaper 1 has been unfolded in a flat state. The bands 3 are arranged symmetrically with respect to a center line A-A longitudinally extending so as to divide the width of the diaper body 2. These bands 3 are shown in Fig. 2 as one 3B of the bands 3 is straightened longitudinally of the diaper body 2 with its distal end 36 fastened to the target zone 11 and the other 3A is folded along the folding line 42 to extend in the direction

orthogonal to the diaper body 2.

The diaper body 2 is shaped substantially in a rectangle which is longitudinally larger. The diaper body 2 has a pair of longitudinally extending side edges 33 and a pair of transversely extending ends 34 wherein each end 34 is divided in two by the imaginary center line A-A and each side edge 33 is divided in two by the imaginary center line B-B.

The band 3 has the distal end 36 detachably fastened to the target zone 11 and a proximal end 37 opposite to the distal end 36. The proximal end 37 indicated by a plurality of dots in Fig. 2 is inseparably bonded to the rear end 7 of the diaper body 2 by means of adhesive agent or heat-sealing technique. The band 3 has between the distal end 36 and the proximal end 37 a section 30 adapted to be spaced from the diaper body 2 and elastically stretchable and contractable longitudinally of the diaper body 2. This section 30 has, in turn, inner and outer side edge 38, 39 extending in parallel to the center line A-A of the diaper body 2 and rectilinear front and rear ends 41, 42 connecting ends of these inner and outer side edges 38, 39 to each other, respectively. The front and rear ends 41, 42 obliquely extend from the inner side edge 38 to the outer side edge 39 so that they gradually get near to the center line B-B dividing the length of the

diaper body 2 in two. The front end 41 obliquely extending in this manner corresponds to the hypotenuse of a right-angled triangle defined by the hook member 10B and also to the folding line for the band 3 as will be apparent from Fig. 2. The rear end 42 also obliquely extending corresponds to a line contouring the proximal end 37 of the band 3. In the vicinity of the front end 41, the band 3 is provided on its outer surface with the second fastening region 32.

With the diaper 1 of such arrangement, the band 3, for example, the band 3B on the left hand as viewed in Fig. 2 is bent at the front and rear ends 41, 42 to turn the band 3B inside out and stretched as indicated by imaginary lines while the diaper body 2 is longitudinally curved with the backsheet 17 facing outside. Thereby the diaper 1 of shorts type as shown in Fig. 1 is formed.

It is also possible, as in the case of the band 3A on the right hand in Fig. 2, to fold the band 3A along the rear end 42 after the distal end 36 has been detached from the target zone 11 so as to extend laterally from the side edge 33 of the diaper body 2. This is true for the band 3B. By folding the bands 3A, 3B so as to extend laterally, the diaper 1 of open type is obtained. With the bands 3A, 3B extending circumferentially of the wearer's torso, the distal

ends 36 of the respective bands 3A, 3B may be pressed against the target zone 11 to anchor the second fastening regions 32 to the zone 11. With the bands 3 extending circumferentially of the wearer's torso, it is also possible to previously fold the first fastening regions 12 along the respective front ends 41 and then to anchor them to the target zone 11. In this case, the first and second fastening regions 12, 32 arranged adjacent to each other can be anchored to the target zone 11 as will be apparently understood from the band 3A in Fig. 1.

Fig. 3 is a view similar to Fig. 2 showing another embodiment of the invention. In this diaper 1, the rear end 7 of the diaper body 2 is provided on its rear side with a relatively small loop member 51 and, in the vicinity of the rear end 42, the band 3 is provided with a relatively small hook member 52. The band 3 may be folded along a folding line 53 so as to extend somewhat obliquely upward as indicated by an imaginary line to engage the loop member 51 with the hook member 52 and thereby to maintain a predetermined angle at which the band 3 obliquely extends. Relative position of the loop member 51 and the hook member 52 may be appropriately selected to obtain the angle at which the band 3 obliquely extends. Engagement between these two

members 51, 52 alleviates a distortion of the band 3 in comparison with the arrangement in which such members 51, 52 are absent.

The diaper 1 according to this invention is characterized in its relatively simple construction comprising the longitudinally larger diaper body 2 provided on its rear side with the elastic bands 3 and a manufacturing cost of the diaper 1 can be correspondingly reduced. In addition, this diaper 1 can be used also as the diaper of open type advantageously not only allowing a length of each belt 3 extending circumferentially of the wearer's torso to be elastically stretched so as to fit the wearer's torso but also allowing the substantial length of each band 3 to be adjusted by selecting a location in the target zone 11 at which the band 3 is fastened. In other words, one and same diaper 1 can be adapted for various trunk sizes and it is unnecessary to prepare various sized diapers. Such aspect of the diaper 1 according to this invention is another important factor to reduce the manufacturing cost.

To exploit this invention, liquid-pervious nonwoven fabric or apertured plastic film may be used as stock material for the topsheet 16. The backsheet 17 may be made of plastic film. The core 18 may be formed by fluff pulp or

a mixture of fluff pulp and superabsorptive polymer particles. With the core 18 substantially identical to the diaper body 2 in length and width as shown and the longitudinally opposite ends of the core 18 underlying the belts 3 when the bands 3 are folded so as to extending circumferentially of the wearer's torso, the core 18 can be pressed by the bands 3. Thereby a good fitness of the core 18 to the wearer's skin can be ensured. The bands 3 may be made of a nonwoven fabric or plastic film. Bonding of the respective members can be achieved by use of suitable adhesive agent such as hot melt adhesive. For the heat-sealable members, the heat-sealing technique can be also employed. As the means to detachably fasten the bands 3 to the diaper body 2, the mechanical fastener adopted by the illustrated embodiments may be suitable adhesive agent. In this alternative embodiment, the first and second fastening regions 12, 32 may be applied with adhesive while the corresponding regions on the diaper body 2 may be adapted so that the first and second fastening regions 12, 32 can be detachably anchored on the corresponding regions.

While the disposable diaper 1 has been described hereinabove as a specific embodiment of the disposable garment of this invention, this garment can be used also in

the other forms such as training pants, pants for patient suffering from incontinence, diaper cover or sanitary shorts. In these uses, the core 18 may be eliminated if it is unnecessary for the particular uses. For such garment without the core 18, the garment is preferably arranged so that a body fluids absorbent pad can be detachably attached to the garment body and the backsheet is preferably made of a liquid-impervious or breathable liquid-impervious sheet.

The disposable diaper according to this invention is effective to reduce a cost for manufacturing it because of its relatively simple construction as well as its high adaptability for various torso sizes.



WHAT IS CLAIMED IS:

1. A disposable garment comprising a longitudinally larger garment body having upper side destined to come in contact with a wearer's skin and lower side opposed to said upper side, said garment body extending across the wearer's crotch back and forth so as to fit the wearer's crotch, hip and belly, and a pair of bands respectively having longitudinally opposite ends bonded to said lower side of said garment body and extending in parallel to each other in the longitudinal direction of said garment body wherein said bands are elastically stretchable and contractable longitudinally of said garment body, said disposable garment being characterized by that:

said garment body has a pair of side edges extending in said longitudinal direction, a pair of ends extending in the transverse direction to intersect said side edges, a first imaginary center line dividing a length of said garment body in two and a second imaginary center line dividing a width of the garment body in two wherein said garment is symmetrically arranged with respect to said second imaginary center line; and

each of said bands having their longitudinally opposite



ends bonded to said lower side of the garment body has an outer side edge extending adjacent the associated side edge of said garment body, an inner side edge extending adjacent said second center line and a pair of end bonding lines each obliquely extending from said inner side edge to said outer side edge toward said first center line wherein one of said end bonding lines (first bonding line) and a section of each band extending beyond said first bonding line in the longitudinal direction of said garment body are detachably bonded to the lower side of said garment body while the other of said end bonding lines (second bonding line) and a section of the band extending beyond said second bonding line in the longitudinal direction of said garment body are inseparably bonded to the lower side of said garment body.

2. The garment according to Claim 1, wherein said band is detachably bonded to the lower side of said garment body also at its portion lying in the vicinity of said second bonding line and placed against the lower side of said garment body as said band is folded back along said second bonding line.

3. The garment according to Claim 1 or 2, wherein said band is provided with a hook member making a part of a



mechanical fastener while said lower side of said garment body is provided with a loop member making the other part of said mechanical fastener so that engagement and disengagement between these hook member and loop member allow said band to be detachably bonded to said lower side of said garment body.

4. The garment according to any one of Claims 1 ~ 3, wherein said lower side of said garment body is formed by a liquid-impervious sheet and said upper side of said garment body is adapted to hold a body fluids absorbent pad member.

5. The garment according to any one of Claims 1 ~ 3, wherein said garment body comprises a liquid-pervious topsheet, a liquid-impervious backsheet and a liquid-absorbent core disposed between these two sheets.

6. The garment according to any one of Claims 1 ~ 5, wherein said garment body is provided in the vicinity of its side edges with elastic members extending in said longitudinal direction in a extended state.

