

DISPOSABLE DIAPER

The present invention relates to a disposable diaper provided with an adhesive tape used to retain a used diaper in a rolled state for disposal thereof.

In the case of a pull-on disposable diaper disclosed in Japanese Utility Model Application Disclosure Gazette No. Hei5-39531, a pair of adhesive tape strips extend from transversely opposite side edges of the diaper, respectively, in parallel to a waist line of the diaper so that the pair of adhesive tape strips may be used to hold a used diaper in its rolled state. The used diaper thus held in its rolled state can be disposed without raising any sanitary problem even if the diaper contains excrement clinging thereto.

In the case of a pull-on disposable diaper disclosed in Japanese Utility Model Application Disclosure Gazette No. Hei6-77722, a rear section of the diaper is provided at a central region thereof with a single strip of adhesive tape adapted to be unfolded in its vertical direction thereof and to hold a used diaper in its rolled state.

To manufacture the diaper disclosed in the foregoing Disclosure Gazette No. Hei5-39531, a pair of tape rolls corresponding to respective adhesive tape strips extending

from the transversely opposite side edges must be prepared and a pair of tape supplier systems must be operated to attach the individual tape strips to the transversely opposite side edges. Compared to the diaper described in the foregoing Disclosure Gazette No. Hei6-77722 using a single strip of adhesive tape, the diaper described in the foregoing Disclosure Gazette No. Hei5-39531 inevitably requires higher costs for preparation of the tape rolls as well as for manufacturing equipment.

With the diaper described in the foregoing Disclosure Gazette No. Hei5-39531, the adhesive tape cannot be effectively used when the diaper is rolled from the transversely opposite side edges from which the pair of adhesive tape strips extend, respectively. To strip the wearer of his or her pull-on diaper which has been stained with excrement, the transversely opposite side edges are usually torn off and thereby front and rear sections of the diaper are separated from each other. The used diaper having the side edges thus torn off is preferably rolled from the side edges so as to prevent a portion of the used diaper stained with excrement from being exposed. To achieve this, the situation in which the adhesive tape cannot be effectively used must be avoided.

In the case of the diaper described in the foregoing Disclosure Gazette No. Hei6-77722, the adhesive tape can not be conveniently used when the used diaper is transversely rolled since the adhesive tape is provided so as to extend in a vertical direction of the diaper.

In view of the problem as described above, it is a principal object of the invention to facilitate a adhesive tape serving to retain a used disposable diaper to be used particularly when the used diaper is transversely rolled for disposal thereof.

The object set forth above is achieved, according to the invention, by a disposable diaper having a front waist section, a rear waist section and a crotch section therebetween, the diaper comprising a liquid-permeable topsheet, a liquid-impermeable backsheet and a liquid-absorbent core disposed therebetween and provided on an outer surface of a backsheet of one of the front and rear waist sections with an adhesive tape used to retain a used diaper in a rolled state for disposal thereof, the diaper being characterized by that:

the adhesive tape comprises a single tape strip extending in a circumferential direction of the diaper a longitudinally

middle portion of the tape strip fixed to one of the front and rear waist sections on a transversely middle region of this waist section, leaving longitudinally opposite portions of the tape strip respectively extending from said middle portion toward transversely opposite side edges of the diaper freely deformable;

and each of said deformable portions is provided at predetermined locations on both surfaces thereof with adhesive regions and folded several times over longitudinally of the tape strip so that the adhesive regions releasably hold said deformable portion in a folded state thereof.

Other and further objects, features and advantages of the invention will appear more fully from the following discription.

Fig. 1 is a perspective view exemplarily showing a diaper according to the invention as partially broken away;

Fig. 2 is a side view showing a tape fastener;

Fig. 3 shows a rolled diaper (A) as viewed in a direction so as to show a rear section and (B) in a direction so as to show a front section of the diaper; and

Fig. 4 is a view similar to Fig. 2 but showing a variant of the diaper according to the invention.

Details of a disposable diaper according to the invention will be more fully understood from the description of preferred embodiments given hereunder in reference with the accompanying drawings.

Pull-on disposable diaper 1 shown by Fig. 1 in a perspective view as viewed from behind and as partially broken away having a front waist section 6, a rear waist section 7 and a crotch section 8 therebetween and comprises a liquid-permeable topsheet 2, a liquid-impermeable backsheet 3 and a liquid-absorbent core 4 disposed therebetween. The front and rear waist sections 6, 7 are put upon and bonded to each other along their transversely opposite ends so as to define transversely opposite side edges 11, 12 as well as a waist-opening 13 and a pair of leg-openings 14. The waist-opening 13 and a pair of leg-openings 14 are provided along their peripheral edges with elastic members 16, 17, respectively, each comprising a plurality of elastic elements. These elastic members 16, 17 are bonded under appropriate tensions to an inner surface of the top- or backsheet 2, 3. An outer surface of the backsheet 3 in the rear waist section 7 carries at its transversely middle region an adhesive tape strip 19 used to keep the used diaper 1 in its rolled state. The adhesive tape strip 19 has its

portion 19A, 19B respectively extending from said middle region toward transversely opposite sides edge of the diaper 1 and conveniently folded several times over so that the portions 19A, 19B may be unfolded left- and rightward, respectively, in a circumferential direction of the diaper 1.

Fig. 2 is a side view showing the adhesive tape strip 19 as viewed in a direction indicated by arrows II-II in which its folded position is shown by solid lines while its unfolded position is shown by imaginary lines. The tape strip 19 has a transversely middle region 23 bonded by means of hot melt adhesive 24 to the outer surface of the backsheet 3, leaving the left and right portions 19A, 19B free for deformation as well as for development in the circumferential direction of the diaper 1. The deformable portions 19A, 19B have adhesive regions 27 defined at predetermined locations on their both surfaces by adhesive 26 applied thereto and can be held in their folded positions under the effect of the adhesive 26. The tape strip 19 has been previously subjected to a surface treatment such that the respective surface sections facing the associated adhesive regions 27 in the folded position of the tape strip 19 may be easily released from the respective adhesive regions 27 and thereby the tape strip 19 may be unfolded as the tape strip 19 is pulled in

its longitudinally opposite directions with longitudinally opposite ends 29A, 29B thereof held by fingers.

Fig. 3 is a perspective view showing the diaper 1 rolled for disposal (A) as viewed from behind so as to show the rear waist section 7 and (B) as viewed from front so as to show the front waist section 6. As shown, the diaper 1 is rolled by, after the crotch section 8 has been folded onto the front waist section 6, rolling the diaper 1 from the left and right side edges 11, 12, successively, with the front waist section 6 inside. As will be apparent from Fig. 3(B), the left and right deformable portions 19A, 19B of the adhesive tape strip 19 are unfolded left- and rightward in the circumferential direction of diaper 1, respectively, to drape them about the rear waist section 7, and the adhesive regions 27 carried by the left and right deformable portions 19A, 19B are fastened to the outer surface of the rear waist section 7 so that the respective adhesive regions 27 may extend across left and right rolled portions of the diaper 1 which have been rolled from the left and right side edges 11, 12, respectively, and thereby the diaper 1 may be prevented from being unrolled. These adhesive regions 27 inclusive of the portions 19A, 19B associated therewith are spaced apart from each other in a vertical direction of the diaper 1.

after they have been fastened to the rolled left and right sides of the diaper 1, as will be seen in Fig. 3(B), so that the diaper 1 in such rolled state can be closed over a wide range in the vertical direction of the diaper and, the portions of the diaper 1 stained with excrement can be effectively prevented from being exposed. It should be understood that, if it is attempted to close the used diaper 1 over such wide range using an adhesive tape strip adapted to be unfolded circumferentially only in one direction, a deformable portion of the tape strip should be too long to be easily handled.

The used diaper 1 must be rolled as shown by Fig.3 for the reason as will be described below. For example, the pull-on diaper 1 stained with excrement is sometimes pulled down along the wearer's legs to strip the wearer of such used diaper and excrement partially clings to various regions of the wearer's body as excrement rubs the wearer's body. To avoid this, the diaper 1 put on the wearer is usually separated into the front and rear waist sections 6, 7 by opening the diaper 1 along the transversely opposite side edges 11, 12 and removed from the wearer in a peel-off manner rather than in a pull-down manner. In this manner, undesirable effect of rubbing can be alleviated. However,

with the diaper 1 thus separated into the front and rear waist sections 6, 7, excrement may be exposed and/or leak along the opened side edges of the diaper 1. In order to avoid such exposure and/or leakage of excrement, it is preferred and necessary to roll the diaper 1 from their transversely opposite side edges 11, 12 which have been opened or torn off, before disposal thereof.

The diaper 1 can be rolled as shown by Fig. 3 no matter whether the diaper 1 is of pull-on type, i.e. closed type or of non-pull-on type, i.e. open-type. In the case of the open type diaper 1, such rolling will be achieved also by a pair of adhesive tape fasteners laterally extending from transversely opposite side edges of this diaper. However, such fasteners are not always free from an apprehension that the user might lose sight of them in the rolled diaper as the tape fasteners of the diaper disclosed by the above-mentioned Japanese Utility Model Application Disclosure Gazette No. Hei5-39531 is the case. In addition, these tape fasteners are not always sufficiently long to retain the used diaper in the rolled state. Accordingly, it is preferred to provide the diaper of open type also with the adhesive tape strip 19 as shown.

Fig. 4 is a view similar to Fig. 2 but showing a

variant of the diaper 1 according to the invention. In this diaper 1, the left and right freely deformable portions 19A, 19B of the adhesive tape strip 19 are provided along their transversely middle lines, respectively, with perforation lines 30 extending longitudinally of the tape strip 19. Immediately before the tape strip 19 is fastened to the rolled diaper 1, as shown by Fig. 3, the respective freely deformable portions 19A, 19B may be torn in two along the perforation lines 30 to facilitate a fastening range to be further widened in the vertical direction. This variant is particularly suitable for the adult-size diaper.

To implement the invention, plastic film or nonwoven fabric may be employed as base material for the adhesive tape strip 19. The tape strip 19 is formed at predetermined locations on both surfaces with the adhesive regions 27 adapted to be used not only to keep the tape strip 19 in its folded position but also to retain the diaper 1 in its rolled state. The free ends 29 serving as tabs are preferably nonadhesive on both surfaces. The tape strip 19 may be present in any one of the front and rear sections 6, 7. Furthermore, the manner in which the diaper 1 is rolled is not limited to the manner illustrated in which the diaper is rolled from the transversely opposite side edges thereof, and

it is also possible to roll the diaper from any of said side edges using the corresponding one of the freely deformable portions 19A, 19B.

With the pull-on disposable diaper according to the invention, a single strip of adhesive tape is fixed at its longitudinally middle portion to the diaper so that the left and right freely deformable portions extend in the circumferential direction. Compared to the prior art adopting a pair of separate strips of adhesive tape, the inventive arrangement contributes to a cost saving since the attachment of adhesive tape is drastically simplified. In addition, the strip of adhesive tape can be easily fastened to the used and rolled diaper since there is no apprehension that the user might lose sight of the left and right freely deformable portions when the used diaper is transversely rolled for disposal thereof. Furthermore, these left and right freely deformable portions can be fastened to the diaper so as to be advantageously spaced apart from each other in the vertical direction and thereby the rolled diaper can be closed over a range as wide as possible.

Having described our invention as related to embodiments shown in the accompanying drawings, it is our intention that the invention be not limited by any of the

details of description, unless otherwise specified, but rather be construed broadly within its spirit and scope as set out in the accompanying claims.

WHAT IS CLAIMED IS:

1. A disposable diaper having a front waist section, a rear waist section and a crotch section therebetween, and the diaper comprising a liquid-permeable topsheet, a liquid-impermeable backsheet and a liquid-absorbent core disposed therebetween and provided on an outer surface of a backsheet of one of the front and rear waist sections with an adhesive tape used to retain a used diaper in a rolled state for disposal thereof, the diaper being characterized by that:

the adhesive tape comprises a single tape strip extending in a circumferential direction of the diaper and a longitudinally middle portion of the tape strip fixed to one of the front and rear sections on a transversely middle region of this section, leaving longitudinally opposite portions of the tape strip respectively extending from said middle portion toward transversely opposite side edges of the diaper freely deformable; and

each of the freely deformable portions is provided at predetermined locations on both surfaces thereof with adhesive regions and folded several times over longitudinally of the tape strip so that the adhesive regions releasably hold said freely deformable portion in a folded position thereof.



2. A disposable diaper according to Claim 1, wherein one of the adhesive regions is adapted to be fastened to the used and rolled diaper at a predetermined location after each of said freely deformable portions has been unfolded.

3. A disposable diaper according to Claim 1 or 2, wherein each of said freely deformable portions is provided along a transversely middle line thereof with a perforation-line extending longitudinally of the tape strip.

