

[54] **DISPOSABLE DIAPER WITH ELASTIC MEANS**

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[51] Int. Cl.² **A41B 13/02; A61F 13/16**

[58] Field of Search..... **128/284, 287, 290 R, 286**

[56] References Cited

UNITED STATES PATENTS

2,199,781	5/1940	Cramer	128/286
2,834,347	5/1958	Connally	128/284

3,077,193	2/1963	Mann	128/284
3,369,545	2/1968	Wanberg	128/287
3,800,796	4/1974	Jacob	128/284
3,875,621	4/1975	Karami	128/287

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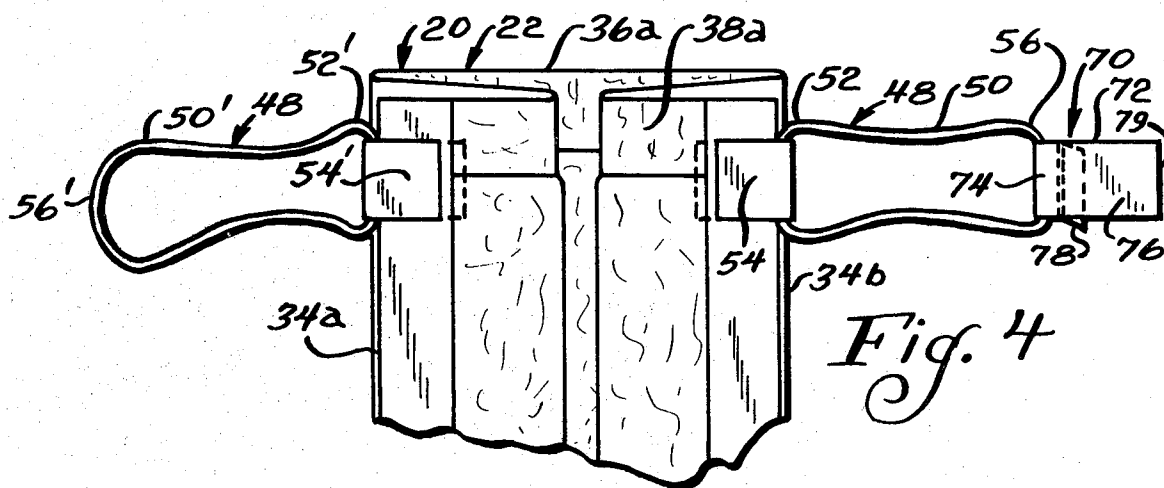
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[57]

ABSTRACT

A disposable diaper comprising, an absorbent pad assembly having a front surface, a back surface, a pair of side edges, and a pair of waistline portions. The diaper has elastic means connectable between one of the waistline portions around the back surface of the other waistline portion to provide a snug fit of the diaper about an infant.

23 Claims, 8 Drawing Figures



DISPOSABLE DIAPER WITH ELASTIC MEANS

BACKGROUND OF THE INVENTION

The present invention relates to absorbent articles, and more particularly to disposable diapers.

During recent years diapers of the disposable type have come into widespread use. Although disposable diapers have attained popularity with parents due to convenience, unfavorable comments have been made about leakage from the diapers during use and their fit on the infant. In particular, the ends of the diaper are normally susceptible to leakage due, in part, to a loose fit of the diaper about the infant.

Many of the present disposable diapers have tape strips located adjacent one end of the diapers. The diapers are normally placed on the infant by laying the infant on the diaper with the strip bearing part of the diaper being located beneath the back waistline of the infant. After removal of release sheets from the tape strips, attachment portions of the strips are brought around the infant's legs, and anchored to the front portion of the diaper. However, in order to obtain a tight fit of the diaper and prevent leakage about the infant's legs, the attachment portions of the strips are frequently secured at a location on the front portion of the diaper which is spaced somewhat from the front end edge or waistline of the diaper.

Since the permanently anchored portions of the strips are usually located adjacent the back end edge of the diaper, after placement of the diaper the tape strips apply tension to the back waistline of the diaper and thus may maintain a relatively close fit of the diaper against the back waistline of the infant. In contrast, the attachment portions of the strips are often spaced from the front waistline of the diaper, and significant tension is not applied by the strips against the diaper front waistline. The front waistline of the diaper is thus permitted to gap away from the infant, increasing the possibility of urine leakage in this area of the diaper, in spite that the front waistline of the diaper is normally more susceptible to urine leakage than the back waistline, since it is closer to the site of urine deposition on the diaper. Also, infants are generally inclined to spend more time on their stomachs than their backs, causing gravity to drive urine in the diaper with greater frequency toward the front waistline. Thus, the diaper ends are normally susceptible to leakage where it should most be prevented.

SUMMARY OF THE INVENTION

A principal feature of the present invention is the provision of a disposable diaper of simplified construction which provides an improved fit and minimizes leakage at an end of the diaper.

The disposable diaper of the present invention comprises, an absorbent pad assembly having a front surface, a back surface, a pair of side edges, and a pair of waistline portions. The diaper has elastic means connectable between one of the waistline portions around the back surface of the other waistline portion.

Thus, a feature of the invention is that the elastic means applies tension to the waistline portions and provides a snug fit of the diaper around the waistline of the infant.

Another feature of the invention is that the constrained waistline portions reduce leakage from an end of the diaper.

A further feature of the invention is that the constrained waistline portions provide a comfortable fit of the diaper on the infant.

Yet another feature of the invention is that in one embodiment the elastic means may be connected adjacent one side edge of the diaper.

Still another feature of the invention is that in another embodiment the elastic means is connectable intermediate opposed side edges of the diaper.

A feature of the invention is that the elastic means is adjustable to provide a desired amount of tension to the waistline portions of the diaper.

Another feature of the invention is the provision of elastic tape means to provide a snug fit of the diaper about the infant.

Yet another feature of the invention is the provision of tape means having one end portion which is releasably attached to the back surface of another end portion.

Further features will become more fully apparent in the following description of the embodiments of this invention and from the appended claims.

DESCRIPTION OF THE DRAWINGS

In the drawings:

FIG. 1 is a fragmentary front plan view of one embodiment of the diaper of the present invention;

FIG. 2 is a perspective view of the diaper of FIG. 1 with elastic means in the diaper being secured after placement of the diaper;

FIG. 3 is a fragmentary front plan view of another embodiment of the diaper of the present invention;

FIG. 4 is a fragmentary front plan view of another embodiment of the diaper of the present invention;

FIG. 5 is a fragmentary plan view of elastic means in the diaper of FIG. 4 as it is being secured together;

FIG. 6 is a fragmentary perspective view of a tape fastener of the present invention for use on a diaper;

FIG. 7 is a fragmentary sectional view taken substantially as indicated along the line 7-7 of FIG. 6; and

FIG. 8 is a fragmentary plan view showing the tape fastener of FIG. 6 as utilized to secure the diaper about an infant.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to FIGS. 1 and 2, there is shown a disposable diaper generally designated 20 having an absorbent pad assembly 22. The pad assembly has a fluid impervious backing sheet 24 defining a back surface 26 of the pad assembly, a fluid pervious cover sheet 28 defining a substantial portion of a front surface 30 of the pad assembly, an absorbent pad 32 intermediate the backing and cover sheets 24 and 28, a pair of side edges 34a and 34b, and a pair of end edges 36a and 36b connecting the side edges 34a and b. The diaper or pad assembly also has a pair of waistline portions 38a and 38b adjacent the end edges 36a and b, and a crotch portion 40 intermediate the waistline portions 38a and b. As shown in FIG. 1, the pad assembly 22 may be folded into a box-pleat configuration, if desired, along a plurality of longitudinally extending folds, with the pleated pad assembly defining a longitudinally extending central panel 42, a pair of first panels 44a and 44b extending from and overlying the front surface 30 of the central panel 42, and a pair of outermost panels 46a and 46b extending from and overlying the first panels 44a and b.

The diaper of FIGS. 1 and 2 has elastic bands means 48 in the form of an elongated elastic loop 50, which may be made of any suitable material, such as rubber. Although the band means 48 will be described primarily as an elastic loop, it will be understood that any suitable form of an elastic means may be used, such as an elongated elastic strip.

The loop 50 has one end 52 secured to the waistline portion 38a adjacent the side edge 34b by a tape strip 54 which passes through the one end 52 of the loop 50, with the tape strip 54 being secured to the surfaces of the diaper adjacent the side edge to retain the end of the loop in place. The loop 50 also has a remote free end 56, and courses of the loop may be secured together intermediate the ends of the loop by any suitable means, if desired. A tape strip 58 is attached to the waistline portion 38a adjacent the other side edge 34a, the tape strip 58 having a securement portion 60 extending outwardly past the side edge 34a which is releasably covered by a release sheet 62. Separate tape strips 64a and 64b may also be secured to the waistline portion 38a adjacent the opposed side edges 34a and b, with securement portions 66a and 66b extending past the side edges 34a and b, respectively, the securement portions being releasably covered by release sheets 68a and 68b. The tape strips 64a and b are preferably located adjacent the tape strips 58 and 54, respectively.

In use, the diaper 20 is unfolded and placed on the infant, with the diaper generally forming the configuration illustrated in FIG. 2. The release sheets 68a and b are removed from the securement portions 66a and b of the tape strips 64a and b, and the securement portions 66a and b are then secured to the back surface 26 of the waistline portion 38b to retain the diaper in place on the infant. Next, the release sheet 62 is removed from the securement portion 60 of the tape strip 58, the elastic loop 50 is expanded around the back surface of the waistline portion 38b, and the securement portion 60 is passed through the free end 56 of the loop 50. The securement portion may then be attached to inner portions of the tape strip 58 or the diaper itself, such that the free end 56 of the loop is captured by the securement portion 60 of the tape strip 58. Thus, the expanded elastic loop 50 is retained in place by the strips 54 and 58 around the back surface 26 of the waistline portion 38b, and the loop 50 applies tension to the waistline portions of the diaper. It is apparent that the amount of tension applied by the elastic loop 50 may be controlled by suitable adjustment of the securement portion 60 of the tape strip 58 when it is passed through the free end 56 of the elastic loop and secured in place. Moreover, the length of the elastic loop 50 may be selected according to the general size of infants who will wear the particular diaper.

It is apparent that the tension applied by the band means or loop 50 causes a snug fit of the waistline portions against the infant's skin to provide added comfort to the infant. Additionally, the elastic or band means 48 prevents gapping away of the waistline portion 38b from the infant's skin and minimizes leakage from the end of the diaper.

Another embodiment of the diaper of the present invention is illustrated in FIG. 3, in which like reference numerals designate like parts. In this embodiment, which is similar in most respects to the diaper described in connection with FIGS. 1 and 2, the tape strips 64a and b have been omitted, and the band means 48 itself is utilized to retain the diaper in place on the infant by

securement of the tape strip 58 through the free end 56 of the elastic loop 50, as previously described. Thus, the expanded band means 48 in the placed diaper retains the waistline portions of the diaper in their proper location on the infant. As shown, the width of the tape strips 54 and 58 may be wider than the side-by-side tape strips illustrated in FIGS. 1 and 2, if desired.

Another embodiment of the diaper of the present invention is illustrated in FIGS. 4 and 5, in which like reference numerals designate like parts. As shown in FIG. 4, in this embodiment one end 52 of the elastic loop 50 is secured to the waistline portion 38a adjacent the side edge 34b by a tape strip 54, as previously described. However, in this embodiment the band means 48 has a second loop 50' having one end 52' secured to the waistline portion 38a adjacent the other side edge 34a by a tape strip 54', the loop 50' having a remote free end 56'. The first loop 50 has means 70 for securing the free end 56 of the loop 50 to free end 56' of the loop 50'. The securing means 70 may be any suitable structure, such as the tape strip 72 shown. The tape strip 72 has one end 74 secured to the free end 56 of the loop 50, and an attachment end 76 having adhesive releasably covered by a release sheet 78. Alternatively, the release sheet 78 may be omitted, and the attachment end 76 may be brought around the back surface of the attachment end 76 through the free end 56 of the loop 50, such that the attachment end 76 may be releasably attached to the back surface of the tape strip 72 itself.

During placement of the diaper, the release sheet 78 is removed from the attachment end 76 of the tape strip 72, and the attachment end 76 is passed through the free end 56' of the loop 50', as shown in FIG. 5. The outer end 79 of the attachment end 76 may be secured to inner portions of the tape strip 72 in order to secure the free ends 56 and 56' together and retain the loops 50 and 50' around the back surface 26 of the waistline portion 38b. The loops 50 and 50' operate as previously described to apply tension to the waistline portions of the diaper, and retain the diaper in place, although additional tape strips, previously described in connection with FIGS. 1 and 2, may be added to the diaper of FIGS. 4 and 5 to assist in retaining the diaper in place on the infant. It is apparent that the tension applied by the loops 50 and 50' may be adjusted by the tape strip 72 as the free ends 56 and 56' are secured together, since the free end 56' may be brought into the desired proximity of the free end 56' by the tape strip.

Another embodiment of the diaper of the present invention is illustrated in FIGS. 6-8, in which like reference numerals designate like parts. In this embodiment, a tape fastener or tape means generally designated 80 is shown having first and second relatively inelastic end portions 82 and 84, respectively, such as sections of pressure-sensitive tape, and elastic band means 86 extending between the end portions 82 and 84. The first end portion 82 of the tape means 80 is secured to the back surface 26 of the diaper adjacent the side edges 34a and b, and the second end portion 84 is releasably attached to the back surface 88 of the first end portion 82. The backing of the first tape section 82 is made of material which provides excellent release characteristics for removal of the second tape section 84. For example, the first tape section 82 may have a backing of polyethylene, or a paper backing having a silicon release coating.

The elastic band means 86 may comprise an elastic loop 90 having opposed ends retained by the end por-

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tions 82 and 84. Thus, one end 92 of the first end portion 82 may pass through the loop 90 adjacent the side edges of the diaper and capture a section of the loop 90 in the end portion 82. Similarly, an opposed end of the loop 90 may be captured and retained by one end 94 of the second end portion 84 which passes through the loop 90. The second end portion 84 of the tape means 80 may be releasably attached to the back surface 88 of the first end portion 82 with the one end 94 of the second end portion 84 being located remote the one end 92 of the first end portion 82, as shown.

In use, during placement of the diaper on an infant the second end portion 84 of the tape fastener 80 is removed from the back surface 88 of the first end portion 82, and the second end portion 84 of the tape fastener is brought into position and secured against the back surface of the other waistline portion 38b with the band means 86 expanded, as shown in FIG. 8. Thus, the tape means or fastener 80 applies tension to the waistline portions to obtain a snug and comfortable fit of the diaper about the infant, and reduce leakage of the diaper at its ends. Moreover, as described, the second end portion 84 of the tape fastener 80 is initially releasably attached to the first end portion 82 of the fastener prior to placement of the diaper, thus eliminating the necessity for a separate release sheet which must otherwise be discarded after placement of the diaper on the infant.

The foregoing detailed description is given for clearness of understanding only and no unnecessary limitations should be understood therefrom, as modifications will be obvious to those skilled in the art.

I claim:

1. A disposable diaper, comprising:
an absorbent pad assembly having a front surface, a back surface, a pair of side edges, and a pair of waistline portions; and
elastic means connectable between a side edge position of one of said waistline portions and extending around the back surface of the other waistline portion to a second edge portion of said one waistline portion to provide a snug fit of the diaper about an infant.

2. The diaper of claim 1 wherein the elastic means is connectable adjacent one side edge of said one waistline portion.

3. The diaper of claim 1 wherein the elastic means is connectable intermediate the side edges of said one waistline portion.

4. The diaper of claim 1 wherein the elastic means comprises an elongated elastic loop.

5. The diaper of claim 1 including tape means for securing said one waistline portion to the other waistline portion adjacent at least one of said side edges.

6. The diaper of claim 1 wherein the connected elastic means extends from opposing sides of said pad assembly adjacent said side edges.

7. The diaper of claim 1 wherein the elastic means comprises elongated elastic band means.

8. The diaper of claim 7 wherein the band means has one end secured to said one waistline portion adjacent one side edge.

9. The diaper of claim 8 including tape means adjacent said one side edge securing the one end of the band means to said one waistline portion.

10. The diaper of claim 9 wherein the band means comprises an elastic loop with said tape means passing through said loop.

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11. The diaper of claim 8 wherein the other end of the band means is attachable to said one waistline portion adjacent the other side edge.

12. The diaper of claim 11 including tape means adjacent said other side edge for securing the other end of the band means to said one waistline portion.

13. The diaper of claim 12 wherein the band means comprises an elastic loop, and in which said tape means is passed through the loop to secure the loop to said one waistline portion.

14. The diaper of claim 7 wherein said band means comprises first and second elastic bands, said bands having one end attached to said one waistline portion adjacent opposing side edges, and including means for securing the other free ends of said bands together intermediate said side edges.

15. The diaper of claim 14 wherein the securing means comprises tape means secured to the free end of the first band, said tape means being attachable to the free end of the second band.

16. The diaper of claim 15 wherein said first and second bands comprises first and second elastic loops, and said tape means has one end passing through and secured to the free end of the first loop, and an attachment end passable through the free end of the second loop to secure the loops together.

17. The diaper of claim 7 wherein the band means is adjustable to modify the tension applied by the band means to the diaper.

18. A disposable diaper, comprising:
an absorbent pad assembly having a front surface, a back surface, and a pair of waistline portions; and
selectively engageable elastic means extending from opposed sides of one waistline portion completely around the back surface of the other waistline portion between side margins of one waistline portion to obtain a snug fit of the diaper about an infant.

19. A tape fastener for a diaper first and second waist-panels comprising, tape means having first and second relatively inelastic end portions, said first end portion being fixedly secured to the diaper adjacent a first waist panel and said second end portion being attachable to a surface of said second waist panel of the diaper to secure the diaper about an infant, said tape means having an elastic loop extending between said first and second end portions.

20. The fastener of claim 19 wherein said first and second end portions comprise first and second sections of pressure-sensitive tape, said first and second sections having one end passing through and secured to said elastic loop.

21. The diaper of claim 19 wherein said second end portion is releasably attached to a back surface of the first end portion prior to placement of the diaper.

22. A tape fastener for a diaper comprising, tape means having first and second end portions, said first end portion being secured to a first panel the diaper and said second end portion being releasably attached to a back surface of the first end portion, said second end portion being attachable to a surface of a second panel the diaper after removal from the first end portion to secure the two panels of the diaper about an infant and means for connecting said first and second end portions.

23. The diaper of claim 22 wherein the connecting means comprises elastic means extending between said first and second end portions.

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UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 3,920,018
DATED : November 18, 1975
INVENTOR(S) : Charles H. Schaar

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 3, line 1, "bands" should be -- band -- .

Column 5, lines 38 and 39, "position" should be -- portion

-- .

Column 6, line 38, after "diaper" add -- having -- .

Signed and Sealed this

thirtieth **Day of** *March* 1976

[SEAL]

Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents and Trademarks