

[54] **FOLDED DISPOSABLE DIAPER**

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128/296

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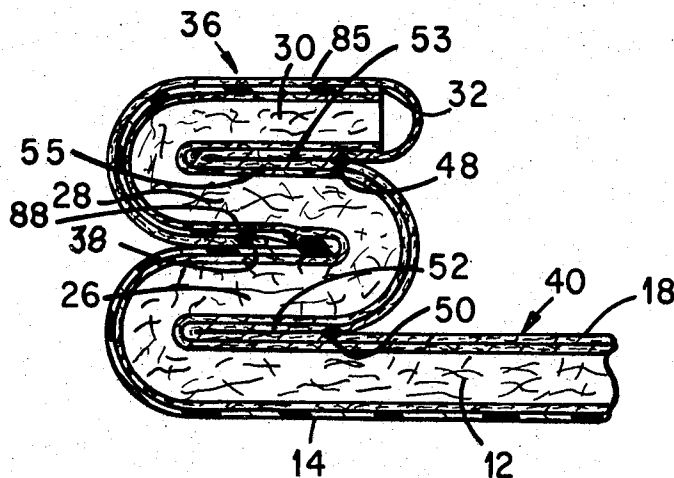
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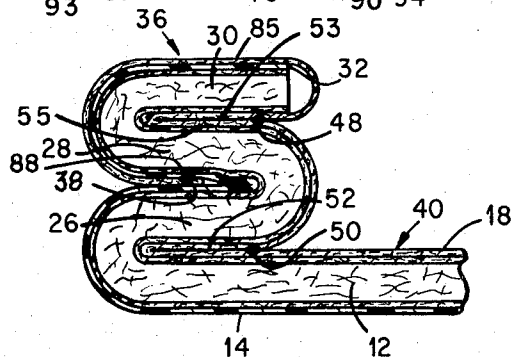
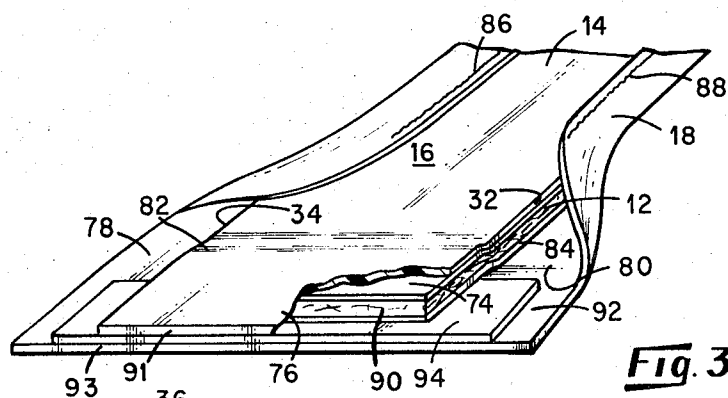
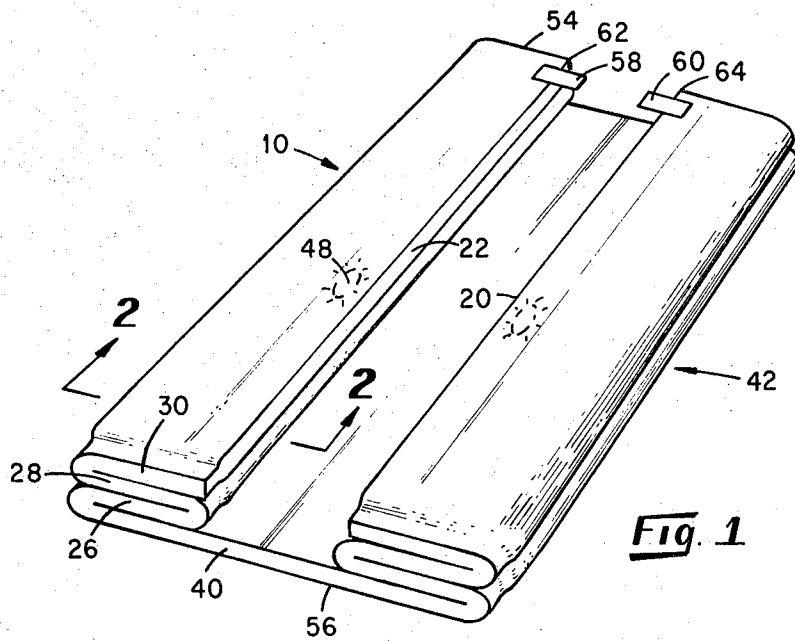
[57] **ABSTRACT**

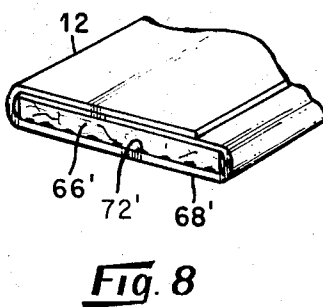
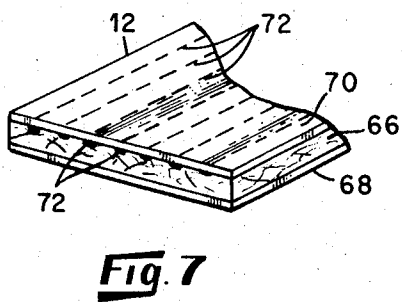
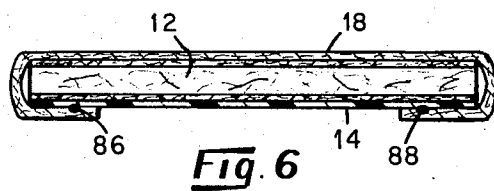
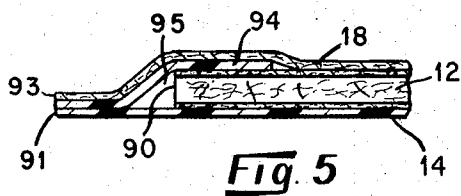
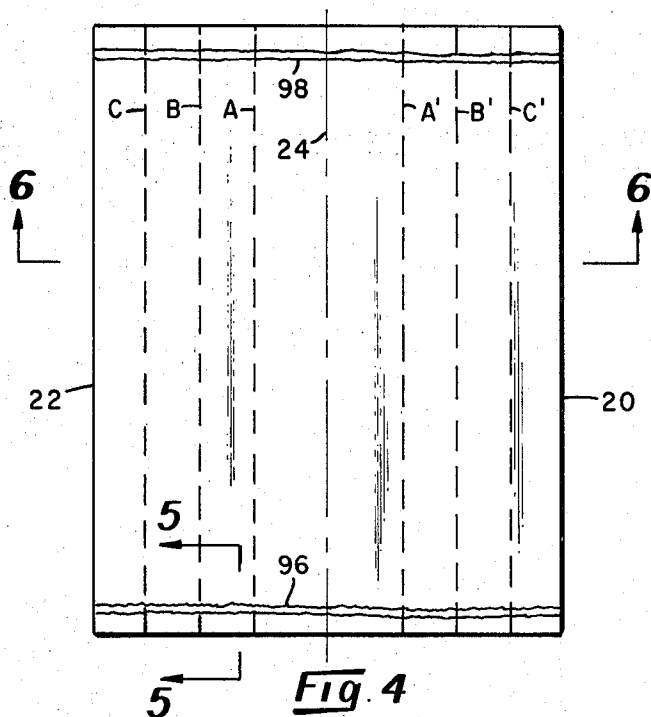
A disposable diaper including an absorbent pad disposed between a backing sheet which resists liquid flow therethrough and a liquid pervious cover sheet. The diaper is folded, using longitudinal folds, into a configuration which in cross section resembles the Greek symbol sigma (Σ) on one side of the longitudinal centerline of the diaper and a reverse sigma on the other side of the diaper. The respective widths and lengths of the pad and backing sheet provide for the fold in contact with the child to be faced by the cover sheet so as to preclude the backing sheet in this fold from contacting the child when the diaper is folded in accordance with the present disclosure.

12 Claims, 9 Drawing Figures



SHEET 1 OF 3





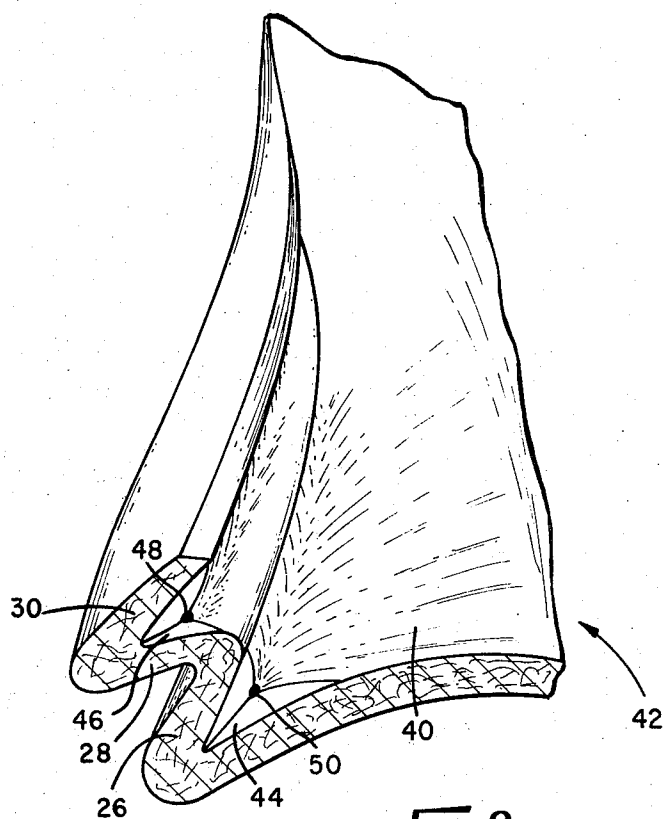


Fig. 9

FOLDED DISPOSABLE DIAPER

This invention relates to disposable diapers; particularly diapers of this type wherein the diaper is provided with longitudinal folds on opposite sides thereof.

Disposable diapers have become a well known item in the marketplace. Diapers including an absorbptive material encapsulated between a liquid pervious cover sheet which is adapted to be disposed adjacent the body of the child, and a liquid impervious, e.g., plastic, backing sheet disposed on that side of the pad away from the child's body are shown in U.S. Pat. Nos. Re. 26,151, issued Jan. 31, 1967 to Duncan et al.; 2,815,027, issued Dec. 3, 1957 to Makela; 2,896,626, issued July 28, 1959 to Voightman; 3,196,874, issued July 27, 1965 to Hreubecky; 3,572,342, issued Mar. 23, 1971 to Lindquist et al.; and 3,520,303, issued July 14, 1970 to Endres. All of these prior disposable diapers have various disadvantages.

It is an object of this invention to provide a disposable diaper which obviates many of the disadvantages heretofore experienced in a disposable diaper. It is also an object of this invention to provide a disposable diaper having minimal leakage of exudate and which provides the advantages of a plastic backed diaper but wherein there is minimal plastic material in contact with the child's skin. It is another object of this invention to provide a disposable diaper which permits limited air circulation into and out of the diaper between the child's legs and the diaper. Other objects of this invention are: to provide a disposable diaper having an enhanced profile and good fit when applied to a child; to provide a disposable diaper which is readily packaged for sale; to provide a disposable diaper wherein the cover sheet, the backing sheet and the absorbptive material therebetween are firmly retained in their relative positions to reduce the opportunity for misalignment of these elements in use; and to provide a folded disposable diaper.

Various of the objects are accomplished by providing a disposable diaper including an absorbent pad disposed between a backing sheet which resists liquid flow therethrough and a liquid pervious cover sheet and folding the diaper, using longitudinal folds, into a configuration which in cross section resembles the Greek symbol sigma (Σ) on one side of the longitudinal centerline of the diaper and a reverse sigma on the opposite side of the diaper. The pad and backing sheet are of substantially the same width with the pad being shorter than the backing sheet. The cover sheet is of the same length as, but is wider than, the backing sheet to provide side portions which wrap the side edges of the pad and cover sheet and which are bonded to the exposed surface of the backing sheet at locations spaced inwardly from the side edges of the backing sheet. When the diaper is folded in accordance with the present disclosure, that fold in contact with the child is faced by the cover sheet so as to preclude the backing sheet from contacting the child, thereby eliminating a source of possible adverse reaction by the child's skin and also eliminating the seal which develops between the child's leg and the backing sheet when the latter becomes moist or wet due to blocked perspiration or liquid exudate. In the preferred diaper, that portion of the cover sheet covering the upper surface of the backing sheet in the top fold is not bonded to the backing sheet so that there is freedom for at least limited relative

movement between the backing sheet and the cover sheet thereby permitting air circulation into and out of the diaper in the leg and crotch region. In the approximate transverse centerline of the folded diaper, the cover sheet is tacked to itself in the folds providing good fit on a child and aiding in holding the longitudinal folds in position to receive, distribute and retain exudate. The ends of the diaper are strengthened and sealed against leakage by folding the ends of the backing sheet back over the pad ends or by providing plastic strips extending transversely across the pad ends and sealing the strips to the backing sheet. In one embodiment, migration of absorbptive matter, e.g., fluff, within the diaper is reduced by covering at least one surface of the fluff with a web, such as a tissue sheet, and bonding the two together by means of spaced-apart bond lines. Adhesive tabs disposed on opposite corners of one end of the diaper provide a means for securing the diaper on the child.

FIG. 1 is a schematic view of a folded diaper including various features of the invention;

FIG. 2 is a schematic enlarged sectional view taken along the line 2—2 of the diaper shown in FIG. 1;

FIG. 3 is a schematic view of an unfolded, partly assembled diaper incorporating various features of the invention; FIG. 4 is a schematic view of an unfolded diaper including various features of the invention;

FIG. 5 is a schematic enlarged fragmentary section taken along line 5—5 of FIG. 4;

FIG. 6 is a schematic section taken along line 6—6 of the diaper shown in FIG. 4;

FIG. 7 is a schematic fragmentary view of an absorbent pad;

FIG. 8 is a schematic fragmentary view of a further absorbent pad; and

FIG. 9 is a schematic fragmentary view of a folded diaper whose ends have been opened as when applied to a child.

A disposable diaper 10 having a rectangular outline and including an absorbent pad 12 encapsulated between a backing sheet 14 which resists liquid flow therethrough and which has an outer exposed surface 16, and a liquid pervious cover sheet 18 is depicted schematically in the Figures. In the present disclosure, the backing sheet is referred to as being of a plastic material but it is recognized that the backing sheet functions to resist the flow of liquid through the diaper and may be other than a plastic material, for example a tissue sheet treated with a water-repellant. As shown in FIGS. 1, 2 and 4, the disclosed diaper is folded employing a sigma fold. In accordance with this folding feature, each of the side edges 20 and 22 of the flat diaper 10 (side edge 22 for example) is folded inwardly toward the longitudinal centerline 24 of the diaper along a longitudinal fold line A located inwardly from the respective side edge 22 of the diaper by about 1/3 of the diaper width, to define a first longitudinal fold 26. The side edge 22 of the diaper is further folded outwardly from the diaper centerline along a second longitudinal fold line B to define a second longitudinal fold 28 overlying the first fold 26. Still further, the diaper side edge 22 is folded inwardly in the same direction as the first fold along a third longitudinal fold line C to define a third longitudinal fold 30 that overlies the second fold 28. Upon completion of this third fold on each side of the diaper, the side edges 20 and 22 of the pad and the side edges 32 and 34 of the backing sheet 14 are

disposed inwardly toward the centerline of the diaper, but the cover sheet 18 extends over the top surface 36 of the third fold 30, wraps the pad and backing sheet at the location of the third longitudinal fold line C, and terminates on the underside 38 of the second fold 28.

In cross section, the central unfolded base 40 of the diaper and the three folds 26, 28 and 30 on each side of the diaper resemble the Greek symbol sigma (Σ), hence is referred to as a sigma fold. (It will be recognized that the fold on one side of the diaper will be the mirror image of the fold on the opposite side of the diaper so that the fold on one side will be a "reverse" Σ .) This fold, in combination with the full width pad, offers the advantage of having a portion of the absorptive pad disposed in the top fold 30 so that as liquid is received in the central portion 40 of the diaper and spreads laterally, there is substantial absorptive capacity in the folds, especially in the top fold, to retain the fluid within the confines of the diaper and prevent it from leaking out of the diaper in the leg regions. Because the plastic backing sheet 14 fully covers the absorbent pad 12 in the top fold (as well as in the other folds) the absorbed liquid is kept from striking through the pad in the crotch region 42 where there is normally a greater amount of flexing and working of the diaper due to the child's leg movements. The exudate is thus trapped within the diaper, keeping the child's skin and/or outer clothing or bedding more free of the liquid exudate. Such trapping of the exudate is enhanced in the disclosed diaper by two V-shaped troughs 44 and 46 formed on each side of the diaper by the folds (see FIG. 9). Both troughs, and particularly the first trough 44, receive and disperse exudate in a direction longitudinally of the diaper. The second of the troughs 46 further serves to assure the containment for a time sufficient to permit absorption of any exudate that moves past the first trough which is closest to the central portion 40 of the pad.

The folds on each side of the diaper are secured in their folded position at points located approximately on the transverse centerline of the diaper, preferably by tack bonds 48 and 50. This is accomplished by placing a small spot of adhesive between selected folds as the folds are being formed. Hot melt adhesive of the ethylene vinyl acetate type known commercially as No. 34-2938 and available from National Starch Company serves satisfactorily for this purpose. This adhesive is not water soluble so that it does not dissolve in the presence of fluid exudate, but rather the spot bonds cause the diaper to retain its folded condition in the crotch region 42 throughout its period of use.

It is acceptable to spot bond each of the folds to any other contiguous fold in the crotch region. In the depicted diaper, tack bonds are provided in the folds on each side of the diaper only between the underside 52 of the first fold 26 and the central portion 40 of the diaper, and between the underside 53 of the top (third) fold 30 and the upperside 55 of the second fold. When the diaper is applied to the child, these tack bonds keep these folds together to insure good fit of the diaper in the crotch region but permit the first and second folds to separate and provide expansion of the diaper to conform to the child's legs. In a preferred tack bond, only the facing portions of the cover sheet in the folds are joined so that when the diaper is applied to the child, the cover sheet 18 unfolds to a lesser extent than the absorbent pad 12 (see FIG. 9) and effectively reduces

the width of the diaper in the crotch region 42 and provides a better fit on the child.

It will be recognized that the diaper is applied to a child in the usual manner, that is, by fanning out one end 54 of the diaper, laying the child on the opened end and bringing the opposite end 56 of the diaper up between the child's legs. This opposite end 56 is also fanned out and the corners of the two ends joined to fasten the diaper about the child's waist. In this operation, the folds remain closed (folded) in the immediate region of the transverse centerline of the diaper but gradually increasingly expand in the direction away from the transverse centerline toward the ends of the diaper. In the present diaper the layers of backing sheet, cover sheet and absorbent pad present in each of the three folds on each side of the diaper are maintained in their relative positions within each fold and can be pulled tight about the child's legs thereby imparting excellent conformability of the diaper to the child in the leg region, hence a better fit on the child. This feature is due also in part to the number of folds which increase the expansibility of the diaper in a direction generally perpendicularly to the diaper proper, so that as the ends of the diaper are fanned open, such action does not place such stresses on the diaper in the crotch region as cause it to buckle and fall away from a good fit about a child's legs.

In the disclosed diaper, adhesive strips 58 and 60 are provided on opposite corners 62 and 64 of one end 54 of the diaper with a portion of each strip projecting from the side edge of each corner. When the two ends of the diaper are in place about the child's waist, these strips provide a means for releasably joining the diaper ends together to secure it in position on the child in a manner well known heretofore.

Referring particularly to FIGS. 7 and 8, the disclosed diaper 10 includes an absorbent pad 12 adapted to be disposed between the cover sheet and the backing sheet. One suitable absorbent pad 12 comprises defiberized pulp referred to in the art as fluff 66. In a common method of manufacturing the pad, the fluff 66 is deposited on a tissue web or sheet 68 (FIG. 7) which is of substantially the same width as the fluff and thereafter overlaid with a second tissue 70 of equal width with the fluff to sandwich the fluff between the two sheets of tissue. Alternatively, the fluff 66' may be deposited on a sheet of tissue 68' (FIG. 8) which is substantially wider than the fluff and the tissue sheet then wrapped around the fluff to envelop it. For purposes of the present discussion, the term "absorbent pad" is intended to include either of these embodiments as well as other variations and combinations of absorptive materials suitable for use in disposable diapers. One such other material comprises multiple plies of creped wadding. The fluff in the disclosed diaper is of uniform thickness across its width. In certain applications, it has been found desirable to provide additional thickness of fluff in the longitudinal center of the pad to provide additional absorptive capacity in such region. The pad in the disclosed diaper extends to the full width of the unfolded diaper so that when the diaper is folded, there is absorbent pad present in each of the folds including the top or third fold 30 to insure absorption of liquid migrating to such areas of the diaper.

The inventors have found that the integrity of the absorbent pad 12 of the present diaper is enhanced by tacking the tissue sheet 70 covering one of the surfaces

of the fluff 66 to the fluff itself using a plurality of spaced apart lines of adhesive 72. These lines of adhesive are spaced apart by distances sufficient to prevent them from adversely reducing the transfer of fluid exudate into the fluff and so as not to stiffen the diaper. For example, adhesive lines, each about one-sixteenth inch wide, spaced about 1 to 2 inches apart satisfactorily reduce the undesired fluff migration. Generally parallel lines of adhesive extending longitudinally of the pad function suitably for this purpose. Other arrangements of the adhesive lines, such as a grid pattern, also provide acceptable bonding between the fluff and the tissue sheet. Bonding of a single surface of the fluff to a covering tissue sheet provides improved integrity to the pad, but either or both of the fluff surfaces may be bonded to covering tissue sheets to provide additional integrity. These bond lines, even though the adhesive only limitedly penetrates the fluff, have been found to reduce migration of the fluff within the diaper and reduce accumulations of fluff that are uncomfortable to the child and which reduce the absorptivity of the diaper. Preferably the adhesive employed in the bond lines is water-insoluble so that the integrity of the fluff is retained when the diaper is wet. The adhesive may be applied directly to the cover sheet or pad. One method for applying the adhesive is to coat a thread, such as 50 denier nylon, with a hot melt adhesive from a bath of liquid adhesive, partially solidify the adhesive on the thread, position the thread between the cover sheet and pad, and thereafter reactivate the adhesive with heat and pressure to effect the desired seal. Other adhesives and methods for their application will be recognized as suitable for bonding the fluff to a covering sheet.

The absorbent pad 12 is overlaid on a liquid-flow resistive backing sheet 14 such as a plastic film which preferably is embossed to enhance its appearance and hand. The backing sheet 14 provides a barrier against liquid flow through the thickness of the diaper and is disposed on that side 74 of the absorbent pad 12 which is intended to face away from the child when the diaper is applied. In the present diaper, the backing sheet 14 is of the same width as the absorbent pad 12 but longer than the pad by an amount sufficient to provide end extensions 76 (only one shown) on opposite ends of the diaper. That side of the backing sheet opposite the side thereof which is in contact with the absorbent pad 12 faces outwardly of the diaper when in use to define an exposed surface 16. Films of various plastics provide acceptable liquid impervious backing sheets. Polyethylene film, embossed with a taffeta pattern, is particularly suitable because of its appearance and availability at low cost. Films of about one mil thickness provide sufficient strength when combined with a suitable cover sheet to provide integrity to the diaper. Such relatively thin films more closely resemble a cloth material so that the diaper is pleasing in appearance and feel. These thinner films also are flexible to the extent that the diaper is permitted to conform to the contour of the child's body and provide a good fit on the child. Films having a thickness of greater than about 3 mils are excessively harsh, displeasing in appearance and more expensive so that their use in the present diaper is not desired.

On that side of the absorbent pad 12 opposite the backing sheet 14, there is overlaid a liquid pervious cover sheet 18. This cover sheet is intended to contact the skin of the child when the diaper is applied and to

permit fluid exudate from the child to pass there-through to be absorbed by the underlying pad. Synthetic nonwoven materials function satisfactorily to pass the fluid exudate, aid in preventing escape of fluff fibers, and simultaneously provide strength to maintain integrity of the diaper. One particularly suitable nonwoven material comprises a web formed from synthetic, hydrophobic fibers, such as rayon fibers alone or mixed with wood fibers, that have been stabilized in web form as by an adhesive which bonds adjacent fibers one to another. Fiber lengths of about one-half inch formed into a web of about 5 mils thickness provide sufficient interfiber bonding to develop good tensile strength in the web so that when the web is incorporated with the plastic backing sheet to a disposable diaper, the diaper resists tearing or other destructive forces such as are present when the diaper is applied to an active child. Nonwoven material comprising rayon fibers and known as Dryfil 300-205 and available from the Nonwoven Products Division of International Paper Company, N.Y. N.Y. has been successfully used as the cover sheet in a disposable diaper having a 1-mil thick polyethylene backing sheet. In webs about 5 mils thick and weighing about 0.624 ounces per square yard, this nonwoven material possesses a toughness such that adjacent folds of the cover sheet can be tacked to each other so that the diaper remains in its folded condition when in use as referred to hereinbefore.

With reference to FIG. 3 showing the disclosed diaper in an inverted position, the cover sheet 18 is of the same length as the backing sheet 14 but is wider than the backing sheet and the absorbent pad 12 to provide side extensions 78 and 80 on opposite sides of the pad 12. In the present diaper, these extensions are folded around the side edges 82 and 84 of the pad and the side edges 32 and 34 of the backing sheet and bonded to the exposed surface 16 of the backing sheet 14 as by longitudinal seams 86 and 88. The distance from the side edge of the backing sheet to a seam is chosen so that when the diaper is folded as discussed hereinbefore the cover sheet, and not the plastic backing sheet, will be exposed on the upper surface of the top fold on each side of the diaper as shown in FIG. 2. Among other things, this feature of the disclosed diaper causes the relatively soft, porous cover sheet of the folded diaper to be exposed on the upperside 36 of the top fold 30 so that this cover sheet, and not the plastic, is in contact with the child. In addition to the comfort afforded the child, the porous cover sheet permits air flow into and out of the diaper between the diaper and the child's legs. Importantly, as depicted in FIG. 2, that portion 85 of the cover sheet 18 which overlies the plastic backing sheet 14 on the upperside 36 of the top fold 30 is not bonded to the backing sheet so that such cover sheet portion 85 has limited freedom of movement with respect to the underlying plastic backing sheet. By this means, these two elements "work" relative to each other during movement of the child's legs permitting the legs to "move" relative to the plastic without being abraded or chaffed by the plastic. This relative movement of the cover sheet and backing sheet on the upperside of the top fold also aids in obtaining air circulation into the diaper in the leg and crotch region.

Preferably, the location of each of the longitudinal seams 86 and 88 is spaced inwardly from the respective side edge of the diaper by a distance sufficient to cause

the seams to be hidden from view on the underside of the second fold 28 of the sigma fold. Such positioning of the seams in the folded diaper also locates them out of contact with the child when the diaper is applied.

In bonding the side extensions of the cover sheet to the exposed surface of the backing sheet, satisfactory retention of the extensions in place has been obtained through the use of longitudinal seams 86 and 88 of hot melt adhesive. Hot melt adhesive of the ethylene vinyl acetate type, available commercially from National Starch Company and identified as No. 34-2938, serves satisfactorily in this function. Threads carrying hot melt adhesive thereon as described hereinbefore provide satisfactory seals between the cover sheet and backing sheet. Alternatively, when either the backing sheet or the cover sheet, or both, is a thermoplastic, the longitudinal seams may be made employing heat and pressure. A single longitudinal seam has been found satisfactory to bond the cover sheet to the backing sheet but in some applications it may be desirable to employ two or more such seams.

As best seen in FIGS. 3 and 5, in the disclosed diaper each of the ends 90 (only one end shown) of the absorbent pad 12 is covered by a plastic cross strip 94. Each cross strip preferably is of a liquid impervious material such as a plastic, e.g., polyethylene of about 2 mil thickness, and extends from the end of the pad to be received between the backing sheet 14 and the cover sheet 18. Each of the ends of the diaper is sealed as by applying heat and pressure to the cover sheet, backing sheet and cross strip therebetween to bond these members to each other across the width of the diaper. In the disclosed diaper, the bond comprises heat-sealed seams 96 and 98 which join the plastic cross strip 94 to the plastic backing sheet 14 to form a liquid impervious seal therebetween and secure the plastic cross strip in position to provide reinforcement in the diaper ends for fastening the diaper about the child's waist and to provide a barrier against leakage of fluid exudate from the ends of the diaper. The use of plastic end barriers in disposable diapers is disclosed in U.S. Pat. No. 3,572,342 issued Mar. 23, 1971 to Lindquist et. al. where the ends of the plastic backing sheet are folded over the ends of the pad to form a type of waterproof pouch for the pad. In U.S. Pat. No. 3,629,039, issued Dec. 21, 1971 to Frick, the pouch is formed of two members, i.e., the backing sheet and strips of plastic, that are sealed together to serve the same purpose of providing a water-tight pouch for the pad. In the disclosed diaper, the plastic strips are wider than the absorbent pad so that they are folded around the side edges of the pad ends with the cover sheet as referred to above. In this manner, a more complete liquid barrier is formed at each end of the diaper and leakage is reduced at the corners of the diaper where pinning or taping occurs and dryness is desired for assuring that the diaper stays fastened on the child.

A diaper of the kind disclosed herein and useful for "daytime" use on infants typically is approximately 18 inches long and 13 inches wide. The absorbent pad of this diaper includes about 19 ¼ grams of fluff and about 6 ½ grams of tissue web covering the fluff on its opposite sides. In this diaper the pad is about 2 inches shorter than the backing sheet and centered on the backing sheet so that the ends of the backing sheet extend about one inch beyond the pad at each end. Each end of the pad is covered by a plastic, e.g., polyethyl-

ene, strip that extends preferably fully across the width of the pad 12 and beyond each of the side edges 82 and 84 of the pad and the side edges 32 and 34 of the backing sheet by about one inch on each side of the pad. This strip also extends from the ends 91 and 93 of the backing sheet 14 and the cover sheet 18, respectively, in the direction of the diaper length by a distance of about 2 ½ inches so that about 1 ½ inches of the length of the pad at its end 90 is overlaid by the strip 94 on that surface of the pad which faces the cover sheet 18. When the strip at each end of the diaper is bonded to the backing sheet as referred to above, the backing sheet and strip form a waterproof pocket or receptacle 95 for the absorptive pad. Accordingly, leakage of fluid exudate from either the sides or ends of the diaper is avoided by this barrier.

The cover sheet for the "daytime" diaper is of the same length as the backing sheet but is about 4 inches wider so as to provide a 2-inch wide extension of the cover sheet on each side of the diaper that is folded around the respective side edges of the pad and backing sheet inwardly toward the centerline of the diaper where it is bonded to the exposed surface of the backing sheet.

In folding this diaper, about 4 ½ inches of a side edge thereof is folded inwardly along a first longitudinal fold line. About three inches of this side edge is folded back upon the first fold to develop about 1 ½ inches width in the first fold. The side edge is further folded back upon the second fold to cause the second and third folds to each have a width of about 1 ½ inches. In this manner, the longitudinal seam 88 that bonds the side extension 80 of the cover sheet 18 to the exposed surface 16 of the backing sheet 14 is not exposed as a result of the folding, but rather, in the folded diaper, the seam is disposed on the underside of the second fold 28. This places the seam out of sight and, importantly, positions it so that it does not contact the child's skin and present a source of irritation to the child. Alternatively, the folding is carried out so that the top or third fold is more narrow than the second fold. In any event, the folds enhance the fit of the diaper on the child and provide an efficient and comfortable item of clothing. It will be recognized that the sigma fold employed in the disclosed diaper permits a diaper of given width to be folded into a more narrow diaper than is possible using prior art folding techniques. The present diaper, therefore, provides a quantity of absorptive material equal to prior diapers, but in a more narrow diaper that better fits between a child's legs.

While a preferred embodiment has been shown and described, it will be understood that there is no intent to limit the invention by such disclosure but, rather, it is intended to cover all modifications and alternate constructions falling within the spirit and scope of the invention as defined in the appended claims.

What is claimed is:

1. In a disposable diaper having a rectangular outline and including an absorbent pad encapsulated between a backing sheet having an exposed surface and a liquid pervious cover sheet, the improvement wherein said cover sheet is wider than said pad and said backing sheet and defines longitudinal side extensions on opposite sides of said diaper, each of said side extensions being wrapped around the side edges of said pad and said backing sheet and bonded to said exposed surface of said backing sheet at a location spaced inwardly

from the respective side edge of said backing sheet, each side edge of said diaper being folded along a longitudinal fold line inwardly toward the centerline of said diaper to define a first longitudinal fold, further folded along a second longitudinal fold line away from said centerline and back upon said first fold to define a second longitudinal fold, and further folded along a third longitudinal fold line inwardly toward said centerline and back upon said second fold to define a third longitudinal fold, whereby said side extensions of said cover sheet are exposed on the respective outer surfaces of said third longitudinal folds in position to cover that portion of said backing sheet disposed in the upperside of said third folds and thereby isolate said backing sheet from the skin of the person to whom the diaper is applied.

2. The disposable diaper of claim 1 wherein said absorbent pad and said backing sheet are substantially coextensive in width.

3. The disposable diaper of claim 1 wherein said absorbent pad is shorter than said backing sheet and disposed substantially centrally thereof to define end extensions of said backing sheet.

4. The disposable diaper of claim 3 wherein said cover sheet is substantially coextensive in length with said backing sheet whereby said cover sheet overlies said backing sheet in the diaper ends to provide lesser thickness of said diaper in the ends than in the central portion thereof.

5. The disposable diaper of claim 1 and including liquid impervious cross strips overlying a portion of each end of said absorbent pad on the surface thereof facing away from said backing sheet and extending from the respective ends of said pad and between said backing sheet and said cover sheet, said backing sheet, cover sheet and said cross strips at each end of said diaper being bonded together along a bond line extending

transversely of said diaper adjacent each of said diaper ends to seal the diaper ends.

6. The disposable diaper of claim 5 wherein each of said strips is wider than said pad but more narrow than said cover sheet whereby the opposite side edges of each strip are wrapped around the side edges of respective pad end to seal the side edges of said pad end.

7. The disposable diaper of claim 1 wherein each of said side extensions of said cover sheet is bonded to the exposed surface of said backing sheet along a longitudinal bond line extending substantially the entire length of said backing sheet.

8. The disposable diaper of claim 7 wherein said longitudinal bond line is disposed inwardly toward the centerline of said diaper by a distance which causes said bond line to be disposed on the underside of said third longitudinal fold when said diaper is folded.

9. The disposable diaper of claim 1 wherein said absorbent pad includes a quantity of fluff, at least one tissue web covering at least one surface of said fluff, and a plurality of spaced apart bonds securing said fluff to said web.

10. The disposable diaper of claim 1 and including at least two tack bonds maintaining the folds on either side of the diaper substantially in their folded positions during use of the diaper, one bond being between the base of the diaper and the underside of the first fold, and one bond being between the upper side of the second fold and the underside of the third fold.

11. The disposable diaper of claim 10 wherein said tack bonds join only adjacent cover sheet portions in said folds.

12. The disposable diaper of claim 1 wherein said backing sheet comprises a liquid impervious plastic material.

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