

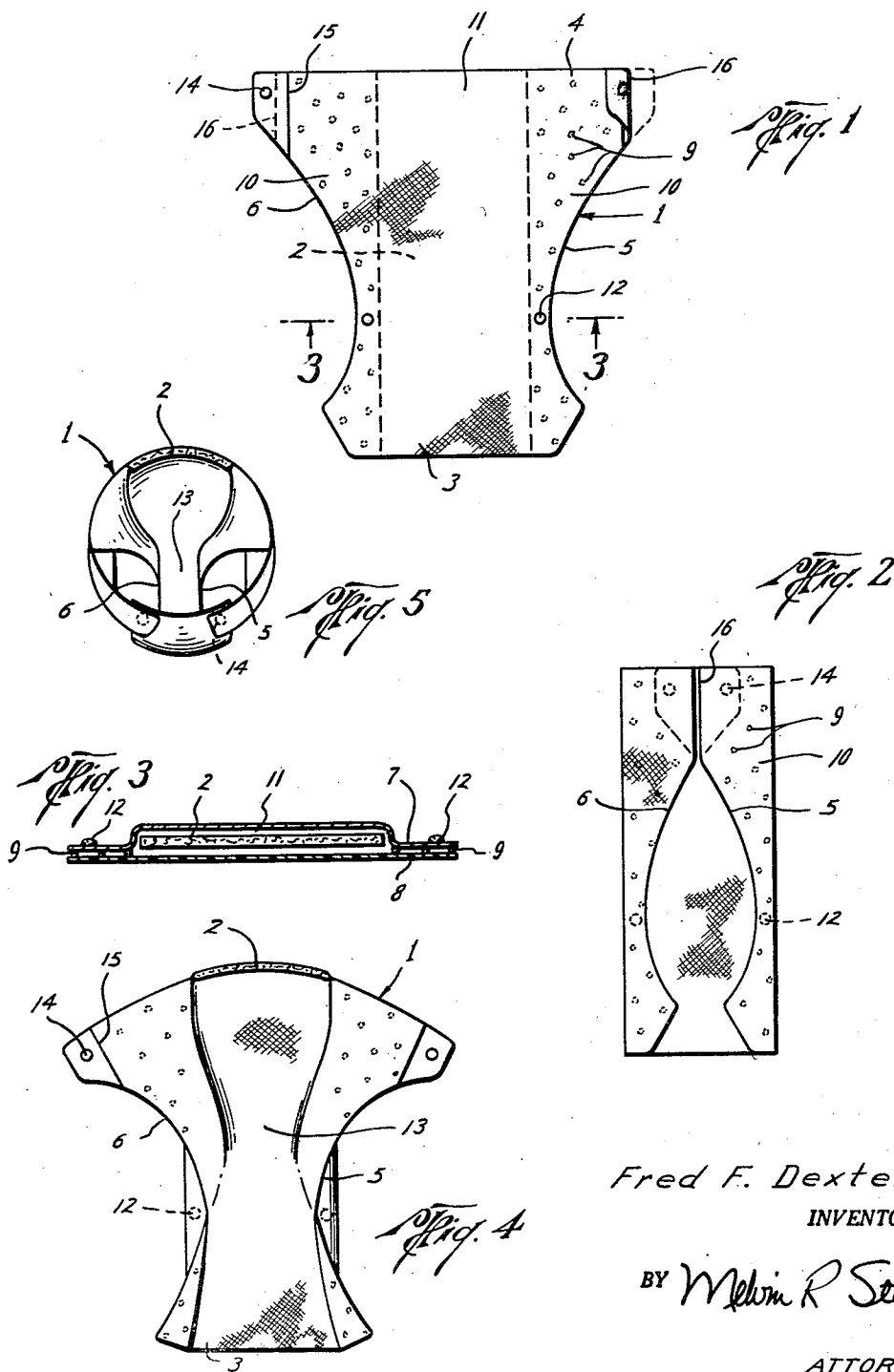
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DISPOSABLE DIAPER

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DISPOSABLE DIAPER

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This invention relates to new and useful improvements in disposable baby diapers.

Previous disposable diapers have failed to provide sufficient absorbency without sacrificing characteristics considered necessary to facilitate their disposability, the very utilitarian function for which such diapers were designed. Such diapers generally comprise a plurality of inner layers of water-absorbent material to which may be secured an outer sheet of water-repellent material. The resultant multi-layer diaper constitutes a rather bulky garment which, though expendable, is not truly disposable because of limited capacity of ordinary waste disposal channels. That is, such diapers may, of course, be deposited in waste containers or released through other large capacity avenues but their utility is severely limited to the extent that they do not lend themselves to disposal through the ideal medium of household plumbing channels. Obviously, to a prudent mother who, rather than risk clogging a plumbing fixture, faces the necessity of either carrying a damp or soiled diaper to a remote waste receptacle or bearing the unpleasantness of a container for soiled diapers in the nursery, the advertised advantages of disposable diapers are lost or, at best, minimized. Of course, such diapers may be so disposed if they are torn apart, but the fact that they require the use of two hands to tear and dissect them often presents mother with a chore more disagreeable than the washing of soiled conventional cotton diapers.

It is, therefore, an object of my invention to provide a disposable diaper which combines maximum absorbency with maximum disposability.

It is a further object of my invention to provide a diaper having a minimum of bulk by confining all of the moisture and soil absorbing material to the moisture and soil producing area on baby.

It is a further object of my invention to provide a disposable diaper which presents extra thicknesses of material for additional absorbency when applied to the baby which may be separated from the body of the diaper to facilitate disposal thereof.

It is a further object of my invention to provide a disposable diaper featuring the maximum of comfort to baby by virtue of its soft and pliable construction.

It is a further object of my invention to provide a disposable infant's diaper which is simple in construction, reliable in use, and which can be manufactured economically.

With these objects in mind I have shown and described, for purposes of illustration the preferred embodiments of my invention.

In carrying out my invention I can initially form my diaper in any one of several conventional shapes such as a square, a rectangle, a triangle or a trapezoid. However, my preferred embodiment is as illustrated in the drawings and features a contour type diaper of irregular configuration which adapts itself to the contour of baby.

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The diaper is of light weight, multi-layer construction having an outer layer of water-repellent material with an inner layer of water-absorbent material substantially co-extensive therewith. The inner and outer layers are joined together in such a manner as to provide maximum pliability and softness of the diaper, the union of the two layers being limited to an area near each side edge of the diaper to form a pocket from top to bottom at the central portion of the diaper for the reception of a removable multi-layered pad of highly absorbent material. Thus, in disposing of the diaper it is, with considerable facility, separated into its two components, one the light weight, bulkless body portion of the diaper and the other the soluble absorbent pad.

The features of my invention which I believe to be novel are set forth with particularity in the appended claims. My invention itself, however, together with further objects and advantages thereof, may best be understood by reference to the following description in connection with the accompanying drawings, in which Fig. 1 is a plan view of an unfolded, disposable diaper comprising my invention; Fig. 2 is a plan view of my disposable diaper folded for packaging or storage; Fig. 3 is a section view taken along line 3—3 of Fig. 1; Fig. 4 is a view in perspective of my diaper as prepared for application to baby; and Fig. 5 is a top view in perspective of my disposable diaper as positioned for application to baby.

Referring now to the drawings, my disposable diaper comprises a diaper body or pad holder 1 and an absorbent insert pad insert 2 (Fig. 3). While the diaper body 1 may be of any conventional configuration, square, rectangular, triangular or trapezoidal, I prefer to form mine of the irregular shape shown to facilitate its accommodation to the body contours of baby. In this form the diaper body 1 is shaped to form a front or abdomen-covering waist band portion 3 and a back waist band portion 4 which are united, when applied as shown in Fig. 5, to encircle the baby's waist. From the back waist band portion 4 of maximum width the side edges 5 and 6 curve inwardly to form a crotch portion of minimum width and then outwardly to the front waist band portion 3. The curvilinear disposition of the side edges 5 and 6 are further advantageous in that they provide (Fig. 5) substantially circular leg-encircling openings.

For maximum versatility and utility, I form the diaper body 1 of two substantially coextensive, united sheets 7 and 8 each of which contribute certain desirable features inherent in their characteristics. The inner sheet 7 is a non-woven vegetable, or composite synthetic and vegetable, sheet material, such as "Viscon". Such a fabric is extremely thin and porous to provide lightness and absorbency; it is warm to the touch for maximum comfort; and it is lint-free for neatness. The high absorbency and extreme wet strength of such material permits the rapid dissipation of moisture without causing the disintegration or tearing of the inner layer or its partial adherence to the infant's skin.

The outer sheet 8 is made of an extremely thin but durable water-proof sheet having considerable tensile strength, such as polyethylene or similar plastic material. Because of these characteristics, the outer sheet 8 inherently provides a strong outer cover for the diaper which retains any moisture therein.

The inner absorbent sheet 7 and the outer water-proof sheet 8 are superimposed upon each other and joined together, by heat sealing or by use of adhesive, only at separated spots 9 to form a unitary diaper body or pad holder. In addition to the obvious saving of adhesive the advantages of joining the inner and outer layers at isolated spots are numerous. For example, and perhaps

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most important, I have found that it minimizes the area of stiffness inherent in conventional adhesives and, hence, provides for extreme pliability of the diapher both to increase vastly its comfort during wear and to facilitate wadding it into a small, readily disposable package. I have found through experimentation that the application of a strip of adhesive or heat seal across the body of a diaper, and particularly along its edges, presents a relatively stiff, sharp seam which often chafes and irritates the baby during wear. Further, as another important advantage, by uniting the sheets 7 and 8 only at isolated spots 9, I preclude the formation of air-tight cells or pockets between the sheets or layers which might otherwise be created by a continuous seal. Such pockets tend to cause the entrapment of air with a resultant inflation or ballooning of the diaper body which increases its bulk and renders it buoyant, to retard immeasurably its disposal through normal plumbing channels.

As best shown in Figs. 1 and 3, the joining of the inner and outer sheets 7 and 8 is confined to the side areas 10 adjacent the edges 5 and 6 to leave unattached the central portion and thus form a pocket 11 extending from top to bottom of the diaper.

Slidably and removably disposed within the pocket 11 between the inner and outer sheets 7 and 8 is the absorbent insert pad 2 made of cellulose or a similar material, such as "Kimpak," having characteristics of high absorbency. The pocket 11, of course, confines the absorbent pad to the central area of the diaper wherein it is most needed; i. e. in the moisture and soil producing area of baby. The confinement of the pad to a narrow, full length strip substantially restricts the spreading of moisture and waste to the central portion of the diaper and eliminates unnecessary bulk near the side edges 5 and 6 to permit retention of the comfort-giving pliability mentioned hereinbefore.

In my preferred embodiment illustrated herein, I provide a spot of pressure-sensitive adhesive 12 or the like adjacent each side edge of the diaper intermediate the top 4 and bottom 3 thereof so that the side edges may be folded inwardly, as shown in Fig. 2, and secured to the central portion of the diaper. By securing the side edges inwardly as shown I provide, not only compactness to facilitate packing, shipping and storage, but also, when the diaper is applied, a natural trap 13 for the reception of waste as disclosed in my co-pending application Serial No. 445,680, filed July 26, 1954.

Near each extremity of the wing-like back portion 4 I provide another spot of pressure-sensitive adhesive 14. This adhesive is preferably applied to the inner surface of the strong outer film 8, in which case the inner, absorbent sheet 7 should be pre-cut at 15 to terminate short of the wing-like extremity of the back waist band portion 4 to leave the extremity of the outer sheet 4 uncovered. Then, in packing the diaper, the extremity of outer sheet with the adhesive thereon may simply be folded over at 16 so that the water repellent sheet itself will serve as a protective covering for the pressure sensitive adhesive until the diaper is ready for use. By thus taking advantage of the characteristics of the materials used in the diaper body I avoid the necessity of the conventional separable protective tabs.

In applying the diaper to the baby, the wing-like back waist band portion and, for a large baby, the front waist band portion 3 are first unfolded to their full width with the side edges still over the central portion to form the waste trap 13 as shown in Figs. 4 and 5. The integral wing extremities or tabs are then folded back to uncover the pressure-sensitive adhesive 15 and the baby is placed on the diaper with his legs on opposite sides of the crotch portion. The front waist band portion 3 is then folded upwardly to cover the baby's abdomen and the wing-like back waist band is folded around baby's waist and secured, by means of the pressure-sensitive adhesive 14, to the front portion 3, as illustrated in

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Fig. 5. Thus, the diaper may be applied without requiring the use of pins, buttons or other fastening members.

When the diaper is soiled the wing-like portion 4 may be pulled free of the front portion 3 and the diaper removed from baby. The diaper may then simply be placed into a toilet bowl and by holding only to one exposed end of the soluble absorbent pad 2 the bowl may be flushed. The resultant water pressure will pull the light weight, bulkless non-soluble diaper body or pad holder 1 away from the partially soluble absorbent insert pad 2 which, in turn is then released to follow the diaper body 1 at one and the same flushing. Because the spot seals 9 uniting the outer and inner sheets 7 and 8 are separated and applied only at isolated points 9 adjacent the side edges, the non-soluble diaper body 1 is of maximum flexibility and incapable of trapping pockets of air which would otherwise retard normal flushing action.

While the present invention has been described by reference to the particular modifications illustrated, it will be understood that those skilled in the art may make further modifications. Therefore, I contemplate that the appended claims cover any such modifications as fall within the true spirit and scope of my invention.

Having described my invention I claim:

1. A disposable baby diaper composing an outer sheet of water-repellent material, an inner sheet of water-absorbent material having a high degree of wet-strength, said inner and outer sheets being substantially coextensive and having a back waist band portion, a front waist band portion and leg-encircling side portions, said inner and outer sheets being united by spot sealing at widely scattered points along said side portions, said spot sealing being adapted to permit substantially unrestricted flow of fluids between said inner and outer sheets and to form an open end pocket between said inner and outer sheets intermediate said side portions, and a pad of absorbent material slidably and removably carried in said pocket.

2. A disposable diaper as defined in claim 1 including a spot of pressure-sensitive adhesive on said outer sheet near each extremity of said back waist band portion.

3. A disposable diaper comprising an outer sheet of water-repellent material, an inner sheet of moisture absorbent material, said inner and outer sheets being coextensive and having curvilinear side edges defining the front portion, an intermediate crotch portion of minimum width and a wing-like back portion of maximum width, said inner and outer sheets being united by spot sealing at isolated points only in an area extending from said back portion to said front portion adjacent each curvilinear side edge, said spot sealing being adapted to permit substantially unrestricted flow of fluids between said sheets and to leave the central portion thereof unjoined forming an open end pocket, and an absorbent pad slidably and removably received in said pocket.

4. A disposable diaper as defined in claim 3 including a spot of pressure-sensitive adhesive on said outer sheet adjacent each extremity of said wing-like back portion.

5. A disposable baby diaper comprising an outer sheet of water-repellent material, an inner sheet of water-absorbent material substantially coextensive therewith, said inner and outer sheets being united only at spaced points by means adapted to permit substantially unrestricted flow of fluids between said inner and outer sheets, an open end pocket between the central portions of said inner and outer sheets, and a pad of absorbent material slidably and removably carried in said pocket.

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