

July 27, 1965

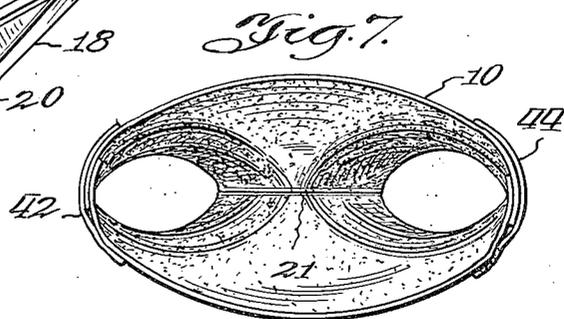
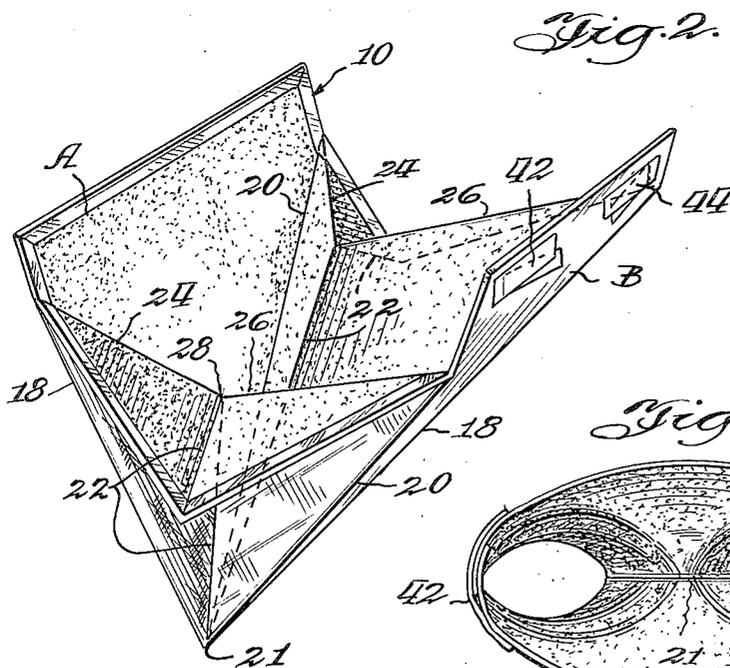
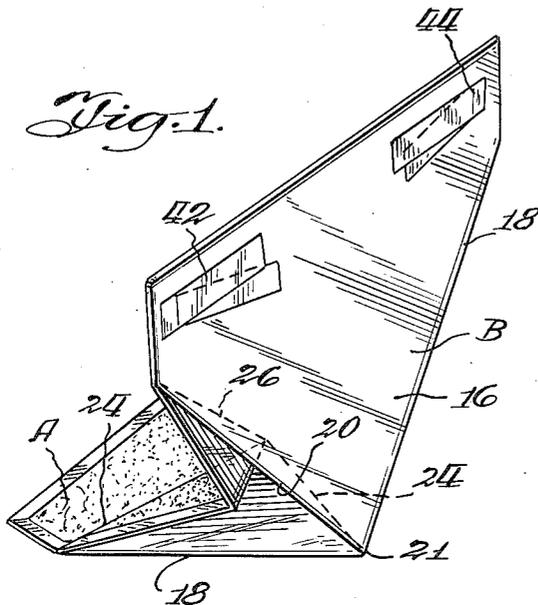
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3,196,874

DISPOSABLE PREFOLDED DIAPER

Filed July 25, 1962

2 Sheets-Sheet 1



July 27, 1965

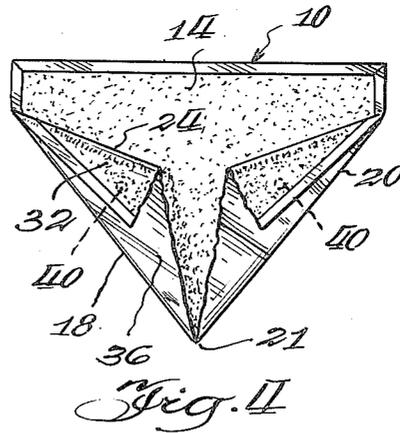
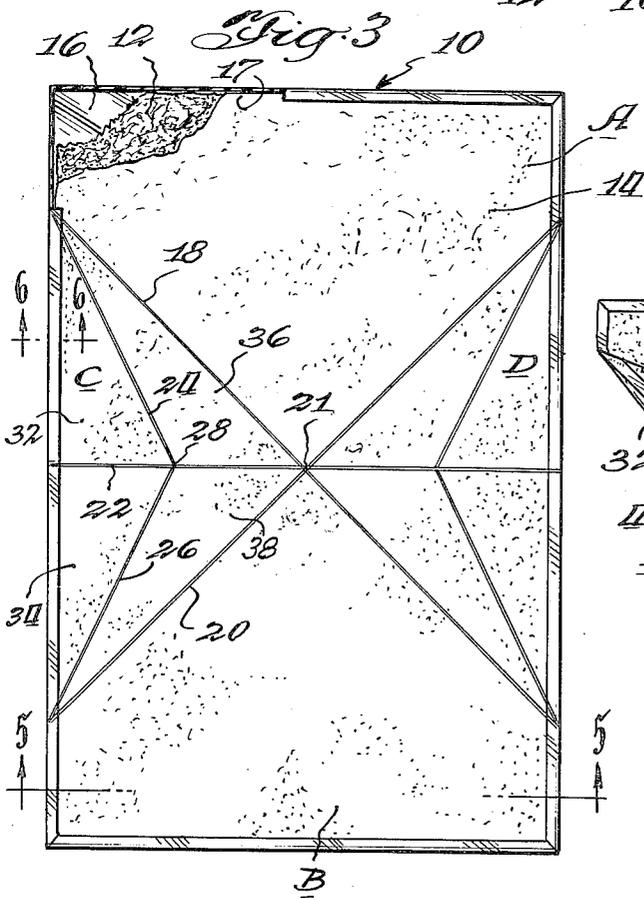
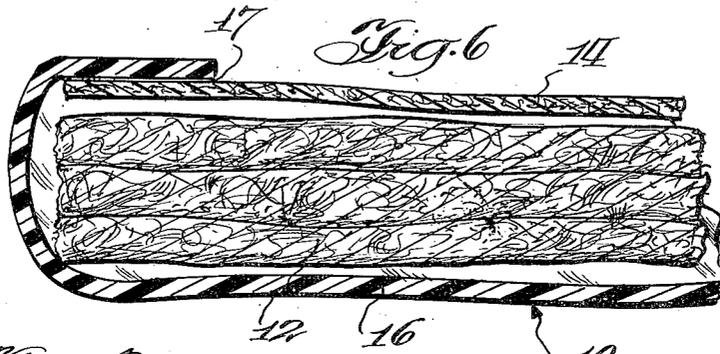
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DISPOSABLE PREFOLDED DIAPER

Filed July 25, 1962

2 Sheets-Sheet 2



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3,196,874

DISPOSABLE PREFOLDED DIAPER

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Filed July 25, 1962, Ser. No. 212,206

1 Claim. (Cl. 128—287)

This invention relates to improvements in diapers, and more specifically to diapers of the disposable or single use type.

An important object of the invention is to provide an improved method of diaper fabrication including pre-folding in a manner to permit easy attachment and removal from an infant.

Another object is to provide a disposable diaper of an improved configuration resulting in optimum utilization of the fluid absorbent material thereof.

Another object is to provide an improved disposable diaper for use without a separate protective garment such as rubber pants.

Another object is to provide an improved diaper pre-folded in a manner to define a depending pocket-like portion properly positioned for the reception of excrement with underwalls of absorbent elements protected by fluid impervious sheet material.

Another object is to provide an improved diaper in which plural elements, some of which are hydrophobic and others hydrophilic in character, are employed in a manner to minimize diaper rash and discomfort.

In the drawings, in which like parts are identified by the same reference numeral,

FIGS. 1 and 2 illustrate in perspective a diaper incorporating the invention.

FIG. 3 shows in plan the absorbent elements of a diaper incorporating the invention as provided with fold lines prior to being folded in the configuration shown in FIGS. 1 and 2.

FIG. 4 fragmentarily illustrates one-half of the diaper of FIG. 3 after portions thereof are folded into the configuration of FIGS. 1 and 2.

FIG. 5 is a transverse section of the unfolded diaper of FIG. 3.

FIG. 6 illustrates in enlarged fragmentary detail the diaper structure of FIG. 5.

FIG. 7 illustrates in plan the configuration of the diaper of FIGS. 1-6 when worn by a baby.

As illustrated in FIGS. 1 and 2, the invention is directed to a pre-formed product which serves the dual function of both a diaper and a fluid impervious protective enclosure therefor and adapted for easy attachment to an infant while eliminating the necessity of a separate protective garment such as rubber pants or the like. While FIGS. 1 and 2 illustrate a diaper as partially opened and ready for application to an infant, it will be understood that as packaged, the article is flat folded with identical half portions contiguously engaged to minimize carton space.

The three dimensional structure, FIGS. 1 and 2, is obtained by suitable infolding of a single blank along fold lines of patterned configuration. FIG. 3 shows diaper 10 in planar form to best illustrate the fold line pattern prior to being formed into the configuration of use as in FIGS. 1 and 2. Diaper 10 may include, as shown in FIGS. 5 and 6, a major absorbent element 12, an overlying protective layer of light weight sheet material 14, and an underlying fluid impervious protective layer 16, marginal portions of which are drawn about corresponding marginal portions of pad 12 and sheet 14 and preferably heat sealed to underlying portions of sheet 14. FIG. 6 illustrates a suitable construction wherein pad 12 con-

sists of plural sheets of creped wadding. Alternately, pad 12 may comprise a layer of cellulosic fluff or any other material offering suitable fluid absorbent characteristics, it being the function of pad 12 to provide the required softness and bulk in addition to its primary function as the major fluid absorbent element. Overlying protective sheet 14 may consist of a nonwoven web of synthetic fibers, such as nylon or rayon fibers maintained in bonded engagement, said webbing being known in the art. Sheet 14 is positioned for direct contact with the body of an infant, thus should be soft and flexible while also being substantially nonadherent to human skin when either dry or wet.

Nonbonded webs formed of synthetic fibers, such for example as nylon or Dacron fibers, while somewhat hydrophobic in character, are particularly adapted for use as overlying sheet 14. When placed contiguous to an underlying element of substantial hydrophilic character such as creped wadding or fluff, the capillary attraction exerted by the underlying element sufficiently counteracts the hydrophobic characteristics of a relatively thin overlying sheet. Hence fluid flow therethrough to the underlying element is permitted, but the overlying sheet 14 remains comparatively dry and nonadherent to an infant's body. The combination of the light weight and comparatively thin overlying protective sheet of the above characteristics and the immediately underlying relatively bulky element of highly fluid absorbent material results in a substantial reduction of diaper rash due to the comparative dryness of the overlying sheet during use. The combination also minimizes the tendency of the diaper cling to the skin of the wearer, and the attendant discomfort. Underlying fluid impervious sheet 16 may, for example, be of polyethylene sheet stock or the like which offers the desirable characteristics of flexibility and softness while serving its primary function as a fluid impervious envelope for the associated diaper elements. Sheet 16 extends coextensively of pad 12, and the margins thereof preferably enclose the marginal areas of both pad 12 and sheet 14, sheet 16 being heat sealed or otherwise bonded along areas shown at 17, FIG. 6, to underlying marginal areas of sheet 14, to provide a unitary assembly the bottom and marginal areas of which define an envelope-like enclosure for pad 12.

As shown in FIG. 3, pad 12, prior to being assembled into the structure of FIGS. 5 and 6, is provided with a symmetrically positioned fold line pattern to facilitate subsequent formation of the three-dimensional configuration best shown in FIGS. 1 and 2. The fold lines, which are preferably formed by embossing, but which may be otherwise formed, include a pair of lines 18, 20 obliquely positioned to extend in X-configuration throughout a major portion of pad 12 with each such line extending between diagonally disposed corner areas of the pad. Lines 18, 20 are symmetrically positioned to cross at a center point 21. Pad 12 is preferably, as herein described, of an elongate rectangular configuration, although other configurations are contemplated. A transverse fold line 22 is positioned medially of the major axis of the pad 12 to extend through center point 21.

Lines 18, 20 thus divide the pad area into two pairs of opposed generally triangular areas such as vertically disposed areas A and B and horizontally disposed areas C and D. Medial line 22 further divides each of triangular areas C and D into two symmetrically disposed triangular areas contiguously positioned on opposite sides of line 22, those areas being unnumbered but each comprising one-half of the respective areas C and D. An additional pair of lines 24, 26 extend within each triangle C and D from the marginal corners thereof to points 28 spaced inwardly of the respective pad margins and preferably positioned to bisect marginally

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disposed corner angles of triangular areas C and D with resultant spacing of point 28 somewhat closer to the margin of pad 12 than to the center point 21. Lines 24, 26 further divide each of the areas C and D into two pairs of symmetrically disposed triangular areas with a common apex at point 28, one pair 32, 34 marginally disposed and the other pair 36, 38 spaced inwardly of the pad margin.

FIGS. 1, 2 and 4 illustrate the configuration of diaper 10 resulting from the infolding thereof along the symmetrically positioned fold lines of FIG. 3. FIG. 4 shows fragmentarily the folding of one-half of diaper 10. Folding may be simultaneously effected along all fold lines in view of the flexible character of the diaper. As diaper 10 is overfolded along line 22, triangular area C folds inwardly along lines 18, 20 and triangular areas 32, 34 fold back along lines 24, 26, that segment of line 22 common to areas 32, 34 folding in a direction opposite to that of the segment of line 22 common to areas 36, 38. Thus as best shown in FIGS. 1, 2 and 4 each of the innermost paired triangular areas is drawn toward areas A and B, respectively, while each of the outermost paired triangular areas is folded both against said innermost pairs and overfolded, one on the other, as the paired halves are drawn into a flat configuration for packing.

While the diaper herein described may be marketed in either its flat or folded configuration, if marketed folded it is desirable to insure against unfolding prior to use, by heat sealing or otherwise interbonding marginal portions of sheet 16 engaged when the diaper is in a flat folded configuration. Interbonding of the overlapped outermost paired triangular areas is shown at 40 in FIG. 4.

As shown in FIG. 1, strips of pressure sensitive tape 42, 44 may be employed, as may other devices to fasten together marginal overlapped upper portions of the diaper during use.

I claim:

A prefolded disposable diaper folded into a configuration suitable for easy attachment to an infant to provide overfolded leg engagement portions and a depend-

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ing excrement trapping pocket centrally disposed in the crotch area, said diaper comprising a rectangular pad of disposable absorbent material and a backing sheet of fluid impervious material, said diaper being symmetrically folded about its medial axis, with said impervious material on the outside, in a manner to provide flat end portions for encircling the body, inpleated leg receiving marginal areas on each side, and an intermediate depending pocket-like portion, said folds and pleats being defined by a plurality of crease lines which include one pair of crease lines extending obliquely between opposite margins of said pads and crossing in X-configuration centrally of said pad at said medial axis to divide a major central pad portion into two pairs of opposed triangular areas, one of said pairs being vertically disposed and the second of said pairs being horizontally disposed, a transverse crease line positioned to bisect each of said horizontally disposed pair of triangular areas into a pair of centrally disposed substantially right triangular side-by-side areas, and a pair of crease lines disposed in each of said right-triangular areas to extend from a common point located on said transverse line inwardly of the pad margin and diverging outwardly to substantially the marginally spaced acute angle of said bisected triangular areas whereby each of said bisected triangular areas are further divided into two equal marginally positioned smaller right-triangular areas and two equal triangular areas disposed inwardly and contiguously of said marginally positioned right-triangular areas.

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