

United States Patent

[11] 3,561,446

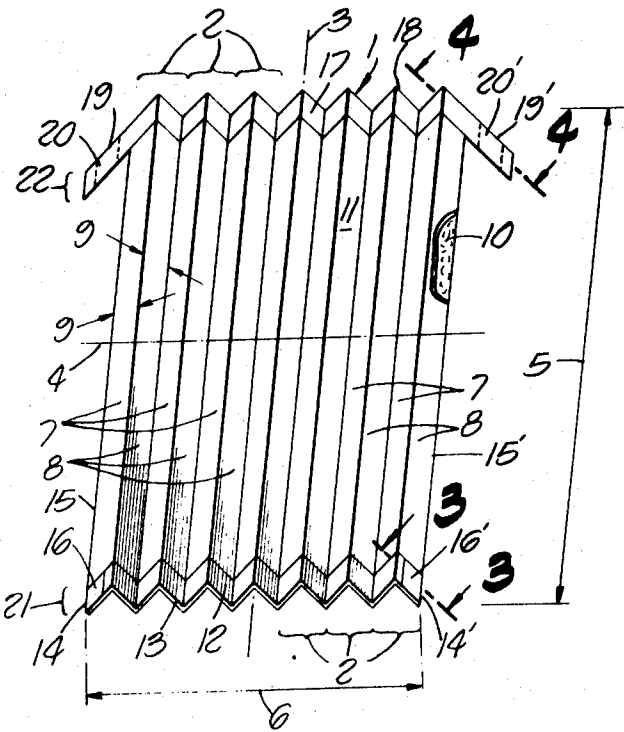
[72] Inventor John Leslie Jones, Sr.
1070 Glen Oaks Blvd., Pasadena, Calif.
91105
[21] Appl. No. 867,713
[22] Filed Oct. 20, 1969
[45] Patented Feb. 9, 1971

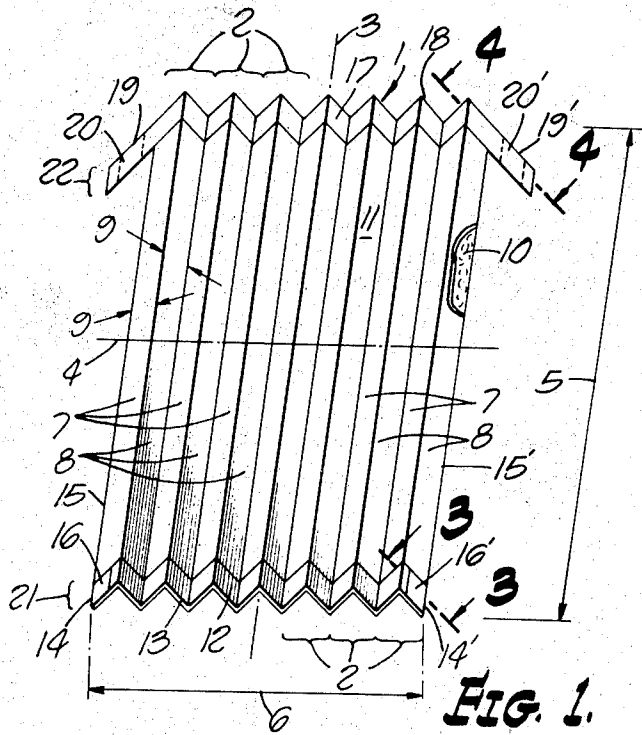
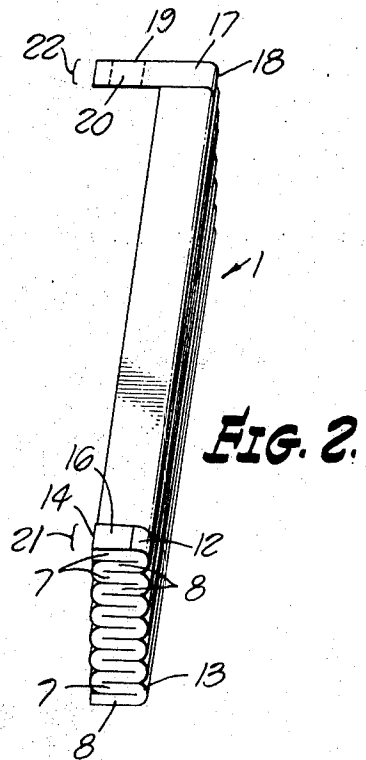
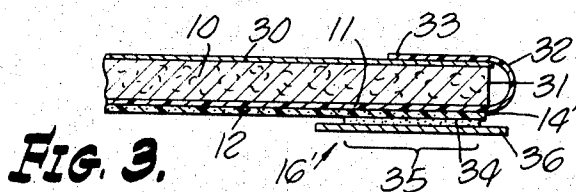
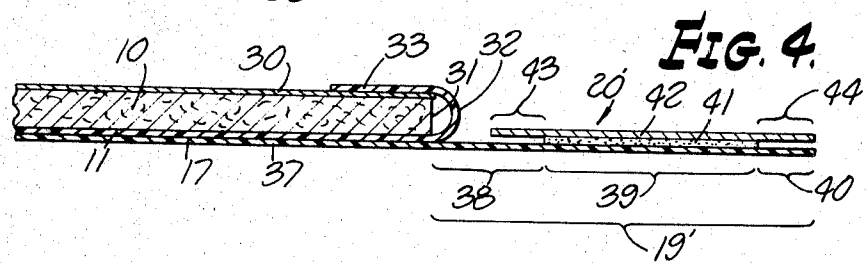
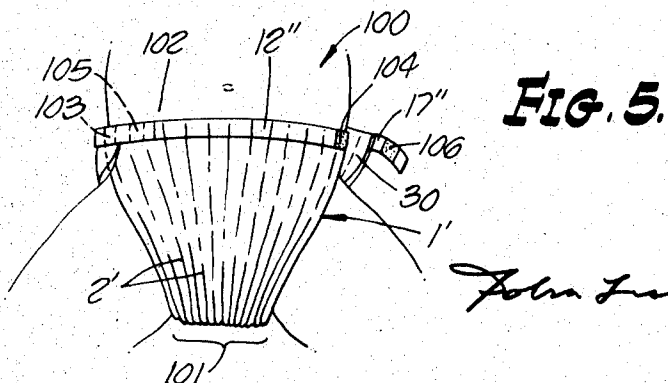
3,180,335 4/1965 Duncan et al. 128/287
3,211,147 10/1965 Pherson et al.
3,430,629 3/1969 Murphy.
3,481,337 12/1969 Ruffo 128/284
Primary Examiner—Charles F. Rosenbaum

[54] PLEATED DIAPER
2 Claims, 5 Drawing Figs.
[52] U.S. Cl. 128/287
[51] Int. Cl. A61f 13/16
[50] Field of Search 128/284,
286, 287

[56] References Cited
UNITED STATES PATENTS
2,714,889 8/1955 Chambers 128/284

ABSTRACT: This invention teaches a single-use, rectangular area, disposable diaper, having multiple longitudinal, parallel pleats disposed in accordion-type folds in the area, said folds being positioned on a baby's torso parallel to the baby's legs. The accordion pleated folds of this diaper simplify the placement of the diaper in the baby's crotch in a position most suitable for maximum absorption and retention of the baby's waste products.





INVENTOR
John Louis Fournier, Jr.

PLEATED DIAPER

CROSS REFERENCE TO A RELATED APPLICATION

This application is related to the U.S. Pat. application filed on this same date titled INTEGRAL DIAPER WAIST BAND FASTENERS, by the same sole inventor.

BACKGROUND OF THE INVENTION

It is well known that washable, reusable cloth diapers are worn to partially clothe a baby up to the age of about 2 years. The cloth diapers are traditionally secured on the baby torso by safety pin fasteners. Commercial single-use, disposable baby diapers are now available. There are difficulties in concentrating the placement of the absorptive diaper material, both the reuseable and the single-use disposable diaper, in a position where the diaper material can completely catch and retain all of the babies' waste products. The accordion pleated folds of this disposable diaper invention simplify the placement of the diaper in the baby's crotch in a position most suitable for a maximum absorption and retention of the baby's waste products.

SUMMARY OF THE INVENTION

This invention teaches a single use, rectangular area, disposable diaper, having multiple longitudinal, equal width parallel pleats disposed in accordion-type folds in the area, said folds being positioned on a baby's torso parallel to the baby's legs. The pleats are distended in a fan shaped array on use on the baby, to provide encircling diaper ends around the baby's abdomen, in the well known pattern. The pleated folds positioned in and around the baby's crotch provide pleated receptacles for holding rapidly gushing urine and feces, until the body wastes can be absorbed and fixed in position in the absorbent pad of the diaper. The multiple parallel pleats can be unequal in fold widths.

Included in the objects of this invention are:

First, to provide integral multiple pleat means for a single-use, disposable baby diaper.

Second, to provide a multiple pleated, accordion-type fold, single-use, disposable diaper for a baby torso.

Third, to provide a safe, simple, multiple pleated, accordion fold, single-use, baby diaper, which places a maximum quantity of fluid absorbent pad in a position on the baby's torso to accept the baby's waste products.

Further objects and advantages of this invention will become apparent in the following description, to be read in conjunction with the accompanying drawing.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view of a single-use, disposable, multiple accordion-type pleated baby diaper, having integral adhesive diaper securing means for a baby's torso.

FIG. 2 is an elevational projective view of a multiple accordion pleated, single-use, disposable diaper of FIG. 1, now tightly folded as for packaging in a commercial retail carton.

FIG. 3 is an enlarged sectional view through 3-3 of FIG. 1, illustrating the construction of the first waistband adhesive securing means.

FIG. 4 is an enlarged sectional view through 4-4 of FIG. 1, illustrating the construction of the second waistband adhesive securing means.

FIG. 5 is a view of the integral pleated diaper of this invention secured in functional position on a baby's torso.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIG. 1 in detail, a single-use, disposable, integral diaper 1 has multiple, accordion folded pleats 2 disposed parallel to the centerline 3 and disposed normal to the centerline 4. The diaper 1 is rectangular in area, having a length axis 5 and a width axis 6. Each of the multiple pleats 2 has a pair of pleat sides 7 and 8, and each pleat side 7 and 8 can have equal pleat width 9. The upper face of the diaper

fluid absorbent pad 10, shown in partial sectional view, has a moisture resistant or fluid impermeable, exterior, thin membrane sheet 11 which covers and encloses one face of the fluid absorbent pad 10. The thin membrane sheet 11 can be a very thin, fluid impermeable plastic film or a chemically treated, wet strength paper base sheet, also resistant to fluid penetration.

The diaper 1 illustrated is rectangular in planar shape, but it can also be a planar square of the required dimension. A square is to be considered a special rectangular shape.

A first face of a thin, flexible, nonextensible, first waistband 12 is permanently, completely secured to the exterior face of the thin membrane sheet 11, parallel to the width axis 6 at the first diaper end 13. The band 12 is disposed completely across the diaper end 13, having a pair of opposed band terminuses 14, 14' which terminate at the opposed diaper sides 15, 15'. The first waistband 12 has a pair of first waistband adhesive securing means 16, 16', each means including a pressure sensitive adhesive coating area permanently secured on the second face of waistband 12 on the band terminuses 14, 14'. Each adhesive coating area can be equal in width to the narrow waistband width 21, and is completely covered by a removable protective release paper sheet, as will be described in detail later.

A first face of a thin, narrow, flexible, nonextensible, second waistband 17, is shown permanently secured to the exterior face of the fluid resistant diaper membrane 11, and disposed completely across the second diaper end 18, parallel to the diaper fold axis 4. The second waistband 17 has a pair of integral, nonextensible band short extensions 19, 19', oppositely extending beyond the respective diaper sides 15, 15'. The band short extensions 19, 19' form a portion of the pressure sensitive adhesive coating securing means 20, 20' which have pressure sensitive adhesive faces, each cooperatively adjacent to the fluid absorbent side of the diaper. Each pressure sensitive adhesive coating area can be equal in width to the waistband width 22, and is completely covered by a removable protective release paper sheet, to form the second waistband adhesive securing means 20, 20'.

FIG. 2 illustrates the compact volume of a single-use, disposable, integral diaper 1, accordion pleated folds closed in a position suitable for commercial packing in a retail carton with other diapers 1. The waistband short extension 19 is shown extended from the diaper pleat side 7, with the second band adhesive securing means 20 disposed on the obverse band side. The multiple, accordion fold pleats 2 are contiguous, with the sides 7 and 8 adjacent to each other. The first waistband 12 is shown secured to the diaper end 13, and the first band adhesive securing means 16 is shown disposed on band 12. The second waistband 17 is shown secured to the directly opposed diaper end 18.

FIG. 3 illustrates the diaper 1 construction through 3-3 of FIG. 1, wherein the first waistband 12 is shown bonded to the exterior face of the thin membrane 11. The sectional view also illustrates the typical well-known construction of single-use diapers, having a nonwoven, porous cover sheet 30 which permits absorption of a baby's waste products in the absorbent pad 10, made of fluffed wood pulp, tissue paper, cotton or rayon fibers or the like. The typical fluid impermeable exterior, thin membrane sheet 11 folds over the edge 31 of absorbent pad 10 at fold 32, and the flap 33 of membrane sheet 11 is bonded to the underlying nonwoven sheet 30. The bonding of flap 33 to sheet 30 may be by heat seal or adhesive, as is well known in the prior art.

The first waistband 12 is a thin, flexible, nonextensible composite structure which is soft and warm to human touch. Band 12 is not rigid or sharp edged, eliminating cutting the baby skin. The nonextensible composite structure of band 12 typically can be a laminate of a thin plastic film and an open mesh woven or nonwoven fiber gauze; or it can be a thin plastic film laminated to paper, typically 50-100 lb. weight. The composite structure is specifically adapted to provide the nonextensibility property of band 12. The plastic film component of

band 12 should be chemically compatible and preferably heat sealable to the membrane sheet 11, although a cement or adhesive can be used to bond 11 and 12 in a known technique. The nonextensibility, softness and the construction properties of band 12 and band 17 are to be fully equivalent to each other.

On the band terminus 14' of band 12, a pressure sensitive adhesive coating area 34 is permanently secured to and covers the band width 21, for a coating area length 35. A thin release paper sheet area 36 at least completely covers all of the pressure sensitive adhesive coating area 34, and is easily removed therefrom with finger tips. The combination of the adhesive coating area 34, permanently secured to a portion of waistband 12, and covered by the release paper sheet area 36, is the first waistband adhesive securing means 16'. The adhesive securing means 16 is equivalent to the adhesive securing means 16' in chemical and mechanical structure, one being the geometrical mirror image of the other.

FIG. 4 illustrates the construction of diaper 1 through 4-4 of FIG. 1, wherein the second waistband 17 is shown bonded to the membrane 11. The sectional view again illustrates the well-known typical single-use diaper construction, in which the nonwoven porous cover sheet 30 is secured to the overlapping flap 33 of the sheet 11, as by heat or adhesive bond. The second waistband 17 has a nonextensible mechanical structure equivalent to the nonextensible structure of the first waistband 12. The plastic film component of band 17 should be chemically compatible, and preferably heat sealable to the membrane sheet 11, although a cement or adhesive can be used to bond 11 and 17 by well-known techniques. The short waistband extension 19' is an integral, continuous extension of the portion 37 of the second waistband 17 secured to the membrane 11. The extension 19' can have three length sections 38, 39, and 40, which together form the total length of 19'. The extension sublength 39 is completely, permanently covered over the band width 22 with a pressure sensitive adhesive coating area 41. A thin, release paper sheet area 42 completely covers all of the pressure sensitive adhesive coating area 41, extending beyond 41 on both of its ends to form the dry alleys 43, 44. The dry alleys 43, 44 serve as handles for the ready removal of the sheet area 42 with finger tips.

The combination 19' as the sublengths 38, 39 and 40, together with the pressure sensitive adhesive coating area 41 and the thin release paper sheet area 42, together form a second waistband adhesive securing means 20'. The adhesive securing means 20 is equivalent to the adhesive securing means 20' in chemical and mechanical structure, one being the geometrical mirror image of the other.

The nonextensibility of waistbands 12 and 17 is an important property. Since the fluid impermeable membrane sheet 11 is typically thin plastic, e.g. 0.003—0.0003 inch thick polyethylene, it will readily cold stretch on tensile loading. The nonextensible waistbands 12 and 17 are substantially thicker, e.g. 0.004—0.010 inches, and their band widths 21 and 22 and typically one-fourth to 1 inch. Thus in application of the single-use diaper, the nonextensible waistbands 12 and 17 provide structural strength in terms of no elongation of the securing waistbands, preventing the integral diaper 1 from structurally stretching or distending at the baby's waist and then falling off the baby's torso. The short waistband extension 19', and the like is typically 2 to 4 inches long, with an adhesive coating area length on the extension typically 1 to 3 inches long.

The release paper sheet areas 36 and 42, and the like, are well-known paper sheet structures, chemically treated on at least one sheet face to provide a treated face which will adhere to a pressure sensitive adhesive coating area, and protect the coating area, yet will not permanently stick to the adhesive. The release paper, 36 and 42, and the like, can be readily removed with finger tips. Typically, 36 and 42 are 0.003 to 0.010 inch thick sheets.

The accordion fold pleats of diaper 1, or the like, may be formed by well-known means, and typically can be three-

eighths to 1 inch wide per fold width 9. The pleats can be of unequal width. The accordion-type folds can be of smaller width in the center of the diaper immediately coadjacent the typical centerline 3, in order to more effectively retain the body wastes by physical entrapment in the folds. The typical entrapment provides time for absorption of the waste fluids on sudden gushing of urine and feces.

In application of this integral pleated diaper, no conventional safety pins are required. The pleats 2 of diaper 1 of FIG. 1 are partially opened and the centerline 3 of the diaper laid parallel and underneath the baby's backbone line in the conventional, well-known manner. The pleats 2 remain constricted in opening, in and around the baby's crotch, placing a maximum of pleated, folded absorbent pad 10 directly adjacent the positions of the baby's torso which emit waste products. The pleats 2 of diaper 1 are fully distended at the first and second waistbands 12 and 17, or the like.

As shown in FIG. 5, the pleats 2' and diaper 1' form a fan-shaped distension on the baby's torso 100, being relatively compressed in and around the baby's crotch 101; and being openly distended over the baby's abdomen 102. The first waistband 12'' is shown stretched to its full length around the baby's abdomen 102, and the second waistband 17'' is also fully distended and overlaps the first waistband 12''. The first waistband adhesive securing means 16 and 16' have been modified by removal of the release paper sheet areas 36, or the like, and by adhesively bonding the band 12'' interiorly to the nonwoven porous sheet 30, or the like, as at 103 and 104. The second waistband adhesive securing means 20 and 20' have also been modified by removing the release paper sheet areas 42, or the like, and adhesively bonding the adhesive coating areas 41, or the like, to the first waistband to form adhesive bonds 105 and 106 on the band 12'.

Thus the integral diaper 1' requires no safety pin fasteners to secure the diaper on the baby's torso, and places the maximum mass of absorbent pad in a position to collect the baby's waste products. The newborn baby is relatively inactive physically and will not necessarily require the adhesive bond securing means 16 and 16' on the first waistband 12. Hence, for the smallest size diaper, typically an area of 10 inches $\times$ 14 inches, the securing means 16 and 16' are omitted. For the more active babies, normally 12 lb. and up in weight, the first waistband adhesive securing means 16 and 16', as well as the second waistband securing means 20 and 20' are both required. The two sets of waistband securing means 16, 16' and 20, 20' are particularly necessary for active toddlers, to prevent the thin, fluid impermeable membrane 11, or the like, from cold stretching while the baby moves, and thus allowing the loose diaper to drop off the baby's abdomen.

Although the pleated diaper of this invention is described in conjunction with the integral diaper waistband fasteners of my copending U.S. Pat. application, filed as of this date, the pleated diaper invention can be practiced alone and without the integral diaper waist band fasteners invention.

Although the absorbent pad, typically 10 of this disclosure, is shown substantially completely coextensive in area with the thin membrane, typically 11, the absorbent pad for entrapping waste fluids can be smaller in area than the membrane. The absorption pad will be typically centrally disposed along the diaper centerline, typically centerline 3.

Obviously many modifications in integral pleated diapers can be made in the light of these teachings. It is therefore understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically described.

I claim:

1. In a single-use, disposable, rectangular area, integral baby diaper having an inner fluid absorbent pad area, and an at least coextensive, exterior, thin film, fluid impermeable membrane sheet area secured to and at least completely covering one face of said pad area, the diaper modification comprising: multiple longitudinal parallel, narrow, freely expandable, full diaper length, accordion fold pleats disposed in and complete-

5

ly extended over said diaper rectangular absorbent pad area, said narrow, full length pleats being disposed in said area parallel to the diaper sides, and normal to the diaper ends adapted to circumscribe a baby's abdomen, adapting said free-

6

ly expandable pleats to placement parallel to a baby's legs when said pleated diaper is secured in use on a baby's torso.

2. The pleated diaper of claim 1 in which said pleats are of equal width.

5

10

15

20

25

30

35

40

45

50

55

60

65

70

75