

[54] **OPTIMUM PROFILE ABSORBENT DIAPER PAD**[76] Inventor: **John Leslie Jones, Sr.**, 1070 Glen Oaks Blvd., Pasadena, Calif. 91105[22] Filed: **Apr. 17, 1972**[21] Appl. No.: **244,982****Related U.S. Application Data**

[63] Continuation of Ser. No. 63,749, Aug. 14, 1970, abandoned.

[52] U.S. Cl. **128/287**[51] Int. Cl. **A61f 13/16**

[58] Field of Search..... 128/284, 286, 287, 128/290, 296

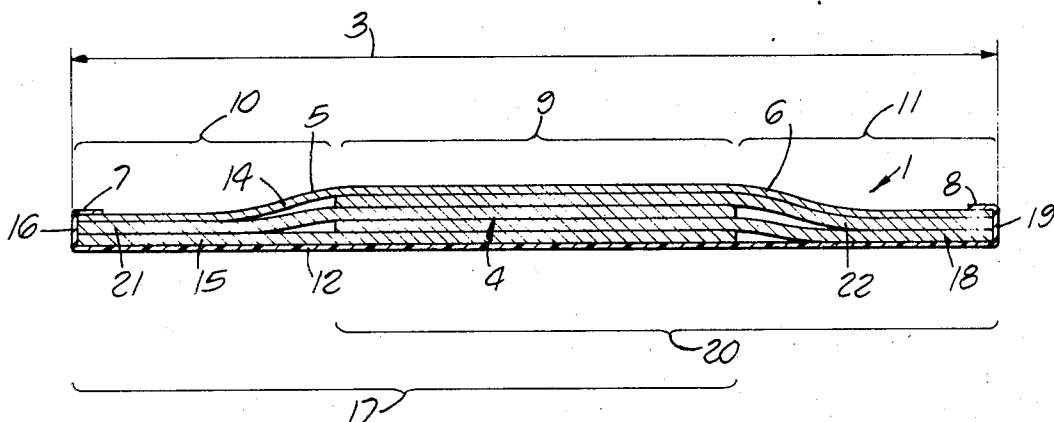
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Primary Examiner—Charles F. Rosenbaum

[57] **ABSTRACT**

A single use, rectangular area, disposable diaper pad has an optimum profile absorbent diaper pad formed of multiple ply of absorbent tissue paper sheets disposed coplanarly adjacent. A first plurality of equal width, fluid absorbent tissue paper ply are coplanarly adjacently disposed along a first absorbent pad longitudinal diaper pad margin forming a first absorbent pad sub-group. A second plurality of equal width, fluid absorbent tissue paper sheet ply are coadjacently disposed along an opposed second longitudinal diaper pad margin forming a second absorbent pad-sub-group. The first sub-group, and the second sub-group, have cooperative sub-group widths adapting the second sub-group to partially overlay a substantial portion of the first sub-group width. The succeeding third sub-group, fourth sub-group and the consecutive like, alternatively partially overlay the sub-group below to form an absorbent pad having a thicker fluid absorptive structure central pad disposed the length of a diaper pad. The optimum absorbent pad profile is centrally disposed in the diaper to absorb the waste products from an infant conventionally secured in the disposable diaper, with the longitudinal pad margins parallel to the infant's legs.

7 Claims, 5 Drawing Figures

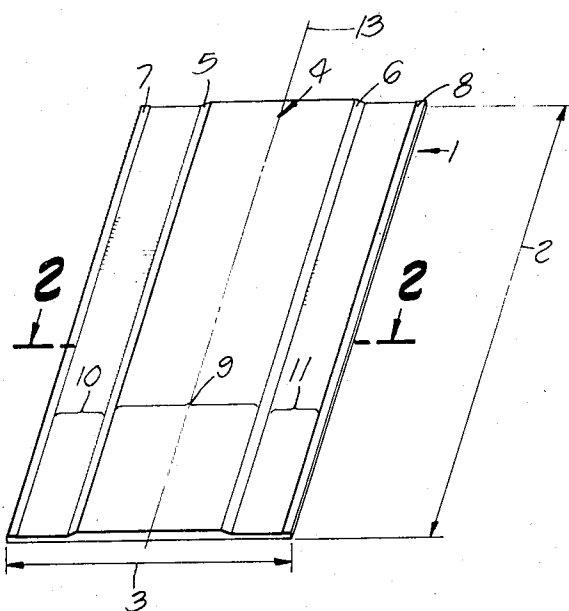


FIG. 1.

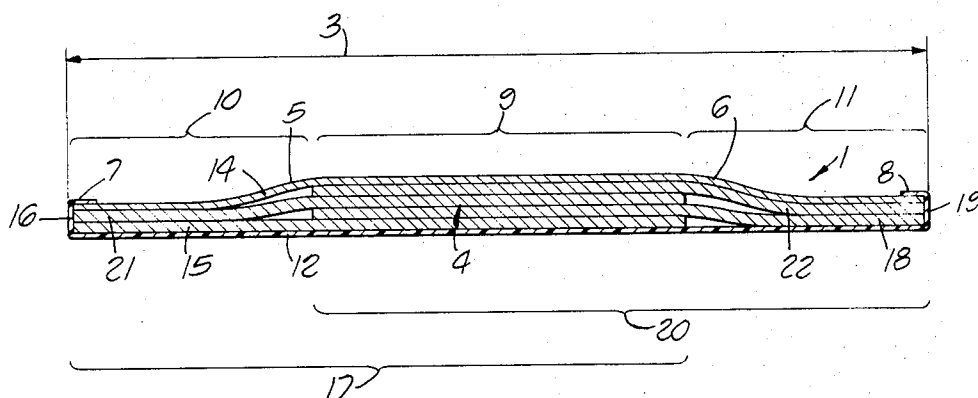


FIG. 2.

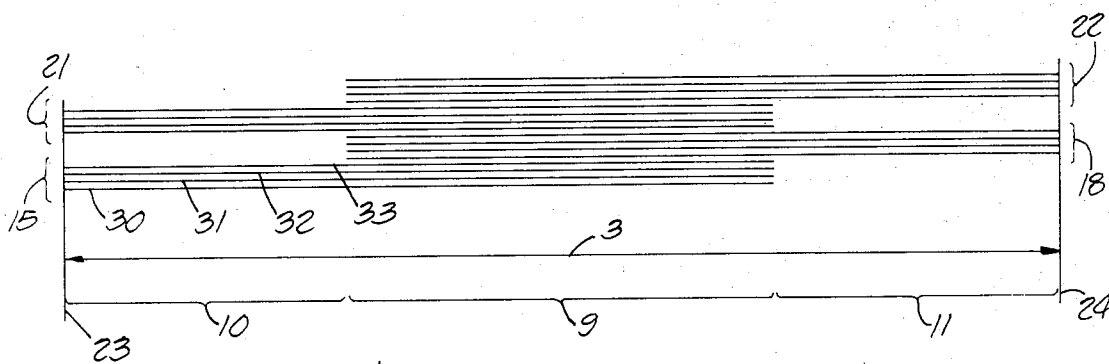


FIG. 3.

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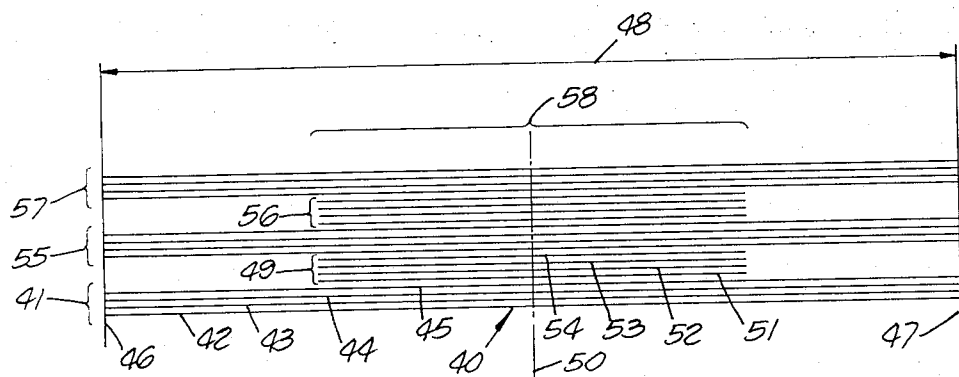


FIG. 4.

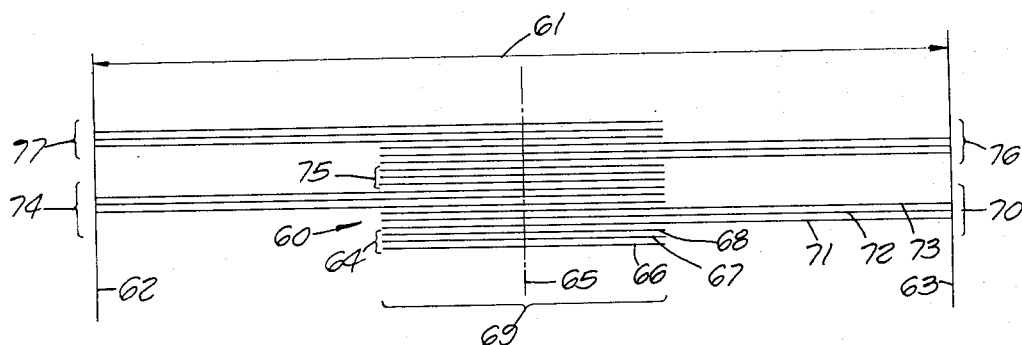


FIG. 5.

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OPTIMUM PROFILE ABSORBENT DIAPER PAD

CROSS REFERENCE TO A RELATED APPLICATION

This application is a continuation of application Ser. No. 63,749 now abandoned.

This application is related to the U.S. patent application Ser. No. 867,713 filed Oct. 20, 1969, by the same sole inventor. This application is also related to the U.S. application Ser. No. 867,505, filed Oct. 20, 1969, by the same sole inventor. Both of the earlier applications teach improved disposable diaper modifications.

BACKGROUND OF THE INVENTION

It is well known that washable, re-usable cloth diapers are worn to partially clothe a baby up to age of about two years. The cloth diapers are traditionally folded and fitted on the baby's torso to place absorbent portions of the diaper in a position to absorb waste fluids. There are difficulties in concentrating the placement of the absorbent diaper material, including the reusable cloth diapers and the single use disposable diaper, in a position where the diaper absorbent material can completely catch and retain the baby's waste products. The optimum profile absorbent diaper pad of this invention cooperatively automatically disposes the placement of the maximum quantity of disposable absorbent pad along the longitudinal central axis of the diaper for maximum catchment of the baby's waste products.

SUMMARY OF THE INVENTION

A single use, rectangular area, disposable diaper pad has a longitudinal centrally disposed optimum profile diaper pad, having multiple ply of fluid absorbent tissue paper sheets coplanarly disposed. The optimum profile of the absorbent diaper pad is formed by coplanarly disposing a first plurality of fluid absorbent tissue paper sheets of equal width in an alignment forming a first diaper pad longitudinal margin, and forming a first pad sub-group. A second plurality of equal width fluid absorbent coplanar tissue paper sheets are coplanarly disposed to form a second longitudinal diaper pad margin, forming a second pad sub-group. The equal width first sub-group pad and the equal width second sub-group pad are coplanarly disposed, the second sub-group coplanarly disposed adjacent to the first sub-group, and the equal width of the first and second sub-groups pads cooperatively adapted to each partially overlap a substantial width of the other sub-group. An additional plural third and fourth sub-group pads, and the like, can be alternatively coplanarly overlapped to form a longitudinal disposed thicker central absorbent pad in the central pad longitudinal area of the diaper, as opposed to the pair of marginal pad longitudinal areas of the diaper. Thus the optimum number of fluid absorbent tissue sheets are disposed in the central pad area of the diaper, to absorb infant waste products as they are excreted, when the diaper is normally secured on the baby's torso with the longitudinal central pad axis of the diaper disposed coadjacent to the baby's longitudinal axis.

Included in the objects of this invention are:

First, to provide a simple manufacturing process for an optimum profile absorbent disposable diaper pad.

Second, to provide a longitudinal centrally disposed optimum fluid absorbent pad area in a single use, disposable baby diaper pad.

Third, to provide an optimum profile fluid absorbent diaper pad in a disposable diaper, which automatically disposes a maximum quantity of fluid absorbent pad in a position on the baby's torso to absorb 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 DRAWING

FIG. 1 is a perspective plan view of a disposable baby diaper illustrating the optimum profile absorbent pad of the diaper.

FIG. 2 is a cross sectional view through 2—2 of FIG. 1, illustrating in detail the overlapping construction of the plural ply sub-groups of fluid absorbent multiple ply tissue paper sheets forming the optimum profile absorbent diaper pad.

FIG. 3 is a schematic cross sectional view schematically similar to the view of FIG. 2, illustrating further modifications of the optimum profile absorbent diaper pad.

FIG. 4 is a schematic cross section similar to the view of FIG. 3, illustrating another modification of the optimum profile absorbent pad.

FIG. 5 is a schematic cross section similar to the view of FIG. 3, illustrating a still further modification of the optimum profile absorbent pad.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIG. 1 in detail, a single use, disposable diaper 1 has a longitudinal pad axis 2 and a pad width axis 3, together with a central longitudinal pad axis 13 disposed parallel to the longitudinal axis 2. The fluid absorbent pad area 4 is shown disposed face up in FIG. 1, having the longitudinal contours 5 and 6 shown disposed in the absorbent diaper pad area 4. The impermeable membrane border seals 7 and 8 secure the coplanarly adjacent diaper pad area 4 materials of construction together. The central, thickest, optimum absorbent pad area 9 is shown longitudinally centrally disposed along the central axis 13 with the marginal longitudinal absorbent pad areas 10 and 11 oppositely disposed adjacent the central absorbent pad area 9.

Referring to the cross sectional view of FIG. 2, the disposable diaper 1 is shown to have the fluid absorbent pad area 4 disposed across the diaper width 3, with the thin fluid impermeable plastic membrane 12 securing the pad at the border seals 7 and 8. The longitudinal pad contours 5 and 6 are shown to be formed by the open mesh, moisture porous cover sheet 14 which conventionally covers the absorbent pad 4. The first sub-group of plural fluid absorbent tissue paper sheets 15 are shown to extend from the diaper pad longitudinal margin 16 across the diaper pad width 3, the diaper pad partial width 17. The second plural absorbent tissue sub-group 18 is shown to extend from the opposed second longitudinal diaper pad margin 19 across the second diaper pad partial width 20. The third plural absorbent tissue sheet sub-group 21 is shown to extend from the first longitudinal diaper pad margin 16 across the first diaper pad partial width 17. The fourth plural absorbent tissue sheet sub-group 22 is shown to extend

from the second longitudinal diaper pad margin 19 across the second diaper pad partial width 20. The open weave porous cover sheet 14, is shown to completely coplanarly cover all of the tissue paper pad sub-groups as they are disposed upon the thin film plastic membrane 12, and also to extend the longitudinal axis length 2 of the diaper 1. The border seals 7 and 8, which serve to mechanically secure the sub-groups 15, 18, 21 and 22 together with the cover sheet 14, are bonded to the pad structure underneath in a conventional, well known manner.

FIG. 3 illustrates in further schematic type detail one typical pad structure having first, second, third and fourth plural absorbent tissue sheet subgroups. The sub-groups 15, 18, 21 and 22 are shown schematically, each sub-group consists of four sheets of two ply 9-11 pound absorbent tissue stock. In practice the lines 30, 31, 32, 33 can alternatively each consist of 1, or 2, or 3, or 4 ply tissue sheet stock. The sub-group 15, 18, 21 and 22 can also typically represent two to four lines each representing one to four plies of tissue sheet stock. Other numbers of plies of tissue sheet stock can be utilized in forming the central optimum absorbent pad area 9. The ratio of the widths of the lateral absorbent pad sections 10 and 11 to the width of the central pad section 9 can be varied over a range. Typically a central optimum absorbent pad area 9 can represent one-half of the total diaper axis width 3, with the lateral absorbent pad sections 10 and 11 being equal in width. The optimum absorbent central pad 9 can typically range from two-thirds to one-fourth of the total width of the diaper pad width axis 3. The illustrated construction of the absorbent diaper pad requires the disposition of the sub-groups, typically 15, 18, 21 and 23, or the like, in overlapping, shingled geometrical disposition to provide the optimum thickest central absorbent pad area, or the like.

FIG. 4 illustrates a further modification of the diaper pad of this invention. The multiple, coplanar tissue sheet, fluid absorbent diaper pad 40 is shown in cross sectional schematic type detail to consist of a first plural absorbent tissue paper sheet sub-group 41, which has the plural ply tissue paper sheets 42, 43, 44 and 45 extending from the first longitudinal diaper pad margin 46 to the second longitudinal diaper pad margin 47, the full width 48 of the diaper pad 40. The second plural absorbent tissue paper sheet sub-group 49 is shown symmetrically disposed upon the first sub-group 41, centrally disposed across the line of center 50 of the diaper pad 40. The second sub-group 49 is likewise shown to consist of the plural two ply tissue paper sheets 51, 52, 53, 54. The third plural sub-group 55 may be equivalent in plural tissue sheet structure to the first sub-group 41, and extends from the first longitudinal diaper pad margin 46 to the second longitudinal diaper pad margin 47. The fourth plural sub-group 56 can be equivalent in plural tissue paper sheet structure to the second sub-group 49, and is likewise centrally symmetrically disposed across the center line 50 of the diaper pad 40, lying upon the sub-group 55. A fifth plural sub-group 57 of plural absorptive tissue paper sheets can be equivalent in its absorptive tissue paper sheet structure to the first plural sub-group 41, and can likewise extend across the full width 48 of the absorbent pad 40. As is earlier described for the modification illustrated in FIG. 3, in practice the lines 42, 43, 44, 45 and lines 51, 52, 53, 54, and the like, can each

represent one, or two, or three, or four ply tissue paper sheet stock. The plural sub-groups 41, 49, 55, 56 and 57 can alternatively likewise typically consist of two to four lines, each representing one to four plies of tissue sheet stock.

In a still further modification of the absorbent diaper pad of this invention, FIG. 5 represents a still further schematic type detail cross sectional structure of a tissue sheet absorbent pad 60, having a full diaper width 61 defined by the first longitudinal diaper pad margin 62 and a second longitudinal diaper pad margin 63. A first plural absorbent tissue sheet sub-group 64 is shown symmetrically disposed across the center line 65 of the diaper width 61. The sub-group 64 is shown to have three lines 66, 67, 68, and each line can consist of one to five ply tissue sheet stock marginally aligned to form a sub-group width 69 symmetrically disposed across the center line 65. The second plural sub-group 70 of absorbent tissue sheet is shown schematically to have the three lines 71, 72 and 73. In practice, the lines 71, 72 and 73 can each consist of one to five ply tissue sheet stock. The schematic representations of the third plural sub-group 74 and the fifth sub-group 76 can be equivalent to the plural absorbent tissue sheet structure of the second sub-group 70. The fourth subgroup 75 is equivalent to sub-group 64. The sixth sub-group 77 can be the full equivalent of the third sub-group 74, in terms of the plural absorbent tissue sheet ply structure.

The fluid absorbent multiple ply tissue paper sheet pad structure of the tissue sheet absorbent pads 4, 40 and 60 can all be formed by coplanarly depositing the multiple plies of tissue sheet stock at high speed on a moving conveyor system to form the ply structures of the several modifications. The teaching of this invention is directed to forming an optimum profile fluid absorbent diaper pad having a symmetrical central thickest absorbent pad area, symmetrically disposed on the longitudinal center line of the diaper pad area. The schematic diaper pad modifications illustrated in FIGS. 1-5 can be further modified by intermixing sub-groups of plural fluid absorbent tissue pads of the required widths and diaper pad marginal alignments, as are required. An open, fluid permeable cover sheet is then applied over the pad.

As is well known in the application of baby diapers on infants, the diaper is placed on the infant in a manner disposing the longitudinal axis 2, or the like, of the diaper in parallel with the legs of the infant, thus placing the optimum thickest central absorbent pad 9, or the like, in symmetrical central alignment on the infant's torso to receive its body wastes.

As to the size of the disposable diaper pad, the absorbent pad may range in size from approximately 10 x 14 inches for the newborn baby infant to 14 x 19 inches for the toddler infant. The fluid absorbent tissue sheet may be creped or uncreped, the creped tissue sheet stock being stretchable and forming a somewhat bulkier absorbent pad. The fluid absorbent tissue paper sheet typical of the standard facial tissue, is a suitable paper stock. The absorbent stock may be colored suitably pink for girls and blue for boys, and it may, be printed with attractive designs. An open cover sheet is applied over the pad.

The optimum profile absorbent pad diaper of this invention can be used in conjunction with my integral diaper waist band fastener of my copending application Ser. No. 867,505, and also in conjunction with my

pleated diaper invention described in my copending U.S. patent application Ser. No. 867,713.

Although the optimum profile absorbent pad of this disclosure is shown substantially completely coextensive in area with the thin fluid impermeable membrane, typically 12, the absorbent pad 4 area can be smaller in area than the membrane, and it can be utilized alone, without an impermeable membrane.

Obviously many modifications in the optimum profile absorbent diaper pad 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 described.

I claim:

1. In an infant diaper having a rectangular, multiple ply, coplanar marginally aligned fluid absorbent tissue paper sheet pad area, said pad area having a pair of longitudinal diaper pad margins oppositely disposed to each other, a central longitudinal diaper pad axis and a diaper total pad width axis normal to said longitudinal diaper pad axis, the optimum profile fluid absorbent diaper comprising:

at least two sub-groups of marginally aligned, plural, fluid absorbent tissue paper sheet pad areas, each consecutive one of said sub-group pad areas having one longitudinal margin serially coincident with one alternative longitudinal diaper pad margin, each one of said serial sub-group pad areas providing a substantial overlap width of the serially subsequent sub-group, providing a central optimum pad area having the required multiplicity of fluid absorbent tissue paper sheets;

and,

a thin, fluid impermeable membrane adjacently coextensive with one face of said rectangular pad area, having each one of a pair of opposed longitudinal border seals disposed on said pair of longitudinal diaper pad margins, said seals securing said diaper pad margins.

2. In the combination set forth in claim 1, the further modification comprising:

the width of said sub-groups being not more than five-sixths of said total pad width axis.

3. In the combination set forth in claim 1, the further modification comprising:

the width of said sub-groups being not less than five-eighths of said total pad width axis.

4. In the combination set forth in claim 1, the further modification comprising:

said pair of opposed longitudinal border seals are disposed on both faces of said longitudinal diaper pad margins.

5. In an infant diaper having a rectangular, multiple ply, coplanar marginally aligned fluid absorbent tissue sheet pad area, said pad area having a pair of longitudinal diaper pad margins oppositely disposed to each other, a central longitudinal diaper pad axis and a dia-

per total pad width axis normal to said longitudinal diaper pad axis, the optimum profile fluid absorbent diaper comprising:

at least two sub-groups of marginally aligned, plural, fluid absorbent tissue paper sheet pad areas, each consecutive one of said sub-group pad areas having one longitudinal margin coincident with one alternative longitudinal diaper pad margin, each one of said sub-groups providing a partial overlap width with another sub-group ranging from not less than one-fourth to not more than two-thirds of said diaper total pad width, providing a central optimum pad area;

and,

a thin fluid impermeable membrane adjacently coextensive with one face of said rectangular pad area, having each one of a pair of opposed longitudinal border seals disposed on said pair of longitudinal diaper pad margins.

6. In the combination set forth in claim 5, the further modification comprising:

said pair of opposed longitudinal border seals are disposed on both faces of said longitudinal diaper pad margins.

7. In an infant diaper having a rectangular, multiple ply, coplanar marginally aligned fluid absorbent tissue paper sheet pad area, said pad area having a pair of longitudinal diaper pad margins oppositely disposed to each other, a central longitudinal diaper pad axis and a diaper total pad width axis normal to said longitudinal diaper pad axis, the optimum profile fluid absorbent diaper comprising:

at least two sub-groups of marginally aligned, plural, fluid absorbent tissue paper sheet pad areas, each consecutive one of said sub-group pad areas having one longitudinal margin serially coincident with one alternative longitudinal diaper pad margin, each one of said serial sub-group pad areas disposed across not more than five-sixths of and not less than five-eighths of said diaper total pad width axis, a first said sub-group having a margin co-aligned with a first said longitudinal diaper pad margin, and a second sub-group having a margin co-aligned with the second longitudinal diaper pad margin opposed to said first longitudinal margin, forming a second sub-group overlap on a first sub-group, providing a central optimum pad area having the required multiplicity of fluid absorbent tissue paper sheets;

and,

a thin, fluid impermeable membrane adjacently coextensive with one face of said rectangular pad area, having each one of a pair of opposed longitudinal border seals secured to said pair of longitudinal diaper pad margins.

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