# United States Patent [19]

**Brooks**

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[54] **EASILY DISPOSABLE DIAPER WITH SEALING BEAD**


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[52] **U.S. Cl.** ..... **128/287,** 128/284

[51] **Int. Cl.** ..... **A61f 13/16**

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



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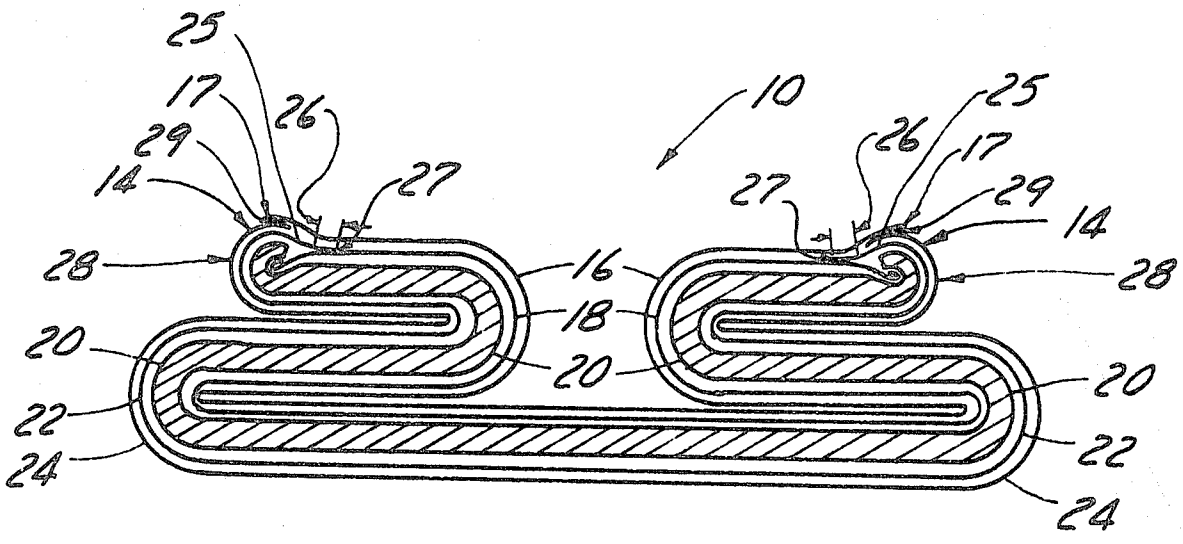
*Attorney, Agent, or Firm*—C. A. Rowley



[57] **ABSTRACT**

The disclosed diaper structure incorporates raised ribs that form sealing beads along each lateral edge of the diaper and also includes a lateral extension on a tissue layer which overlaps in face-to-face relationship with another tissue in the folded diaper structure thereby providing an overlapped section trapping a pulp pad between the tissue layers.


**6 Claims, 4 Drawing Figures**



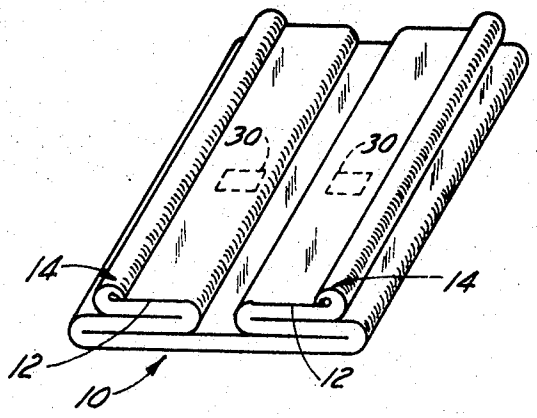



FIG. 1

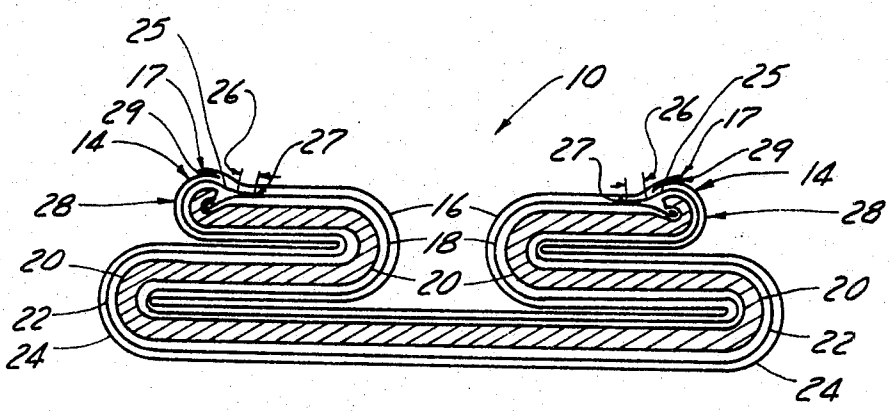



FIG. 2

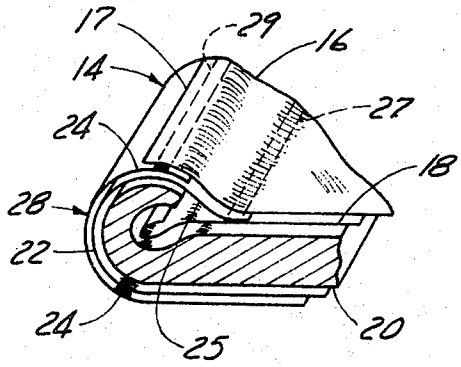



FIG. 3

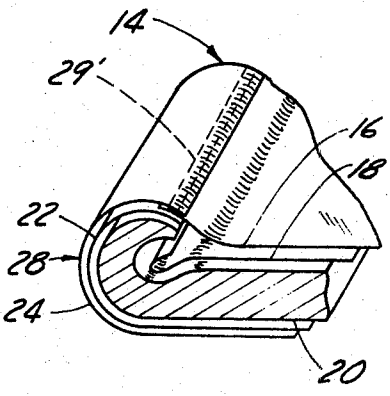



FIG. 4

# EASILY DISPOSABLE DIAPER WITH SEALING BEAD

## FIELD OF THE INVENTION

The present invention relates to a diaper, more particularly to a diaper incorporating raised beads as seals along its lateral edges and to a diaper construction facilitating retaining of the pulp pad in position.

## DESCRIPTION OF THE PRIOR ART

Disposable diapers incorporating a facing sheet of hydrophobic water permeable material and a backing sheet of imperforate material with an absorbent pad sandwiched therebetween are quite well known and have gained substantial acceptance particularly in the United States. These diapers normally are pleated along the opposite sides so that the diaper may be expanded to extend around the baby's middle and yet be sufficiently narrow in the crotch area, so that they may be worn comfortably. Generally, the plastic backing sheet is folded over onto the facing side of the diaper and contact between this folded-over portion of the backing sheet and the baby is relied on to prevent escape of moisture around the side edges of the diaper. Such a seal is not always adequate.

To overcome these difficulties it has been proposed, for example, in Canadian Patent No. 903,401, issued June 27, 1972 to Lindquist et al to provide compressible fluid impermeable strips along each side of the diaper. These strips contact the baby and prevent the escape of moisture from beneath the diaper. Obviously, this arrangement is considerably more complex in that it requires further manufacturing operations to apply the extra elements and requires further component parts thereby rendering the diaper more expensive.

It is an object of the present invention to provide a simple inexpensive mechanism for a better sealing of the side edges of the diaper.

## SUMMARY OF THE INVENTION

Broadly, the present invention relates to a diaper comprising an impermeable backing sheet and a hydrophobic porous facing sheet with an absorbent pad sandwiched therebetween, said absorbent pad extending to the edges of said plastic backing sheet and being folded over adjacent each of the lateral edges to form a sealing bead along opposite side edges of the diaper, said bead providing a raised rim at each edge of the diaper to ensure better contact between the side of the diaper and the baby thereby provide a better seal along the side edges.

In the preferred construction of the present invention, the pad is provided with a tissue interposed between the facing sheet and the pad and between the plastic backing and the pad. The tissue sheet interposed between the plastic backing and the pad is wider than both of these and projects at opposite sides of the diaper so that when the side edges are folded over the projecting ends overlap and lie in face-to-face contact with the other tissue sheet thereby to provide an overlapping area of tissue which traps the pulp pad in the diaper.

## BRIEF DESCRIPTION OF THE DRAWINGS

Further features, objects and advantages will be evident from the following detailed description of the preferred embodiments of the present invention taken in conjunction with the accompanying drawings in which:



FIG. 1 is an isometric view of a diaper constructed in accordance with the present invention;

FIG. 2 is an enlarged transverse cross-sectional view of the diaper slightly extended to show the various layers;

FIG. 3 is a detailed view of the edge structure at each side of the diaper, and

FIG. 4 is a detailed view of a modified form of edge structure.

## DESCRIPTION OF THE PREFERRED EMBODIMENTS

As shown in FIG. 1, the diaper **10** is generally formed with pleats **12** along each side thereof. These pleats **12** may be extended or opened outside of the crotch area to the width of the diaper thereby to facilitate encircling the baby and better ensure a good fit. It will be noted that a bead **14** is formed at each side edge of the diaper by folding over of the pad structure as will be described in more detail hereinbelow.

As can be seen from FIG. 2, the preferred arrangement of the present invention, the diaper **10** comprises a non-woven facing sheet **16**, a first or upper tissue sheet **18**, an absorbent pad **20**, a second or lower tissue sheet **22** and an impervious flexible backing sheet **24**. In the arrangement illustrated the tissue sheet **18**, pad **20** and backing sheet **24** are essentially the same width with their end edges terminating in a plane. The second tissue or lower tissue sheet **22** extends laterally beyond the free edges of these other elements as indicated at **25** and overlaps with the tissue sheet **18** in the area generally designated at **26** at each end of the diaper. In this area **26**, adhesive may be applied as indicated at **27** to secure the plys **18** and **22** together and in some cases the facing sheet **16** together. The plastic backing sheet **24** is normally adhesively secured to the tissue **22**.

In the preferred arrangement of the present invention no adhesive is applied to the overlapped areas **26** and the diaper structure is secured together by an adhesive strip **29** securing the non-woven **16** to the folded over portion of the backing sheet **24** as illustrated.

It will be noted that the pad **20**, the tissue **18** and the tissue **22** together with the backing sheet **24** are folded back on themselves in a reversed fold **28** to provide the raised edge **14** at each side of the diaper. In the arrangement illustrated in FIG. 2, the pad **20** has been reduced in thickness in the area of the raised edge but it will still be noted that the edge projects above the height of the remainder of the pad whereby the pressure between the baby and the diaper is concentrated along the raised edge to improve the seal. The pad thickness should not be reduced by more than 40 percent of its thickness in this area so that when doubled over it will project above the remainder of the diaper.

The two strips of adhesive **27** one at each side of the diaper secure the diaper together. These strips **27** of adhesive are located entirely in the area of the overlap between the extensions **25** of the tissue **22** and the tissue **18** so that any free adhesive may penetrate the pad **20** and normally will do so thereby ensuring that when the diapers are folded in face-to-face relationship during manufacture there will be little if any tendency for the faces of the diapers to stick together.

In the arrangement illustrated, the facing sheet **16** is positioned on top of the backing sheet **24** in the area of the rolled edge or rim **14**. This makes the diaper more comfortable without significantly increasing the

lateral leakage of the diaper particularly when the facing sheet **16** does not extend to the side edges of the diaper. Preferably the side edges **17** of sheet **16** will not be less than ⅛ inch from the side edge of the diaper as defined by the outer edge of the sealing beads **14**.

The adhesive seams **27** or **29** in the illustrated arrangements are formed by continuous adhesive lines, but it is also possible to use an intermittent adhesive line and retain the required strength.

If desired, the backing sheet **24** may be separated from the tissue **22** at least in the area of the upper section of the folded section **28** and the extension **25** eliminated as shown in FIG. **4**. In this arrangement, the non-woven sheet is laid in direct contact with the tissue **22** in the area of the raised rim **14** and then the plastic backing sheet **24** is folded over onto the adhesive strip **29'** which functions to secure the plastic backing sheet to the non-woven sheet and the non-woven sheet to the tissue **22**. With the structure shown in FIG. **4**, the plastic backing **24** directly contacts the baby along the raised edge and provides a slightly better seal at the expense of the comfort of the infant.

When the diaper is formed either using the FIG. **1** to **3** or the FIG. **4** embodiment of the present invention the pleats **12** are secured together in the crotch area by tack points generally indicated at **30** in FIG. **1**. These tack points hold the pleat together and prevent it from being opened in this area thereby forming a crotch section that is permanently equal in width to the width of the folded diaper. These tack points **30** may be located along the transverse centre line of the diaper or may be positioned forwardly of this centre line to provide a front and a back to the diaper, the front being the shorter section. Generally these tack points will not be shifted forward more than about **2** inches.

In the arrangement illustrated the Z-fold at the side of the diaper terminates a distance in from the lateral edge of the diaper. If desired, the fold may be rearranged so that the fold forming the outside of the raised edge **14** is located at the lateral edge of the diaper.

The double thickness provided by the reverse fold **28** normally will not project from the free edge **15** of the diaper pad is towards the centre thereof a distance of more than **2** inches and preferably will extend in between ½ and 1½ inches from the free edge.

No tying devices have been shown, however suitable adhesive tabs may be applied to the backing sheet **24** at the side thereof and adjacent the back of the end of the diaper. These adhesive tabs secure the front and rear sections of the diaper together around the baby and thereby hold the diaper in position. The adhesive used is such that the tab may easily be separated from the front of the diaper to facilitate removal of the diaper for changing.

Modifications may be made without departing from the spirit of the invention as defined in the appended claims.

I claim:

**1.** A diaper comprising a porous hydrophobic facing layer, an impervious backing layer, an absorbent pad sandwiched between said facing and said backing layers, said pad being substantially the same width as said backing layer, a means for providing a moisture seal comprising a pleat extending outwardly toward each side of said diaper and terminating in a folded edge portion at the lateral extremities of the pad formed by a portion of said pad and said backing sheet folded over into a reverse fold in an inward direction and providing a raised sealing bead along each side edge of the diaper.

**2.** A diaper as defined in claim **1** wherein each said reverse fold extend in from a lateral free edge of said pad a distance of at least ½ inch.

**3.** A diaper as defined in claim **2** wherein said pad comprises a top tissue and a bottom tissue with an absorbent padding therebetween, said bottom tissue being wider than the other components of said diaper and forming lateral extensions on each side of said pad and backing sheet, said lateral extensions overlying said top tissue in the area immediately adjacent the side edges of the pad when the diaper is folded to form said reverse fold.

**4.** A diaper as defined in claim **1**, wherein said facing sheet overlies said raised beads.

**5.** A diaper as defined in claim **2** wherein said facing sheet overlies said raised beads.

**6.** A diaper as defined in claim **3** wherein said facing sheet overlies said raised beads.

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