United States Patent [19]

Gellert

[11] **3,874,385**

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[54] **LAMINATED DIAPER TOPSHEET TO PROVIDE DISPOSABILITY OF SOLID WASTES**

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[73] Assignee: **The Procter & Gamble Company,** Cincinnati, Ohio

[22] Filed: **Sept. 17, 1973**

[21] Appl. No.: **397,530**

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

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

[58] **Field of Search**..... 128/287, 284, 286, 290 B, 128/290 R, 296, 270; 161/406, 151

[56] **References Cited**

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3,667,466	6/1972	Ralph	128/287
3,794,038	2/1974	Buell	128/287

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[57] **ABSTRACT**

A disposable diaper is provided with a laminated topsheet for covering of the absorbent pad and contacting the infant. By delamination and removal of the outer portion of the topsheet, it and the solid waste thereon may be disposed of separately from the remainder of the diaper, particularly the bulky portion which absorbs the water-like liquid wastes.

2 Claims, 4 Drawing Figures

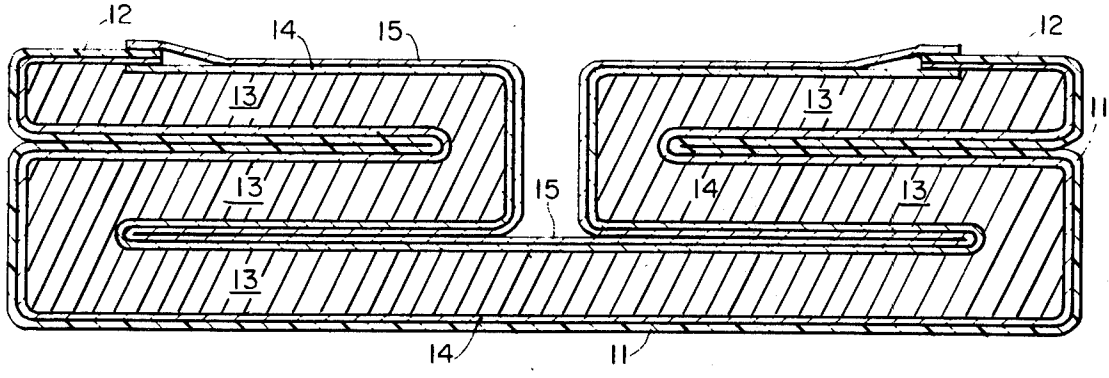


Fig. 1

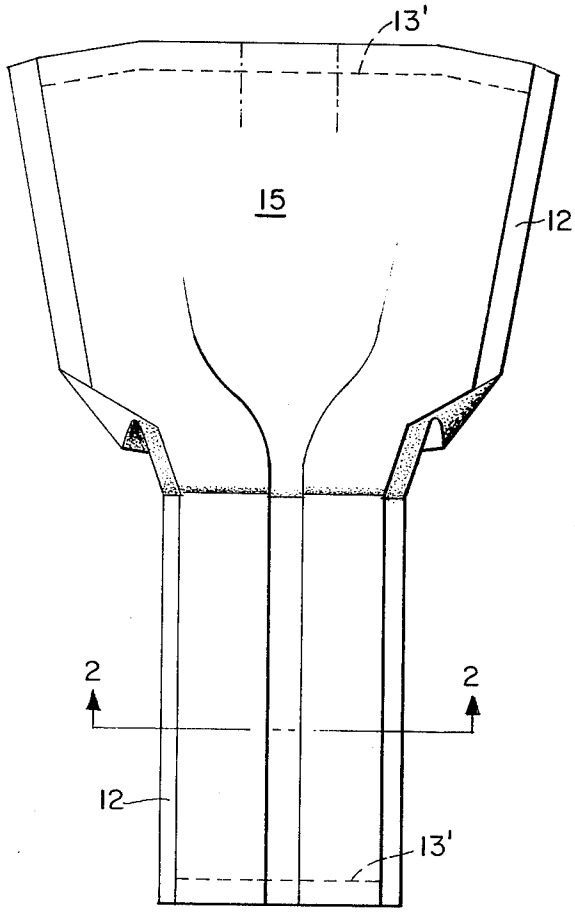


Fig. 2

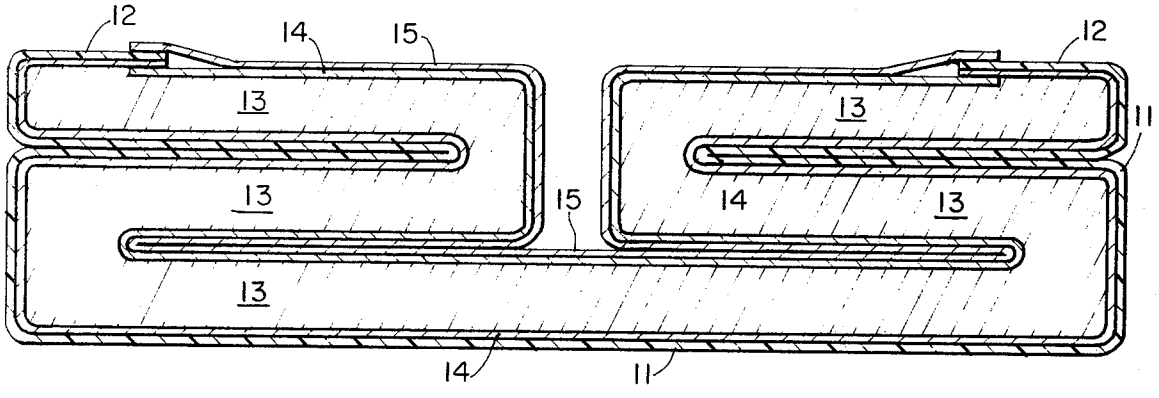


Fig. 3

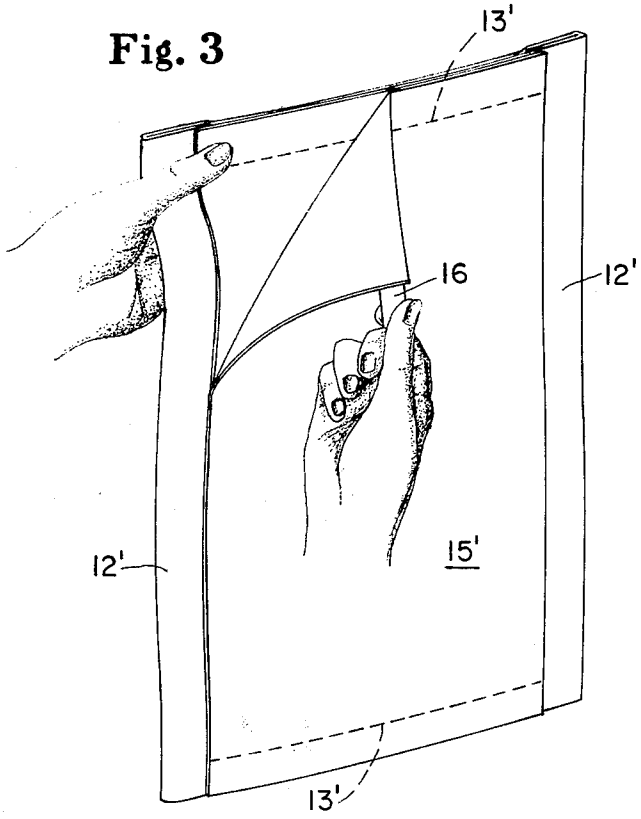
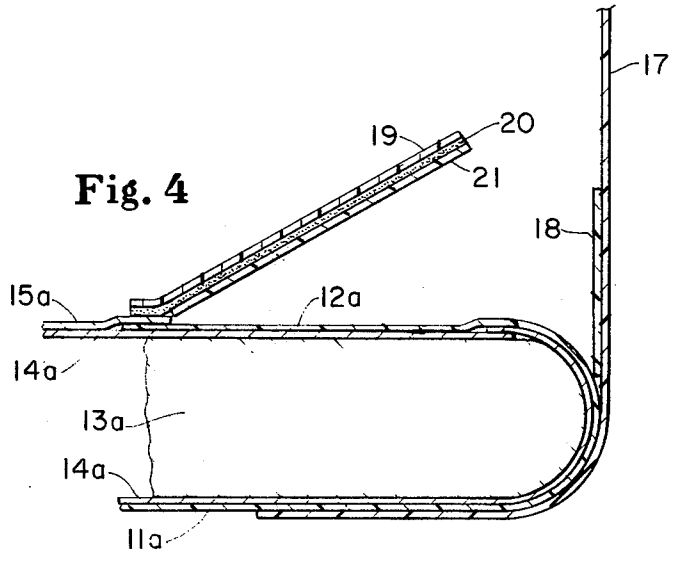


Fig. 4



LAMINATED DIAPER TOPSHEET TO PROVIDE DISPOSABILITY OF SOLID WASTES

BACKGROUND OF THE INVENTION

This invention relates to a liquid-pervious topsheet for disposable diapers and more particularly relates to such a topsheet which is laminated and can be delaminated for convenient disposal of fecal material deposited thereon.

In the past decade, improvements in disposable diapers have revolutionized the diapering of infants. As the term "disposable " implies, these diapers are designed to be discarded after a single use. Disposable diapers generally consist of an absorbent pad, a pad-covering topsheet which contacts the infant, and a liquid-impervious backsheet for containing the liquid wastes within the absorbent pad. Not all disposable diapers include all of these features; for example, some disposable diapers contain no backsheet and are used in conjunction with a separate pair of liquid-impervious pants.

A variety of pad-like inserts for use with specially designed pants or for application within a conventional cloth diaper have also been used, typical ones of which are described in U.S. Pat. No. 2,450,059 which issued Sept. 28, 1948, to F. K. Rickerson and U.S. Pat. No. 2,002,368, which issued May 21, 1935, to C. L. Fancher. Also, separate loose paper-like liners have been used in the past with cloth diapers.

While going part of the way to solving the disposal problems, the prior art does not address itself to the problems raised in disposing of a single use diaper which is fecally soiled. Although many disposable diapers have an absorbent pad assembly, typically comprising an absorbent pad and a pad-covering body-contacting topsheet, which is suited for disposal by flushing in a water closet, this manner of disposal of the absorbent pad assembly has some significant drawbacks. Generally, the absorbent pad assembly is held in the flowing stream of water resulting from flushing the water closet so that the pad is gradually torn apart by the flowing water. The inconvenience of holding the diaper as it is being flushed away discourages many users from disposing of the absorbent pad assembly by flushing it down the water closet.

The alternatives to flushing the absorbent pad assembly also have major drawbacks. If the absorbent pad assembly is fecally soiled, disposal of it in the garbage is both unpleasant and potentially unsanitary. Therefore, one concerned with the undesirable aspects of disposing of a fecally soiled diaper in the garbage must first scrape or rinse the soil into the toilet and then dispose of the pad assembly in the garbage. In copending U.S. Pat. application Ser. No. 313,079, Gellert, filed Dec. 7, 1972 and assigned to the assignee of the present application, one solution to the problems posed above is provided. This solution, simply stated, involves the provision of a topsheet for a diaper or the like which is or which has a portion which is smaller than the absorbent pad and is separable therefrom.

OBJECTS OF THE INVENTION

It is an object of this invention to provide an alternative solution to that of the aforementioned patent application to reduce the inconvenience associated with the disposal of single-use diapers which are fecally soiled.

It is a further object of this invention to provide for the separate disposal of solid wastes from diapers without the inconvenience of having to manipulate a loose liner to accomplish this end.

It is still a further object of this invention to allow separate disposal of the solid waste from a diaper together with a minimum amount of topsheet material and without the bulky absorbent pad.

SUMMARY OF THE INVENTION

To accomplish these objects, a disposable diaper is provided with a topsheet which is laminated and which can be delaminated to facilitate fecal disposal. Upon delamination, the separated portion of the topsheet together with the solid waste on it may be disposed of separately from the remainder of the diaper.

BRIEF DESCRIPTION OF THE DRAWINGS

While the specification concludes with claims particularly pointing out and distinctly claiming the invention, it is believed that the invention will be better understood by reference to the following explanation and accompanying drawings in which:

FIG. **1** is a plan view of one embodiment of a diaper of the present invention;

FIG. **2** is a vertical cross sectional view of the diaper of FIG. **1** taken at line **2—2**;

FIG. **3** is an elevational view of a diaper of the present invention showing delamination for disposal; and

FIG. **4** is a vertical cross-sectional view of a preferred delamination initiation means.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIG. **1** is a plan view of a preferred embodiment of the diapers of the present invention. Although the present invention can be used in conjunction with many of the disposable diaper structures known in the art, a preferred diaper is that of U.S. Pat. No. Re. 26,151, Duncan and Baker issued Jan. 31, 1967 and incorporated herein by reference.

With reference to both FIGS. **1** and **2**, a typical diaper of the present invention includes a water impervious backsheet **11**, a "side flap" portion **12** of which wraps about the lateral edges of the diaper and, in use, forms a seal about the wearer's legs.

An absorbent material **13** such as multiple plies of creped tissue or comminuted wood pulp provide a urine absorbing core for the diaper. Comminuted wood pulp is preferred for material **13.** Bacause of the low strength of such material, an envelope **14** of paper or other absorbent material with at least moderate wet strength preferably surrounds the absorbent core **13.** The absorbent material **13** preferably extends lengthwise of the diaper only to lines **13'** and, in use, the portion of the backsheet **11** which extends therebeyond is folded thereover to provide a double thickness backsheet enclosed waistband for the diaper.

A topsheet **15** of generally hydrophobic material which will allow water to pass overlies and is typically attached to the absorbent core **13** (or the envelope **14** therefor) and serves to keep urine out of contact with the wearer of the diaper. The essence of the present invention is the provision of a diaper having a delaminatable topsheet **15.** Such a topsheet **15** can be formed in a variety of ways as will hereinafter be more fully described. With the provision of such a topsheet **15,** a fe-

cally soiled diaper can be readily separated to facilitate safe convenient disposal of its parts. Typically, the topsheet **15** extends lengthwise of the diaper to fully cover the backsheet **11.**

Typically, a fecally soiled diaper of the present invention will be held above the water closet and the topsheet **15** will be delaminated to allow disposal of the fecal soil in the water closet and the remainder of the diaper in the garbage. The outer portion of the topsheet, which is separated together with the fecal waste, can be rinsed in the water closet and disposed of with the remainder of the diaper or can be deposited in the water closet with the fecal soil. The reduced bulk of the fecally soiled portion of the topsheet **15,** which is only about half the bulk of the entire topsheet **15,** minimizes the concerns associated with flushing part or all of the non-plastic portion of a disposable diaper in the water closet.

In addition, the provision of a laminated topsheet **15** allows the optimum design of each of the laminate layers for its particular function. For example, the upper (wearer contacting) portion of the topsheet **15** need only be strong enough to support the solid waste and its own weight during separation and disposal. Consequently, a relatively weak top portion of the topsheet **15** can be used while the lower portion can provide most of the strength required from the topsheet. In this connection, it should be noted that the topsheet **15** provides a good deal of the overall strength of the diaper when using a weak comminuted wood pulp absorbent material **13** and pins to secure the diaper about the wearer; the pins provide a point load which the backsheet **11,** alone, is ill equipped to withstand. Thus, it is particularly advantageous to build the requisite topsheet-strength into the lower portion of the topsheet **15** since this portion is not disposed of in the water closet. Other variations wherein the topsheet **15** is preferably formed of layers having different properties will occur to those skilled in the art.

In order to allow ready delamination of the topsheet **15,** access to a corner or edge thereof is required. In the simple embodiment of FIGS. **1** and **2** access to an edge of the topsheet **15** is readily available, allowing ready delamination. If the edge of topsheet **15** is attached to the remainder of the diaper, the corner of the diaper and the edge of the upper portion of the topsheet **15** are grasped to delaminate the topsheet **15.** If the topsheet **15** is attached only by the central portion to the remainder of the diaper, delamination of the topsheet **15** will typically be accomplished by grasping both halves thereof and peeling the upper portion from the lower. FIG. **3** generally illustrates such delamination in a diaper having a delamination initiation means.

The delaminatable topsheet **15** can be made in a variety of ways as will be appreciated by those skilled in the art. For example, a process generally like that described in U.S. Pat. No. 3,663,348, which issued to Liloia et al. on May 16, 1972 and which is hereby incorporated herein by reference, is preferably used. Briefly, such a process involves the forming of a first fibrous layer and the laying of a second fibrous layer thereover. Of course, the intralayer bonding must be stronger than the interlayer bonding to allow delamination. The interlayer bonding can be due to interfiber bonding resulting from the nature of the fibers and the forming process or can be due to the use of a separate adhesive. An especially preferred adhesive to join the two layers of the topsheet is one which is urine soluble such as poly(vinyl alcohol), thus providing a diaper which delaminates in use.

In an alternative embodiment two sheets can be separately formed and lightly adhered (continuously or discontinuously) together. Whether the sheets are formed one on the other or preformed and then assembled, the two layers of the topsheet can be the same or different and, as mentioned, in an especially preferred embodiment the top layer is relatively weak while the lower layer is relatively strong.

Preferably, means are provided to facilitate the initiation of delamination of the topsheet **15.** One such means comprises a tab **16,** as shown in FIG. **3,** affixed by any suitable means such as an adhesive to the removable portion of the topsheet **15.** The tab **16** can be of any material having sufficient strength and, preferably, flexibility. Woven materials such as cloth or nonwoven (paper-like) materials with wet strength are preferably used for the tab **16.** In order to make the tab **16** readily identifiable it can be made of colored material to stand out on the generally white background of the diaper.

The tab **16** can be affixed to the underside of the removable portion of the topsheet **15** as shown in FIG. **3** or to the top thereof. Preferably, the tab **16** extends about 1 inch beyond the lateral or longitudinal edge of the topsheet **15.** Although less preferred, the tab **16** can be limited in size so as to extend only to the edges of the topsheet **15.** In this event, the main benefit from the tab **16** is the identification of the corner of the topsheet to encourage the delamination thereof upon disposal and to add rigidity to the upper portion of the topsheet **15** at the corner to facilitate delamination.

A particularly preferred delamination initiation means for use with the present invention is that shown in copending U.S. Pat. application Ser. No. 298,142, Buell, filed Oct. 16, 1972 and now U.S. Pat. No. 3,794,038 which is hereby incorporated herein by reference. Such a delamination initiation means is shown in vertical cross-section in FIG. **4** and consists of a modified portion of the release liner associated with an integral tape fastener for the diaper.

The portion of the diaper shown in FIG. **4** is a vertical cross-section of the lateral edge taken transversely of the diaper near the end thereof. The portions of the diaper of FIG. **4** which correspond to the diaper portions of FIGS. **1, 2** and **3** are similarly numbered but with the suffix *a.* Tape **17** shown in FIG. **4** is one of a pair of such tapes located one on either edge of the diaper and used to secure the diaper about the wearer. Joinder of the tape to the diaper is effected by any suitable adhesive known in the art.

A blocking sheet **18** is preferably employed to avoid adhesion between the tape **17** and the edge and a portion of the top of the side flap **12.** Alternatively, although less conveniently in practice, a tape **17** can be provided which does not have adhesive in the region of desired non-attachment. The blocking sheet **18** can be of any suitable material, preferably relatively thin plastic sheeting or paper.

As is well known in the art, the portion of the tape **17** which is adhered to the diaper only in use (i.e., the portion above the blocking sheet **18** as shown in FIG. **4**) is provided with a release liner to avoid premature adherence thereof to the diaper. Such a release liner is typically paper treated with a silicon compound which

allows ready separation of the liner from the tape. In the embodiment of FIG. **4** the release liner **19** is secured by adhesive **20** to the topsheet **15***a* and thus provides a delamination initiation means to allow ready separation of the two halves thereof.

A tab **21** of plastic sheeting or the like preferably underlies the release liner **19** and is affixed thereto by the intervening layer of adhesive **20.** Such a tab serves, in practice, to simplify the construction and assembly of the tape and release liner combination and also aids in calling the user's attention to the free part of the release liner **19** and its use to delaminate the topsheet **15***a* for disposal. For simplicity of construction, the blocking sheet **18** will typically be of the same material as either the release liner **19** or the tab **21,** allowing the formation of the entire tape, release liner, tab and blocking sheet from three rolls of material.

As with the other configurations, disposal of the diaper partially illustrated in FIG. **4** involves delaminating the topsheet **15***a* and disposing of the same together with any fecal soil thereon in the water closet. Again, the remainder of the diaper is readily disposed of in the garbage.

Many other variations of the present invention involving different types of delaminatable topsheets and delamination initiating means will occur to those skilled in the art in view of the above exemplary embodiments.

What is claimed is:

1. In a disposable diaper of the type comprising a water-impervious backsheet, an absorbent core superimposed on said backsheet, a generally hydrophobic topsheet overlying and enclosing said absorbent core, and a pair of tape fasteners for securing said diaper in an operative position about the wearer's waist, the improvement wherein said topsheet comprises two layers and wherein the inter-layer bonding between said topsheet layers is less strong than the intra-layer bonding between said topsheet and the remainder of said diaper, said diaper including a topsheet delamination initiation means comprising a release liner for at least one of said tape fasteners whereby said topsheet can be delaminated to allow separate disposal of the layers thereof.

2. The disposable diaper of claim **1** wherein said release liner comprises a tab affixed to said topsheet.

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UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 3,874,385

DATED : April 1, 1975

INVENTOR(S) : DALE ALBERT GELLERT

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 4, line 56, after "12" insert the suffix -- a --.

Signed and Sealed this

Twenty-fifth Day of January 1977

[SEAL]

Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents and Trademarks