

United States Patent

[11] 3,578,155

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[21] Appl. No. **801,407**
[22] Filed **Feb. 24, 1969**
[45] Patented **May 11, 1971**
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[56]

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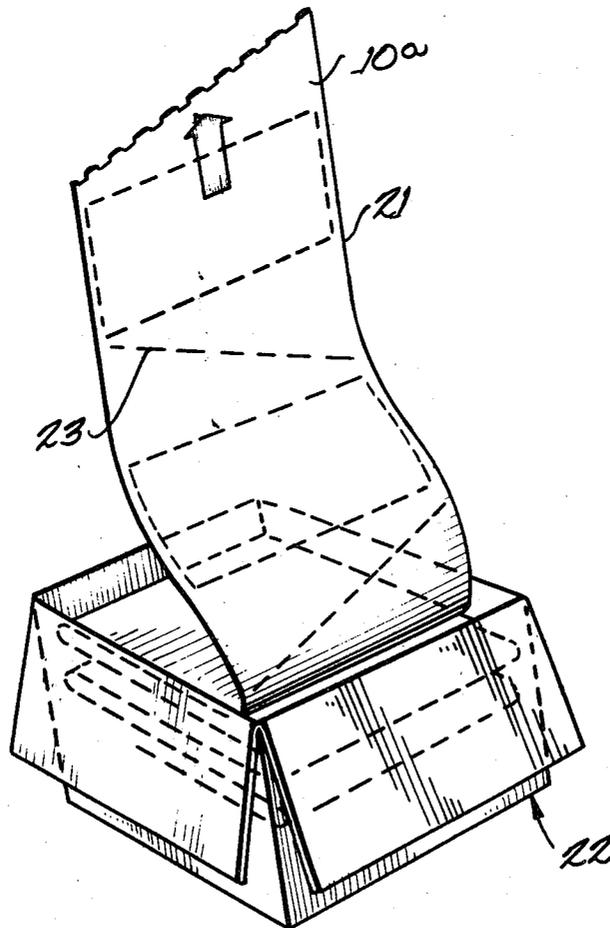
[54] **DISPOSABLE PRODUCT**
4 Claims, 7 Drawing Figs.

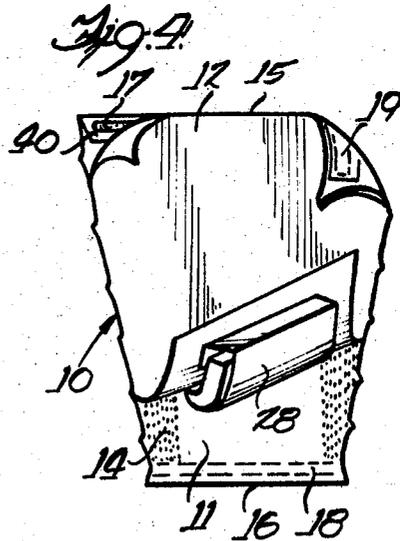
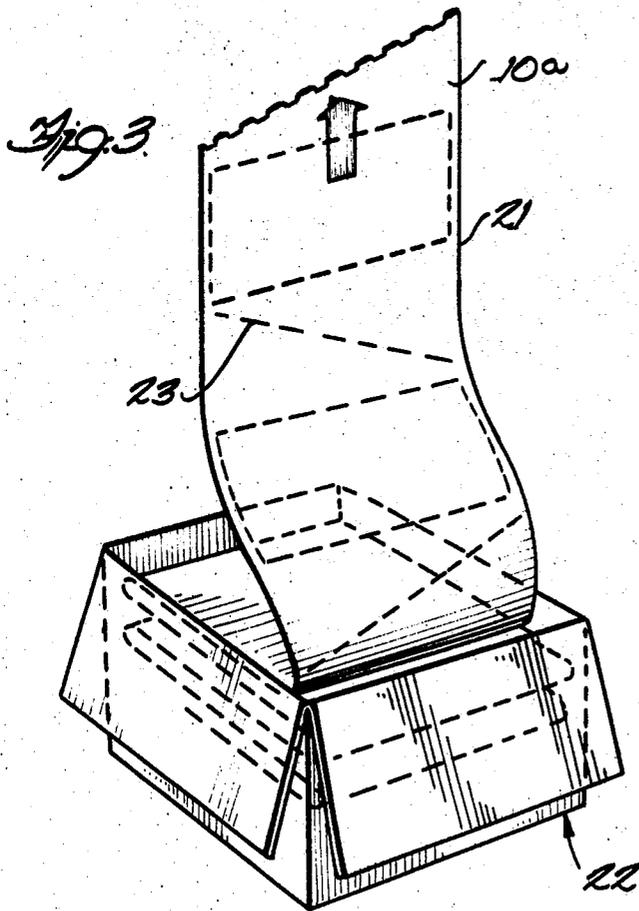
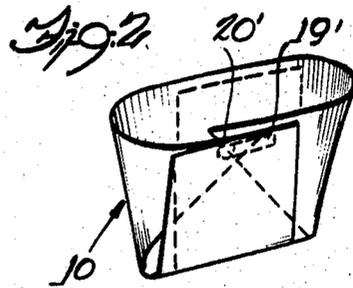
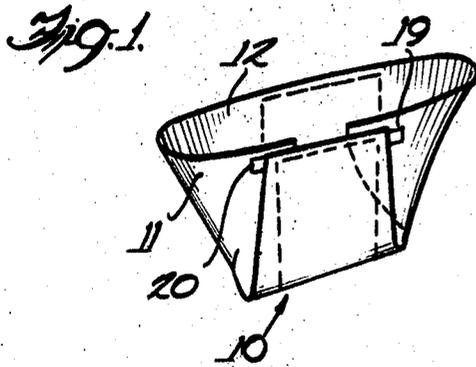
[52] U.S. Cl..... 206/58,
128/287

[51] Int. Cl..... B65d 85/67

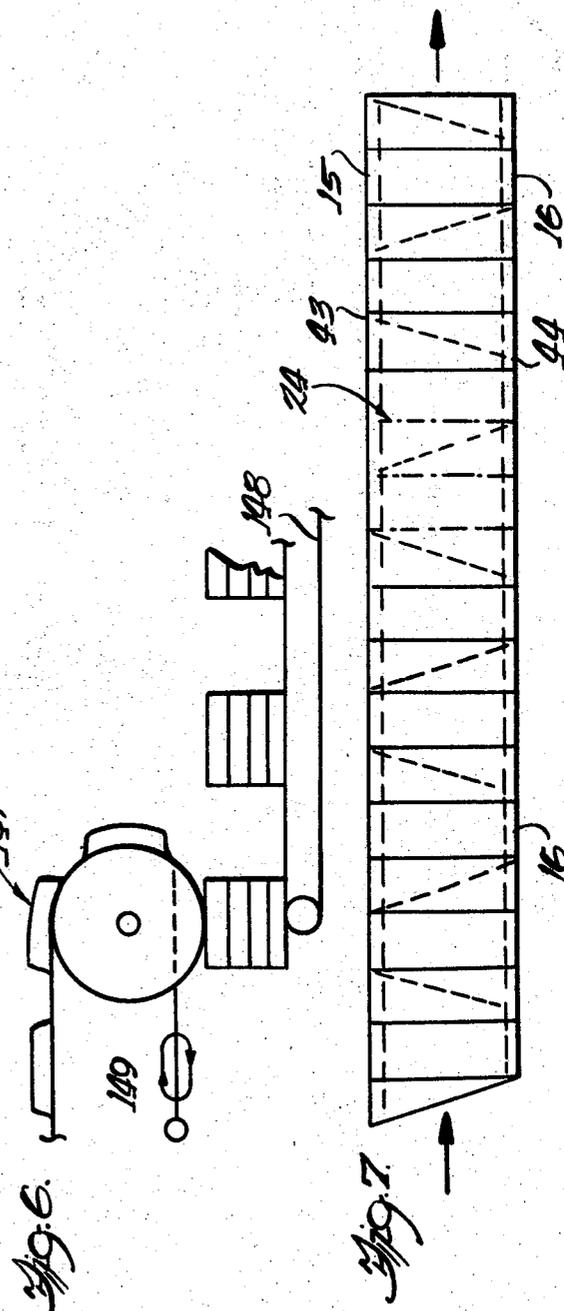
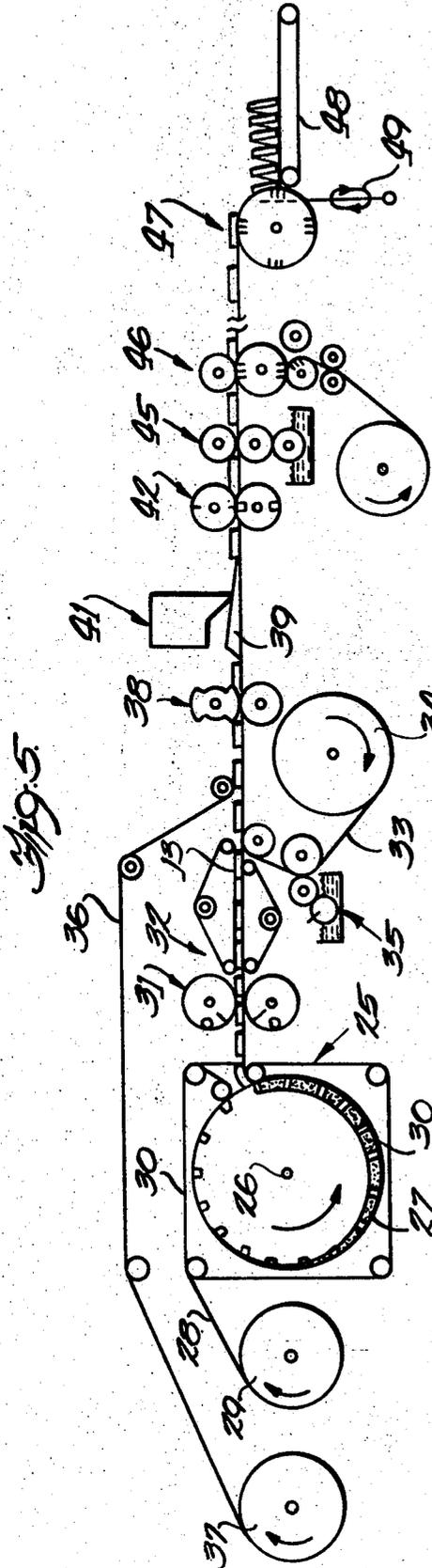
[50] Field of Search..... 206/56
(A4), 56 (A3), 58, (Adhesive Digest);
156/(Inquired); 161/(Inquired); 128/284, 287

ABSTRACT: A disposable product such as a diaper characterized by having a generally trapezoidal configuration and made up of outer sheets confining a generally rectangular fluff pad, the product sheets being united to confine the pad and perforated along generally straight lines to define detachable products.





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DISPOSABLE PRODUCT

BACKGROUND AND SUMMARY OF INVENTION

Through the use of webs united together in a unique fashion and of specified construction, a complete unit is readily produced by an in-line machine to provide a product available for ready and secure installation. The provision of such constitutes an important object of the invention. Other objects and advantages of the invention may be seen as this specification proceeds.

DETAILED DESCRIPTION

The invention is described in conjunction with the accompanying drawing, in which:

FIG. 1 is a perspective view of the inventive diaper and shown in operational condition, i.e., as it would be installed on an infant;

FIG. 2 is a perspective view essentially similar to FIG. 1 but in a slightly different operational condition as would be the case when it is installed on a smaller infant;

FIG. 3 is a perspective view of a commercial product, complete with packaging, utilizing teachings of the invention;

FIG. 4 is a perspective view partially disassembled of the diaper seen in FIG. 1;

FIG. 5 is a schematic representation of apparatus employed in the manufacture of the inventive disposable product;

FIG. 6 is a schematic view of alternative equipment; and

FIG. 7 is a top plan view of the product before folding.

In the illustration given and with particular reference to FIGS. 1, 2 and 4, the numeral 10 designates generally a disposable diaper. The diaper is made up of a first or outer sheet or web 11 and a second or inner sheet or web 12. Interposed centrally of the sheets 11 and 12 is a pad of fluff material designated 13. In the illustration given in FIG. 4 the outer sheet 11 is a laminate of paper and a polyethylene film. This renders the product impervious to moisture penetration but it will be appreciated that in certain instances this moisture barrier may be dispensed with. In some cases, the mother may prefer to use some kind of extra pants and thus would not need the moisture barrier. Alternatively, the barrier may be provided by a single impregnated paper sheet. As illustrated, however, the sheets 11 and 12 are advantageously constructed of paper such as the tissue employed in toilet paper.

The individual diaper 10 is integrated into a single unit by means of a plurality of areas of union 14 as can be appreciated best from a consideration of FIG. 4. These serve to confine the pad 13 against movement longitudinally, i.e., parallel to top and bottom edges 15 and 16. Further, longitudinally aligned areas of union are provided along the top as at 17 and the bottom as at 18. These, like the areas 14, may be glue (via a liquid adhesive, for example) or heat seals where a thermoplastic material is employed as part of the web 11.

Comparing FIGS. 1 and 2 reveals another facet of the invention and that is the adjustability in size of the diaper made available through the provision of adhesive patches 19 and 20. These patches may be covered with a release strip and when exposed permit the corners of the diaper to be positioned in contacting, adhering relation with the "top" portion of the inner sheet 12 as seen at 10a in FIG. 1 or in mutual overlapping relation as seen at 19' and 20' in FIG. 2.

The zigzag folded product 21 is seen in final usable form in FIG. 3. There the numeral 22 generally designates a carton in which a dozen diaper units are provided for use by the person dressing the baby. It will be seen that a given diaper unit 10a is in the process of being removed from the carton 22 and is adapted to be detached from the remaining web along the angled line of perforation 23. In this fashion, the diapers can be dispensed sequentially yet confined in an easy to store rectangular container. Because the adjacent diapers are oriented oppositely, it is possible to store them compactly along transverse fold lines, designated in dot-dash lines as at 24 in FIG. 7.

The procedure and equipment for producing the inventive diaper 10 can be appreciated principally from a consideration

of FIG. 5. There, the numeral 25 designates generally a fluff-forming drum apparatus wherein shredded cellulosic material is introduced axially as at 26 and by virtue of suction is caused to build up on the inner circumference of the rotating drum, this being depicted schematically. Crossbars as at 27 are provided which separate the fluff pads into discrete segments. The fluff is laid down on a carrier sheet 28 (see also FIG. 4) which is unwound from a reel as at 29. A wire screen 30 is continuously moved to accompany the rotation of the drum 30 and confine the carrier sheet thereagainst.

The pads issuing from the apparatus 25 are supported on the carrier sheet 28 which is transversely severed by a cutoff mechanism generally designated 31. Following cutoff, the individual pads are conducted by a speedup conveyor generally designated 32 for engagement with a web 33. The web 33 ultimately becomes the outer sheet 11, and, in the illustration given, is a laminate of polyethylene and tissue delivered from a reel 34. Just prior to the engagement of the web 33 with the pads 13, a liquid adhesive is applied from the adhesive fountain and applying unit generally designated 35. This ultimately provides the areas of union previously identified as at 14 relative to FIG. 4.

A top web 36 is applied to the fluff pads 13, this ultimately becoming the top sheet 12 previously identified in FIG. 4. The web 36 is unwound from a reel 37 positioned at the extreme left-hand portion of FIG. 5. The diaper "blanks" are subjected to a calendering operation via the calender generally designated 38 after which the edges are folded by the folding apparatus 39. This develops the fold 40 seen in FIG. 4 after which adhesive (as at 17 in FIG. 4) is applied by the device designated 41 in FIG. 5.

Moving further to the right in FIG. 5, it is seen that the webs 33 and 36 are transversely perforated by means of a perforating apparatus generally designated 42. This develops the trapezoidal configuration seen most clearly in FIGS. 3 and 7. In other words, the lines of perforation are arranged at an angle to both the transverse and longitudinal directions with alternate lines being parallel, i.e., running from the rear corner of one pad to the opposite front corner of the successive pad, as from 43 to 44 in FIG. 7.

Next in the path of the web in the "in-line" machine, the diaper blanks are subjected to another adhesive applying unit generally designated 45. Here the pressure sensitive adhesive which results in the areas 19 and 20 is applied after which a release tape is applied by the mechanism generally designated 46. This can be peeled off to expose the areas 19 and 20 to develop diaper configurations such as those seen in FIGS. 1 and 2.

The now completed, interconnected, detachable diapers are conducted to a packaging station which makes use of a vacuum delivery orbital packer generally designated 47. The packer 47 in FIG. 5 is arranged for vertical delivery and permits a manual count and separation into the units ultimately to be packaged.

In FIG. 6 the orbital packer is generally designated by the numeral 147 and is arranged for horizontal delivery on the conveyor 148. It will be seen that the conveyor 148 is positioned lower than the conveyor 48 of the apparatus seen in FIG. 5 and the vacuum applying unit 149 is effective over a greater segment of the periphery of the packer 147 than is the vacuum system 49 associated with the packer 47 of FIG. 5. Just prior to encountering the packer 47 or 147, as the case may be, the interconnected, detachable diaper unit has the configuration seen in FIG. 7.

We claim:

1. A disposable product comprising first and second elongated sheets, one of said sheets being substantially liquid impermeable, a plurality of elongated generally rectangular fluff pads having opposing right and left short sides disposed in spaced relation along the length of said sheets with the longitudinal dimension of each fluff pad extending transversely to the length of said sheets, said sheets being joined along the side edges thereof and between adjacent pads, a first set of

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spaced-apart generally parallel lines of perforation, each perforation line of said first set extending between opposite side edges of said joined sheets from adjacent the left short side of a pad to adjacent the right short side of the next pad, each perforation line of said first set being separated by a pair of intervening fluff pads, a second set of spaced-apart generally parallel lines of perforation, a perforation line of said second set extending between opposite side edges of said joined sheets between the fluff pads of each of said intervening pairs from adjacent the right short side of a pad to adjacent the left short side of the next pad whereby said sheets may be separated along adjacent lines of perforation to provide a generally trapezoidal-shaped diaper unit.

2. The product of claim 1 in which said first sheet is wider than said second sheet whereby said first sheet is foldable on itself along the longitudinal edges thereof, the folded portions

of said first sheet being adhesively united to said second sheet.

3. A process for forming a disposable diaper comprising advancing spaced-apart generally rectangular fluff pads sequentially along a predetermined path, applying first and second webs to a plurality of said pads to sandwich the same, one of said sheets having adhesive areas thereon for engagement with the other of said sheets, and perforating said sheets along lines at an angle to said path with the lines extending from one rear corner of a given pad to the opposite front corner of the succeeding pad whereby generally trapezoidal-shaped diaper units are provided.

4. The process of claim 3 including the steps of applying a pressure-sensitive adhesive to spaced-apart areas on the outside of one of said sheets and thereafter applying a release tape over each of said pressure sensitive adhesive areas.

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