

- [54] **DISPOSABLE ABSORBENT PAD**
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- [73] Assignee: **Cellu-Products Company, Patterson, N.C.**
- [22] Filed: **Dec. 30, 1971**
- [21] Appl. No.: **214,168**

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- [52] U.S. Cl. **128/287**
- [51] Int. Cl. **A41b 13/02**
- [58] Field of Search... 128/284, 287, 290 R, 290 W, 128/290 P, 296

- [56] **References Cited**
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[57] **ABSTRACT**

An absorbent pad structure is provided of the sort that is arranged to be disposable and that is particularly suited for use in forming disposable diapers. The disclosed structure incorporates pad means of moisture permeable material having a peripheral margin thereof rendered moisture impermeable and a moisture impermeable backing sheet secured at the peripheral margin of the pad means.

1 Claim, 2 Drawing Figures

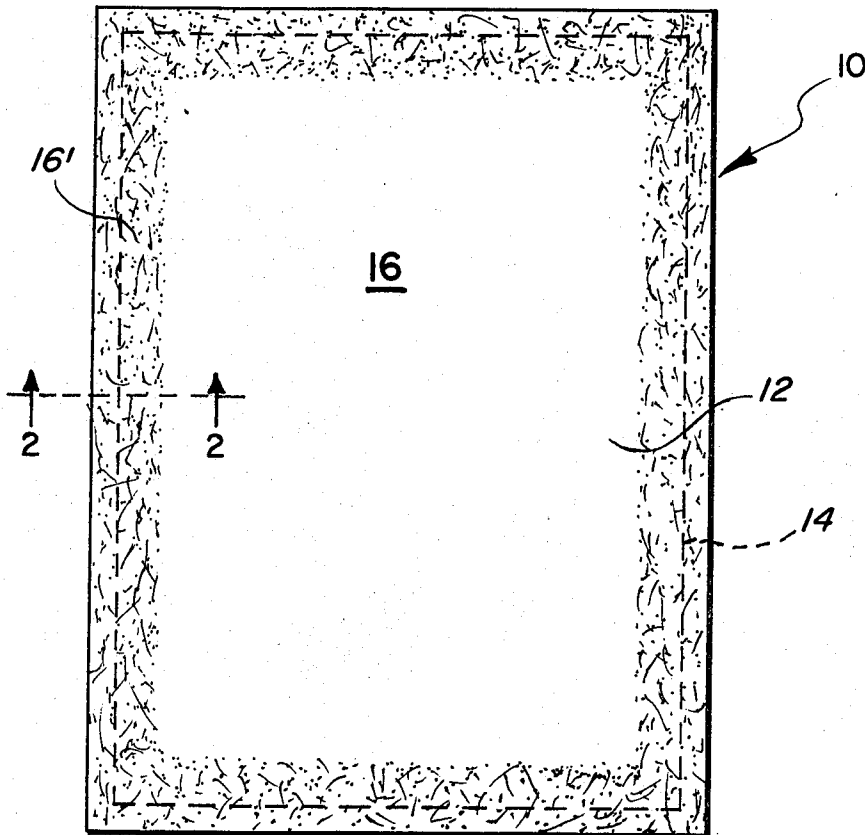


Fig. 1

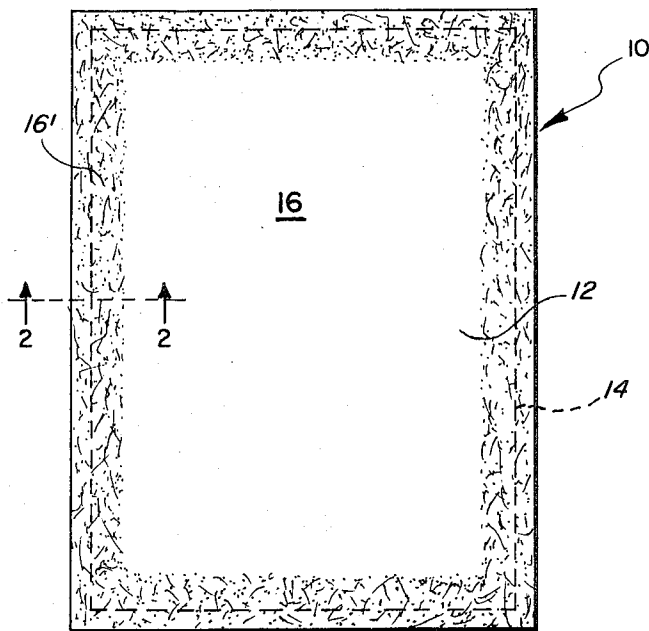
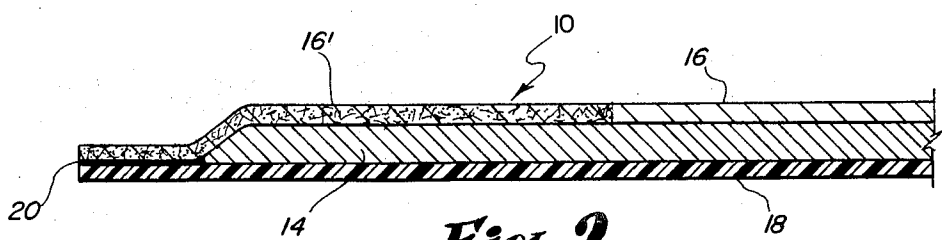


Fig. 2

DISPOSABLE ABSORBENT PAD

BACKGROUND OF THE INVENTION

Disposable diapers as heretofore developed in the art commonly employ an absorbent pad of plied and creped wood pulp wadding covered with a moisture permeable non-woven fabric sheet and backed by a moisture impermeable protective sheet. Representative prior disclosures are found in U.S. Pats. No. 2,788,003, Reissue No. 26,151, and No. 3,426,756. A problem evident from these prior disclosures has been that of providing satisfactorily against leakage of waste materials by wicking or seepage at the edges of the diaper. The present invention deals effectively with this problem in an improved manner.

SUMMARY OF THE INVENTION

Briefly described, the present invention is characterized by the combination of pad means of moisture permeable material having a peripheral margin thereof rendered moisture impermeable and a moisture impermeable backing sheet secured to the pad means at its peripheral margin so as to be sealed thereat against lateral escape of moisture from the pad means.

The peripheral margin of the pad means is rendered moisture impermeable by treatment with a suitable waterproofing composition as noted further below, and marginal sealing of the backing sheet is preferably effected with a waterproof adhesive, although heat sealing may be employed alternatively for this purpose if desired.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view of a disposable diaper structure embodying the present invention; and

FIG. 2 is an enlarged partial section detail taken substantially at the line 2—2 in FIG. 1.

DETAILED DESCRIPTION OF THIS INVENTION

The disposable diaper structure illustrated in the drawings, and indicated generally by the reference numeral 10, incorporates a pad means 12 formed by a core pad 14 of absorbent material, such as plied and creped wood pulp wadding of the usual sort, with a covering sheet 16 of moisture permeable non-woven fabric of hydrophobic character, such as may be formed with blended acrylic and rayon fiber, applied thereto.

As shown, the diaper structure 10 is shaped rectangularly in plan with the non-woven cover sheet 16 extending somewhat beyond the core pad 14 in both length and breadth. For example, in a diaper size using a core pad 14 in a length of 16 inches and a width of 12 inches, the dimension of cover sheet 16 should be increased by 1 inch in both directions so as to provide a ½ inch extension all around for the securing purposes explained in detail further below.

Additionally, a peripheral margin of the pad means 12 is rendered moisture impermeable by treating the cover sheet 16 with a waterproofing composition in an extent reaching inwardly over the edges of core pad 14 as indicated by stippling at 16' in FIGS. 1 and 2. For exemplary dimensions such as are mentioned above, this inward extent of the peripheral waterproofing of cover sheet 16 should reach over core pad 14 for about 1 inch from its edges.

The diaper structure 10 is completed by a waterproof backing sheet 18 of a moisture impermeable material

such as polyethylene film, which is provided in a size corresponding with that of cover sheet 16 and is secured marginally to cover sheet 16 with a waterproof adhesive, as indicated in FIG. 2 at 20, as to form a seal thereat against lateral escape of moisture from the core pad 14.

The result of this arrangement is to contain the absorbent core pad 14 edgewise within a moisture impermeable envelope that not only eliminates all problem with leakage of waste materials therefrom, but also prevents any objectionable separation of core pad portions from the pad unit during use, which has been a further problem with prior art arrangements.

Treatment of the covering sheet 16 to render its peripheral margin 16' moisture impermeable can be effected with any composition that will apply readily to saturate the covering sheet material and cure to waterproof the same without stiffening unduly or being chemically irritating in any respect during use of the pad unit. A suitable composition meeting these requirements employs (by weight) 100 parts of emulsified acrylic polyester at 40–70 percent solids formulated with 1–15 parts of emulsified polyacrylic acid salt at 20–40 percent solids and adjusted for proper application viscosity with 3–12 parts of a volatile amine or hydroxide base as well as incorporating 0.1–5.0 parts of a latent acid catalyst.

Alternatively, a solvent solution of 100 parts (by weight) of acrylic polyester at 40–70 percent solids with 15–45 parts of formaldehyde, urea or melamine type resins at 50–90 percent solids may be used. Either of these compositions can be applied effectively to non-woven covering sheet material by roller printing and cured in times ranging from 15 seconds to 5 minutes at temperatures within the range of 200° to 450°F.

A further composition that may be used is composed of 100 parts (by weight) of emulsified and stabilized butyl rubber polymer at 40–70 percent solids which may be cured with or without heat (up to 350°F) in from 20 minutes to overnight, or from which vulcanizates may be obtained by adding 2–6 parts of elemental sulfur or 2–10 parts of zinc diethyl dithiocarbamate or 2–8 parts of zinc dibutyl dithiocarbamate, together with a small amount of soluble ionic dithiocarbamate or 2–5 parts of an alkaline dispersion of guanadine acetate. Such additions are mixed with the butyl rubber polymer at a pH of 7.0–9.5, and viscosity is adjusted by further addition of 1–8 parts of ammonium or sodium carboxymethyl cellulose or 0.1–3.0 parts of ammonium or sodium chloride. Whenever necessary application tack may be improved by the further addition of 5–30 parts phenol-formaldehyde resin or the like.

Any of these formulations may be pigmented if desired although the first and last ones require use of a primary dispersant for this purpose. Also, all three formulations can be modified to exhibit fire retardant properties by the addition of 15–45 parts of zinc borate, alumina trihydrate, or alumina hexahydrate.

In addition, either of the first two formulations can be used quite well as adhesives for securing the covering and backing sheets 16 and 18 peripherally when adjusted to a suitably increased viscosity for this purpose.

The procedure for forming a pad structure 10 in accordance with the present invention for disposable diaper use follows usual practice in plying and creping (or embossing) the wood pulp wadding and then cutting the same transversely to form successive core pads 14

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of proper size. Then the cut core pads 14 are laminated in registering relation between a suitably wider top running strip of the non-woven covering sheet material, to which a formulation of the foregoing sort has been applied and cured to render the same moisture impermeable at the areas that will form the peripheral margins 16' in successive pad units 10, and a correspondingly wide bottom running strip of the moisture impermeable backing sheet material, to which securing adhesive has been applied to form the peripheral seal 20 during the laminating step. After which, the laminated structure, still in running strip form, is box pleated to the usual disposable diaper disposition and then cut into separate diaper units and finally doubled lengthwise to the arrangement in which such units are normally packed for marketing.

The present invention has been described in detail above for purposes of illustration only and is not intended to be limited by this description or otherwise to

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exclude any variation or equivalent form or procedure that would be apparent from, or reasonably suggested by, the foregoing disclosure to the skill of the art.

We claim:

1. A disposable absorbent pad comprising a moisture impermeable backing sheet, a core pad of absorbent material superimposed on said backing sheet, and a moisture impermeable covering sheet applied to said core pad, said backing and covering sheets corresponding in size and extending peripherally beyond said core pad, and said covering sheet being treated to render the same moisture impermeable at a continuous peripheral margin thereof reaching inwardly over a substantial peripheral portion of said core pad and being secured to said back sheet throughout the entire peripheral extent of said margin so as to form a seal thereat against lateral escape of moisture from said core pad in any direction.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,799,167 Dated March 26, 1974

Inventor(s) Alan H. Miller and Grover C. Currie

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

Column 2, line 4, after "20" delete "as" and insert therefor --so--; Column 2, line 8, delete "abosrbent" and insert therefor --absorbent--; Column 2, line 27, delete "catlyst" and insert therefor --catalyst--; Column 2, line 48, delete "ammonium" and insert therefor --methyl--; Column 3, line 3, delete "stip" and insert therefor --strip--; Column 4, line 8, delete "impermeable" and insert therefor --permeable--; Column 4, line 15, delete "back" and insert therefor --backing--.

Signed and sealed this 4th day of February 1975.

(SEAL)

Attest:

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Attesting Officer

C. MARSHALL DANN
Commissioner of Patents