United States Patent [19]

Ralph

[11] **3,771,524**

[45] **Nov. 13, 1973**

[54] **DIAPER GARMENT WITH INTERLEAVED LINER AND RETAINER**

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[22] Filed: **Jan. 3, 1972**

[21] Appl. No.: **214,974**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 74,013, Sept. 21, 1970.

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

[51] **Int. Cl.** **A41b 13/02**

[58] **Field of Search** 128/284, 286, 287, 128/288

[56] **References Cited**

UNITED STATES PATENTS

2,545,674	3/1951	Ralph	128/287
3,430,629	3/1969	Murphy	128/284
3,543,756	12/1970	Murphy et al.	128/284

Primary Examiner—Charles F. Rosenbaum
Attorney—Thomas M. Small

[57] **ABSTRACT**

A moisture-impervious snap-on retainer comprising a generally rectangular main body panel with side and end flaps on one side defining a reservoir, and an absorbent liner comprising a rectangular central panel underlying said flaps, and an integral V-shaped pleat along each side of the liner defining laterally opening slit and formed by a barrier panel beneath the side flap of the retainer and a protective panel joined to the barrier panel to substantially cover the side flap, both to minimize contact with the wearer and to frictionally hold the liner against slipping in the retainer. The end flaps loosely overlie the side flaps and have seals offset outwardly from the side flaps, and the pleats normally are maintained flat by lines of stitches along folded margins of the panels forming the pleats.

6 Claims, 6 Drawing Figures

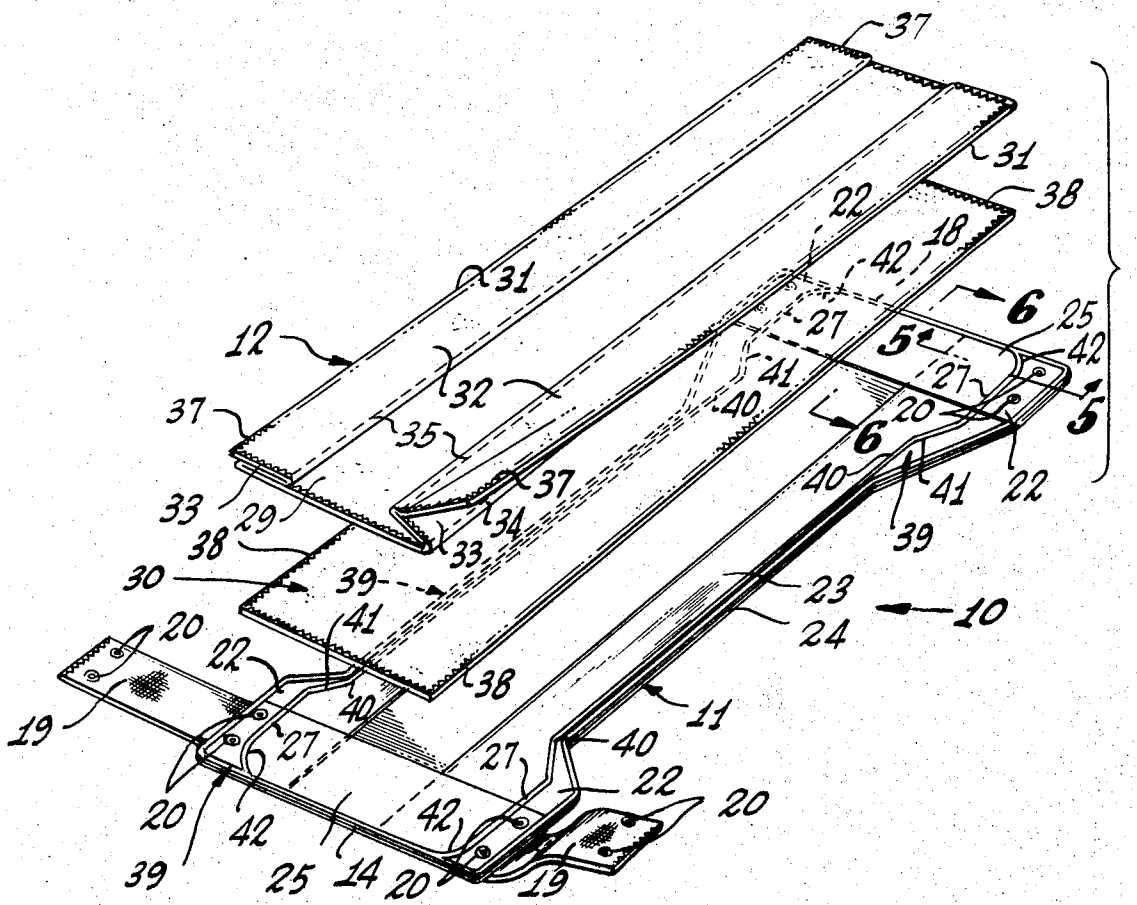


Fig. 1

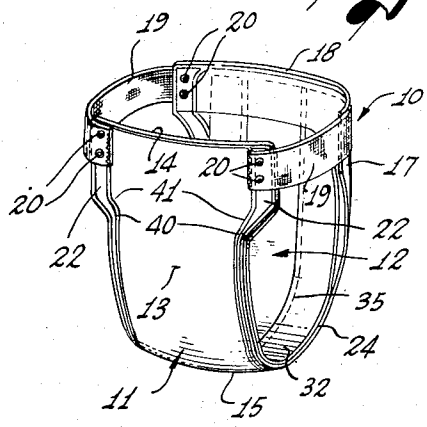
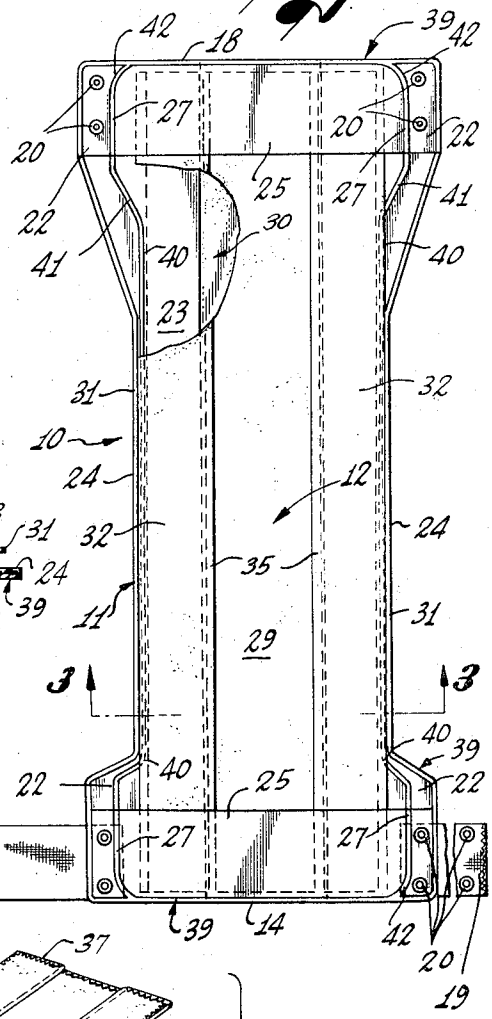


Fig. 2



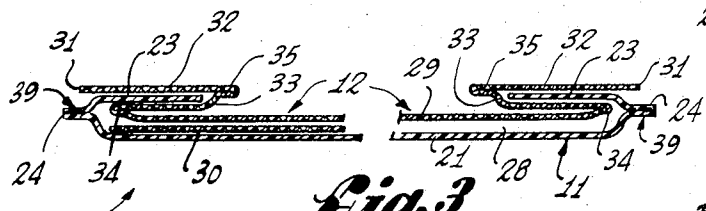


Fig. 3

Fig. 6

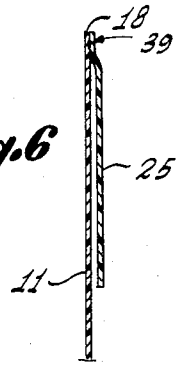


Fig. 4

Fig. 5

DIAPER GARMENT WITH INTERLEAVED LINER AND RETAINER

CROSS REFERENCE TO RELATED APPLICATION

This is a continuation-in-part of copending application Ser. No. 74,013, filed Sept. 21, 1970.

BACKGROUND OF THE INVENTION

This invention relates to diaper garments for incontinents, and has particular reference to an absorbent diaper liner and to the combination of such a liner with a moisture-impervious outer garment which serves as a reusable retainer for the liner.

Various types of diaper garments have been provided for infants, young children, and other incontinents, including adults, and typically comprise one or more sheets of absorbent material such as cloth or disposable paper, adapted to be fitted through the crotch area and secured about the wearer's waist, and an outer protective covering of moisture-impervious material. This covering may be in the form of waterproof pants, a modified snap-on retainer of vinyl or the like, or simply an exterior impervious sheet secured to the absorbent material and pinned in place with the material.

An example of a simple disposable diaper, shown in U.S. Pat. No. 3,426,756, has an absorbent pad enclosed in an envelope formed by a liquid-permeable facing sheet on one side and by a polyethylene backing sheet on the other side. This diaper is generally rectangular, but is centrally cinched into a gathered form in the crotch area, and has been quite popular as an inexpensive, disposable diaper.

More sophisticated, comfortable and effective diaper garments are shown in U.S. Pat. Nos. 2,575,164, 2,545,674, and 3,441,025. In the former, an absorbent pad is retained removably in a reusable snap-on retainer having an outer panel that is wider at its ends than in the crotch area, and an arrangement of flaps and sidewalls which forms an open-sided reservoir of considerable depth between the flaps and the outer panel, for holding the absorbent pad.

The other two patents disclose diaper garments having reusable moisture-impervious retainers with outer panels adapted to be snapped around a wearer, and with sheets of absorbent material fitted removably into the retainers and held in place by side and end flaps overlying the pads in basically flat, facing relation therewith, to define flat, virtually planar, moisture-retaining reservoirs between the planes of the flaps and the outer panels. The absorbent sheets may be composed of disposable material, or they may be composed of material suitable for laundering and reuse.

With the foregoing diaper garments in which absorbent material is held in reusable retainers for easy removal after use, and with other garments of the same general type, two primary problems have been encountered. First, it has been difficult to prevent the absorbent material from slipping within the retainer, with a resulting tendency to "bunch" or gather in the crotch area. This tendency may be counteracted by tapering the absorbent material and the retainer, by folding the ends of the absorbent material over with the end flaps of the retainer, or by special detent arrangements which interlock the absorbent material and the retainer.

In addition, the moisture-impervious materials used for the retainers are significantly "harder" in surface finish, and to the extent that a retainer contacts the wearer's skin, it provides a source of discomfort and sometimes even skin irritation. This problem exists with the portion of the retainer forming the flaps which overlie the absorbent material along the edges of the retainer to hold the material in the reservoir defined between flaps and the outer, main body panel of the retainer.

SUMMARY OF THE INVENTION

The present invention resides in an improved diaper liner of absorbent material, and the retainer therefor, in which the retainer and the liner are interleaved in a novel manner to serve the purposes of minimizing contact between the hard retainer material and the wear's skin, of holding the liner removably in the retainer and resisting slipping of the liner within the retainer so as to prevent displacement and bunching in use, and of maintaining the integrity of the reservoir even when the garment is crushed in the crotch area. Moreover, these important advantages are achieved in an extremely simply and inexpensive manner without interfering with the ability of the garment to serve its basic purposes of confining moisture to the reservoir within the retainer and of holding the liner for quick and easy removal after use.

More specifically, and as incorporated in the preferred embodiment shown herein for purposes of illustration, the liner comprises an elongated central panel or sheet of absorbent material, and an elongated, preshaped pleat of closed, V-shaped cross-section joined to each side margin of the central panel to extend first inwardly therefrom and then reversely, back upon itself, to a free outer edge adjacent the outer margin of the central panel, thereby defining a laterally opening slit along each side of the liner between elongated inner and outer panels of absorbent material.

The retainer is formed with inwardly extending, moisture-impervious side flaps which are sealed to the outer edges of the main body panel and overlie the side edge portions thereof, and these side flaps fit into the slits defined by the V-shaped pleats, in flat, interleaved relation so as to be covered by the outer panels of the pleats. End flaps extend across both ends of the retainer and loosely across the side flaps thereon, being sealed to the side and end edges of the main body panel of the retainer to complete the reservoir. The side flaps of the retainer and the V-shaped pleats of the liner extend under these end flaps, the ends of which are sealed to the retainer far enough away from the free outer margins of the liner to permit quick and easy installation of tne liner in the retainer.

When the liner is in place in the retainer, it is disposed completely inside the reservoir defined by the retainer, except for the elongated outer panels which overlie and cover the side flaps of the retainer to minimize contact of the retainer with the wearer. At the same time, both the inner backing or barrier panels, and the marginal portions of the central panel are confined beneath the side flaps, and are frictionally held against slipping when the garment is in use, but are easily released when the liner is to be removed from the retainer.

Other objects and aspects of the invention will become apparent from the following detailed description, taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a diaper garment embodying the novel features of the present invention, showing the garment in the shape it has while being worn;

FIG. 2 is an enlarged plan view of the garment of FIG. 1, laid out flat in condition with the liner in the retainer, with parts broken away for clarity of illustration;

FIG. 3 is an enlarged, break-away cross-section taken along line 3—3 of FIG. 2 with the parts spaced apart for clarity of illustration;

FIG. 4 is an exploded perspective view of the garment of FIG. 2;

FIG. 5 is an enlarged fragmentary cross-sectional view taken along line 5—5 of FIG. 4, showing parts of the retainer alone; and

FIG. 6 is an enlarged fragmentary cross-section taken along line 6—6 of FIG. 4, showing parts of the retainer alone.

DETAILED DESCRIPTION

As shown in the drawings for purposes of illustration, the invention is embodied in a diaper garment, indicated generally by the reference number **10**, of the type comprising a repeatedly usable, moisture-impervious retainer **11** and a readily insertible and removable absorbent liner **12** which is fitted in the retainer to be held thereby in the shape shown in FIG. **1** while the garment is worn by an infant or other incontinent person. The garment is generally U-shaped in use, having a front side **13** (FIG. **1**) adapted to be disposed against the abdomen of the wearer with a front end **14** adjacent the wearer's waist, a central crotch portion **15** for extending between the legs of the wearer, and a rear side **17** for extending upwardly to the level of the front end, and terminating in a rear end **18.** Belt-type straps **19,** preferably of elastic material, are secured to the sides of the retainer adjacent the front and rear ends thereof by snap fasteners **20** and extend around the waist of the wearer, as shown in FIG. **1,** to hold the garment **10** comfortably in place.

Thus, it will be seen that the garment **10** employs the general combination of elements described in U.S. Pat. No. 2,545,674, and is intended for use in the same general manner. The retainer **11** is made of moisture-impervious sheet material such as vinyl plastic, and has an elongated, generally rectangular main body panel **21** (FIG. **3**) which flares outwardly to an increased width on both sides adjacent each end **14, 18** to form front and rear pairs of laterally projecting tabs **22** (FIGS. **1, 2** and **4**) on which the snap fasteners **20** are mounted. Elongated side flaps **23,** also composed of impervious material such as vinyl plastic, overlie the side marginal portions of the main body panel and are sealed to this panel along the side edges **24** thereof. These flaps, which preferably are substantially parallel, are of the same length as the main panel **21** and are considerably narrower than one-half its width, so as to be spaced apart to leave a gap of substantial width along the center of the retainer. They are arranged to lie flat against the main panel when there is no liner **12** in the retainer.

At each end **14, 18** of the retainer **11,** an end flap **25** of impervious material extends across the retainer and is sealed across the end thereof and also at **27** to the two laterally projecting tabs **22** at that end. The seals **27** between the tabs and the ends of the end flaps are spaced laterally outwardly from the side flaps **23** so that the end flaps loosely overlie the side flaps.

With this arrangement, it will be seen that the retainer **11** defines a virtually planar reservoir between the main panel **21** and the flaps **23** and **25,** the reservoir being indicated in the expanded illustration in FIG. **3** by the reference number **28.** The absorbent liner **12** is disposed in, and virtually fills, this reservoir, in flat, generally planar condition, to receive and hold waste from the wearer.

In general, the liner **12** comprises a central sheet or panel **29** sized and shaped to fit within the reservoir **28** and to substantially cover the inside surface of the main body panel **21.** With a rectangular main body panel, the central panel also should be rectangular, and thus has side and end marginal portions which are disposed under the side and end flaps **23** and **25** of the retainer **11** when the garment **10** is assembled. Various absorbent materials presently are available for use as diaper liners, including launderable cloth, disposable paper, and the like.

To increase the absorbing capacity of the liner **12,** one or more additional backing sheets **30** of absorbent material may be added between the central panel **29** and the main body panel **21** of the retainer, preferably in the form of simple rectangular sheets, one such sheet being shown herein. It should be understood, however, that the use of such sheets is an optional addition to the present invention.

In accordance with a primary aspect of the invention, the diaper liner **12** has elongated, preformed pleats of normally closed, V-shaped cross-section that are composed of soft, absorbent material and are joined to the longitudinal margins of the central panel **29** to overlie the marginal portions thereof. Each pleat extends first inwardly across the central panel and then back upon itself, to an outer edge **31** which extends along the adjacent side margin of the central panel. The pleats thus define laterally opening slits along both sides of the liner for receiving the side flaps **23** of the retainer in interfitting, interleaved relation, preferably along the full length of each side flap, so that the side flaps are covered by the upper portions **32** of the pleats, hereinafter refined to as the "protective panels", and are backed by the lower portions **33** of the pleats, hereinafter called the "barrier panels". Accordingly, the overlying protective panels minimize or eliminate contact of the retainer with the wearer's skin, and cooperate with the underlying barrier panels in frictionally gripping the side flaps to resist slipping of the liner within the retainer.

In this instance, the liner **12** is formed by a single rectangular sheet of absorbent material (which may be multi-layered), large enough to form the central panel **28** and the two V-shaped pleats as integral parts. Each barrier panel **33** is joined to a side margin of the central panel by an integral fold, and each protective panel **32** is joined to the outer side margin of the associated barrier panel by a similar, but reverse, fold. To impart permanence to the folded and pleated configuration, lines **34** and **35** of stitches are applied along these folds, very close thereto as shown most clearly in FIGS. **2** and **4.**

In this manner, the liner **12** is given the general shape shown in FIG. **4,** wherein the lower end of the pleat along the right-hand margin of the central panel **29** has been lifted to "open" the normally closed V of the pleat. One such pleat normally lies flat against each

side margin of the central panel and is coextensive in length with the panel but sufficiently less than one-half the width of the central panel to leave a central gap, which is shown herein as having approximately the same width as each of the pleats.

When two or more layers of cloth are used in the liner **12**, the edges of the layers are stitched together along the free edges, that is, along all end edges and along the free edges of the pleats. This stitching is indicated at **37** in selected areas of FIG. **4**. When a backing sheet **30** is used beneath the regular liner, it also may be multi-layered and stitched together along its edges, as indicated at **38** in FIG. **4**.

While the protective panels **32** may be sized for complete coverage of the side flaps **23**, they preferably are made slightly narrower to leave a narrow exposed strip of side flap along each edge of the retainer. If the protective panel becomes damp, this slight gap reduces transmission of the dampness to the outer garments of the wearer. When the diaper garment is on the wearer, the overlying protective panels not only prevent slipping of the liner in the retainer, but also hold the side flaps in stabilized condition in the crotch area to prevent displacement of the flaps, thereby maintaining the effectiveness of the side flaps to confine liquid in the reservoir.

It has been noted that the seals **27** between the tabs **22** and the ends of the end flaps **25** are spaced laterally outwardly from the side flaps **23** so that the end flaps loosely overlie the side flaps. This permits the end flaps to be lifted freely away from the side flaps during insertion of a liner **12** in the retainer **11**, so that the protective panels **32** of the pleats can be disposed between the side and end flaps at each end.

The retainer **11** has been designated to fabrication using basically conventional mass-production techniques. One suitable production method is to feed a strip of vinyl sheet material longitudinally through a machine (not shown), the strip being at least as wide as the widest parts of the retainer, that is, the ends where the tabs **22** project laterally from the main body panel **21**. Two narrower strips of vinyl are laid over the wider strip in the positions of the side flaps **23**, and transverse strips are laid across the narrower strips at selected intervals to form the end flaps **25**. Then, in a simple heat-sealing operation, the entire retainer is out-lined by a continuous, so-called "tear-seal," indicated at **39** in various places on the drawings, which peripherally seals the retainer and weakens the plastic outside the peripheral seal so that waste plastic can be stripped off.

In an equally simple operation, another seal is applied inside the peripheral seal **39**, primarily for the purpose of isolating the tab areas from the reservoir so that corrosive liquid cannot reach the snap fasteners **20** or collect in hard-to-reach corners and pockets. This seal is shown as extending around each end of the reservoir, beginning at **40** on one side where the retainer flares outwardly toward the tabs, then inclined outwardly at **41** to the offset seal **27**, and then curving at **42** to the end of the retainer and merging with the peripheral seal across each end. Between the tabs **22** on each side, the two seals can be merged, or the inside seal can parallel the outside seal to reinforce the edge of the retainer.

Finally, the snap fasteners **20** and the elastic straps **19** are added, and the retainer is ready for use. The liner **12** is inserted in the retainer **11** (after any desired backing sheets **30** have been placed against the main body panel **21**), simply by placing the liner on top of the retainer, lifting the side flaps **23** over the sides of the liner, above the pleats, tucking the ends of the liner under the end flaps **25**, and then slipping the protective panels **32** around and over the side flaps. This leaves the garment in the assembled condition shown in FIG. **2**, ready for use.

When a soiled liner **12** is to be replaced with a fresh one, the garment can be held over a suitable receptacle (not shown), with the open side of the reservoir **28** down, and a mild shaking action usually will release the liner into the receptacle. Then a new liner can be inserted in the manner previously described.

From the foregoing, it will be evident that the diaper garment **10** of the present invention uses interleaved side flaps **23** on the retainer **11** and pleats on the liner **12** to minimize irritating contact between the wearer and the "hard" plastic material, to maintain the integrity of the reservoir in the crotch area, to join the liner frictionally to the retainer in a manner which assists in preventing slipping of the liner in the retainer. Moreover, the offset seals **27** across the ends of the end flaps **25** facilitate insertion of such a liner in the retainer. At the same time, these important and practical advantages are achieved in a diaper garment which may be mass-produced at a competitive cost and which is effective for its basic purposes and relatively comfortable to wear.

It also will be evident that, while a preferred embodiment has been illustrated and described, various changes and modifications may be made without departing from the spirit and scope of the invention.

I claim:

1. The combination of:

a moisture-impervious diaper retainer comprising an elongated main body panel, and a pair of elongated side flaps overlying side portions of said body panel and having outer edges sealed to said body panel and free inner edges spaced from each other; and

an absorbent diaper liner removably held in said retainer and comprising an elongated central panel of absorbent material disposed against said main body panel and having side margins disposed beneath said side flaps adjacent said outer edges thereof,

elongated barrier panels disposed beneath said side flaps and having outer margins extending along the outer margins of said central panel and joined thereto, and inner margins extending along said free inner edges of said side flaps, and

elongated protective panels disposed above said side flaps and substantially covering the latter, said protective panels having inner margins extending along the free edges of said flaps and joined to the inner margins of said barrier panels, and having outer edges extending along the outer edges of said flaps, thereby forming a V-shaped pleat along each of said central panel for covering said flaps and retaining said liner removably in said retainer, said protective panels being freely separable from said barrier panels along said side flaps to permit interleaving of said panels with said side flaps.

2. The combination defined in claim **1** further including two end flaps on said retainer extending across the ends of said liner and the ends of said side flaps with the ends of said protective panels disposed between said end flaps and said side flaps.

3. The combination defined in claim 2 in which each of said end flaps is sealed along one side to an end of said main body panel, and has ends which are sealed to the sides of said main body panel, laterally beyond the outer edges of said protective panels, thereby defining end pockets which loosely overlie said side flaps and cooperate therewith in holding said liner in said retainer.

4. The combination defined in claim 3 in which said protective and barrier panels are integrally joined to said central panel by folds, and further including lines of stitches along said folds normally maintaining said V-shaped pleats in flat folded condition.

5. The combination defined in claim 1 further including means normally maintaining said pleats in flat folded condition.

6. The combination of:

a moisture-impervious diaper retainer comprising an elongated, generally rectangular main body panel, a pair of side flaps overlying the side edge portions of said body panel and having outer edges and opposite ends sealed to said body panel, and a pair of end flaps overlying the opposite end portions of said body panel and of said side flaps and sealed to said body panel along the outer sides and ends of said end flaps, thereby defining in said retainer a moisture-retaining reservoir, and means for joining the ends of said retainer together around a wearer; and an absorbent diaper liner removably held in said retainer and comprising an elongated, generally rectangular central panel of absorbent material having approximately the same size and shape as said body panel and disposed against the latter beneath said side and end flaps, and an elongated pleat of absorbent material and of V-shaped cross-section joined to each side margin of said central panel and interleaved with said side flaps to hold said diaper liner is said retainer, each such pleat having an elongated protective panel of absorbent material substantially covering the associated side flap and extending under an end flap at each end of the protective panel.

* * * * *

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,771,524 Dated November 13,1973

Inventor(s) Harold J. Ralph

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

Column 6, line 57, after "each" insert -- side --.

Signed and sealed this 12th day of November 1974.

(SEAL)
Attest:

McCOY M. GIBSON JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents

FORM PO-1050 (10-69)

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U.S. GOVERNMENT PRINTING OFFICE : 869-930

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,771,524 Dated November 13, 1973

Inventor(s) Harold J. Ralph

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 53, change "tne" to --the--

Column 5, line 35, change "designated to" to --designed for--

Signed and sealed this 23rd day of July 1974.

(SEAL)
Attest:

McCOY M. GIBSON, JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents