ABSTRACT

A re-useable diaper is provided having two fabric panels joined to each other by means of a non-wicking, waterproof web, said panels being superimposable by folding along said web to orient the same as an inner, body contacting panel and an outer or visible panel, and moistureproof film means disposed between said superimposed panels and extending to said web to prevent moisture accumulated in said inner panel from reaching said outer panel. This assemblage permits the diaper to be used without the need of an outer protective garment such as "rubber pants", since the non-wicking web and the moistureproof overlay prevent moisture from being transmitted from the fabric ply placed against an infant to the outermost fabric ply. In other embodiments, the diaper can be folded in various sizes to accommodate the increased size of an infant during growth, and can also be used in larger sizes for adults requiring such protection for medical purposes.

10 Claims, 8 Drawing Figures
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RE-USEABLE DIAPER

This invention relates to a novel diaper assemblage which permits a re-useable diaper to be applied without an outer protective garment.

BACKGROUND OF THE INVENTION

The prior art contains many illustrations of various types of diaper constructions as is exemplified by U.S. Pat. Nos. 2,507,197; 2,649,859; 3,073,308; 3,400,717; 3,520,303; and the like. In some of these prior art diapers, various means are employed to render them "waterproof" while other prior art diapers are directed to the "disposable" type of diapers.

Although the "disposable" type diaper has received a great deal of attention and is quite easy to use, such diapers are generally not used on a day-to-day basis due to their relatively high cost. In addition, many people refrain from using such diapers for fear of adding to increasing pollution problems as these "disposable diapers" are flush disposable.

In one prior art patent U.S. Pat. No. 3,559,650) a sanitary napkin is provided having waterproofing material between inner and outer layers of absorbent material. The waterproofing is obtained by means of a greasy or waxy material which forms a waterproof barrier between the backing and the pad which is further modified by being crimped in order to reduce the thickness of the pad layers. This crimping tends to permeate the reduced thickness with the waterproofing material to provide a structure wherein moisture is retained in the central absorbent portion of the pad and prevents moisture from seeping out along the edges. This assemblage is intended for only single use after which the sanitary napkin is discarded. Although waterproofing means is provided in the sanitary napkin, its assemblage is altogether different from that of the diaper of this invention as will become apparent from the following description.

THE INVENTION

The novel diaper assemblage of this invention permits moisture absorbent fabrics to be employed so that during use, the outermost ply of fabric remains dry thereby eliminating the necessity of using an outer protective garment such as rubber pants. In general, this is achieved by providing two panels of water absorbent material joined together by a connecting pad or web of waterproof or non-wicking material so that moisture in one panel is not transmitted to the other panel. As the diaper is folded along the web to superimpose one panel on the other, a film of waterproof material is provided between the superimposed panel surfaces and extending to the web. This film can be a separate, thin sheet of flexible plastic material having an area slightly greater than the superimposed panel area. Alternatively, this film can be an adherent film coextensive with the surface of the outer panel as applied to the body.

In one embodiment, the diaper assemblage of the invention permits the innermost ply to be adjustably folded in various sizes so that it can accommodate an infant during growth.

The novel features of the diaper of the invention will be better understood from the following description when considered together with the accompanying drawing wherein the several figures illustrate preferred embodiments thereof and wherein:

FIG. 1 is a plan view of one embodiment of the diaper of the invention;
FIG. 2 is an enlarged view of the diaper shown in FIG. 1 taken substantially along the line 2—2 of FIG. 1;
FIG. 3 is an enlarged, fragmentary end view of the diaper shown in FIGS. 1 and 2 in its folded condition ready for use;
FIG. 4 is an enlarged, fragmentary, sectional view similar to that of FIG. 2 illustrating an alternate assemblage and showing details of the connecting web portion thereof;
FIG. 5 is a fragmentary, plan view of an alternate embodiment of the diaper of the invention;
FIG. 6 is an enlarged, fragmentary end view of the diaper shown in FIG. 5 in its partially folded and assembled condition;
FIG. 7 is an alternate embodiment of the diaper assemblage shown in FIG. 6; and,
FIG. 8 is an enlarged, fragmentary end sectional view similar to FIG. 4 showing a modified form of connecting web.

As shown in FIGS. 1–3, one embodiment of the diaper assemblage of the invention comprises a first or outer panel 10, and a second or inner panel 11 which are joined to each other at their adjacent side edges 10a and 11a by a connecting web or band 12. Panels 10 and 11 are preferably rectangularly shaped and of a moisture absorbent material such as cotton or any other fabric normally employed as a reusable diaper.

Connecting web 12, however, is of a moisture-proof, non-wicking material which prevents moisture from being transferred from one panel to the other. Web 12 can be provided from any suitable, non-wicking material such as, for example, cotton, wool, and the like, or synthetically produced materials such as nylon, rayon, and the like, having a suitable plastic coating, such as polyvinylchloride, and the like. The plastic coating can be applied by known methods such as, for example, hot mill rolling, reverse rolling as described in U.S. Pat. No. 2,813,052, by fluid roller techniques, and the like.

While panel 10 can be a single ply of fabric, panel 11 consists of at least 2 and preferably 3 or more fabric plies such as shown at 13a, 13b, and 13c in FIGS. 2 and 3.

Overlying panel 10 is a moisture-proof film 14 suitably comprising a flexible plastic material such as polyvinylchloride, polyvinylpropylene, and the like, said film being provided in the form of a separate sheet as shown in FIGS. 1 to 4 or a coating 14' adhering to the surface of panel 10 as shown in FIG. 8. In the embodiment shown in FIGS. 1–4 plastic overlay 14 is of a size so that its outer edges extend beyond the peripheral edges of panel 10 and preferably also extend beyond the side edge 12e of web 12 to also partially overlay web 12 as clearly shown in FIG. 1.

When panel 11 comprises a plurality of plies as shown at 13a, 13b and 13c in FIG. 2, these plies can be joined to each other to form a unitary panel by stitching them together along their longitudinal edges as indicated at 15, 15a, and web 12 can be similarly secured to panels 10 and 11 as shown at 12b and 12c (FIGS. 2–4).

To prepare the diaper for use, panel 11, comprising the multiple plies 13a, 13b, 13c is folded to overlie panel 10 as shown in FIG. 3 with the waterproof overlay 14 oriented between and extending beyond the outer
edges of panels 10 and 11 on one side as at 14a and be partially coextensive with web 12 on the opposite side as seen at 14b. The diaper is now in condition to be placed upon an infant.

The multiple plies comprising panel 11 can also be provided as shown in FIG. 4 from a single, elongated ply of fabric 16 which is folded back upon itself and joined at its longitudinal edges by stitching 15, 15a to form a pocket 17 which can be used to accommodate one or more additional plies of fabric as indicated at 18.

In FIG. 5 an alternate embodiment of the diaper assemblage of the invention is shown wherein panel 11 consists of a single, elongated, rectangularly shaped length of fabric which can be folded over upon itself along fold lines as indicated by dot-dash lines at 19, 19a to provide a multiple of fabric plies 20a, 20b and 20c as seen in FIG. 6. This construction permits panel 11 to be abjustably folded to fit different sized infants or the same infant during growth. If desired, the overlapped plies can also be stitched along their longitudinal edges as shown in FIG. 7 to provide a single or standard sized diaper. In this embodiment, waterproof film 14' has been shown to be bonded directly to panel 10, while web 12 can be a separate member joined to the panels 10 and 11 by stitching 12b, 12c as shown in FIGS. 5 to 7 or can be an integral portion of a unitary member forming panels 10, 11 as shown in FIG. 8.

The illustration in FIG. 8 is intended to show details of modified forms of the invention, wherein waterproofing, as needed, is achieved by direct bonding of a plastic film to the fabric ply. A continuous strip of fabric 21 can be treated on opposing surfaces of a connecting section 12' between panel sections 10' and 11' with aligned layers of plastic material 22, 22' providing penetration of the fabric, as indicated in FIG. 8, so that the treated section 12' is substantially impregnated and incapable of conducting moisture through the interstices of the fabric. The aligned impregnation bands 22, 22' can suitably be applied by roller application or by long lengths of fabric which can then be cut transversely of the bands 22, 22' to provide diaper blanks such, for example, as the diaper blank shown in plan view in FIG. 5. If it is desired to bond the waterproofing film 14' to the inner surface of the panels 10', the plastic films 14' and 22' can be applied as a unitary deposit in a single roller application.

It is to be understood that the modification described in connection with FIG. 8, wherein the connecting web 12' and the panels 10' and 11' are portions of a unitary ply of fabric, can be adapted to any of the forms of construction earlier described, wherein the panel portion 11' includes additional plies of absorbent material secured thereto by stitching or the like, as shown in FIGS. 2, 4 and 7. While the unitary construction with impregnated waterproofing as described in connection with FIG. 8 is viewed as providing the most economical form of construction, it will be apparent that the use of separate panels 10 and 11 secured together by a waterproof connecting web 12 can be of special advantage when it is desired to employ ornamented fabric for panel 10, which forms the outer surface of the diaper assemblage as applied to the body.

As indicated earlier, this diaper assemblage permits the diaper to be re-used after ordinary washing without the need of a protective outer garment and can be provided either in a single, standard size or from an elongated length of fabric which can then be abjustably folded to accommodate an infant during growth or to accommodate infants of different size, or used for adults who require such protection for medical purposes.

Various changes and modifications in the diaper assemblage as herein described will occur to those skilled in the art and, to the extent that such changes and modifications are embraced by the appended claims, it is to be understood that they constitute part of the present invention.

What is claimed:

1. A diaper assemblage comprising a first outer panel of moisture absorbent fabric having at least one ply, a second inner panel having a plurality of plies of moisture absorbent fabric; a connecting web having non-wicking, waterproof properties joining and spacing the adjacent side edges of said first and second panels, said web providing a zone of folding when superimposing said inner panel on said outer panel to assemble the diaper for use; and a moistureproof film disposed such that it is oriented between said panels when said panels are in a superimposed relationship, said moistureproof film extending to said web to prevent moisture accumulated in said inner panel from reaching said outer panel.

2. A diaper assemblage as defined in claim 1, wherein said moistureproof film comprises a separate flexible plastic film having a length and width slightly greater than the length and width respectively of said outer panel.

3. A diaper assemblage as defined in claim 1, wherein said moistureproof film constitutes an impregnation of flexible plastic material on and co-extensive with the area of the inner surface of said outer panel.

4. A diaper assemblage as defined in claim 1, wherein said web is a separate member having its edges stitched to adjacent edges of said inner and outer panels.

5. A diaper assemblage as defined in claim 1, wherein said web comprises a portion of fabric integral with the fabric of said inner and outer panels with said portion of the fabric carrying on opposed surfaces thereof impregnations of flexible plastic material imparting non-wicking, waterproof properties thereto.

6. A diaper assemblage as defined in claim 5, wherein the impregnation of plastic material forming the inner surface of said web is continued throughout the inner surface area of said outer panel to provide the moistureproof film of said assemblage.

7. A diaper assemblage as defined in claim 1, wherein the plurality of plies comprising said inner panel are folded portions of an elongated unitary piece of fabric.

8. A diaper assemblage as defined in claim 1, wherein the plurality of plies comprising said inner panel are folded portions of an elongated unitary piece of fabric, and folded portions thereof are retained in position by lines of stitching.

9. A diaper assemblage as defined in claim 1, wherein the plurality of plies in said inner panel comprise separate fabric members secured together along opposed edges thereof paralleling said web.
10. A diaper assemblage as defined in claim 1, wherein the plurality of plies in said inner panel comprise separate fabric members secured together along opposed edges thereof paralleling said web, and edges of said second panel perpendicular to said web containing no stitching, whereby the superimposed plies of said panel provide pockets adapted to receive additional plies of moisture absorbent material as needed.