

[54] **DISPOSABLE COMBINATION
FLUSHABLE DIAPER AND
PROTECTIVE COVER**

[72] Inventor: **Donald K. George, Aiken, S.C.**

[73] Assignee: **Riegel Textile Corporation, Ware Shoals,
S.C.**

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

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

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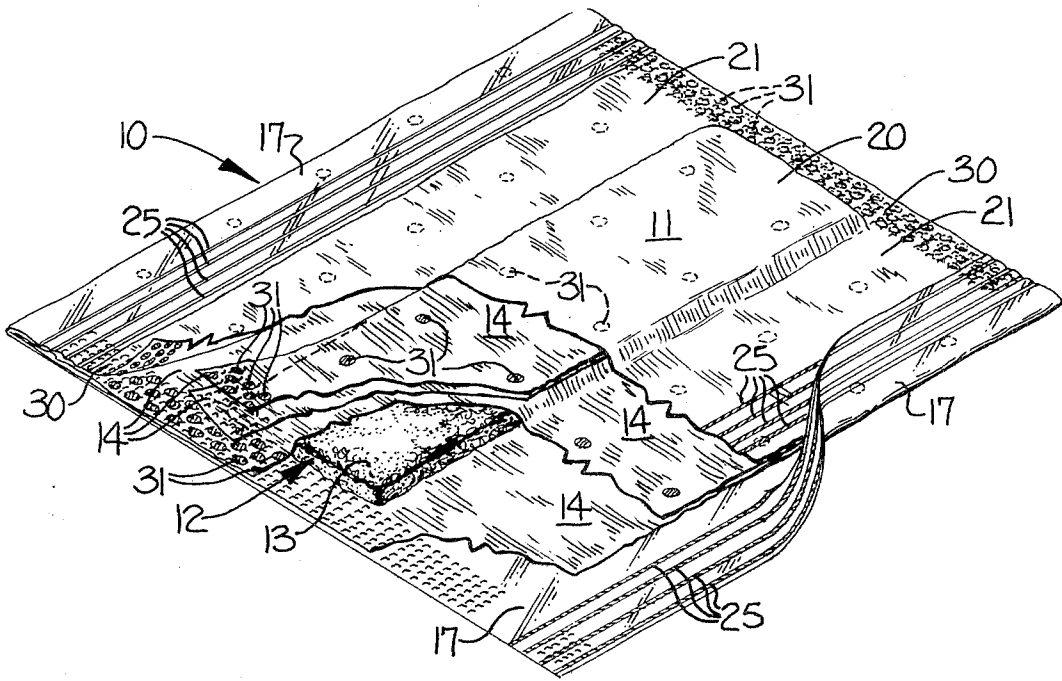
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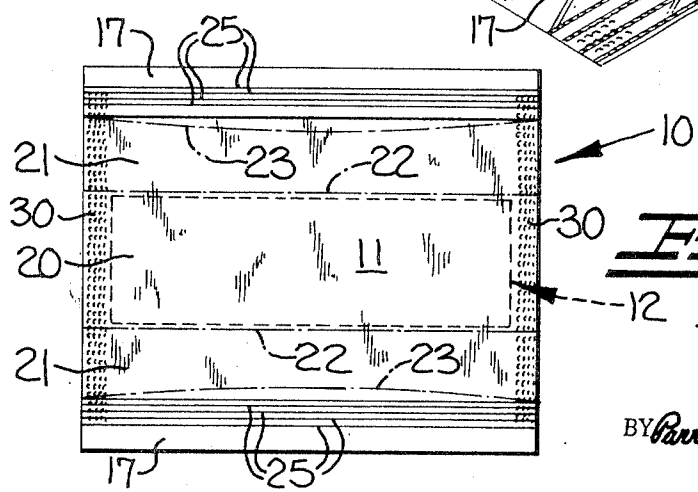
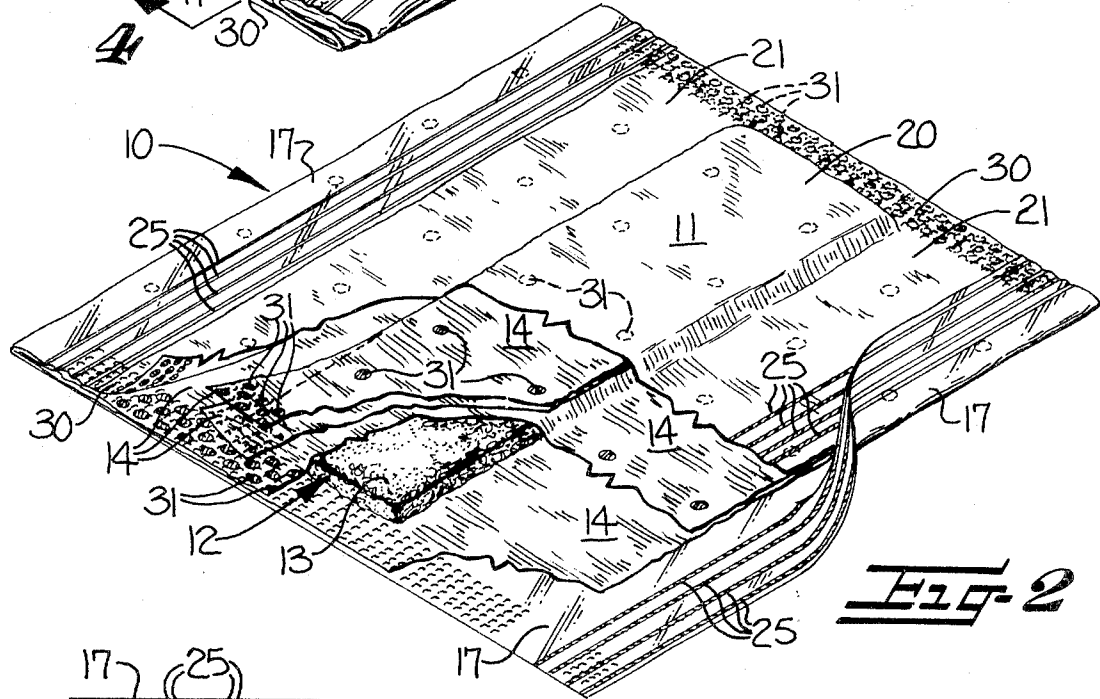
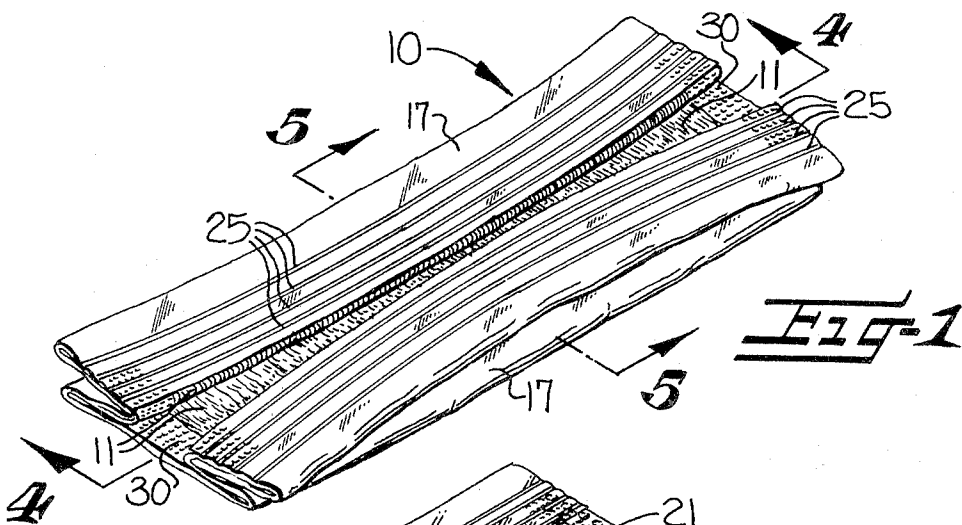
Primary Examiner—Charles F. Rosenbaum
Attorney—Parrott, Bell, Seltzer, Park & Gibson

[57] **ABSTRACT**

A disposable, unitary, combination flushable diaper and protective cover characterized by serving the dual function of a conventional diaper and protective pants and by being easily disposable by stripping off the protective cover and flushing the diaper in an ordinary water closet. The product includes a dispersible, fluid-permeable, body contacting layer for receiving the moisture of the wearer and preferably comprising flat regenerated cellulose fibers of the collapsed multicellular form. A flushable, moisture absorbing, interior pad is superimposed on the body contacting layer for absorbing the moisture of the wearer. The pad comprises a batt of fiberized cellulosic fibers for providing absorbency and at least one ply of cellulosic sheet material on each side of the batt for providing strength. A protective cover of moisture impervious material is preferably superimposed on the pad and forms an envelope with the body contacting layer around the interior pad.

7 Claims, 5 Drawing Figures



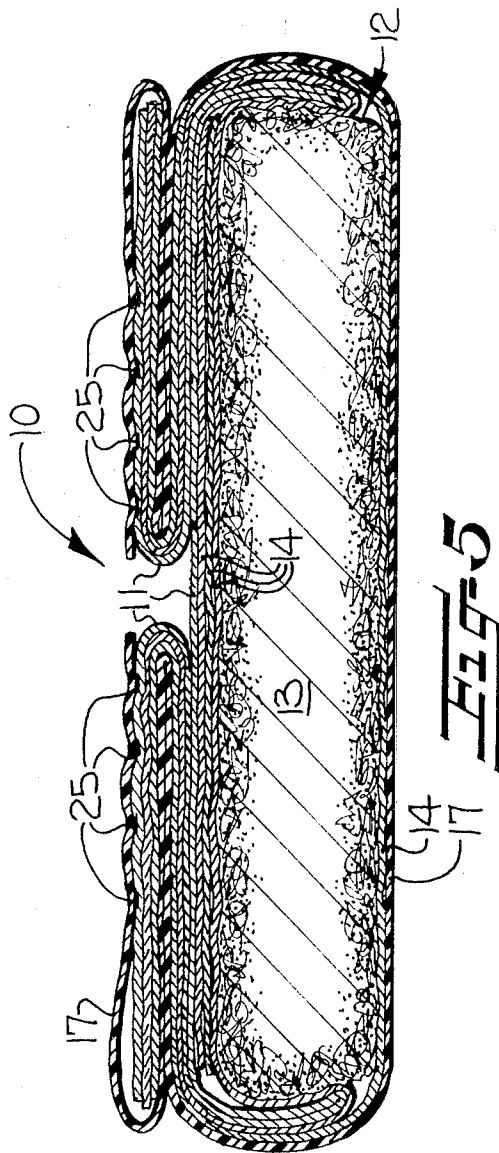
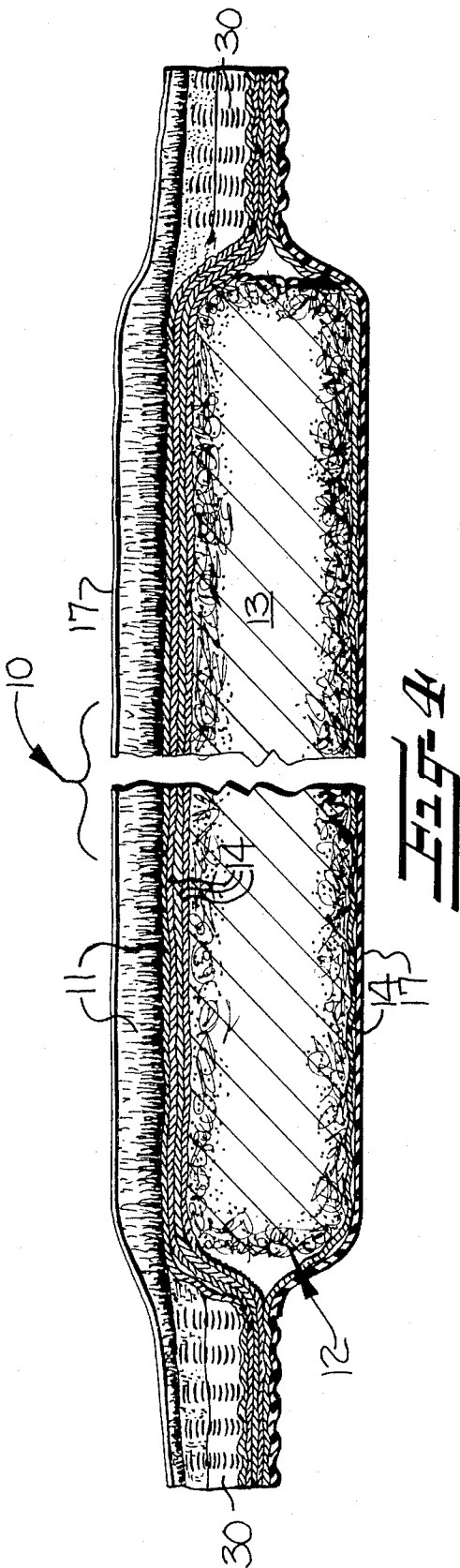


INVENTOR:

DONALD K. GEORGE

BY *Parratt, Bell, Seltzer, Park & Libson*

ATTORNEYS



INVENTOR:
DONALD K. GEORGE

BY *Parrott, Bell, Seltzer, Park & Libson*
ATTORNEYS

DISPOSABLE COMBINATION FLUSHABLE DIAPER AND PROTECTIVE COVER

This invention relates to a disposable, unitary, combination flushable diaper and protective cover and more specifically to a combination diaper and protective cover which is characterized by serving the dual function of a conventional diaper and protective pants and which is easily disposable by stripping off the protective cover and flushing in an ordinary water closet.

Heretofore, so-called "disposable" diapers have been commercially provided. However, they have not been easily disposable by flushing inasmuch as delamination or tearing apart of each of the component parts was required prior to flushing in an ordinary water closet, even if flushing of the individual component parts were feasible, such as tearing away the front cover sheet, the back cover sheet and the interior pad to separate the component parts of the diaper for individual flushing or other disposal thereof. This was particularly true because the prior "disposable" diapers did not conventionally include a front cover sheet or body contacting sheet which was disposable.

These previously manufactured "disposable" diapers have included a variety of constructions of interior absorbent pads. However, all of these prior interior pads have either been lacking in strength or absorbency. It is necessary that the interior pad include both superior absorbency characteristics and strength for providing both of these qualities in the overall disposable diaper.

Also, with a number of previously manufactured "disposable" diapers, it has been necessary to utilize a separate pair of protective pants, i.e., plastic or rubber pants, for protecting against the passage of moisture from the disposable diaper to the clothing of the infant.

Accordingly, it is the object of this invention to provide a disposable, unitary, combination flushable diaper and protective cover which is characterized by serving the dual function of a conventional diaper and protective pants and by being easily disposable by stripping of the protective cover and flushing the diaper in an ordinary water closet.

It is a further object of this invention to provide the above diaper with an improved flushable, moisture absorbing, interior pad which provides both superior absorbency and strength to the combination diaper.

It has been found by this invention that the above objects may be accomplished by providing a disposable, unitary, combination flushable diaper and protective cover comprising a dispersible, fluid-permeable, body contacting layer for receiving the moisture of the wearer. This layer preferably comprises hydrophilic, flat, ribbonlike, aerated, regenerated cellulose fibers of the generally collapsed multicellular form having natural bonding characteristics. The diaper and cover further includes a flushable, moisture absorbing, interior pad superimposed on the body contacting layer for absorbing the moisture of the wearer. The pad comprises a batt of fiberized cellulosic fibers for providing superior absorbency characteristics and at least one ply of cellulosic sheet material positioned on each side of the batt for providing strength and additional absorbency to the pad. The combination diaper and cover also includes a protective cover of moisture impervious sheet material superimposed on the pad and secured to the body contacting layer along longitudinal and transverse edges thereof to form therewith an envelope around the interior pad.

In the preferred form of the combination flushable diaper and protective cover of this invention, the protective cover extends around the longitudinal edges and overlaps the fluid-permeable body contacting layer and is secured thereto to prevent leakage of the moisture at the longitudinal edges of the diaper and body contacting layer is creped in the transverse direction of the diaper for wicking moisture toward the longitudinal edges of the diaper having the protective cover therearound to prevent leakage of moisture from the diaper.

Preferably, the combination diaper and protective cover includes embossed portions along the transverse edges of the combination diaper and cover for uniting the body contacting

layer and the protective cover with each other and with the interior pad to form a unitary combination diaper and protective cover.

The combination diaper and protective cover also preferably includes longitudinally extending central and side portions in which the side portions are folded inwardly over the central portion and then folded outwardly back over themselves to form a prefolded combination flushable diaper and protective cover.

Some of the objects of this invention having been stated, other objects will appear as the description proceeds when taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a perspective view of a disposable, unitary, combination flushable diaper and protective cover, constructed in accordance with this invention, and which has been prefolded;

FIG. 2 is a perspective view of the combination flushable diaper and protective cover, shown in FIG. 1, in the unfolded condition thereof, with certain component parts broken away;

FIG. 3 is a top plan view of the unfolded combination diaper and protective cover of FIG. 2 illustrating the fold lines in phantom therein;

FIG. 4 is a longitudinal cross-sectional view, taken along the line 4-4 of FIG. 1, of the prefolded combination flushable diaper and protective cover; and

FIG. 5 is a transverse cross-sectional view, taken along the line 5-5 of FIG. 1, of the prefolded combination flushable diaper and protective cover.

Referring now to the drawings, the disposable, unitary, combination flushable diaper and protective cover of this invention is illustrated in its prefolded condition in FIGS. 1, 4 and 5 and in its unfolded condition in FIGS. 2 and 3 and is generally referred to therein by the reference numeral 10.

The combination diaper and protective cover 10 comprises a dispersible, fluid-permeable, body contacting layer 11 for receiving the moisture of the wearer when the diaper is placed in position on the wearer to allow the moisture to pass or wick internally of the diaper. This body contacting layer 11 is formed from hydrophilic, flat, ribbonlike, aerated, regenerated cellulose fibers of the generally collapsed multicellular form having natural bonding characteristics. The nature of this material provides high dry strength to prevent tearing of the body contacting layer 11 during normal use, high wet hang or wet strength when subjected to the normal moisture of the wearer and the ability to disperse when agitated in a large excess of water such that the body contacting layer will disperse when agitated in an ordinary water closet to provide ease in flushing of the diaper.

The combination flushable diaper and protective cover 10 further includes a flushable, moisture absorbing, interior pad 12 superimposed on the body contacting layer 11 for absorbing the moisture of the wearer received or wicked through the body contacting layer 11. The interior pad 12 comprises a batt 13 of fiberized cellulosic fibers for providing superior absorbency characteristics and at least one ply 14 of cellulosic sheet material positioned on each side of the batt 13 for providing strength and additional absorbency to the pad 12. As illustrated in the drawings, a plurality of plies 14 are positioned on the side of the interior pad 12 adjacent the body contacting layer 11 and one ply 14 of cellulosic sheet material is positioned on the other side of the batt 13 of fibers. However, it is to be understood that any arrangement or number of plies 14 of cellulosic sheet material may be used on each side of the batt 13 of fibers in the interior pad 12 for providing the desired strength and additional moisture absorption characteristics to the interior pad 12. These plies of cellulosic sheet material may be creped tissue paper layers which are easily flushable in an ordinary water closet. Manifestly, the batt 13 of fibers is dispersible and easily flushable in an ordinary water closet.

The combination flushable diaper and protective cover 10 further includes a protective cover 17 moisture impervious sheet material superimposed on the other side of the interior

pad 12 and secured to the body contacting layer 11 along longitudinal and transverse edges thereof of form therewith an envelope around the interior pad 12. This fluid impervious protective cover 17 provides combination diaper and protective cover 10 which does not require the use of protective pants when diapering an infant. The protective cover 17 may be formed of any moisture impervious sheet material, such as plastic or the like.

The thus formed combination disposable diaper and protective cover 10, in the unfolded condition thereof, as shown in FIGS. 2 and 3, includes a longitudinally extending central portion 20 and side portions 21. In the prefolded condition of the combination diaper and protective cover 10, as shown in FIGS. 1, 4 and 5, the side portions 21 are each folded inwardly over the central portion 20 and then folded outwardly back over themselves. Specifically, the side portions 21 are each folded inwardly over the central portion 20 along first longitudinally extending, preferably linear, fold lines 22 extending the length of the combination diaper and protective cover and located adjacent the central portion 20. The outermost sections of the thus folded side portions 21 are then folded outwardly back over themselves along second longitudinally extending, preferably slightly outwardly curved fold lines 23 extending the length of the combination diaper and protective cover and located between the first fold lines 22 and the longitudinal side edges of the unfolded diaper.

In the preferred form of the combination flushable diaper and protective cover 10, the protective cover 17 extends around the longitudinal edges of the diaper and overlaps the fluid-permeable body contacting layer 11, as shown particularly in FIGS. 1, 2 and 5. The overlapping protective cover is secured to the body contacting layer 11, such as by heat sealing. This heat sealing, as shown in the drawings, could be formed as a plurality of longitudinally extending heat sealed lines 25. This overlapping arrangement of the protective cover seals and prevents leakage of moisture at the longitudinal edges of the combination diaper and protective cover 10 and provides strong pinning areas at the corners of the diaper.

For cooperating with the overlapped protective cover, the body contacting layer is preferably creped in the transverse direction of the diaper for wicking excessive moisture toward the longitudinal edges of the diaper having the protective cover overlapped therearound and thereby prevents leakage of moisture from the diaper.

The combination flushable diaper and protective cover 10 includes embossed portions 30 along the transverse edges of the combination diaper and cover for uniting body contacting layer 11 and the protective cover 17 with each other and with the interior pad 12 to form a unitary combination diaper and protective cover. Preferably, the embossed portions 30 include a plurality of adhesive deposits 31 disposed within the embossed portions for cooperating therewith to form the unitary combination diaper and protective cover and for aiding in holding together the various components within the embossed portions 30.

Also, there is preferably provided additional adhesive deposits 31 between the body contacting layer 11 and the interior pad 12 for securing these components together at the location of the deposits so that stresses applied through the diaper use are distributed throughout the combination diaper and protective cover and for preventing relative displacement between the body contacting layer 11 and the interior pad 12.

A preferred form of an interior pad 12 for use in the combination diaper and protective cover 10 of this invention is illustrated in the drawings and includes a batt 13 of fiberized fibers which has a length equal to the combination diaper and protective cover, but which terminates at and does not extend into the embossed portions at the transverse edges for facilitating the uniting of the remaining components included in the embossed areas 30 and to hold these components together and prevent delamination. If the batt of fibers extended into the embossed areas, it would be very difficult to hold the components in the embossed areas together. Also,

the batt 13 of fiberized fibers preferably has a width equal to only that of the central portion of the unfolded diaper, as may be seen in FIG. 2, to provide a greater thickness in the central portion for increased moisture absorption where it is needed in the central portion and to allow easier folding of the side portions of the diaper.

When this width batt 13 of fibers is used, the plies 14 of cellulosic material on either side of the batt 14 should extend throughout the length and width of the combination diaper and protective cover 10 for providing strength thereto and for providing additional absorbency in the central portion and absorbency in the side portions.

The thus formed and prefolded combination flushable diaper and protective cover may be easily fitted onto any size wearer by locating the middle thereof in the crotch of the wearer and positioning the combination diaper and protective cover in a generally U-shaped configuration around the trunk or lower body of the wearer such that the transverse embossed edges will extend around the waist of the wearer. These transverse edges in the prefolded configuration, shown in FIG. 1, may be extended simply by pulling on the side portions thereof until they fit around the waist of the wearer, whereupon pins may be inserted to hold the combination diaper and protective cover in place. This construction eliminates any folding of the combination diaper and backing in the crotch portion and allows manipulation of the transverse edges which form the waist portion of the combination diaper and protective cover 10 for easily fitting the wearer. The generally contoured configuration obtained by prefolding of the diaper, as described above provides a diaper which easily fits the body of the wearer and prevents bulkiness, etc., when placed in position on the wearer. Manifestly, no protective pants are needed when utilizing the combination diaper and protective cover 10 of this invention. Also, the improved interior pad construction provides strength and absorbency not normally obtained with conventional disposable diapers.

After the combination diaper and protective cover 10 has been used, it may be easily disposed of by stripping off and disposing of the protective cover 17 and then flushing the diaper in an ordinary water closet. The agitation of flushing will cause the body contacting layer 11 to disperse allowing the remaining portions of the diaper to disperse and be easily flushed in the water closet.

In the drawings and specification there has been set forth a preferred embodiment of the invention and, although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation.

What is claimed is:

1. A disposable, unitary, prefolded, combination flushable diaper and protective cover of generally rectangular unfolded configuration defining longitudinally extending central and side portions and characterized by serving the dual function of a conventional diaper and protective pants and by being easily disposable by stripping off the protective cover and flushing the diaper in an ordinary water closet after use, said combination diaper and protective cover comprising

a dispersible, fluid-permeable, body contacting layer for receiving the moisture of the wearer and comprising hydrophilic, flat, ribbonlike, aerated, regenerated cellulose fibers of the generally collapsed multicellular form having natural bonding characteristics and which provides a body contacting layer having high dry strength, wet hang and dispersibility characteristics when agitated in a large excess of water,

a flushable, moisture absorbing, interior pad superimposed on said body contacting layer for absorbing the moisture of the wearer received through said body contacting layer, said pad comprising a batt of fiberized cellulosic fibers for providing superior moisture absorbing characteristics to said pad and at least one ply of cellulosic sheet material positioned on opposite sides of said batt fibers for providing strength and additional absorbency to said pad,

a protective cover of moisture impervious sheet material superimposed on said interior pad to prevent moisture from passing therefrom and secured to said body contacting layer along longitudinal and transverse edges thereof to form therewith an envelope around said interior pad and to form the unitary combination diaper and protective cover,

embossed portions along the transverse edges of said combination diaper and protective cover uniting said body contacting layer and said protective cover with each other and with said interior pad to form the unitary combination diaper and protective cover,

a plurality of adhesive deposits disposed within said embossed portions for cooperating therewith to form the unitary combination diaper and protective cover,

said batt of fiberized fibers forming a part of said interior pad having a length substantially equal to said combination diaper and protective cover for providing absorbency thereto but terminating at and not extending into said embossed portions for facilitating the uniting of said body contacting layer and said protective cover,

additional adhesive deposits disposed between and uniting said body contacting layer and said interior pad for distributing stresses applied throughout the diaper and preventing relative displacement between said body contacting layer and said interior pad, and

said side portions of said combination diaper and protective cover being folded inwardly over said central portion and then folded outwardly back over themselves to form a prefolded combination diaper and protective cover.

2. A disposable combination flushable diaper and protective cover, as set forth in claim 1, in which said protective cover extends around the longitudinal edges and overlaps said fluid-permeable body contacting layer and is secured thereto for preventing leakage of moisture at the longitudinal edges of said diaper and for providing a strong pinning area at the corners of said diaper in the unfolded condition.

3. A disposable combination flushable diaper and protective cover, as set forth in claim 2, in which said body contacting layer is creped in the transverse direction of said diaper for wicking moisture toward the longitudinal edges of said diaper having said protective cover therearound to prevent leakage of moisture from said diaper.

4. A disposable combination flushable diaper and protective cover, as set forth in claim 1, in which said diaper and protective cover includes longitudinally extending central and side portions and in which said central portion is of greater thickness than said side portions for providing increased moisture absorption in said central portion.

5. A disposable flushable diaper and protective cover, as set forth in claim 1, in which said batt of fiberized fibers forming a part of said interior pad has a width substantially equal to and is disposed in said central portion of said combination diaper and protective cover for concentrating absorbency therein and allowing easy folding of said combination diaper and protective cover.

6. A disposable combination flushable diaper and protective cover, as set forth in claim 5, in which said layers of cellulosic sheet material, superimposed on opposite sides of said batt of fibers and forming part of said interior pad, extend throughout the length and width of said combination diaper and protective cover for providing strength and absorbency thereto.

7. A disposable, unitary, prefolded, combination flushable diaper and protective cover of generally rectangular unfolded configuration defining longitudinally extending central and

side portions and characterized by serving the dual function of a conventional diaper and protective pants and being easily disposable by stripping off the protective cover and flushing the diaper in an ordinary water closet after use, said combination diaper and protective cover comprising

a dispersible, fluid permeable, body contacting layer for receiving the moisture of the wearer comprising hydrophilic, flat ribbonlike, aerated, regenerated cellulose fibers of the generally collapsed multicellular form having natural bonding characteristics and which provide a body contacting layer having high dry strength, wet hand and dispersibility characteristics when agitated in a large excess of water,

a flushable, moisture absorbing, interior pad superimposed on said body contacting layer for absorbing the moisture of the wearer received through said body contacting layer, said pad comprising a batt of fiberized cellulosic fibers having a width substantially equal to and being disposed in said central portion of said combination diaper and protective cover for providing concentrated absorbency therein and at least one ply of cellulosic sheet material positioned on each side of said batt of fibers and extending throughout the length and width of said combination diaper and protective cover for providing strength and absorbency thereto,

a protective cover of moisture impervious sheet material superimposed on said interior pad to prevent moisture from passing therefrom and secured to the said body contacting layer along longitudinal and transverse edges to form therewith an envelope around said interior pad and to form the unitary combination diaper and protective cover, said protective cover extending around the longitudinal edges and overlapping said body contacting layer and being secured thereto for preventing leakage of moisture at the longitudinal edges of said diaper and for providing a strong pinning area at the corners of said diaper,

embossed portions along the transverse edges of said combination diaper and protective cover uniting said body contacting layer and said protective cover with each other and with said interior pad to form the unitary combination diaper and protective cover,

a plurality of adhesive deposits disposed within said embossed portions for cooperating therewith to form the unitary combination diaper and protective cover,

said body contacting layer being creped in the transverse direction for wicking moisture toward the longitudinal edges of said diaper having the overlapped protective cover therearound to prevent leakage of moisture,

said batt of fiberized fibers forming a part of said interior pad having a length substantially equal to said combination diaper and protective cover for providing absorbency thereto but terminating at and not extending into said embossed portions for facilitating the uniting of said body contacting layer and said protective cover,

additional adhesive deposits disposed between and uniting said body contacting layer and said interior pad for distributing stresses applied thereto throughout the diaper and preventing relative displacement between said body contacting layer and said interior pad, and said side portions of said combination diaper and protective cover being folded inwardly over said central portion and then folded outwardly back over themselves to form a prefolded combination diaper and protective cover.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,636,952 Dated January 25, 1972

Inventor(s) Donald K. George

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

- Column 1, line 13, after "to" insert --any--
line 40, after "further" insert --more specific--.
- Column 3, line 2, "of" should be --to--
line 4, after "provides" insert --a--.
- Column 4, line 8, "14" should be --13--
line 58, cancel "and"
line 71, after "batt" insert --of--.
- Column 5, line 45, after "said" insert --combination--
line 50, after "disposable" insert --combination--.
- Column 6, line 11, "hand" should be --hang--
line 28, after "to" cancel --the--.

Signed and sealed this 15th day of August 1972.

(SEAL)

Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents