ABSORBENT ARTICLE AND METHOD

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ABSTRACT
An article having an absorbent pad assembly. The pad assembly has a pair of side edges, a longitudinally extending central panel, a pair of doubled longitudinally extending back panels underlying the central panel, and a pair of longitudinally extending top panels extending from the back panels and overlying the central panel.

24 Claims, 9 Drawing Figures
ABSORBENT ARTICLE AND METHOD

BACKGROUND OF THE INVENTION

The present invention relates to absorbent articles, and more particularly to disposable diapers. In the recent past, a various assortment of disposable diapers have been proposed for use on infants. Although a number of such diapers are in everyday use, a few factors have created problems which prevent a totally satisfactory diaper. First, the shape of the infant’s thigh in the crotch region presents an irregular surface with which it is difficult to achieve a close fit of the diaper; second, it has been difficult to attain a proper fluid barrier to prevent diaper leakage in the crotch region; and third, it has been difficult to place sufficient absorbent material in the crotch region of the diaper, where absorbency is most needed, without adding significantly to the bulk of the diaper and resultant discomfort to the infant.

SUMMARY OF THE INVENTION

A principal feature of the present invention is the provision of a diaper of simplified construction and improved fit.

The diaper of the present invention has an absorbent pad assembly having a pair of side edges, a longitudinally extending central panel, a pair of doubled longitudinally extending back panels underlying the central panel, and a pair of longitudinally extending top panels extending from the back panels and overlying the central panel. Means is provided for securing the top panels and the back panels to the central panel in the crotch region of the diaper.

A feature of the present invention is that the diaper provides a contoured fit in the crotch region.

Another feature of the invention is that the doubled back panels define pocket means for receiving and retaining fluid runoff from the central panel.

Yet another feature of the invention is that the back panels increase the amount of diaper absorbency in the crotch region without adding significantly to the bulk of the diaper.

Still another feature of the invention is that the multiple layers of the pad assembly in the crotch region provide an improved gasketing effect about the infant's legs.

The diaper of the present invention has a fluid impervious backing sheet covering the outer surface of the top panels relative the central panel and at least a portion of the inner surface of the top panels intermediate the top panels and the central panel.

Thus, another feature of the present invention is that the fluid impervious outer surface of the top panels prevents leakage of the diaper in the crotch region.

Still another feature of the invention is that the top panels have a fluid impervious barrier adjacent the side edges to prevent leakage in the crotch region of the diaper.

Yet another feature of the invention is that the top panels direct fluid to the back panels for retention therein.

Still another feature of the invention is the provision of a method for making the diaper of the invention.

Further features will become more fully apparent in the following description of the embodiments of this invention and from the appended claims.

DESCRIPTION OF THE DRAWINGS

In the drawings:

FIG. 1 is a fragmentary front plan view of the diaper of the present invention;
FIG. 2 is a fragmentary back plan view of the diaper of FIG. 1;
FIG. 3 is a sectional view taken substantially as indicated along the line 3–3 of FIG. 1;
FIG. 4 is fragmentary sectional view of a pad assembly prior to folding into a configuration defining the diaper of the present invention;
FIG. 5 is a fragmentary sectional view showing the pad assembly of FIG. 4 partially folded into the configuration of the diaper of the present invention;
FIG. 6 is a perspective view of the diaper of FIG. 1 showing the diaper as partly unfolded for placement on an infant;
FIGS. 7 and 8 are fragmentary sectional views of other embodiments of a pad assembly for the diaper of FIG. 1; and
FIG. 9 is a fragmentary sectional view of another embodiment of the diaper of FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to FIGS. 1 and 4, there is shown a disposable diaper generally designated 20 having an absorbent pad assembly 22. The pad assembly 22 has a pair of side edges 24a and 24b, and a pair of end edges 26a and 26b connecting the side edges 24a and b. As shown in FIG. 4, the pad assembly 22 has a fluid impervious top sheet 28 defining a substantial portion of the front surface 30 of the pad assembly, a fluid impervious backing sheet 32 defining a back surface 34 of the pad assembly, and an absorbent pad 36 positioned intermediate the top and backing sheets 28 and 32. The width of the backing sheet 32 is greater than the width of the absorbent pad 36, and end sections 38a and 38b of the backing sheet are folded over the front surface 30 of the pad assembly 22 and secured in place over the absorbent pad 36. Similarly, as shown in FIG. 1, the length of the backing sheet 32 may be greater than the length of the absorbent pad, such that end sections 40a and 40b may be folded over the front surface of the pad 36 to define fluid barriers at the longitudinal ends of the pad assembly 22.

The diaper of the present invention may be formed from the pad assembly of FIG. 4 according to a method of the invention as follows. The pad assembly is first folded along a pair of longitudinally extending fold lines 42a and 42b, as shown in FIG. 5, with the fold lines 42a and b defining a pair of side panels 44a and 44b extending between the side edges 24a and b and the first fold lines 42a and b, the side panels 44a and b being folded against the front surface 30 of the pad assembly 22. The side panels 44a and b are secured to the front surface 30 of the pad assembly 22 in the crotch region of the diaper, and in one embodiment adjacent the side edges 24a and b by suitable means 46a and 46b, such as adhesive. The securing means 46a and b is preferably offset 1–2 inches from the longitudinal mid-point of the diaper toward the end edge 26a at the front of the diaper.

Next, the folded pad assembly of FIG. 5 is folded along a second pair of longitudinally extending fold lines 48a and 48b which are intermediate the side edges 24a and b and the first fold lines 42a and b, as shown in
Additional embodiments of the pad assembly 22 are illustrated in FIGS. 7 and 8, in which like reference numerals designate like parts. The absorbent pad 36 in the pad assembly of FIG. 7 has a plurality of longitudinally extending embossments 70a, 70b, and 70c on each side of the longitudinal center line of the diaper, such that the thickness of the pad is reduced in the embossed areas. The embossments 70a, b, and c correspond with the fold lines 48a, 42a, and 62a, respectively, on one side of the diaper, as shown, and 48b, 42b, and 62b on the other side of the diaper, and facilitate folding of the pad assembly along the fold lines during manufacture due to the reduced thickness in the areas of the fold lines. Similarly the absorbent pad 36 of FIG. 8 has a plurality of spaced longitudinally extending pad segments 37a, 37b, 37c, and 37d defining separated areas 39a, 39b, and 39c on each side of the diaper in the areas of the fold lines to facilitate folding of the diaper.

In a preferred embodiment, the securing means 46a and b is spaced from the side edges 24a and b of the top panels 54a and b, as shown in FIG. 9, such that the securing means retains the end sections 38a and b of the backing sheet against the front surface of the central panel at a location spaced from the side edges 24a and b. After placement of the diaper, stress is applied to the top panels adjacent the side edges 24a and b, and the spaced securing means permits edge portions 67 of the top panels adjacent the side edges to rise from the front surface of the central panel. Thus, the edge portions 67 are positioned in the juncture of the infant's crotch and thigh during use, and a fluid impervious seal is formed by the edge portions against the infant's skin to prevent leakage.

Thus, there has been described a diaper which provides an improved fit in the crotch region without adding significantly to the bulk of the diaper. At the same time, the diaper minimizes fluid leakage and provides for greater fluid retention in the crotch region. Methods have also been described for making the diaper of the present invention from the pad assembly of FIG. 4.

The foregoing detailed description is given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, as modifications will be obvious to those skilled in the art.

1. A disposable diaper comprising, an absorbent pad assembly having a front surface, a back surface, a pair of side edges, a first fold of said pad assembly along a first pair of longitudinally extending fold lines defining a pair of side panels extending between said side edges and the first pair of fold lines, said side panels being folded against the front surface of the pad assembly, and a second fold of the pad assembly along a second pair of longitudinally extending fold lines intermediate said side edges and first fold lines, the second fold lines defining doubled edge sections remote said side edges being folded against the back surface of the pad assembly.

2. The diaper of claim 1 wherein said side panels are secured to the front surface of the pad assembly in the longitudinal central region of the diaper.

3. The diaper of claim 1 wherein said edge sections are secured to the back surface of the pad assembly in the longitudinal central region of the diaper.

4. The diaper of claim 1 wherein said pad assembly is embossed in the region of at least a part of said fold lines to facilitate folding of said pad assembly.
5. The diaper of claim 1 wherein said pad assembly has a plurality of spaced longitudinally extending pad segments defining separated areas in the region of at least a part of said fold lines to facilitate folding of said pad assembly.

6. The diaper of claim 1 including a fluid impervious backing sheet defining the back surface of the pad assembly.

7. The diaper of claim 6 wherein said backing sheet covers a portion of the front surface of the side panels adjacent said side edges.

8. An absorbent article comprising, an absorbent pad assembly having a pair of side edges, a longitudinally extending central panel, a pair of doubled longitudinally extending back panels folded against the central panel, and a pair of longitudinally extending top panels extending from the back panels and folded against the central panel.

9. The diaper of claim 8 including means for securing the top panels to the central panel in the longitudinal central region of the diaper.

10. The diaper of claim 9 wherein said securing means is located adjacent said side edges.

11. The diaper of claim 9 wherein said securing means is spaced from said side edges.

12. The diaper of claim 11 wherein said panel includes a fluid impervious backing sheet having end sections covering at least a portion of the inner surface of the top panels intermediate the top panels and the central panel, and said securing means secures said end sections to the central panel.

13. The diaper of claim 8 including means for securing the back panels to the central panel in the longitudinal central region of the diaper.

14. The diaper of claim 13 wherein each of said back panels includes a longitudinally extending fold line underlying the central panel, and said securing means are located adjacent said fold lines.

15. The diaper of claim 8 wherein said pad assembly includes a fluid impervious backing sheet covering the outer surface of the top panels relative the central panel and at least a portion of the inner surface of the top panels intermediate the top panels and the central panel.

16. A disposable diaper comprising, an absorbent pad assembly having a pair of side edges, a substantially fluid pervious front surface, a fluid impervious backing sheet defining a back surface of the pad assembly, said backing sheet extending past said side edges and covering a portion of the front surface of the pad assembly, longitudinally extending edge portions of the pad assembly being folded over and secured to the front surface of the pad assembly, the longitudinally extending edge portions of the folded pad assembly being folded under and secured to the back surface of the pad assembly.

17. A disposable diaper comprising, an absorbent pad assembly having a longitudinally extending central panel having a front surface and a back surface, a pair of longitudinally extending top panels overlying the front surface of the central panel and having a pair of inwardly directed side edges, a fluid impervious outer surface, and a fluid impervious inner surface portion adjacent the side edges and facing the central panel, and fluid pocket means underlying the back surface of the central panel to receive fluid runoff from the front surface of the central panel.

18. A disposable diaper comprising, an absorbent pad assembly having a pair of side edges, a front surface, a back surface, a first fold of the pad assembly along a first pair of longitudinally extending fold lines defining a central panel and a pair of side panels, said side panels being folded against the back surface of the central panel, a second fold of the side panels along a second pair of longitudinally extending fold lines intermediate the first fold lines and said side edges, said second fold lines defining a pair of edge panels being folded around the first fold lines and overlying the front surface of the central panel.

19. A method of making a disposable diaper comprising the steps of:

folding longitudinally extending side panels of an absorbent pad assembly against a front surface of the assembly to define a doubled portion of the pad assembly; and

folding longitudinally extending edge sections of said doubled portion against a back surface of a longitudinally extending central pad in the assembly.

20. The method of claim 19 including the step after the first folding step of securing the side panels against the front surface of the pad assembly in the longitudinal central region of the diaper.

21. The method of claim 19 including the step after the second folding step of securing the edge sections against the back surface of the pad assembly in the longitudinal central region of the diaper.

22. A method of making a disposable diaper, comprising the steps of:

folding longitudinally extending side panels of an absorbent pad assembly against a back surface of a longitudinally extending central pad in the assembly; and

folding longitudinally extending edge panels of the side panels against a front surface of the pad assembly.

23. The method of claim 22 including the step after the first folding step of securing a portion of the side panels to the back surface of the pad assembly in the longitudinal central region of the diaper.

24. The method of claim 22 including the step after the second folding step of securing the edge panels to the front surface of the pad assembly in the longitudinal central region of the diaper.