

ABSORBENT ARTICLE HAVING MULTIPLE TOPSHEETS

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FIELD OF THE INVENTION

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The present invention relates to absorbent articles such as sanitary napkins, disposable diapers, adult incontinent briefs, and the like, and more particularly, the present invention relates to absorbent articles having multiple topsheets.

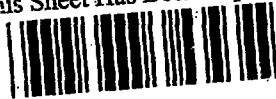
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BACKGROUND OF THE INVENTION

It has long been known in the disposable absorbent bandage art that it is extremely desirable to construct absorptive devices such as disposable diapers, catamenial pads, sanitary napkins, incontinent briefs, and the like, which present a dry surface feel to the user to improve wearing comfort and to minimize the development of undesirable skin conditions due to prolonged exposure to moisture absorbed within the bandage.

One viable prior art solution to the aforementioned problem is disclosed in commonly assigned U.S. Pat. No. 4,342,314 issued to Radel, et al. on August 3, 1982 and hereby incorporated herein by reference. Radel, et al. discloses an absorbent bandage with a wearer-contacting topsheet comprising a resilient, macroscopically expanded, three-dimensional plastic web exhibiting a combination of fiber-like and plastic properties. In a preferred embodiment, the macroscopically expanded, three-dimensional, plastic web topsheet disclosed in Radel, et al. exhibits a fine scale three-dimensional microstructure comprising a regulated continuum of capillary networks originating in and extending from one surface of the web and terminating in the form of apertures in the opposite surface thereof to promote rapid fluid transport. The web's fiber-like appearance is comprised of a continuum of fiber-like elements, the opposed ends of each of the fiber-like elements are interconnected to at least one other of the fiber-like elements.





A typical capillary network in the Radel, et al. structure comprises an uppermost capillary opening or aperture formed by a multiplicity of fiber-like elements interconnected to one another in the uppermost plane of the web. Each of the fiber-like elements exhibits a substantially uniform U-shaped cross-section along its length. The cross-section of the fiber-like element comprises a base portion located in the wearer-contacting plane and a sidewall portion joined to each edge of the base portion, the sidewall portions extend generally in the direction of the absorbent pad-contacting surface of the web. The sidewall portions which intersect one another are joined to one another intermediate the wearing contacting surface and the absorbent pad contacting surface of the web, thereby forming a capillary network interconnecting the opposed surfaces of the web.

A topsheet of the type generally disclosed by Radel, et al. is highly effective in promoting rapid fluid transfer from the first, wearer-contacting surface to the second, absorbent pad-contacting surface of the topsheet. Accordingly, topsheets of this type have enjoyed widespread commercial success on catamenial pads due to their clean and dry appearance in use when contrasted to conventional nonwoven fibrous topsheets. While an absorbent article having a topsheet of the type disclosed in Radel, et al. is highly effective in promoting rapid transfer of bodily fluids from the first, wearer-contacting surface to the second, absorbent pad-contacting surface, the degree of masking of bodily fluids, e.g., menses, retained within the absorbent core is dependent upon the size of the capillary networks. As the size of the capillary networks decrease the amount of masking provided by the topsheet increases. However, if the capillary networks are too small bodily fluids are not able to pass through the topsheet into the absorbent core thereby exposing the skin to moisture.

Accordingly, it is an object of the present invention to provide an absorbent article with a topsheet or multiple topsheets having superior fluid handling properties while providing increased masking of bodily fluids retained within the absorbent core.

SUMMARY OF THE INVENTION

The present invention pertains, in a preferred embodiment, to an absorbent article, e.g., sanitary napkin, pantiliner, diaper, adult incontinent brief, bandage, and the like having multiple topsheets. Preferably, the absorbent article comprises



a first topsheet including a first apertured, macroscopically expanded, three-dimensional, polymeric web. The macroscopically expanded, three-dimensional, polymeric web has a body facing surface and a garment facing surface which are located in planes remote from one another. The absorbent article also includes a
5 second topsheet underlying the first topsheet. The second topsheet includes a second apertured, macroscopically expanded, three-dimensional, polymeric web having a body facing surface and a garment facing surface which are located in planes remote from one another. The absorbent article includes an absorbent core underlying the second topsheet. The absorbent core includes a body facing surface
10 and a garment facing surface. The absorbent article also includes a backsheet underlying the absorbent core. The backsheet has a body facing surface and a garment facing surface.

In a preferred embodiment, the first and second topsheets include a continuum of interconnected, fiber-like elements forming a network of capillaries.
15 To transmit fluids through the first and second topsheets and into the absorbent core, the apertures in the first topsheet are larger than the apertures in the second topsheet. In a particularly preferred embodiment, the apertures in the first topsheet are substantially non-aligned with the apertures in the second topsheet.

Preferably, the first and second topsheets are each comprised of a
20 multilayer polymeric film. To increase the masking of bodily fluids absorbed and retained in the absorbent core the multilayer polymeric film includes titanium dioxide.

BRIEF DESCRIPTION OF THE DRAWINGS

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While the specification concludes with claims particularly pointing out and distinctly claiming the present invention, it is believed that the present invention will be better understood from the following description in conjunction with the accompanying drawings, in which like reference numerals identify identical
30 elements and wherein:

Fig. 1 is a top plan view of a sanitary napkin with portions cut-away to more clearly show the construction of the sanitary napkin;

Fig. 2 is a cross-sectional view of the sanitary napkin of Fig. 1 taken along the section line 2-2; and

35 Fig. 3 is an enlarged, partially segmented, perspective illustration of a preferred fluid pervious web suitable for use as the first topsheet and the second



topsheet of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

5 As used herein, the term "absorbent article" refers to devices which absorb and contain body exudates, and, more specifically, refers to devices which are placed against or in proximity to the body of the wearer to absorb and contain the various exudates discharged from the body. The term "disposable" is used herein to describe absorbent articles which are not intended to be laundered or otherwise
10 restored or reused as an absorbent article (i.e., they are intended to be discarded after a single use, and, preferably, to be recycled, composted or otherwise disposed of in an environmentally compatible manner). A "unitary" absorbent article refers to absorbent articles which are formed of separate parts united together to form a coordinated entity so that they do not require separate
15 manipulative parts like a separate holder and pad.

 A preferred embodiment of a unitary disposable absorbent article of the present invention is the catamenial pad, sanitary napkin 20, shown in Fig. 1. As used herein, the term "sanitary napkin" refers to an absorbent article which is worn by females adjacent to the pudendal region, generally external to the urogenital
20 region, and which is intended to absorb and contain menstrual fluids and other vaginal discharges from the wearer's body (e.g., blood, menses, and urine). Interlabial devices which reside partially within and partially external of the wearer's vestibule are also within the scope of this invention. As used herein, the term "pudendal" refers to the externally visible female genitalia. It should be
25 understood, however, that the present invention is also applicable to other feminine hygiene or catamenial pads such as pantliners, or other absorbent articles such as incontinence briefs, and the like.

 Fig. 1 is a plan view of the sanitary napkin 20 of the present invention in its flat-out state with portions of the structure being cut-away to more clearly show
30 the construction of the sanitary napkin 20 and with the portion of the sanitary napkin 20 which faces or contacts the wearer, oriented towards the viewer. As shown in Fig. 1, the sanitary napkin 20 preferably comprises a first, fluid pervious topsheet 21, a second, fluid pervious topsheet 22, a fluid impervious backsheet 23 joined with topsheets 21 and 22, and an absorbent core 24 positioned between the
35 second topsheet 22 and the backsheet 23.

 The sanitary napkin 20 has two surfaces, a body-contacting surface or



body facing surface 20a and a garment facing surface 20b. The sanitary napkin 20 is shown in Fig. 1 as viewed from its body facing surface 20a. The body facing surface 20a is intended to be worn adjacent to the body of the wearer while the garment facing surface 20b is on the opposite side and is intended to be placed adjacent to the wearer's undergarments when the sanitary napkin 20 is worn. The sanitary napkin 20 has two centerlines, a longitudinal centerline "l" and a transverse centerline "t". The term "longitudinal", as used herein, refers to a line, axis or direction in the plane of the sanitary napkin 20 that is generally aligned with (e.g., approximately parallel to) a vertical plane which bisects a standing wearer into left and right body halves when the sanitary napkin 20 is worn. The terms "transverse" or "lateral" as used herein, are interchangeable, and refer to a line, axis or direction which lies within the plane of the sanitary napkin 20 that is generally perpendicular to the longitudinal direction. Fig. 1 also shows that the sanitary napkin 20 has a periphery 30 which is defined by the outer edges of the sanitary napkin 20 in which the longitudinal edges (or "side edges") are designated 31 and the end edges (or "ends") are designated 32.

Fig. 1 shows a preferred embodiment of the sanitary napkin 20 in which the topsheets 21 and 22 and the backsheet 23 have length and width dimensions generally larger than those of the absorbent core 24. The topsheets 21 and 22 and the backsheet 23 extend beyond the edges of the absorbent core 24 to thereby form not only portions of the periphery but also side flaps.

Sanitary napkin 20 preferably includes optional side flaps or "wings" 34 that are folded around the crotch portion of the wearer's panties. The side flaps 34 can serve a number of purposes, including, but not limited to protecting the wearer's panties from soiling and keeping the sanitary napkin secured to the wearer's panties.

Fig. 2 is a cross-sectional view of the sanitary napkin 20 taken along section line 2-2 of Fig. 1. As can be seen in Fig. 2, the sanitary napkin 20 preferably includes an adhesive fastening means 36 for attaching the sanitary napkin 20 to the undergarment of the wearer. Removable release liners 37 cover the adhesive fastening means 36 to keep the adhesive from sticking to a surface other than a crotch portion of the undergarment prior to use.

The absorbent core 24 may be any absorbent means which is capable of absorbing or retaining liquids (e.g., menses and/or urine). As shown in Fig. 1, the absorbent core 24 has a body facing surface, a garment facing surface, side edges, and end edges. The absorbent core 28 may be manufactured in a wide variety of



sizes and shapes (e.g., rectangular, oval, hourglass, dog bone, asymmetric, etc.) and from a wide variety of liquid-absorbent materials commonly used in sanitary napkins and other absorbent articles such as comminuted wood pulp which is generally referred to as airfelt. Examples of other suitable absorbent materials include creped cellulose wadding; meltblown polymers including coform; chemically stiffened, modified or cross-linked cellulosic fibers; synthetic fibers such as crimped polyester fibers; peat moss; tissue including tissue wraps and tissue laminates; absorbent foams; absorbent sponges; superabsorbent polymers; absorbent gelling materials; or any equivalent material or combinations of materials, or mixtures of these. The configuration and construction of the absorbent core may also be varied (e.g., the absorbent core may have varying caliper zones (e.g., profiled so as to be thicker in the center), hydrophilic gradients, superabsorbent gradients, or lower density and lower average basis weight acquisition zones; or may comprise one or more layers or structures). The total absorbent capacity of the absorbent core should, however, be compatible with the design loading and the intended use of the sanitary napkin. Further, the size and absorbent capacity of the absorbent core may be varied to accommodate different uses such as incontinence pads, pantliners, regular sanitary napkins, or overnight sanitary napkins.

Exemplary absorbent structures for use as the absorbent core 24 of the present invention are described in U.S. Pat. No. 4,950,264 issued to Osborn on August 21, 1990; U.S. Pat. No. 4,610,678 issued to Weisman et al. on September 9, 1986; U.S. Pat. No. 4,834,735 issued to Alemany et al. on May 30, 1989; and European Patent Application No. 0 198 683, The Procter & Gamble Company, published October 22, 1986 in the name of Duenk, et al. Each of these patents are incorporated herein by reference.

The backsheet 23 and the second topsheet 22 are positioned adjacent the garment facing surface and the body facing surface, respectively, of the absorbent core 24 and are preferably joined thereto and to each other by attachment means (not shown) such as those well known in the art. For example, the backsheet 23 and/or the second topsheet 22 may be secured to the absorbent core 24 or to each other by a uniform continuous layer of adhesive, a patterned layer of adhesive, or an array of separate lines, spirals, or spots of adhesive. Adhesives which have been found to be satisfactory are manufactured by H. B. Fuller Company of St. Paul, Minnesota under the designation HL-1258 or H-2031. The attachment means will preferably comprise an open pattern network of filaments of adhesive



as is disclosed in U.S. Pat. No. 4,573,986 issued to Minetola, et al. on March 4, 1986, and which is incorporated herein by reference. An exemplary attachment means of an open pattern network of filaments comprises several lines of adhesive filaments swirled into a spiral pattern such as illustrated by the apparatus and method shown in U.S. Pat. No. 3,911,173 issued to Sprague, Jr. on October 7, 1975; U.S. Pat. No. 4,785,996 issued to Zieker, et al. on November 22, 1978; and U.S. Pat. No. 4,842,666 issued to Werenicz on June 27, 1989. Each of these patents are incorporated herein by reference. Alternatively, the attachment means may comprise heat bonds, pressure bonds, ultrasonic bonds, dynamic mechanical bonds, or any other suitable attachment means or combinations of these attachment means as are known in the art.

The backsheet 23 has a body facing surface and a garment facing surface. The backsheet 23 is impervious to liquids (e.g., menses and/or urine) and is preferably manufactured from a thin plastic film, although other flexible liquid impervious materials may also be used. As used herein, the term "flexible" refers to materials which are compliant and will readily conform to the general shape and contours of the human body. The backsheet 23 prevents the exudates absorbed and contained in the absorbent core 24 from wetting articles which contact the sanitary napkin 20 such as pants, pajamas and undergarments. The backsheet 23 may thus comprise a woven or nonwoven material, polymeric films such as thermoplastic films of polyethylene or polypropylene, or composite materials such as a film-coated nonwoven material. Preferably, the backsheet is a polyethylene film having a thickness of from about 0.012 mm (0.5 mil) to about 0.051 mm (2.0 mils). Exemplary polyethylene films are manufactured by Clopay Corporation of Cincinnati, Ohio, under the designation P18-0401 and by Ethyl Corporation, Visqueen Division, of Terre Haute, Indiana, under the designation XP-39385. The backsheet is preferably embossed and/or matte finished to provide a more clothlike appearance. Further, the backsheet 23 may permit vapors to escape from the absorbent core 24 (i.e., breathable) while still preventing exudates from passing through the backsheet 23.

The first and second topsheets, 21 and 22, are compliant, soft feeling, and non-irritating to the wearer's skin. Further, the topsheets are liquid pervious permitting liquids (e.g., menses and/or urine) to readily penetrate through their thickness. Preferred topsheets comprise an apertured formed film. Apertured formed films are preferred for the topsheets because they are pervious to body exudates and yet non-absorbent and have a reduced tendency to allow liquids to



pass back through and rewet the wearer's skin. Thus, the surface of the formed film which is in contact with the body remains dry, thereby reducing body soiling and creating a more comfortable feel for the wearer. Suitable formed films are described in U.S. Pat. No. 3,929,135, issued to Thompson on December 30, 1975; 5 U.S. Pat. No. 4,324,246 issued to Mullane, et al. on April 13, 1982; U.S. Pat. No. 4,342,314 issued to Radel, et al. on August 3, 1982; U.S. Pat. No. 4,463,045 issued to Ahr et al. on July 31, 1984; and U.S. Pat. No. 5,006,394 issued to Baird on April 9, 1991. Each of these patents are incorporated herein by reference.

Fig. 3 is an enlarged, partially segmented, perspective illustration of a particularly preferred embodiment of an apertured, macroscopically expanded, 10 three-dimensional, fiber-like, fluid pervious, polymeric web 40, generally in accordance with the teachings of commonly assigned U.S. Pat. No. 4,342,314 issued to Radel et al. on August 3, 1982, which has been found suitable for use as the first topsheet 21 and the second topsheet 22 on sanitary napkin 20. The term 15 "macroscopically expanded", when used to describe three-dimensional plastic webs of the present invention, refers to webs, ribbons and films which have been caused to conform to the surface of a three-dimensional forming structure so that both surfaces thereof exhibit a three-dimensional forming pattern of surface aberrations corresponding to the macroscopic cross-section of the forming structure, the 20 surface aberrations comprising the pattern are individually discernible to the normal naked eye, i.e., a normal naked eye having 20/20 vision unaided by an instrument that changes the apparent size or distance of an object or otherwise alters the visual powers of the eye, when the perpendicular distance between the viewer's eye and the plane of the web is about 12 inches. The term "fiber-like", as 25 utilized herein to describe the appearance of plastic webs of the present invention, refers generally to any fine scale pattern of apertures, random or non random, reticulated or non-reticulated, which connote an overall appearance and impression of a woven or nonwoven fibrous web when viewed by the human eye. As can be seen in Fig. 3, the webs fiber-like appearance is comprised of a continuum of fiber-like elements, the opposed ends of each of the fiber-like elements are interconnected to at least one other of the fiber-like elements. In the embodiment disclosed in Fig. 3, the interconnected fiber-like elements form a pattern network of pentagonally shaped capillaries 41. The web 40 which exhibits a fiber-like appearance, embodies a three-dimensional microstructure extending from the webs 30 uppermost, wearer-contacting or body facing surface 42 in plane 43 to its 35 lowermost or garment facing surface 44 in plane 45 to promote rapid fluid



transport from the uppermost surface 42 to the lowermost surface 44 of the web without lateral transmission of fluid between adjacent capillaries 41. As utilized herein, the term "microstructure" refers to a structure of such fine scale that its precise detail is readily perceived by the human eye only upon magnification by
5 microscopic or other means well known in the art.

Apertures 47 in the body surface 42 are formed by a multiplicity of intersecting fiber-like elements, e.g., elements 48, 49, 50, 51, and 52, interconnected to one another in the body facing surface of the web. Each fiber-like element comprises a base portion, e.g., base portion 54, located in plane 43.
10 Each base portion has a sidewall portion, e.g., sidewall portions 56, attached to each edge thereof. The sidewall portions 56 extend generally in the direction of the second surface 44 of the web. The intersecting sidewall portions of the fiber-like elements are interconnected to one another intermediate the first and second surfaces of the web and terminate substantially concurrently with one another in
15 the plane 45 of the second surface.

In the particularly preferred embodiment shown in Fig. 3, the interconnected sidewall portions 56 terminate substantially concurrently with one another in the plane of the second surface 45 to form apertures 58 in the second surface 45 of the web. The network of capillaries 41 formed by the interconnected
20 sidewall portions 56 between apertures 47 and 58 allows for free transfer of fluids from the body facing surface of the web directly to the garment facing surface of the web without lateral transmission of the fluid between adjacent capillaries.

The base portion 54 preferably includes a microscopic pattern of surface aberrations 60, generally in accordance with the teachings of commonly assigned
25 U.S. Pat. No. 4,463,045 issued to Ahr et al. on July 31, 1984. The microscopic pattern of surface aberrations 60 provide a substantially non-glossy visible surface when the web 40 is struck by incident light rays.

To increase the masking of bodily fluids retained in the absorbent core, the capillaries of the first topsheet 21 are not of the same size, shape and/or in
30 alignment with the capillaries of the underlying second topsheet 22. Accordingly, if the first and second topsheets are made from the same forming structure, thus creating similar topsheets, the first topsheet is preferably placed over the second topsheet such that the capillaries of the first and second topsheets are substantially non-aligned with one another. Alternatively, different forming structures can be
35 used to form the first and second topsheets, respectively, such that they have different patterns, thus preventing alignment of the respective capillaries.



While non-alignment of the capillaries of the first topsheet 21 with those of the second topsheet 22 provides increased masking of bodily fluids retained by the absorbent core 24, bodily fluids must be allowed to transmit from the first topsheet 21 to and through the second topsheet 22 into the absorbent core 24. Therefore, the second topsheet cannot be sized, shaped or aligned such that it completely obstructs the apertures in the garment facing surface of the first topsheet 21. There must be a path for fluids to travel along between the first and second topsheets.

Preferably, the capillaries of the second topsheet 22 are slightly smaller in size than the capillaries of the first topsheet. By having the capillaries of the first topsheet 21 slightly larger than those of the second topsheet 22 a capillary gradient is created. The capillary gradient assists in the transmission of fluid deposited on the first topsheet 21, to and through the second topsheet 22 and into the absorbent core 24.

The first and second topsheets 21 and 22, are each preferably comprised of a multilayer polymeric film which exhibits an opaque appearance. The multilayer film includes a first outer layer comprised substantially of a polymeric material and a central filler-containing polymeric layer substantially continuously joined to one side of the first outer layer. The central filler-containing layer preferably has about 20 to 60 weight percent fillers relative to the filler-containing layer which are substantially uniformly dispersed therein. A filler such as titanium dioxide or carbonate may be used to give the topsheet a whitish, opaque appearance. The central filler-containing layer has a thickness from about 30 to about 70 percent of the total thickness of the multilayer film. A second outer layer comprised substantially of a polymeric material has one side substantially continuously joined to the second side of the central filler-containing layer. The total multilayer film preferably has at least 20 weight percent filler relative to the total multilayer film. A suitable example of such a multilayer topsheet is found in commonly assigned U.S. Patent Application Serial No. 07/863,936, entitled "Multilayer Film Exhibiting an Opaque Appearance", filed April 6, 1992, in the names of Visscher and Perry, and which is incorporated herein by reference.

Preferred polymeric materials for the outer layers and the central filler-containing layer include polyolefins, particularly polyethelenes, polypropylenes and copolymers having at least one olefinic constituent. Other materials such as polyesters, nylons, copolymers thereof and combinations of any foregoing may also be suitable.



In a preferred embodiment of the present invention, the body facing surface of the formed film topsheets are hydrophilic so as to help liquid to transfer through the topsheets faster than if the body facing surface was not hydrophilic so as to diminish the likelihood that menstrual fluid will flow off the topsheets rather than flowing into and being absorbed by the absorbent core. In a preferred embodiment, surfactant is incorporated into the polymeric materials of the first and second formed film topsheets such as is described in U.S. Patent Application Serial No. 07/794,745, "Absorbent Article Having A Nonwoven and Apertured Film Coversheet" filed on November 19, 1991 by Aziz, et al., which is incorporated herein by reference. Alternatively, the body facing surfaces of the topsheets can be made hydrophilic by treating them with a surfactant such as is described in the above referenced U.S. 4,950,254 issued to Osborn, incorporated herein by reference.

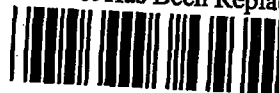
In use, the sanitary napkin 20 can be held in place by any support means or attachment means well-known for such purposes. Preferably, the sanitary napkin is placed in the user's undergarment or panty and secured thereto by a fastener such as an adhesive 36. The adhesive 36 provides a means for securing the sanitary napkin 20 in the crotch portion of the panty. Thus, a portion or all of the outer surface of the backsheet 23 is coated with adhesive. Any adhesive or glue used in the art for such purposes can be used for the adhesive herein, with pressure-sensitive adhesives being preferred. Suitable adhesives are Century A-305-IV manufactured by the Century Adhesives Corporation of Columbus, Ohio; and Instant Lock 34-2823 manufactured by the National Starch and Chemical Company of Bridgewater, NJ. Suitable adhesive fasteners are also described in U.S. Patent 4,917,697. Before the sanitary napkin is placed in use, the pressure-sensitive adhesive 36 is typically covered with a removable release liner 37 in order to keep the adhesive 36 from drying out or adhering to a surface other than the crotch portion of the panty prior to use. Suitable release liners 37 are also described in the above-referenced U.S. Patent 4,917,697. Any commercially available release liners commonly used for such purposes can be utilized herein. Non-limiting examples of suitable release liners are BL30MG-A Silox E1/0 and BL30MG-A Silox 4P/O both of which are manufactured by the Akrosil Corporation of Menasha, WI. The sanitary napkin 20 of the present invention is used by removing the release liner 37 and thereafter placing the sanitary napkin 20 in a panty so that the adhesive 36 contacts the panty. The adhesive 36 maintains the sanitary napkin in its position within the panty during

use.

In a preferred embodiment of the present invention, the sanitary napkin 20 has two flaps 34 each of which are adjacent to and extend laterally from the side edge of the absorbent core. The flaps 34 are configured to drape over the edges of the wearer's panties in the crotch region so that the flaps are disposed between the edges of the wearer's panties and the thighs. The flaps 34 serve at least two purposes. First, the flaps 34 help serve to prevent soiling of the wearer's body and panties by menstrual fluid, preferably by forming a double wall barrier along the edges of the panty. Second, the flaps 34 are preferably provided with attachment means on their garment surface so that the flaps can be folded back under the panty and attached to the garment facing side of the panty. In this way, the flaps 34 serve to keep the sanitary napkin 20 properly positioned in the panty. The flaps 34 can be constructed of various materials including materials similar to the topsheet, backsheet, tissue, or combination of these materials. Further, the flaps 34 may be a separate element attached to the main body of the napkin or can comprise extensions of the topsheet and backsheet (i.e., unitary). A number of sanitary napkins having flaps suitable or adaptable for use with the sanitary napkins of the present invention are disclosed in U.S. Pat. No. 4,687,478 issued to Van Tilburg on August 18, 1987; U.S. Pat. No. 4,589,876 issued to Van Tilburg on May 20, 1986; and U.S. Pat. No. 4,608,047 issued to Mattingly on August 26, 1986. Each of these patents are incorporated herein by reference.

While particular embodiments of the present invention have been illustrated and described, it would be obvious to those skilled in the art that various other changes and modifications can be made without departing from the spirit and scope of the invention. It is therefore intended to cover in the appended claims all such changes and modifications that are within the scope of this invention.

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What is claimed is:

1. An absorbent article characterized by:
 - 5 (a) a first topsheet (21), said first topsheet (21) including a first apertured, macroscopically expanded, three-dimensional, polymeric web (40) having a body facing surface and a garment facing surface located in planes remote from one another;
 - 10 (b) a second topsheet (22) underlying said first topsheet, said second topsheet (22) including a second apertured, macroscopically expanded, three-dimensional, polymeric web (40) having a body facing surface and a garment facing surface located in planes remote from one another;
 - 15 (c) an absorbent core (24) underlying said second topsheet (22), said absorbent core (24) having a body facing surface and a garment facing surface; and
 - (d) a backsheet (23) underlying said absorbent core (24), said backsheet (23) having a body facing surface and a garment facing surface.
- 20 2. The absorbent article of Claim 1, wherein the apertures in said first topsheet are larger than the apertures in said second topsheet.
3. The absorbent article of Claim 1 or Claim 2, wherein the apertures in said first
25 topsheet are substantially non-aligned with the apertures in said second topsheet.
4. The absorbent article of any one of the preceding Claims, wherein said first
30 topsheet includes a continuum of interconnected, fiber-like elements forming a network of capillaries.
5. The absorbent article of any one of the preceding Claims, wherein said second
35 topsheet includes a continuum of interconnected, fiber-like elements forming a network of capillaries.
6. The absorbent article of any one of the preceding Claims, wherein the body facing
surfaces of said first and second topsheets are substantially hydrophilic.



7. The absorbent article of any one of the preceding Claims, wherein said first and second topsheets are comprised of a multilayer polymeric film.
- 5 8. The absorbent article of Claim 7, wherein said multilayer polymeric film includes titanium dioxide.
9. The absorbent article of any one of the preceding Claims, wherein said absorbent article is a sanitary napkin.

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