MULTI-LINER DISPOSABLE ABSORBENT PRODUCT AND RELATED METHODS

A disposable absorbent product (10) includes first and second absorbent assemblies (13, 15). The first absorbent assembly (13) has a fluid-pervious first topsheet (13a) and a fluid-impervious first backsheet (13b) in overlaying relationship with one another. The second absorbent assembly (15) is releasably coupled to the first absorbent assembly (13), and includes a second topsheet (15a) and a fluid-impervious second backsheet (15b) in overlaying relationship with one another. The second backsheet (15b) is adjacent the first topsheet (13a) and the second topsheet (15a) is configured to face toward the wearer of the product (10) during use. The second topsheet (15a) has a fluid-pervious first region (21) and an adjacent fluid-impervious second region (22) that at least hinders the passage of fluid secreted by the wearer of the product (10) there through.
MULTI-LINER DISPOSABLE ABSORBENT PRODUCT AND RELATED METHODS

TECHNICAL FIELD

The present invention is generally related to absorbent products and, more particularly, to disposable absorbent products made up of more than one absorbent liner and which are worn by humans for the containment and absorption of fluid bodily secretions.

BACKGROUND

Disposable absorbent products for absorption of bodily fluids are available in different types, designs, and dimensions. For example, training pants, baby diapers, adult diapers, and incontinence guards are products designed for the containment of urine and excrement. There are other types of disposable absorbent articles, such as feminine hygiene products (e.g., heavy and light incontinence pads, pantiliners) that are primarily designed to retain urine and/or menses secreted by female wearers. One known type of disposable absorbent product takes the form of a double-liner product. A known double-liner product includes two or more individual absorbent liners, each individually capable of retaining fluids secreted by the wearer, and which are coupled in a manner that permits their separation, particularly after one of the liners has been soiled. In products of that type, the liners have similar shapes and dimensions, which may make their separation challenging for the person wearing the product. In addition to this, separation of the liners may require the wearer to handle parts of the liner being removed e.g., the topsheet of that liner, that is soiled with secreted fluid. For many wearers, this is an unpleasant experience, and it may lead to contamination of the wearer's hands arising from contact with the secreted fluid in the soiled topsheet.
Accordingly, it is desirable to provide disposable absorbent products of the type generally described above, that address these and other shortcomings.

SUMMARY

In one embodiment, a disposable absorbent product is provided that includes first and second absorbent assemblies. The first absorbent assembly has a fluid-pervious first topsheet and a fluid-impervious first backsheet in overlaying relationship with one another. The first backsheet and the first topsheet are respectively configured to face away from and toward a wearer of the disposable absorbent product during use. The second absorbent assembly is releasably coupled to the first absorbent assembly, and includes a second topsheet and a fluid-impervious second backsheet in overlaying relationship with one another. The second backsheet is adjacent the first topsheet and the second topsheet is configured to face toward the wearer of the disposable absorbent product during use. In that embodiment, the second topsheet has a first region and a second region adjacent the first region, with the first region being fluid-pervious so as to permit the passage of fluid secreted by the wearer of the disposable absorbent product there through. The second region is fluid-impervious so as to at least hinder the passage of fluid secreted by the wearer of the disposable absorbent product there through.

In specific embodiments, the second region includes a base layer and a film coating on a surface of the base layer. In other embodiments, the second region includes a base layer and a fluid-impervious barrier substrate coupled to the base layer, with that coupling in some embodiments being in the form of an adhesive coupling. The fluid-impervious barrier substrate may include a hydrophobic nonwoven material and/or a thermoplastic material. Additionally or alternatively in those
embodiments, the first and second absorbent assemblies may be releasably coupled to one another through a plurality of bonds, with the bonds extending through the fluid-impervious barrier substrate.

In other specific embodiments, a perimeter of the second absorbent assembly may define a notch forming part of the second region. In yet other specific embodiments, the first and second absorbent assemblies are releasably coupled to one another through a plurality of pressure bonds. The first and second absorbent assemblies may be releasably coupled to one another at a plurality of locations generally proximate a perimeter of the second absorbent assembly. Additionally or alternatively, the first region of the second topsheet may have a first color and the second region of the second topsheet may have a second color that is different from the first color.

Other contemplated embodiments of the disposable absorbent product include a first absorbent core in the first absorbent assembly that is disposed between the first backsheet and the first topsheet, or in the second absorbent assembly and which is disposed between the second backsheet and the second topsheet, for storing fluid secreted by the wearer of the disposable absorbent product. Additionally, the disposable absorbent product may include a second absorbent core in the other of the first absorbent assembly or the second absorbent assembly, with the second absorbent core being disposed between the first backsheet and the first topsheet or between the second backsheet and the second topsheet, for storing fluid secreted by the wearer of the disposable absorbent product. The disposable absorbent product may also include, in certain embodiments, an adhesive layer on an exposed surface of the first backsheet, adapted to secure the disposable absorbent product to a
garment worn by the wearer, as well as a release liner that is releasably coupled to the first backsheet through the adhesive layer. In another embodiment, a disposable absorbent product is provided that has a first absorbent assembly and a second absorbent assembly in overlaying relationship with one another. The first absorbent assembly includes a fluid-pervious first topsheet and a fluid-impervious first backsheet in overlaying relationship with one another, with the first backsheet and the first topsheet being respectively configured to face away from and toward a wearer of the disposable absorbent product during use. The second absorbent assembly includes a second topsheet and a fluid-impervious second backsheet in overlaying relationship with one another, with the second backsheet being releasably coupled to at least the first topsheet, and with the second topsheet being configured to face toward the wearer of the disposable absorbent product during use.

In that embodiment, the second absorbent assembly includes a perimeter defining a notch, and the second topsheet has a fluid-pervious first region and a second region adjacent said first region. The second region includes the notch. In addition, the second region has a fluid-pervious base layer and a fluid-impervious thermoplastic barrier layer coupled to the base layer so as to at least hinder the passage of fluid secreted by the wearer of the disposable absorbent product through the second region. The first region may have a first color and the thermoplastic barrier layer may have a second color that is different from the first color. Additionally or alternatively, the thermoplastic barrier layer may be pressure-bonded to a remainder of the disposable absorbent product. In a specific embodiment, an extension of the fluid-pervious first region defines the fluid-pervious base layer.
In yet another embodiment, a process is provided for making a disposable absorbent product. The method includes obtaining first and second absorbent laminates, each having a fluid-pervious topsheet and a fluid-impervious backsheet, and releasably coupling the first and second absorbent laminates to one another, in an overlaying relationship. A fluid-impervious barrier layer of material is coupled onto only a portion of a surface of the topsheet of the second absorbent laminate, so as to define a fluid-pervious region and an adjacent fluid-impervious region in the topsheet of the second absorbent laminate. In specific embodiments, coupling the fluid-impervious barrier layer of material includes coupling a thermoplastic layer of material onto the surface of the topsheet of the second absorbent laminate. The process may additionally include cutting a notch along a perimeter of the second absorbent laminate and through the fluid-impervious barrier layer of material.

BRIEF DESCRIPTION OF THE DRAWINGS
The objectives and features of the invention will become more readily apparent from the following detailed description taken in conjunction with the accompanying drawings in which:

Fig. 1 is a perspective view of a disposable absorbent product in accordance with one embodiment of the invention.

Fig. 2 is a partially disassembled, perspective view of the disposable absorbent product of Fig. 1.

Fig. 3 is a schematic, cross-sectional view taken generally along line 3-3 of Fig. 1.
Fig. 3A is a view similar to Fig. 3, illustrating a disposable absorbent product in accordance with another embodiment of the invention.

Fig. 4 is a view similar to Figs. 3 and 3A, illustrating a disposable absorbent product in accordance with yet another embodiment of the invention.

Fig. 5 is a perspective view of the disposable absorbent product of Figs. 1-3, illustrating an exemplary separation of two components thereof.

Fig. 6 is a broken away, top view of a portion of the disposable absorbent product of Figs. 1-3.

Fig. 7 is a view similar to Fig. 6, in accordance with another embodiment of the invention.

Fig. 8 is a view similar to Figs. 6 and 7, in accordance with yet another embodiment of the invention.

Fig. 9 is a view similar to Fig. 6-8, in accordance with another embodiment of the invention.

Fig. 10 is a schematic perspective view of an exemplary process for making disposable absorbent products of the type illustrated in the preceding figures, in accordance with one embodiment of the invention.

Fig. 11 is a view similar to Fig. 10, in accordance with another embodiment of the invention.
DETAILED DESCRIPTION
To the extent that any meaning or definition of a term in this written
document conflicts with any meaning or definition of the term in a
document incorporated by reference, the meaning or definition assigned to
the term in this written document shall govern. Also, it is to be understood
that the phraseology and terminology used herein is for the purpose of
description and should not be regarded as limiting. The use of "including,"
"comprising," or "having" and variations thereof herein is meant to
encompass the items listed thereafter and equivalents thereof as well as
additional items. Unless specified or limited otherwise, the terms
"mounted," "connected," "supported," and "coupled" and variations thereof are used broadly and encompass both direct and indirect mountings,
connections, supports, and couplings. Further, "connected" and "coupled"
are not restricted to physical or mechanical connections or couplings, and
the term "releasably coupled" and derivatives thereof refer to a coupling of
elements or components that permits their separation substantially without
causing the tearing, breaking or destruction of those elements or
components.

With reference to the figures, and more particularly to Figs. 1, 2, and 3, an
exemplary disposable absorbent product is illustrated, in the form of a
double-liner pad 10. Pad 10 may be, for example and without limitation, a
light, medium or high incontinence product that is primarily configured to be
worn by a wearer so as to retain fluid e.g., urine, runny feces, secreted by
the wearer of the pad 10. Alternatively or additionally, pad 10 may be a
catamenial product in the form of a sanitary napkin, which is primarily
configured to retain menses and related bodily secretions. Pad 10 may be
intended to be a stand-alone product, designed to be directly secured to
the wearer's undergarment, or may instead be designed to be worn as a
removable part of a disposable adult brief, baby diaper, or training pant.
The exemplary pad 10 of Figs. 1-3 includes first and second absorbent assemblies or liners 13, 15, overlaying and releasably coupled to one another, so as to permit their selective separation by the wearer of pad 10, when desired, without either of the liners 13, 15 losing their integrity. Pad 10 extends along a longitudinal axis 10y, and along an orthogonal transverse axis 10x (Fig. 1), and has an elongate shape that is suitably chosen so as to conform to the wearer's anatomy. The exemplary embodiment of Figs. 1-3 further includes a release liner 17, which is releasably coupled to the exposed surface of first liner 13, through a layer of adhesive 18 (Fig. 3). In use, upon removal of the release liner 17, the layer of adhesive 18 is used to releasably secure the pad 10 to the wearer's undergarment. It is understood that the layer of adhesive 18, and/or the release liner 17, may or may not form part of alternative embodiments. For example, a pad that is intended to be used as a removable part of a disposable brief (not shown) may be secured to other portions of that brief through other methods or features.

While Fig. 3 illustrates the layer of adhesive 18 as a continuous layer, coextensive with first liner 13, it is understood that layer of adhesive 18 may instead have any other shape and/or dimensions. Also, while the exemplary pad 10 of Figs. 1-3 has a total of two absorbent liners 13, 15, it is contemplated that the features disclosed herein are similarly applicable to disposable absorbent products having more than two absorbent liners. For example, it is contemplated that a disposable absorbent product may have a total of 3 or 4 absorbent liners that are releasably coupled to one another, so as to permit their ready separation when desired by the wearer of the product.

The first liner 13 of exemplary pad 10 includes a fluid-pervious topsheet 13a, and a fluid-impervious backsheet 13b disposed opposite the topsheet
13a, such that the topsheet 13a and backsheet 13b are in an overlaying relationship with one another. In use, the topsheet 13a faces the body of the wearer, and the backsheet 13b, by contrast, faces away from the body of the wearer. The topsheet 13a may be made of a hydrophilic nonwoven, and may be in the form of a single, continuous layer across the length and/or width of the first liner 13, or may alternatively be in the form of two or more layers of the same material or of materials different from one another that jointly, rather than individually, span the length and/or width of the first liner 13. Topsheet 13a also includes, as shown in Figs. 1 and 2, a plurality of channels c, configured to direct the flow of fluid on the surface of the topsheet 13a, and also serving as an ornamental feature designed to enhance the aesthetic appeal of pad 10. In alternative embodiments, the topsheet 13a has no channels c, or has channels in numbers and/or shapes that are different from those in the embodiment of Figs. 1-3.

The backsheet 13b includes a fluid-impervious material, such as a hydrophobic nonwoven (e.g., spunbond nonwoven), a layer of polypropylene or polyethylene film, or a laminate combining films, nonwoven, or other materials that ultimately define a fluid-impervious laminate. Backsheet 13b may be in the form of a single, continuous layer across the length and/or width of the first liner 13, or may alternatively be in the form of two or more layers of the same material or of materials different from one another that jointly, rather than individually, span the length and/or width of the first liner 13.

With continued reference to Figs. 1-3, the topsheet and backsheet 13a, 13b are permanently (rather than releasably) coupled to one another so as to form an integral absorbent first liner 13 that is capable of absorbing and retaining fluid secreted by the wearer of the pad 10 when first liner 13 is directly exposed to the skin of the wearer. In that regard, the topsheet and
backsheet 13a, 13b may be coupled to one another through a suitably chosen adhesive (not shown), and/or through mechanical bonds such as heat bonds, ultrasonic bonds, CPW bonds, or other types of bonds primarily designed to melt and/or otherwise cause the permanent entanglement of the materials making up topsheet and backsheet 13a, 13b to one another.

The second absorbent liner 15 has a construction that is similar to that of first liner 13. More specifically, second liner 15 has a fluid-pervious topsheet 15a, and a fluid-impervious backsheet 15b disposed opposite the topsheet 15a, such that the topsheet 15a and backsheet 15b are in an overlaying relationship with one another. The topsheet and backsheet 15a, 15b are coupled to one another through a suitably chosen adhesive (not shown), and/or through mechanical bonds such as heat bonds, ultrasonic bonds, CPW bonds, or other types of bonds primarily designed to melt and/or otherwise cause the permanent entanglement of the materials making up topsheet and backsheet 15a, 15b to one another. The backsheet 15b may be made of materials and/or have a construction similar to those of backsheet 13b, forming part of first liner 13. The topsheet 15a, on the other hand, has first and second regions 21, 22, adjacent one another, configured to behave differently in the presence of fluid, particularly fluid secreted by the wearer of the pad 10. The first region 21 may be made of materials and/or have a construction similar to those of topsheet 13a, forming part of first liner 13. In that regard, the first region 21 is configured to absorb and permit the flow of fluid there through. The first region 21 of the illustrated embodiment also includes channels c, similar to those present in the exemplary first topsheet 13a of liner 13.

The second region 22 is made from or otherwise includes a fluid-impervious barrier substrate or layer of material that at least hinders, if not
prevents fluid from being absorbed by or through that portion of the topsheet 15a.

In the embodiment illustrated in Figs. 1-3, the second region 22 of topsheet 15a includes a base layer 25 that, in that embodiment, is defined by an extension of first region 21, and a fluid-impervious barrier layer 27 coupled to the upper surface of base layer 25. As used herein, the terms "upper," "lower," "top," bottom," "above," "below," and derivatives thereof are used for ease of understanding, and refer to the particular orientation of the pad as illustrated in Figs. 1-3, and are therefore not intended to be limiting. The fluid-impervious barrier layer 27 is permanently secured to the base layer 25, so as to define an integral second region 22 of the topsheet 15a. The fluid-impervious barrier layer 27 is made from a suitably chosen material such as, and without limitation, a thermoplastic film, a thermosetting film, a hydrophobic nonwoven, a coated cellulose-based material, or any combination of the above. The fluid-impervious barrier layer 27 may be adhesively attached to the base layer 25, and/or may be permanently secured to the base layer 25 through mechanical bonds such as heat bonds, ultrasonic bonds, CPW bonds, or other types of bonds primarily designed to melt and/or otherwise cause the permanent entanglement of the materials making up fluid-impervious barrier layer 27 and the base layer 25. In a contemplated variation, the fluid-impervious barrier layer 27 is in the form of a film coating extruded or otherwise applied onto the upper surface of the base layer 25. The film coating is suitably chosen such that, at room temperature, same exhibits substantially zero tackiness, thereby avoiding any discomfort from exposure to the wearer's skin. An exemplary material that may at least form part of that film coating is silicone.
While the embodiment of Figs. 1-3 has a fluid-impervious barrier layer 27 that is secured to a base layer 25 defined by an extension of the first region 21 of topsheet 15a, variations are contemplated in which the base layer 25 is a substrate independent from first region 21. In those contemplated embodiments, the base layer 25, the fluid-impervious barrier layer 27, or both, are secured to the first region 21, so as to define a generally planar topsheet 15a. One of these variations is illustrated in Fig. 3A, in which like reference numerals refer to similar features in the preceding figures. In the embodiment of Fig. 3A, the pad 10a shown in that figure includes a second region 22a made up of a base layer 25a that slightly overlaps and is bonded (adhesively and/or through mechanical bonds - not shown) to the first region 21. In that embodiment, the base layer 25a is coated with a fluid-impervious barrier layer in the form of a film material 27a, to thereby define a fluid-impervious second region 22a of the topsheet 15a. In a non-limiting example, the fluid-impervious film material defining barrier layer 27a may be silicone, or a combination of silicone and other materials.

Yet in another contemplated variation, the second region 22 may be made up of a single layer of fluid-impervious material bonded along an edge to the first region 21, so as to define an integral topsheet 15a. For example and without limitation, second region 22 may be made of a single layer of hydrophobic spunbond nonwoven material, which slightly overlaps the material making up first region 21. In that particular example, the overlapping edges of the first and second regions 21, 22 include adhesive or mechanical bonds that join the first and second regions 21, 22 to one another.

With continued reference to Figs. 1-3, and 3A, the presence of fluid-impervious barrier layer 27, 27a in the topsheet 15a defines a second
region 22, 22a of topsheet 15a that prevents fluid secreted by the wearer from being absorbed by the second region 22, 22a. In use, fluid secreted by the wearer is absorbed by the first region 21, and may travel, due to capillary action, along the surface making up first region 21. But the fluid-impervious nature of second region 22, 22a prevents that portion of the topsheet 15a from receiving and absorbing any of the secreted fluid. The presence of the fluid-impervious barrier layer 27, 27a, accordingly, results in a portion of the topsheet 15a i.e., second region 22, 22a, that is at least substantially free of the fluid secreted by the wearer of the pad 10. While in the exemplary embodiment of Figs. 3 and 3A fluid may travel, due to capillary action, along the base layer 25, under the fluid-impervious barrier layer 27, 27a, the configuration of the second region 22, 22a nevertheless provides an enhanced experience to the wearer. More specifically, since the portion of backsheet 15b immediately below the second region 22, 22a is substantially out of view at the time of removal of the second liner 15, the fluid-impervious second region 22, 22a is effective to at least suggest to the wearer that the entire portion of the pad 10, 10a including second region 22, 22a and the portion of backsheet 15b immediately below, are substantially free of contamination and therefore hygienic to handle.

Referring now to Fig. 4, in which like reference numerals refer to similar features in the preceding figures, another exemplary embodiment of a pad 10b is illustrated. Pad 10b is similar in most respects to pad 10 (Figs. 1-3), but includes first and second absorbent cores 13h, 15h, respectively in first and second absorbent liners 13c, 15c. More specifically, the first absorbent core 13h is disposed between the topsheet 13a and backsheet 13b of first liner 13c, and the second absorbent core 15h is disposed between the topsheet 15a and backsheet 15b of second liner 15c. The absorbent cores 13h, 15h are configured to absorb and retain fluids, such as urine and/or menses, secreted by the wearer. Each of the absorbent
cores 13h, 15h may have a single main absorbent structure or may instead have more than one main absorbent structure. Each absorbent core 13h, 15h is made up of fluff pulp or some other natural or synthetic fluid management material, and may also include a fluid storage material such as SAP or some other natural or synthetic fluid storage material. In addition to the cores 13h, 15h, each of the liners 13c, 15c may also include an acquisition layer, adjacent the respective absorbent core 13h, 15h, primarily designed to rapidly acquire and distribute fluid received through the topsheet 13a, 15a.

Exemplary materials suitable for the absorbent core 13h, 15h are airlaid-based materials known as "VH600.101 .B6001" and "VH460.103.B6001 ," both commercially available from Glatfelter Falkenhagen GmbH, of Falkenhagen, Germany. Other exemplary materials for absorbent cores 13h, 15h are foam-based materials such as those known as High Internal Phase Emulsion (HIPE) foams, of the types described, for example, in U.S. Patent Nos. 5,387,207; 5,260,345, 5,650,222; and 5,849,805.

While Fig. 4 illustrates an embodiment in which each of the liners 13c, 15c has an absorbent core 13h, 15h, alternative embodiments are contemplated in which only the first liner 13c has an absorbent core 13h, or in which only the second liner 15c has an absorbent core 15h. Similarly, it is contemplated that the absorbent core 13h may have a shape, dimensions, and/or composition different from those of absorbent core 15h, with pads incorporating such absorbent cores still falling within the scope of the present disclosure.

As discussed above, and referring again to Figs. 1-3, the first and second liners 13, 15 are releasably coupled to one another, so as to permit their selective separation, when desired, by the wearer. In that regard, a low-
tackiness adhesive may be able to provide that type of coupling, by adhering the lower surface of the backsheets 15b of the second liner 15 to the upper surface of the adjacent topsheet 13a of first liner 13. In that type of embodiment, the materials making up topsheet 13a and backsheet 15b, as well as the type of adhesive chosen to join those materials to one another, may be such that the adhesive is forced to stay with the backsheet 15b upon separation of the liners 13, 15 from one another. This may be desirable in some embodiments, to prevent the wearer’s skin from coming in contact with the adhesive once the second liner 15 has been removed. For example, an adhesive may be chosen that has a stronger bond to the backsheet 15b than it does to the topsheet 13a, so that upon separation, the adhesive will be carried by the second liner 15 being removed.

Alternatively or additionally, the first and second liners 13, 15 may be releasably coupled to one another through mechanical fasteners e.g., hook-and-loop fasteners. More specifically in one type of embodiment (not shown), the backsheet 15b or the adjacent topsheet 13a has a hook-type element, which engages a cooperating loop-type element on the confronting surface of the other of the backsheet 15b or adjacent topsheet 13a. In a contemplated variation, the backsheet 15b has on its bottom surface a hook element, which is designed to engage a surface of a fibrous material making up adjacent topsheet 13a, thereby releasably coupling the first and second liners 13, 15 to one another.

In yet another variation, illustrated in Figs. 1-3, the releasable intercoupling of liners 13, 15 is provided by a plurality of relatively weak pressure bonds extending generally proximate and along the perimeter of pad 10, and which extend at least through the thicknesses of the first and second liners 13, 15. In the exemplary embodiment of Figs. 1-3, the bonds 30 extend
only through the thicknesses of the first and second liners 13, 15, but do not extend through the thickness of the fluid-impervious barrier layer 27. Those of ordinary skill in the art will readily appreciate that alternative constructions may be used instead in which, for example, the bonds 30 also extend through the thickness of the fluid-impervious barrier layer 27.

With continued reference to Figs. 1-3, and further referring to Fig. 5, the exemplary pad 10 includes features that facilitate the separation of liners 13 and 15 from one another when so desired by the wearer. Specifically, the perimeter of second liner 15 defines a notch 33 in the second region 22 of topsheet 15a, that exposes a small portion of the topsheet 13a below. In use, as schematically illustrated in Fig. 5, the user may grip the second liner 15 at the notch, while simultaneously holding the first liner 13 down. Additionally, the fluid-impervious nature of the second region 22 permits the wearer to pull and handle a portion of the second liner 15 that is at least substantially free of secreted fluid, thereby without contaminating the wearer's hand in the process.

In addition to the above, in embodiments in which the fluid-impervious barrier layer 27 is of a nature that makes the second region 22 more rigid than the first region 21, the higher rigidity of the second region 22 further facilitates the separation of second liner 15 from the first liner 13 below. More specifically, a relative rigid second region 22 defines a natural interface between the first and second regions 21, 22 that makes second region 22 easier to bend than in alternative embodiments in which the first and second regions 21, 22 have a similar level of rigidity.

Referring now to Figs. 6, 7, 8, and 9, those figures illustrate different embodiments of pads, in which the respective second regions 22, 22c, 22d, 22e of the topsheet in the second (upper) liner have different
configurations. For ease of understanding, like reference numerals in those figures refer to similar features in those and the preceding figures. In Fig. 6, the second region 22 in that embodiment has a distal edge 35 that defines the notch 33 described above, and a longitudinally opposed, proximal edge 38 that is substantially linear. The fluid-impervious barrier layer 27 in that embodiment lies above the bonds 30 underneath i.e., the bonds 30 do not extend through the thickness of fluid-impervious barrier layer 27. Fig. 7 illustrates a similar embodiment, in which a proximal edge 38c of the second region 22c therein has a plurality of arcuate portions, defining a wavy shape of proximal edge 38c. The wavy shape of proximal edge 38c may enhance the aesthetic appeal of the pad.

Fig. 8 illustrates an embodiment similar to pad 10 of Fig. 6, in which the second region 22d has a shape similar to second region 22 in Fig. 6, but in which the bonds 30 extend through the thickness of fluid-impervious barrier layer 27. And Fig. 9 illustrates an embodiment similar to that of Fig. 7, in which the second region 22e therein has a shape similar to second region 22c in Fig. 7, but in which the bonds 30 also extend through the thickness of fluid-impervious barrier layer 27. Those of ordinary skill in the art will readily appreciate that fluid-impervious barrier layer 27 and, generally second region 22, 22c, 22d, 22e may have shapes and/or dimensions that are different from those shown in Figs. 6-9, without deviating from the scope and spirit of the present disclosure. Additionally, in the embodiments of Figs. 6-9, the respective second regions 22, 22c, 22d, 22e may have a color that is different from the color of the first region 21. For example, the second region 22, 22c, 22d, 22e may be substantially red, pink, green, yellow or blue, or a combination thereof, while the first region 21 has a color corresponding to the natural, dye-free color of fibers making up that portion of the topsheet 15a i.e., approximating white or an off-white color. The difference in color between the first region 21 and the second
region 22, 22c, 22d, 22e permits the wearer of the pad 10 to identify which portion of the topsheet 15a is expected to be free of secreted fluid i.e., free of contamination. In that regard, the wearer of the pad 10 would understand that handling of the pad 10 for removal of the upper, second liner 15 should be limited to that second region 22, 22c, 22d, 22e in order to avoid or at least minimize contamination of the wearer’s hands.

While the embodiments in Figs. 1-3, 3A, and 4-9 have their respective second regions 22, 22a, 22c, 22d, 22e located at a longitudinal end portion of the topsheet 15a of pad 10, 10a, 10b that in use generally lies against the front of the wearer’s body, it is contemplated that they may instead be located at the opposite longitudinal end thereof i.e., at the longitudinal end portion of the topsheet 15a that in use generally lies against the back of the wearer’s body, behind the wearer’s crotch region. Further, the second regions 22, 22a, 22c, 22d, 22e in alternative embodiments (not shown) may be located inboard of the ends of respective pads 10, 10a, 10b, rather than at the ends. More specifically in those alternative embodiments, in contrast to the exemplary embodiments of Figs. 1-3, 3A, and 4-9, the distal edge 35 may be located so as not to form part of the perimeter of the pad 10, 10a, 10b.

In another aspect of these and other contemplated embodiments, and without limitation, the second region 22, 22a, 22c, 22d, 22e may occupy between about 0.5% and about 50% of the total upper surface area of the topsheet 15, or between about 1% and about 40% of the total upper surface area of the topsheet 15, or between about 1.5% and about 20% of the total upper surface area of the topsheet 15. Additionally or alternatively, the second region 22, 22a, 22c, 22d, 22e may have a length i.e., the largest dimension thereof along axis 10y (Fig. 1) that is between about 0.3% and about 40% of the total length of the topsheet 15, or
between about 1% and about 25% of the total length of the topsheet 15, or between about 3% and about 15% of the total length of the topsheet 15. It is further contemplated that alternative embodiments may have more than one region with a construction and functionality of the second region 22, 22a, 22c, 22d, 22e of the illustrated embodiments, with those alternatives being considered to fall within the scope of the present disclosure.

With reference to Figs. 10 and 11, those figures schematically illustrate exemplary processes (i.e., methods) for making the pads 10, 10a, 10b of the preceding figures. Referring particularly to Fig. 10, first and second webs 43, 45 of laminate material are unwound from respective rolls 53, 55. Each of the webs 43, 45 is made up of the components making up, respectively, the first and second liners 13, 15 described above with respect to the embodiment of Figs. 1-3, or contemplated variations thereof e.g., those of any of Fig. 3A, or Figs. 4-9. In that regard, the web 43 has a material corresponding to the backsheet 13b, and a material corresponding to the topsheet 13a. The web 45 has a material corresponding to the backsheet 15b, as well as a material corresponding to the first region 21 and base layer 25 of topsheet 15a. A third web 47, shown being unwound from a respective roll 57, is made up of the material defining fluid-impervious barrier layer 27. In that regard, while Fig. 10 schematically illustrates web 47 as a generally solid material, it is understood that same may correspond instead to a liquid or semi-solid material extruded upon a surface of the second web 45.

In the shown embodiment, web 47 has an adhesive layer thereon (not shown) that permits adhesive bonding of web 47 with web 45. In a contemplated variation, a schematically-represented optional joining device 61, shown in phantom, receives the combined webs 45, 47 and forms mechanical bonds (e.g., heat bonds, ultrasonic bonds, CPW bonds)
between those webs 45, 47 so as to permanently join them to one another. The joining of webs 45, 47 to one another defines a combined laminate web 64, which is in turn processed through a schematically-represented cutting device 68, configured to cut and remove small pieces from combined laminate web 64, to thereby form a plurality of notches 33 therein.

A second joining device 70, also schematically represented in Fig. 10, receives combined laminate web 64 and first web 43, and forms a releasable joint between them, corresponding to the releasable coupling between the first and second liners 13, 15 of the finished pad 10, downstream in the process. In that regard, second joining device 70 may form adhesive bonds and/or use mechanical elements or processes in order to releasably join webs 43 and 64 to one another, thereby defining a second combined web 75. In the illustrated embodiment, second joining device 70 may for example form pressure bonds such as the bonds 30 described above in connection with the embodiments of Figs. 8 and 9, which extend through the thickness of fluid-impervious barrier layer 27. Other contemplated operations in the process for making pad 10, not shown in Fig. 10, may be used to cut the second combined web 75 into individual pads 10, and to add optional elements to same, such as a release liner 17 and adhesive layer 18 (Fig. 2), as well as packaging elements to contain the finished pads 10.

While Fig. 10 illustrates webs 43 and 45 as pre-combined laminates defining the topsheet and backsheet 13a, 13b of first liner 13 and the first region 21, base layer 25, and backsheet 15b of second liner 15, variations are contemplated in which those webs 43, 45 are not pre-combined. For example, it is contemplated that individual webs of material corresponding to the topsheet and backsheet 13a, 13b are fed through one or more
joining devices to form permanent bonds between those webs, and the
combined assembly then fed through additional processing devices such
as the second joining device 70 shown in Fig. 10.

Fig. 11 illustrates another embodiment of a process for making the pads 10
or contemplated variations thereof. For ease of understanding, like
reference numbers in Fig. 11 refer to similar features in Fig. 10, the
description of which may be referred to for an understanding of the
features of the embodiment of Fig. 11 as well. In the illustrated
embodiment, the webs 43, 45 and 47 are fed through a first joining device
81, which is configured to join all three of those webs together, for example
so as to form a plurality of pressure bonds between them, effective to
define a releasable coupling between the liners 13 and 15 in the resulting
pad 10, downstream in the process. In this embodiment, and while not
shown, the fluid-impervious material web 47 may have an adhesive layer
that permanently secures web 47 to web 45. Alternatively, as discussed
above with respect to the embodiment of Fig. 10, web 47 may be in liquid
or semi-solid form and extruded onto the confronting surface of second
web 45. A cutting device 86 receives the laminate made up of webs 43,
45, 47, cutting the combined assembly into individual pads 10.

Those of ordinary skill in the art will readily appreciate variations of the
exemplary processes illustrated in FIGS. 10 and 11. For example, an
alternative embodiment of those processes includes joining the web 47 to
an already combined laminate made up of webs 43 and 45, with the
coupling joining webs 43 and 45 being of the releasable type discussed
above.

Exemplary embodiments of the invention are described as follows, in non-
limiting fashion:
1. A disposable absorbent product comprising:
   a first absorbent assembly including a fluid-pervious first topsheet and a fluid-impervious first backsheet in overlaying relationship with one another, said first backsheet and said first topsheet being respectively configured to face away from and toward a wearer of the disposable absorbent product during use; and
   a second absorbent assembly releasably coupled to said first absorbent assembly, said second absorbent assembly including a second topsheet and a fluid-impervious second backsheet in overlaying relationship with one another, said second backsheet being adjacent said first topsheet and said second topsheet being configured to face toward the wearer of the disposable absorbent product during use, wherein:
   said second topsheet has a first region and a second region adjacent said first region,
   said first region is fluid-pervious so as to permit the passage of fluid secreted by the wearer of the disposable absorbent product there through, and
   said second region is fluid-impervious so as to at least hinder the passage of fluid secreted by the wearer of the disposable absorbent product there through.

2. The disposable absorbent product of claim 1, wherein said second region includes a base layer and a film coating on a surface of said base layer.

3. The disposable absorbent product of claim 1, wherein said second region includes a base layer and a fluid-impervious barrier substrate coupled to said base layer.
4. The disposable absorbent product of either of claims 2 or 3, wherein said fluid-impervious barrier substrate includes a hydrophobic nonwoven material.

5. The disposable absorbent product of any of claims 2-4, wherein said fluid-impervious barrier substrate includes a thermoplastic material.

6. The disposable absorbent product of any of claims 2-5, wherein said fluid-impervious barrier substrate is adhesively coupled to said base layer.

7. The disposable absorbent product of any of claims 1-6, wherein: said first and second absorbent assemblies are releasably coupled to one another through a plurality of bonds, and said bonds extend through said fluid-impervious barrier substrate.

8. The disposable absorbent product of any of claims 1-7, wherein a perimeter of said second absorbent assembly defines a notch, said notch forming part of said second region.

9. The disposable absorbent product of any of claims 1-8, wherein said first and second absorbent assemblies are releasably coupled to one another through a plurality of pressure bonds.

10. The disposable absorbent product of any of claims 1-9, wherein said first and second absorbent assemblies are releasably coupled to one another at a plurality of locations generally proximate a perimeter of said second absorbent assembly.
11. The disposable absorbent product of any of claims 1-10, wherein said first region has a first color and said second region has a second color different from said first color.

12. The disposable absorbent product of any of claims 1-11, further comprising a first absorbent core in said first absorbent assembly disposed between said first backsheet and said first topsheet, or in said second absorbent assembly disposed between said second backsheet and said second topsheet, for storing fluid secreted by the wearer of the disposable absorbent product.

13. The disposable absorbent product of claim 12, further comprising a second absorbent core in the other of said first absorbent assembly or said second absorbent assembly, said second absorbent core being disposed between said first backsheet and said first topsheet or between said second backsheet and said second topsheet, for storing fluid secreted by the wearer of the disposable absorbent product.

14. The disposable absorbent product of any of claims 1-13, further comprising:

   an adhesive layer on an exposed surface of said first backsheet, adapted to secure the disposable absorbent product to a garment worn by the wearer; and

   a release liner releasably coupled to said first backsheet through said adhesive layer.

15. The disposable absorbent product of any of claims 1-14, wherein said second region of said second topsheet has a length that is between about 0.3% and about 40% of a total length of said second topsheet.
16. The disposable absorbent product of any of claims 1-15, wherein said second region of said second topsheet is located at a longitudinal end of said second topsheet.

17. A disposable absorbent product comprising:

a first absorbent assembly including a fluid-pervious first topsheet and a fluid-impervious first backsheet in overlaying relationship with one another, said first backsheet and said first topsheet being respectively configured to face away from and toward a wearer of the disposable absorbent product during use; and

a second absorbent assembly in overlaying relationship with said first absorbent assembly, said second absorbent assembly including a second topsheet and a fluid-impervious second backsheet in overlaying relationship with one another, said second backsheet being releasably coupled to at least said first topsheet and said second topsheet being configured to face toward the wearer of the disposable absorbent product during use, wherein:

said second absorbent assembly includes a perimeter defining a notch,

said second topsheet has a fluid-pervious first region and a second region adjacent said first region, said second region including said notch, and

said second region has a fluid-pervious base layer and a fluid-impervious thermoplastic barrier layer coupled thereto so as to at least hinder the passage of fluid secreted by the wearer of the disposable absorbent product through said second region.

18. The disposable absorbent product of claim 17, wherein said first region has a first color and said thermoplastic barrier layer has a second color different from said first color.
19. The disposable absorbent product of either of claims 17 or 18, wherein said thermoplastic barrier layer is pressure-bonded to a remainder of the disposable absorbent product.

20. The disposable absorbent product of any of claims 17-19, wherein an extension of said fluid-pervious first region defines said fluid-pervious base layer.

21. A process for making a disposable absorbent product, the method comprising:

obtaining first and second absorbent laminates, each having a fluid-pervious topsheet and a fluid-impervious backsheet;
releasably coupling the first and second absorbent laminates to one another, in an overlaying relationship; and

22. The process of claim 21, wherein coupling the fluid-impervious barrier layer of material includes coupling a thermoplastic layer of material onto the surface of the topsheet of the second absorbent laminate.

23. The process of either of claims 21 or 22, further comprising:

cutting a notch along a perimeter of the second absorbent laminate and through the fluid-impervious barrier layer of material.

Yet other embodiments are also contemplated for uses of and methods for making disposable absorbent products according to any of claims 1-20, as described above, as well as methods of the type described in claims 21-23,
above, further incorporating any combination of the features described in claims 1-20, above.

From the above disclosure of the general principles of the present invention and the preceding detailed description of exemplary embodiments, those skilled in the art will readily comprehend the various modifications to which this invention is susceptible. Accordingly, this invention is intended to be limited only by the scope of the following claims and equivalents thereof.
1. A disposable absorbent product comprising:
a first absorbent assembly including a fluid-pervious first topsheet and a
fluid-impervious first backsheet in overlaying relationship with one another,
said first backsheet and said first topsheet being respectively configured to
face away from and toward a wearer of the disposable absorbent product
during use; and
a second absorbent assembly releasably coupled to said first
absorbent assembly, said second absorbent assembly including a second
topsheet and a fluid-impervious second backsheet in overlaying
relationship with one another, said second backsheet being adjacent said
first topsheet and said second topsheet being configured to face toward
the wearer of the disposable absorbent product during use, wherein:
said second topsheet has a first region and a second region adjacent
to said first region,
said first region is fluid-pervious so as to permit the passage of fluid
secreted by the wearer of the disposable absorbent product there through,
and
said second region is fluid-impervious so as to at least hinder the
passage of fluid secreted by the wearer of the disposable absorbent
product there through.

2. The disposable absorbent product of claim 1, wherein said second
region includes a base layer and a film coating on a surface of said base
layer.

3. The disposable absorbent product of claim 1, wherein said second
region includes a base layer and a fluid-impervious barrier substrate
coupled to said base layer.
4. The disposable absorbent product of claim 3, wherein said fluid-impervious barrier substrate includes a hydrophobic nonwoven material.

5. The disposable absorbent product of claim 3, wherein said fluid-impervious barrier substrate includes a thermoplastic material.

6. The disposable absorbent product of claim 3, wherein said fluid-impervious barrier substrate is adhesively coupled to said base layer.

7. The disposable absorbent product of claim 3, wherein:
   said first and second absorbent assemblies are releasably coupled to one another through a plurality of bonds, and
   said bonds extend through said fluid-impervious barrier substrate.

8. The disposable absorbent product of claim 1, wherein a perimeter of said second absorbent assembly defines a notch, said notch forming part of said second region.

9. The disposable absorbent product of claim 1, wherein said first and second absorbent assemblies are releasably coupled to one another through a plurality of pressure bonds.

10. The disposable absorbent product of claim 1, wherein said first and second absorbent assemblies are releasably coupled to one another at a plurality of locations generally proximate a perimeter of said second absorbent assembly.
11. The disposable absorbent product of claim 1, wherein said first region has a first color and said second region has a second color different from said first color.

12. The disposable absorbent product of claim 1, further comprising a first absorbent core in said first absorbent assembly disposed between said first backsheet and said first topsheet, or in said second absorbent assembly disposed between said second backsheet and said second topsheet, for storing fluid secreted by the wearer of the disposable absorbent product.

13. The disposable absorbent product of claim 12, further comprising a second absorbent core in the other of said first absorbent assembly or said second absorbent assembly, said second absorbent core being disposed between said first backsheet and said first topsheet or between said second backsheet and said second topsheet, for storing fluid secreted by the wearer of the disposable absorbent product.

14. The disposable absorbent product of claim 1, further comprising:

an adhesive layer on an exposed surface of said first backsheet, adapted to secure the disposable absorbent product to a garment worn by the wearer; and

a release liner releasably coupled to said first backsheet through said adhesive layer.

15. The disposable absorbent product of claim 1, wherein said second region of said second topsheet has a length that is between about 0.3% and about 40% of a total length of said second topsheet.
16. The disposable absorbent product of claim 1, wherein said second region of said second topsheet is located at a longitudinal end of said second topsheet.

17. A disposable absorbent product comprising:
a first absorbent assembly including a fluid-pervious first topsheet and a fluid-impervious first backsheet in overlaying relationship with one another, said first backsheet and said first topsheet being respectively configured to face away from and toward a wearer of the disposable absorbent product during use; and
	a second absorbent assembly in overlaying relationship with said first absorbent assembly, said second absorbent assembly including a second topsheet and a fluid-impervious second backsheet in overlaying relationship with one another, said second backsheet being releasably coupled to at least said first topsheet and said second topsheet being configured to face toward the wearer of the disposable absorbent product during use, wherein:

said second absorbent assembly includes a perimeter defining a notch,
said second topsheet has a fluid-pervious first region and a second region adjacent said first region, said second region including said notch, and

said second region has a fluid-pervious base layer and a fluid-impervious thermoplastic barrier layer coupled thereto so as to at least hinder the passage of fluid secreted by the wearer of the disposable absorbent product through said second region.

18. The disposable absorbent product of claim 17, wherein said first region has a first color and said thermoplastic barrier layer has a second color different from said first color.
19. The disposable absorbent product of claim 17, wherein said thermoplastic barrier layer is pressure-bonded to a remainder of the disposable absorbent product.

20. The disposable absorbent product of claim 17, wherein an extension of said fluid-pervious first region defines said fluid-pervious base layer.

21. A process for making a disposable absorbent product, the method comprising:

- obtaining first and second absorbent laminates, each having a fluid-pervious topsheet and a fluid-impervious backsheet;
- releasably coupling the first and second absorbent laminates to one another, in an overlaying relationship; and
- coupling a fluid-impervious barrier layer of material onto only a portion of a surface of the topsheet of the second absorbent laminate, so as to define a fluid-pervious region and an adjacent fluid-impervious region in the topsheet of the second absorbent laminate.

22. The process of claim 21, wherein coupling the fluid-impervious barrier layer of material includes coupling a thermoplastic layer of material onto the surface of the topsheet of the second absorbent laminate.

23. The process of claim 21, further comprising:

- cutting a notch along a perimeter of the second absorbent laminate and through the fluid-impervious barrier layer of material.
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

IPC: see extra sheet

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: A61 F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE, DK, FI, NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, PAJ, WPI data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category*</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>AU 2006209275 A 1 (PROCTER &amp; GAMBLE), 5 October 2006 (2006-1 0-05); page 54, line 27 - page 55, line 12; Page number 54 has BNS page nummer 57 (and page 55 has BNS page 58)</td>
<td>1-23</td>
</tr>
<tr>
<td>Y</td>
<td>CA 2189037 C (CLARK TRACEY A ET AL), 9 November 1995 (1995-1 1-09); claim 1</td>
<td>1-23</td>
</tr>
<tr>
<td>A</td>
<td>US 201 2031 0202 A 1 (WILSON BRENDA J), 6 December 2012 (201-2 1-2-06); whole document</td>
<td>1-23</td>
</tr>
</tbody>
</table>

Further documents are listed in the continuation of Box C. See patent family annex.

Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search 21-08-2014

Date of mailing of the international search report 22-08-2014

Name and mailing address of the ISA/SE
Patent- och registreringssverket
Box 5055
S-102 42 STOCKHOLM
Facsimile No. +46 8 666 02 86

Authorized officer
Erika Stenroos
Telephone No. +46 8 782 25 00

Form PCT/ISA/210 (second sheet) (July 2009)
<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuation of: second sheet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>International Patent Classification (IPC)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A61F 13/505 (2006.01)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A61F 13/474 (2006.01)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Information on patent family members

<table>
<thead>
<tr>
<th>Country</th>
<th>Application Number</th>
<th>Date</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>AU</td>
<td>2006209275 A1</td>
<td>05/10/2006</td>
<td>NONE</td>
</tr>
<tr>
<td>CA</td>
<td>2189037 C1</td>
<td>09/1/1995</td>
<td>NONE</td>
</tr>
<tr>
<td>US</td>
<td>20120310202 A1</td>
<td>06/12/2012</td>
<td>NONE</td>
</tr>
<tr>
<td>US</td>
<td>20080119812 A1</td>
<td>22/05/2008</td>
<td>US 7842020 B2 30/1/2010</td>
</tr>
</tbody>
</table>