

Description

FIELD OF THE INVENTION

The present invention relates to sanitary napkins and more particularly to sanitary napkins having segmented cores adapted to better conform to the body of the wearer.

BACKGROUND OF THE INVENTION

The present invention relates to sanitary napkins and more particularly to the core of a sanitary napkin which is transversely segmented into a plurality of independently acting segments. Each segment is free from the constraints against movement imposed by other parts of the core, according to sanitary napkins of the prior art. The absence, and even diminution, of constraints allows each core segment to more accurately, authentically, and comfortably conform to the body of the wearer.

Several attempts have been made in the art to provide a sanitary napkin which properly and advantageously conforms to the body of the wearer. For example, U.S. Patent 3,954,107 issued May 4, 1976 to Chesky et al. discloses a longitudinally articulated sanitary napkin. This napkin features a pair of absorbent pads disposed side-by-side. While this arrangement may provide for good conformance of the sanitary napkin to the right-hand and left-hand body halves of the wearer, such a structure does not provide for, nor accommodate, the front-to-back differences in the shape of the body of the wearer.

U.S. Patent 3,071,138 discloses sanitary napkins being transversely separatable into segments to facilitate disposal of the sanitary napkin after use.

U.S. Patent 4,589,876 issued May 20, 1986 to Van Tilburg discloses a sanitary napkin having flaps extending from each longitudinal edge of a central absorbent pad. The flaps preferentially bend at a line of juncture between the flap and the longitudinal edge of the central absorbent pad. However, such line of juncture is also principally longitudinally oriented and does not provide a means for adapting the sanitary napkin to the front-to-back differences in the shape of the body of the wearer.

U.S. Patent 4,773,905 issued September 27, 1988 to Molee et al. discloses a winged sanitary napkin having two transverse hinges formed by compressed areas of the core. This arrangement alleges to allow the sanitary napkin to be readily bent about such hinges. However, because the sanitary napkin is connected by the hinges and the hinges bridge the various portions of the core of the sanitary napkin, significant and unobstructed Z-direction discontinuities between various portion of

the core are not feasible unless significant stresses are incurred.

Another series of patents teaches raised central sections which are somewhat adapted to conform to the genitalia of the wearer. For example, U.S. Patent 2,747,575 issued May 29, 1956, to Mercer discloses a catamenial bandage having a laterally gathered body which forms a permanently maintained hump. The catamenial bandage is provided with hump retaining means, such as parallel lines of stitches, so that the hump retains its shape and is inherently form fitting to the body and comfortable. U.S. Patents 4,631,062 issued December 23, 1986, to Lassen et al. and 4,673,403 issued June 16, 1987, to Lassen et al. disclose convex upwardly shaped sanitary napkin having a raised profile for disposition within the vestibule of a wearer.

U.S. Patent 4,758,240 issued July 19, 1988 to Glassman discloses a sanitary napkin having a plurality of longitudinal channels and a raised central crest coincident with the longitudinal centerline of the sanitary napkin. However, one shortcoming to all such teachings is that either the raised portion of the sanitary napkin extends throughout its entire longitudinal length, without regard to where such raised portion is most beneficial or properly needed and, such a raised portion may be undesirable in the mons region of the wearer's body.

It is an object of this invention to provide a sanitary napkin which accommodates the front-to-back differences in the shape of the body of the wearer and more accurately and comfortably fits to the body of the wearer throughout the entire longitudinal length of the sanitary napkin. It is also an object of this invention to provide a sanitary napkin which provides for Z-direction discontinuities without incurring significant stresses in adjacent portions of the core. It is also an object of this invention to provide a sanitary napkin which provides for a raised central section only in the portion of the sanitary napkin where such a section provides a benefit to the wearer.

BRIEF SUMMARY OF THE INVENTION

The present invention comprises a sanitary napkin having a longitudinal centerline, two longitudinal side margins, and two lateral side margins. The sanitary napkin has a liquid pervious topsheet and a liquid impervious backsheet at least partially peripherally joined to the topsheet. Between the topsheet and the backsheet is a transversely segmented absorbent core divided into a plurality of independent segments.

The independent segments of the transversely segmented core comprises at least one isthmus connection joining adjacent independent segments.

Dependent upon the chosen embodiment, there may be one isthmus connection substantially registered with the longitudinal centerline of the sanitary napkin or, alternatively, two isthmus connections, each being substantially registered with the longitudinal side edge of the absorbent core.

BRIEF DESCRIPTION OF THE DRAWINGS

While the Specification concludes with claims particularly pointing out and distinctly claiming the present invention, it is believed the same will be better understood from the following description taken in conjunction with the accompanying drawings wherein like parts are given the same reference numeral, analogous parts are designated with a prime symbol. The embodiment of Figure 1 is not covered by the claims, but is useful for the understanding of the invention.

Figure 1 is a plan view of a sanitary napkin, with the topsheet shown partially in cutaway, and having three independent, disconnected, transversely segmented core segments;

Figure 2 is a plan view of a sanitary napkin core according to the present invention having three independent segments, each joined to the adjacent segment by two isthmus connections, each isthmus connection substantially registered with a longitudinal side edge of the absorbent core;

Figure 3 is a plan view of a sanitary napkin core according to the present invention having two independent segments joined by an isthmus connection registered with the longitudinal centerline of the sanitary napkin;

Figure 4 is a plan view of a hybrid sanitary napkin core according to the present invention having three independent segments, two joined by isthmus connections registered with the longitudinal edges of the core and two joined by an isthmus connection registered with the longitudinal centerline of the sanitary napkin; and

Figure 5 is an enlarged, fragmentary vertical sectional view taken along line 5-5 of Figure 1 showing the mutually opposed co-bevelled transverse edges of the core of the sanitary napkin of Figure 1.

DETAILED DESCRIPTION OF THE INVENTION

Referring to Figure 1. The sanitary napkin 20 is used to collect vaginal discharges, such as menses, and to prevent soiling of the wearer's bedding and clothing by such discharges. The sanitary napkin 20 features a liquid pervious topsheet 22, a liquid impervious backsheet 24, and an absorbent core 26 intermediate the topsheet 22 and the backsheet 24. The perimeter of the sanitary napkin 20 is defined by two longitudinal side margins 30 and

two lateral side margins 32.

The sanitary napkin 20 and absorbent core 26 have a longitudinal centerline 34 which conceptually divides the sanitary napkin 20 into two substantially symmetrically opposite halves. As used herein the term "longitudinal" refers to an imaginary line, axis or direction of the sanitary napkin 20 of the absorbent core 26, which line, axis or direction is generally centered between the longitudinal side margins 30 of the absorbent core 26 and is generally aligned with the vertical plane which bisects a standing wearer into left and right body halves. The term "lateral" refers to an imaginary line, axis or direction generally orthogonal the longitudinal direction, within the plane of the sanitary napkin 20 of the absorbent core 26, and is generally sideways aligned relative to the wearer.

Examining the components in more detail, with continuing reference to Figure 1, the topsheet 22 is the component of the garment which is oriented towards and contacts the body of the wearer, and receives bodily discharges. The topsheet 22 is liquid pervious and should be flexible and nonirritating to the skin. As used herein the term "flexible" refers to materials which are compliant and readily conform to the shape of the body or respond by easily deforming in the presence of external forces. Preferably the topsheet 22 is not noisy, to provide discretion for the wearer. The topsheet 22 should be sanitary, clean in appearance and somewhat opaque to hide the bodily discharges collected in and absorbed by the core 26.

The topsheet 22 should further exhibit good strikethrough and rewet characteristics, permitting bodily discharges to rapidly penetrate the topsheet 22 to the core 26, but not flow back through the topsheet 22 to the skin of the wearer. Suitable topsheets 22 may be made from nonwoven materials or perforated polyolefinic films.

The topsheet 22 has a plurality of apertures to permit liquids deposited thereon to pass through to the core 26. An apertured polyolefinic film topsheet 22 having about 5 to about 60 percent open area, typically about 25 percent open area, and a thickness of about 0.01 to about 0.05 millimeters prior to aperturing and about 0.42 to about 0.51 millimeters after aperturing is suitable.

If desired, the topsheet 22 may be sprayed with a surfactant to enhance liquid penetration to the core 26. The surfactant is typically nonionic and should be nonirritating to the skin. A surfactant density of about 0.01 milligrams per square centimeter of topsheet 22 area is suitable. A suitable surfactant is sold by the Glyco Chemical, Inc. of Greenwich, Connecticut as Pegosperse 200 ML.

A particularly suitable topsheet 22 may be made in accordance with commonly assigned U.S.

Patent 4,342,314 issued August 3, 1982 to Radel et al. and commonly assigned U.S. Patent 4,463,045 issued July 31, 1984 to Ahr et al., which patents are incorporated herein by reference for the purpose of disclosing particularly preferred executions of liquid pervious topsheets. A topsheet 22 made of model X-3265 or model P1552 apertured formed film sold by the Tredegar Corporation of Terre Haute, Indiana has been found to work well.

The backsheet 24 may be any flexible, liquid resistant, preferably liquid impervious material, such as a polyolefinic film. The backsheet 24 prevents discharges collected by and contained in the sanitary napkin 20, and particularly discharges absorbed by the core 26, from escaping the sanitary napkin 20 and soiling the clothing and bedding of the wearer. Preferably the backsheet 24 is not noisy, to provide discretion for the wearer.

The backsheet 24 may also be impervious to malodorous gases generated by absorbed bodily discharges, so that the malodors do not escape and become noticed by the wearer. A low density polyethylene backsheet 24 about 0.01 to about 0.08 millimeters in thickness, preferably about 0.05 millimeters in thickness, has been found to work well. A polyethylene film, such as is sold by the Tredegar Corporation of Terre Haute, Indiana, under model X-813 has been found particularly well suited for the backsheet 24.

Alternatively, the backsheet 24 may be made of a soft clothlike material which is hydrophobic relative to the topsheet 22, e.g., a polyester or polyolefinic fiber backsheet 24 works well. A particularly preferred soft, clothlike backsheet 24 material is a laminate of a polyester nonwoven material lamina and a film such as described in commonly assigned U.S. Patent 4,476,180 issued October 9, 1984 to Wnuk.

In one embodiment, the backsheet 24 is slightly larger than the topsheet 22 and the intermediate absorbent core 26. In such an embodiment, the topsheet 22 and intermediate absorbent core 26 are peripherally circumscribed by the backsheet 24 which has a radial margin of about 0.5 centimeters to about 1.5 centimeters, preferably about 1.0 centimeter, from the side margins of the topsheet 22. This geometry provides a marginal area of protection should the core 26 become overloaded or the sanitary napkin 20 otherwise fail. In such an embodiment the backsheet 24 and flaps are preferably unitary and coextensive.

The outwardly oriented face of the backsheet 24 may further comprise a means for attaching the sanitary napkin 20 to the undergarment of the wearer. Pressure sensitive adhesive has been commonly found to work well for this purpose. Preferably a strip of longitudinally oriented adhesive provides good protection against either the front or the

back of the sanitary napkin 20 becoming detached from the wearer's undergarment. The adhesive strip may be continuous or intermittent. A particularly preferred arrangement utilizes two longitudinally oriented strips, one on each side of the longitudinal centerline 34.

The topsheet 22 and the backsheet 24 are preferentially peripherally joined using known techniques, either entirely so that the entire perimeter of the sanitary napkin 20 is circumscribed by such joiner or are partially peripherally joined at the perimeter. The term "joined" refers to the condition where a first member or component is affixed to a second member or component either directly; or indirectly, where the first member or component is affixed to an intermediate member or component which in turn is affixed to the second member or component. The joined condition between the first member, or component, and the second member, or component, is intended to remain for the life of the sanitary napkin 20.

The core 26 is preferably interposed between the topsheet 22 and backsheet 24 to prevent the absorbent material of the core 26 from shredding or becoming detached while the sanitary napkin 20 is worn and to ensure proper containment of bodily discharges. This arrangement also helps to provide for a unitary assembly of the sanitary napkin.

Any joined arrangement that provides for capture of the core 26 intermediate the topsheet 22 and the backsheet 24 and a unitary assembly is suitable. Such an assembly has two mutually opposed major faces, one defined by the topsheet 22 and one defined by the backsheet 24.

The absorbent core 26 is the means for collecting and containing bodily discharges, particularly menses, deposited thereon or which otherwise traverses through the liquid permeable topsheet 22. The core 26 is the component of the sanitary napkin 20 which receives and retains the bodily discharges. The core 26 is conformable and nonirritating to the skin.

The core 26 may have a rectangular or hourglass shaped perimeter. The perimeter of the absorbent core 26 is defined by two longitudinal side edges 30' and two lateral side edges 32', which are aligned with the longitudinal and lateral side margins 30 and 32 of the sanitary napkin 20 respectively. The core 26 preferably has two opposed major faces, one oriented towards the backsheet 24 and one oriented towards the topsheet 22 and is generally planar, i.e. does not have significant variations in thickness or isolated macroscopic undulations.

Suitable materials for the core 26 include combinations of airfelt, such as cellulose wadding, and fibrated communiton pulp; layers of tissue paper; and absorbent gelling materials. If a tissue paper

core 26 is selected, tissue paper made in accordance with commonly assigned U.S. Patent 4,191,609 issued March 4, 1980 to Trokhan and incorporated herein by reference to show a particularly preferred tissue paper core construction for the sanitary napkin 20 described herein. If it is desired to incorporate absorbent gelling materials into the core 26 of the sanitary napkin 20, absorbent gelling materials made in accordance with commonly assigned U.S. Patent Re. 32,649 issued April 19, 1988 to Brandt et al., and incorporated herein by reference for showing particularly preferred absorbent gelling materials, are suitable. A suitable laminate of absorbent gelling materials and tissue may be purchased from the Grain Processing Corporation of Muscatine, Iowa under Model Number L535.

The core 26 need not have a total absorbent capacity much greater than the total amount of bodily discharges to be absorbed. The core 26 is preferably narrow and thin, to be comfortable to the wearer. For the embodiment described herein the capacity of the core 26 should be at least about 2 grams of 0.9 percent saline solution. Suitable saline solution is sold by Travenol Laboratories of Deerfield, Illinois.

The core 26 should be sized to register with the topsheet 22 and backsheet 24. For ease of manufacturing, the absorbent core 26 should be rectangularly shaped. However, the absorbent core 26 may have arcuate side edges 30' and 32', tapering inwardly as the lateral centerline is approached to provide a generally preferential shaped appearance. The absorbent core 26 may be somewhat hourglass shaped, at the expense of manufacturing difficulties, to provide a generally preferred appearance.

The sanitary napkin 20 preferably has a caliper of less than about 4 millimeters and more preferably less than about 6 millimeters (0.24 inches), as measured with a comparator gage having an approximately 80.0 gram test weight, an approximately 10.0 gram comparator foot having a diameter of about 2.54 centimeters and a contact surface area of approximately 5.1 square centimeters. Also, the sanitary napkin 20 should have a topsheet 22 surface area of at least about 100 square centimeters to prevent discharged liquids from missing the target area.

The core 26 may be joined to the backsheet 24. Joining of the core 26 to the backsheet 24 is preferentially accomplished by adhesively bonding the core 26 to the backsheet 24. Such adhesive (not shown) may be applied in any suitable spray pattern, such as a spiral or longitudinally oriented beads. The adhesive should be surfactant resistant and of low pressure sensitivity, so as not to stick to the skin of the wearer.

The sanitary napkin 20 may also comprise a flap (not shown) extending from a longitudinal side margin 30 of the sanitary napkin 20, and preferably one flap extending from each longitudinal side margin 30 of the sanitary napkin 20. The flaps have a proximal end 36 which is typically coincident with the juncture of attachment of the flap to the longitudinal side margin 30 of the sanitary napkin 20 or, alternatively, the proximal end 36 of the flap may be joined to the sanitary napkin 20 at any other location juxtaposed with the longitudinal side margin 30. The flaps extend laterally outwardly from the sanitary napkin 20 and terminate at a distal end 38 which represents the point of the flap furthest from the longitudinal axis 34 of the sanitary napkin 20.

The flaps may be comprised of an integral and contiguous extension of the topsheet 22, the backsheet 24, or a laminate of both. Alternatively, the flaps may be made of a separate and independent piece of material joined to the longitudinal side margin 30 of the sanitary napkin 20. The flaps are preferably made in accordance with the teachings of commonly assigned U.S. Patents 4,589,876 issued May 20, 1986 to Van Tilburg and 4,687,478 issued August 18, 1987 to Van Tilburg.

The core 26 is divided into a plurality of independent segments 26'. Particularly, the segments 26' are transversely independently segmented. As used herein, segments 26' are considered to be "independent" if the segments 26' may have relative movement, in the Z-direction, without being constrained from such movement by an adjacent segment 26'. Cores 26 having fold lines and score lines are not considered to have segments 26' which are "independent" because, constraint from Z-direction movement occurs across the fold line or the score line, even though the fold line or score line may act as a hinge to allow bending of the core 26 at a particular juncture. A core 26 is considered to be transversely segmented when the division between adjacent segments 26' has a vector component within the plane of the core 26 and generally orthogonal the longitudinal axis 34. As used herein, the "Z-direction" refers to the direction generally orthogonal the plane of the core 26 or sanitary napkin 20.

The core 26 may be divided into a plurality of segments 26', preferably three independent segments 26'. A three segment core 26 is desirable because the body of the wearer may be divided into three anatomically distinct shaped regions when the wearer is viewed along the longitudinal axis. From the front of the wearer's body to the back of the wearer's body, the first of the three regions may be thought of as the mons region having a compound curved convex upward shape. The second region is defined by the labia majora

and resembles a W-shaped outline. The third region is determined by the gluteal groove and is generally cusp-shaped and defined by two convex upward and outwardly diverging lines. Clearly, a need exists for a sanitary napkin 20 which can adapt to these three very distinct shapes of the wearer's body.

A sanitary napkin 20 may comprise a core 26 having three disconnected segments 26'. Segments 26' of the core 26 are considered to the "disconnected" if the segments 26' are not directly joined to the adjacent segments 26'. However, segments 26' may be considered independent which are indirectly connected, such as through the topsheet 22, backsheet 24, or any tissue wrapping the core 26.

If a sanitary napkin 20 is provided with three segments 26', they need not be of equal length in the longitudinal direction. For example, a sanitary napkin 20 having three segments 26' with the back segment 26' being about 7.0 centimeters (2.75 inches) in longitudinal direction, the center segment 26' being about 7.0 centimeters (2.75 inches), and the front segment 26' being about 6.4 centimeters (2.5 inches) in longitudinal dimension has been found to work well.

The differences in longitudinal dimension between the segments 26' may be accounted for because the central segment 26' which fits the labia majora region of the wearer's body is the most critical to obtain good fit. The second most critical area to obtain good fit occurs in the back portion of the sanitary napkin 20 so that the gluteal groove is accommodated, while the fit of the front of the sanitary napkin 20 to the mons region of the wearer's body is least critical.

Referring to Figure 2, the core 26 of a sanitary napkin 20 according to the present invention may have independent but connected segments 26'. Segments 26' may be connected through an isthmus connection 27. The isthmus connection 27 preferably comprises not more than about twenty percent, and preferably not more than about ten percent of the width of the core 26 of the sanitary napkin 20. As illustrated in Figure 2, the isthmus connection 27 may be disposed along the longitudinal edges 30' of the core 26 of the sanitary napkin 20. Such an arrangement provides for maximum relative Z-direction displacement between adjacent segments 26' of the core 26 of the sanitary napkin 20 to occur generally coincident the longitudinal centerline 34 of the sanitary napkin 20. This arrangement is, therefore, particularly desirable for obtaining good conformance of the core 26 of the sanitary napkin 20 to the vaginal opening of the wearer.

Referring to Figure 3, if desired, the core 26 of a sanitary napkin 20 according to the present in-

vention may comprise a plurality of two independent segments 26'. If such an arrangement is selected, the division between these segments 26' should be allocated so that the back segment 26' of the core 26 of the sanitary napkin 20 comprises about twenty percent to about sixty percent of the total longitudinal dimension of the core 26 of the sanitary napkin 20. The front segment 26' of the core 26 may be longer than the rear segment 26', to accommodate the convex upward configurations of both the front and the center regions of the wearer's body, as described above.

Also, as illustrated by Figure 3, the isthmus connection 27 may be substantially registered with the longitudinal centerline 34 of the sanitary napkin 20. This arrangement provides the advantages that the longitudinal edges 30' of the core 26 of the sanitary napkin 20 are free and maximum Z-direction relative displacement between adjacent segments 26' of the core 26 of the sanitary napkin 20 can occur at such longitudinal edges 30'. However, while this arrangement may provide a more comfortable fit to the wearer, with less chafing against the inner thighs, maximum fit with the vaginal opening may not be obtained.

Referring to Figure 4, a hybrid sanitary napkin 20 may be made incorporating the isthmus connections 27 of both Figures 2 and 3. Such a sanitary napkin 20 has an isthmus connection 27, registered with the longitudinal centerline 34 and joining the front and center segments 26' of the core 26 of the sanitary napkin 20. This isthmus connection 27 allows the segment 26' of the core 26 registered with the more gradual convex upwardly curved shape of the mons region to have a greater radius of curvature than the segment 26' of the core 26 registered with the sharper, more concave shape of the labia majora region of the wearer's body having a lesser radius of curvature. It will be apparent to one skilled in the art that as the radius of curvature of a particular segment 26' increases, the span between the longitudinal side edges 30' of that segment 26' and between the longitudinal side edges 30' of the sanitary napkin 20 increases.

However, the isthmus connections 27 joining the rear and center segments 26' of the sanitary napkin 20 may be substantially registered with the longitudinal edges of the core 26 of the sanitary napkin 20. This arrangement allows maximum Z-direction displacement of the rear section to occur at the longitudinal centerline 34 of the sanitary napkin 20, so that the rear segment 26' may accurately and comfortably fit into the gluteal groove of the wearer.

If desired, the rear segment 26' of the core 26 may be provided with a longitudinally oriented slit (not shown) to further enhance the fit of the rear segment 26' to the wearer. However, if a slit is

provided in the rear segment 26' of the core 26 of the sanitary napkin 20, the slit should not penetrate the backsheet, otherwise leakage onto the clothing and bedding of the wearer may occur.

It is not necessary that the slit in the rear segment 26' of the core 26 of the sanitary napkin 20 be parallel to the longitudinal axis. Instead, the slit may be oriented within about ± 45 degrees of the longitudinal axis or resemble a V-shape having its vertex registered with the border between the rear segment 26' and the adjacent segment 26' of the core 26 of the sanitary napkin 20.

Referring to Figure 5, if desired, the sanitary napkin 20 may be provided with a means to promote longitudinal movement between adjacent segments 26' of the core 26 of the sanitary napkin 20. Typically, longitudinal movement between the rear and center segments 26' occurs due to forces imparted to the sanitary napkin 20, and its core 26, by body movements of the wearer, such as sitting or lying down.

One means to promote longitudinal movement between adjacent segments 26' of the core is to provide the segments 26' with mutually co-bevelled edges 33. The transverse edges of the segments 26' should be mutually co-bevelled particularly if the core 26 is relatively thick. Most particularly, longitudinal movement may be more readily promoted by providing mutually co-bevelled edges 33 between the rear segment 26' and the adjacent segment 26', so that the rear segment 26' may overlap the adjacent segment 26'. When the rear segment 26' overlaps and is on top of the adjacent segment, the rear segment 26' is interposed between the adjacent segment 26' and the topsheet 22. Edges of the segments 26' of the core 26 are considered to be "mutually co-bevelled" if each edge has a diagonal plane, relative to the Z-direction, which is approximately mutually parallel to the diagonally opposed plane of the edge of the segment 26' of the core 26 which it faces.

It is particularly desirable that if mutually co-bevelled edges 33 are provided, the segments 26' are disconnected so that longitudinal movement is not hindered by the isthmus connections 27 which otherwise allow Z-directional movement.

It will be apparent to one skilled in the art that various other combinations and mutations of the foregoing embodiments may be applied by one skilled in the art, all of which are within the scope of the appended claims.

For example, the borders between adjacent segments 26' need not be straight, as shown. Instead, the borders between adjacent segments 26' may be arcuate or comprise a plurality of rectilinear line segments 26' which are diagonal relative to the longitudinal axis 34 of the sanitary napkin 20.

Claims

1. A sanitary napkin (20) having a longitudinal centerline (34), two longitudinal side margins (30) and two lateral side margins (32), said sanitary napkin (20) comprising a liquid pervious topsheet (22), a liquid impervious backsheet (24) at least partially peripherally joined to said topsheet (22), and an absorbent core (26) intermediate said topsheet (22) and said backsheet (24), said sanitary napkin (20) characterized in that said absorbent core (26) is transversely divided into a plurality of independent segments (26'), said segments being joined by at least one isthmus connection (27).
2. A sanitary napkin (20) according to claim 1 characterized in that: said isthmus connection (27) is substantially registered with the longitudinal centerline (34) of said sanitary napkin (20).
3. A sanitary napkin (20) according to claim 1 wherein, said absorbent core having two longitudinal side edges (30'), and said isthmus connection (27) is substantially registered with a longitudinal side edge (30') of said core.
4. A sanitary napkin (20) according to Claims 1, 2 or 3 characterized in that said core comprises at least two, preferably three independent segments (26').
5. A sanitary napkin (20) according to Claim 1 further comprising a means to promote relative longitudinal movement between adjacent segments of said core, said core segments have transverse edges (32') and said means for promoting relative longitudinal movement between adjacent segments comprises mutually opposed co-bevelled transverse edges (33) of said independent core segments (26') and one said segment (26') of said core is a rear segment, said rear segment being adapted to longitudinally move on to the top of said adjacent segment, so that said rear segment is interposed between said adjacent segment and said topsheet.
6. A sanitary napkin (20) according to Claim 1 or 2 characterized in that two said adjacent segments (26') of said segmented core (26) have substantially zero Z-direction relative displacement at the longitudinal centerline (34) and maximum Z-direction relative displacement at the longitudinal edges (30') of said core.



provided in the rear segment 26' of the core 26 of the sanitary napkin 20, the slit should not penetrate the backsheet, otherwise leakage onto the clothing and bedding of the wearer may occur.

It is not necessary that the slit in the rear segment 26' of the core 26 of the sanitary napkin 20 be parallel to the longitudinal axis. Instead, the slit may be oriented within about ± 45 degrees of the longitudinal axis or resemble a V-shape having its vertex registered with the border between the rear segment 26' and the adjacent segment 26' of the core 26 of the sanitary napkin 20.

Referring to Figure 5, if desired, the sanitary napkin 20 may be provided with a means to promote longitudinal movement between adjacent segments 26' of the core 26 of the sanitary napkin 20. Typically, longitudinal movement between the rear and center segments 26' occurs due to forces imparted to the sanitary napkin 20, and its core 26, by body movements of the wearer, such as sitting or lying down.

One means to promote longitudinal movement between adjacent segments 26' of the core is to provide the segments 26' with mutually co-bevelled edges 33. The transverse edges of the segments 26' should be mutually co-bevelled particularly if the core 26 is relatively thick. Most particularly, longitudinal movement may be more readily promoted by providing mutually co-bevelled edges 33 between the rear segment 26' and the adjacent segment 26', so that the rear segment 26' may overlap the adjacent segment 26'. When the rear segment 26' overlaps and is on top of the adjacent segment, the rear segment 26' is interposed between the adjacent segment 26' and the topsheet 22. Edges of the segments 26' of the core 26 are considered to be "mutually co-bevelled" if each edge has a diagonal plane, relative to the Z-direction, which is approximately mutually parallel to the diagonally opposed plane of the edge of the segment 26' of the core 26 which it faces.

It is particularly desirable that if mutually co-bevelled edges 33 are provided, the segments 26' are disconnected so that longitudinal movement is not hindered by the isthmus connections 27 which otherwise allow Z-directional movement.

It will be apparent to one skilled in the art that various other combinations and mutations of the foregoing embodiments may be applied by one skilled in the art, all of which are within in the scope of the appended claims.

For example, the borders between adjacent segments 26' need not be straight, as shown. Instead, the borders between adjacent segments 26' may be arcuate or comprise a plurality of rectilinear segments 26' which are diagonal relative to the longitudinal axis 34 of the sanitary napkin 20.

Claims

1. A sanitary napkin (20) having a longitudinal centerline (34), two longitudinal side margins (30) and two lateral side margins (32), said sanitary napkin (20) comprising a liquid pervious topsheet (22), a liquid impervious backsheet (24) at least partially peripherally joined to said topsheet (22), and an absorbent core (26) intermediate said topsheet (22) and said backsheet (24), said sanitary napkin (20) characterized in that said absorbent core (26) is transversely divided into a plurality of independent segments (26'), said segments being joined by at least one isthmus connection (27).
2. A sanitary napkin (20) according to claim 1 characterized in that: said isthmus connection (27) is substantially registered with the longitudinal centerline (34) of said sanitary napkin (20).
3. A sanitary napkin (20) according to claim 1 wherein, said absorbent core having two longitudinal side edges (30'), and said isthmus connection (27) is substantially registered with a longitudinal side edge (30') of said core.
4. A sanitary napkin (20) according to Claims 1, 2 or 3 characterized in that said core comprises at least two, preferably three independent segments (26').
5. A sanitary napkin (20) according to Claim 1 further comprising a means to promote relative longitudinal movement between adjacent segments of said core, said core segments have transverse edges (32') and said means for promoting relative longitudinal movement between adjacent segments comprises mutually opposed co-bevelled transverse edges (33) of said independent core segments (26') and one said segment (26') of said core is a rear segment, said rear segment being adapted to longitudinally move on to the top of said adjacent segment, so that said rear segment is interposed between said adjacent segment and said topsheet.
6. A sanitary napkin (20) according to Claim 1 or 2 characterized in that two said adjacent segments (26') of said segmented core (26) have substantially zero Z-direction relative displacement at the longitudinal centerline (34) and maximum Z-direction relative displacement at the longitudinal edges (30') of said core.



7. A sanitary napkin (20) according to Claim 1 or 3 characterized in that two said adjacent segments (26') of said segmented core (26) have substantially zero Z-direction relative displacement at said longitudinal side edges (30') and maximum Z-direction relative displacement at the longitudinal centerline (34) of said sanitary napkin (20).

Patentansprüche

1. Eine Damenbinde (20) mit einer Längsmittellinie (34), zwei Längsseitenrändern (30) und zwei Querseitenrändern (32), wobei die genannte Damenbinde (20) ein flüssigkeitsdurchlässiges Deckblatt (22), ein mindestens teilweise peripher am genannten Deckblatt (22) angefügtes flüssigkeitsundurchlässiges Rückenblatt (24) und einen absorbierenden Kern (26) zwischen den genannten Deckblatt (22) und dem genannten Rückenblatt (24) aufweist, wobei die genannte Damenbinde (20) **dadurch gekennzeichnet** ist, daß der genannte absorbierende Kern (26) quer in eine Mehrzahl von unabhängigen Segmenten (26') unterteilt ist, wobei die genannten Segmente durch mindestens eine Steg-Verbindung (27) verbunden sind.
2. Eine Damenbinde (20) nach Anspruch 1, **dadurch gekennzeichnet**, daß die genannte Steg-Verbindung (27) im wesentlichen mit der Längsmittellinie (36) der genannten Damenbinde (20) übereingestimmt ist.
3. Eine Damenbinde (20) nach Anspruch 1, bei welcher der genannte absorbierende Kern zwei Längsseitenränder (30') aufweist und die genannte Steg-Verbindung (27) im wesentlichen mit einem Längsseitenrand (30') des genannten Kerns übereingestimmt ist.
4. Eine Damenbinde (20) nach Anspruch 1, 2 oder 3, **dadurch gekennzeichnet**, daß der genannte Kern mindestens zwei, vorzugsweise drei, unabhängige Segmente (26') umfaßt.
5. Eine Damenbinde (20) nach Anspruch 1, welche weiters ein Mittel umfaßt, um relative Längsbewegung zwischen benachbarten Segmenten des genannten Kerns zu fördern, wobei die genannten Kernsegmente Querränder (32') aufweisen und das genannte Mittel zum Fördern von relativer Längsbewegung zwischen benachbarten Segmenten einander gegenüberliegend angeordnete gegeneinander abgeschrägte Querränder (33) der genannten unabhängigen Kernsegmente (26') umfaßt und ein genanntes Segment (26') des genannten

ten Kerns ein hinteres Segment ist, wobei das genannte hintere Segment adaptiert ist, um sich der Länge nach auf die Oberseite des genannten benachbarten Segments zuzubewegen, sodaß das genannte hintere Segment zwischen dem genannten benachbarten Segment und dem genannten Deckblatt dazwischengelegt ist.

6. Eine Damenbinde (20) nach Anspruch 1 oder 2, **dadurch gekennzeichnet**, daß zwei genannte benachbarte Segmente (26') des genannten segmentierten Kerns (26) im wesentlichen Null Relativversetzung in Z-Richtung an der Längsmittellinie (34) und maximale Relativversetzung in Z-Richtung an den Längsrändern (30') des genannten Kerns aufweisen.
7. Eine Damenbinde (20) nach Anspruch 1 oder 3, **dadurch gekennzeichnet**, daß zwei genannte benachbarte Segmente (26') des genannten segmentierten Kerns (26) im wesentlichen Null Relativversetzung in Z-Richtung an den genannten Längsseitenrändern (30') und maximale Relativversetzung in Z-Richtung an der Längsmittellinie (34) der genannten Damenbinde (20) aufweisen.

Revendications

1. Une serviette hygiénique (20) ayant une ligne médiane longitudinale (34), deux lisières de côté, longitudinales (30) et deux lisières de côté, latérales (32), ladite serviette hygiénique (20) comprenant une feuille de dessus perméable aux liquides (22), une feuille de fond imperméable aux liquides (24) réunie, au moins partiellement à la périphérie, à ladite feuille de dessus (22), et une âme absorbante (26) intercalée entre ladite feuille de dessus (22) et ladite feuille de fond (24), ladite serviette hygiénique (20) étant caractérisée en ce que ladite âme absorbante (26) est divisée transversalement en une pluralité de segments indépendants (26'), lesdits segments étant réunis par au moins un raccordement isthmique (27).
2. Une serviette hygiénique (20) selon la revendication 1, caractérisée en ce que ledit raccordement isthmique (27) coïncide sensiblement avec la ligne médiane longitudinale (34) de ladite serviette hygiénique (20).
3. Une serviette hygiénique (20) selon la revendication 1, dans laquelle ladite âme absorbante a deux bords latéraux longitudinaux (30') et ledit raccordement isthmique (27) coïncide sensiblement avec un bord latéral longitudinal (30')



de ladite âme.

4. Une serviette hygiénique (20) selon les revendications 1, 2 ou 3, caractérisée en ce que ladite âme comprend au moins deux, et de préférence trois, segments indépendants (26'). 5
5. Une serviette hygiénique (20) selon la revendication 1 comportant, en outre, un moyen pour favoriser le déplacement longitudinal relatif entre les segments adjacents de ladite âme, lesdits segments de l'âme ayant des bords transversaux (32') et ledit moyen pour favoriser le déplacement longitudinal relatif entre les segments adjacents comprend les bords transversaux, mutuellement opposés, co-chanfreinés (33) desdits segments indépendants de l'âme (26') et l'un desdits segments (26') de ladite âme est un segment arrière, ledit segment arrière étant apte à se déplacer longitudinalement sur le dessus dudit segment adjacent, de telle sorte que ledit segment arrière est intercalé entre ledit segment adjacent et ladite feuille de dessus. 10
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6. Une serviette hygiénique (20) selon la revendication 1 ou 2, caractérisée en ce que deux desdits segments adjacents (26') de ladite âme à segments (26) ont un déplacement relatif, dans la direction-Z, pratiquement nul sur la ligne médiane longitudinale (34) et un déplacement relatif, dans la direction-Z maximal, sur les bords longitudinaux (30') de ladite âme. 25
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7. Une serviette hygiénique (20) selon la revendication 1 ou 3, caractérisée en ce que deux desdits segments adjacents (26') de ladite âme à segments (26) ont un déplacement relatif dans la direction-Z pratiquement nul sur lesdits bords latéraux longitudinaux (30') et un déplacement relatif dans la direction-Z, maximal sur la ligne médiane longitudinale (34) de ladite serviette hygiénique (20). 35
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