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SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
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Act: 538 PETICION Folios: 2

Señora Jefe de la
DIVISION DE NUEVAS CREACIONES
Superintendencia de Industria y Comerc
E. S. D.

Trámite :011
Evento :379
Actuación :538

Referencia	:	Expediente No. 05.109.272
Asunto	:	SOLICITUD DE PATENTE PARA **ARTICULO ABSORBENTE QUE COMPRENDE UNA ESTRUCTURA ABSORBENTE**
Solicitante	:	SCA HYGIENE PRODUCTS AB
Clase	:	A61F 013/015, A61F 013/534, A61L 015/060
Publicada en	:	La Gaceta No. **575** Del 30 de abril de 2007
Fecha de Solicitud	:	26 de octubre de 2005

1. Yo, Emilio FERRERO, identificado como aparece al pie de mi firma, actuando como apoderado en el asunto de la referencia, atentamente, solicito se efectúe el examen de patentabilidad de la solicitud en referencia presentada de acuerdo con el Capítulo II del PCT y según lo establecido en el artículo 44 de la Decisión 486 de la Comisión de la Comunidad Andina. Para tal efecto presento junto con este escrito el recibo por valor de $202.000,oo, que corresponde a la tasa fijada según lo dispuesto en la resolución No. 36155 de 28 de diciembre de 2006.

2. Ruego atentamente a la Señora Jefe se sirva ordenar que se anexe este recibo para que se efectúe dicho examen y se continúe con el trámite de la solicitud.

Señora Jefe,

EMILIO FERRERO
T.P.A. No. 31.929

COLO-11256-841-076-8
SCT\MVN\ID-110105\WPC11256
No. M-2007-110105\SCT

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SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

NIT : 800176089-2

RECIBO OFICIAL DE CAJA : 07 - 77,102
FECHA : SEPTIEMBRE 24 DE 2007

***** C O N S I G N A C I O N *****

DEPOSITANTE	TIPO PAGO	BANCO	CUENTA	No. PAGO	FECHA PGO	Vr. PAGO
CAVELIER ABOGADOS	CONSIGNACION	BANCO POPULAR	050-00110-6	69422940	24/09/2007	29,866,000.00

***** C O N C E P T O *****

CANT.	RENTISTICO	CONCEPTO		TOTAL CONCEPTO
1	50005-01-01 SOLICITUDES	114	PTC CAP-II EXAMEN DE PATENTIBILID	202,000.00
			TOTAL : $	202,000.00

SON: DOSCIENTOS DOS MIL PESOS

RESPONSABLE : _____

Cdo 11256-841-076-8

RECIBO DE CAJA APLICADO AL EXPEDIENTE No. _____

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Industria y Comercio
SUPERINTENDENCIA

DIVISIÓN DE NUEVAS CREACIONES

RADICACIÓN EXPEDIENTE No. 5 -109272

EL EXTRACTO DE LA PRESENTE SOLICITUD DE **PATENTE DE INVENCIÓN**

FUE PUBLICADO EN LA GACETA DE PROPIEDAD INDUSTRIAL No **575** DE

FECHA **30 DE ABRIL DE 2007** EL TÉRMINO HÁBIL SEÑALADO POR LA LEY

EXPIRA EL **31 DE JULIO DE 2007**

NOTA: Dentro del plazo de los seis (6) meses siguientes a partir de la fecha de publicación en la gaceta de Propiedad Industrial, deberá solicitar y cancelar el examen de patentabilidad so pena de que la solicitud caiga en abandono, de acuerdo con lo establecido en el Artículo 44 de la Decisión 486/2000.

SE PRESENTARON OPOSICIONES POR PARTE DE TERCEROS.

SI _____ NO ____X____

US005304161A

United States Patent [19]

Noel et al.

[11] Patent Number: 5,304,161

[45] Date of Patent: Apr. 19, 1994

[54] **ABSORBENT ARTICLE HAVING RAPID ACQUIRING, MULTIPLE LAYER ABSORBENT CORE**

[75] Inventors: **John R. Noel; Nicholas A. Ahr**, both of Cinncinati, Ohio

[73] Assignee: **The Procter & Gamble Company**, Cincinnati, Ohio

[21] Appl. No.: **931,122**

[22] Filed: **Aug. 17, 1992**

Related U.S. Application Data

[63] Continuation of Ser. No. 637,090, Jan. 3, 1991, abandoned.

[51] **Int. Cl.**[5] **A61F 13/15**; A61F 13/20

[52] **U.S. Cl.** **604/378**; 604/358; 604/368; 604/385.1

[58] **Field of Search** 604/358, 365, 368, 369, 604/378, 385.1, 366, 370, 375

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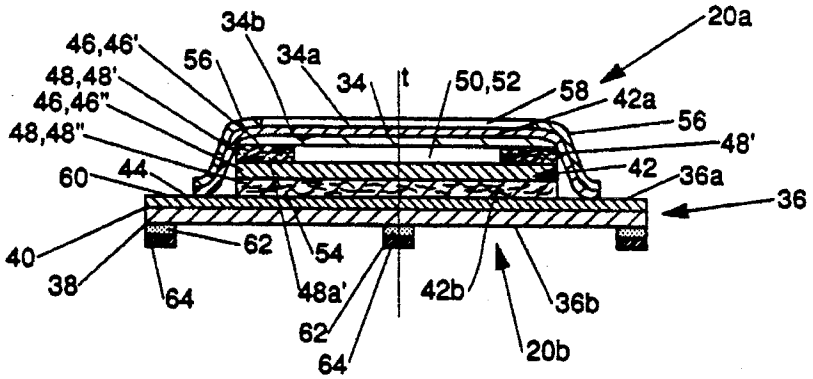
Assistant Examiner—P. Zuttarelli
Attorney, Agent, or Firm—Jeffrey V. Bamber; Steven W. Miller; E. Kelly Linman

[57] **ABSTRACT**

An absorbent article, such as a disposable diaper, adult incontinent pad, sanitary napkin, and the like, is disclosed which has a rapid acquiring, multiple layer absorbent core. The absorbent article may be in an improved shape that can be worn in the wearer's usual undergarments. The absorbent article of the present invention comprises a liquid pervious topsheet, a liquid impervious backsheet, and a multiple layer absorbent core positioned between the topsheet and the backsheet. The multiple layer absorbent core comprises at least one rapid acquiring acquisition/distribution layer and at least one storage layer positioned subjacent each acquisition layer. The acquisition/distribution layers have a fluid acquisition/distribution rate of at least about 2 cubic centimeters of synthetic urine per second when tested under a pressure of about 28 grams per square centimeter. The storage layers at least partially comprise a "high-speed" absorbent gelling material which is capable of reaching at least about 40% of its absorptive capacity in less than or equal to about 10 seconds. A multiple layer absorbent core for an absorbent article is also disclosed.

10 Claims, 4 Drawing Sheets



It is another object of the present invention to provide an absorbent core for an absorbent article which is especially efficient in acquiring, distributing, and storing exudates as they are deposited on the absorbent article.

In particular, it is an object of the present invention to provide an absorbent core that has a system in which the functions of acquiring and distributing exudates are handled by layers that are separate from the layers used for storing exudates. Ideally, such a system will allow exudates to be continuously acquired and distributed to storage layers by layers that are not subject to the prior problems of saturation and gel blocking.

These and other objects of the present invention will be more readily apparent when considered in reference to the following description and when taken in conjunction with the accompanying drawings.

SUMMARY OF THE INVENTION

The present invention provides absorbent articles, such as disposable diapers, incontinent pads, sanitary napkins and the like that have multiple layer absorbent cores that are capable of acquiring and containing liquids in an especially effective and efficient manner. In one embodiment, the absorbent articles of the present invention can be in an elongated-pear shape that can be worn in the wearer's undergarments.

The absorbent articles of the present invention comprise a liquid pervious topsheet, a liquid impervious backsheet joined with the topsheet, and an absorbent core positioned between the topsheet and the backsheet. The absorbent core of the present invention comprises multiple layers. The multiple layers comprise at least one pair of layers. In each pair of layers, the uppermost layer is a rapid acquiring exudate acquisition/distribution layer (typically a low density web or batt of material). A storage layer comprised at least partially of a high-speed absorbent gelling material is positioned subjacent each acquisition/distribution layer.

The acquisition/distribution layers have a fluid acquisition/distribution rate of at least about 2 cubic centimeters of synthetic urine per second when the acquisition/distribution layer is tested according to the Fluid Acquisition/Distribution Test under a pressure of about 28 grams per square centimeter. The acquisition/distribution layers in at least some embodiments will comprise a "low density" web or batt of material, such as a nonwoven web, with a density of less than or equal to about 0.1 grams per cubic centimeter and a basis weight of from about 17 to about 270 grams per square meter, when the acquisition/distribution layers are placed under a load of 0.1 psi (7 grams per square centimeter).

The storage layers are comprised at least partially of a "high-speed" absorbent gelling material. A "high-speed" absorbent gelling material is an absorbent gelling material which reaches at least about 40% of its absorptive capacity in less than or equal to about 10 seconds. Preferably, this will be a material that has a total capacity of at least about 25 times its dry weight in fluid, such as synthetic urine, and a liquid acquisition rate of greater than or equal to about 0.8 grams of synthetic urine per second per gram of such material. Preferably, the storage layers each have a basis weight of between about 20 to about 1,200 grams/square meter and a density of less than or equal to about 0.2 grams per cubic centimeter.

In use, it is believed that the exudate acquisition/distribution layer is capable of quickly taking exudates into itself as they are deposited on the absorbent article and distributing such exudates to the lower storage layer in a manner that substantially reduces or eliminates prior problems of saturation of the materials adjacent the zone of exudate application and gel blocking. It is believed that the combination of the layers of the particular materials used provides a structure that is also capable of quickly storing the absorbed liquids.

While not wishing to be bound by any particular theory, it is believed that the multiple layer absorbent core distributes exudates by a cascading effect. It is believed that the manner of acquisition, distribution, and storage of the multiple layer absorbent core can be analogized to the filling of an ice cube tray with water in that when one region of the absorbent core is filled, exudates will quickly flow laterally to the sides of the filled region to begin filling other unfilled regions.

The present invention also relates to multiple layer absorbent cores that can be employed in absorbent articles of other sizes and shapes.

BRIEF DESCRIPTION OF THE DRAWINGS

While the specification concludes with claims particularly pointing out and distinctly claiming the subject matter which is regarded as forming the present invention, it is believed that the invention will be better understood from the following description which is taken in conjunction with the accompanying drawings in which like designations are used to designate substantially identical elements, and in which:

FIG. 1 is a plan view of a preferred embodiment of the absorbent article of the present invention.

FIG. 2 is an enlarged transverse sectional view of the absorbent article of the present invention taken along line 2—2 of FIG. 1.

FIG. 3 is a longitudinal sectional view of the absorbent article of the present invention taken along line 3—3 of FIG. 1.

FIG. 4 is a plan view of an absorbent article having an aperture of a different configuration.

FIG. 5 is a plan view of an absorbent article having a multiplicity of apertures.

FIG. 6 is a transverse sectional view taken from an angle similar to that of FIG. 2 of an embodiment of the absorbent article of the present invention which has an alternative core arrangement.

FIG. 7 is a transverse sectional view similar to that of FIG. 6 of an embodiment of the absorbent article of the present invention which has another alternative core arrangement.

FIG. 8 is a perspective view of an incontinent brief that includes the absorbent core of the present invention.

FIG. 9 is a transverse sectional view of the incontinent brief shown in FIG 8, taken along line 9—9 of FIG. 8.

FIG. 10 is a schematic view of the apparatus used in the Horizontal Fluid Acquisition/Distribution Rate Test.

DETAILED DESCRIPTION OF THE INVENTION

1. Overall Characteristics of the Absorbent Article

The overall characteristics of the absorbent article of the present invention will be discussed first.

FIGS. 1-3 show a preferred embodiment of a disposable absorbent article of the present invention. The

absorbent article of the present invention shown in the drawings is of an improved shape that can fit into the wearer's undergarments. The absorbent article has a multiple layer absorbent core that is capable of quickly acquiring, distributing, and storing body exudates.

As used herein, the term "absorbent article" refers to articles which absorb and contain body exudates. More specifically, the term refers to articles which are placed against or in proximity to the body of the wearer to absorb and contain the various exudates discharged from the body. The term "absorbent article" is intended to include diapers, incontinent articles, sanitary napkins, and the like. The term "incontinent articles" is intended to include pads, undergarments (pads held in place by a suspension system of some type, such as a belt, or the like), inserts for absorbent articles, capacity boosters for absorbent articles, briefs, bed pads, and the like, regardless of whether they be worn by adults or other incontinent persons. The term "disposable" refers to articles which are intended to be discarded after a single use. That is, disposable articles are not intended to be laundered or otherwise restored or reused.

In the preferred embodiment illustrated, the absorbent article is an adult incontinent pad (or "pad") designated **20**. (It should be understood that even though the preferred embodiment is illustrated and described in the form of an incontinent pad, the description of the various component parts of the incontinent pad **20** will also apply generally to other types and shapes of absorbent articles that are made according to the present invention.)

The incontinent pad **20** has two surfaces, a body-contacting surface or "body surface" **20***a* and a garment surface **20***b*. The incontinent pad **20** is shown in FIG. **1** as viewed from its body surface **20***a*. The body surface **20***a* is intended to be worn adjacent to the body of the wearer. The garment surface **20***b* of the incontinent pad **20** (shown in FIG. **2**) is on the opposite side and is intended to be placed adjacent to the wearer's undergarments when the incontinent pad **20** is worn.

The incontinent pad **20** has two centerlines, a longitudinal centerline l and a transverse centerline t. As used herein the term "longitudinal" refers to a line, axis or direction in the plane of the incontinent pad **20** that is generally aligned with (e.g., approximately parallel to) a vertical plane that bisects a standing wearer into left and right body halves when the incontinent pad **20** is worn. The term "transverse" refers to the line, axis or direction generally perpendicular to the longitudinal direction which lies within the plane of the incontinent pad **20**. The incontinent pad **20** has a longitudinal dimension that runs in the general direction of the longitudinal centerline l, and a transverse dimension that runs in the general direction of the transverse centerline t. The incontinent pad **20** is typically longer in the longitudinal dimension than in the transverse dimension.

FIG. **1** shows that the incontinent pad **20** has two spaced apart longitudinal edges **22** and two spaced apart transverse or end edges (or "ends") **24**, which together form the periphery **26** of the incontinent pad **20**. When the incontinent pad **20** is worn, one of the end edges **24** will be oriented toward the front of the wearer, and one of the end edges **24** will be oriented toward the rear of the wearer. The end edge **24** oriented toward the front of the wearer, the "front end edge", is designated **24***a*, and the end edge oriented toward the rear of the wearer, the "rear end edge" or "back end edge", is designated **24***b*.

The shape of the absorbent article **20** of the present invention in plan view is shown in FIG. **1**. While the absorbent article **20** may have any shape known in the art, the preferred embodiment of the absorbent article, incontinent pad **20**, shown in FIG. **1** is symmetrical about its longitudinal centerline l, but is asymmetrical about its transverse centerline t. The absorbent article **20** can be divided into three regions in plan view: a first end region **28**, a central region **30**, and a second end region **32**.

The first end region **28** is intended to be to the front of the wearer's body when the incontinent pad **20** is worn. The second end region **32** is intended to be to the wearer's rear when the incontinent pad **20** is worn. The central region **30** lies between the first and second end regions, and is intended to be worn in the area of the wearer's crotch. The first end region **28** and the second end region **32** extend outwardly from the central region **30** toward the ends **24***a* and **24***b* respectively, a distance of about $\frac{1}{8}$ to about $\frac{1}{3}$ of the total length of the incontinent pad **20**; although the exact size of the first and second end regions will vary according to the precise design and intended positioning of the incontinent pad **20**.

The shape of the longitudinal edges **22** of the incontinent pad **20** in the first end region **28** is defined by curved convex outward (or outwardly arcuate with relation to each other) lines on each side of the longitudinal centerline l. The lines that form the longitudinal edges **22** change direction of curvature and curve inward toward each other in at least a portion of the central region **30**. The longitudinal side edges **22** are generally straight and parallel to each other in the second end region **32** in the embodiment shown in FIGS. **1-3**. In alternative embodiments, the longitudinal side edges **22** could be inwardly tapered toward the longitudinal centerline l in the second end region **32** so that the longitudinal side edges **22** become closer together near the rear end edge **24***b* of the incontinent pad **20** than they are adjacent the central region **30**. The end edges **24** of the incontinent pad **20** are rounded and curved convex outwardly.

The overall shape of the incontinent pad **20** shown in FIG. **1** could be described in a number of ways. The incontinent pad **20** could be said to be dog bone-shaped or hourglass-shaped on one side of the transverse centerline t, and could be said to have longitudinal side edges on the other side of the transverse centerline t that are either approximately parallel to each other or inwardly tapered. Alternatively, the incontinent pad **20** could be viewed as being of an elongated pear-shape.

There are several reasons for providing an incontinent pad in such a shape. The first end region **28** of the incontinent pad **20** is worn to the wearer's front. This is the area in which the wearer's genitals are located, and thus, where urine is typically deposited. The first end region **28** of the incontinent pad **20** has been made larger than the other regions of the pad to provide a large target to receive this urine. The central region **30** is made narrower than the first end region **28** so the incontinent pad **20** will fit comfortably between the wearer's legs and will accommodate the wearer's movements. The second end region **32** is narrower than the widest portion of the first end region **28** so that there will be less tendency for the second end region **32** to buckle and wedge in the crevice of the user's body between the buttocks.

The dimensions of the preferred incontinent pad **20** shown in FIG. **1** are as follows. The incontinent pad **20** has an overall length l_1 of about 35 centimeters (cm.). The overall width of the pad **20** w_1 at its widest portion (in the first end region **28**, not including the span of the optional side flaps **60** described below) is about 16 cm. The overall length l_2 of the absorbent core **42** of the incontinent pad **20** is about 33 cm. The overall width w_2 of the absorbent core **42** at its widest portion is about 14 cm. The width of the absorbent core **42** narrows to about 9 cm. in the central region **30** at the transverse centerline t, and to about 8.5 cm. in the second end region **32**. The latter dimension is measured inboard, i.e., toward the intersection of the longitudinal and transverse centerlines l and t, of the place where the curvature of the end edge **24***b* of the incontinent pad **20** begins. In addition, as shown in FIG. **1**, the topsheet **34** and the backsheet **36** extend outward away from the intersection of the longitudinal and transverse centerlines l and t to form a border **44** approximately 1 cm. wide around the circumference of the absorbent core **42**. The incontinent pad **20** has a surface area of approximately 55 square inches (about 355 cm^2), and is much smaller than traditional diaper-like incontinent briefs.

It should be understood, however, that the above dimensions are preferred for the particular embodiment of the incontinent pad **20** shown in FIGS. **1-3**. The multiple layer absorbent core **42** of the present invention can be used in other types of absorbent articles and can be in many other shapes and sizes depending on the type of absorbent article and the absorbent capacity needed.

FIG. **2** shows the individual components of the incontinent pad **20**. The incontinent pad **20** of the present invention generally comprises three primary components. These include a liquid pervious topsheet **34**, a liquid impervious backsheet **36**, and a multiple layer absorbent core **42**. The absorbent core **42** is positioned between the topsheet **34** and the backsheet **36**. There are two basic types of layers in the absorbent core **42**, acquisition/distribution layers **46**, comprised of a low density (or "high loft") material capable of rapidly taking in and distributing exudates, and storage layers **48** comprised at least partially of a high-speed absorbent gelling material.

The layers of the absorbent core **42** are arranged in pairs so that an acquisition/distribution layer **46** is always on top of a storage layer **48** (that is, the acquisition/distribution layer **46** in issue is always positioned between the topsheet **34** and the underlying storage layer **48**). In the embodiment shown in FIGS. **1-3**, the absorbent core **42** comprises four layers. As shown in FIG. **2**, the four layers comprise from the top of the absorbent core **42** to the bottom: a first acquisition/distribution layer **46'**, a first storage layer **48'**, a second acquisition/distribution layer **46''** and a second storage layer **48''**.

The incontinent pad **20** of the present invention can also be provided with any optional additional components that are known in the art. The optional components may include one or more longitudinal barrier shields **56** (shown in FIG. **1**), one or more transverse barrier shields **58** (also shown in FIG. **1**), side flaps or "wings" **60** (FIGS. **1** and **2**), an adhesive fastening means **62** (FIG. **2**), and a removable cover strip or release liner **64** (FIG. **2**). In the embodiment shown in FIG. **2**, the incontinent pad **20** of the present invention is provided with one longitudinal barrier shield **56** along each longitudinal edge **22** of the pad, and one transverse barrier shield **58** along each end edge **24** of the pad. The side flaps or "wings" **60** may be at least partially folded around the crotch portion of the wearer's undergarments. The adhesive fastening means **62** serves as a means for attaching the incontinent pad **20** to the wearer's undergarments. The removable release liner **64** covers the adhesive fastening means **62** in order to keep the adhesive from becoming contaminated or sticking to a surface other than the crotch portion of the undergarment prior to use.

In the following sections of this description, the characteristics of the individual components are discussed in greater detail in Section **2**. The optional components of the incontinent pad **20** are discussed in Section **3**. The alternative embodiments of the absorbent article are discussed in Section **4**. The test methods used herein are described in Section **5**.

2. The Individual Components of the Absorbent Article

Looking at the components of the incontinent pad **20** more specifically, FIG. **2** shows the liquid pervious topsheet (or simply the "topsheet") **34** overlies the other components of the incontinent pad **20** (other than the barrier shields). The topsheet **34** is oriented towards and contacts the body of the wearer. The topsheet **34** is the portion of the incontinent pad **20** that initially receives bodily discharges. The topsheet **34** has a body-facing side (or "body surface") **34***a* and a core-facing side **34***b*. The body-facing side **34***a* of the topsheet **34** generally forms at least a portion of the body-contacting surface ("body surface") **20***a* of the incontinent pad **20**.

The topsheet **34** should permit liquids to readily transfer through its thickness toward the absorbent core **42**. The topsheet **34** should, therefore, be liquid pervious. The topsheet **34** should also be flexible and nonirritating to the wearer's 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 **34** is not noisy, to provide discretion for the wearer. The topsheet **34** should be clean in appearance and somewhat opaque to hide the bodily discharges collected in and absorbed by the absorbent components. The topsheet **34** should further exhibit good strikethrough and a reduced tendency to rewet, permitting bodily discharges to rapidly penetrate the topsheet **34** and make their way to the the absorbent core **42**, but not allowing such discharges to flow back through the topsheet **34** to the skin of the wearer.

A suitable topsheet **34** may be made from a number of different materials, such as porous foams, reticulated foams, apertured plastic films, natural fibers (e.g., wood or cotton fibers), synthetic fibers (e.g., polyester or polypropylene fibers), or from a combination of natural or synthetic fibers. Preferably, the topsheet is made of a hydrophobic material to isolate the wearer's skin from liquids in the absorbent core **42**.

There are a number of manufacturing techniques which may be used to manufacture the topsheet **34**. For example, the topsheet **34** may be woven, nonwoven (e.g., spunbonded, carded or the like), foamed, or cast. A preferred topsheet **34** is spunbonded and thermally bonded by means well-known to those skilled in the fabric art. Preferably, the topsheet has a weight from about **18** to about 30 grams per square meter, a minimum dry tensile strength of at least about 400 grams per

materials are discussed in U.S. Pat. No. 4,781,711 to Houghton, et al., previously incorporated by reference herein. The preferred form of absorbent gelling materials for use in the present invention, however, is a fibrous high speed absorbent gelling material.

The term "fibrous absorbent gelling materials" as used herein, means those absorbent gelling materials that are in the form of fibers. Such fibers (though not necessarily high-speed fibrous absorbent gelling materials) are discussed more fully in U.S. Pat. No. 4,855,179, issued Aug. 8, 1989, to Bourland, et al., the disclosure of which is incorporated by reference herein. The term "fibrous absorbent gelling materials", as used herein, is intended to include absorbent gelling materials in the form of fibers that are comprised entirely of absorbent gelling material and bi-component fibers that are comprised at least partially of other materials which have their surfaces coated with absorbent gelling materials.

Fibrous absorbent gelling materials are preferred for several reasons. Fibrous absorbent gelling materials can be easily incorporated into the structure of a nonwoven material. Fibrous absorbent gelling materials remain in place better than absorbent gelling materials in some other forms when compressive forces and other forces act on the absorbent article. Further, fibrous absorbent gelling materials are generally softer and more flexible than particulate absorbent gelling materials. Fibrous absorbent gelling materials also may have less tendency to cause holes in the backsheet **36** when they are in their dry state than some particulate absorbent gelling materials. Fibrous absorbent gelling materials can be distributed within a layer of material so that the fibers are generally spaced away from adjacent fibers a sufficient distance. As a result of this last characteristic, fibrous absorbent gelling materials will have a reduced tendency to come in contact with each other and cause gel blocking when they absorb liquids and swell.

A suitable fibrous high speed absorbent gelling material is known as FIBERSORB SA7000 and is available from Arco Chemical Company of Newton Square, Pa. FIBERSORB SA7000 is capable of absorbing fluid at the rate of at least about 1.9 grams per second per gram of such a material . An especially preferred fibrous high-speed absorbent gelling material is known as FIBERSORB SA7200, and is also made by Arco Chemical Company, but is not commercially available. FIBERSORB SA7200 is capable of absorbing fluid at the rate of at least about 2 grams per second per gram of such material.

It is desirable to use high speed absorbent gelling materials because, due to their high speed, they can substantially contribute to the immediately available capacity of the absorbent core **42**. The absorbent gelling materials typically used in prior absorbent articles required several seconds or minutes to reach a substantial level of absorptive capacity. They were, therefore, of little value during the initial application of exudates to the absorbent articles. They became of significant value primarily during subsequent application of exudates.

It may be desirable to mix other materials with the high-speed absorbent gelling materials in the storage layers **48**. There may be several purposes for including such other materials in the storage layers **48**. Other materials may be used to hold the particles or fibers of the absorbent gelling material in place. They may also be used to bind the absorbent gelling material, or other components of the storage layers **48** together. They may be used to maintain space between the individual particles or fibers of absorbent gelling material in order to insure that adequate space is available for the absorbent gelling material to swell to its full size when it reaches its absorptive capacity.

The other materials that may be included in the storage layers **48** may be any of the types of materials specified above for use in the acquisition/distribution layers **46**, and possibly a binder of some type.

However, as described in greater detail below, the characteristics (such as material composition, density, basis weight, and horizontal fluid acquisition rate) of the storage layers **48** do not have to be the same as the acquisition/distribution layers **46**. The relative proportions of the types of the materials, in particular the amount of synthetic fibers that may be used, however, should be less than is used in the acquisition/distribution layers **46** because it is desirable to have greater absorptive capacity in the storage layers **48**. The specific amounts of materials used are described below.

Binders, such as binder fibers, are used to bind the fibers that comprise the storage layers **48** to each other and to bind such fibers to the high-speed absorbent gelling materials used in the storage layers **48**. A suitable binder fiber, if one is used, should be capable of bonding to the types of fibers described herein as being suitable for use in the storage layers **48** at temperatures that are less than the melting temperature of such fibers. A preferred commercially available binder fiber is known as KODEL 410 and is manufactured by the Eastman Chemical Products, Inc. of Kingsport, Tenn.

The composition of the materials used to form the storage layers **48** can vary within certain limits. All percentages of material composition referred to in this description are by weight, unless otherwise specified. The percentage of each of the materials used must be such that the total of the percentages equals 100%. In addition, all percentages of composition (and horizontal fluid acquisition/distribution) specified in this description and the appended claims are meant to include absorbent articles that have the specified percentage measured in some portion of the layer in issue (e.g., in at least some section of the absorbent article), regardless of whether the entire layer has the percentage in issue.

The storage layers **48** can contain between about 10% or 20% to about 100% high speed absorbent gelling materials; as much as about 80% natural fibers, such as wood pulp; as much as about 80% synthetic fibers, such as polyester fibers; as much as about 80% cross-linked cellulose fibers; and as much as about 20% binder fibers. When the storage layers **48** are described as having "as much as" a specified percentage of a material, this means that the material may be used in the layer, but it does not have to be present in the layer. In other words, the layer could have none of the material (0%), or it could have the material present in an amount between some small percentage such as 0.1% and the specified percentage of the material (e.g., 30%). One particularly preferred storage layer **48** is a thermally bonded mixture that contains about 50% FIBERSORB SA7000 absorbent gelling material, about 30% wood pulp, and about 20% KODEL 410 binder fiber.

There are a number of manufacturing techniques that may be used to manufacture the storage layers **48**. For example, the storage layers **48** can be air laid, or carded. A preferred storage layer **48** is an air laid mixture of high speed absorbent gelling materials and airfelt. Typically, an air laying process involves mixing the components in air, and condensing and rearranging the mix-

ture on a forming screen. Any suitable conventional air laying process may be used.

The storage layers **48** should have a basis weight of from about 0.01 to about 0.8 grams per square inch (from about 20 to about 1200 grams per square meter), and a density of less than about 3 grams per cubic inch (about 0.183 grams per cubic centimeter (g/cc)). As in the case of the acquisition/distribution layers **46**, the characteristics (for example, the material composition, basis weight, and density) of the storage layers **48** may differ between layers when there is more than one storage layer **48**.

Preferably, in the case of the preferred embodiment shown in FIGS. **1-3**, where there are two storage layers, the top storage layer, first storage layer **48'** has a basis weight from about 0.01 to about 0.4 grams per square inch (about 20 to about 600 grams per square meter), most preferably about 0.2 grams per square inch (about 300 grams per square meter), and a density of less than about 2 grams per cubic inch (about 0.12 g/cc), most preferably about 1.5 grams per cubic inch (about 0.092 g/cc). The lower storage layer, second storage layer **48''**, has a basis weight from about 0.2 to about 0.8 grams per square inch (about 300 to about 1200 grams per square meter), most preferably about 0.4 grams per square inch (about 600 grams per square meter), and a density of less than about 2 grams per cubic inch (about 0.12 g/cc), most preferably about 1.5 grams per cubic inch (about 0.092 g/cc).

The different layers of the multiple layer absorbent core **42** may be bonded together by any suitable means such as spray gluing, or they may be unbonded.

When there is more than one pair of the layers described above (that is, when there is more than one acquisition/distribution layer and more than one storage layer), there should be some type of interconnection between each pair of layers because exudates will generally not be able to travel through a full storage layer (such as first storage layer **48'** shown in FIG. **2**) to underlying acquisition/distribution layers and storage layers because of the reduction in void space therein and swelling of the absorbent gelling materials. A completely full storage layer will tend to block the flow of exudates. Thus, the pairs of layers, particularly the acquisition/distribution layers **46** in each pair, should be in fluid communication with each other. The term "fluid communication" simply means that fluids should be able to pass between the layers or pairs of layers. This fluid communication between the layers may be provided by any suitable means. For instance, in the embodiment shown in FIGS. **1-3**, there is at least one fluid passageway or path (or simply "passageway") **50** for exudates to travel through from the one layer, such as first acquisition/distribution layer **46'**, to the underlying layers, such as second acquisition/distribution layer **46''**.

The terms "passageway" or "path", as used herein, refer to a structure through which exudates may flow from one layer to another layer. The passageway **50** may be any suitable structure that will allow exudates to flow from an upper acquisition/distribution layer to a lower acquisition/distribution layer or storage layer. The term "passageway" is thus not limited to a structure of any particular shape. For instance, a suitable passageway could comprise one or more apertures, one or more pieces of fluid pervious material that connect two layers, or it could comprise portions of the layers themselves, or an arrangement of layers that interconnect or simply touch each other. In addition, or as an alternative to the above, the passageway could comprise a low density area, or any of the other types of structures described in U.S. patent application Ser. No. 07/198,032 filed May 24, 1988 in the name of George S. Raising, et al., the disclosure of which was previously incorporated by reference herein and in U.S. Pat. No. 4,880,419 issued Nov. 14, 1989 to Irving S. Ness, the disclosure of which is hereby also incorporated by reference herein.

If the passageway **50** comprises one or more apertures **52**, there are several factors that should be considered. The apertures **52** should be properly positioned, and should be sufficient in size to transfer exudates from one layer to another. The apertures **52** should be located at places where exudates would otherwise accumulate when the upper storage layer or layers reach capacity. Typically, this place will be immediately below the region where exudates are deposited onto the incontinent pad **20** (referred to as the "area or zone of typical exudate deposition"). The apertures **52** in each storage layer **48** should, therefore, be located between the transverse centerline t and the front end edge **24***a* (that is, in the front half of the incontinent pad **20**). The width of the apertures **52** should be such that the apertures **52** do not close up if the incontinent pad **20** is compressed in the transverse direction when worn, or when the absorbent gelling materials swell when wetted. The incontinent pad **20** may have any number of apertures **52**, from one to virtually an infinite number of a plurality or multiplicity of apertures.

The area that the apertures **52** should be located in preferably, at a minimum, covers at least the area shown in dotted lines in FIG. **4**. This area is in the shape of an isosceles triangle. The base of the isosceles triangle is generally perpendicular to the longitudinal centerline l, and is spaced about 2 inches (about 5 cm.) from the front end edge **24***a* of the incontinent pad **20**. The length of the base of the triangular-shaped area is about 2 inches (about 5 cm.). The height is about 3 inches (about 7.6 cm.). The triangular-shaped area covers about 3 square inches (about 19 square centimeters).

A particularly preferred passageway **50** is shown in FIGS. **1-3**. The passageway **50** shown in FIGS. **1-3** comprises a single aperture **52** in the first storage layer **48'**. It is believed that when there is only one aperture **52** in the storage layer or layers **48**, the dimensions of such a single aperture **52** need to be made relatively large to avoid the tendency of the aperture **52** to close up when the incontinent pad **20** is worn and shut off the flow of exudates to the lower layers. The aperture **52** extends the entire length of the first storage layer **48'** in the embodiment shown in FIGS. **1-3**. In the embodiment shown in FIGS. **1-3**, the width of the aperture **52** is greater in the first end region **28** than in parts of the central region **30** and in the second end region **32** of the incontinent pad **20**. Preferably, the width of the aperture **52** is at least about 2 inches (about 5 cm.) in the first end region **28**. The preferred aperture **52** shown in FIGS. **1-3** has longitudinal side walls that follow the curvature of the longitudinal side edges **22** of the incontinent pad **20**.

The storage layer **48'** and the aperture **52** in the embodiment shown in FIGS. **1-3** can be thought of in an alternative manner since the aperture **52** is relatively wide and extends the full length of the core **42**. The storage layer **48'** can be thought of as being in the form of at least two strips of material, such as strips **48***a'* and

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Published
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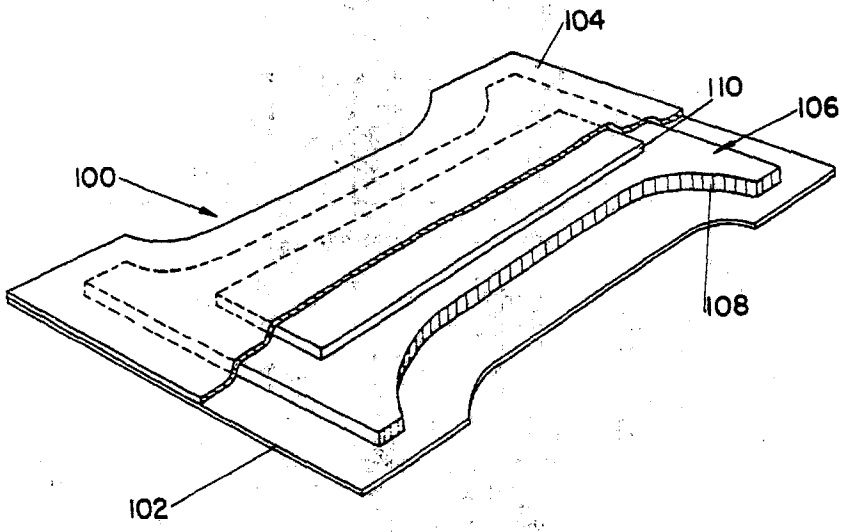
(54) Title: ABSORBENT STRUCTURES CONTAINING THERMALLY-BONDED STIFFENED FIBER LAYER AND SUPERABSORBENT MATERIAL LAYER



(57) Abstract

Absorbent structures (100) comprising a thermally-bonded fluid acquisition/distribution layer (10) comprising from about 10 % to about 50 % thermoplastic bonding material and from about 50 % to about 90 % of chemically stiffened cellulosic fibers and, positioned beneath said fluid acquisition/distribution layer, a fluid storage layer (106) comprising at least about 15 % by weight, superabsorbent material. The thermally-bonded fluid acquisition/distribution layer is a web comprising the chemically stiffened cellulosic fibers and thermoplastic bonding material made by blending the stiffened fibers with the thermoplastic bonding material when in a fibrous form, forming the web, heating the web to melt the thermoplastic fibrous material, and cooling the web.

hereinafter described. Suitable superabsorbent material categories include polymeric absorbent gelling materials, typically utilized in the form of discrete particles, and superabsorbent fibers, such as acrylate grafted fibers and superabsorbent modified cellulosic fibers.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 represents a perspective view of a diaper with an absorbent core having the multiple layer configuration of the present invention. The absorbent core shown has a rectangular-shaped acquisition/distribution layer and an hour glass-shaped storage layer.

Figure 2 represents a perspective view of a diaper structure similar to Figure 1, but wherein the storage layer has a modified hour-glass shape.

Figure 3 represents a direct view of an absorbent core useful for diaper applications, such as in Figures 1 and 2, wherein the core has a modified hour glass-shaped storage core and a similar hour glass-shaped acquisition/distribution layer.

DETAILED DESCRIPTION OF THE INVENTION

The absorbent structures of the present invention can be utilized in disposable products which are capable of absorbing significant quantities of body fluids, such as urine and water in body wastes. Such articles may be prepared in the form of disposable diapers, adult incontinence briefs, adult incontinence pads and the like.

The absorbent articles herein generally comprise three basic structural components. One such component is a liquid impervious backsheet. On top of this backsheet is disposed an absorbent core which itself comprises two distinct layers, and which includes a superabsorbent material in one of the layers. On top of this absorbent core and joined to the backsheet is a water pervious topsheet. The topsheet is the element of the article which is placed next to the skin of the wearer. As used herein, the term "joined" encompasses configurations whereby the topsheet is directly joined to the backsheet by affixing the topsheet directly to the backsheet, and configurations whereby the topsheet is indirectly joined to the backsheet by affixing the topsheet to

polyolefins. Such topsheets can have tapered capillaries of certain diameter and taper positioned in the topsheet to permit flow of discharged fluid through the topsheet into the underlying absorbent core of the article.

The topsheets used in the articles of the present invention should be relatively hydrophobic in comparison with the absorbent core of said articles. Topsheet construction is generally disclosed in Davidson, U.S. Patent 2,905,176, Issued September 22, 1959; Del Guercio, U.S. Patent 3,063,452, Issued November 13, 1962; Holliday, U.S. Patent 3,113,570, Issued December 10, 1963, and Thompson, U.S. Patent 3,929,135; Issued December 30, 1975; which patents are incorporated herein by reference. Preferred topsheets are constructed from polyester, rayon, rayon/polyester blends, polyethylene or polypropylene. The topsheet can be treated with surfactant to make it more wettable and therefore relatively less hydrophobic, to thereby increase fluid flow through it at least upon initial wetting. However, the topsheet should still be more hydrophobic than the absorbent article element which receives fluids after passing through the topsheet.

An absorbent core, which is preferably flexible, is positioned between the elongated backsheet and the topsheet to form the absorbent articles herein. This core essentially comprises both an upper fluid acquisition/distribution layer and a lower fluid storage layer. It should be understood that for purposes of this invention these two types of layers refer merely to the upper and lower zones of the absorbent core and are not necessarily limited to single layers or sheets of material. Thus both the fluid acquisition/distribution layer and the fluid storage layer may actually comprise laminates or combinations of several sheets or webs of the requisite type of materials as hereinafter described. The storage layer can comprise a single sheet of essentially 100% superabsorbent material, as will be hereinafter described, or can include a carrier. As used herein, the term "layer" includes the terms "layers" and "layered." For purposes of this invention, it should also be understood that the term "upper" refers to the layer of the absorbent core which is nearest to and faces the article topsheet; conversely, the term

thereof and the like. Preferred synthetic fibers have a denier of from about 3 denier per filament to about 25 denier per filament, more preferably from about 5 denier per filament to about 16 denier per filament. Also preferably, the fiber surfaces are hydrophilic or are treated to be hydrophilic.

The average dry density of the fluid storage layer comprising nonsuperabsorbent fibers as superabsorbent material carrier means will generally be in the range of from about 0.06 to about 0.5 g/cm^3, and more preferably within the range of from about 0.10 to about 0.4 g/cm^3, even more preferably from about 0.15 to about 0.3 g/cm^3, most preferably from about 0.15 to about 0.25 g/cm^3. Typically the basis weight of the lower fluid storage layer can range from about 0.02 to 0.12 g/cm^2, more preferably from about 0.04 to 0.08 g/cm^2, most preferably from about 0.05 to 0.07 g/cm^2.

As with the acquisition/distribution layer, density and basis weight need not be uniform throughout the storage layer. The storage layer can contain regions of relatively higher and relatively lower density and basis weight. Also as with the acquisition/distribution layer, density values for the storage layer are calculated from basis weight and layer caliper measured under a confining pressure of 0.2 psi (1.43 kPa). Density and basis weight values include the weight of the superabsorbent material. Additionally, the storage layer can have a superabsorbent material gradient, such as with more superabsorbent material being present in regions of relatively high fluid handling requirements (i.e., near the region of fluid discharge) and less superabsorbent material at lower demand regions.

The superabsorbent material which is employed in the storage layer of the absorbent core will most often comprise a substantially water-insoluble, slightly cross-linked, partially neutralized, polymeric gelling material. This material forms a hydrogel upon contact with water. Such polymer materials can be prepared from polymerizable, unsaturated, acid-containing monomers. Suitable unsaturated acidic monomers for use in preparing the polymeric absorbent gelling material used in this invention include those listed in Brandt/Goldman/Inglin; U.S. Patent 4,654,039, Issued March 31, 1987, and reissued as RE 32,649

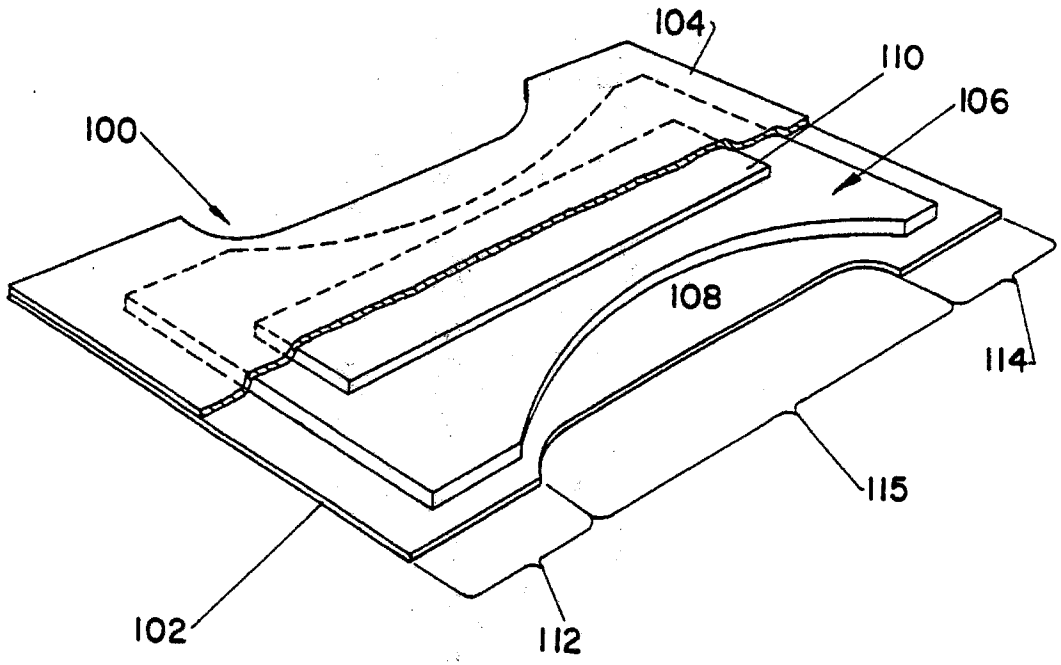


Fig. 2

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
DIVISION DE NUEVAS CREACIONES

2020

Abogado
EMILIO FERRERO

ASUNTO	Radicación	05-109272
	Trámite	011
	Evento	379
	Actuación	430
	Oficio	№ 15591
	Folios	021

Patente de Invención [x] Patente de Modelo de Utilidad [ ]

Vía Nacional [ ]

Vía PCT (fase nacional) [x] Cap.I [ ] Cap. II [x]

No. Sol. Internacional: PCT/SE2004/000048
Fecha de Presentación Internacional: enero 16 de 2004

Como resultado del examen de fondo, realizado con fundamento en el artículo 45 de la Decisión 486 de la Comisión de la Comunidad Andina, se le comunica:

1. Documentos estudiados

Descripción:	Folios: 30 a 64
Reivindicaciones:	Folios: 65 a 68
Dibujos:	Folios: 70 a 71
Prioridad:	26 de marzo de 2003, SE. No. 0300878-6

2. Objeto de la invención

- La Invención se titula **"ARTÍCULO ABSORBENTE QUE COMPRENDE UNA ESTRUCTURA ABSORBENTE"** (folio 1)

- El problema planteado en esta solicitud consiste en desarrollar un artículo absorbente delgado con propiedades mejoradas de adquisición, distribución y almacenamiento de fluidos.

  La solicitud en estudio presenta un artículo absorbente cuya estructura absorbente comprende una capa de adquisición de líquidos y una capa de almacenamiento que contiene materiales superabsorbentes; tiene una densidad mayor de 0.4 g/cm^3 en condición seca y presenta aberturas/canales en la porción de entrepierna.

3. De la solicitud de Patente

Reivindicaciones *(artículo 30 D 486)*

- La reivindicación 11 define un artículo absorbente caracterizado porque "el material de espuma **exhibe un valor de rigidez de Gurley que es inferior a 1000 mg**" (negrita personal)

  La frase en negrita señala el resultado a alcanzar con determinado material de espuma, es cual se obtiene mediante ciertas metodologías de medición. Es importante mencionar que las reivindicaciones deben caracterizar un producto por la forma o constitución del mismo, las partes que lo componen y todo lo que permita establecer cómo se llego a tales resultados. No se aceptan reivindicaciones que caractericen resultados, ventajas o efectos. Por lo anterior las frases en negrita deben eliminarse de la citada reivindicación.

- La reivindicación 13 cuya categoría es de producto, define dicho producto por el tratamiento al que se somete la capa de adquisición. Es importante aclarar que un producto debe definirse por sus características estructurales y no por la forma de obtenerse. Así las cosas, el solicitante debe realizar la correspondiente corrección.

En conclusión, el capítulo reivindicatorio no cumpliría con el requisito de claridad de acuerdo con el artículo 30 de la Decisión 486.

4. Determinación del Estado de la Técnica

Considerando que la fecha de presentación de la primera solicitud de patente de la cual se reivindica prioridad es: 26 de marzo de 2003, se buscaron documentos del estado de la técnica relacionados, con fecha de publicación anterior a esta.

N°	Documento	Título	Fecha de Publicación
D1	US 5,304,161	"ABSORBENT ARTICLE HAVING RAPID ACQUIRING, MULTIPLE LAYER ABSORBENT CORE"	19 de abril de 1994
D2	WO 91/11162	"ABSORBENT STRUCTURES CONTAINING THERMALLY-BONDED STIFFENED FIBER LAYER SUPERABSORBENT MATERIAL LAYER"	08 de agosto de 1991

5. Análisis de patentabilidad (según requisito) (artículo 14 D486)

El siguiente análisis de patentabilidad se realizó teniendo en cuenta las objeciones citadas en el numeral 3 de la presente comunicación

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Nivel inventivo *(artículo18 D486)*

Respecto al estado de la técnica

- El documento US 5,304,161 (llamado D1 de aquí en adelante) divulga un artículo absorbente (20) tal como un pañal, una protección de incontinencia, una toalla sanitaria o similar (columna 3, líneas 20-27) que define en la dirección longitudinal una región de entrepierna (30) y dos regiones de extremo 828 y 32) (columna 6, líneas 9-11), el cual comprende:
  - una lámina superior permeable al líquido (34) (columna 7, línea 36)
  - una estructura absorbente (42) (columna 7, líneas 37-38) constituida por una capa de adquisición (46) (columna 7, líneas 40-41) y al menos una primera capa de almacenamiento (48) (columna 7, línea 43) que contiene al menos un 50% en peso de material superabsorbente (columna 18, líneas 57-61), tiene una densidad igual a 0.183 g/cm^3 (columna 19, línea 7) y presenta aberturas (52) en la porción de entrepierna (columna 20, líneas 21-22).

- El documento WO 91/11162 (llamado D2 de aquí en adelante), enseña un artículo absorbente (100), tal como un pañal, protección de incontinencia y similar (página 8, líneas 20-25) que define en la dirección longitudinal una porción de entrepierna (115) y dos porciones de extremo (112 y 114) (página 44, figura 2), dicho artículo comprende:
  - una hoja superior permeable al líquido (104) (página 8, líneas 31-32)
  - un corazón absorbente (106) (página 8, línea 28) compuesto por una capa de adquisición (110) (página 10, línea 23) y al menos una capa de almacenamiento de fluidos (108) (página 10, línea 24) que contiene al menos un 50% en peso de material superabsorbente (página 10, líneas 31-32) y una densidad que excede 0.4 g/cm^3 (página 27, líneas 6-10)

Respecto a la solicitud en estudio:

- De acuerdo con la reivindicación independiente 1 de la solicitud en estudio, se entiende que el principio técnico sobre el cual se fundamenta la propuesta consiste en desarrollar un artículo absorbente cuya estructura absorbente comprenda una capa de adquisición y al menos una capa de almacenamiento que contenga material superabsorbente, exhiba aberturas y presente una determinada densidad. No obstante, en D1 se encuentra divulgado un artículo absorbente que comprende los mismos componentes con las características señaladas en la solicitud en estudio.

  La única diferencia entre la solicitud en estudio y D1 corresponde a la densidad de la capa de almacenamiento, ya que D1 utiliza materiales con densidades entre 0.09 cm^3 y 0.183 g/cm^3. No obstante, D2 indica una capa de almacenamiento de una estructura absorbente que tiene la densidad que define la solicitud en estudio.

  Así las cosas, un técnico de nivel medio versado en la materia que tuviera acceso a D1 y D2, podría verse motivado a desarrollar artículos absorbentes cuyas estructuras absorbentes comprendan una capa de adquisición y al menos una capa de almacenamiento con una densidad que excede 0.4 g/cm^3,

Dado lo anterior, la materia de invención propuesta en la solicitud en estudio, no representa un avance tecnológico o un salto cualitativo sobre el estado de la técnica.

En conclusión, la materia de invención de la solicitud se encuentra afectada en su nivel inventivo ya que se deriva de manera evidente del estado de la técnica y puede ser obvia para un técnico de nivel medio versado en la materia. Por tanto, no cumple con las disposiciones del artículo 18 de Decisión 486 de la Comisión de la Comunidad Andina.

6. Conclusión:

Los requisitos de patentabilidad de la presente solicitud se encuentran afectados así:

N°	Documento N°	Reivindicaciones Afectadas	Requisito que Afecta
D1	US 5,304,161	1-14	Nivel Inventivo
D2	WO 91/11162	1-14	Nivel Inventivo

En cumplimiento del artículo 45 de la Decisión 486 de la Comisión de la Comunidad Andina, se le indica que debe dar respuesta dentro del término de sesenta días contados a partir de la fecha de notificación de la presente comunicación. En caso de no dar respuesta al presente requerimiento, o si a pesar de la respuesta subsistieran los impedimentos para la concesión, se denegará la patente.

Notifíquese el presente oficio conforme a lo dispuesto en el numeral 5.2 literal e) del capítulo quinto del título primero de la Circular Única No. 10 de 2001.

ALIX CARMENZA CESPEDES DE VERGEL
Jefe de División de Nuevas Creaciones

El anterior requerimiento fue notificado por fijación en lista, de fecha 05 DIC. 2008

CONCEPTO TECNICO No. 3051	**EXAMINADOR TECNICO** Código No.202076