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SUPERINDUSTRIA Y COMERCIO
Radicación: 01101245 00000004 Folios: 2
Fecha (HH): 2004-09-30 16:24:03
Trámite: 002 PATENTES D 1 REGISTRO/ 530 PETICION
Dependencia: 2020 DIVISION DE NUEVAS CREACIONES

Señores
Superintendencia de Industria y Comercio
División de Nuevas Creaciones
E. S. D.

Ref: Expediente No 01-101.245
Solicitud de Patente de Invención denominada
"Ropa Interior desechable"
Solicitante: UNI-CHARM CORPORATION

Darío Cárdenas Navas, identificado como aparece al pie de mi firma y obrando en mi condición de apoderado de la sociedad **UNI-CHARM CORPORATION**, solicitante de la patente de invención mencionada en la referencia, solicito al Despacho se sirva proceder con el examen de patentabilidad de esta patente. Para tal fin adjunto el Recibo oficial No 04-76,998 por un valor de \$353.000.00.

Atentamente,



Darío Cárdenas Navas
C.C 17.066.629 de Bogotá
T.P. 1.250 del Consejo Superior de la Judicatura *OL*
Fol No P-191

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NIT : 800176089-2

SUPERINDUSTRIA Y COMERCIO
Radicacion : 81181245 00000004 Folios: 1
Fecha (AM): 2004-09-30 16:24:03
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Dependencia: ESEN DIVISION DE NUEVAS CREACIONES

RECIBO OFICIAL DE CAJA : 04 - 76,998
FECHA : SEPTIEMBRE 29 DE 2004

CONSIGNACION

DEPOSITANTE	TIPO PAGO	BANCO	CUENTA	No. PAGO	FECHA PGO	Vr. PAGO
CARDENAS Y CARDENAS P.I. CONSIGNACION		BANCO POPULAR	050-00110-6	22193321	29/09/2004	483,000.
CARDENAS Y CARDENAS P.I. CONSIGNACION		BANCO POPULAR	050-00110-6	28718311	29/09/2004	87,000.00

CONCEPTO

CANT. HISTORICO	CONCEPTO	TOTAL CONCEPTO
1 30003-01-01 SOLICITUDES	05 EXAMEN DE PATENTABILIDAD DE INVEN	333,000.00
	TOTAL :	0 333,000.00

SON: TRESCIENTOS CINCUENTA Y TRES MIL PESOS

RESPONSABLE : 

RECIBO DE CAJA APLICADO AL EXPEDIENTE No. _____

CARDENAS & CARDENAS
ABOGADOS

DIVISION DE NUEVAS CREACIONES

RADICACIÓN EXPEDIENTE No. 01-101245

EL EXTRACTO DE LA PRESENTE SOLICITUD DE PATENTE DE INVENCION FUE PUBLICADO

EN LA GACETA DE PROPIEDAD INDUSTRIAL No 538, DE FECHA 31 DE MARZO DE 2004, EL

TERMINO HABIL SEÑALADO POR LA LEY EXPIRA EL 01 DE JULIO DE 2004.

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**

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**SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
DIVISIÓN DE NUEVAS CREACIONES**

2020

Bogotá D.C., Diciembre 20 de 2005

Doctor

DARIO CÁRDENAS NAVAS

Apoderado UNI-CHARM CORPORATION

ASUNTO	Radicación	01-101245
	Trámite	002
	Evento	001
	Actuación	430
	Oficio	13989
	Folios	015

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:

- A. Para el presente estudio se tuvo en cuenta el capítulo descriptivo, comprendido en los folios 101 a 121 del expediente correspondiente a la solicitud en estudio, tal como fue radicado al inicio del trámite.
- B. Dibujos en los folios 129 a 136.
- C. El capítulo reivindicatorio tomado en cuenta para el presente estudio comprende 4 reivindicaciones y se encuentra en los folios 121 a 124, tal como fue radicado al inicio del trámite.
- D. Conforme lo establecen los artículos 9, 10 y 11 de la Decisión 486 de la Comisión de la Comunidad Andina, la presente solicitud en estudio fue presentada el 26 de noviembre de 2000, en el momento de la radicación se reclamó prioridad. La copia certificada de la solicitud cuya prioridad fue reivindicada (JP 2000-357938 del 24 de noviembre de 2000) aparece junto con su traducción del idioma japonés al idioma inglés en los folios 5 a 100.

2. Objeto de la Invención:

- A. Las reivindicaciones 1 a 4 de la solicitud en estudio se refieren a: ropa interior desechable que comprende una región frontal de cintura, una región posterior de cintura y una región de entrepierna que se extiende a través de estas regiones de cintura; un par de aberturas de pierna; miembros elásticos en dichas aberturas de pierna que comprende un primer miembro elástico que se extiende en un arco circular desde los respectivos bordes delanteros hacia atrás longitudinalmente; un segundo miembro elástico que se extiende en arco circular desde los respectivos bordes traseros hacia delante longitudinalmente; y miembros terceros elásticos que se extienden en dirección longitudinal a lo largo de las porciones de borde lateral transversalmente opuestas entre dichos primeros y segundos miembros elásticos; dicha ropa interior que además comprende: dicho primer miembro elástico tiene porciones primeras a ambos lados que se extienden en los respectivos bordes de dichas porciones de borde lateral transversalmente opuestas y una primera porción del centro que se extiende a través de dicha región de entrepierna; el segundo miembro elástico que tiene porciones segundas a ambos lados que se extienden en dichos borde traseros de dichas porciones de borde

lateral transversalmente opuestas y una segunda porción del centro en dirección longitudinal desde dicha primera porción del centro por medio de una dimensión suministrada y que se extiende a través de dicha región de entrepierna; y dichos terceros miembros elásticos se extienden respectivamente a lo largo de dichas porciones de borde lateral transversalmente opuestas describiendo de esta manera arcos circulares que son convexos hacia adentro transversalmente y que tienen unas primeras porciones conectoras que se extienden desde los respectivos puntos de ramificación entre dichas primeras porciones laterales en ambos lados y dicha primera porción central y que se unen con dichas primeras porciones de ambos lados y segundas porciones conectoras que se extienden desde la vecindad de los respectivos puntos de ramificación entre dichas segundas porciones de ambos lados y dicha segunda porción central y se une con dichas segunda porciones laterales de los dos lados.

- B. El objeto de la solicitud se puede clasificar según la clasificación internacional como C 07 F 9/00.

3. Claridad de la Solicitud:

- A. El artículo 28 de la Decisión 486 de la Comisión de la Comunidad Andina establece "la descripción deberá divulgar la invención de una manera suficientemente clara y completa para su comprensión y para que una persona capacitada en la materia técnica correspondiente pueda ejecutarla"

La traducción de la descripción es en general muy confusa, no es posible entender en qué consiste específicamente la invención, cuál de los elementos que tiene el pañal son nuevos y en qué consiste realmente su altura inventiva. Por ejemplo, no es claro qué significa "unir por tensión". Nótese por ejemplo la siguiente oración: "el pañal se suministra con una membrana unida por tensión al pañal para extenderse entre los bordes frontales de su lado opuesto respectivamente". No es claro qué significa "bordes frontales de su lado opuesto respectivamente". ¿Qué significa "respectivamente"? ¿"su lado" es el lado de qué?

Más adelante se expresa: "y que describe un arco circular". ¿Qué describe un arco circular? ¿la membrana elástica? No se entiende.

En la segunda página se puede leer: "membrana... que se extiende entre los bordes posteriores de los borde laterales". No se entiende qué es un borde posterior de un borde lateral. No es claro qué es un arco convexo hacia delante. ¿hacia delante de qué? También se habla de "una segunda porción media distanciada hacia atrás" en castellano no se entiende el significado de esas expresiones. Cuando se habla de distanciamiento habría que por lo menos especificar qué está distanciado de qué.

No se entiende qué significa la cercanía de los bordes. Cercanía es un concepto relativo. Lo que para alguien es cerca para otra persona puede no ser cerca. ¿Cercanía son milímetros, centímetros?

De acuerdo con lo anterior, la descripción no cumple con el requisito de claridad según lo establecido en el artículo 28 de la Decisión 486.

- B. En el artículo 30 de la decisión 486 de la Comisión de la Comunidad Andina se establece: "Las reivindicaciones definirán la materia que se desea proteger mediante la patente. Deben ser claras y concisas y estar enteramente sustentadas por la descripción. Las reivindicaciones podrán ser independientes o dependientes. Una reivindicación será independiente cuando defina la materia que se desea proteger sin referencia a otra reivindicación anterior. Una reivindicación será dependiente cuando

defina la materia que se desea proteger refiriéndose a una reivindicación anterior. Una reivindicación que se refiera a dos o más reivindicaciones anteriores se considerará una reivindicación dependiente múltiple." En el artículo 51 se establece además: "El alcance de la protección conferida por la patente estará determinado por el tenor de las reivindicaciones."

- i. El capítulo reivindicatorio no se encuentra correctamente redactado. Por su estructura todas las reivindicaciones deben constar de dos partes. Una primera parte, el preámbulo, sirve para situar el objeto de la invención dentro de un contexto técnico; es lo que se conoce y sobre lo cual no se reclama ningún privilegio. La segunda parte o parte característica, define lo que se considera novedoso y se desea proteger. Estas dos partes están separadas por expresiones como "caracterizado por" o similares. En las reivindicaciones, especialmente la 1 y la 4, no es posible saber sobre cuáles características está reclamando protección el solicitante.
- ii. Al igual que en la descripción, la traducción del texto es muy confusa. No se entiende qué significa "un par de aberturas de pluma definidas a las porciones de borde" ¿cómo así "definidas a las porciones"? tampoco se entiende qué es exactamente un miembro elástico asociado con una abertura. No se entiende qué significan "las porciones de borde lateral transversalmente opuestas". No se entiende qué significan los bordes de las porciones de borde. No se sabe cuáles son los bordes traseros.
- iii. El término "vecindad" es muy vago y no define con exactitud lo que se quiere proteger.
- iv. No es claro a qué se refiere el solicitante con la expresión "transversalmente opuestas hacia atrás longitudinalmente". No se entiende qué quiere decir el solicitante con las expresiones "hacia atrás" y "hacia delante". No es claro adelante o atrás de qué.
- v. No es claro cómo un material elástico se extiende en dirección longitudinal
- vi. No es claro qué es punto de ramificación.
- vii. En general, la redacción es muy confusa y se debe revisar totalmente la traducción. No se entiende cuáles son las porciones conectoras. En la página 22 se afirma que los terceros miembros elásticos tienen unas primeras porciones conectoras que se extienden desde una vecindad de los respectivos puntos de ramificación entre dichas primeras porciones laterales en ambos lados. ¿en ambos lados de qué? ¿cuáles son esas primeras porciones laterales?
- viii. La expresión "substancialmente" también es muy vaga y le resta concisión a la materia reivindicada.

De acuerdo con lo anterior, el capítulo reivindicatorio no cumple con el requisito de claridad según lo establecido en el artículo 30 de la Decisión 486. El solicitante deberá anexar un nuevo capítulo reivindicatorio totalmente corregido de tal manera que se entienda perfectamente sin lugar a dudas.

4. Determinación del estado de la técnica:

El artículo 16 de la Decisión 486 de la Comisión establece que: "El estado de la técnica comprenderá todo lo que haya sido accesible al público por una descripción escrita u oral, utilización, comercialización o cualquier otro medio antes de la fecha de presentación de la solicitud de patente o, en su caso, de la prioridad reconocida."

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"Solo para el efecto de la determinación de la novedad, también se considerará dentro del estado de la técnica el contenido de una solicitud de patente en trámite ante la oficina nacional competente, cuya fecha de presentación o de prioridad fuese anterior a la fecha de presentación o de prioridad de la solicitud de patente que se estuviese examinando, siempre que dicho contenido esté incluido en la solicitud de fecha anterior cuando ella se publique o hubiese transcurrido el plazo previsto en el artículo 40"

La fecha para determinar el estado de la técnica es el 24 de noviembre de 2000, tomando en cuenta la prioridad reivindicada.

En la medida en que se pudo entender de que se trata la solicitud se consultaron las bases de datos y los archivos con que cuenta la entidad, especialmente bajo las clasificaciones A 61 F 13/15, y se encontró que antes del 24 de noviembre de 2000 habían sido publicados los documentos enumerados en la siguiente tabla.

No.	Documento	Título	Fecha de publicación
D1	EP 0823 846 B1	Absorbent article	2000-09-20
D2	US 5,830,203	Absorbent article	1998-11-03

5. Evaluación de los requisitos de patentabilidad:

El artículo 14 de la Decisión 486 de la Comunidad Andina establece que: *"Los Países Miembros otorgarán patentes para las invenciones, sean de producto o de procedimiento en todos los campos de la tecnología, siempre que sean nuevas, tengan nivel inventivo y sean susceptibles de aplicación industrial"*.

En cumplimiento del artículo 14 de la Decisión 486, se procedió a evaluar los requisitos de novedad, nivel inventivo y aplicación industrial con el fin de establecer la patentabilidad del objeto de la solicitud reivindicado en la solicitud en estudio.

A. Evaluación de la Novedad:

El artículo 16 de la decisión 486 de la Comisión de la Comunidad Andina establece:

"Una invención se considerará nueva cuando no esté comprendida en el estado de la técnica." "El estado de la técnica comprenderá todo lo que haya sido accesible al público por una descripción escrita u oral, utilización, comercialización o cualquier otro medio antes de la fecha de presentación de la solicitud de patente o, en su caso, de la prioridad reconocida."

En la medida que se pudo entender el objeto de la solicitud, el documento D1 revela también un pañal con tres elementos elásticos como el reclamado por el solicitante. Ver específicamente la columna 8 en las líneas 8 a 19, en las cuales se mencionan los tres elementos elásticos que caracterizan al objeto reivindicado.

El documento D2 también habla de un pañal que tiene los mismos tres elementos elásticos que caracterizan al objeto reivindicado. Ver el dibujo 7 y la columna 4 hasta la 5.

Así las cosas, la novedad del objeto reivindicado se ve afectada y por lo tanto no cumple con lo exigido en el artículo 16 de la decisión 486.

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B. Evaluación del nivel inventivo:

El artículo 18 de la Decisión 486 de la Comisión de la Comunidad Andina dispone que: "Se considerará que una invención tiene nivel inventivo, si para una persona del oficio normalmente versada en la materia técnica correspondiente, esa invención no hubiese resultado obvia ni se hubiese derivado de manera evidente del estado de la técnica".

Hasta donde se pudo entender el objeto de la solicitud, el nivel inventivo del objeto solicitado también se ve afectado por lo divulgado en D1 y D2 porque el problema técnico planteado en la solicitud se resuelve de la misma manera: contar con una serie de elementos elásticos que ajustan la prenda hacia el cuerpo del usuario.

Por lo tanto, la solicitud en estudio no cumple con el requisito de nivel inventivo establecido por el artículo 18 de la Decisión 486.

C. Resumen

En conclusión los requisitos de patentabilidad de la presente solicitud podrían encontrarse afectados así:

No.	Documento	Reivindicaciones afectadas	Requisito afectado
D1	EP 0823 846 B1	1 a 4	Novedad y nivel inventivo
D2	US 5,830,203	1 a 4	Novedad y nivel inventivo

Se anexa copia de las anterioridades mencionadas.

6. Notificación

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 la 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.



CLARA CECILIA CASTELLANOS DE JAIMES
Jefe de la División de Nuevas Creaciones (E)

El anterior requerimiento fue notificado por fijación en lista, de fecha 29 DIC. 2003.

CONCEPTO TÉCNICO Número: 2030	EXAMINADOR TÉCNICO Código: 202043
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(19)



Europäisches Patentamt

European Patent Office

Office européen des brevets



(11) EP 0 823 846 B1

(12)

EUROPEAN PATENT SPECIFICATION

- (45) Date of publication and mention of the grant of the patent:
20.09.2000 Bulletin 2000/38

(51) Int Cl.7: A61F 13/15

(21) Application number: 98912388.0

(86) International application number:
PCT/SE98/00501

(22) Date of filing: 18.04.1998

(87) International publication number:
WO 98/34588 (07.11.1998 Gazette 1998/48)

(54) ABSORBENT ARTICLE

ABSORBIERENDER ARTIKEL

ARTICLE ABSORBANT

(84) Designated Contracting States: DE ES FR GB IT NL SE (30) Priority: 03.05.1995 SE 9501619 (43) Date of publication of application: 18.02.1998 Bulletin 1998/08 (73) Proprietor: SCA Hygiene Products AB 405 03 Göteborg (SE)	(72) Inventor: FERNFORB, Ingemar S-431 38 Mölndal (SE) (74) Representative: Harrison, Michael Charles Albühne GmbH, Grasserstrasse 10 80339 München (DE) (56) References cited: EP-A- 0 437 771 GB-A- 2 276 529
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Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

EP 0 823 846 B1

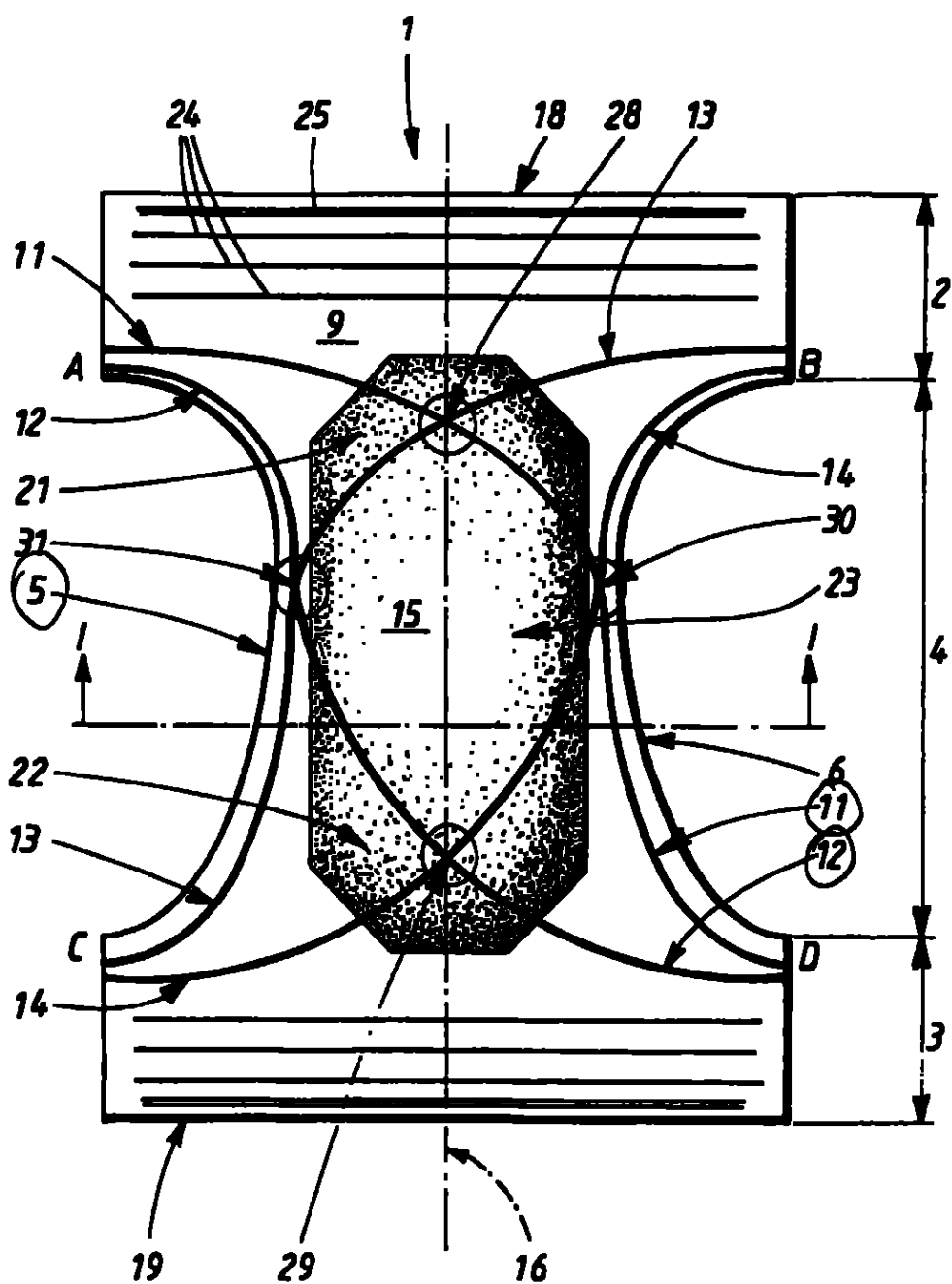


FIG. 1

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gion. Since the tension is transferred from the elastic elements to the absorbent core, this tends to bulge and rise up along the contour of the collection region, this creating a bowl-shaped basin for collection of fluids and faeces.

[0020] The invention will now be described in more detail with reference to embodiments depicted in the accompanying drawings.

Brief description of the drawings

[0021] Fig. 1 of the drawings depicts a pair of absorbent pants in a planar extended state, said absorbent pants not having been attached together into their pants form.

[0022] Fig. 2 shows a cross-section of the same absorbent pants along line I-I in Fig. 1.

[0023] Fig. 3 shows the absorbent pants in a condition of use.

Description of embodiments

[0024] An article for the collection of urine or faeces which is particularly representative for the invention has been chosen as an embodiment, namely a pair of absorbent pants, primarily intended to be worn by adult persons who suffer from incontinence, for example sudden-incontinence.

[0025] The absorbent pants comprise a frontal waist portion 2 intended to contact the user's stomach during use, a rear waist portion 3 intended to be in contact behind the user's back and a crutch region 4 positioned between the frontal and rear waist regions, said crutch region being intended to cover the comparatively narrow space of the user's lower pelvis between the groin creases and the inside of the thighs.

[0026] In order to be described more easily, the absorbent pants 1 are shown in a planar extended state, i.e. not attached in the form of a pair of pants. In reality the absorbent pants do not look like this, neither when they are being taken out of a packet nor when they are in use. In these instances the absorbent pants instead resemble a pair of normal, somewhat thick, underpants. The extended state in Fig. 1 may however possibly be present during production of a pair of absorbent pants according to the invention.

[0027] The crutch region 4 of the absorbent pants 1 is normally narrower than the waist regions 2, 3. The side edges of the crutch region gradually converge from the frontal waist region to the article's narrowest portion which is somewhat displaced with respect to the article's lateral central axis, whereafter the width of the crutch region increases successively towards the rear waist portion. The side edges of the crutch region are to follow the shape of the user's trunk from the frontal part of the hips along the converging lines of the groin creases to the inside of the thighs and thereafter diverge around the rear part of the thighs and up to the rear part of the

hips. In the extended state, the absorbent pants 1 thus present the contours of a somewhat asymmetrical hour-glass around the central lateral axis 17.

[0028] Each waist region 2, 3 has two side edges orientated in the article's longitudinal direction and one end edge extending in the article's lateral direction. The frontal end edge 18 and the rear end edge 19 are preferably the same length. The side edges of the waist regions extend by the same amount in the shown embodiment.

[0029] The crutch region 4 of the absorbent pants 1 is longer in the article's length direction than each waist region 2, 3. The length of the crutch region 4 suitably constitutes between half and three-quarters of the article's total length, preferably about two thirds of the article's total length.

The crutch region 4 is narrower than the other parts of the article and its smallest part suitably constitutes about one third of the article's total width. The lateral dimension of the absorbent pants 1 is constant in the waist area. The side edges of the crutch region 4 assume an even concave arc on either side of the article's central longitudinal axis; an arc which basically describes a semicircle or a half-ellipse and is dimensioned to surround the user's thighs during use.

The absorbent pants 1 are made up of three different layers 7, 8, 20 and absorbent core 9. The absorbent pants thus comprise an inner, fluid-permeable layer (sheet) 7 of, for example, hydrophillic fibrous material, so-called "non-woven", comprising fibres of e.g. polyethylene, polypropylene, polyester or mixtures of these, which inner layer 7, during use, faces inwardly towards the side of the absorbent core 9 directed towards the user.

The inner layer 7 might also consist of, or comprise, viscose fibres or it might be constituted by a perforated plastic film, a plastic net, or a sheet of fluid-permeable foam material.

[0030] Additionally, the absorbent pants present a fluid-impervious, or at least fluid-repelling fluid-barrier layer 8 of plastic material, for example polyethylene or a hydrophobic fibre material, possibly a fibre material which has been suitably impregnated, or alternatively another suitable material, said fluid-barrier layer 8 being intended to be affixed to the side of the absorbent core 9 which, during use, faces away from the user.

A third layer 20, in the following referred to as the outer layer 20, of fibre material or the like for example, is fastened or laminated onto the side of the fluid-barrier layer 8 which faces away from the absorbent core 9. The outer layer 20 has the primary purpose of giving the outside of the absorbent pants 1 a textile-like guise, at least to the touch but also to a certain extent with respect to its appearance.

[0031] The absorbent pants 1 also comprise, as already mentioned, an elongated absorbent core 9 in the longitudinal direction of the article, said core 9 being enclosed between the inner layer 7 and the outer layer 20.

The extent of the inner layer 7 coincides with the total extent of the absorbent pants and is joined, by means of adhesive, heat-sealing, ultra-sound welding or another suitable conventional method, to the fluid-barrier layer

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er 8 and to the outer layer 20. The layers 7, 8, 20 are joined over the surfaces which extend outside the absorbent core 9 and together thereby form an envelope which encloses the absorbent material. The absorbent core 9 can for example contain cellulose fibres and can even comprise other absorbent materials such as polymeric hydrocolloidal materials, in particle form for example. Such materials, generally known under the name "superabsorbents" have the capacity to absorb many times their own weight of fluid. The absorbent core 9 can also contain non-absorbent materials such as thermoplastic fused-fibres having the purpose of strengthening the absorbent core 9 or improving its tendency to spring back after having been subjected to compression in a package, or in connection with use. The absorbent core 9 can advantageously be made up of a plurality of different layers of absorbent material, or of different regions which present mutually different characteristics with regard to their capacity for absorbing, spreading and storing fluid. The absorption speed can be raised in the receiving zone by a suitable choice of fibre structure, whilst the capacity to store and retain fluid can be improved in parts of the absorbent core 9 which do not lie in direct contact with the receiving zone and towards which fluid can be spread, by using a higher amount of superabsorbent.

[0032] The absorbent core 9 further presents a frontal end portion 21, a rear end portion 22 and a central portion 23 positioned therebetween, two side edges and two end edges. The shape of the absorbent core is substantially rectangular, possibly with somewhat wider end portions 21, 22 and a somewhat narrowing central portion 23 in comparison thereto. The absorbent body 9 is narrower and shorter than the inner layer 7 and suitably, as shown in Fig. 1, displaced forwardly in the absorbent pants 1, whereby the frontal end portion 21 of the absorbent core 9 extends over a part of the frontal waist portion 2 of the absorbent pants 1 and the absorbent core's central portion 23 is arranged in the crotch region 4 of the absorbent pants.

[0033] The fluid-barrier layer 8 does not have the same extent in the lengthwise direction as the inner layer 7, but instead extends only to a point just outside the end edges of the absorbent core 9, whereby large parts of the rear portion of the absorbent pants are not covered by fluid-proof material, which is something which allows and facilitates air permeability through these parts. The fluid-barrier layer 8 can of course extend over substantially the total area of the article in order to ensure a better protection against leakage. In such a case, the outer fluid-imperious layer 8 should consist of an air-permeable and vapour-permeable material or should be provided with perforations over parts of the regions which do not cover the absorbent core 9.

[0034] The textile-like outer layer 20 and the fluid-barrier layer 8 are suitably united with one another over the whole common area of the layers, by lamination using any suitable conventional method, such as gluing, heat-

sealing, ultra-sound welding, extrusion-coating or similar. The textile-like rear layer consists of a vapour-permeable material and extends over the whole rear side of the article. The inner layer 7 and the outer layer 20 can be constituted of like materials and be connected with each other over those parts of the article which extend outside the absorbent core 9.

[0035] A plurality of elastic elements 24, for example threads, strips or the like are attached in a stretched state across the frontal as well as the rear waist region 2, 3. The number of elastic elements 24 can vary and is by no means limited to that depicted in the figures. The elastic elements 24 are continuously or intermittently attached with adhesive, or attached in another suitable way, between the inner layer 7 and the textile-like outer layer 20, or joined to at least one of the inner layer 7, the fluid-barrier layer 8 or the outer layer respectively, across the frontal waist region 2 and the rear waist region 3.

[0036] In accordance with an alternative embodiment, the inner layer 7 is folded over along the article's end edges 18, 19, over the whole of, or at least part of, the waist regions 2, 3, whereby the elastic elements 24 are attached in the fold which is thereby formed in the inner layer 7.

[0037] By means of the elastic elements 24, both the waist regions 2, 3 of the absorbent parts 1 are given an elasticity and stretchability such that, during use, they sealingly surround the user's waist in a close and pliant manner. Instead of the elastic threads or strips, a sheet or a net of elastically extensible material, such as an elastic fibre material or foam material, can of course be laminated over at least parts of the two waist regions 2, 3. Such an elastically extensible film can for example comprise ethylene-vinyl-acetate, ethylene-acrylic acid, ethyl-butylacetate, polyurethane, styrene-butadiene, polybutadiene, polyisoprene, isoprene rubber or ethylene-propylene rubber.

[0038] The waist regions 2, 3 of the absorbent pants further comprise elastic elements 25, attached along respective end edges 18, 19 of the article. These elements 25 can also be pre-tensioned attached threads, strips or the like. They however preferably exhibit larger stretching and contraction forces than the separate elastic elements in the aforementioned elasticated stretchable waist regions 2, 3. As an alternative to providing the waist regions 2, 3, with elastic elements 24, 25, the waist regions 2, 3 can be constituted by an elastically stretchable material.

[0039] The absorbent pants 1 further comprise an array of elastic elements which also extend in the article's central portion 4 and which basically have the purpose of creating sealing edges surrounding the user's legs in use and also forming a bowl-shaped region in the middle of the absorbent pants crotch region 4, intended to collect excreted fluid. The bowl-shaped region coincides substantially with the so-called receiving zone/region of the absorbent pants, which is the part of the absorbent

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pants crutch region 4 which during use is first wetted by the bodily fluid excreted into the article.

[0040] The crutch region 4 of the absorbent pants presents two side edges 5, 6, which are substantially semi-circularly, or semi-elliptically, curved in a concave manner with respect to the central longitudinal axis of the article, said edges 5, 6 constituting the article's first and second leg edge-portions 5, 6. The crutch region 4 of the absorbent pants also presents four corners A, B, C, D; namely a first corner A positioned on the borderline between the first side edge of the frontal waist region 2 and the first leg edge-portion 5; a second corner B positioned on the borderline between the second side edge of the frontal waist region and the second leg edge-portion 6; a third corner C positioned on the borderline between the first side edge of the rear waist region 3 and the first leg edge-portion 5, as well as a fourth corner D positioned on the borderline between the second side edge of the waist region 3 and the second leg edge-portion 6.

[0041] Elastic elements 10 are attached along at least four different curved paths 11, 12, 13, 14, of which a first path 11 and a second path 12 extend from the first side edge of the frontal waist region to the opposite side edge of the rear waist region, from a point close to the first corner A to a point close to the fourth corner D, i.e. basically diagonally over the article's crutch region 4 along different routes from the frontal part of the first leg edge-portion 5 to the rear part of the second leg edge-portion 6. A third path 13 and a fourth path 14 run from the first side edge of the rear waist region to the opposite side edge of the frontal waist region, from a point close to the third corner C to a point close to the second corner B, i.e. basically diagonally over the article's central region 4 along different routes from the rear part of the first leg edge-portion 5 to the frontal part of the second leg edge-portion 6.

[0042] The first path 11 extends, as can best be observed in Fig. 1, from a point close to the first corner A in an evenly-curved arc to an intersection point 28. The first path 11 and the third path 13 meet at the intersection point 28 which is positioned on, or in the immediate vicinity of, the article's central longitudinal axis 16 on a level with the front portion 21 of the absorbent core. The first path 11 thereafter curves from the intersection point 28 towards the other leg edge-portion 6 and crosses the fourth path 14 at its point of inflection 30, positioned close to the second leg edge-portion 6 on a level with the article's narrowest portion. By "point of inflection" is meant the point where the radius of curvature of a curve changes sign, i.e. where the curvature of the curve shifts from being convex to concave, or vice-versa.

[0043] The first path 11 substantially follows the rear part of the second leg edge-portion 6 from the point of inflection 30, along the arc-shaped contour up to a point close to the fourth corner D.

[0044] The second path 12 basically follows the front portion of the first leg edge-portion 5, along its arc-

shaped contour, from a point near to the first corner A to a point of inflection 31 positioned close to the border of the first leg edge-portion 5, on a level with article's narrowest part. Both points of inflection 31, 31 lie at the same level on either side of the article's central longitudinal axis 16.

[0045] The second path 12 crosses the third path 13 at the point of inflection 31 and then curves in a direction towards the article's central longitudinal axis 16. The second path 12 crosses the fourth path 14 at an intersection point 29 positioned on, or in the immediate vicinity of, the article's central longitudinal axis 16 on a level with the rear portion 22 of the absorbent core, whereafter the second path curves to a point close to the fourth corner D.

[0046] The third path 13 is a mirror image of the first path 11, or more precisely expressed is a 180° rotation of the first path 11 around the article's central longitudinal axis 16. The fourth path 14 is similarly a 180° rotation of the second path 12 around the article's central longitudinal axis 16.

[0047] Consequently the four paths 11, 12, 13, 14, in Fig. 1 form a configuration in accordance with the following:

[0048] The first path 11 starts in the article's lateral direction from the first side edge of the frontal waist region 2, at the frontal portion of the first leg edge-portion 5 and then curves continuously, i.e. deviates gradually from the lateral direction, to its point of inflection 30. At the point of inflection 30, the direction of path 11 is tangential to the contour of the leg edge-portion 6, after which the path 11 curves around the rear part of the second leg edge-portion 6 to the second side edge of the rear waist region 3 where the path is again directed laterally to the article. At its point of inflection 30, the path forms an angle of between 45 and 90 degrees, preferably between 60 and 80 degrees, to the article's lateral direction. The second path 12 starts in the article's lateral direction from the first side edge of the frontal waist region and curves around the frontal part of the first leg edge-portion 5 to its point of inflection 31 which is positioned close to the first border of the first leg edge-portion 5 on the same level as the point of inflection 30 of the first path 11.

[0049] The first and second paths 11, 12, basically have the same direction at respective points of inflection 30, 31. The second path thereafter curves over the rear portion of the absorbent core to the second side edge of the rear waist region. The third path and the fourth path 13, 14, are mirror images of the second and first path 12, 11, respectively.

[0050] At least a part of each path runs over the absorbent core. The first path 11 crosses the fourth path 14 outside the side edge of the absorbent core at the point of inflection 30. The second path 12 crosses the third path 13 outside the opposite side edge of the absorbent core at the point of inflection 31. The first and the third paths 11, 13 have their intersection point 28 in

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the frontal part 21 of the absorbent core and the second and fourth paths 12, 14 have their intersection point 29 in the rear part 22 of the absorbent core. In this way, the four different paths 11, 12, 13, 14 enclose a region 15 positioned in the article's crutch region 4, which region 15 basically has the form of a rhombus with convex curved sides and which is determined by the four points 28, 30, 29, 31.

[0051] The above-defined, curved rhombus-shaped area of the receiving zone is symmetrical about the article's central longitudinal axis. The short diagonal of the rhombus extends in the article's lateral direction over the narrowest part of the crutch region between the leg edge-portions 5, 6, whilst its long diagonal runs over the absorbent core along the article's central longitudinal axis between the front and rear part of the absorbent core. This curved rhombus-shaped region constitutes the article's collection region 15 and is intended, during use, to temporarily retain the portion of the fluid which is not immediately taken up by the absorbent material.

[0052] It is therefore desirable to give the collection region 15 a bulging bowl-shape primarily for preventing the fluid from running out sideways towards the leg edge-portions 5, 6. One or more elastic elements 10 such as threads, strips or the like are attached in a pre-tensioned state substantially along the four different paths 11, 12, 13, 14 and these exert a contracting tension directed towards the respective radii of curvature.

[0053] In a preferred embodiment, the two elastic elements 10, for example consisting of flat elastic strips, are arranged along each path, said elements being joined to at least one of the layers 7, 8, 20. The strips are preferably attached between the fluid-barrier layer 8 and the outer textile-like layer 20 and tensioned over its whole extent. The strips are continuously, or intermittently, fixedly adhered to at least the outer textile-like layer 20. The strips can of course be affixed with other conventional methods.

[0054] The elastic strips can also be attached to the inside of the article, i.e. on the side of the inner layer 7 which faces the absorbent core 9, which is something that gives rise to certain advantages with regard to the desire of giving the collection zone 15 an outwardly-bulging shape, but which however increases the risk of skin irritation.

[0055] In a preferred embodiment, at least two elastic threads or strips are attached to the side of the outer, textile-like sheet 20 which faces the fluid-barrier layer 8. The separation distance of the strips can be constant or it can vary along the respective path. In a preferred case, the separation distance of the strips varies proportionally with the angle which the path forms with the article's lateral direction. The separation distance between the strips consequently has its greatest value at the path's respective point of inflection where the strips can be separated by an amount of between one millimetre up to many centimetres, preferably between three millimetres and fourteen millimetres. In the vicinity of the side

edges of the waist regions 2, 3 the separation distance is suitably reduced.

[0056] In an alternative embodiment, a plurality of elastic strips can be arranged along each path. The distance between the innermost and outermost strips running along one and the same path should then be sufficiently large in order to raise up the leg edge-portions towards the inside of the article and thereby form leakage barriers on either side of the absorbent core.

[0057] The different elastic elements which run along one and the same path may additionally be attached with different tensions, or may be pre-tensioned with varying tensions in different segments of the path. The points of inflection 30, 31 do not have to be positioned outside the absorbent core's side edges but can just as well be positioned inside these. In the same way, the intersection points 28, 29 can lie outside the end edges of the absorbent core or in respective waist regions.

[0058] At least one of the different elastic elements which run along one and the same path can, in those places where the path is tangential to the edges of the absorbent core, extend inside the absorbent core whilst the remaining elements run outside of this.

[0059] The collection region 15 is, as already stated, surrounded by four segments of elastic paths 11, 12, 13, 14 and thereby also bordered by the pre-tensioned attached elastic elements 10 which exert a contracting force along its whole contour. In this way a closed elastic circuit is created which tends to be drawn together into its relaxed state. Whether the elastic elements 10 are arranged on the outside or the inside of the absorbent core 9, the same will bulge under the influence of the elastic circuit's contracting force. At each point, the contracting elastic force is directed along the path and consequently has a tangential component and a radial component directed perpendicularly to this. The former is directed along the path's tangent at the point of action and the latter points along the radius of curvature. The tangential components cooperate in order to shrink the perimeter of the collection region. Since the edges of the collection region are curved in a convex manner, all of the radial force components act towards the interior of the collection region.

[0060] Since the elastic elements are directly or indirectly united with the absorbent core's flexible material, the force can be transferred to the same. For example, at the intersection points 28 and 29, the resultant of the cooperating radial force components from the paths 11 and 13 and 12 and 14 respectively will point along the article's central longitudinal axis towards the centre of the collection region. In the same way, one can easily be assured that the resultant forces from the cooperating radial components at the points of inflection 30 and 31 will point in the lateral direction towards the centre of the collection region.

[0061] Since the collection region is symmetrical, the radial force components from both sides cancel out each other along the article's central longitudinal axis,

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US005830203A

United States Patent [19]
Suzuki et al.

[11] **Patent Number:** **5,830,203**
[45] **Date of Patent:** **Nov. 3, 1998**

[54] **ABSORBENT ARTICLE AND METHOD OF MANUFACTURING THE SAME**
[75] **Inventors:** **Miyako Suzuki, Kanagawa; Hiroaki Fukui, Saitama, both of Japan**
[73] **Assignee:** **Paragon Trade Brands, Inc., Norcross, Ga.**
[21] **Appl. No.:** **674,815**
[22] **Filed:** **Jul. 3, 1996**

Related U.S. Application Data

[63] **Continuation-in-part of Ser. No. 248,423, May 24, 1994, abandoned.**
[51] **Int. Cl.⁶** **A61F 13/15; B32B 23/02**
[52] **U.S. Cl.** **604/385.2; 604/358; 604/378; 604/385.1; 428/192**
[58] **Field of Search** **604/378, 385.1, 604/385.2, 393, 394, 395, 396, 397, 398; 428/192**

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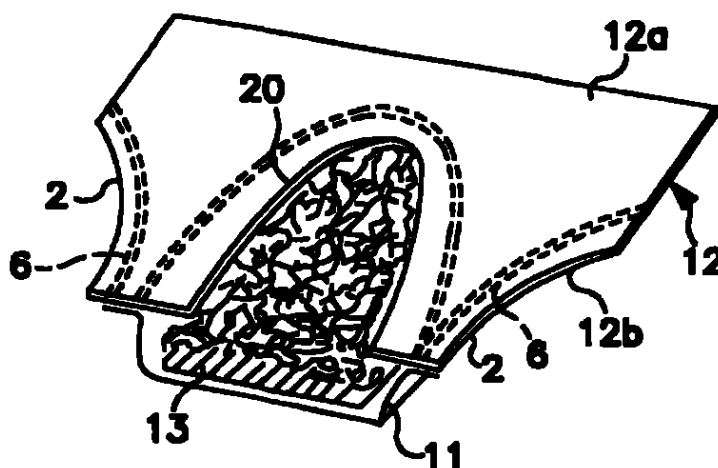
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[57] **ABSTRACT**

An absorbent article incorporating a main body which has a waist hole and a pair of leg holes, and comprises a topsheet positioned in a facing relation to a wearer's body, a backsheet positioned opposite thereto, and an absorbent core interposed between the backsheet and the topsheet. The topsheet is a composite which comprises two layers of sheet material and two elastic members sandwiched between the two sheets of material. The topsheet further has communicating means disposed in a crotch region of the absorbent article for receiving body exudates. The communicating means is surrounded by the elastic members which form leg gathers, and serves as a passage to communicate body exudates to a space defined between the topsheet and the backsheet. The absorbent article of the present invention can provide excellent flexibility, a snug fit and comfort to a wearer during use, while effectively preventing leakage from the leg gathers.

4 Claims, 9 Drawing Sheets



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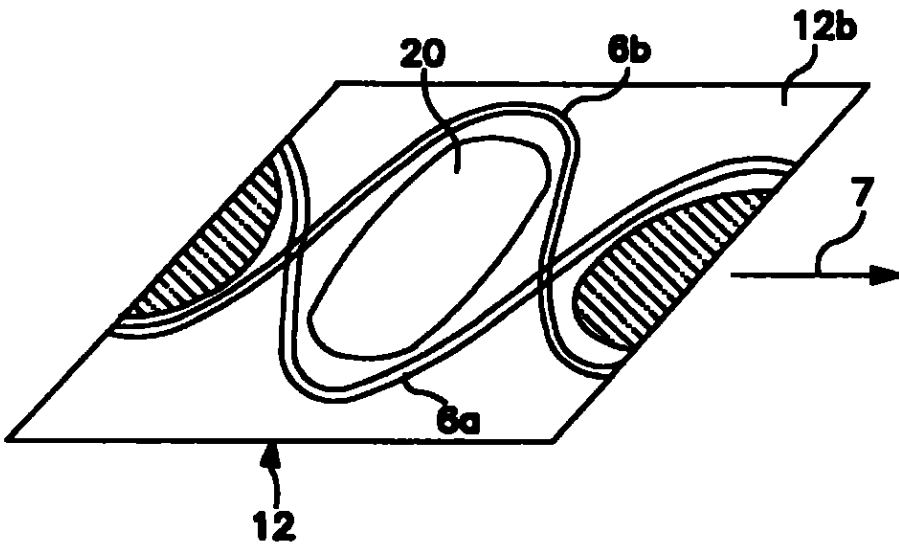


FIG. 6

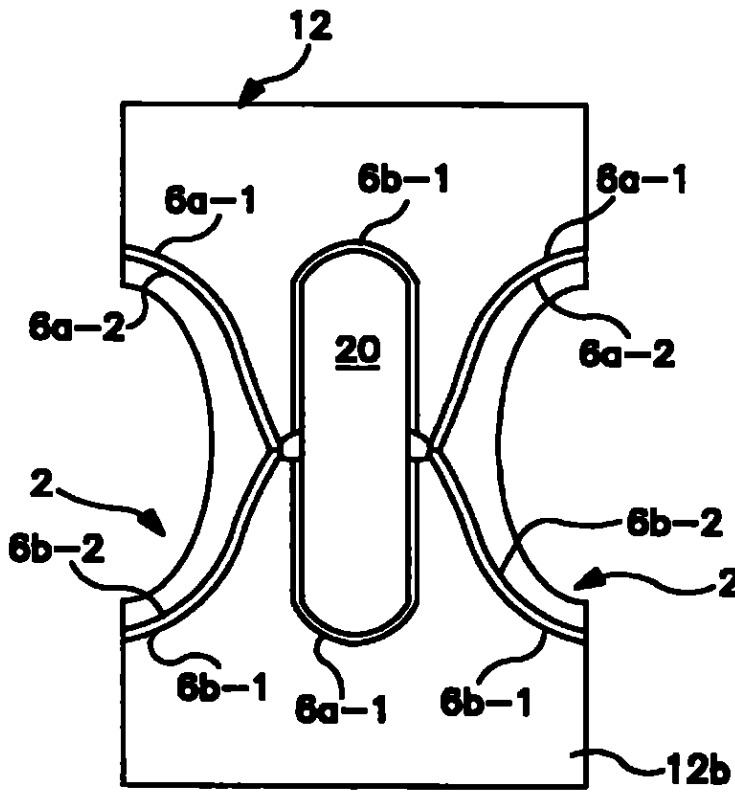


FIG. 7

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are not viewed or observed from outside the article. This helps provide the article with a good appearance in its crotch region.

One embodiment of the present invention will be explained hereinafter with reference to the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view illustrating one embodiment of an absorbent article in accordance with the present invention.

FIG. 2 is a developed plan view of the absorbent article of FIG. 1.

FIG. 3 is a cross-sectional view taken along a line A—A of FIG. 2.

FIG. 4 is a cross-sectional view taken along a line B—B of FIG. 2.

FIG. 5 is a fragmentary enlarged, perspective view of the absorbent article of FIG. 1.

FIG. 6 is a perspective view illustrating the positional relationship of a topsheet and elastic members incorporated in the absorbent article.

FIG. 7 is a developed, plan view illustrating a topsheet incorporated in a second embodiment of the absorbent article in accordance with the present invention.

FIG. 8 is a developed, plan view illustrating a topsheet incorporated in a third embodiment of the absorbent article in accordance with the present invention.

FIG. 9 is an explanatory view illustrating the positional relationship of sheet materials and elastic members during a process of manufacturing the topsheet of FIG. 8.

FIG. 10 is a developed, plan view illustrating a topsheet incorporated in a fourth embodiment of the absorbent article in accordance with the present invention.

FIG. 11 is a developed, plan view illustrating a topsheet incorporated in a fifth embodiment of the absorbent article in accordance with the present invention.

FIG. 12 is a developed, plan view illustrating a topsheet incorporated in a sixth embodiment of the absorbent article in accordance with the present invention.

FIG. 13 is a developed, plan view illustrating a topsheet incorporated in a seventh embodiment of the absorbent article in accordance with the present invention.

FIG. 14 is an enlarged, cross-sectional view taken along a line C—C of FIG. 13.

FIG. 15 is a developed, plan view illustrating a topsheet incorporated in an eighth embodiment of the absorbent article in accordance with the present invention.

FIG. 16 is a cross-sectional view taken along a line D—D of FIG. 15.

FIG. 17 is a developed, plan view illustrating a topsheet incorporated in a ninth embodiment of the absorbent article in accordance with the present invention.

FIG. 18 is a cross-sectional view taken along a line E—E of FIG. 17.

FIG. 19 is a cross-sectional view taken along a line F—F of FIG. 17.

FIGS. 20 to 23 illustrate other absorbent articles embodying the present invention in cross section to reveal the structure of a portion of the leg gather at one side of an article.

DESCRIPTION OF THE PREFERRED EMBODIMENT

FIG. 1 is a perspective view illustrating one embodiment of a tapeless absorbent article in accordance with the present

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invention. FIG. 2 is a plan view illustrating the absorbent article of FIG. 1 prior to folding and sealing the respective side panels thereof to each other.

The absorbent article as illustrated in FIG. 1 comprises a main body 10 of a pant-type which has a waist hole 1 and a pair of leg holes 2. The main body 10 includes a waist gather 3 disposed along the periphery of the waist hole 1, and a leg gather 4 disposed along the periphery of each of the leg holes 2. The leg gather 4 is formed by the contracting force of a number of elastic members 6 incorporated therein. A reference numeral 5 indicates elastic members optionally provided for improved fitting of the main body to a waist portion of a wearer.

The main body 10 comprises a backsheet 11 formed of liquid impermeable material, a topsheet 12 formed of liquid impermeable material, preferably hydrophobic material, and an absorbent core 13 interposed therebetween.

As illustrated in FIGS. 3 through 5, the topsheet 12 comprises a first layer 12a positioned in facing relation to a wearer's body, and a second layer 12b positioned in facing relation to the backsheet 11. A communicating means, such as a through aperture 20 is disposed in a crotch area of the garment located between the pair of leg holes 2.

In the illustrated embodiment, the elastic members 6 extend inwardly of and along right and left contoured edges of the absorbent article to form the pair of right and left leg gathers 4, and comprise separate, first and second elastic members 6a, 6b.

The elastic members 6 generally comprise a number of parallel rubber threads, or strands, to form a leg gather that is flexible and has sufficient elastic contractibility to provide leakage protection. Each elastic member 6a, 6b can generally be considered a unitary and integral group of rubber threads, although particular designs may separate an elastic member into separate rubber threads.

In the illustrated example, the first elastic member 6a meets or crosses the second elastic member 6b at a midpoint of one of the leg holes 2, and continuously extends therefrom along a half peripheral portion of the aperture 20 to a midpoint of the other of the leg holes 2. From the midpoint, the first elastic member 6a further extends to one end of the other of the leg holes 2. The second elastic member 6b is disposed to extend like the first elastic member 6a, but with its orientation being reversed therefrom. The first and second elastic members 6a, 6b are bonded in sandwiched relationship between the first and second layers 12a, 12b.

Explaining further, the first elastic member 6a extends along a periphery of a first leg hole from the first end thereof to a midpoint thereof, continuously extends therefrom along one portion of the periphery of the communicating means, or aperture, 20 to a midpoint of a second leg hole, and further extends therefrom to the first end of the second leg hole so that the first elastic member is disposed in a first substantially U-shaped configuration. The second elastic member 6b extends along a periphery of the first leg hole from the second end thereof to a midpoint thereof, continuously extends therefrom along a portion of the periphery of the communicating means, or aperture, 20 to a midpoint of the second leg hole and further extends therefrom to the second end of the second leg hole so that the second elastic member is disposed in a second substantially U-shaped configuration which is inverted relative to the first U-shaped configuration described previously.

The first and second elastic members each form one half of a leg gather on each leg hole and extend around one half of the periphery of the aperture. Together, the elastic members form both leg gathers and encircle the aperture.

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The embodiment of FIG. 2, consequently, only requires two unitary elastic members to form both the crotch and leg gathers. This construction is more efficient and economical to manufacture than previously known constructions of tapeless absorbent articles that require at least three elastic members to form a similar pair of U-shaped patterns inverted relative to each other.

The composite sheet of such construction can be readily manufactured by the following process.

Elongated sheet material in web form that forms the second layer 12b is continuously transported in one direction, as illustrated by arrow 7 in FIG. 6. The two elastic members 6a, 6b are placed onto the sheet material 12b in overlapping sinusoidal configurations with an inverted phase relation to each other. A second sheet of material 12a (not shown in FIG. 6) is further overlaid onto the sheet material 12b so as to sandwich the elastic members therebetween. The second sheet of material 12a and the elastic members are bonded to the sheet material 12b by conventional bonding means to form a composite sheet. The through aperture 20 is simultaneously formed which penetrates the dual-layered sheet material. The resultant composite topsheet is then cut into an individual, article unit length which is further cut to form leg holes (shown by cross hatch lines).

The composite sheet thus formed is subsequently combined with the backsheet 11, the absorbent core 13, and the other article elements to manufacture the absorbent articles in accordance with conventional manufacturing processes. The relative positions of the layered materials within the garment are illustrated in the cross-sectional views FIGS. 3-5.

In the embodiment as shown in FIG. 7, first and second elastic members 6a, 6b are disposed to extend along peripheries of the leg holes 2. In this case, two rubber threads 6_{a-1}, 6_{a-2} follow closely parallel paths, and two rubber threads 6_{b-1}, 6_{b-2} follow closely parallel paths. The rubber threads 6_{a-1}, 6_{b-1}, which are positioned more remote from the peripheries of the leg holes 2 extend between the pair of leg holes 2 along the periphery of the aperture 20. However, the rubber threads 6_{a-2}, 6_{b-2} which are positioned closer to the peripheries of the leg holes 2 are discontinued at the periphery of the aperture 20 by cutting.

In such construction, the contracting force of the elastic members 6 along the periphery of the aperture 20 is controlled to be smaller than that along the peripheries of the leg holes 2, so that the inlet of the pocket provided by the aperture 20 may not be excessively restricted or closed. The contracting forces along the periphery of the aperture 20 and along the peripheries of the leg holes 2 can be selectively controlled by setting a ratio of the number of rubber threads which form the elastic members 6 to the number of rubber threads which are severed adjacent the periphery of the aperture 20 within a proper range.

FIG. 8 illustrates the topsheet 12 in still another embodiment of the absorbent article in accordance with the present invention. In this embodiment, the first elastic member 6a extends along the periphery of the aperture 20 while the second elastic member 6b is discontinued at the periphery of the aperture 20 by cutting.

The topsheet 12 of such construction can be readily manufactured by a continuous process. Typically, during the process that the two elastic members 6a, 6b are positioned between the two sheet materials in continuous web forms for attachment thereto, the amplitude of the sinusoidal configuration that the first elastic member 6a describes is set greater,

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and the amplitude of the sinusoidal configuration that the second elastic member 6b describes is set smaller, as illustrated in FIG. 9. The aperture 20 is formed in the sheet material by cutting which simultaneously splits the second elastic member 6b at a periphery of the aperture as shown.

FIG. 10 illustrates a fourth embodiment of the absorbent article wherein the aperture 20 is formed within an area surrounded by the two elastic members 6a, 6b in a crotch region of the topsheet 12 as illustrated in FIG. 9.

FIG. 11 illustrates a fifth embodiment of the absorbent article which incorporates slits 21 extending from respective sides of the aperture 20 to form a flap 22 in the topsheet 12 of FIG. 10. A number of slits 23 may be additionally placed in the flap 22 in accordance with a sixth embodiment of the absorbent article as illustrated in FIG. 12.

FIGS. 13 and 14 illustrate the topsheet 12 incorporated in a seventh embodiment of the absorbent article. In this embodiment, the two elastic members 6a, 6b define a substantially oblong crotch area, and a number of slits 24 are formed within and along a periphery of the area. Those slits 24 permit variation in the elevation of a central area 25 surrounded by the slits in a thickness direction of the topsheet 12 as the slits 24 open up. More specifically, the slits 24 provide an accordion-like characteristic and allow a central portion of the topsheet attached to the absorbent core to remain closely adjacent the central area of the absorbent core as the core shifts toward and away from the user. The central area of the topsheet is bonded to the absorbent core 13 by appropriate bonding means such as hot-melt-type adhesives.

Accordingly, the topsheet 12 defines a recess in the crotch region of the article which serves as a pocket for receiving and containing body wastes.

FIGS. 15 and 16 illustrate an eighth embodiment of the absorbent article wherein about a half part of the substantially oblong crotch region as shown in FIG. 13 is cut out to form an aperture 26. The aperture 26 is positioned in a rear section of the absorbent article in use so as to serve as a pocket of high containment capacity for receiving and containing body wastes, particularly fecal material. Like the slits 24 in FIG. 14, slits 30 formed in the front section of the topsheet permit at least a portion of the topsheet to remain closely adjacent the core 13 and shift therewith toward and away from the user. Explaining further, as a portion of the topsheet in FIG. 14 is secured closely adjacent the absorbent core in the central area 25 to rise and fall therewith, so too is a portion of topsheet 12 in FIGS. 15 and 16 attached closely adjacent the core 13. The backsheet and absorbent core area are not pressed tightly toward the user and are spaced apart from the user in the central area. In this position, slits 30 are opened up to allow a portion of topsheet 12 to remain closely adjacent the absorbent core. If the core is urged toward the user, the slits close up. The slits, therefore, provide an accordion-like characteristic that allow the portion of the topsheet adjacent the core to closely follow movement of the core.

FIGS. 17 through 19 illustrate a ninth embodiment of the absorbent article in accordance with the present invention. The first and second elastic members 6a, 6b respectively comprise first, two rubber threads 6_{a-1}, 6_{a-2}, and second, two rubber threads 6_{b-1}, 6_{b-2}. The rubber threads 6_{a-1}, 6_{b-1} are disposed to extend outwardly of and along the substantially oblong, crotch region, while the rubber threads 6_{a-2}, 6_{b-2} are disposed to extend transversely of a central portion of the crotch region. Accordingly, the crotch region is divided into a pair of first and second regions which are respectively