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

SUPERINDUSTRIA Y COMERCIO
Radicación : 02999032 00000004 Folios: 2
Fecha (RM): 2004-07-14 15:41:50
Trámite : 002 PATENTES D 1 REGISTRO/ 530 PETICION
Dependencia: 2020 DIVISION DE NUEVAS CREACIONES

Ref: Expediente No 02-099.032
Solicitud de Patente de Invención denominada "
Artículo absorbente desechable con doble barrera
antiescurrimientos y proceso para su fabricación"
Solicitante: Grupo P.I. Mabe, S.A. de C.V.

Darío Cárdenas Navas, identificado como aparece al pie de mi firma y obrando en mi condición de apoderado de la sociedad Grupo P.I. Mabe, S.A. de C.V., 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 04-49,879 del 24 de Junio de 2004 por un valor de \$353.000.00.

Atentamente,



Darío Cárdenas Navas *or*
C.C 17.066.629 de Bogotá
T.P. 1.250 del Consejo Superior de la Judicatura
Fol No P-201

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114

SUPERINDUSTRIA Y COMERCIO
Radicación : 82999032 00000004 Folios: 2
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NIT : 800176089-2

RECIBO OFICIAL DE CAJA : 04 - 49,879
FECHA : JUNIO 24 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	28716312	24/06/2004	11,189,000.00

***** CONCEPTO *****

CANT. RENTISTICO	CONCEPTO	TOTAL CONCEPTO
1 50005-01-01 SOLICITUDES	85 EXAMEN DE PATENTABILIDAD DE INVEN	353,000.00
	TOTAL :	\$ 353,000.00

SON: TRESCIENTOS CINCUENTA Y TRES MIL PESOS

RESPONSABLE : 

RECIBO DE CAJA APLICADO AL EXPEDIENTE No. 02-099.032

CARDENAS & CARDENAS
ABOGADOS

DIVISION DE NUEVAS CREACIONES

RADICACIÓN EXPEDIENTE No. 02- 99032

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

EN LA GACETA DE PROPIEDAD INDUSTRIAL No 540, DE FECHA 31 DE MAYO DE 2004, EL

TERMINO HABIL SEÑALADO POR LA LEY EXPIRA EL 30 DE AGOSTO 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**

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

2020

Bogotá, D.C., 3 de febrero de 2006

Doctor
DARIO CARDENAS NAVAS
Apoderado

Oficio No. **1421**

ASUNTO	Radicación	02-99032
	Trámite	002
	Evento	001
	Actuación	430
	Folios	022

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

- Para el presente estudio se tuvo en cuenta el capítulo descriptivo que se encuentra en los folios 5 a 21, los dibujos que se encuentran en los folios 34 a 37 y el capítulo reivindicatorio que se encuentra en los folios 22 a 32 que comprende treinta (30) reivindicaciones.
- Se considerará la prioridad reivindicada sobre las solicitudes de México No. PA/a/2001/011093 del 31 de octubre de 2001 y No. PA/a/2001/011094 del 31 de octubre de 2001.

2. Objeto de la Invención

- La invención propuesta se relaciona con artículos absorbentes desechables con elementos antlescurrimientos mejorados. Se afirma que consiste en un diseño de producto que permite incrementar la calidad de los artículos absorbentes desechables y un método que permite incorporar en los mismos una estructura de doble barrera antlescurrimientos, formada por dos barreras hidrófobas y/o impermeable colocada en la parte superior del artículo absorbente desechable.

En la reivindicación independiente 1 se define un artículo absorbente desechable formado por una capa superior permeable, una capa inferior impermeable, un núcleo absorbente colocado entre ambas capas, bandas elásticas de cintura y un sistema de sujeción, tanto el artículo como la matriz absorbente del mismo teniendo dos orillas longitudinales, dos orillas transversales y una zona de entrepierna en la parte por la cual el artículo estará en contacto con la entrepierna del usuario cuando el mismo está en uso, caracterizado porque tiene una primera barrera anti-escurrimientos colocada en la parte superior del artículo y adyacente a cada una de las orillas longitudinales de la matriz absorbente en la zona de entrepierna y que se extiende de preferencia a todo lo largo del artículo y una segunda barrera anti-escurrimientos colocada en la parte superior del artículo en forma adyacente a la primera barrera, entre ésta y cada una de las orillas longitudinales del mismo en la zona de entrepierna y que se extiende de preferencia a todo lo largo del artículo.

En la reivindicación independiente 22 se define un proceso para fabricar un artículo absorbente desechable tal como el descrito en las reivindicaciones 1 y 2, que tiene dos barreras anti-escurrimientos a cada lado del núcleo absorbente del mismo; cada barrera teniendo una orilla fija, una orilla alejada y una base, de modo que la orilla fija de la primera barrera esté adyacente a las orillas longitudinales del núcleo absorbente a cada lado del mismo, la orilla fija de la segunda barrera esté adyacente a la orilla fija de la primera barrera y esté colocada entre ésta y las orillas longitudinales del artículo a cada lado del mismo, y la base de la segunda barrera termina, de preferencia, en las orillas longitudinales del artículo; cada una de las barreras se extiende, de preferencia a todo lo largo del mismo, **caracterizado porque** ambas barreras primera y segunda son formadas a partir de una sola película.

- Se afirma que han surgido una infinidad de propuestas tendientes a corregir los escurrimientos laterales, de desechos líquidos y semilíquidos, pero a pesar de que numerosas invenciones han disminuido en buena medida ese problema, las mismas no lo han podido solucionar por completo.
- El objeto de la invención definido se catalogó como A61F 13/15, según la Clasificación Internacional de Patentes (IPC).

3. Claridad de la solicitud

El artículo 30 de la Decisión 486 de la Comisión de la Comunidad Andina establece que: "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".

- Dado que la comprensión de la materia de la invención se facilita a partir de los dibujos, se recomienda que las reivindicaciones incluyan entre paréntesis los numerales que corresponden a cada una de las partes del artículo.
- El capítulo reivindicatorio contiene magnitudes precedidas por la expresión 'alrededor' que no confieren precisión a la invención y por lo tanto, se recomienda eliminar dicha expresión.
- En la reivindicación independiente 22 se espera plantear un proceso para fabricar un artículo absorbente desechable pero la forma de caracterizar resulta incoherente dado que se emplean características del artículo a elaborar y no se incluye la secuencia de etapas, condiciones de operación, etc.

Dado que un método debe caracterizarse mediante la secuencia de etapas, las operaciones unitarias y/o condiciones de operación, se recomienda modificar la parte caracterizante de la reivindicación independiente de modo que incluya información como la que se halla en las reivindicaciones 23, 25 y/o 29 siempre que contenga el aporte novedoso.

- En las reivindicaciones 23 a 30 se incluyen muchas reivindicaciones dependientes que repiten información sobre las etapas y la secuencia de etapas del proceso. Esto se presta para confusión, reduce la concisión y la claridad del enunciado del proceso. Por ello, se recomienda que exista una **reivindicación independiente completa** que incorpore la secuencia y las etapas del proceso y mejor emplear las reivindicaciones dependientes para

especificar detalles particulares del proceso sin tener que volver a repetir todas las etapas.

- En conclusión, el capítulo reivindicatorio no cumpliría con el requisito de claridad de acuerdo con el artículo 30 de la Decisión 486. Por lo tanto, se recomienda realizar las modificaciones pertinentes según las observaciones incluidas y allegar un nuevo capítulo reivindicatorio con tales modificaciones.

4. Determinación del estado de la técnica

El artículo 16 de la Decisión 486 de la Comisión establece: "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.

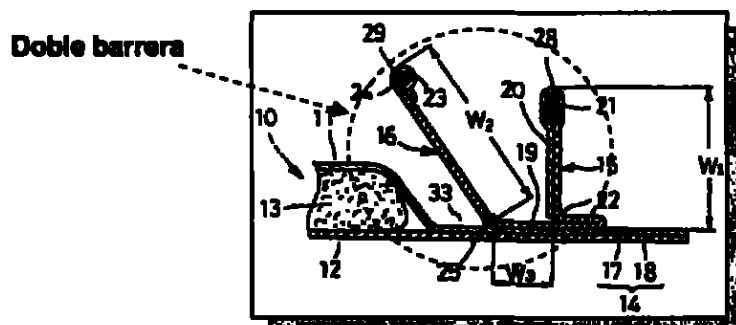
Sólo para el efecto de la determinación de la novedad, también se considerará dentro del estado de la técnica, el contenido de una solicitud de patente en trámite ante la oficina nacional competente, cuya fecha de presentación o de prioridad fuese anterior a la fecha de presentación o de prioridad de 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."

- Se consultaron las bases de datos con que cuenta y tiene acceso la entidad y se consideró el **31 de Octubre de 2001** como fecha para investigar el estado de la técnica.
- De acuerdo con lo establecido en el artículo 16 se determinó el estado de la técnica y se encontraron los siguientes antecedentes:

No.	Documento No.	Título	Fecha de Publicación
1	US5167653	"DISPOSABLE GARMENTS"	1 de diciembre de 1992
2	EP0913137	"DISPOSABLE DIAPER"	28 de octubre de 1998

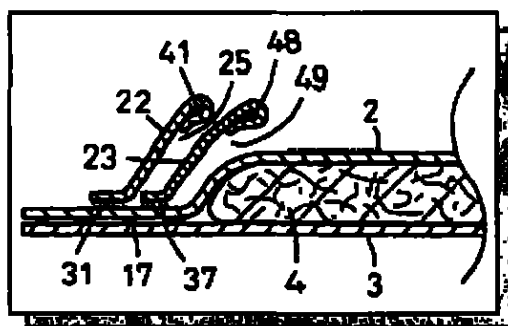
Respecto al estado de la técnica:

- En el documento **US5167653** (llamado D1 de aquí en adelante) se define un pantalón desechable para capturar los fluidos corporales o excreciones y particularmente a un pantalón provisto con una pluralidad de aletas que se extienden longitudinalmente de lado a lado a lo largo de los lados opuestos lateralmente del pantalón. La siguiente es la figura representativa de la invención:



- En el documento EP0913137 (llamado D2 de aquí en adelante) se divulga un pañal desechable que incluye una hoja superior, una hoja posterior y un cuerpo absorbente dispuesto entre ellas, bordes de lado opuestos transversalmente y longitudinalmente, estos siendo formados un par de barreras de pierna de lado exterior 22 y un par de barreras de pierna de lado internas 23 que yacen más interiormente respecto a las barreras de pierna externas 22. Cada barrera externa 22 tiene su borde opuesto longitudinalmente cubierto con un par de aletas de barrera 22, 27 colocadas adyacentes a los bordes opuestos longitudinalmente 18, 19 del pañal de modo que forman un bolsillo frontal 26 A y un bolsillo posterior 27 A, respectivamente. Una dimensión longitudinal de la barrera de lado interna 23 es más corta que las barreras externas 22.

La figura más representativa de la invención es la siguiente:



5. Evaluación de los requisitos de patentabilidad

El artículo 14 de la Decisión 486 de la Comisión de la Comunidad Andina establece: "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 con este artículo, se procedió a evaluar los requisitos de novedad, nivel inventivo y aplicación industrial con el fin de establecer la patentabilidad de la invención reivindicada en la solicitud en estudio.

Evaluación de la Novedad

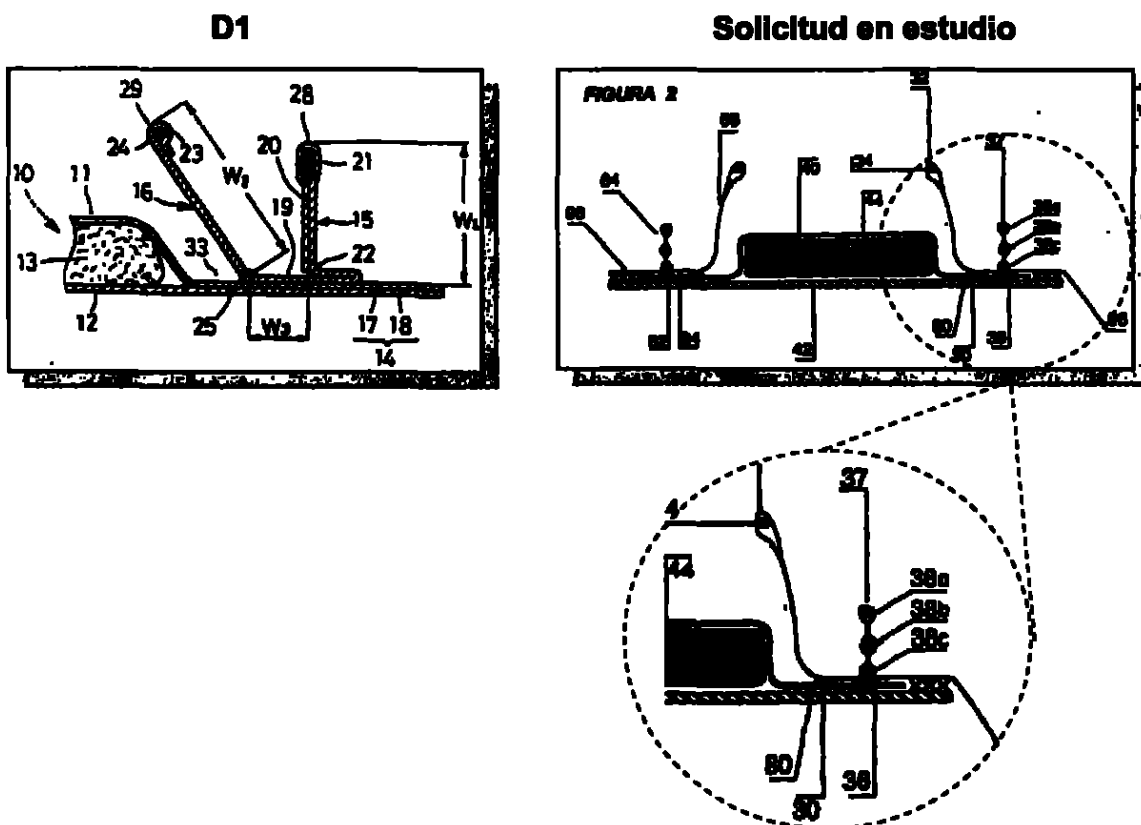
El artículo 16 de la Decisión 486 de la Comisión de la Comunidad Andina establece: "Una invención se considerará nueva cuando no está comprendida en el estado de la técnica." "El estado de la técnica comprenderá todo lo que haya sido accesible al público por una descripción escrita u oral, utilización, comercialización o cualquier otro medio antes de la fecha de presentación de la solicitud de patente o, en su caso, de la prioridad reconocida."

Sólo 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."

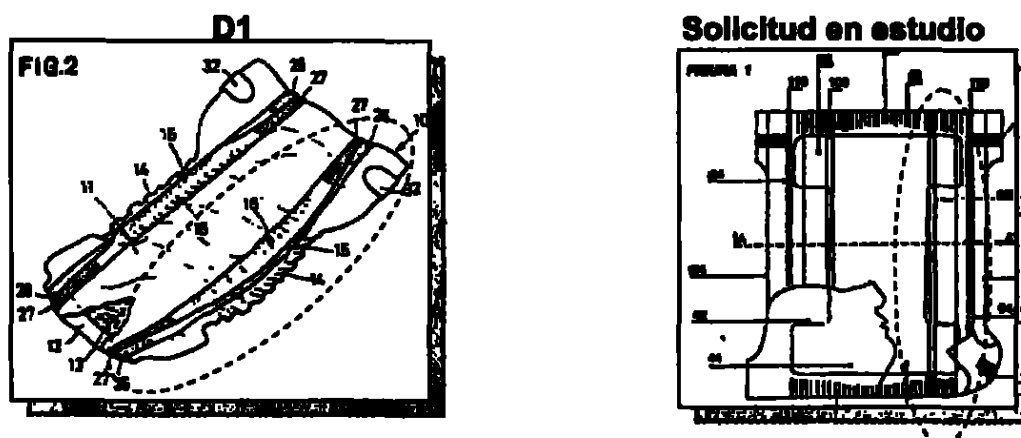
Respecto a la solicitud en estudio:

- En la reivindicación independiente 1 se caracteriza el artículo absorbente desechable porque tiene una primera barrera anti-escurrimiento colocada en la parte superior del artículo y adyacente a cada una de las orillas longitudinales de la matriz absorbente en la zona de entrepierna y que se extiende de preferencia a todo lo largo del artículo y una segunda barrera anti-escurrimientos colocada en la parte superior del artículo en forma adyacente a la primera barrera, entre ésta y cada una de las orillas longitudinales del mismo en la zona de entrepierna y que se extiende de preferencia a todo lo largo del artículo. Sin embargo, D1 contiene todos y cada uno de los elementos de la caracterización porque también figura un artículo absorbente desechable que incluye dos barreras antiescurrimientos dispuestas en la misma forma que la solicitud en estudio tal como se puede concluir de la comparación elemento por elemento y como se aprecia en las figuras.

En la figura representativa de D1 se puede observar la presencia de una primera barrera colocada en la parte superior del artículo y adyacente a cada una de las orillas longitudinales de la matriz en la zona de entrepierna, y una segunda barrera antiescurrimientos también colocada en la parte superior del artículo en forma adyacente a la primera barrera.



En la siguiente figura de D1 se puede observar que tanto la primera como la segunda barrera se extienden de preferencia a lo largo de todo el artículo:



- En la reivindicación dependiente 2 se menciona que ambas barreras primera y segunda se forman a partir de una sola película, cosa que también se revela en D1 según la primera figura incorporada.
- En la reivindicación dependiente 5 se menciona que la primera barrera tiene una orilla fija unida adyacente a cada una de las orillas longitudinales de la matriz absorbente en la zona de entrepierna, una orilla alejada que está separada de la capa superior del artículo mediante al menos un miembro elástico y una base que se extiende hacia fuera de la orilla fija y hacia las orillas longitudinales del artículo, la barrera extendiéndose de preferencia a todo lo largo del artículo absorbente desechable. Sin embargo, D1 también revela una orilla fija adyacente a la matriz, una orilla alejada separada de la capa superior del artículo también con un miembro elástico y una base que se extiende hacia fuera de la orilla y hacia orillas longitudinales, tal como se puede observar en los dibujos de D1.
- En la reivindicación dependiente 6 se mencionan las características de la segunda barrera anti-escurrimientos que también se divulgan en D1.
- En la reivindicación dependiente 11 se menciona que la segunda barrera tiene de uno a ocho miembros o elementos elásticos y sin embargo en D1 se observa que presenta un miembro elástico.
- En las reivindicaciones dependientes 20 y 21 se menciona que el artículo es un pañal desechable para bebés, para adultos incontinentes o calzón absorbente desechable y asimismo corresponde en D1.
- Dado que en las reivindicaciones independientes 22 y 26 se plantea el proceso para fabricar el artículo absorbente desechable mediante las características de las barreras del producto, se observa que dichas características ya se encuentran divulgadas en D1 como se demostró anteriormente.
- El documento D2 analizado independientemente de D1 también divulga un artículo absorbente desechable con la característica de poseer dos barreras anti-escurrimientos por lo cual afecta las reivindicaciones 1, 3, 5, 6, 7, 11, 20, 22 y 26.
- En conclusión, la invención definida en las reivindicaciones 1, 2, 5, 6, 11, 20, 22 y 26, se encontraría afectada en el requisito de novedad al ser divulgadas sus características por el documento D1 y las reivindicaciones 1, 3, 5, 6, 7, 11 y 20 al ser divulgadas sus características en el documento D2. La invención se encontraría afectada en la novedad con base en el artículo 16 de la Decisión 486.

Evaluación del Nivel Inventivo:

El artículo 18 de la Decisión 486 de la Comisión de la Comunidad Andina establece: "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."

Respecto a la solicitud en estudio:

- El técnico de nivel medio versado en la materia encargado de resolver el problema técnico abordado puede ser un ingeniero químico que labore en la industria de artículos absorbentes y que atienda a planes de mejoramiento continuo normalmente formulados por las empresas.

- Características específicas como la formación de las películas para las barreras anti-escurrimientos mediante diferentes materiales, las dimensiones de ellas, el número de elementos elásticos que pueden incluirse en cada barrera, la naturaleza hidrófoba o impermeable y las particularidades de la forma, son conocimientos básicos que un técnico de nivel medio versado en la materia posee y que normalmente tiene en cuenta para desarrollar un artículo absorbente desechable equivalente a la solicitud. De tal manera, las reivindicaciones dependientes presentan características convencionales.
- Por lo anteriormente expuesto, las Invenciones definidas por las reivindicaciones 4, 8 a 10, 12, 15 a 19 y 22 a 30 de la solicitud, podrían verse afectadas en su nivel inventivo ya que se derivan 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 cumpliría con las disposiciones del artículo 18 de la Decisión 486 de la Comisión de la Comunidad Andina.
- En conclusión los requisitos de patentabilidad de la presente solicitud se encuentran afectados así:

No.	Documento	Reivindicaciones Afectadas	Requisito que afecta
1.	US5167653	1, 2, 5, 6, 11, 20, 22 y 26 4, 8 a 10, 12, 15 – 19, 22 – 30	Novedad Nivel Inventivo
2.	EP0913137	1, 3, 5, 6, 7, 11 y 20	Novedad

Se anexan los apartes principales de las anterioridades en el documento adjunto.

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 09 FEB. 2006

CONCEPTO TECNICO No. 141	EXAMINADOR TECNICO Código No. 202042
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U.S. PATENT AND TRADEMARK OFFICE

US005167653A

United States Patent [19]
Igaue et al.

[11] **Patent Number:** 5,167,653
[45] **Date of Patent:** Dec. 1, 1992

[34] **DISPOSABLE GARMENTS**
[75] **Inventors:** Takamitsu Igaue; Hirotsugu Mukai,
both of Kawano; Michiyo
Matsumita, Iyomishima, all of Japan
[73] **Assignee:** Uni-Charm Corporation, Ehime,
Japan
[21] **Appl. No.:** 806,334
[22] **Filed:** Dec. 12, 1991
[30] **Foreign Application Priority Data**
Dec. 18, 1990 [JP] Japan 2-411432
[51] **Int. Cl.:** A61F 13/15
[52] **U.S. Cl.:** 604/385.2
[58] **Field of Search:** 604/358, 385.1, 385.2
[56] **References Cited**

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4,904,251 2/1990 Igaue et al. 604/385.2
5,021,081 6/1991 Huke 604/385.2

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0346477 12/1989 European Pat. Off. .
2161059 1/1986 United Kingdom .
2193625 2/1988 United Kingdom .
2216393 10/1989 United Kingdom .
8902228 3/1989 World Int. Prop. O. 604/385.1

Primary Examiner—Ronald Frinks
Assistant Examiner—Mary Beth O. Jones
Attorney, Agent, or Firm—Fred Philpitt

[57] **ABSTRACT**

The present invention relates to a disposable garment for catching body fluids or excretions and particularly to a garment provided with a plurality of flaps extending longitudinally side-by-side along laterally opposite sides of the garment and normally biased by their own elastic shrinking potential to turn up.

6 Claims, 4 Drawing Sheets

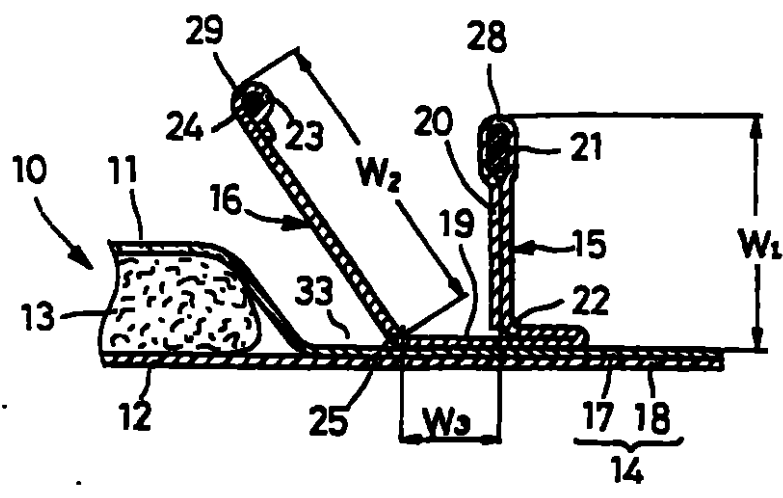


FIG. 1

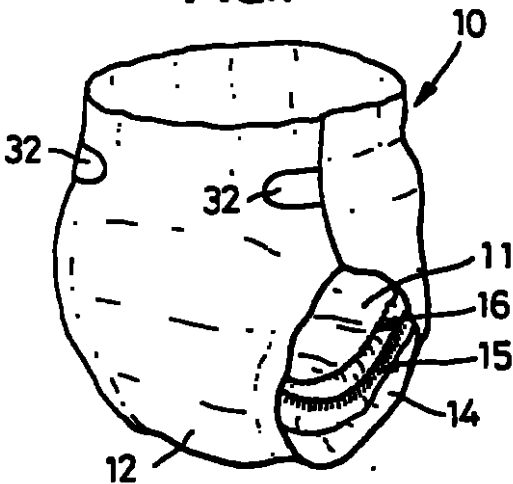


FIG. 2

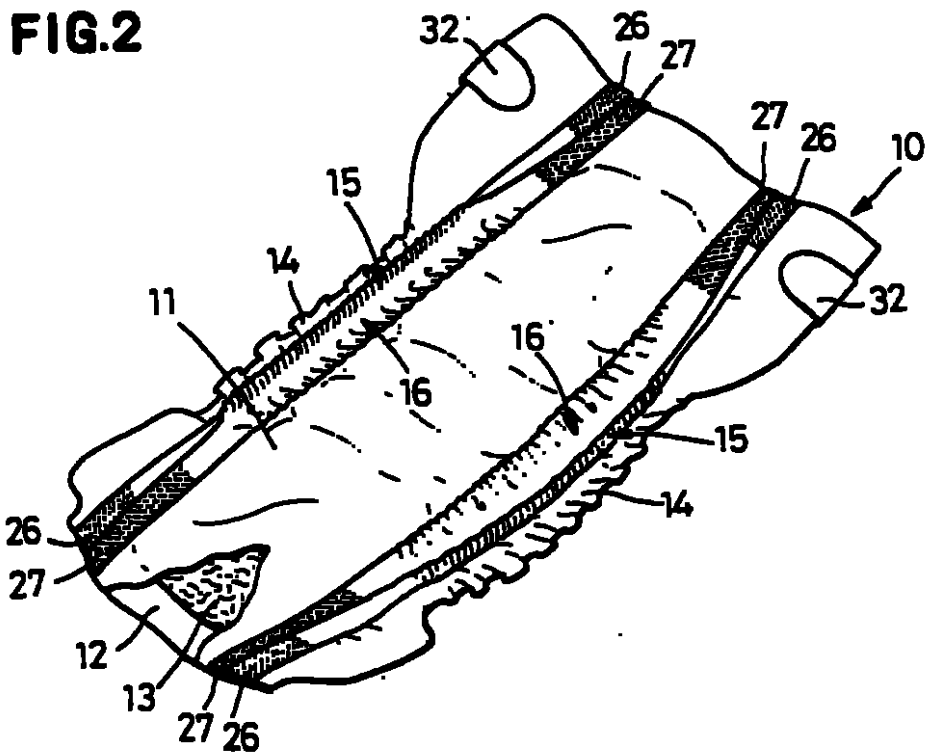


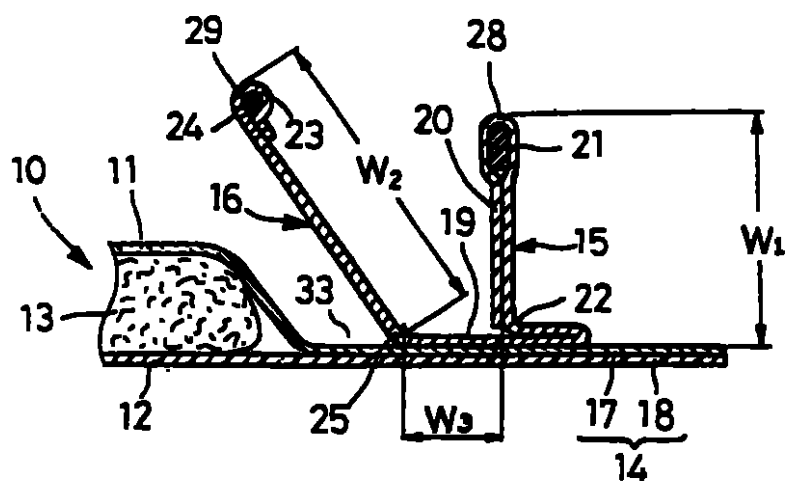
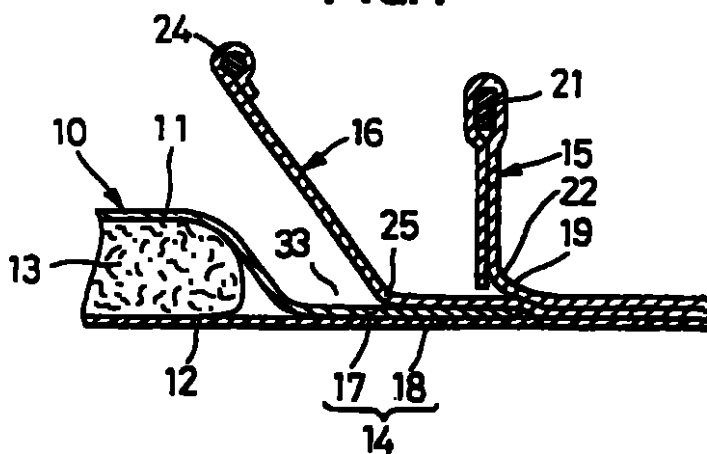
FIG.3**FIG.4**

FIG. 5

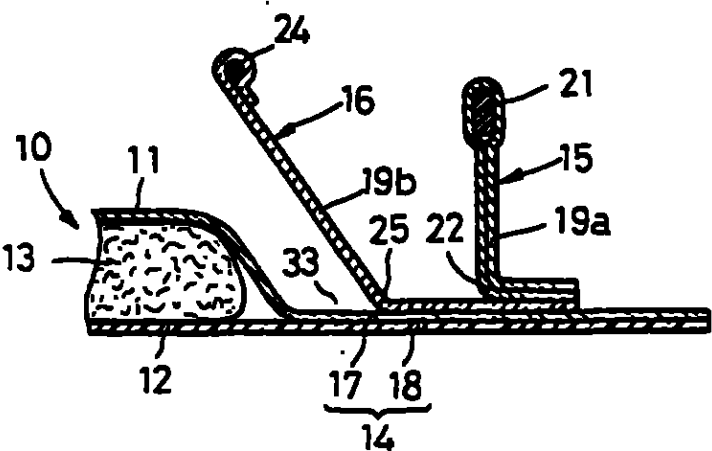


FIG. 6

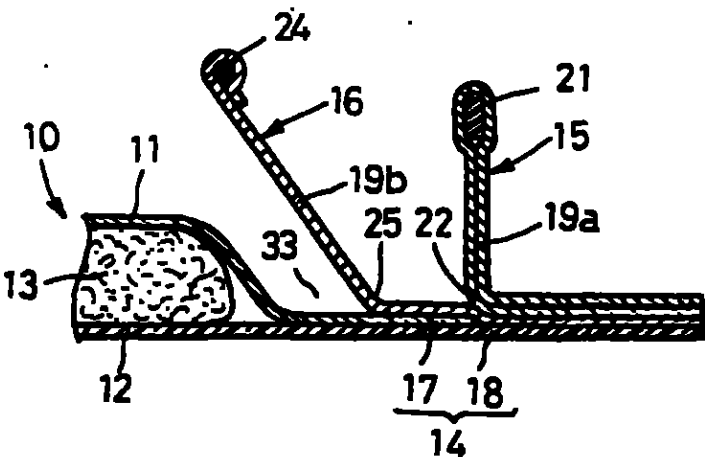


FIG. 7

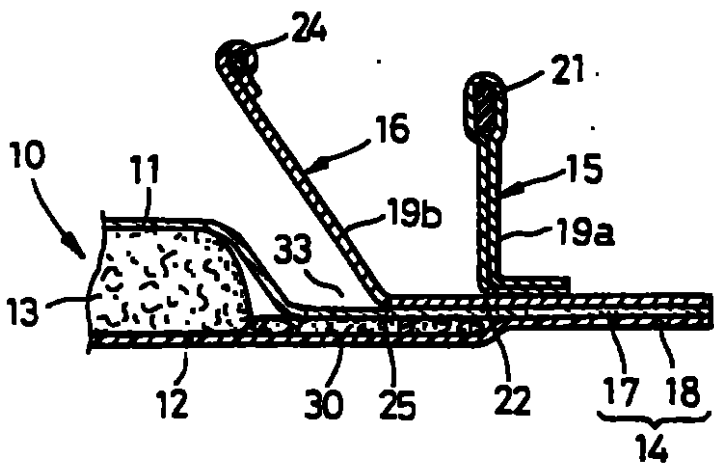
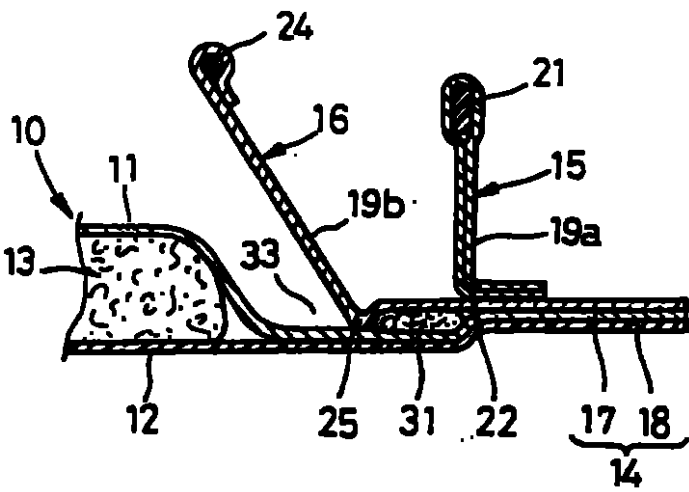


FIG. 8



DISPOSABLE GARMENTS

BACKGROUND OF THE INVENTION

The present invention relates to disposable garments used to catch body fluids or excretions and more particularly to such disposable garments provided with a plurality of flaps longitudinally extending side by side along laterally opposite sides of the garments and normally biased by their own elastic shrinking potential to turn up.

U.S. Pat. No. 4,695,278 (referred to hereinafter as the first prior art) discloses garments such as disposable diapers comprising a liquid-permeable inner sheet, a liquid-impermeable outer sheet, a liquid-absorptive core sandwiched between these sheets, a pair of base flaps (i.e., gasket cuffs) extending outward from laterally opposite side edges of said core and provided with elastic members, respectively, and a second pair of flaps (i.e., barrier cuffs) having root edges on areas of the respective base flaps extending inwardly from the respective elastic members and normally biased by elastic members mounted along free edges of the respective second flaps to turn up along said root edges. Said base flaps are pressed against respective thighs of the wearer. Said second pair of flaps are fixed at longitudinally opposite ends with said ends being collapsed inward and with intermediate portions being biased by their own elastic shrinking potential to turn up and thereby free edges of these intermediate portions being pressed against roots of the wearer's thighs.

U.S. Pat. No. 4,904,251 (referred to hereinafter as the second prior art) discloses disposable diapers comprising a liquid-permeable inner sheet, a liquid-impermeable outer sheet, a liquid-absorptive core sandwiched between these sheets, a pair of base flaps extending outward from laterally opposite side edges of said core, and a second pair of flaps having root edges on the upper surfaces of the respective base flaps and normally biased by elastic members mounted along their free edges to turn up along the respective root edges. Said second pair of flaps are fixed at longitudinally opposite ends with said ends being collapsed outward and with intermediate portions being biased by their own elastic shrinking potential to turn up and thereby free edges of these intermediate portions being pressed against roots of the wearer's thighs.

Initially, said first prior art will be considered.

Said base flaps have a rather planar configuration and are curved under the effect of their own elastic shrinking potential but insufficiently to fit around the thighs and thereby to prevent excretions from leaking out, as has usually been the case with the flaps of the conventional disposable diapers.

In order that the pockets defined by said second pair of flaps adapted to be pressed against the thigh roots of the wearer can adequately opened and reliably catch excretions, it is essential that the free edges of the respective second flaps should be always stabilized against the thighs' roots of the wearer. However, the first prior art discloses neither width dimensioning nor stiffness adjustment for each second flap required to achieve such ideal fitness.

The free edges of the second flaps must be always stabilized against the roots of the wearer's thighs as has been mentioned above, but the pressure at which the second flaps are pressed against the thighs' roots are too high so that wearing of this prior art for a relatively

long period will result in a pressure mark on the wearer's skin and pain.

Said second prior art will be considered.

Said base flaps have no elastic shrinkability and therefore can not be elastically pressed against the wearer's thighs for positive prevention of excretions leakage. Certainly, the second pair of flaps have such function, but, in view of the position at which each second flap is pressed against the wearer's body, these second flaps correspond to the base flaps of the first prior art. In other words, the second prior art has no members corresponding to the second flaps of the first prior art.

Accordingly, it is a principal object of the present invention to provide disposable garments so improved to solve the above-mentioned problem encountered by the first and second prior arts by providing members corresponding to the second flaps of the first and second prior arts and setting tensile stress, width and stiffness of the members corresponding to the second flaps of the first prior art to optimized levels.

ASPECTS OF THE INVENTION

The object set forth above is achieved, in accordance with the present invention, by a garment comprising a liquid-absorptive core, a first pair of flaps extending along laterally opposite sides of the article and a second pair of flaps extending inside the respective first flaps, wherein both the first and second pairs of flaps have elastic shrinking potential by which these flaps are biased to turn up. In addition, a tensile stress of the second flaps is adjusted to be lower than a tensile stress of the first flaps, a width of each second flap is dimensioned to be larger than a width of each first flap, and stiffness of the second flaps is adjusted to be lower than a stiffness of the first flaps.

Preferably, the first and second pairs of flaps are branched from associated base flaps extending outward from laterally opposite side edges of the liquid-absorptive core, respectively. In this embodiment, the first and second pairs of flaps may be provided independently or continuously.

When the garment of the invention having the arrangement as has been described above is put on the wearer's body, the free edges of the respective first flaps are pressed relatively tight against the wearer's thighs and the free edges of the second flaps are pressed rather loosely around the wearer's thigh roots. During movement of the wearer's legs, the free edges of the first flaps slidably move on the skin of the wearer's thighs and the free edges of the second flaps remain substantially fixed around the thigh roots.

According to the invention, the tensile stress of each second flap is lower than that of each first flap so that, even if the second flap continues to be pressed against the wearer's skin for a relatively long period, the area of the skin against which the second flap has been pressed is free from any pressure mark or pain.

The other important feature of this invention such that the width (or the height) of each second flap as measure from the root edge to the free edge of this second flap is dimensioned to be larger than that of each first flap as measured from the root edge to the free edge of this first flap and the stiffness of each second flap is adjusted to be lower than that of each first flap is effective to absorb or attenuate any movement of the diaper, the body or the thighs of the wearer instead of transferring such movement to the free edge of each

second flap which is held against the thigh around the root thereof. Accordingly, the free edge of each second flap is stabilized against the thigh root and thus the pocket defined by the second flap is kept open so that liquid or solid excretions can be reliably received by this pocket. Any quantity of excretions which was forced, no matter what the cause is, beyond the second flap is effectively prevented by the associated first flap from further flowing out.

According to the invention, furthermore, there is provided on each base flap the absorbent layer between the pair of first and second flaps associated with this base flap so that any quantity of excretions sometimes present between these first and second flaps can be absorbed by this absorbent layer for further reliable prevention of said leakage.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view showing an individual disposable diaper, in assembled condition, as one of embodiments of garment constructed in accordance with the teachings of the present invention;

FIG. 2 is a perspective view showing said diaper in developed condition;

FIG. 3 is a sectional view showing an important part of said diaper;

FIG. 4 is a view similar to FIG. 3 but showing another embodiment;

FIGS. 5 and 6 are views similar to FIGS. 3 and 4, respectively, showing further embodiments; and

FIGS. 7 and 8 are views similar to FIGS. 3 and 4, respectively, showing still other embodiments both including absorbent layers placed on the base flaps.

PREFERRED EMBODIMENTS OF THE INVENTION

Several embodiments of disposable diaper will be described as embodiments of a garment constructed in accordance with the teachings of the present invention with reference to the attached drawings.

Referring to FIGS. 1 through 3, a diaper 10 comprises a liquid-permeable inner sheet 11, a liquid-impermeable outer sheet 12, a liquid-absorptive core 13, a pair of laterally opposite base flaps 14, a first pair of laterally opposite flaps 15 and a second pair of laterally opposite flaps 16. The base flaps 14 extend outward from opposite outer edges of the core 13, respectively, and each comprises portions 17, 18 of the inner and outer sheets bonded together by adhesive or welding (inclusive of ultrasonic welding).

Both the first flaps 15 and the second flaps 16 are formed by an air-permeable but liquid-resistant sheets 19 bonded substantially over central zones to the upper surfaces of the respective base flaps 14 by adhesive or welding (inclusive of ultrasonic welding). Each of these first flaps 15 contains an elastic member 21 within a sleeve-like free edge 20 defined by a portion of the sheet 19 and said elastic member 21 has been mounted in its longitudinally stretched condition so that an elastic shrinkability of said elastic member 21 biases this first flap 15 to turn up along its root edge 22 along which said first flap 15 is branched away from the associated base flaps 14. Similarly, each of the second flaps 16 contains an elastic member 24 within a sleeve-like free edge 23 defined by another portion of the sheet 19 and said elastic member 24 has been mounted in its longitudinally stretched condition so that an elastic shrinkability biases this second flap 16 to turn up along its root

edge 23 which is inwardly spaced from said root edge 22 by an appropriate distance and along which said second flap 16 is branched away from the associated base flap 14. Each of the first flaps 15 is bonded at longitudinally opposite ends 26 onto the associated base flap 14 by adhesive or welding (inclusive of ultrasonic welding) with a longitudinally intermediate portion of this flap 15 maintained as it turns up and with said longitudinally opposite ends 26 collapsed inward. However, it should be understood that the first flap 15 may be bonded onto the associated base flap 14 in an alternative manner, i.e., with said longitudinally intermediate portion maintained as it turns up but with said longitudinally opposite ends 26 collapsed outward. Similarly, each of the second flaps 16 is bonded at longitudinally opposite ends 27 onto the associated base flap 14 and the core 13 by adhesive or welding (inclusive of ultrasonic welding) with a longitudinally intermediate portion maintained as it turns up and with said longitudinally opposite ends 27 collapsed inward so as to define a relatively deep pocket 33. Although both the first and second flaps 15, 16 having the intermediate portions between said longitudinally opposite ends 26, 27, respectively, which are normally biased to turn up, these intermediate portions also will be collapsed inward as these flaps 15, 16 are longitudinally stretched substantially to predetermined stretch limits. Obviously, when the first flap 15 is bonded at the longitudinally opposite ends 26 onto the associated base flap 14 in said alternative manner, i.e., with the intermediate portion maintained as it turns up and with said longitudinally opposite ends 26 collapsed outward, said intermediate portion will be collapsed outward as this flap 15 is stretched in its longitudinal direction substantially to the predetermined stretch limit.

A tensile stress of the second flaps 16 is adjusted to be lower than a tensile stress of the first flap 15 so that an area of the wearer's skin against which the second flap 16 has been pressed under shrinking potential thereof be free from any pressure mark or pain even after said second flap 16 has been pressed against the wearer's skin for a relatively long period. A tensile stress of the elastic member 21 is typically adjusted to a value from 100 g to 300 g. A width (or height) W_2 of the second flap 16 as measured from the root edge 23 to the free edge 29 is dimensioned to be larger than a width (or height) W_1 of the first flap 15 as measured from the root edge 22 to the free edge 28 and a stiffness of the second flap 16 is adjusted to be lower than a stiffness of the first flap 15 so that any movement of the diaper 10, the body or the thighs of the wearer be absorbed or attenuated instead of being transferred to the free edge 29 of the second flap 16 which is held against the thigh around a root thereof. For example, the width W_1 of the first flap 15 may be 20 mm to 35 mm, the width W_2 of the second flap 16 may be 30 mm to 100 mm, and longitudinal and transverse dimensions of the second flap 16 as measured in accordance with the Japanese Industrial Standard-JS143 may be less than 100 mm and less than 60 mm, respectively. The corresponding dimensions of the first flap 15 may be substantially equal to those of the side flap in the typical disposable diaper of prior art. Preferably, a width W_3 as measured between the root edges 22, 23 should not be larger than the width W_1 of the first flap 15. The root edge 23 may be positioned adjacent to or in contact with the associated outer side edge of the core 13.

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In an alternative embodiment shown by FIG. 4, each of the base flaps 14 comprises the portion 17 of the inner sheet and the portion 18 of the outer sheet having a width larger than that of said portion 17. In other words, the base flap 14 is so formed that said portion 18 extends outward from the outer side edge of said portion 17. The sheet 19 is partially bonded onto such extension of said portion 18 along which said portion 17 does not lie on the top of said portion 17 and thereby forms the first and second flaps 15, 16. This embodiment is particularly advantageous in that a material saving is achieved for the inner sheet 11 since the inner sheet 11 may have a width narrower than that of the outer sheet 12 and any leakage of body fluids which might otherwise occur beyond the outer side edges of the respective base flaps 14 can be avoided even if said body fluids permeate and diffuse into the liquid-permeable portion 17 of the inner sheet since the liquid-resistant sheet 19 forming the first and second flaps 15, 16 is bonded to the portion 18 of the liquid-impermeable outer sheet without said liquid-permeable inner sheet interposed therebetween.

The first and second flaps are formed, in still another embodiment shown by FIGS. 5 and 6, from different sheets 19a, 19b, respectively. A water pressure resistance (liquid-impermeability) of the first flap 15 is adjusted to a value higher than that of the second flap 16. Except such feature, the arrangement of the first and second flaps 15, 16 and the base flaps 14 in this embodiment is substantially the same as in the embodiment shown by FIGS. 3 and 4.

In an embodiment shown by FIG. 7, there is interposed a relatively thin, highly flexible absorbent layer 30 between the portions 17, 18 of the inner and outer sheets, respectively, so as to extend between the outer side edge of the core 13 and the root edge 22 of the associated first flap 15. In an embodiment shown by FIG. 8, there is interposed a relatively thin, highly flexible absorbent layer 31 between the portion 17 of the inner sheet and the sheet 19b so as to extend between the root edges 22, 25 of the first and second flaps 15, 16. These embodiments are adapted to provide a liquid absorptivity at least between the root edges 22, 25 so that any quantity of body fluids which might stay between the first and second flaps 15, 16, even if such stay is temporary, can be absorbed by the absorbent layers 30, 31, respectively.

As will be apparent from FIGS. 1 and 2, tape fasteners 32 applied with pressure-sensitive adhesive are attached to the respective base flaps 14 on the rear side of the diaper 10. The diaper 10 can be assembled on the body of the wearer by fastening free ends of the respective tape fasteners 32 onto the outer sheet 12.

The inner sheet 11 is formed from material such as fibrous nonwoven fabric or porous plastic film and the outer sheet 12 is formed from material such as plastic film or laminate sheet of said film and nonwoven fabric. It should be understood that such laminate sheet is used with the nonwoven fabric facing outward. The plastic film which is suitable as material for the outer sheet 12 is preferably air-impermeable, the core 13 comprises a mat-like body formed from fluff pulp mixed or not mixed with superabsorbent polymer powder and covered with liquid-permeable sheet at least over top and bottom sides. In view of the material from which the core 13 is formed, the core 13 is semi-rigid. It will be obviously understood that the core 13 is rather firmly bonded to the inner sheet 11 and/or the outer sheet 12

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with adhesive. The elastic members 21, 24 respectively comprise material such as thread- or tape-like rubber, tape-like plastic foam or plastic film presenting elastic stretchability under heat treatment. The first and second flaps 15, 16 are formed from water-repellent nonwoven fabric. However, it is not always essential that the second flaps 16 should be formed from liquid-resistant material so long as the second flaps 16 can properly function to hold back any possible leakage of solid excretion since the second flaps 16 have been surfactant-treated particularly over their inner surfaces and thereby obtained hydrophilicity. The absorbent layers 30, 31 comprise narrow strips formed from fluff pulp mixed or not mixed with superabsorbent polymer powder.

When the diaper 10 having the construction as has been described above is put on the wearer's body, the first and second flaps 15, 16 turn up (i.e., toward the wearer's body) along the respective root edges 22, 25 under the elastic shrinkage of the respective elastic members 21, 24 wrapped by the respective free edges 28, 29. However, both the first and second flaps 15, 16 have their root edges 22, 25 intersecting the associated base flaps 14 or bend relative to the associated base flaps 14 so as to form inverted T-shaped cross-sections and, in consequence, said elastic shrinkage of the respective elastic members 21, 24 is substantially prevented from being transferred through the respective root edges 22, 25 to the outer sides of the respective base flaps 14. In other words, presence of the root edges 22, 25 minimizes a phenomenon that the elastic shrinkage of the elastic members 21, 24 might be transferred directly to the outer sides of the respective base flaps 14, resulting in that said outer sides might be creased with wrinkles.

What is claimed is:

1. A disposable garment comprising a liquid-permeable inner sheet (11) joined to a liquid-impermeable outer sheet (12) with a liquid absorbent core (13) interposed therebetween, a pair of first flaps (15), a pair of second flaps (16), each of said pairs (15, 16) extending longitudinally with respect to said liquid-absorbent core (13) along laterally opposite sides thereof, said garment being further characterized by the fact that:

- (1) said pair of first flaps (15) containing elastic (21) and having their root edges (22) located on laterally opposite sides of said core (13) and being mounted so that the first flaps (15) will turn upwardly under their own elastic shrinking potential,
- (2) said second pair of second flaps (16) having their root edges (25) located at a spaced distance (W3) inwardly from said root edges (22) of said pair of first flaps (15) and containing elastic so that the second flaps (16) after mounting will also turn upwardly under their own elastic shrinking potential,
- (3) each second flap (16) having a tensile stress lower than the tensile strength of each first flap (15),
- (4) the width of each second flap (16) as measured from its root edge to its free edge being greater than the width of each first flap (15) as measured from its root edge to its free edge, and
- (5) the stiffness of each flap (16) being lower than the stiffness of each first flap (15).

2. A disposable garment according to claim 1 wherein a liquid absorbent layer (30, 31) is included in the spaced distance (W3) between the root edge (22) of said first flap (15) and the root edge (25) of said second flap (16).

3. A disposable garment as recited in claim 1 wherein said first and second pairs of flaps (15, 16) are fastened at their longitudinally opposite ends (26, 27) with said first pair of flaps (15) being collapsed inward or outward and said second pair of flaps (16) being collapsed inward.

4. A disposable garment comprising a liquid-permeable inner sheet (11) joined to a liquid-impermeable outer sheet (12) with a liquid absorbent core (13) interposed therebetween, laterally extending base flaps (14), a pair of first flaps (15), a pair of second flaps (16), each of said pairs (15, 16) extending longitudinally with respect to said liquid-absorbent core (13) along laterally opposite sides thereof and being located inwardly with respect to the outer lateral edges of said base flaps (14), said garment being further characterized by the fact that:

- (1) said pair of first flaps (15) containing elastic (21) and having their root edges (22) located on laterally opposite sides of said core (13) and being mounted so that the first flaps (15) will turn upwardly under their own elastic shrinking potential,
- (2) said pair of second flaps (16) having their root edges (25) located at a spaced distance (W3) inwardly from said root edges (22) of said pair of first

flaps (15) and containing elastic so that the second flaps (16) after mounting will also turn upwardly under their own elastic shrinking potential,

- (3) each second flap (16) having a tensile stress lower than the tensile strength of each first flap (15),
- (4) the width of each second flap (16) as measured from its root edge to its free edge being greater than the width of each first flap (15) as measured from its root edge to its free edge, and
- (5) the stiffness of each second flap (16) being lower than the stiffness of each first flap (15).

5. A disposable garment according to claim 4 wherein a liquid absorbent layer (30, 31) is included in the spaced distance (W3) between the root edge (22) of said first flap (15) and the root edge (25) of said second flap (16).

6. A disposable garment as recited in claim 4 wherein said first and second pairs of flaps (15, 16) are fastened at their longitudinally opposite ends (26, 27) with said first pair of flaps (15) being collapsed inward or outward and said second pair of flaps (16) being collapsed inward.

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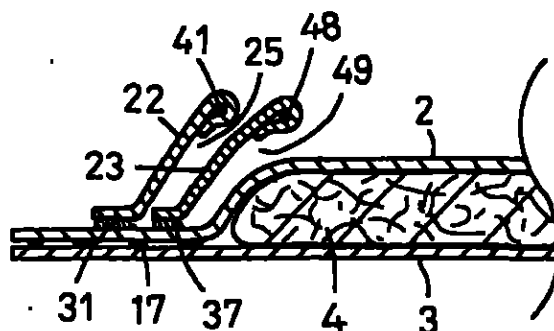
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(54) Disposable diaper

(57) A disposable diaper including a topsheet, a backsheet and a core disposed therebetween, adjacent transversely opposite side edges and longitudinally of the diaper, there being formed a pair of outer side barrier cuffs 22 and a pair of inner side barrier cuffs 23 lying more inwardly of the outer side barrier cuffs 22. Each of the

outer side barrier cuffs 22 has its longitudinally opposite ends covered with a pair of end barrier flaps 25, 27 placed adjacent longitudinally opposite ends 18, 19 of the diaper so as to form a front pocket 26A and a rear pocket 27A, respectively. A longitudinal dimension of the inner side barrier cuff 23 is shorter than that of the outer side barrier cuff 22.

FIG.2



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Description

[0001] This invention relates to disposable diapers for absorbing and containing excretion.

[0002] Japanese Patent Application Disclosure Gazette (Kokai) No. Hei3-138553 discloses an integral or unit disposable diaper having on a topsheet defining its inner surface a pair of side barrier cuffs extending along its transversely opposite side edges and a pair of end barrier flaps extending along its longitudinally opposite ends, both being adapted to be collapsible inwardly of the diaper. The side barrier cuffs extend between the longitudinally opposite ends of the diaper while the end barrier flaps extend between the transversely opposite sides so as to cover longitudinally opposite ends of the side barrier cuffs.

[0003] The side barrier cuffs are longitudinally elastic so that the side barrier cuffs are normally biased under the effect of their longitudinal elasticity to rise up on the topsheet and thereby to form pockets opening inwardly of the diaper between the side barrier cuffs and the topsheet as the diaper is put on a wearer's body. However, it is not sufficient to prevent excretion from leaking from sides of the diaper with side barrier cuffs alone, even if side flaps extending outwardly of the side barrier cuffs are provided with elastic members so as to contact the side flaps against a wearer's skin.

[0004] In view of the above problem, it is an object of the invention to improve an effect of preventing excretion from leaking sideways in diapers such as the known one.

[0005] According to the invention, there is provided a diaper comprising a laminate of a liquid-permeable topsheet, a liquid-impermeable backsheet and a liquid-absorbent core disposed therebetween, the laminate having an external shape defined by longitudinally opposite ends and transversely opposite side edges extending between the longitudinally opposite ends, the laminate including a pair of first side barrier cuffs formed on an inner surface adjacent the opposite side edges and extending longitudinally of the laminate so as to be collapsible inwardly of the laminate; and a pair of end barrier flaps placed in the proximity of the longitudinally opposite ends of the laminate so as to extend between the transversely opposite side edges of the laminate and to cover the longitudinally opposite ends of the pair of first side barrier cuffs, respectively, the end barrier flaps being partially bonded to the inner surface of the laminate and thereby forming a pair of pockets adapted to open inwardly of the laminate, wherein: inwardly of the first side barrier cuffs formed on the inner surface of the laminate, there are formed a pair of second side barrier cuffs each extending from a longitudinally middle zone of the laminate in opposite directions longitudinally of the laminate, an outer edge of the second side barrier cuff is bonded to the inner surface of the laminate while an inner edge of said second barrier cuff extending in parallel to the outer edge is longitudinally elastic so as to be col-

lapsible inwardly of the laminate; and each of the second side barrier cuffs has a dimension between longitudinally opposite ends of the second side barrier cuff shorter than that of the first side barrier cuff and is bonded to the inner surface of the laminate so that the longitudinally opposite ends of the second side barrier cuff lie more inwardly of the laminate than the longitudinally opposite ends of the first side barrier cuff.

[0006] According to a preferred embodiment of the invention, the longitudinally opposite ends of the second side barrier cuff lie more inwardly of the laminate than the longitudinally opposite ends of the first side barrier cuff, respectively, by 20 mm or more.

[0007] According to another preferred embodiment of the invention, the first side barrier cuff, the second side barrier cuff and the end barrier flaps forming the pockets are made of liquid-resistant materials.

[0008] Details of a disposable diaper according to the invention will be more fully understood from the description given hereunder with reference to the accompanying drawings, in which:

Fig. 1 is a partly cutaway plan view depicting a diaper according to the invention;

Fig. 2 is a sectional view taken along a line II-II in Fig. 1;

Fig. 3 is a sectional view taken along a line III-III in Fig. 1; and

Fig. 4 is a partly cutaway enlarged plan view depicting the diaper.

[0009] Figs. 1, 2 and 3 are respectively a partly cutaway plan view depicting an embodiment of a disposable diaper according to the invention, a sectional view taken along a line II-II in Fig. 1 and a sectional view taken along a line III-III in Fig. 1. A disposable diaper shown by these figures includes a main body 5 in the form of a laminate comprising a liquid-permeable topsheet 2, a liquid-impermeable backsheet 3 and a liquid-absorbent core 4 disposed between these two sheets 2, 3. The main body 5 has a front waist region 6, a rear waist region 7 and a crotch region 8 extending between these two waist regions 6, 7. The main body 5 is defined by longitudinally opposite ends 11, 12 extending in the transverse direction of the front and rear waist regions 6, 7, respectively, and transversely opposite side edges 13, 13 extending between these longitudinally opposite ends 11, 12. The respective side edges 13, 13 are inwardly curved in the crotch region 8. The topsheet 2 and the backsheet 3 are placed one upon another and intermittently bonded together by adhesive 17 means such as a hot melt adhesive agent along their portions extending laterally beyond transversely opposite edge of the core 4 so as to form longitudinally opposite end flaps 18, 19 and transversely opposite side flaps 21, 21.

[0010] The main body 5 includes on its inner surface outer and inner side barrier cuffs 22, 22; 23, 23 extending in parallel to the side edges 13, 13, respectively. On

the inner surface, the main body 5 further includes front and rear pockets 26A, 27A both opening inwardly of the diaper. The pockets 26A, 27A comprise a pair of end barrier flaps 26, 27 extending on the inner surface in the transverse direction of the front and rear waist regions 6, 7, respectively, so that the pockets 26A, 27A may be defined between the respective end barrier flaps 26, 27 and the topsheet 2. Zones represented by many dots are hot melt adhesive applied zones along which the end barrier flaps 26, 27 and the side barrier 22, 22'; 23, 23' are bonded to the underlying component of the diaper.

[0011] Each of the outer and barrier flap 22, 22' is formed by a strip of liquid-resistant sheet extending to the vicinity of the longitudinally opposite ends 11, 12 of the main body 5. Outer side edge 22A and longitudinally opposite ends 22B, 22C (22B is shown in Fig. 4) of the side barrier cuffs 22 are bonded to the topsheet 2 along first adhesive applied zone 31 and second adhesive applied zones 32A, 32B (32B is shown in Fig. 4) lying in the proximity of the longitudinally opposite ends 11, 12, respectively. Inner side edge 22D of the side barrier cuff 22 lies more inwardly of the main body 5 than the outer side edge 22A and a longitudinally extending first elastic member 41 is secured under appropriate tension to an inner surface of the inner side edge 22D. With the outer side barrier cuff 22 of the arrangement as described above, the inner side edge 22D is spaced upward from the topsheet 2 under the effect of the elastic member 41 between the longitudinally opposite ends 22B, 22C so as to form a first pocket 25 opening inwardly of the main body 5 when the diaper is put on a wearer's body.

[0012] The end barrier flaps 26, 27 respectively forming the front and rear pockets 26A, 27A are substantially rectangular liquid-resistant sheets. Longitudinally opposite ends of the respective end barrier flaps 26, 27 cover the longitudinally opposite ends 22B, 22C of the respective outer side barrier flaps 22. The end barrier flaps 26, 27 are bonded to the inner surface of the main body 5 along third and fourth adhesive applied zones 33, 34 extending along the longitudinally opposite ends 11, 12 of the main body 5, on one hand, and along fifth and sixth adhesive applied zones 35, 36 respectively extending from the longitudinally opposite ends 11, 12 inwardly of the main body 5. The fifth and sixth adhesive applied zones 35, 36 are formed on upper surfaces of the respective collapsed outer side barrier cuff 22 and/or the upper surface of the topsheet 2 extending outward beyond the outer side edges of the side barrier cuffs 22. Third and fourth elastic members 46, 47 are secured under appropriate tension to an inner surfaces of the respective end barrier flaps 26, 27 along their inner edges extending along a wearer's waist line.

[0013] Each of the inner side barrier cuffs 23 is formed by a strip of liquid-resistant sheet having its outer side edge 23A as well as its longitudinally opposite ends 23B, 23C bonded to the inner surface of the main body 5 along longitudinally extending seventh adhesive applied

zone 37 and along eighth and ninth adhesive applied zones 38, 39 formed adjacent longitudinally opposite ends of the adhesive applied zone 37. An inner side edge 23D lies more inwardly of the main body 5 than the outer side edge 23A. A longitudinally extending fourth elastic member 48 is secured under appropriate tension to the inner surface of the side barrier cuff 23 along the inner side edge 23D. The inner side barrier flap 23 forms a second pocket 49 adapted to open inwardly of the diaper when the diaper is put on a wearer's body.

[0014] Fig. 4 is a partly cutaway enlarged plan view depicting the diaper of Fig. 2. Each of the inner side barrier cuffs 23 has a region L₁ extending between its longitudinally opposite ends 23B, 23C both bonded to the topsheet 2 so as to be spaced from the upper surface of the topsheet 2 and thereby to open a second pocket 49 inwardly. The longitudinally opposite ends 23B, 23C are respectively spaced from the longitudinally opposite ends 22B, 22C at which the outer side barrier cuff 22 is bonded to the topsheet 2 by distances D₁, D₂. These distances D₁, D₂ respectively correspond to the distances from the second adhesive applied zones 32A, 32B to the eighth and ninth adhesive applied zones 38, 39, i.e., to the region L₁ of the inner side barrier cuff 23. For the inner side barrier cuff 23, D₁, D₂ are preferably 20 mm or longer and not covered with the strips of sheet 26, 27, respectively, as in the embodiment shown by Fig. 4. Compared to the length L₁ over which the inner side barrier cuff 23 can open, a length over which the outer side barrier cuff 22 can open is relatively long since this distance corresponds to a sum of L₁, D₁ and D₂.

[0015] With the diaper constructed as described above, the inner and outer side barrier cuffs 22, 23 are biased by contraction of the first and second elastic members 41, 48 to rise up on the upper surface of the topsheet 2 when the diaper is longitudinally curved on a wearer's body with the topsheet 2 lying inside. The outer side barrier cuff 22, the front pocket 26 and rear pocket 27 serve to prevent excretion from leaking beyond a periphery of the diaper. The inner side barrier cuffs 23 serve to prevent, particularly in the crotch region 8, excretion from flowing sideways and thereby to reduce the amount of excretion which would otherwise stay in the proximity of the outer side barrier cuff 22. Each of the inner side barrier cuffs 23 has a longitudinal dimension substantially equal to the previously mentioned length L₁ and is shorter than a substantial dimension of the outer side barrier cuff 22 as measured in parallel to the L₁. Transversely of the diaper, an amount of excretion which has overflowed the inner side barrier cuffs 23 to the outer side barrier cuff 22 may continue to flow along these outer side barrier cuffs 22 toward one of the longitudinally opposite ends 11, 12 of the main body 5. Excretion may now flow inwardly of the diaper as indicated by arrows X, Y (See Fig. 4) since the inner side barrier cuffs 22 are not present in the proximity of the ends 11, 12. In this way, the amount of excretion

which would attain the outer side barrier cuffs 22 can be reduced and thereby an amount of excretion which would otherwise leak beyond the side barrier cuffs 22 can be reduced.

[0016] In the diaper according to the invention, the liquid-resistant sheets employed as material for the inner and outer side barrier cuffs 22, 23 as well as the end barrier flaps 26, 27 should be understood to include various sheets which function as substantially liquid-impermeable or liquid-permeation-retardant sheets during practical use of the diaper. The outer side barrier cuffs 22 and the longitudinally opposite end barrier flaps 26, 27 may be bonded together over parts of their overlapping zones or substantially over these entire zones. An alternative embodiment of the invention is also conceivable in which the front and rear end barrier flaps 26, 27 are not provided with the third and fourth elastic members 48, 47, respectively. At least one of the front and rear waist regions 6, 7, elastic members extending along a wearer's waist line may be secured under appropriate tension to the longitudinally opposite end flaps 18, 19. Fig. 1 depicts the diaper of so-called "open type" in which the rear waist region 7 is provided on its transversely opposite side edges with tape fasteners 51, respectively, adapted to be releasably fastened to an outer surface of the front waist region 6. It should be understood that the invention is not limited to the illustrated embodiment but applicable to the diaper of pull-on or shorts type.

[0017] In the disposable diaper according to the invention, each of the side barrier cuffs functioning to prevent excretion from leaking sideways is provided in the form of a combination of the inner and outer side barrier cuffs of which the longitudinal dimensions are different from each other. Therefore, leakage of excretion can be effectively prevented. An amount of excretion having overflowed the inner side barrier cuff to the associated outer side barrier cuff may continue to flow along this outer side barrier cuff toward one of the longitudinally opposite ends of the diaper. In the proximity of these ends, the inner side barrier cuff is not present and therefore the amount of excretion can flow inwardly of the diaper without being restricted by the inner side barrier cuff. By guiding the flow of excretion inwardly of the diaper, an amount of excretion which would otherwise stay in the proximity of the outer side barrier cuff can be reduced and thereby leaking sideways of excretion can be further effectively prevented.

Claims

1. A disposable diaper comprising a laminate of a liquid-permeable topsheet, a liquid-impermeable backsheet and a liquid-absorbent core disposed therebetween, said laminate having an external shape defined by longitudinally opposite ends and transversely opposite side edges extending be-

tween said longitudinally opposite ends, said laminate including a pair of first side barrier cuffs formed on an inner surface of said laminate adjacent said respective side edges and extending longitudinally of said laminate so as to be collapsible inwardly of said laminate; and a pair of end barrier flaps placed in the proximity of said longitudinally opposite ends of said laminate so as to extend between said transversely opposite side edges of said laminate and to cover the longitudinally opposite ends of said pair of first side barrier cuffs, respectively, said end barrier flaps being partially bonded to said inner surface and thereby forming a pair of pockets adapted to open inwardly of said laminate, wherein:

Inwardly of said first side barrier cuffs formed on the inner surface of said laminate, there are formed a pair of second side barrier cuffs each extending from a longitudinally middle zone of the laminate in opposite directions longitudinally of the laminate, an outer edge of said second side barrier cuff bonded to said inner surface while an inner edge of said second side barrier cuff which extends in parallel to said outer edge is longitudinally elastic so as to be collapsed inwardly of said laminate; and each of said second side barrier cuff has a dimension between longitudinally opposite ends of said second side barrier cuff shorter than that of said first side barrier cuff and is bonded to said inner surface of said laminate so that said longitudinally opposite ends of said first side barrier cuff lie more inwardly of said laminate than said longitudinally opposite ends of said first side barrier cuff.

2. The diaper according to Claim 1, wherein said longitudinally opposite ends of said second barrier cuff lie more inwardly of said laminate than said longitudinally opposite ends of said first side barrier cuff, respectively, by 20 mm or more.
3. The diaper according to Claim 1 or 2, wherein said first side barrier cuffs, said second side barrier cuffs and said end barrier flaps forming said pockets are made of liquid-resistant materials.

FIG.3

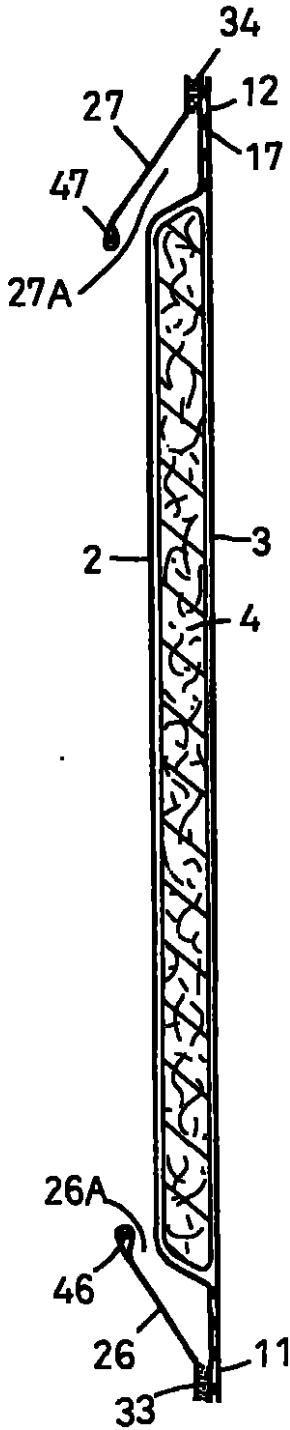


FIG.2

