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Clarke, Mod
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SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
No. 06-031935- -00004-0000
Fecha: 2009-04-14 16:06:56 Dep 2020 NUECREACION!
Tra. 2 PATENTES Eve: 1 REGDEPOSITO
Act. 444 RESPUESTAREQUE Folios 18

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
DIVISION DE NUEVAS CREACIONES
E. S. D.

Re: Expediente No. 06-31935
Solicitud de patente a nombre de **McNeil PPC, Inc.**

Yo, DILIA MARIA RODRIGUEZ D'ALEMAN, actuando como apoderada sustituta de acuerdo con la sustitución adjunta, identificada como aparece al pie de mi firma, domiciliada en la Carrera 11 No. 86-53, piso 6, obrando como apoderada de la sociedad **McNeil PPC, Inc.** domiciliada en Skillman, New Jersey, Estados Unidos de América, solicitante de la patente de la referencia, en respuesta al oficio No. 0519 notificado por fijación en lista el 22 de enero de 2009, relacionado con el concepto técnico de fondo No. 0029, me permito manifestar:

1. Con fundamento en la facultad que confiere el artículo 34 de la Decisión 486 al solicitante para modificar la solicitud de patente en cualquier momento del trámite, presento junto con este memorial nueva descripción y nuevo capítulo reivindicatorio que consta de 22 reivindicaciones, en los cuales se realizaron las siguientes modificaciones:
 - 1.1 Como primera medida, se modificó la descripción para eliminar las palabras "a un" en la página 4, se cambió el porcentaje 600% por 60% en la página 11 y se corrigió la palabra barrea por barrera en la página 21. Anexamos páginas corregidas.
 - 1.2 De otra parte, se modificó el capítulo reivindicatorio para incluir como nueva reivindicación 1 la antigua reivindicación 28, que precisa que el adhesivo del artículo absorbente es un gel adhesivo basado en un copolímero de bloque estireno-etileno-butileno-estireno (SEBS).
 - 1.3 Se eliminaron las antiguas reivindicaciones 1, 7 a 9, 12, 13 y 29.
 - 1.4 Se eliminaron los términos imprecisos tales como demás de cerca, de menos de y "de cerca de".
 - 1.5 La expresión "grado PDL" fue reemplazada por "proporción PDL."
 - 1.6 Se creó una dependencia entre todas las nuevas reivindicaciones, limitando

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así el alcance de la invención y eliminando aquellas características que hacían que las reivindicaciones no fueran concisas.

- 1.7 Finalmente, se renumeró todo el capítulo reivindicatorio teniendo en cuenta las modificaciones anteriormente mencionadas.

En cuanto a estas modificaciones, me permito decir que las mismas no amplían de ninguna manera la materia objeto de la presente solicitud y se realizaron con el ánimo de superar las objeciones de claridad y unidad de invención planteadas por el examinador en su concepto técnico.

Teniendo en cuenta el concepto técnico emitido por el Señor Superintendente Delegado para la propiedad intelectual Gian Carlo Marcenaro Jiménez a la doctora Ana Maria Castro Wey, el cual fue radicado el día 4 de marzo de 2009 bajo el No. 09-012566, se presenta las tasas adicionales N° 09-25,175 y 09-8,705, con las cuales se cubre el costo correspondiente a 7 reivindicaciones, toda vez que el nuevo capítulo reivindicatorio comprende 22 reivindicaciones.

2. Claridad de la solicitud

Respecto a este punto, el solicitante manifiesta que mediante las modificaciones realizadas tanto en la descripción como en el capítulo reivindicatorio, quedan subsanadas la totalidad de las objeciones, de modo tal que el nuevo capítulo descriptivo y las nuevas reivindicaciones proporcionan claridad y concisión a la invención descrita, siguiendo las recomendaciones realizadas por el examinador en su concepto técnico.

En cuanto a la objeción relativa a la expresión "grado PDL", es necesario precisar que ésta ha sido modificada por "proporción PDL", la cual se encuentra definida entre las páginas 13 y 14 de la descripción, en donde se indica: "*La proporción PDL es una medida de la resistividad química de un material particular listado a un medio de exposición.*" Teniendo en cuenta esta definición, la propiedad técnica utilizada en las nuevas reivindicaciones 4 a 6 es clara para cualquier persona versada en la materia, más aun cuando hay artículos como "PDL Chemical Resistance of Plastic and Elastomers" publicado por William Andrew Publishing; 2001, ISBN 1-884207-90-1, donde se hace referencia al "Mineral Oil Exposure Medium Table" y esta tabla describe las proporciones PDL de varios materiales.

3. Novedad

El examinador establece en su concepto técnico No. 0519 que las

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reivindicaciones 1 a 27 y 29 de la presente solicitud carecen de novedad a la luz de los documentos ES 2147789 (D1) y GB 2284767 (D2).

En este sentido, me permito decir que el artículo 16 de la Decisión 486 de la Comisión de la Comunidad Andina establece que la invención se considera como nueva cuando no está comprendida en el estado de la técnica. De acuerdo con la norma, para que la invención pierda su calidad de novedosa, es claro que ella, TODA ELLA, ha de estar contenida en el "*conjunto de conocimientos existentes que son aplicables al proceso industrial*" como define el estado de la técnica el Tribunal de justicia del Acuerdo de Cartagena (Proceso No. 6-IP-89, sentencia de 31 de octubre de 1989, publicada en Jurisprudencia del Tribunal de Justicia del Acuerdo de Cartagena, Tomo 11, BID-INTAL, Buenos Aires, 1994, página 60).

Esto se conoce como NOVEDAD ABSOLUTA, de conformidad con lo cual para desvirtuar el requisito de novedad de una invención será necesario que lo reivindicado por la invención bajo estudio corresponda de forma total con lo revelado en un documento o anterioridad señalada, conclusión a la que se llega después de un análisis exhaustivo mediante una comparación entre el capítulo reivindicatorio de la invención en estudio y la divulgación de las referencias D1 o D2.

Ahora bien, si un determinado elemento, condición o circunstancia de la nueva creación ya hace parte del estado de la técnica no quiere ello decir, desde luego, que la invención deba ser rechazada por carecer del requisito de novedad. No sin razón ha dicho el mencionado Tribunal: "*hay que advertir que toda creación es en cierta forma, producto del estado de la técnica existente, en el sentido de que el inventor ha de tener en cuenta un conjunto de conocimientos técnicos que le permitan crear nuevos procedimientos aplicables a la industria*" (Ibídem, páginas 53 y 54) (el subrayado es nuestro).

Por lo tanto, como mínimo la novedad debe contemplar los siguientes aspectos:

-Que la invención en estudio esté contenida de forma TOTAL y ABSOLUTA en el documento que se menciona como anterioridad o de forma independiente en los documentos que se mencionan, si son varios.

-Que la invención en estudio puede partir de conocimientos conocidos, caso en el cual habrá que hacer la comparación no de lo conocido sino de lo inédito y novedoso, teniendo que analizarse el valor agregado que aporta la invención con sus nuevas características al campo técnico al cual pertenece la invención en estudio.

Aplicando lo anterior al caso concreto, para que las razones que aduce ese

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despacho para desvirtuar la novedad fuesen ciertas, sería forzoso que se demostrara que la invención ahora reivindicada por mi mandante está comprendida en el estado de la técnica de forma TOTAL, lo cual no sucede con la materia reclamada en las nuevas reivindicaciones.

En este sentido, el solicitante hace énfasis en que el análisis realizado por ese Despacho reconoce la novedad de la reivindicación 28. Siendo así y dado que el nuevo capítulo reivindicatorio tiene la mencionada reivindicación 28 como reivindicación independiente, es claro que la nueva reivindicación 1 es novedosa, pues ninguno de los documentos citados como arte previo divulga un artículo absorbente que comprende un adhesivo para asegurar el artículo al cuerpo, donde dicho adhesivo es un gel adhesivo basado en un copolímero de bloque estireno-etileno-butileno-estireno (SEBS).

Así las cosas, es deseo del solicitante manifestar que por medio de las modificaciones enunciadas en el punto 1 de este memorial, las nuevas reivindicaciones 1 a 22 cumplen con el requisito de novedad, toda vez que se ha limitado el alcance de la invención al artículo absorbente que comprende específicamente un adhesivo basado en un copolímero de bloque estireno-etileno-butileno-estireno (SEBS), hecho que no había sido sugerido ni divulgado en ningún momento por los documentos D1 o D2.

4. Conversión de la Solicitud a Patente de Modelo de Utilidad

En virtud del Artículo 35 de la Decisión 486 que establece: *“El solicitante de una patente de invención podrá pedir, en cualquier momento del trámite, que su solicitud se convierta en una solicitud de patente de modelo de utilidad. La conversión de la solicitud sólo procederá cuando la naturaleza de la invención lo permita.*

La petición de conversión de una solicitud podrá presentarse sólo una vez. La solicitud convertida mantendrá la fecha de presentación de la solicitud inicial.

Las oficinas nacionales competentes podrán sugerir la conversión de la solicitud en cualquier momento del trámite, así como disponer el cobro de una tasa adicional para la presentación de las solicitudes de conversión. El solicitante podrá aceptar o rechazar la propuesta, entendiéndose que si ésta es rechazada, se continuará la tramitación del expediente en la modalidad solicitada originalmente”, es deseo del solicitante convertir la presente solicitud de patente de invención en una solicitud de patente de modelo de utilidad.

Con relación a la tasa de conversión de patente de invención a modelo de utilidad, me permito informar que con la presentación de la solicitud de patente el 31 de marzo de 2006, se adjuntó el recibo de pago No. 06-23,005 del 22 de

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marzo de 2006, por valor de \$463.000 pesos. Dado que el costo de la tasa de presentación de un modelo de utilidad es inferior, con el recibo mencionado queda cubierta la tasa de conversión de patente de invención a modelo de utilidad.

Así pues, el modelo de utilidad ahora reivindicado cumple con lo establecido en el artículo 81, que define un modelo de utilidad en los siguientes términos: "*Se considera modelo de utilidad, a toda nueva forma, configuración o disposición de elementos, de algún artefacto, herramienta, instrumento, mecanismo u otro objeto o de alguna parte del mismo, que permita un mejor o diferente funcionamiento, utilización o fabricación del objeto que le incorpore o que le proporcione alguna utilidad, ventaja o efecto técnico que antes no tenía.*"

Los modelos de utilidad se protegerán mediante patentes".

Basándonos en el citado artículo, es claro que la materia descrita en las nuevas reivindicaciones 1 a 22 puede ser considerada un modelo de utilidad, dado que la invención se refiere a un artículo absorbente que comprende una capa de cubierta, una capa de barrera, un adhesivo en gel basado en un copolímero de bloque estireno-etileno-butileno-estireno (SEBS), el cual es aplicado sobre la superficie de la cubierta permeable para asegurar el artículo al cuerpo del usuario, y un miembro de liberación removible para cubrir el adhesivo, lo que constituye una nueva configuración y disposición de elementos que permiten obtener un artículo absorbente con propiedades de adhesión al cuerpo, que garantizan mayor comodidad y seguridad para el usuario, sin que ello implique la presencia de machas sobre el miembro de liberación removible y por ende, la eliminación de problemas estéticos resultantes de la migración de adhesivo hacia al papel de liberación y la apariencia grasosa que deja sobre el mismo.

De acuerdo con los argumentos del párrafo anterior, el objeto que acá se reivindica cumple con los parámetros establecidos por el Artículo 81 de la Decisión 486, toda vez que el artículo absorbente definido en la reivindicación 1 describe exactamente un objeto que se acopla a los parámetros requeridos para un modelo de utilidad.

Adicionalmente, esta invención cumple con el requisito de novedad, tal y como se indicó en el punto 3 del presente memorial, donde se explican las modificaciones realizadas a las reivindicaciones, que permiten que la materia descrita en dicho capítulo reivindicatorio sea novedosa a la luz de la Decisión 486. Por lo tanto, la solicitud cumple completamente con los parámetros necesarios para ser objeto de obtención de patente de modelo de utilidad.

En resumen, me permito decir que gracias a las modificaciones expuestas en el

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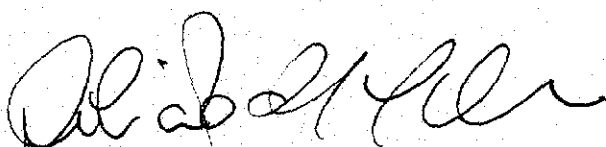
Clarke, Modet & C^o

COLOMBIA

punto 1 de este memorial y los argumentos anteriormente mencionados, la presente solicitud cumple cabalmente con los requisitos de claridad y novedad. Además, por medio de la conversión a patente de modelo de utilidad, se evitan futuras objeciones relacionadas con el cumplimiento del requisito de nivel inventivo de la presente solicitud. Por lo tanto, me permito solicitar comedidamente a ese Despacho se sirva reconocer estos requisitos y conceder el privilegio de patente de modelo de utilidad a la solicitud en estudio.

De otra parte, solicitamos a ese despacho pronunciarse en relación con todos los argumentos presentados en este memorial dando estricta aplicación al principio del debido proceso consagrado en el artículo 29 de la Constitución Nacional. De igual forma, si el examinador considera que subsisten razones para objetar la presente invención ruego expedir otro examen de fondo con los debidos motivos y razones que sustenten su objeción con el fin de que mi mandante tenga la posibilidad de exponer sus argumentos con base en la interpretación de los artículos 45 de la Decisión 486 -el cual otorga la facultad al examinador para emitir los exámenes de fondo-, 35 y 59 del Código Contencioso Administrativo que señala que: *"habiéndose dado oportunidad a los interesados para expresar sus opiniones, y con base en las pruebas e informes disponibles, se tomará la decisión que será motivada al menos en forma sumaria si afecta a particulares"* y *"(.) deberá proferirse la decisión definitiva. Esta se motivará en sus aspectos de hecho y de derecho, y en los de conveniencia si es el caso"*, respectivamente (el subrayado es nuestro).

Señor Superintendente,



DILIA MARIA RODRIGUEZ D'ALEMAN

CC. 41.654.882

TP 20824 CSJ

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COLOMBIA

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SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

DIVISION DE NUEVAS CREACIONES

EXPEDIENTE NR. 06.031.935

REF: **EXPEDIENTE NR. 06.031.935**

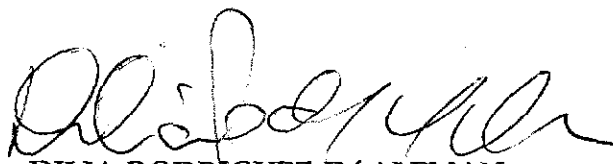
Yo, JIMENA ESCOBAR URIBE, identificada como aparece al pie de mi firma, domiciliada en la Carrera 11 No. 86-53 Piso 6, atentamente digo a usted que sustituyo el poder con que obro a la doctora DILIA RODRIGUEZ D'ALEMAN, domiciliada en Bogotá, D.C., portadora de la tarjeta profesional No. 20.824, con las mismas facultades con que me fueron conferidas para este caso.


JIMENA ESCOBAR URIBE

C.C. 30.779.452 de Usaquén

T.P. 68.228

Acepto sustitución


DILIA RODRIGUEZ D' ALEMAN

C.C. 41.654.882 de Bogotá

T.P. 20.824

PRESENTACION PERSONAL

El anterior escrito fue presentado ante el
NOTARIO ONCE DEL CIRCULO DE BOGOTA, D.C.
personalmente por JIMENA TOCOPAL
UIZQUE
quien exhibió la c.c. 39779432 de UDAGUEA
y Tarjeta Profesional No. 68228 C.C.U.

Fecha - 1 ABR 2009
Jimena Tocopal



FORMULARIO ÚNICO DE CONVERSIÓN Y FUSIÓN DE SOLICITUDES
SOLICITUD DE:

1



Conversión



Fusión



Patente de invención



Patente de Modelo de Utilidad



Registro de Diseño Industrial



Esquemas de Trazado para Circuitos Integrados

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SOLICITANTE

Nombre: **McNeil-PPC, Inc.**

Dirección: Grandview Road, Skillman, New Jersey 08558, Estados Unidos de América

Nacionalidad o domicilio: Skillman, New Jersey, Estados Unidos de América

Lugar de Constitución: New Jersey, Estados Unidos de América

Teléfono:

Fax:

E-mail

IDENTIFICACIÓN

C.C.

☐

NIT

☐

C.E.

☐

Otro

☐

Cúal

Número

3)

**REPRESENTANTE
O APODERADO**

Nombre: **DILIA MARÍA RODRÍGUEZ
D'ALEMAN**

Dirección: Carrera 11 N°. 86-53 Piso 6 Bogotá D.C.

Teléfono: 6181088 Fax: 6350824

E. Mail: info@clarkemodet.com.co

IDENTIFICACIÓN

C.C.

☐

NIT:

☐

C.E.

☐

OTRO

☐

NÚMERO: 41.654.882
TP: 20824 CSJ

4. CONVERSIÓN

Expediente No.: 06.031.935

De: PATENTE DE INVENCION
A: MODELO DE UTILIDAD

5. DIVISIÓN

Expediente No.: _____

No. De divisionales _____

6. FUSIÓN

Expediente No.: _____

Expediente No.: _____

7 Comprobante de pago No. _____

Fecha _____

8 Anexos:

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Comprobante de pago de la tasa

☐

Poderes si fuese el caso

☐

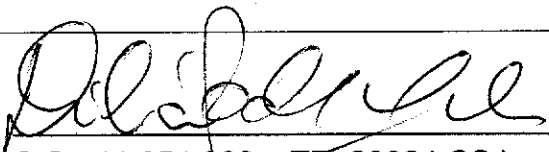
Documento que acredita la existencia y representación legal de las partes, cuando sean personas jurídicas.

☐

Copia de la solicitud Divisional.

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Nombre: DILIA RODRÍGUEZ D'ALEMAN


C.C.: 41.654.882 TP: 20824 CSJ

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

NTT : 000176099-2

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



No. 06-031935- -00004-0000

Fecha: 2009-04-14 16:06:56 Dep. 2020 NUECREACIONE
Tra. 2 PATENTES Eve: 1 REGDEPOSITO
Act. 444 RESPUESTAREQUE Folios 18

CERTIFICACION DE EXCEDENTE : 07 - 25,175
FECHA : MARZO 31 DE 2009

***** CONSIGNACION *****

DEPOSITANTE	TIPO PAGO	BANCO	CUENTA	No. PAGO	FECHA PGO	VR. PAGO
CLARKE MODET Y CO. COLOMBIA	CONSIGNACION	BANCO DE BOGOTA	062794067	111723194	31/03/2009	80,435,000.00

***** CONCEPTO *****

CANT.	CONCEPTO	TOTAL CONCEPTO
1	50005-01-09 OTROS SERVICIOS DE PROPIEDAD I	170,000.00
	99 OTROS SERVICIOS ADMINISTRATIVOS	170,000.00
	TOTAL :	170,000.00

SON: CIENTO SETENTA MIL PESOS

RESPONSABLE :

RECIBO DE CAJA APLICADO AL EXPEDIENTE No. _____

ESTA CERTIFICACION DE EXCEDENTE DE PAGO SOLO PODRA SER UTILIZADA
COMO PARTE DE LA CANCELACION DE UNA TARIFA VIGENTE Y NO PODRA SER
SUSTITUIDA POR NINGUN RECIBO.

P-1665
9

NIT : 800176089-2

CERTIFICACION DE EXCEDENTE : 9 - 8,705
FECHA : FEBRERO 3 DE 2009

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



No. 06-031935- -00004-0000

Fecha: 2009-04-14 16:08:56 Dep. 2020 NUECREACION
Tra 2 PATENTES Eve: 1 REGDEPOSITO
Act. 444 RESPUESTAREQUE Folios: 18

***** CONSIGNACION *****

DEPOSITANTE	TIPO PAGO	BANCO	CUENTA	No. PAGO	FECHA PGO	Vr. PAGO
CLARKE MODET Y CO. COLOMBIA	CONSIGNACION	BANCO DE BOGOTA	062754387	108004750	02/02/2009	31,570,000.00

***** CONCEPTO *****

CANT.	RENTISTICO	CONCEPTO	TOTAL CONCEPTO
1	50005-01-09	OTROS SERVICIOS DE PROPIEDAD I	
		99 OTROS SERVICIOS ADMINISTRATIVOS	5,000.00
		TOTAL :	\$ 5,000.00

SON: CINCO MIL PESOS

RESPONSABLE :

RECIBO DE CAJA APLICADO AL ASUNTO No.

ESTA CERTIFICACION DE EXCEDENTE DE PAGO SOLO PODRA SER UTILIZADA
COMO PARTE DE LA CANCELACION DE UNA TARIFA VIGENTE Y NO PODRA SER
SUSTITUIDA POR NINGUN RECIBO.

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cuerpo, un adhesivo para asegurar el artículo al cuerpo dispuesto sobre la superficie que enfrenta al cuerpo, un miembro de liberación removible para cubrir el adhesivo antes de uso, el miembro de liberación que es impermeable a la migración de cualquiera de los componentes del adhesivo a través de éste.

De acuerdo con otro aspecto de la invención, la presente invención se relaciona con un artículo absorbente que incluye una cubierta permeable a los líquidos, una barrera impermeable en los líquidos, una superficie que enfrenta al cuerpo, un adhesivo para asegurar el artículo al cuerpo dispuesto sobre la superficie que enfrenta al cuerpo, en donde el adhesivo es un gel adhesivo basado en un copolímero de bloque de estireno-etileno-butileno-estireno (SEBS), un miembro de liberación removible para cubrir el adhesivo antes de uso, el miembro de liberación siendo impermeable a la migración de cualquiera de los componentes a través de éste.

De acuerdo con otro aspecto de la invención, la presente invención se relaciona con un método para prevenir una migración de un adhesivo aunque un miembro de liberación removible en un artículo sanitario unible al cuerpo, el método incluye las etapas de suministrar una superficie que enfrenta al cuerpo, aplicar un adhesivo a la superficie que enfrenta al cuerpo para asegurar el artículo al cuerpo del

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De 0% a 50% en peso de la composición, preferiblemente de 0 a 60% de la sustancia polimérica macromolecular de una resina pegajosa cuyo alcance principal es ajustar el Tg especialmente en sistemas basados en polímeros sintéticos;

De 0 a 10 % y más preferiblemente de 0 a 5% en peso de sustancias para facilitar y estabilizar el gel y el proceso de formador de gel tanto de los plastificadores líquidos hidrofílicos como hidrófobos. Estos pueden ser para sistemas aceitosos, por ejemplo, ácidos grasos de C_8 a C_{22} , sus sales metálicas y sus derivados polioxo, derivados de lanolina, sílice; bentonita, montmorillonita y sus derivados; poliamidas, ceras o mezclas de estos.

El adhesivo también puede ser del tipo descrito de la patente U.S. No. 6,213,993 de Zacharias et al.. En particular el adhesivo puede comprender:

Un adhesivo basado en caucho tal como estirenobutadieno, poliisobutileno, polibutadieno y poliisopreno; un adhesivo soluble del agua tal como polivinilalcohol, polivinilacetato, y metilcelulosa; un adhesivo que funde en caliente tal como los copolímeros de bloque de estireno-butadieno-estireno, estireno-isopreno-estireno, estireno-etilenopropileno-estireno, estireno-etilenobutileno-estireno y copolímeros tetrabloque tales como: estireno-etilenopropileno-estireno-

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preferidos para uso en la presente invención son poliacrilatos reticulados, tales como el producto ofrecido por Sumitomo Seika Chemicals Co., de Osaka Japón bajo la designación de SA 70N y productos ofrecidos por Stockhausen Inc.

Cuerpo Principal- Capa de Barreras

Por debajo de la capa absorbente 44 hay una capa de barrera 50 que comprende un material de película impermeable a los líquidos para evitar que el líquido que está atrapado en el sistema absorbente 44 salga de la toalla sanitaria y manche la prenda interior del usuario. La barrera de capa 50 se hace preferiblemente de película polimérica, aunque ésta se puede hacer de material permeable al aire impermeable a los líquidos tal como espumas o películas micro porosas o no tejidos tratados con repelente.

La capa de barrera puede ser respirable, es decir, permite transpirar vapor. Materiales para este propósito incluyen materiales no tejidos y películas micro porosas en las que la micro porosidad se crea por, entre otros, estiramiento de una película orientada. Capas múltiples o sencillas de películas permeables, telas, materiales fundidos por soplado y combinaciones de estos que suministran una trayectoria tortuosa, y/o cuyas características de superficie suministran

REIVINDICACIONES

1. Un artículo absorbente que comprende:

- Una cubierta ⁽²¹⁾ permeable a los líquidos, que tiene una superficie que se enfrenta al cuerpo;
- Una barrera ⁽⁴⁰⁾ impermeable a los líquidos;
- Un adhesivo ⁽³³⁾ para asegurar el artículo ⁽²⁰⁾ al cuerpo dispuesto sobre la superficie que enfrenta al cuerpo, en donde dicho adhesivo es un gel adhesivo basado en un copolímero de bloque estireno-etileno-butileno-estireno (SEBS);
- Un miembro ⁽⁴⁷⁾ de liberación removible para cubrir el adhesivo ⁽³³⁾ antes de uso, dicho miembro ⁽⁴⁷⁾ de liberación es impermeable a la migración de cualquier componente de dicho adhesivo a través de este.

2. El artículo absorbente de acuerdo con la reivindicación 1, en donde dicho miembro de liberación removible es una estructura laminada que comprende una primera capa formada de papel celulósico y al menos una segunda capa formada de un recubrimiento de película no poroso.

3. El artículo absorbente de acuerdo con la reivindicación 1, en donde dicho miembro de liberación removible se forma a partir de un material de película no poroso.

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4. El artículo absorbente de acuerdo con la reivindicación 2 o 3, en donde dicho recubrimiento de película tiene una proporción PDL mayor de 7 cuando un medio de exposición es aceite mineral a una temperatura de 20° C.
5. El artículo absorbente de acuerdo con la reivindicación 4, en donde dicho recubrimiento de película tiene una proporción PDL mayor de 8.
6. El artículo absorbente de acuerdo con la reivindicación 4, en donde dicho recubrimiento de película tiene una proporción PDL de 9.
7. El artículo absorbente de acuerdo con la reivindicación 2 o 3, en donde dicho miembro de liberación comprende un recubrimiento de silicona.
8. El artículo absorbente de acuerdo con la reivindicación 2 o 3, en donde dicho recubrimiento de película es uno de polipropileno y polietileno.
9. El artículo absorbente de acuerdo con la reivindicación 1, en donde dicho adhesivo tiene un contenido de plastificador líquido mayor de 50% en peso.

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10. El artículo absorbente de acuerdo con la reivindicación 9, en donde dicho adhesivo tiene un contenido de plastificador líquido mayor de 65% en peso.
11. El artículo absorbente de acuerdo con la reivindicación 10, en donde dicho adhesivo tiene un contenido de plastificador líquido mayor de 80% en peso.
12. El artículo absorbente de acuerdo con la reivindicación 9, en donde dicho plastificador líquido tiene un peso molecular menor de 1000 g/mol
13. El artículo absorbente de acuerdo con la reivindicación 12, en donde dicho plastificador líquido tiene un peso molecular menor de 750 g/mol.
14. El artículo absorbente de acuerdo con la reivindicación 13, en donde dicho plastificador líquido tiene un peso molecular de menos de 500 g/mol
15. El artículo absorbente de acuerdo con la reivindicación 1, en donde dicho adhesivo se selecciona del grupo que consiste adhesivos que tienen estructuras de copolímero radial o lineal que tienen la fórmula $(A-B)_x$ en donde el bloque A es un bloque de polivinilareno, el bloque B es bloque poli(monoalquénilo), x denota el número de bazos

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poliméricos, y en donde x es un entero mayor que o igual a uno.

16. El artículo absorbente de acuerdo con la reivindicación 15, en donde dichos polivinilarenos de bloque A se seleccionan del grupo que consiste esencialmente de poliestireno, polialfa-metilestireno, poliviniltolueno, y combinaciones de estos.

17. El artículo absorbente de acuerdo con la reivindicación 16, en donde dicho poli(monoalqueno) de bloque B se selecciona del grupo que consiste esencialmente de elastómeros dieno que incluyen polibutadieno, poliisopreno, elastómeros hidrogenados que incluyen etileno-butileno o etileno-propileno o poliisobutileno, o combinaciones de estos, adhesivos que consisten de copolímeros de bloque estireno-etileno-butileno-estirenos (SEBS) y aceites minerales, aceites de procesos nafténicos o parafínicos, y opcionalmente una resina pegajosa que incluye resinas modificadas y naturales; ésteres de pentaeritritol y glicerol de resinas naturales y modificadas; resinas de politerpeno; copolímeros y terpolímeros de terpenos naturales; resinas de terpeno fenólicas modificadas y derivados hidrogenados de éstos; resinas de petróleo alifáticas y los derivados hidrogenados de éstos; resinas de petróleo aromático y

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derivados hidrogenados de éstos; y derivados alifáticos/aromáticos

18. El artículo absorbente de acuerdo con la reivindicación 1, en donde dicha cubierta se hace de material hilado no tejido que tiene de 0 a 100% poliéster y de 0 a 100% rayón.

19. El artículo absorbente de acuerdo con la reivindicación 28, en donde dicha cubierta es material hilado hecho de 10% a 75% rayón y de 35% a 90% poliéster.

20. El artículo absorbente de acuerdo con la reivindicación 1, en donde dicha cubierta se hace de un material de película abierto.

21. El artículo absorbente de acuerdo con la reivindicación 1, en donde dicha barrera se forma de un material de película respirable.

22. El artículo absorbente de acuerdo con la reivindicación 1 en donde dicho artículo absorbente es uno de una toalla sanitaria, protector y un producto para incontinencia de adultos.

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US006544642B2

B5
A5(12) **United States Patent**
Cinelli et al.(10) **Patent No.:** **US 6,544,642 B2**
(45) **Date of Patent:** **Apr. 8, 2003**(54) **DISPOSABLE ABSORBENT ARTICLES WITH
IMPROVED ADHESIVE FOR ATTACHMENT
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2002/0015689 A1 * 2/2002 Munro et al. 424/78.31(75) **Inventors:** **Fabio Cinelli**, Bologna (IT); **Antonello
Colaiani**, Pescara (IT); **Adelia
Alessandra Tordone**, Pescara (IT);
Hugh Semple Munro, Chipping
Camden (GB); **Brian John Tighe**,
Aston Triangle (GB)(73) **Assignee:** **The Procter & Gamble Company**,
Cincinnati, OH (US)(*) **Notice:** Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 0 days.(21) **Appl. No.:** **09/917,577**(22) **Filed:** **Jul. 27, 2001**(65) **Prior Publication Data**

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Feb. 2, 2000.(30) **Foreign Application Priority Data**

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(51) **Int. Cl.** **B32B 7/12**(52) **U.S. Cl.** **428/343; 525/56; 525/92 A;
525/185; 525/218; 525/222; 525/105; 524/366;
524/387**(58) **Field of Search** **524/387, 366;
525/56, 92 A, 185, 218, 222; 523/105**(56) **References Cited****U.S. PATENT DOCUMENTS**3,577,989 A 5/1971 Anderson
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Primary Examiner—David W. Wu**Assistant Examiner**—Rip A Lee(74) **Attorney, Agent, or Firm**—Peter D. Meyer(57) **ABSTRACT**

The present invention relates to a disposable absorbent articles such as diapers and sanitary napkins which are provided with adhesives for attachment of the article to the skin. In particular the present invention relates to adhesives which provide secure attachment and are pleasing to the skin upon application, yet cause no discomfort upon removal. In particular the present invention relates to an adhesive which provide secure attachment to oily and greasy skin. Preferably the adhesive also provides secure attachment under moist and wet skin conditions and which maintains adhesive peel strength even under exposure to excess water.

16 Claims, No Drawings

SELF-ADHERING ABSORBENT ARTICLE

This application is a continuation of application Ser. No. 08/331,072 entitled "SELF-ADHERING ABSORBENT ARTICLE" and filed in the U.S. Patent and Trademark Office on Oct. 28, 1994, now abandoned. The entirety of this application is hereby incorporated by reference.

FIELD OF THE INVENTION

The present invention relates to a disposable absorbent article having an adhesive disposed adjacent to a wearer's skin. More particularly, the invention relates to a catamenial device having a supportive adhesive residing on the body-side surface of the device.

BACKGROUND OF THE INVENTION

All manner and variety of externally positioned disposable absorbent articles configured for the absorption of body fluids such as menses, urine, feces and the like are well known. For simplicity of describing the invention, such articles will be collectively referred to herein as a sanitary napkin. Those skilled in the art understand the differences in these structures and will readily appreciate the adaptability of this invention to these other structures.

Securement of the sanitary napkin during use is often accomplished by attaching the sanitary napkin to the wearer's undergarment by a pressure sensitive adhesive. Securing a sanitary napkin to an undergarment can exhibit a number of drawbacks. One drawback is that the adhesive can stick too aggressively to the inside surface of the undergarment leaving residue. Another disadvantage is the napkin will tend to move with the undergarment rather than associating with the bodily movements of the wearer. This can result in a less secure fit and increase the incidence of fluid leakage, irritation, chafing, and discomfort.

In the past, attempts have been made to adhere a sanitary napkin to the wearer. However, the sanitary napkins have been large enough so as to avoid the adhesive being placed in contact with the wearer's pubic hair and sensitive genitalia. This is because in securing the sanitary napkin to the wearer, the prior art teaches using adhesives of the type used in various surgical applications. Removal of these adhesives typically causes sudden pain and discomfort to the wearer. Thus, avoiding such sensitive areas has been desirable.

It would therefore be desirable to have a sanitary napkin that can be secured to the wearer's body that would be comfortable to wear, would be discrete, give the wearer a feeling of security during use and would not cause discomfort upon removal.

SUMMARY OF THE INVENTION

Briefly, this invention relates to an absorbent article having an absorbent core with at least one surface designed to be positioned adjacent to a wearer's body, i.e., having a bodyfacing surface, and a pressure sensitive adhesive secured to the bodyfacing surface. Preferably the adhesive is a hot melt adhesive. Adhesives in accordance with the present invention have a rheological property, $\tan \delta$ (delta) referenced to 20° C., ranging from about 0.01 to about 0.6 and preferably from about 0.06 to about 0.48 at a frequency of 0.1 radians per second and a $\tan \delta$ ranging from about 0.10 to about 1.7 and preferably from about 0.20 to about 1.5 at a frequency of 1000 radians per second. In a preferred embodiment of the invention the absorbent article includes a cover wherein the adhesive is secured to the bodyfacing surface of the cover.

The general object of this invention is to provide an absorbent article that is adhesively attached to the wearer's body. A more specific object of this invention is to provide a sanitary napkin that uses one or more adhesives having specific rheological properties to secure the sanitary napkin to the wearer.

Another object of the invention is to provide a sanitary napkin that is comfortable to wear and can be readily removed with little or no pain or discomfort to the wearer.

Other objects and advantages of the present invention will become more apparent to those skilled in the art in view of the following description and the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a top plan view of an absorbent article showing one embodiment of the invention.

FIG. 2 is a cross-sectional view of FIG. 1 taken along line 2-2.

FIG. 3 is a time-temperature superposition graphical plot of the frequency (in radians per second) versus the rheological property $\tan \delta$ referenced to 20° C. for National Starch adhesive 34-5516.

FIG. 4 is a time-temperature superposition graphical plot of the frequency (in radians per second) versus the rheological property $\tan \delta$ referenced to 20° C. for National Starch adhesive 70-9908.

FIG. 5 is a time-temperature superposition graphical plot of the frequency (in radians per second) versus the rheological property $\tan \delta$ referenced to 20° C. for Finley adhesive H2292H.

FIG. 6 is a time-temperature superposition graphical plot of the frequency (in radians per second) versus the rheological property $\tan \delta$ referenced to 20° C. for National Starch adhesive 7659-42-3 in accordance with the present invention.

FIG. 7 is a time-temperature superposition graphical plot of the frequency (in radians per second) versus the rheological property $\tan \delta$ referenced to 20° C. for National Starch adhesive 8111-60-4 in accordance with the present invention.

FIG. 8 is a time-temperature superposition graphical plot of the frequency (in radians per second) versus the rheological property $\tan \delta$ referenced to 20° C. for National Starch adhesive 8111-69-2 in accordance with the present invention.

FIG. 9 is a time-temperature superposition graphical plot of the frequency (in radians per second) versus the rheological property $\tan \delta$ referenced to 20° C. for National Starch adhesive 7659-41-3 in accordance with the present invention.

FIG. 10 is a graphical plot of frequency (in radians per second) versus the rheological property $\tan \delta$ illustrating the quadrangle ABCD.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The present invention relates generally to disposable absorbent articles that are secured to the body of a wearer by a pressure sensitive adhesive and preferably a hot melt, pressure sensitive adhesive. For convenience of description only, the invention will be described as applied to a catamenial device, i.e., a sanitary napkin, but the invention is not limited thereto. As used herein, the term "sanitary napkin" refers to an article which is worn by females adjacent to the

pubic region and which is intended to absorb and contain various exudates which are discharged from the body, such as, blood, menses and urine. The sanitary napkin is intended to be discarded after a single use. Interlaminar devices which reside partially within and partially external of the female wearer's vestibule are also within the scope of this invention. It is to be understood that the invention may be adapted for use in other absorbent articles such as diapers, incontinent devices and the like.

For ease of understanding when referring to the figures, similar numerals designate like parts in the different views and embodiments. Referring to FIGS. 1 and 2, an embodiment of a sanitary napkin 10 is shown. Although depicted as having generally race track shape, the sanitary napkin 10 can have any variety of shapes well known to those skilled in the art. For example, hourglass, oval etc. In the most basic embodiment, the sanitary napkin 10 has a pair of longitudinal sides 12 and 14, transverse ends 16 and 18, an absorbent core 20 and a body-side adhesive 22. The sanitary napkin 10 has at least one major surface 24 adapted to be positioned adjacent to a wearer's body. That is, the surface 24 is soft and liquid-permeable. Positioned distally from the bodyfacing surface 24 is a fluid-impermeable baffle 26.

The absorbent core 20 may be any material which is generally compressible, comfortable, non-irritating to the wearer's skin and capable of absorbing and containing body exudates such as urine, menses, blood and the like. Desirably, the absorbent core 20 maintains its integrity when wetted during use. The absorbent core 20 can be manufactured into different shapes and from a variety of liquid-absorbent materials commonly known in the disposable absorbent article art. For example, absorbent materials such as cellulose fibers, wood pulp, regenerated cellulose or cotton fibers can be used. Such fibers may be chemically or physically modified. The absorbent core 20 may include any of the above fibers in combination with other materials, both natural and synthetic, such as hydrophilic foams, hydrophilic polymers or the like. Wood pulp is frequently the material of choice primarily because it is inexpensive and readily available. The absorbent core 20 may also include a thin absorbent layer of material such as tissue, fabric or the like made of cellulosic fibers. The absorbent core 20 can also include one or more superabsorbent materials known in the art. By "superabsorbent" we mean a hydrocolloid material that is capable of absorbing an amount of water which is at least ten times the weight of the hydrocolloid particles in the dry form and preferably from about 15 to 70 times the dry weight. Such materials are further described in U.S. Pat. No. 5,247,072 issued on Sep. 21, 1993 to Ning et al. the disclosure of which is incorporated herein and made a part hereof.

The baffle 26 which is typically liquid-impermeable, can be designed to permit the passage of air and moisture vapor to the outer surface while blocking the passage of liquids. The baffle 26 may be made from one or more polymeric films such as polyethylene, polypropylene, cellophane, or a film/nonwoven laminate and the like. The baffle 26 can also be constructed from a liquid-permeable material that has been treated or coated to become liquid impervious.

Referring to FIG. 2, the sanitary napkin 10 includes a liquid-permeable cover 28 having a bodyfacing surface 24. The cover 28 is positioned adjacent to the absorbent core 20. The cover 28, which is designed to contact the wearer's body, can be made from various polymeric films that are apertured for fluid migration into the absorbent core, or from woven or nonwoven fibers or strands produced from natural or synthetic materials which are easily penetrated by body

fluids. Thermoplastic polymer films made from polyethylene or polypropylene are preferred. Other acceptable covers might be produced by laminating film and fiber substrates. It can also be beneficial to aperture or emboss (not shown) the cover 28 to increase the rate at which the body fluids can penetrate down and into the absorbent core 20.

The body-side adhesive 22 is positioned adjacent to the cover 28 in an open, substantially rectangular pattern of small discrete dots or adhesive members 30 so as to leave numerous areas free from adhesive. The adhesive members 30 can have a surface area of about 0.03 square centimeters (cm^2) to about 20 cm^2 and preferably about 0.15 cm^2 to about 15 cm^2 . As measured from the bodyfacing surface 24 of the cover 28, the adhesive members 30 can have a thickness of about 0.01 millimeters to about 2 millimeters. The dot pattern of FIG. 1 contains approximately the least amount of body-side adhesive 22 required to obtain sufficient adherence to achieve the desired result and provide a satisfactory removal comfort. Generally, the adhesive 22 is secured to less than about 90 percent of the area of the bodyfacing surface 24, preferably less than about 70 percent of the area and most preferably less than about 20 percent of the area.

It is to be understood that any suitable adhesive pattern may be selected for applying the adhesive 22 to the bodyfacing surface 24 of the sanitary napkin 10, provided it is consistent with the concentration of adhesive 22 desired on the bodyfacing surface 24 yet allowing the sanitary napkin 10 to retain the requisite amount of absorbency. For example, adhesive patterns can be oval, swirls, various linear or non-linear arrays of adhesive longitudinally and/or transversely oriented and reticulated webs having unobstructed interstices between the adhesive fibers or combinations thereof. The adhesive patterns may be open or closed. By "open" it is meant that the adhesive can have an intermittent or continuous pattern that does not substantially cover one or more of the transverse ends 16 and/or 18 of the sanitary napkin 10. While "closed" means the adhesive would encircle the absorbent core 20. Preferably, the pattern of the adhesive 22 substantially corresponds to the configuration of the absorbent core 20. Desirably, the adhesive 22 is applied in a pattern that is symmetrical about an axis which bisects the sanitary napkin 10 and divides the sanitary napkin 10 into substantially equal portions. This gives the wearer a balanced feel when wearing the sanitary napkin 10. It also reduces the perception of any associated discomfort when the sanitary napkin 10 is removed from the body.

The adhesive 22 can be applied to the bodyfacing surface 24 by techniques known in the art. For example, screen printing or extending the adhesive 22 from one or more nozzles onto the bodyfacing surface 24 as described in the commonly assigned U.S. Pat. No. 4,995,333 issued to Keller et al. on Feb. 26, 1991, the entire disclosure of which is incorporated herein and made a part hereof.

The adhesive deposited in accordance with the present invention may be any pressure sensitive adhesive, and preferably a hot melt adhesive, that is characterized as having specific rheological properties described below. Suitable adhesives include A-B-A block copolymers, A-B-B-A block copolymers, wherein A is a block polymer of monovinyl substituted aromatic hydrocarbon and B is an elastomeric block polymer of a conjugated diene. The rheological analysis of an adhesive is a method of determining the viscoelastic property of polymers. Further explanations of polymer rheology and their measurement are discussed in *Viscoelastic Properties of Polymers*, John D. Ferry, John Wiley & Sons, third edition, pages 264-280 (1980), "Studies

of Triblock Copolymer-Tackifying Resin Interactions by Viscoelasticity and Adhesive Performance", Mun Pu Tse, Journal of Adhesion Science/Technology, Vol. 3, No. 7, pages 551-570 (1989), and test procedure ASTM D 4440-84 the disclosures of which are incorporated herein by reference and made a part hereof. It is critical to the present invention that the adhesive have a rheology property, $\tan \delta$ (referenced to 20° Centigrade), ranging from about 0.01 to about 0.6 and preferably from about 0.06 to about 0.48 and most preferably from about 0.06 to about 0.40 at a frequency of about 0.1 radians per second and a $\tan \delta$ ranging from about 0.1 to about 1.7, preferably from about 0.20 to about 1.5 and most preferably from about 0.6 to about 1.5 at a frequency of about 1000 radians per second.

Preferred adhesives have a $\tan \delta$, (referenced to 20° Centigrade), inside the Quadrangle ABCD between the frequency range of about 0.1 radians per second to about 1000 radians per second, as seen in FIG. 10. The sides defining the Quadrangle ABCD are determined by plotting as points A, D, B and C the crucial range of $\tan \delta$ described above at the lower and upper frequencies, i.e. 0.1 radians/second and 1000 radians/second, respectively. Generally, adhesives having a $\tan \delta$ outside of the Quadrangle ABCD provide insufficient adhesion to support the sanitary napkin 10 in the wearer or not allowing the sanitary napkin 10 to be comfortably removed. For example, referring to FIG. 10, adhesives having $\tan \delta$ values below line AB at frequencies of about 0.1 to about 100 radians per second lack sufficient flow and wet-out characteristics to provide initial adhesion or quick-stick of the sanitary napkin 10 to the body. Adhesives having a $\tan \delta$ below line AB at frequencies of about 150 to about 1000 radians per second lack sufficient adhesion to keep the sanitary napkin 10 securely and comfortably attached to the body of the wearer during use.

Moreover, adhesives having $\tan \delta$ values greater than line CD, at frequencies of about 0.1 radians per second to about 100 radians per second lack sufficient cohesive strength to remain in place on the sanitary napkin 10 during storage, use and removal. While adhesives having a $\tan \delta$ greater than line CD at frequencies of about 150 to about 1000 radians per second cause discomfort during removal of the soiled sanitary napkin 10.

Especially preferred adhesives have a Secondary Transition Frequency peak within the Quadrangle ABCD and a Primary Transition Frequency peak at a frequency greater than about 1000 radians per second, as seen in FIGS. 6-9. The "Primary Transition Frequency" and "Secondary Transition Frequency" peaks are determined by amplitude. The peak having the greater amplitude is the primary peak regardless of its occurrence in the frequency sweep. The peaks are determined by graphically plotting, on a log/log scale, the frequency (in radians per second) versus $\tan \delta$ (referenced to 20° C.) of the adhesive 22 using a time-temperature superposition master curve between the frequencies of about 0.001 and 10⁷ radians per second. These curves are determined using a Rheometrics Dynamic Spectrometer (RDS II E), located at 1 Possumtown Road, Piscataway, N.J. 08854. The rheological quantities for $\tan \delta$ are measured on bulk adhesive samples not suspended on any substrate and having a thickness of approximately 2 to 3 millimeters. The adhesive was cut into a 25 millimeter diameter circle and placed between two 25 millimeter parallel plate fixtures of the Rheometrics Dynamic Spectrometer. The upper platen was lowered onto the sample until the normal force meter indicates a slight deflection. The samples are allowed to equilibrate at a selected test temperature

before analyzing. A microcomputer governs the application of a 1% peak-to-peak shear strain to the sample. The frequency of the application can be controlled to a fraction of a radian/sec. The values of the loss tangent ($\tan \delta$) are calculated from geometry factors, peak-to-peak amplitude of the torque signal, and phase lag of the torque output wave. Typically, a computer using RHIO software available from Rheometrics, Inc. is used to control the operation of the apparatus and to calculate values for time-temperature superposition using known techniques.

Frequency sweeps from 0.1 rad/s to 100 rad/s are run at 10° increments from -60° C. to 120° C. The RHIO software shifts the curves relative to a reference temperature of 20° C. From these shifted curves, a "master" curve can be generated.

The adhesive can be a rubber-based adhesive such as styrenebutadiene; polyisobutylene; polybutadiene and polyisoprene; a water soluble adhesive such as polyvinyl alcohol, polyvinyl acetate, and methyl cellulose; and preferably, a hot melt adhesive such as block copolymers of styrene-butadiene-styrene, styrene-isoprene-styrene, styrene-ethylene-propylene-styrene, styrene-ethylene-butylene-styrene and tetrablock copolymers such as styrene-ethylene-propylene-styrene-ethylene-propylene. Incorporated with the adhesives can be suitable tackifying resins and, if appropriate, oils. Such adhesives are available commercially from Findley Adhesives located at Watertown Plank Road, Wauwatosa, Wis., 53226 and National Starch and Chemical Company, 10 Funder Avenue, P.O. Box 6500, Bridgewater, N.J. 08807-3300.

Polyacrylate copolymers such as vinyl acetate-2-ethyl hexyl-acrylate combined with tackifiers, such as, for example, ethylene amine can be used but these adhesives are not preferred since they are extremely aggressive and generally cause a high level of discomfort upon removal of the sanitary napkin 10. Moreover, the acrylate adhesives can leave adhesive residue on the wearer when the sanitary napkin 10 is removed.

The present invention will be more clearly understood from the following examples, which are an exemplary nature only and are not intended to limit the scope of the invention.

COMPARATIVE EXAMPLES A-C

Three adhesives, National Starch 34-5516, National Starch 70-5908 and Findley H2292H were analyzed for their viscoelastic property, $\tan \delta$, peel strength and comfort.

FIGS. 3-5 are the graphical plots of Frequency (rad/sec) vs. the viscoelastic property $\tan \delta$ (referenced to 20° C.) for these respective adhesives. As can be seen from each graphical plot, these adhesives would not be acceptable for contacting the sensitive vulvar region.

Peel strength data was obtained by preparing adhesive test laminates as follows.

The adhesive was coated onto a substrate such as a silicone coated release paper. The adhesive pattern used for conducting the tests was two (2) lines of adhesive each approximately 6 mm wide running parallel to the longitudinal axis of the substrate. The adhesive lines were spaced about 38 millimeters apart and equidistant from the center of the laminate. The adhesive was slot coated onto a substrate using techniques known in the art. The adhesive/substrate was then contacted with a nonwoven material, spunbond polypropylene. The spunbond had a basis weight of 0.6 ounces per square yard. The substrate/spunbond laminate was subjected to a pressure ranging from about 35 pounds per square inch gauge (psig) to about 80 psig from a heated

nip roller to ensure adequate transfer of the adhesive onto the spunbond material. The nip temperature ranged from about 25° Centigrade to about 150° Centigrade. Total adhesive add on to the spunbond was approximately 263 grams per square meter. Surface area covered by the adhesive was approximately 16-25 percent. The substrate was then removed and the adhesive laminates were then tested for peel strength.

The peel strength of the adhesive was determined using a modified Pressure Sensitive Tape Council 180° peel resistance test (PSTC-1) described below. PSTC-1 is a standardized test procedure that is described in greater detail on page 23 of the tenth edition of *Test Methods* copyright 1992, available from Pressure Sensitive Tape Council 401 North Michigan Ave., Chicago, Ill. 60611 4267 the disclosure of which is incorporated herein and made a part hereof. The peel adhesion values were determined according to the following procedure.

A double sided adhesive tape of approximately 13 millimeters wide was secured to the top and bottom edges of a stainless steel test plate having dimensions of about 100 millimeters wide and 152 millimeters long. The adhesive tape was 3M #665 available from the 3M Corporation located in St. Paul, Minn. A polyethylene film 0.05 millimeters thick, male embossed, was secured to the double sided tape with male embossed side as the test surface. The polyethylene film is available from Edison Plastic, located in Washington, Ga. One end of the spunbond, i.e. the end that will be the leading end, was rigidly secured to a leading strip of non-stretchable material. The leading strip should be stronger than the peel strength of the adhesive. The test sample was pressed down on the polyethylene film with a 2043 gram mechanical roller (available from Chemsultant International, Mentor, Ohio). The 180° peel was then immediately conducted on a Materials Test System model 810 available from MTS Corp., Minneapolis, Minn. 55424. When placing the test specimen in the tester, the jaws of the tester were initially set 17.78 cm apart. The steel test panel was secured in the stationary jaw (1.27 cm) with the unsecured leading strip extending past the position of the stationary jaw. The leading strip was then doubled back and clamped in a centered arrangement within the moving jaw of the tester. The tester was activated to conduct the 180° peel test. The moving jaw travelled a total distance of 20.32 cm, with the adhesive tested in the middle 10.16 cm. The MTS can be programmed to control the peel rate using a microprocessor model 458.91.

The peel strength of the three adhesives were tested in accordance with the procedure described above. The results are set forth in TABLE A below.

TABLE A

Example	Adhesive	Peel Adhesion 100 mm/min	(grams force) 1200 mm/min	at a rate of 3500 mm/min
A	34-5516	390	>1200	>1200
B	70-5908	280	>1200	>1200
C	H2292H	450	>1200	>1200

Comfort data were obtained by testing the adhesives on five subjects. Each subject had an average hair density of about 6 to about 20 hairs per square centimeter (cm²) on the forearms. Each subject placed two (2) adhesive test members on each forearm.

Each adhesive member was composed of a substrate slot coated with the test adhesive. The substrate was composed of a nonwoven material such as spunbond polypropylene

63.5 millimeters (2.5 inches) wide. The test adhesive was slot coated onto the substrate in 2-six (6) millimeter (1/4 inch) wide strips using techniques known in the art. Each adhesive strip was spaced apart by a distance of 38.1 millimeters (1.5 inches). The adhesive strips extended the length of the substrate. The first adhesive member had a length of 127 millimeters (5 inches) and the second adhesive member had a length of about 51 millimeters (2 inches).

The first adhesive member was placed on the upper portion of the subject's forearm, as viewed with the palm of the hand resting downward, with the longitudinal centerline of the adhesive member parallel to the longitudinal axis of the forearm. The second adhesive member was placed on the lower portion of the subject's forearm in a like manner. Each adhesive members was pressed down onto the subject's forearm with a force of less than about 8 pounds.

The adhesive was tested for initial tack and comfort and again after two (2) hours by removing the adhesive member from the forearm.

The test subjects evaluating the comfort of the adhesive in accordance with the procedure described above determined those three adhesives to have excessive discomfort upon removal.

EXAMPLES 1-4

Other adhesives, National Starch 7659-42-3, National Starch 811-60-4, National Starch 8111-69-2 and National Starch 7659-41-3 were analyzed as described above for Examples A-C for the viscoelastic property $\tan \delta$, peel strength and comfort. FIGS. 6-9 are graphical plots of Frequency vs. $\tan \delta$ (referenced to 20° C.) for these respective adhesives. As can be seen from each graphical plot, these adhesives would be acceptable for contacting the sensitive vulvar region.

Peel strength of these adhesives were tested in accordance with the procedure described above for Examples A-C. The results are set forth in TABLE 1 below.

TABLE 1

Example	Adhesive	Peel Adhesion 100 mm/min	(grams force) 1200 mm/min	at a rate of 3500 mm/min
1	7659-42-3	90	430	700
2	8111-60-4	80	400	580
3	8111-69-2	60	350	580
4	7659-41-3	180	580	1050

The test subjects evaluating the comfort of these adhesives in accordance with the procedure described above determined these adhesives to not have excessive discomfort upon removal.

From the above tests, one can see the importance of having a low $\tan \delta$ in the frequency region that would correspond to a removal rate for the absorbent article. While the invention has been described in conjunction with a specific embodiment, it is to be understood that many alternatives, modifications and variations will be apparent to those skilled in the art in light of the foregoing description. Accordingly, this invention is intended to embrace all such alternatives, modifications and variations which fall within the spirit and scope of the appended claims.

We claim:

1. An absorbent article comprising:
 - a) a cover having a bodyfacing surface with a predetermined area and a garmentfacing surface;
 - b) an absorbent core adjacent to said garmentfacing surface of said cover; and



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Zacharias et al.

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(54) **SELF-ADHERING ABSORBENT ARTICLE**

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604/390

(58) Field of Search **604/386, 387,**
604/389, 390

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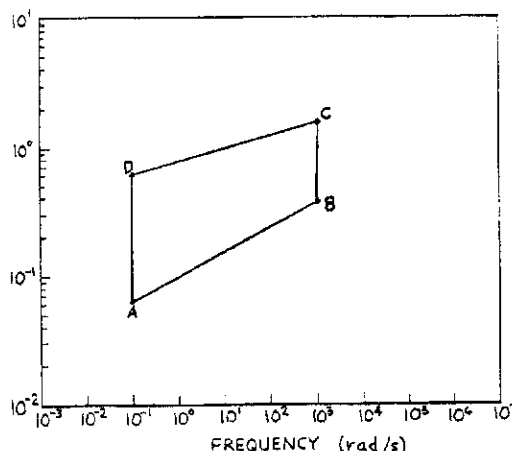
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(57) **ABSTRACT**

An absorbent article is provided having an adhesive on the
bodyfacing surface for securement of the article to the
wearer. The adhesive has a rheological property $\tan \delta$ at 20°
C. ranging from about 0.01 to about 0.6 at a frequency of
about 0.1 radian per second and a $\tan \delta$ ranging from about
0.1 to about 1.7 at a frequency of about 1000 radians per
second. Preferably the adhesive is a hot melt adhesive.

9 Claims, 9 Drawing Sheets



difficulty be considered typical pressure sensitive adhesives (referred to as PSA hereinafter) on the basis of the most characteristic rheological behaviours identifying such materials.

In fact as the person skilled in the art of adhesives knows, the most characteristic feature that distinguishes a PSA from other substances that can temporarily adhere objects (e.g. water between two glass plates could) is the fact that their rheological parameters and especially the Elastic Modulus G' vary greatly with the frequency of applied stresses. More in particular, G' of PSA can increase over some orders of magnitude, while the frequency of applied stresses varies from typical bonding frequency to typical debonding frequency, i.e. 1 rad/s to 100 rad/s as indicated below.

As a first consequence, it is therefore inadmissible to define materials intended for use as "adhesives" by giving values of rheological parameters and especially of G' at a fixed value of frequency. This can be misleading because in the absence of other characteristics such as surface chemistry it will include materials which have no practical value. It is hence necessary that rheological characterisation must be on the basis of dynamic considerations. This not only applies to the Elastic Modulus G' but also to the viscous modulus G'' and hence also for $\tan(\delta) = G''/G'$.

It is well known that typical PSAs have not only a high variation of G' across the considered frequencies, but also that there is an even higher variation of G'' which can get close or become even higher than the value of G' , i.e. $\tan(\delta)$ becomes about or even greater than 1, in particular at the frequencies that are typical of debonding.

Without wishing to be bound by theory this can be interpreted as meaning that a high fraction of the energy applied for the debonding is dissipated within the adhesive (so it is not effective in causing the debonding) and through the interface of the adhesive and the skin, while this fact causes macroscopically the recording of a very high level of adhesive force.

As indicated above materials useful as adhesives according to the present invention have rheological characteristics which are measured at a reference temperature of 37° C. (as usual body temperature of humans) and in a range of frequencies. It has been found that upon application of an absorbent article with a adhesive the adhesive contact is formed at a low frequency, while debonding happens at the speed of removing the article. This speed is expressed as a frequency of 100 rad/s, while the low frequency of forming the adhesive bond has been found to be on the order of 1 rad/s. Therefore, the frequency range for use according to the present invention is between 1 and 100 rad/s.

In order to provide good conditions of bonding, i.e. at a frequency of about 1 rad/sec, the absolute values of the elastic modulus should not be too high, otherwise the adhesive is too hard and it is not able to intimately join or mold to the surface to which it is expected to adhere. It is also important to have a low absolute value of G'' in order to have good cohesion while the material remains soft and capable of gently adhering to skin.

The ratio of G'_{37} (1 rad/sec) over G''_{37} (1 rad/sec) is important to ensure that these two values are balanced upon adhesion to the skin.

Importantly, the ratio of $\frac{G'_{37}(100 \text{ rad/sec}) - G''_{37}(100 \text{ rad/sec})}{G'_{37}(1 \text{ rad/sec}) - G''_{37}(1 \text{ rad/sec})}$

needs to be large enough to ensure that the dynamic behaviour of both the elastic and the viscous module are maintained in a relationship which provides secure adhesion and painless and easy removal.

Finally the person skilled in the art will also recognise that the Glass Transition Temperature T_g of the adhesive composition, the specific heat capacity, and the specific heat conductivity are parameters which are useful to more fully define the group of useful adhesives.

The following set of characteristics should preferably be satisfied for the adhesive of the present invention:

G'_{37} (1 rad/sec)	is in the range 500 Pa to 20000 Pa, preferably 700 Pa to 15000 Pa, most preferably 1000 Pa to 10000 Pa.
G''_{37} (1 rad/sec)	is in the range 100 Pa to 15000 Pa, preferably 100 Pa to 10000 Pa, most preferably 300 Pa to 5000 Pa.
the ratio of G'_{37} (1 rad/sec)/ G''_{37} (1 rad/sec)	is in the range of 1 to 30.
the ratio	$\frac{G'_{37}(100 \text{ rad/sec}) - G''_{37}(100 \text{ rad/sec})}{G'_{37}(1 \text{ rad/sec}) - G''_{37}(1 \text{ rad/sec})}$
	is not less than 0.5, preferably in the range 0.7 to 3, most preferably in the range 1 to 1.8.

The value of the ratio of G'_{37}/G''_{37} at least for the frequency range above 1 rads/up to 100 rads/s should preferably be not less than 0.5, preferably from 0.7 to 10 and most preferably from 1 to 7.

The rheological behaviour can also be related to the values of the Glass Transition Temperature T_g . For topical adhesives according to the present invention T_g should preferably be less than 0° C., more preferably less than -5° C. and most preferably less than -10.

In order to provide adhesive compositions which satisfy the requirements of the above rheological and physical characteristics of an adhesive any medically suitable substantially water insoluble pressure sensitive adhesives comprising a polymer which forms a 3-dimensional matrix meeting the these characteristics may be utilised.

According to the present invention, the 3 dimensional matrix, also referred to herein as a gel, comprises as an essential component, a polymer, which can be physically, or chemically, cross-linked. The polymer may be naturally or synthetically derived. The uncrosslinked polymer includes repeating units or monomers derived from vinyl alcohols, vinyl ethers and their copolymers, carboxy vinyl monomer, vinyl ester monomers, esters of carboxy vinyl monomers, vinyl amide monomers, hydroxy vinyl monomers, cationic vinyl monomers containing amines or quaternary groups, N-vinyl lactam monomer, polyethylene oxides, polyvinylpyrrolidone (PVP), polyurethanes, acrylics such as methyl acrylate, 2-hydroxyethyl methacrylate, methoxydiethoxyethyl methacrylate and hydroxydiethoxyethyl methacrylate, acrylamides, and sulphonated polymers such as acrylamide sulphonated polymers for example 2-acrylamido methylpropane sulphonic acid, (acrylic 3-sulphopropyl ester) acid, salts thereof, and mixtures thereof. Also acrylonitrile, methacrylamide, N,N,-

dimethylacrylamide, acrylic esters such as methyl, ethyl and butyl acrylates. Alternatively, the uncrosslinked polymer may be a homopolymer or copolymer of a polyvinyl ether, or a copolymer derived from a half ester of maleic ester. Similarly, any other compatible polymer monomer units may be used as copolymers such as, for example, polyvinyl alcohol and polyacrylic acid or ethylene and vinyl acetate.

As another alternative, the polymers may be block copolymer thermoplastic elastomers such as ABA block copolymers such as styrene-olefin-styrene block copolymers or ethylene-propylene block copolymers. More preferably such polymers include hydrogenated grade styrol/ethylene-butylene/styrol (SEBS), styrene/isoprene/styrene (SIS), and styrol/ethylene-propylene/styrol (SEPS).

Particularly preferred polymers are acrylics, sulphonated polymers such as acrylamide sulphonated polymers, vinyl alcohols, vinyl pyrrolidone, polyethylene oxide and mixtures thereof. Most preferred are nitrogen containing polymers.

According to the present invention the 3 dimensional adhesive matrix also essentially comprises a plasticiser, which is preferably a liquid at room temperature. This material is selected such that the polymer may be solubilized or dispersed within the plasticiser. For embodiments wherein irradiation cross linking is to be carried out, the plasticiser must also be irradiation cross linking compatible such that it does not inhibit the irradiation cross linking process of the polymer. The plasticiser may be hydrophilic or hydrophobic.

Suitable plasticisers include water, alcohols, polyhydric alcohols such as glycerol and sorbitol, and glycols and ether glycols such as mono- or diethers of polyalkylene glycol, mono- or diester polyalkylene glycols, polyethylene glycols (typically up to a molecular weight of about 600), glycolates, glycerol, sorbitan esters, esters of citric and tartaric acid, imidazoline derived amphoteric surfactants, lactams, amides, polyamides, quaternary ammonium compounds, esters such as phthalates, adipates, searates, palmitates, sebacates, or myristates, and combinations thereof. Particularly preferred are polyhydric alcohols, polyethylene glycol (with a molecular weight up to about 600), glycerol, sorbitol, water and mixtures thereof.

Typically the adhesive comprises a ratio of polymer to plasticiser by weight of from 1:100 to 100:1, more preferably from 50:1 to 1:50. However, the exact amounts and ratios of the polymer and plasticiser will depend to a large extent on the exact nature of polymer and plasticisers utilised and can be readily selected by the skilled person in the art. For example a high molecular weight polymer material will require a greater amount of plasticiser than a low molecular weight polymer.

In addition, the adhesive also further preferably comprises a lipid-micellising polymer, i.e. a so-called hypercoiling polymer. This polymer functions to micellise and remove the rolled up pockets of grease from the gel-skin interface.

This hypercoiling polymer has the capability of more effectively solvating the primary surfactant micelles that contact hydrophobic skin contaminant such as skin lipid or skin creme. The consequence of this functional role is that the work of adhesion between adhesive and skin is progressively less affected by the presence of either or both surfactant or hydrophobic skin contaminant.

The hypercoiling polymer preferably comprises any of the following, either alone or in combination: poly (maleic acid styrene), poly (maleic acid butyl vinyl ether), poly (maleic acid propyl vinyl ether), poly (maleic acid ethyl vinyl ether) and poly (acrylic acid ethyl acrylate).

A particularly preferred example is an alternating copolymer of styrene and maleic anhydride. As discussed herein after the adhesive seeks to provide a biphasic structure on polymerisation. These two phases are hydrophilic and hydrophobic. The hydrophobic phase may be provided by a hydrophobic monomer which is initially maintained as part of the homogenous reaction mixture by way of a reactive solvent bridge. Alternatively and/or additionally the hydrophobic component is provided as a polymer which separates from the aqueous phase on polymerisation.

The exact amounts and ratios of the hypercoiling polymer will depend to a large extent on the nature of the components.

In certain circumstances the reaction mixture preferably comprises from 3% to 20%, and more preferably from 8% to 18% by weight of the reaction mixture, of a stabilised polymer dispersion that is used to provide a stable phase separated system. The polymer preferably comprises any of the following either alone or in combination: vinylacetate dioctyl maleate copolymer or ethylene-vinyl acetate copolymer. Ethylene-vinylacetate copolymer is preferred, such as that marketed under the trade name DM137 by Harlow Chemicals.

The adhesive also preferably comprise surfactants such as nonionic, cationic, anionic, amphoteric and any mixtures thereof.

Suitable nonreactive nonionic surfactants include but are not limited to those selected from the group consisting of the condensation products of a higher aliphatic alcohol, such as a fatty alcohol, containing about 8 to about 20 carbon atoms, in a straight or branched chain configuration, condensed with about 3 to about 100 moles, preferably about 5 to about 40 moles and most preferably about 5 to about 20 moles of ethylene oxide. Examples of such nonionic ethoxylated fatty alcohol surfactants are the TergitolTM, 15-S series from Union Carbide and BrijTM, surfactants from ICI. TergitolTM, 15-S Surfactants include C.sub.11-C.sub.15 secondary alcohol polyethyleneglycol ethers. BrijTM 58 Surfactant is Polyoxyethylene(20) cetyl ether, and BrijTM 76 Surfactant is Polyoxyethylene(10) stearyl ether.

Other suitable nonreactive nonionic surfactants include but are not limited to those selected from the group consisting of the polyethylene oxide condensates of one mole of alkyl phenol containing from about 6 to 12 carbon atoms in a straight or branched chain configuration, with about 3 to about 100 moles of ethylene oxide. Examples of nonionic surfactants are the IgepalTM, CO and CA series from Rhone-Poulenc. IgepalTM, CO surfactants include nonylphenoxy poly(ethyleneoxy) ethanols. IgepalTM, CA surfactants include octylphenoxy poly(ethyleneoxy) ethanols.

Another group of usable nonreactive nonionic surfactants include but are not limited to those selected from the group consisting of block copolymers of ethylene oxide and propylene oxide or butylene oxide.

Examples of such nonionic block copolymer surfactants are the PluronicTM, and TetronicTM, series of surfactants from BASF. PluronicTM, surfactants include ethylene oxide-propylene oxide block copolymers. TetronicTM, surfactants include ethylene oxide-propylene oxide block copolymers. Suitable examples are Pluronic L68 and Tetronic 1307. Particularly suitable examples are Pluronic I.64 and Tetronic 1107.

Still other satisfactory nonreactive nonionic surfactants include but are not limited to those selected from the group consisting of sorbitan fatty acid esters, polyoxyethylene sorbitan fatty acid esters and polyoxyethylene stearates. Examples of such fatty acid ester nonionic surfactants are

contain one or more surface active agents which may assist or promote phase separation but in the course of polymerisation become anisotropically distributed between the result phases.

The presence of a hydrophobic monomer or polymer may be necessary in the initial homogenous dispersion in order to more effectively promote phase separation.

It is a consequence of this invention that the phase separated material contains relatively hydrophobic regions, which enable the polymer to function as a pressure sensitive adhesive, and substantially hydrophilic region, which enable the surface active agent to function in an aqueous environment at the interface between the polymer and mammalian skin. When the polymer is placed in contact with skin, the nature and quantity of surface active agent are chosen to bring about the removal of natural or synthetic hydrophobic material, such as skin lipid or skin creme, from the skin surface without adversely diminishing the work of adhesion between the hydrophobic domains and the skin surface. In as much as both the polymeric adhesive formed in this invention and the skin with which it is contacted are deformable under conditions of normal use, an equilibrium interfacial situation is reached in which some spatial exchange of hydrophobic regions and hydrophilic regions will have taken place on the skin surface.

Suitable preferred hydrophilic monomers are acrylic acid, and salts thereof, 2-acrylamido methylpropane sulphonic acid, acrylic (3-sulphopropyl) ester acid and salts thereof and combinations thereof. Suitable hydrophobic monomer components are acrylamide, acrylonitrile, methyl-, ethyl-, butyl hexyl, iso octyl- and isodecyl acrylates and methacrylate, vinyl ethers, vinyl pyrrolidine, glycidyl acrylate and 2-hydroxyethyl acrylate, tetra-hydrofurfuryl acrylate, hydroxypropyl acrylate, vinyl propionate and vinyl butyrate, and combinations thereof. Particularly preferred are ethoxy ethyl acrylate or butyl acrylate.

When the adhesive comprises a hydrophobic component, such as butyl acrylate as well as a hydrophilic monomer (i.e. the aforesaid water soluble ionic monomer), such as NaAMPS, the nonionic water soluble monomer, for example NNDMA, acts as a so-called "reactive solvent bridge" to provide intimate mixing of the various seemingly incompatible components of the reaction mixture prior to polymerisation. The reaction mixture thus has a homogenous structure containing both hydrophilic and hydrophobic components that are intimately mixed, as the NNDMA acts as a solvent for both hydrophilic and hydrophobic materials, providing a clear compatible coating solution or dispersion. As the reactive solvent bridge is polymerised and thus essentially removed from the reaction mixture the stability of the system is adversely affected and the compatible coating solutions or dispersions undergo phase separation so as to provide a biphasic structure.

In preparing adhesive compositions in accordance with the invention, the ingredients will usually be mixed to provide a reaction mixture in the form of an initial pre-gel aqueous based liquid formulation, and this is then converted into a gel by a free radical polymerisation reaction. This may be achieved for example using conventional thermal initiators and/or photoinitiators or by ionizing radiation. Photoinitiation is a preferred method and will usually be applied by subjecting the pre-gel reaction mixture containing an appropriate photoinitiation agent to UV light after it has been spread or coated as a layer on siliconised release paper or other solid substrate. The incident UV intensity, at a wavelength in the range from 240 to 420 nm, is ideally substantially 40 mW/cm². The processing will generally be

carried out in a controlled manner involving a precise predetermined sequence of mixing and thermal treatment or history.

The UV irradiation time scale should ideally be less than 60 seconds, and preferably less than 10 seconds to form a gel with better than 95% conversion of the monomers and for conversion better than 99.95% exposure to UV light less than 60 seconds and preferably less than 40 seconds is preferred. Those skilled in the art will appreciate that the extent of irradiation will be dependent on the thickness of the reaction mixture, concentration of photoinitiator and nature of substrate on to which the reaction mixture is coated and the source of UV.

These timings are for medium pressure mercury arc lamps as the source of UV operating at 100 W/cm. The intensity of UV @ 254 nm and 313 nm reaching the surface of the substrate is approximately 150 μ W/cm² and 750 μ W/cm². For a given lamp UV intensity in a function of the operating power and distance of the reaction mixture from the UV source.

In order to minimize and preferably eliminate the presence of any residual monomers it is important to ensure that the reaction is complete. This is dependent upon a number of factors such as the substrate onto which the adhesive is applied, the type and intensity of the ultra violet light and the number of ultra violet light passes. Preferably the conversion of the hydrophilic monomers present such as NaAMPS should be 98%, preferably 99% most preferably 99.9% so that the amount of monomer within the adhesive is 4600 microg/g or less, preferably 2300 microg/g or less, most preferably 230 microg/g or less. Similarly, the conversion of the hydrophobic monomers present such as NNDMA should be 99%, preferably 99.9%, most preferably 99.99% so that the amount of monomer present in the adhesive is 2200 microg/g or less, preferably 220 microg/g or less, more preferably 22 microg/g or less.

The adhesive is thus typically formed by polymerising an aqueous reaction comprising from 5 to 50%, preferably from 30% to 50% by weight of the reaction mixture, of hydrophilic monomer, i.e. an ionic water soluble monomer, from 10% to 50%, preferably from 15% to 45% by weight of the reaction mixture, of a plasticiser (other than water), from 10% to 50%, preferably from 15% to 30% more preferably from 15% to 25% by weight of the reaction mixture, of a hydrophobic nonionic monomer, i.e. nonionic water soluble monomer, from 3 to 40%, by weight of the reaction mixture, of water. If present the reaction mixture comprises from 10%, by weight of the reaction mixture, of a surfactant. Similarly the reaction mixture may also comprise from 0.1% to 5%, by weight of the reaction mixture, of a lipid micelling polymer.

The adhesive is provided, typically on at least a portion of the wearer facing surface of the article, as a layer having a thickness or caliper $\bar{C}$ that is preferably constant, or that alternatively can vary over the surface of application of the adhesive.

When considering particularly the removal phase of an adhesive composition for attachment to the skin of a wearer, it is commonly recognised that good conditions of removal, i.e. at a frequency of about 100 rad/sec, of the adhesive applied to at least part of the wearer facing surface of the article, are achieved when the adhesive can be easily removed from the skin, and particularly from the bodily hair that may be located on this area of the skin, where the article contacts the body, without causing pain to the wearer, therefore without adhering too hard upon removal, to the skin and the hair of the wearer. Moreover, a good removal implies that the adhesive does not leave residues on the skin or on the hair.

The relationship between the thickness or caliper C measured in millimetres (mm) of the layer of the adhesive typically onto at least part of the wearer's facing surface of the article, and the viscous modulus G''_{25} at 25° C. at about 100 rad/sec of the topical adhesive gives an indication of painless and easy removal of the adhesive from the skin.

Without being bound to any theory, it is believed that for higher values of G''_{25} at 100 rad/sec, which overall correspond to a higher adhesiveness of the composition, a thicker calliper or thickness C of the adhesive layer is needed so that the energy applied for the removal is more evenly distributed within the mass of the adhesive, and is therefore transferred smoothly to the skin, so avoiding peaks of energy that typically cause the pain sensation to the wearer. In other words, thinner layers of the adhesive necessitate an adhesive with a lower G''_{25} at 100 rad/sec to achieve a reduced pain sensation upon removal of the article.

According to the present invention, the adhesive is preferably provided as a layer having a thickness C such that the viscous modulus G''_{25} (100 rad/sec) and the thickness C of the adhesive layer satisfy the following empirical equation:

$$G''_{25} \leq [(7.00-C) \times 3000] \text{ Pa}$$

and preferably the following empirical equation:

$$G''_{25} \leq [(5.50+C) \times 700] \text{ Pa}$$

While in a preferred embodiment of the present invention the thickness C of the adhesive layer is constant, such an adhesive layer can also have different thicknesses in different portions of the wearer facing surface of the article where it is applied, provided that the above mentioned relationship between C and G''_{25} is in any case satisfied in each portion.

Description of the Disposable Absorbent Article

Absorbent articles, in which the adhesive according to the present invention can be used, can be made by any of the ways usual in the art. The application of the adhesive to the wearer facing surface, typically the topsheet surface of an absorbent article should not cause major problems to those skilled in the art since it can be provided by any well known techniques commonly used to apply adhesives. Most preferably the adhesive is provided in a pattern of small incremental areas such as dots or similar.

The adhesive is applied on at least portion of the wearer facing surface of disposable absorbent articles in a layer having a thickness or caliper that is preferably constant, or that alternatively can vary over the surface interested by the application of the adhesive. The adhesive can be applied to the wearer facing surface of the article by any means known in the art such as slot coating, spiral or bead application or printing. Typically the adhesive is applied at a basis weight of from 20 g/m² to 2500 g/m², preferably from 500 g/m² to 2000 g/m², most preferably from 700 g/m² to 1500 g/m² depending in the end use envisioned.

If possible, the article also provides breathability by being at least water vapour permeable, preferably air permeable to prevent stuffiness. Breathability, if not supported by the adhesive as such, can be limited to the area of the article where no adhesive is applied.

The adhesive on an article is preferably protected prior to use. This protection can be provided by a release liner such as a siliconised or surfactant treated paper, providing easy release for the selected adhesive.

This invention can be used beneficially on disposable absorbent articles which are applied directly to the skin of a

user. The article usually exhibits absorbency for bodily fluids, the protection of the user's garments from soiling, is comfortable to the user, and is easy to produce and to package. The disposable absorbent article is described below by reference to a diaper, a sanitary napkin or catamenial, however panty liners, adult incontinence articles, tampons or perspiration pads are also included under the term disposable absorbent articles. The term "sanitary napkin", as used herein, refers to an article which is worn by females adjacent to the pudendal region and which is intended to absorb and contain the various body fluids which are discharged from the body (e.g., vaginal discharges, menses, and/or urine) and which is intended to be discarded after a single use. A disposable absorbent article is preferably thin, more preferably between 1 and 5 mm thick and either substantially flat prior to use or in a reshaped form.

The terms "joined" or "affixed", as used herein, encompasses configurations whereby a first member is directly connected to a second member and configurations whereby a first member is indirectly connected to a second member by connecting the first member to intermediate members which in turn are connected to the second member.

The sanitary napkin has two main surfaces, a body contacting or wearer facing surface on which the adhesive is applied and a garment facing or contacting surface. In a one preferred embodiment a sanitary napkin of the present invention comprises a liquid pervious topsheet, a liquid impervious backsheet joined to the topsheet, and an absorbent core intermediate the topsheet and the backsheet. In an alternative embodiment, the sanitary napkin or panty liner may utilize the adhesive to absorb quantities of liquid up to amounts of about 10 g, such that a separate core and topsheet are not required. Such products preferably have a backsheet as described below.

The topsheet is compliant, soft feeling, and non-irritating to the wearer's skin. The topsheet also can have elastic characteristics allowing it to be stretched in one or two directions in portions of the topsheet or throughout its extension. Further, the topsheet is fluid pervious permitting fluids (e.g., menses and/or urine) to readily penetrate through its thickness.

Preferred topsheets for use in the present invention are typically selected from high loft nonwoven topsheets and apertured formed film topsheets. Apertured formed films are especially preferred for the topsheets because they are pervious to body exudates and yet non absorbent and have a reduced tendency to allow fluids to pass back through and rewet the wearer's skin. Thus, the surface of the formed film that is in contact with the wearer remains dry, thereby reducing body soiling and creating a more comfortable feel for the wearer. Suitable formed films are described in U.S. Pat. No. 3,929,135; U.S. Pat. No. 4,324,246; U.S. Pat. No. 4,342,314; U.S. Pat. No. 4,463,045; and U.S. Pat. No. 5,006,394. Particularly preferred micro apertured formed film topsheets are disclosed in U.S. Pat. No. 4,609,518 and U.S. Pat. No. 4,629,643. A preferred topsheet for the present invention comprises the formed film described in one or more of the above patents and marketed on sanitary napkins by The Procter & Gamble Company of Cincinnati, Ohio as "DRI-WEAVE".

Adhesives are most suitably used on topsheets having not a homogeneous distribution of liquid passage ways but only a portion of the topsheet comprising liquid passage ways oriented such that they result in a centrally permeable and peripherally impermeable topsheet for liquids.

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SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
DIVISIÓN DE NUEVAS CREACIONES

2020
Bogotá, D.C.,

Doctora
DILIA RODRIGUEZ D'ALEMAN
Abogada

ASUNTO	Radicación	06-31935
	Trámite	002
	Evento	001
	Actuación	430
	Oficio	9571
	Folios	05

Patente de Invención ☒ Patente de Modelo de Utilidad ☐

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

1. Documentos estudiados

Descripción:	Folios: 7 a 30	como se radicó inicialmente
Reivindicaciones:	Folios: 31 a 38	como se radicó inicialmente
	Folios: 130 a 134	modificadas
Dibujos:	Folios: 39 a 41	como se radicó inicialmente
Prioridad:	31 de marzo de 2005	
	US11/095,049	

2. Objeto de la invención

Titulo:
Articulo de protección sanitaria unible al cuerpo que incluye un miembro de liberación que no mancha.

El problema planteado en esta solicitud es la mancha dejada por los adhesivos cuando migran los componentes plastificantes de estos tipos de adhesivos que son absorbidos por el papel de liberación, comprometiendo el desempeño de unión al cuerpo del adhesivo.

Para solucionar este problema técnico se desarrolla un artículo absorbente en el cual los adhesivos permitan asegurar el artículo al cuerpo, pero no migren al papel de liberación.

Clasificación internacional (IPC) en A61F 13/15.

3. Modificaciones no aceptadas

La nueva reivindicación independiente 1, presenta los componentes de un articulo

absorbente como son: una cubierta permeable a los líquidos, que tiene una superficie que enfrenta el cuerpo, una barrera impermeable a los líquidos, un miembro de liberación removible y un adhesivo para asegurar el artículo al cuerpo dispuesto sobre la superficie que enfrenta el cuerpo, en donde dicho adhesivo es un gel adhesivo basado en un copolímero de bloque estireno-etileno-butileno-estireno (SEBS), mostrando que se desea también patentar la clase de adhesivo (copolímero de bloque SEBS) utilizado en este artículo absorbente. Es así que es inaceptable, que en una solicitud de modelo de utilidad se pretenda proteger composiciones, sustancias y como en esta solicitud compuestos, ya que estos no cumplen con la definición de modelo de utilidad. Lo anterior de acuerdo al artículo 81 de la Decisión 486 de la Comisión de la Comunidad Andina donde se define claramente lo que es un modelo de utilidad, a toda nueva forma, configuración o disposición de elementos..., que permitan un menor o diferente funcionamiento, utilización o fabricación del objeto que le incorpore o que le proporcione alguna utilidad, ventaja o efecto técnico que antes no tenía", es decir, aparatos, mecanismos, máquinas, herramientas, instrumentos, artefactos.

Como conclusión **no se acepta** la modificación de patente de invención a patente de modelo de utilidad.

4. De la solicitud de Patente (según el caso)

Reivindicaciones (artículo 30 D 486)

- En la reivindicación 1, no son claras las características técnicas esenciales de la invención, las cuales definen la invención y la hacen distintiva del estado de técnica. Estas características esenciales son importantes porque definen la solución al problema técnico que se desea resolver. Es así como estas características técnicas se presentan en la parte caracterizante de la reivindicación, pero particularmente en esta reivindicación no se identifican las características técnicas que no forman parte del estado la técnica y las que si.
- Las reivindicaciones 4, 5, y 6 se definen por "la proporción PDL" del recubrimiento de película, siendo un parámetro no usualmente utilizado en el área técnica de la solicitud (artículos absorbentes), por lo tanto debe hacerse una comparación con parámetros conocidos y/o aclarar la forma de determinación esta característica de un forma clara, precisa e inequívoca por medio de procedimientos objetivos usuales en el arte, esto sin incurrir en extender el contenido y alcance de la solicitud. Por lo tanto, esta oficina requiere el artículo que se hace referencia en la descripción (*PDL Chemical Resistance of Plastic and Elastomers*), para solucionar los problemas de claridad respecto a esta característica técnica.

Por lo anterior, el capítulo reivindicatorio no cumple con el requisito de claridad y concisión de acuerdo al art. 30 de la Decisión 486.

5. Determinación del Estado de la Técnica

La fecha para determinar el estado de la técnica es el 31 de marzo de 2005, de acuerdo al la fecha de prioridad invocada.

Tendiendo en cuenta la anterior fecha indicada, se realiza la búsqueda de las anterioridades de la presente solicitud, encontrándose los siguientes documentos relevantes:

Nº	Documento	Título	Fecha de Publicación
D4	US6544642	DISPOSABLE ABSORBENT ARTICLES WITH IMPROVED ADHESIVE FOR ATTACHMENT TO THE SKIN TO FACILITATE ADHESION IN OILY CONDITIONS	2003-04-08
D5	US6213993	SELF-ADHERING ABSORBENT ARTICLE	2001-04-10

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

Novedad (artículo 16 D486)

Es importante mencionar que el siguiente análisis de patentabilidad se realizó teniendo en cuenta las objeciones de los numerales 3 y 4 de la presente comunicación.

Respecto a la reivindicación 1

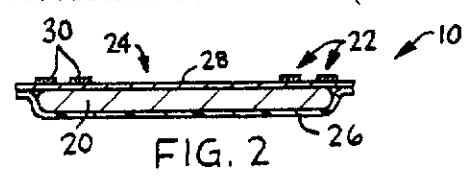
La reivindicación 1 dice "Un artículo absorbente que comprende:

- una cubierta permeable a los líquidos, que tiene una superficie que enfrenta el cuerpo
- una barrera impermeable a los líquidos,
- un adhesivo para asegurar el artículo a al cuerpo dispuesto sobre la superficie que enfrenta el cuerpo, en donde dicho adhesivo es un gel adhesivo basado en un copolimero de bloque estireno-etileno-butileno-estireno (SEBS)
- un miembro de liberación removible para cubrir el adhesivo antes del uso, dicho miembro es impermeable a la migración de adhesivo a través de este".

Respecto al estado de la técnica:

D4 describe un artículo absorbente que tiene un adhesivo adyacente a la piel de la usuaria. El artículo absorbente comprende (fig. 2):

- una cubierta permeable a los líquidos (28) que tiene una superficie enfrente del cuerpo de la usuaria (24) (Col 3 líneas 60-62)
- una barrera (26) impermeable a los fluidos (Col 3 línea 23)
- adhesivo del lado del cuerpo (22) es posicionado adyacente a la cubierta (28) en un patrón rectangular, generalmente el adhesivo (22) se garantiza en al menos 90% del área de la superficie que enfrenta el cuerpo (24). El adhesivo se basa en copolímeros de bloques A-B-B-A (Col 4 líneas 59-60), tales como estireno-etileno-butileno-estireno (Col 6 líneas 22-23).
- Papel de liberación recubierto con silicona (Col 6 líneas 55-56)



D5 relata un artículo absorbente tales como pañales y toallas sanitarias los cuales están provistos con adhesivos que unen el artículo la piel (Resumen). La toalla sanitaria comprende:

- una hoja superior permeable a los líquidos (Col 16 líneas 28), superficie en frente del usuario en contacto con el cuerpo en el cual el adhesivo es aplicado (Col 16 líneas 24-26)

- una hoja posterior impermeable unida a la hoja superior (Col 16 líneas 29)
- el adhesivo es localizado en una superficie en enfrente del usuario (Col 14 líneas 50-51). De acuerdo con la invención la matriz dimensional, también se refiere como una gel que comprende un polímero como componente esencial (Col 8 líneas 49-51). Los polímeros pueden ser elastómeros termoplásticos de copolímeros de bloque mas específicamente estireno-etileno-butileno-estireno (SEBS) (Col 9 líneas 8-14).
- El adhesivo en el artículo es preferiblemente protegido antes del uso. La protección se realiza con un revestimiento de liberación tal como un papel tratado con silicona o un surfactante (Col 15 líneas 62-65).

Respecto a la solicitud en estudio:

De acuerdo a lo descrito en las anterioridades D4 y D5 se observa que todas las características técnicas de la reivindicación 1 ya eran conocidas en el estado de la técnica.

Dado lo anterior, el objeto de la invención recogido en la reivindicación 1 ha sido divulgado idénticamente en las anterioridades D4 y D5 por lo tanto esta reivindicación y sus dependientes no se pueden considerarse nuevas.

7. Conclusión

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

Nº	Documento	Reivindicaciones afectadas	Requisito que afecta
D4	US6544642	1-22	Novedad
D5	US6213993	1-22	Novedad

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 60 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 N° 10 de 2001.

ALIX CARMENZA CÉSPEDES DE VERGEL
Jefe de División de Nuevas Creaciones

El anterior requerimiento fue notificado por fijación en lista, de fecha 20 AGO 2008

CONCEPTO TÉCNICO Nº 1485	EXAMINADOR TÉCNICO Código N° 202090
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