



Industria y Comercio

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Tra. 11 PATENTEIYII Eve: 378 FASENACIONALI
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TITULO APARATO DE EXPULSIÓN DE ADHESIVO

CLASIFICACION INTERNACIONAL _____

SOLICITANTE UNICHARM CORPORATION

DOMICILIO Japón

APODERADO DARIO CARDENAS NAVAS

BOGOTA D.C. _____



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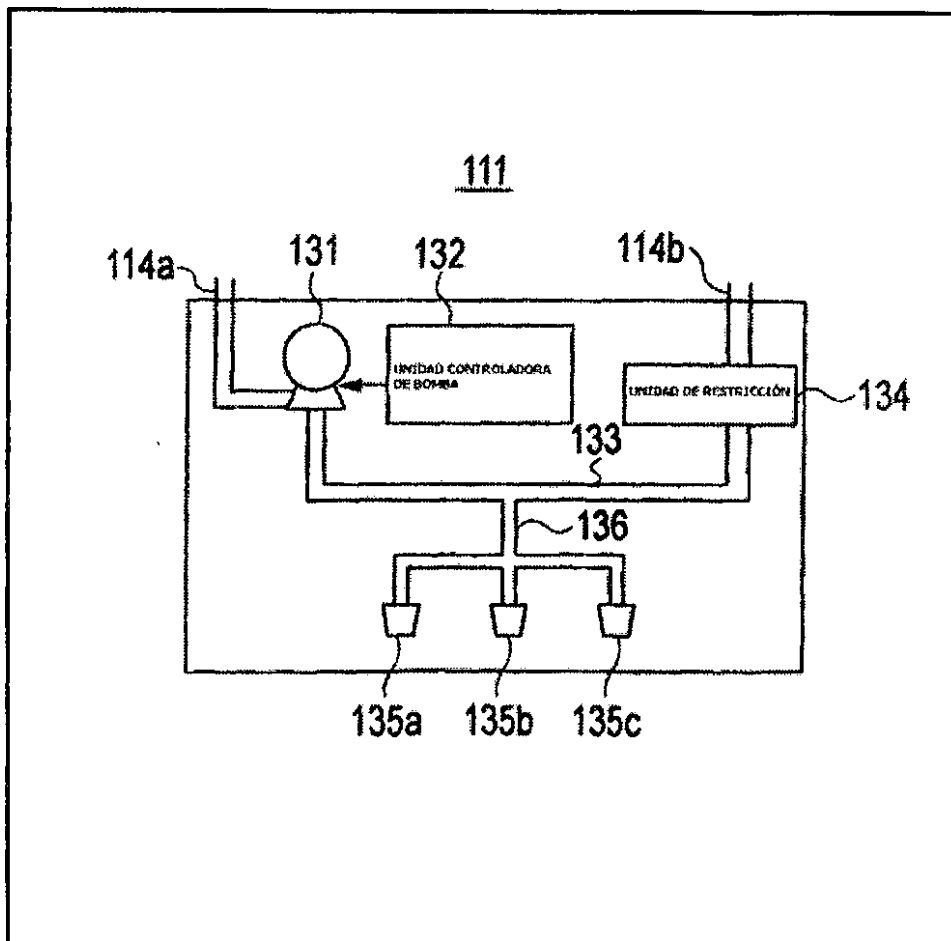
**FORMULARIO UNICO DE SOLICITUD DE PATENTE
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① SOLICITUD DE:			
☒ Patente de Invención		☐ Patente de Modelo de Utilidad	
☒ Capítulo I		☐ Capítulo II	
② SOLICITANTE	Nombre: UNICHARM CORPORATION		IDENTIFICACION ☐ NIT ☐ NIT ☐ Otro ☒ Otro Cual Número
	Dirección: 182 Shimobun, Kinsei-cho, Shikokuchuo-shi, Ehime 799-0111, Japón Nacionalidad o Domicilio: Japón Lugar de Constitución: Japón Teléfono: 3137800 Fax: 3122410 E-mail: general@cardenasycardenas.com		
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	Dirección: Carrera 7 No 71-52 Torre B Piso 9 Teléfono: 3137800 Fax: 3122410 E-Mail: general@cardenasycardenas.com		
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⑤ PCT (86) Solicitud Internacional No. <u>PCT/JP2010/053732</u> Fecha <u>02.03.2010</u> Publicación Internacional No. <u>WO 2010/101275 A1</u> Fecha <u>10.09.2010</u>			
⑥ Título(54): APARATO DE EXPULSIÓN DE ADHESIVO			
⑦ Clasificación Internacional (51):			
⑧ Prioridad SI ☒ NO ☐	(33)País de Origen	(32)Fecha	(31)N° de Solicitud
	JP	02.03.2009	2009-048653
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⑨ Comprobante de Pago No.: 11-0090495 Fecha 14.09.2011			

10 ANEXOS

- ☒ Comprobante de pago de la tasa de presentación de la solicitud.
- ☒ Documento que acredita la existencia y representación legal cuando el solicitante sea persona jurídica.
- ☒ Poderes, si fuere el caso. Presentado Exp 11-119943
- ☐ Documento de cesión del inventor al solicitante o a su causante.
- ☒ Traducción de la solicitud internacional al castellano (Resumen, descripción, reivindicaciones, dibujos)
- ☐ Copia del examen preliminar internacional efectuado por la Autoridad Internacional de Examen Preliminar (IPEA)
- ☐ Traducción del examen preliminar internacional efectuado por la IPEA.
- ☐ De ser el caso, copia del contrato de acceso.
- ☐ De ser el caso, documento que acredite la licencia o autorización de uso de conocimientos tradicionales de las comunidades indígenas.
- ☐ De ser el caso, certificado de depósito del material biológico.
- ☒ Arte final 12x12.
- ☐ De ser el caso, información sobre otras solicitudes de patente o títulos obtenidos en el extranjero por el mismo titular o su causante, relacionadas parcial o totalmente con la invención de esta solicitud.
- ☐ De ser el caso, modificaciones efectuadas a la solicitud internacional.
- ☒ Prioridad No.
<http://www.wipo.int/patentscope/search/en/detail.jsf;jsessionid=3FFF615271148D7423EFE5B867FC883E.wapp2?docId=WO2010101275&recNum=1&tab=PCTDocuments&maxRec=&office=&prevFilter=&sortOption=&queryString=>
- ☐ Recibo de reivindicaciones adicionales

11 FIGURA CARACTERISTICA



12

Solicito la Concesión de la patente

NOMBRE DARIO CARDENAS NAVAS

FIRMA [Firma manuscrita]

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TP

1.250 C.S.J.

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RECIBIDO DE : CARDENAS & CARDENAS ABOGADOS PI LTDA	NI 830.083.491
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*** Soporte del Pago ***					
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CONSIGNACION	BANCO DE BOGOTA	062754387	411763531	14/09/2011	5.559.000.00

*** Conceptos Pagados ***				
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1	50005-01-01 SOLICITUDES	1 TRAMITES DE SOL. DE PATENTE DE INVENCIÓN	571.000.00	571.000.00
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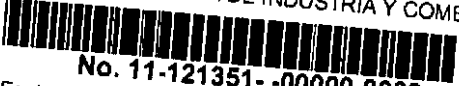
SON: **QUINIENTOS SETENTA Y UN MIL PESOS MON

Responsable: _____

Recibo de Caja Aplicado al Expediente No. _____

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CARDENAS & CARDENAS
ABOGADOS

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**Industria y Comercio**

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(71) Solicitante(s) UNICHARM CORPORATION

(72) Inventor(es) Hiroki Yamamoto

(74) Apoderado: DARIO CARDENAS NAVAS

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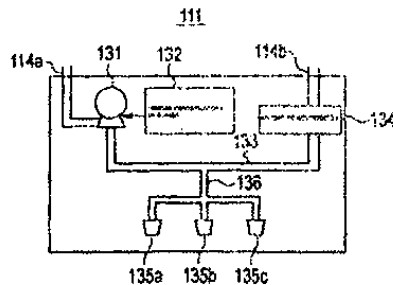
(86) Datos relativos a la presentación de la solicitud PCT

Fecha de presentación de la solicitud: 02.03.2010

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(54) Título APARATO DE EXPULSIÓN DE ADHESIVO

(21) N° de solicitud:		(22) Fecha de solicitud:	
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(71) Solicitante(s) UNICHARM CORPORATION			
(72) Inventor(es) Hiroki Yamamoto			
(74) Apoderado: DARIO CARDENAS NAVAS			
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No. de solicitud PCT/JP2010/053732			



(54) Título: APARATO DE EXPULSIÓN DE ADHESIVO

(57) Resumen:

Un mecanismo de expulsión (111) incluye una bomba (131), una unidad controladora de bomba (132), un tubo de distribución (133), una unidad de restricción (134), y las boquillas de adhesivo (135a a 135c). La unidad controladora de bomba (132) está configurada para controlar, con el fin de aumentar o reducir, la cantidad de adhesivo a admitir en la bomba (131). La unidad de distribución está configurada para enviar una cantidad predeterminada de adhesivo a las boquillas de adhesivo (135a a 135c) del adhesivo suministrado por la bomba (131), y devolver el resto de adhesivo a un tubo de descarga (114b) del adhesivo suministrado, excepto la cantidad predeterminada de adhesivo. La unidad de restricción (134) está configurada para disponerse entre la unidad de distribución (133) y el tubo de descarga (114b) y está configurada para limitar la cantidad de adhesivo a devolver al tubo (113).



Industria y Comercio
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SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
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(30) Prioridad	(31) No. Prioridad	32) Fecha	(33) País	(72) Inventor(es) Hiroki Yamamoto		
	2009-048653	02.03.2009	JP	(74) Apoderado: DARIO CARDENAS NAVAS		
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ESPAÑOL
DESCRIPCIÓN

126.900

APARATO DE EXPULSIÓN DE ADHESIVO**Campo técnico**

La presente revelación se refiere a un aparato de expulsión de adhesivo para eyectar adhesivo hacia un elemento a pegar.

Arte previo

Un artículo absorbente, como un pañal descartable tipo bombacha, en general incluye una región de línea de cintura anterior que calza en la línea de cintura anterior de un usuario, una región de línea de cintura posterior que calza en la línea de cintura posterior del usuario, una región de entrepierna que calza en la entrepierna del usuario, y regiones que circundan las piernas (por ejemplo, orificios para las piernas) respectivamente a los costados de la región de entrepierna.

Este artículo absorbente está fundamentalmente constituido por: una lámina superior permeable a los líquidos configurada para ponerse en contacto con la piel de a usuario; una lámina inferior provista fuera de la lámina superior; y un absorbente provisto entre la lámina superior y la lámina inferior y configurado para absorber la excreción del usuario.

La lámina superior, la lámina inferior, y el absorbente están pegados entre si con adhesivo.

En consideración de la comodidad de uso para el usuario del artículo absorbente, es conveniente que el adhesivo sea aplicado en una pequeña cantidad.

Por ejemplo, se ha revelado una técnica para aplicar adhesivo en una pequeña cantidad sobre un artículo

absorbente (referirse al Documento Patentario 1). En la técnica conocida, el adhesivo es aplicado sobre una trama continuamente en un patrón predeterminado abriendo y cerrando parcial y periódicamente una pluralidad de pequeños orificios dispuestos en una boquilla.

Los inventores han descubierto que, en la técnica conocida, la presión interna en la boquilla aumenta mientras los orificios pequeños están cerrados. Como resultado de ello, inmediatamente después de abrirse los orificios, es probable que se expulse una gran cantidad de adhesivo.

Cuando una pluralidad de orificios pequeños dispuestos en la boquilla se abren y cierran parcial y periódicamente, la cantidad de expulsión y presión de expulsión pueden desestabilizarse a causa de una falla en la aplicación de adhesivo.

Se necesita proveer un aparato de expulsión de adhesivo capaz de aplicar adhesivo en una pequeña cantidad y de una manera uniforme.

Lista de Citas

[Documentos Patentario]

[Documento Patentario 1] Patente Japonesa Número 2619595
(p. 4; Figura 2 y Figura 5)

Resumen

En consecuencia, la presente invención ha sido concebida en consideración de los problemas antes mencionados. Constituye un objeto de la presente invención proveer un aparato de expulsión de adhesivo capaz de aplicar adhesivo en una pequeña cantidad de manera uniforme sobre un elemento a pegar.

En un aspecto de la presente invención, un aparato

de expulsión de adhesivo incluye: una unidad de almacenamiento, un tubo de flujo, al menos un mecanismo de expulsión. La unidad de almacenamiento está configurada para almacenar el adhesivo a aplicar sobre un elemento a pegar. La unidad de almacenamiento comprende: una salida a través de la cual el adhesivo almacenado en la unidad de almacenamiento es enviado al mecanismo de expulsión, y una entrada a través de la cual el adhesivo que fluye por el tubo de flujo es devuelto a la unidad de almacenamiento. El tubo de flujo posee un extremo conectado a la salida y otro extremo conectado a la entrada, de modo que el adhesivo almacenado en la unidad de almacenamiento fluya por el tubo de flujo. El mecanismo de expulsión está conectado al tubo de flujo y configurado para expulsar el adhesivo hacia el elemento a pegar. El mecanismo de expulsión incluye: al menos una unidad eyectora configurada para expulsar el adhesivo hacia el elemento a pegar; una unidad de suministro configurada para alimentar la unidad eyectora con el adhesivo que fluye por el tubo de flujo; una unidad de distribución configurada para enviar una cantidad predeterminada de adhesivo suministrado por la unidad de suministro a la unidad eyectora, y devolver el resto del adhesivo suministrado al tubo de flujo; y una unidad de restricción dispuesta entre la unidad de distribución y el tubo de flujo y configurada para limitar la cantidad de adhesivo a devolver al tubo de flujo. La unidad de suministro está configurada para suministrar adhesivo desde el tubo de flujo a la unidad eyectora en una cantidad mayor que una cantidad de expulsión de adhesivo específica a expulsar por la unidad eyectora.

De acuerdo a las características de la presente invención, es posible proveer un aparato de expulsión de

adhesivo capaz de aplicar adhesivo en una pequeña cantidad de manera uniforme sobre un elemento a pegar.

Breve descripción de los dibujos

La Figura 1 es una vista en perspectiva, parcialmente recortada de un artículo absorbente de acuerdo a una o más realizaciones.

La Figura 2 es un diagrama para explicar un método de fabricación de un artículo absorbente de acuerdo a una o más realizaciones.

La Figura 3 es una vista en perspectiva de una parte relevante de un aparato para fabricar un artículo absorbente de acuerdo a una o más realizaciones.

La Figura 4 es una vista esquemática de un aparato de expulsión de adhesivo de acuerdo a una o más realizaciones.

La Figura 5 es una vista esquemática para explicar la configuración de un mecanismo de aplicación de acuerdo a una o más realizaciones.

Descripción detallada

En adelante, un método y un aparato para fabricar un artículo absorbente, de acuerdo a una o más realizaciones de la presente invención, serán descritos con referencia a los dibujos.

Adviértase que, en la siguiente descripción de los dibujos, las mismas referencias denotan los mismos elementos y porciones. Además, debe advertirse que los dibujos son esquemáticos y no están a escala salvo indicación en contrario. En consecuencia, las dimensiones específicas y similares deben determinarse en consideración a la siguiente descripción. Por otra parte, los dibujos no necesariamente reflejan las relaciones de

dimensiones y proporciones de los componentes reales.

En primer lugar, se describirá una estructura de un artículo absorbente 1 de acuerdo a una o más realizaciones con referencia a la Figura 1 que es una vista en perspectiva parcialmente recortada que ilustra el artículo absorbente 1. En la realización ilustrada particularmente, el artículo absorbente 1 es un pañal descartable tipo bombacha para adultos.

Según se ilustra en la Figura 1, el artículo absorbente 1 está fundamentalmente compuesto de una lámina superior 2, una lámina inferior 3, un absorbente 4, y una lámina impermeable 5.

La lámina superior 2 está configurada para ponerse en contacto con la piel de una persona que está usando el artículo absorbente 1 (en adelante, denominada "usuario"). Como la lámina superior 2, se usa una lámina permeable a los líquidos, como una trama no tejida o una película plástica perforada.

La lámina inferior 3 se provee fuera de la lámina superior 2, en otras palabras, la lámina inferior se provee en la cara más lejana al usuario respecto de la lámina superior 2. Como la lámina inferior 3, se usa una trama no tejida o similar.

El absorbente 4 se provee entre la lámina superior 2 y la lámina inferior 3, y está configurado para absorber la excreción del usuario. Como absorbente 4, se usa una mezcla de pulpa de madera triturada y partículas de polímero superabsorbente, o similar.

La lámina impermeable 5 se provee entre la lámina inferior 3 y el absorbente 4, y no permite que la excreción del usuario penetre. La lámina impermeable 5 es una lámina impermeable a los líquidos y permeable a la humedad que es impermeable al líquido pero permeable a la

humedad.

El artículo absorbente 1 está provisto de la lámina superior 2, el absorbente 4, la lámina impermeable 5 y la lámina posterior 3 en orden, desde el lado de la piel del usuario.

El artículo absorbente 1 según se ha descripto se forma combinando: una porción de línea de cintura anterior 10 que calza en la cintura anterior del usuario; una porción de línea de cintura posterior 20 que calza en la cintura posterior del usuario; y la porción de entrepierna 30 que calza en la entrepierna del usuario.

Adviértase que, las aberturas que circundan las piernas 40 se forman respectivamente a los costados de la porción de entrepierna 30, y las piernas del usuario deben insertarse por las aberturas que circundan las piernas 40.

La porción de línea de cintura anterior 10 y la porción de línea de cintura posterior 20 están unidas por porciones de empalme 50, y así forman una abertura de la línea de cintura 60 que calza alrededor del cuerpo del usuario.

Un frunce de cintura 6A hecho de hebras de goma o similar con capacidad de estiramiento se provee en los bordes periféricos de la porción de línea de cintura anterior 10 y la porción de línea de cintura posterior 20.

Por ejemplo, la porción de línea de cintura anterior 10 y la porción de línea de cintura posterior 20 pueden estar provistas del frunce de cintura 6A para ser así estirables en una dirección transversal a una dirección anterior a posterior que se extiende desde la porción de línea de cintura anterior 10 a la porción de línea de cintura posterior 20, o pueden en si mismas estar hechas

de láminas con capacidad de estiramiento para ser así estirables en la dirección transversal.

La porción de entrepierna 30 se provee entre la porción de línea de cintura anterior 10 y la porción de línea de cintura posterior 20.

Los frunces de pierna 6B están respectivamente hechos de hebras de goma o similar con capacidad de estiramiento disponiéndose respectivamente a los costados de la porción de entrepierna 30.

Por ejemplo, la porción de entrepierna 30 puede estar provista de los frunces de pierna 6B para ser así estirables en la dirección anterior a posterior del artículo absorbente 1, o puede en si misma estar hecha de una lámina con capacidad de estiramiento para ser así estirable en la dirección anterior a posterior del artículo absorbente 1.

A continuación, un método de fabricación de un artículo absorbente 1 de acuerdo a una o más realizaciones será descripto con referencia a la Figura 2 que es una vista para explicar una parte relevante del método de fabricación de un artículo absorbente.

Según se ilustra en la Figura 2, el método de fabricación del artículo absorbente 1 incluye al menos una etapa de formación de la línea de cintura S1, un etapa de transferencia de absorbente S2, una etapa de formación de circundado de las piernas S3, una etapa de plegado S4, una etapa de empalme S5, y una etapa de corte S6.

En la etapa de formación de la línea de cintura S1 se forma una trama 7 disponiendo los frunces (el frunce de cintura 6A y/o los frunces de pierna 6B) entre una trama 7A y una trama 7B. La trama 7 ha de ser procesada en la porción de línea de cintura anterior 10 y la

porción de línea de cintura posterior 20.

Adviértase que, la trama 7 (las tramas 7A y 7B) transportada es estirable en una dirección transversal CD (dirección a lo ancho) ortogonal a una dirección de transporte MD (Dirección de la Máquina) de la trama 7.

Además, la trama 7 es asimétrica con respecto a una línea central CL que divide un ancho en la dirección transversal CD de la trama 7 y se extiende en la dirección de transporte MD de la trama 7.

En la etapa de transferencia de absorbente S2, un elemento de porción de entrepierna 30A a ser procesado en la porción de entrepierna 30 es transferido sobre la trama 7, específicamente, entre la porción de línea de cintura anterior 10 y la porción de línea de cintura posterior 20, luego de la etapa de formación de la línea de cintura S1. Adviértase que, el elemento de porción de entrepierna 30A está constituido por la lámina inferior 3 y el absorbente 4.

En la etapa de formación de circundado de las piernas S3, las aberturas que circundan las piernas 40 (llamadas orificios para las piernas) se forman cortando la trama 7 (las tramas 7A y 7B) luego de la etapa de transferencia de absorbente S2.

Adviértase que, las aberturas que circundan las piernas 40 no se forman necesariamente cortando únicamente la trama 7 (las tramas 7A y 7B), sino que alternativamente pueden formarse cortando la lámina inferior 3 que constituye el elemento de porción de entrepierna 30A junto con la trama 7A y la trama 7B.

En este caso, la etapa de transferencia de absorbente S2 y la etapa de formación de circundado de las piernas S3 pueden ejecutarse en el orden inverso.

En la etapa de plegado S4, la trama 7 se pliega a la

mitad a lo largo una línea de pliegue que se extiende en la dirección de transporte MD de la trama 7, puenteando un borde lateral 10A de la porción de línea de cintura anterior 10 en la trama 7 hacia un borde lateral 20A de la porción de línea de cintura posterior 20 en la trama 7, luego de la etapa de formación de circundado de las piernas S3.

Adviértase que, en la realización particularmente ilustrada, la línea de pliegue es la misma que la línea central CL. Por otra parte, la línea de pliegue no necesariamente coincide con la línea central CL, y puede estar desplazada de la línea central CL hacia el borde lateral 10A o hacia el borde lateral 20A.

En la etapa de empalme S5, las partes plegadas de la trama 7 se unen en regiones de empalme 50A para ser procesadas en las porciones de empalme 50 del artículo absorbente 1 mediante un tratamiento ultrasónico o un tratamiento por calor, luego de la etapa de plegado S4.

Adviértase que las regiones de empalme 50A respectivamente indican regiones a ambos lados de una línea imaginaria SL en la dirección de transporte MD. La línea imaginaria SL indica una línea de corte que se extiende en la dirección del ancho CD.

En la etapa de corte S6, la trama 7 a la cual las regiones de empalme 50A se han unido es cortada a lo largo la línea imaginaria SL luego de la etapa de empalme S5. Como resultado de ello, se obtiene el artículo absorbente 1.

En la etapa de formación de la línea de cintura S1, la trama 7A y la trama 7B son superpuestas entre sí, interponiendo los frunces de cintura 6A y/o los frunces de pierna 6B entre ellas. Luego, la trama 7A y la trama 7B se unen entre sí con adhesivo o similar.

Además, en la etapa de transferencia de absorbente S2, el elemento de porción de entrepierna 30A transferido sobre la trama 7 (la trama constituida por las tramas superpuestas 7B y 7A) que posee los orificios que circundan las piernas 40 se une a la trama 7 con adhesivo o similar.

A continuación, se describirá un aparato para uso en cualquier etapa en la cual las tramas se unen entre si o una trama y un elemento (una lámina o frunce) se unen entre si, como la etapa de formación de la línea de cintura S1 y la etapa de transferencia de absorbente S2.

La Figura 3 es una vista en perspectiva de una parte relevante de un aparato de expulsión de adhesivo 10 para fabricar el artículo absorbente 1 de acuerdo a una o más realizaciones.

El aparato de expulsión de adhesivo 100 incluye los mecanismo de expulsión 111 y 112 configurados respectivamente para expulsar un adhesivo fluible sobre la trama 7B, por medio de lo cual se aplica el adhesivo a la trama 7B. Un tubo 113 se conecta a cada uno de los mecanismos de expulsión 111 y 112. El adhesivo es suministrado al tubo 113 desde una unidad de almacenamiento de adhesivo 115, que se ilustra en la Figura 4.

En algunas realizaciones, el aparato de expulsión de adhesivo 100 incluye una pluralidad de mecanismos de expulsión. El mecanismo de expulsión 111 y el mecanismo de expulsión 112 están dispuestos en paralelo en la dirección transversal CD (la dirección a lo ancho de la trama 7B) ortogonal a la dirección de transporte MD de la trama 7B.

En el aparato de expulsión de adhesivo 100, el mecanismo de expulsión 111 y el mecanismo de expulsión

112 están configurados para expulsar un adhesivo fluible sobre la trama 7B. En otras palabras, el mecanismo de expulsión 111 y el mecanismo de expulsión 112 son capaces de colocar el adhesivo sobre la trama 7B sin ponerse en contacto con la trama 7B.

El adhesivo expulsado del mecanismo de expulsión 111 forma una región de adhesión 201 sobre la trama 7B. El adhesivo expulsado del mecanismo de expulsión 112 forma una región de adhesión 202 sobre la trama 7B.

En otras palabras, el mecanismo de expulsión 111 y el mecanismo de expulsión 112 están configurados para ejecutar una etapa de aplicación en la dirección de transporte MD de la trama 7B, en la cual se aplica el adhesivo sobre la trama 7B continuamente en la dirección de transporte MD.

El mecanismo de expulsión 111 y el mecanismo de expulsión 112 incluyen las boquillas de adhesivo 135a a 135c (se ilustran en la Figura 5).

Además, el mecanismo de expulsión 111 y el mecanismo de expulsión 112 incluyen las boquillas de aire (no se ilustran) configuradas para soplar aire en una pluralidad de direcciones hacia el adhesivo expulsado de las boquillas de adhesivo.

El mecanismo de expulsión 111 y el mecanismo de expulsión 112 están configurados para cambiar la trayectoria del adhesivo en el aire, soplando aire en la medida de lo necesario en una pluralidad de direcciones hacia el adhesivo expulsado de las boquillas de adhesivo.

Esta configuración permite que el mecanismo de expulsión 111 y el mecanismo de expulsión 112 cambien la forma del adhesivo colocado sobre la trama 7B.

En la realización ilustrada particularmente en la Figura 3, se dispone un mecanismo de compresión 120

adyacente al aparato de expulsión de adhesivo 100. El mecanismo de compresión 120 está configurado para colocar la trama 7A o un absorbente sobre la trama 7B que posee el adhesivo aplicado, y luego comprimir las tramas 7A y 7B entre si.

El mecanismo de compresión 120 incluye un rodillo superior 121 y un rodillo inferior 122.

El rodillo superior 121 y el rodillo inferior 122 están configurados para sostener la trama 7B y la trama 7A que se superpone a la trama 7B por arriba y/o por abajo.

El rodillo superior 121 y el rodillo inferior 122 están configurados para comprimir la trama 7A y la trama 7B entre si, sosteniendo la trama 7A y la trama 7B en una dirección transversal al plano de las tramas 7A y 7B.

El rodillo superior 121 y el rodillo inferior 122 forman una región de compresión que se extiende en una dirección transversal a la dirección de transporte MD sobre las tramas 7A y 7B.

En la realización, un eje rotacional 121a del rodillo superior 121 y un eje rotacional 122a del rodillo inferior 122 son paralelos a la dirección transversal CD ortogonal a la dirección de transporte MD.

El mecanismo de compresión 120 está configurado para ejecutar una etapa de compresión en la cual las tramas superpuestas 7A y 7B son comprimidas entre si en la región de compresión que se extiende en la dirección transversal CD.

En la Figura 3, un ejemplo de la trama 7B es la lámina inferior 3, y un ejemplo de la trama 7A es la lámina impermeable 5. A continuación puede ejecutarse una etapa de colocación de uno o más elementos elásticos (por ejemplo, un frunce 6) sobre la región de adhesión

201 y/o la región de adhesión 202 formada sobre la lámina inferior 3.

A continuación, se describirá la configuración del aparato de expulsión de adhesivo 100 en detalle con referencia a la Figura 4 que es una vista esquemática del aparato de expulsión de adhesivo 100.

El aparato de expulsión de adhesivo 100 incluye la unidad de almacenamiento de adhesivo 115, el tubo 113, el mecanismo de expulsión 111, y el mecanismo de expulsión 112.

El adhesivo es almacenado en la unidad de almacenamiento de adhesivo 115. El tubo 113 está conectado a la unidad de almacenamiento de adhesivo 115, y el adhesivo almacenado en la unidad de almacenamiento de adhesivo 115 se hace fluir por el tubo 113.

Además, el tubo 113 está provisto de una porción de calentamiento (no se ilustra) configurada para calentar el adhesivo que fluye por el tubo 113. El mecanismo de expulsión 111 y el mecanismo de expulsión 112 están conectados al tubo 113, y están configurados para expulsar el adhesivo hacia la trama 7A. En este caso, el tubo 113 constituye un tubo de flujo.

Es posible utilizar materiales poliméricos termoplásticos de un grupo de gomas o grupo de olefinas como el adhesivo, fundamentalmente del grupo de gomas. A pesar que la temperatura de fusión varía de acuerdo al material, normalmente es posible emplear un adhesivo que sea sólido a 40 °C o menos, y que se funda en un rango que oscile entre 65 °C y 150 °C. La viscosidad del adhesivo puede ser de 10,000 cps o menos y normalmente oscila entre 2,000 cps y 5,000 cps.

La unidad de almacenamiento de adhesivo 115 posee una salida 115a y una entrada 115b.

La salida 115a está conectada a un extremo del tubo 113, y el adhesivo almacenado en la unidad de almacenamiento de adhesivo 115 es enviado al mecanismo de expulsión 111 y el mecanismo de expulsión 112 por la salida 115a.

La entrada 115b está conectada al otro extremo del tubo 113, y el adhesivo que fluye por el tubo 113 es devuelto a la unidad de almacenamiento de adhesivo 115 por la entrada 115b.

El mecanismo de expulsión 111 y el mecanismo de expulsión 112 incluyen: un tubo de admisión 114a a través de la cual el adhesivo es admitido desde el tubo 113; y un tubo de descarga 114b a través del cual el exceso de adhesivo es enviado al tubo 113.

Adviértase que, la unidad de almacenamiento de adhesivo 115 en la realización constituye una unidad de almacenamiento; el tubo 113 en la realización constituye un tubo de flujo; y la trama 7B en la realización constituye un elemento a pegar.

A continuación, la configuración del mecanismo de expulsión 111 y el mecanismo de expulsión 112 se describirá en detalle con referencia a la Figura 5.

La Figura 5 es una vista esquemática del mecanismo de expulsión 111 y el mecanismo de expulsión 112. En algunas realizaciones, el mecanismo de expulsión 111 y el mecanismo de expulsión 112 pueden utilizarse indistintamente. En consecuencia, la configuración del mecanismo de expulsión 111 será descripta a continuación.

El mecanismo de expulsión 111 incluye una bomba 131, una unidad controladora de bomba 132, un tubo de distribución 133, una unidad de restricción 134, y las boquillas de adhesivo 135a a 135c. En la realización ilustrada particularmente, el mecanismo de expulsión 111

incluye tres boquillas.

La bomba 131 está configurada para admitir el adhesivo que fluye por el tubo 113 en el mecanismo de expulsión 111 a través del tubo de admisión 114a. La unidad controladora de bomba 132 está configurada para controlar un aumento o reducción en la cantidad de adhesivo a admitir por la bomba 131. En otras palabras, la bomba 131 y la unidad controladora de bomba 132 constituyen una unidad de suministro.

El tubo de distribución 133 está configurado para enviar una cantidad predeterminada de adhesivo a las boquillas de adhesivo 135a a 135c desde la unidad de suministro. El tubo de distribución 133 también está configurado para enviar toda cantidad no usada del adhesivo suministrado al tubo de descarga 114b. El tubo de distribución 133 constituye una unidad de distribución.

La unidad de restricción 134 se dispone entre el tubo de distribución 133 y el tubo de descarga 114b, y está configurada para limitar la cantidad de adhesivo a devolver al tubo 113. En una o más realizaciones, la unidad de restricción 134 es una válvula controlable.

En una o más realizaciones, la unidad de restricción 134 posee una estructura tal que la cantidad de adhesivo devuelta al tubo 113 sea ajustable. La apertura y cierre de la unidad de restricción 134 es controlada por una unidad controladora no ilustrada. En algunas realizaciones, el controlador de bomba 132 también está configurado para controlar la unidad de restricción 134.

Cada una de las boquillas de adhesivo 135a a 135c aplica el adhesivo sobre la trama 7B en un patrón predeterminado sin ponerse en contacto con la trama 7B. Las boquillas de adhesivo 135a a 135c constituyen una

unidad eyectora.

En la configuración antes descrita, la bomba 131 y la unidad controladora de bomba 132 están configuradas para admitir, desde el tubo 113, el adhesivo en una cantidad mayor que una cantidad de expulsión de adhesivo específica a ser expulsado de cada una de las boquillas de adhesivo 135a a 135c, y para suministrar el adhesivo admitido a cada una de las boquillas de adhesivo 135a a 135c.

En algunas realizaciones, cuando la cantidad de expulsión específica para una boquilla de adhesivo es 100%, la bomba 131 y la unidad controladora de bomba 132 están configuradas para admitir el adhesivo en una cantidad de 120% de la cantidad de expulsión específica para cada boquilla de adhesivo. En una o más realizaciones, la unidad de restricción 134 puede medirse mediante un sensor de flujo de masa que no se ilustra en la Figura.

En la realización ilustrada particularmente, el mecanismo de expulsión 111 incluye tres boquillas de adhesivo 135a a 135c, cada una de las cuales expulsa la misma cantidad de adhesivo. En consecuencia, el adhesivo en una cantidad de 360% de la cantidad de expulsión específica es admitido desde el tubo 113.

El tubo de distribución 133 está configurado para enviar la cantidad de expulsión de adhesivo específica a cada una de las boquillas de adhesivo 135a a 135c a partir del adhesivo suministrado por la bomba 131, y además suministra el resto, es decir, el 20% del adhesivo de regreso al tubo 113 en todo momento durante la operación.

En la realización, un tubo de distribución 136 está adicionalmente conectado entre el tubo de distribución

133 y las boquillas de adhesivo 135a a 135c.

El tubo de distribución 136 puede tener un diámetro interno menor que el del tubo de distribución 133. Con el tubo de distribución 133, el tubo de distribución 136, y la apertura controlable de la unidad de restricción 134, es posible ajustar la cantidad de adhesivo a devolver al tubo 113 y la cantidad de adhesivo a expulsar de cada una de las boquillas de adhesivo 135a a 135c.

En una o más realizaciones, la cantidad de expulsión específica oscila entre 1 g/m^2 y 20 g/m^2 . Por ejemplo, una boquilla de recubrimiento por vaporización para aplicar un adhesivo sin contacto con el objeto a revestir puede ser usada como las boquillas 135a a 135c. Específicamente, es posible emplear una boquilla de recubrimiento en espiral que permita un recubrimiento en espiral continuo. La cantidad de expulsión de adhesivo puede ser ajustada mediante tales boquillas.

Si el peso cae por debajo de 1 g/m^2 , se dificulta un enlace seguro. Por otra parte, si el peso excede 20 g/m^2 , se deteriora la comodidad de uso del producto. Por otra parte, si el peso excede 20 g/m^2 , la permeabilidad al aire del producto se reduce. En realizaciones adicionales, la cantidad de expulsión específica oscila entre 1 g/m^2 y 10 g/m^2 en términos de peso de recubrimiento. Además, la cantidad de expulsión puede oscilar entre 2 g/m^2 y 8 g/m^2 en termino de peso de recubrimiento.

Según se ha descripto, en el mecanismo de expulsión 111 y el mecanismo de expulsión 112 del aparato de expulsión de adhesivo 100, parte del adhesivo admitido al mecanismo de expulsión 111 y el mecanismo de expulsión 112 del el tubo 113 siempre vuelve al tubo 113. En otras palabras, el adhesivo siempre circula entre el interior

del tubo 113 y la unidad de almacenamiento de adhesivo 115.

En consecuencia, cuando las boquillas de adhesivo 135a a 135c se usan intermitentemente, es posible reducir la diferencia en la presión interna entre el momento en la cual las boquillas de adhesivo 135a a 135c se abren y el momento en el cual las boquillas de adhesivo 135a a 135c se cierran. Como resultado de ello, el adhesivo puede aplicarse en una pequeña cantidad de manera uniforme sobre el elemento a pegar.

En la etapa de aplicación donde las boquillas de adhesivo 135a a 135c se usan individual e intermitentemente, la presión interna aplicada en cada una de las boquillas de adhesivo 135a a 135c varía de acuerdo al hecho que todas o algunas de ellas se usen.

Por esta razón, ha resultado difícil mantener constante la cantidad de adhesivo expulsado de cada una de las boquillas de adhesivo 135a a 135c, cambiando la presión a aplicar a cada una de ellas.

A este respecto, el aparato de expulsión de adhesivo 100 de acuerdo a la realización incluye la unidad de suministro para controlar un aumento o reducción en la cantidad de adhesivo a admitir y la unidad de distribución para devolver el exceso del adhesivo al tubo 113 en todo momento.

En consecuencia, el aparato de expulsión de adhesivo 100 es capaz de reducir la diferencia entre las presiones internas generadas en las respectivas boquillas de adhesivo 135a a 135c aún en la etapa de aplicación donde las boquillas de adhesivo 135a a 135c se usan individual e intermitentemente. Como resultado de ello, el adhesivo puede aplicarse en una pequeña cantidad de manera uniforme sobre el elemento a pegar.

El uso del aparato de expulsión de adhesivo 100 permite la aplicación de adhesivo en una pequeña cantidad de recubrimiento sobre el elemento a pegar en la fabricación de artículos absorbentes. En consecuencia, es posible unir con firmeza láminas, o una lámina y otro elemento, entre sí sin deteriorar la permeabilidad a la humedad del artículo.

Además, dado que el aparato de expulsión de adhesivo 100 es capaz de aplicar una pequeña cantidad de recubrimiento, el aparato de expulsión de adhesivo 100 puede unir materiales, que incluyen una lámina y otro elemento, entre sí sin deteriorar la flexibilidad de los materiales aún cuando el adhesivo sea aplicado a los materiales.

Como resultado de ello, el aparato de expulsión de adhesivo 100 es capaz de producir artículos absorbentes sin sacrificar la comodidad del usuario y textura del producto.

Según se ha descripto, los detalles de varias realizaciones han sido revelados a título ilustrativo. Sin embargo, debe entenderse que la descripción y los dibujos que integran esta revelación no limitan la presente invención. En base a lo revelado, los expertos en el arte podrán concebir con facilidad varias realizaciones, ejemplos y técnicas de operación alternativas.

A pesar de haberse descripto el caso en el cual el aparato de expulsión de adhesivo 100 incluye dos mecanismos de expulsión 111 y 112 en la descripción precedente, el aparato de expulsión de adhesivo 100 puede incluir solamente un mecanismo de expulsión, o más de dos mecanismos de expulsión.

A pesar de haberse descripto el caso en el cual el

mecanismo de expulsión 111 incluye tres boquillas de adhesivo 135a a 135c, el mecanismo de expulsión 111 puede incluir solamente una o dos boquillas de adhesivo, o más de tres boquillas de adhesivo.

Además, el artículo absorbente fabricado de acuerdo a la presente invención no se limita a un pañal descartable, sino que puede ser una toalla higiénica o un protector femenino, por ejemplo, o cualquier otro producto además de los artículos absorbentes.

Según se ha descrito, la presente invención naturalmente incluye varias realizaciones que no están descriptas. En consecuencia, el alcance técnico de la presente invención debe determinarse solamente a través de las reivindicaciones que se acompañan basadas en la descripción precedente.

Quedan incorporadas por completo como referencia las Solicitudes de Patente Japonesa 2009-048653 (presentada en 2 de Marzo de 2009) y 2010-041933 (presentada en 26 de Febrero de 2010).

Aplicabilidad industrial

En consecuencia, dado que el aparato de expulsión de adhesivo de la presente invención provee un aparato de expulsión de adhesivo capaz de aplicar adhesivo en una pequeña cantidad de manera uniforme sobre un elemento a pegar, resulta de utilidad en la tecnología de fabricación de artículos absorbentes.

Listado de referencias

- 1 artículo absorbente
- 2 lámina superior
- 3 lámina inferior
- 4 absorbente
- 5 lámina impermeable

6 frunce
6A frunce de cintura
6B frunce de pierna
7A, 7B, trama
10 porción de línea de cintura anterior
20 porción de línea de cintura posterior
40 aberturas que circundan las piernas
50 porción de empalme
50A región de empalme
60 aberturas de cintura
100 aparato de expulsión de adhesivo
111, 112 mecanismo de expulsión
113 tubo
114a tubo de admisión
114b tubo de descarga
115 depósito de adhesivo
115a salida
115b entrada
120 mecanismo de compresión
121 rodillo superior
121a eje rotacional
122 rodillo inferior
122a eje rotacional
131 bomba
132 controlador de bomba
133 tubo de distribución
134 unidad de restricción
135a a 135c boquilla de adhesivo
136 tubo de distribución
201 región de adhesión
202 región de adhesión

Reivindicaciones

1. Un aparato de expulsión de adhesivo, caracterizado porque comprende:

- una unidad de almacenamiento configurada para almacenar un adhesivo a aplicar sobre un elemento a pegar;

- un tubo de flujo conectado a la unidad de almacenamiento y a través del cual el adhesivo almacenado en la unidad de almacenamiento fluye; y

- al menos un mecanismo de expulsión conectado al tubo de flujo y configurado para expulsar el adhesivo hacia el elemento a pegar, en tanto

- la unidad de almacenamiento comprende:

- una salida a través de la cual el adhesivo almacenado en la unidad de almacenamiento es enviado al mecanismo de expulsión; y

- una entrada a través de la cual el adhesivo que fluye por el tubo de flujo es devuelto a la unidad de almacenamiento;

- un extremo del tubo de flujo está conectado a la salida;

- otro extremo del tubo de flujo está conectado a la entrada;

- el mecanismo de expulsión comprende:

- al menos una unidad eyectora configurada para expulsar el adhesivo hacia el elemento a pegar;

- una unidad de suministro configurada para alimentar la unidad eyectora con el adhesivo que fluye desde el tubo de flujo;

- una unidad de distribución configurada para enviar una cantidad predeterminada de adhesivo suministrada por la unidad de suministro a la unidad

eyectora, y devolver el resto del adhesivo suministrado al tubo de flujo; y

una unidad de restricción dispuesta entre la unidad de distribución y el tubo de flujo y configurada para limitar la cantidad de adhesivo a devolver al tubo de flujo; en tanto

la unidad de suministro está configurada para suministrar adhesivo desde el tubo de flujo a la unidad eyectora en una cantidad mayor que una cantidad de expulsión de adhesivo específica a expulsar por la unidad eyectora.

2. El aparato de expulsión de adhesivo de acuerdo a la Reivindicación 1, caracterizado porque

el mecanismo de expulsión incluye una pluralidad de unidades eyectoras; y

la unidad de distribución está configurada para distribuir el adhesivo suministrado desde la unidad de suministro a la pluralidad de unidades eyectoras.

3. El aparato de expulsión de adhesivo de acuerdo a cualquiera de las Reivindicaciones 1 a 2, caracterizado porque comprende además una pluralidad de los mecanismo de expulsión, en tanto

los mecanismos de expulsión están dispuestos en paralelo entre si en una dirección ortogonal a una dirección de transporte del elemento a pegar.

4. El aparato de expulsión de adhesivo de acuerdo a cualquiera de las Reivindicaciones 1 a 3, caracterizado porque

la unidad de restricción está configurada para ajustar la cantidad de adhesivo a devolver al tubo de

flujo.

5. El aparato de expulsión de adhesivo de acuerdo a cualquiera de las Reivindicaciones 1 a 4, caracterizado porque

el mecanismo de expulsión está configurado para aplicar adhesivo sobre el elemento a pegar en un peso de 1 g/m^2 a 10 g/m^2 .

6. El aparato de expulsión de adhesivo de acuerdo a la Reivindicación 1, caracterizado porque

el elemento a pegar es una trama hecha de un material continuo para integrar un artículo absorbente; y

el mecanismo de expulsión está configurado para expulsar el adhesivo hacia la trama continuamente desplazada en una dirección longitudinal de la misma como la dirección de transporte.

7. El aparato de expulsión de adhesivo de acuerdo a la Reivindicación 6, caracterizado porque

el artículo absorbente incluye al menos una lámina permeable a la humedad que es permeable a la humedad; y

el elemento a pegar es la lámina permeable a la humedad.

8. El aparato de expulsión de adhesivo de acuerdo a la Reivindicación 6, caracterizado porque

el artículo absorbente es un pañal tipo bombacha; y

el mecanismo de expulsión está configurado para expulsar el adhesivo hacia la trama en una región a procesar en al menos una porción de línea de cintura anterior y una porción de línea de cintura posterior del pañal

tipo

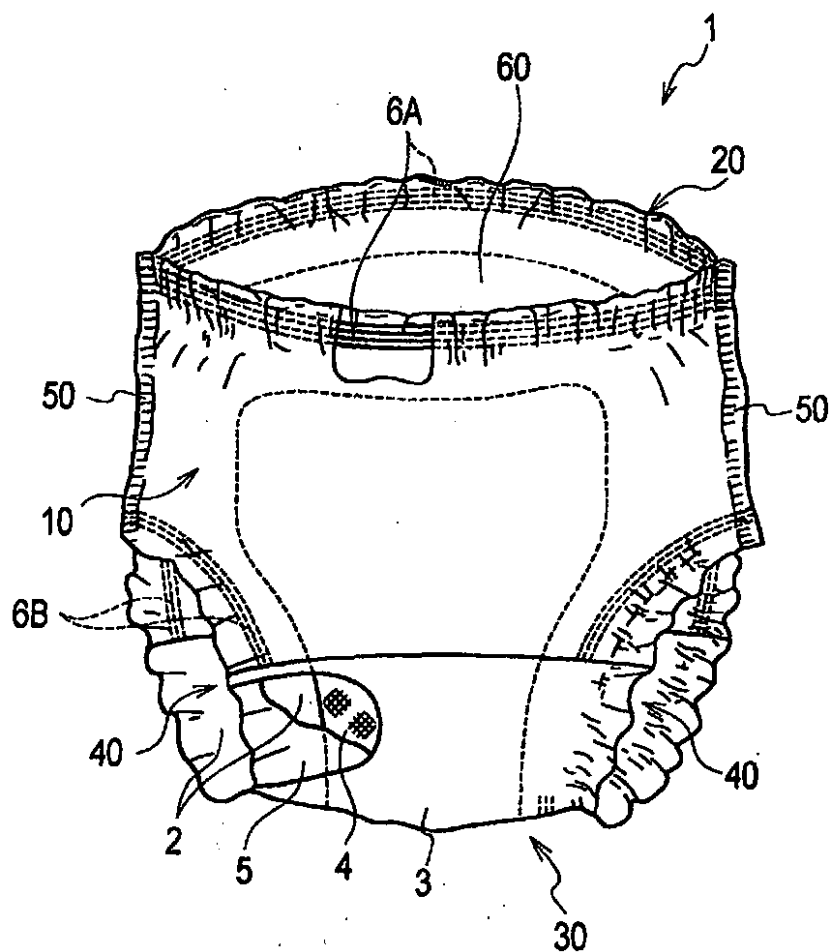
bombacha.

Resumen de la invención

Un mecanismo de expulsión (111) incluye una bomba (131), una unidad controladora de bomba (132), un tubo de distribución (133), una unidad de restricción (134), y las boquillas de adhesivo (135a a 135c). La unidad controladora de bomba (132) está configurada para controlar, con el fin de aumentar o reducir, la cantidad de adhesivo a admitir en la bomba (131). La unidad de distribución está configurada para enviar una cantidad predeterminada de adhesivo a las boquillas de adhesivo (135a a 135c) del adhesivo suministrado por la bomba (131), y devolver el resto de adhesivo a un tubo de descarga (114b) del adhesivo suministrado, excepto la cantidad predeterminada de adhesivo. La unidad de restricción (134) está configurada para disponerse entre la unidad de distribución (133) y el tubo de descarga (114b) y está configurada para limitar la cantidad de adhesivo a devolver al tubo (113).

1/4

FIG. 1



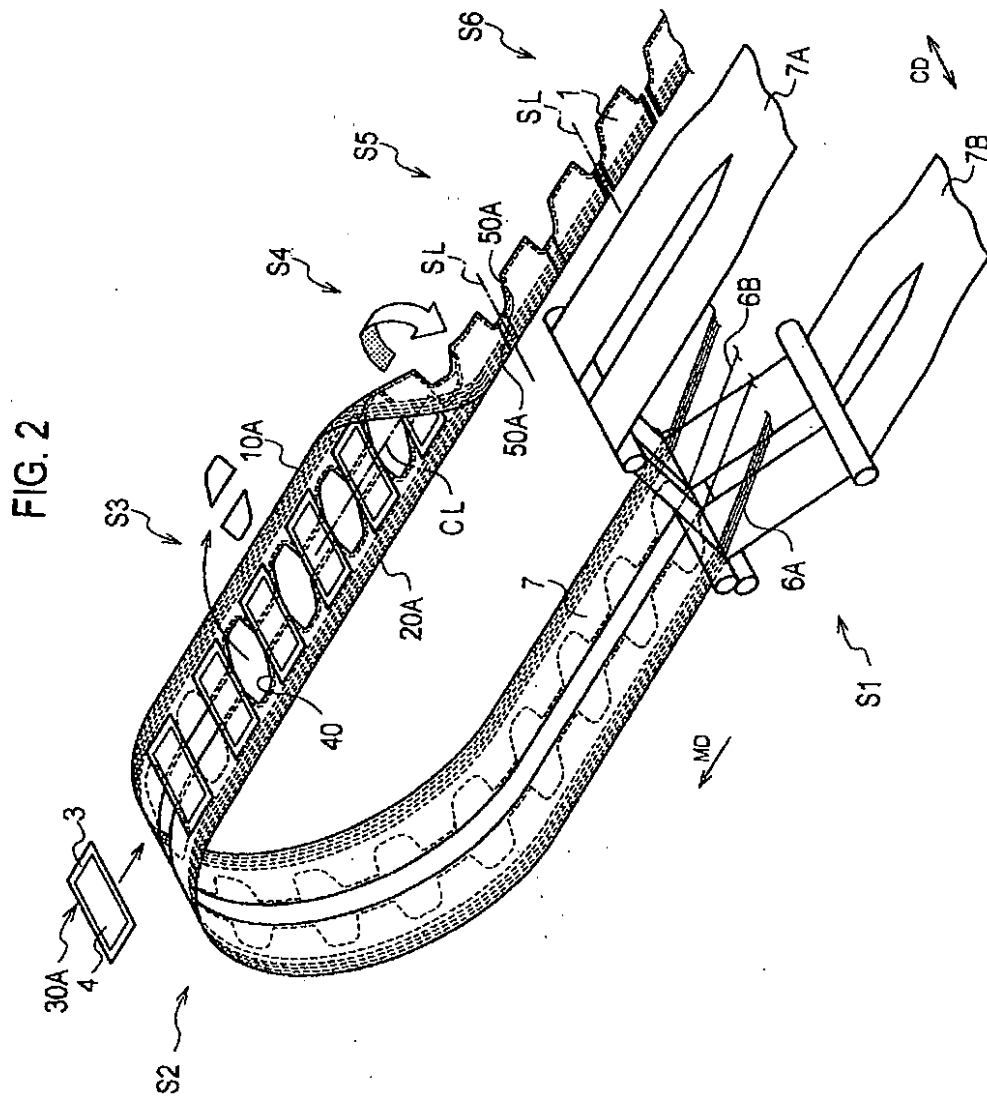


FIG. 4

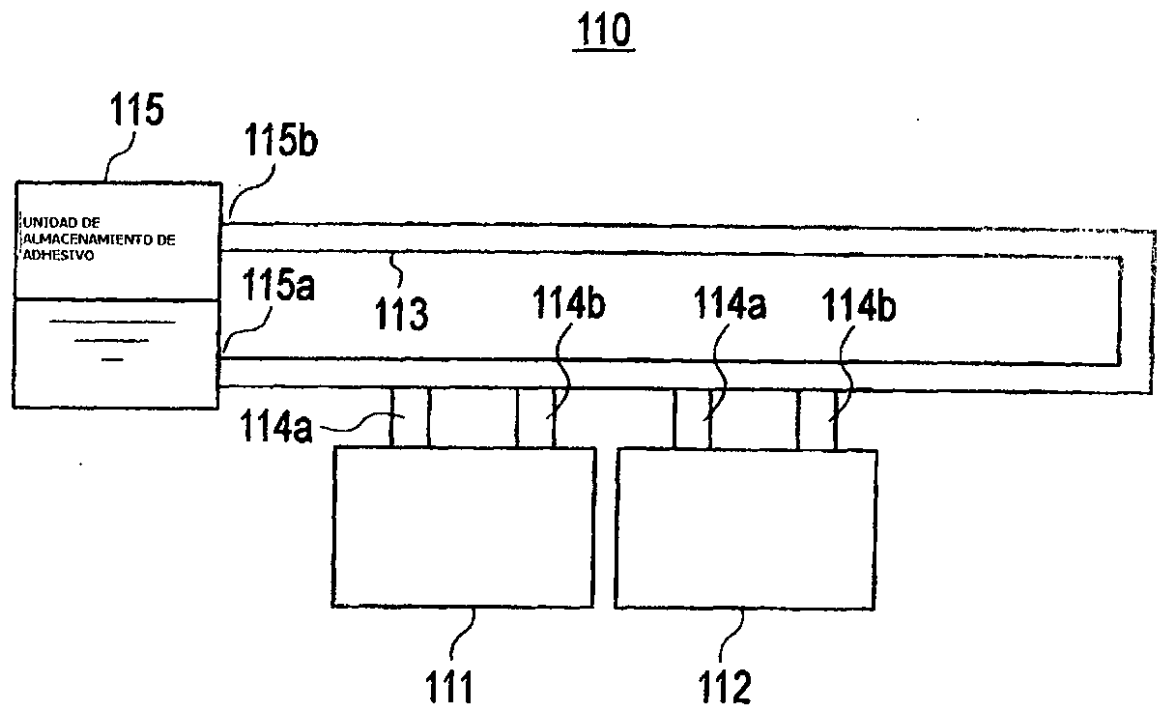
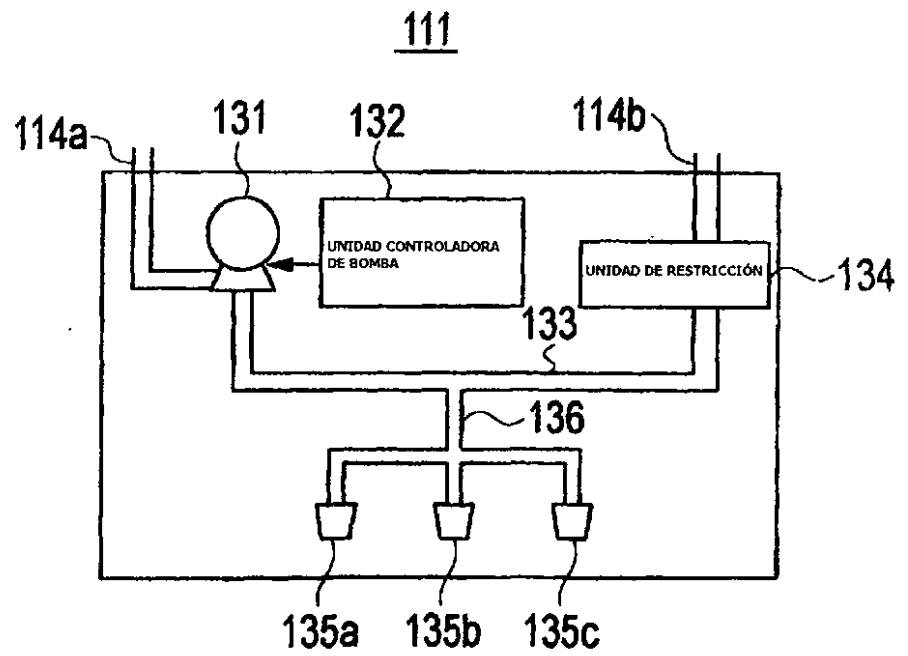


FIG. 5



DESCRIPTION

Title of Invention

ADHESIVE EJECTING APPARATUS

5

Technical Field

The present disclosure relates to an adhesive ejecting apparatus for ejecting adhesive toward a to-be-joined member.

10 **Background Art**

An absorbent article, such as a pants-type disposable diaper, generally includes a front waistline region to be fitted to the front waistline of a wearer, a back waistline region to be fitted to the back waistline of the wearer, a crotch region to be fitted to the crotch of the wearer, and leg-surrounding regions (for example, leg holes) respectively at sides of the crotch region.

Such an absorbent article is formed mainly of: a liquid-permeable top sheet configured to come into contact with the skin of a wearer; a back sheet provided outside of the top sheet; and an absorber provided between the top sheet and the back sheet and configured to absorb excretion of the wearer.

The top sheet, the back sheet, and the absorber are bonded together with adhesive.

In consideration of the wear comfort of the absorbent article to the wearer, it is desirable that the adhesive be applied in a small amount.

For example, a technique to apply adhesive in a small amount onto an absorbent article has been disclosed (refer to

~~Patent Literature~~PTL 1). In the known technique, adhesive is applied onto a web continuously in a predetermined pattern by partially and periodically opening and closing a plurality of small holes provided in a nozzle.

5 The inventors have discovered that, in the known technique, the internal pressure in the nozzle increases while the small holes are closed. As a result, immediately after the small holes are opened, a large amount of adhesive is likely to be ejected.

10 When a plurality of small holes provided in the nozzle are partially and periodically opened and closed, the ejection amount and ejection pressure may be destabilized to cause adhesive application failure.

15 There is a need to provide an adhesive ejecting apparatus capable of applying adhesive in a small amount yet uniformly.

Citation List

~~{Patent Literature}~~

20 ~~{Patent Literature~~PTL 1}: Japanese Patent No. 2619595 (p. 4; Fig. 2 and Fig. 5)

25 ~~SUMMARY~~

Summary

30 Therefore, the present invention has been made in consideration of the above problems. It is an object of the present invention to provide an adhesive ejecting apparatus

capable of applying adhesive in a small weight uniformly onto a to-be-joined member.

In an aspect of the present invention, an adhesive ejecting apparatus includes: a reservoir unit, a flow pipe, at least an ejecting mechanism. The reservoir unit is configured to store adhesive to be applied onto a to-be-joined member. The reservoir unit comprises: an outlet through which the adhesive stored in the reservoir unit is sent out to the ejecting mechanism, and an inlet through which the adhesive flowing through the flow pipe is returned to the reservoir unit. The flow pipe has one end connected to the outlet and another end connected to the inlet, so that the adhesive stored in the reservoir unit flows through the flow pipe. The ejecting mechanism is connected to the flow pipe and configured to eject the adhesive toward the to-be-joined member. The ejecting mechanism includes: at least an ejector unit configured to eject the adhesive toward the to-be-joined member; a supply unit configured to supply the ejector unit with the adhesive flowing through the flow pipe; a distribution unit configured to send a predetermined amount of adhesive supplied by the supply unit to the ejector unit, and to return the rest of the supplied adhesive to the flow pipe; and a restricting unit disposed between the distribution unit and the flow pipe and configured to restrict an amount of adhesive to be returned to the flow pipe. The supply unit is configured to supply adhesive from the flow pipe to the ejector unit in an amount larger than a specified ejection amount of adhesive to be ejected by the ejector unit.

According to the characteristics of the present invention, it is possible to provide an adhesive ejecting

apparatus capable of applying adhesive in a small weight uniformly onto a to-be-joined member.

Brief Description of ~~THE~~ Drawings

5 | [Fig. 1] Fig. 1 is a partially cutaway, perspective view of an absorbent article according to one or more embodiments.

| [Fig. 2] Fig. 2 is a diagram for explaining a method of manufacturing an absorbent article according to one or more embodiments.

10 | [Fig. 3] Fig. 3 is a perspective view of a relevant part of an apparatus for manufacturing an absorbent article according to one or more embodiments.

| [Fig. 4] Fig. 4 is a schematic view of an adhesive ejecting apparatus according to one or more embodiments.

15 | [Fig. 5] Fig. 5 is a schematic view for explaining a configuration of an application mechanism in accordance with one or more embodiments.

Detailed Description

20 Hereinafter, a method of and an apparatus for manufacturing an absorbent article, according to one or more embodiments of the present invention, will be described with reference to the drawings.

25 Note that, in the following description of the drawings, same or similar reference signs denote same or similar elements and portions. In addition, it should be noted that the drawings are schematic are not to scale unless otherwise specified. Therefore, specific dimensions and the like should be determined in consideration of the following description.

30 Moreover, the drawings do not necessarily reflect the

real-life dimensional relationships and ratios of components.

First, a structure of an absorbent article 1 according to one or more embodiments will be described with reference to Fig. 1 which is a partially cutaway perspective view showing the absorbent article 1. In the particularly illustrated embodiment, the absorbent article 1 is a pants-type disposal diaper for adults.

As shown in Fig. 1, the absorbent article 1 is formed mainly of a top sheet 2; a back sheet 3, an absorber 4, and a waterproof sheet 5.

The top sheet 2 is configured to come into contact with a skin of a person wearing the absorbent article 1 (hereinafter, referred to as "wearer"). As the top sheet 2, a liquid-permeable sheet, such as a non-woven fabric or a perforated plastic film, is used.

The back sheet 3 is provided outside of the top sheet 2, in other words, the back sheet is provided at the side farther from the wearer than top sheet 2. As the back sheet 3, a non-woven fabric or the like is used.

The absorber 4 is provided between the top sheet 2 and the back sheet 3, and is configured to absorb excretion of the wearer. As the absorber 4, a mixture of comminuted wood pulp and superabsorbent polymer particles, or the like, is used.

The waterproof sheet 5 is provided between the back sheet 3 and the absorber 4, and does not allow excretion of the wearer to permeate therethrough. The waterproof sheet 5 is a liquid-impermeable and moisture-permeable sheet that is impermeable to liquid but permeable to moisture.

The absorbent article 1 is provided with the top sheet 2, the absorber 4, the waterproof sheet 5 and the back sheet

3 in order, from the skin side of the wearer.

The absorbent article 1 as described above is formed by combining: a front waistline portion 10 to be fitted to the front waist of the wearer; a back waistline portion 20 to be
5 fitted to the back waist of the wearer; and the crotch portion 30 to be fitted to the crotch of the wearer.

Note that, leg-surrounding openings 40 are formed respectively at sides of the crotch portion 30, and the legs of the wearer are to be inserted through the leg-surrounding
10 openings 40.

The front waistline portion 10 and the back waistline portion 20 are united by joint portions 50, and thus form a waistline opening 60 to be fit around the body of the wearer.

A waist gather 6A made of rubber strands or the like having
15 stretchability is provided in the peripheral edges of the front waistline portion 10 and the back waistline portion 20.

For example, the front waistline portion 10 and the back waistline portion 20 may be provided with the waist gather 6A to be thus stretchable in a cross direction crossing a
20 front-to-back direction extending from the front waistline portion 10 to the back waistline portion 20, or may themselves be formed of sheets having stretchability to be thus stretchable in the cross direction.

The crotch portion 30 is provided between the front
25 waistline portion 10 and the back waistline portion 20.

Leg gathers 6B each made of rubber strands or the like having stretchability are provided respectively at the sides of the crotch portion 30.

For example, the crotch portion 30 may be provided with
30 the leg gathers 6B to be thus stretchable in the front-to-back

direction of the absorbent article 1, or may itself be formed of a sheet having stretchability to be thus stretchable in the front-to-back direction of the absorbent article 1.

Next, a method of manufacturing an absorbent article 1 according to one or more embodiments will be described with reference to Fig. 2 which is an explanatory view for explaining a relevant part of the absorbent article manufacturing method.

As shown in Fig. 2, the method of manufacturing the absorbent article 1 includes at least a waistline forming step S1, an absorber transferring step S2, a leg-surrounding forming step S3, a folding step S4, a joining step S5, and a cutting step S6.

In the waistline forming step S1 a web 7 is formed by disposing gathers (the waist gather 6A and/or the leg gathers 6B) between a web 7A and a web 7B. The web 7 is to be processed into the front waistline portion 10 and the back waistline portion 20.

Note that, the web 7 (the webs 7A and 7B) being conveyed is stretchable in a cross direction CD (a width direction) orthogonal to a conveyance direction MD (Machine Direction) of the web 7.

In addition, the web 7 is asymmetrical with respect to a center line CL that bisects a width in the cross direction CD of the web 7 and extends in the conveyance direction MD of the web 7.

In the absorber transferring step S2, a crotch portion member 30A to be processed into the crotch portion 30 is transferred onto the web 7, specifically, between the front waistline portion 10 and the back waistline portion 20, after the waistline forming step S1. Note that, the crotch portion

member 30A is formed of the back sheet 3 and the absorber 4.

In the leg-surrounding forming step S3, the leg-surrounding openings 40 (so-called leg holes) are formed by cutting the web 7 (the webs 7A and 7B) after the absorber
5 transferring step S2.

Note that, the leg-surrounding openings 40 are not necessarily formed by cutting only the web 7 (the webs 7A and 7B), but may alternatively be formed by cutting the back sheet 3 forming the crotch portion member 30A together with the web
10 7A and the web 7B.

Here, the absorber transferring step S2 and the leg-surrounding forming step S3 may be performed in the reverse order.

In the folding step S4, the web 7 is folded in half along
15 a folding line extending in the conveyance direction MD of the web 7, by bringing a side edge 10A of the front waistline portion 10 in the web 7 toward a side edge 20A of the back waistline portion 20 in the web 7, after the leg-surrounding forming step S3.

Note that, in the particularly illustrated embodiment, the folding line is the same as the center line CL. Moreover, the folding line does not necessarily coincide with the center line CL, and may be offset from the center line CL toward the side edge 10A or toward the side edge 20A.
20

In the joining step S5, the folded parts of the web 7 are joined at joint regions 50A to be processed into the joint portions 50 of the absorbent article 1 by an ultrasonic treatment or a heat treatment, after the folding step S4.
25

Note that the joint regions 50A respectively indicate
30 regions at both sides of an imaginary line SL in the conveyance

direction MD. The imaginary line SL indicates a cutting line extending in the width direction CD.

In the cutting step S6, the web 7 in which the joint regions 50A have been joined is cut along the imaginary line SL after the joining step S5. As a result, the absorbent article 1 is manufactured.

In the waistline forming step S1, the web 7A and the web 7B are overlaid one upon another, sandwiching the waist gathers 6A and/or the leg gathers 6B therebetween. Then, the web 7A and the web 7B are joined to each other with adhesive or the like.

In addition, in the absorber transferring step S2, the crotch portion member 30A transferred onto the web 7 (the web formed of the overlaid webs 7B and 7A) having the leg-surrounding opening 40 formed therein is joined to the web 7 with adhesive or the like.

Herein below, a description will be given of an apparatus for use in any step in which webs are joined to each other or a web and a member (a sheet or a gather) are joined to each other, such as the waistline forming step S1 and the absorber transferring step S2.

Fig. 3 is a perspective view of a relevant part of an adhesive ejecting apparatus 10 for manufacturing the absorbent article 1 according to one or more embodiments.

The adhesive ejecting apparatus 100 includes ejecting mechanisms 111 and 112 each configured to eject a flowable adhesive onto the web 7B, thereby applying the adhesive to the web 7B. A pipe 113 is connected to each of the ejecting mechanisms 111 and 112. The adhesive is supplied to the pipe 113 from an adhesive reservoir unit 115, which is shown in Fig.

4.

In the some embodiments, the adhesive ejecting apparatus 100 includes a plurality of ejecting mechanisms. The ejecting mechanism 111 and the ejecting mechanism 112 are arranged in parallel in the cross direction CD (the width direction of the web 7B) orthogonal to the conveyance direction MD of the web 7B.

In the adhesive ejecting apparatus 100, each of the ejecting mechanism 111 and the ejecting mechanism 112 is configured to eject a flowable adhesive onto the web 7B. In other words, each of the ejecting mechanism 111 and the ejecting mechanism 112 is capable of placing the adhesive on the web 7B without coming into contact with the web 7B.

The adhesive ejected from the ejecting mechanism 111 forms an adhesion region 201 on the web 7B. The adhesive ejected from the ejecting mechanism 112 forms an adhesion region 202 on the web 7B.

In other words, the ejecting mechanism 111 and the ejecting mechanism 112 are configured to perform an application step in the conveyance direction MD of the web 7B, in which the adhesive is applied onto the web 7B continuously in the conveyance direction MD.

Each of the ejecting mechanism 111 and the ejecting mechanism 112 includes adhesive nozzles 135a to 135c (shown in Fig. 5).

In addition, each of the ejecting mechanism 111 and the ejecting mechanism 112 includes air nozzles (not shown) configured to blow air in a plurality of directions to the adhesive ejected from the adhesive nozzles.

Each of the ejecting mechanism 111 and the ejecting

mechanism 112 is configured to change the trajectory of the adhesive in the air, by blowing air as appropriate in a plurality of directions to the adhesive ejected from the adhesive nozzles.

5 This configuration enables each of the ejecting mechanism 111 and the ejecting mechanism 112 to change the shape of the adhesive placed on the web 7B.

10 In the particularly illustrated embodiment shown in Fig. 3, a press mechanism 120 is disposed adjacent to the adhesive ejecting apparatus 100. The press mechanism 120 is configured to place the web 7A or an absorber onto the web 7B having the adhesive applied thereonto, and then to press the webs 7A and 7B against each other.

15 The press mechanism 120 includes an upper roller 121 and a lower roller 122.

 The upper roller 121 and the lower roller 122 are configured to hold the web 7B and the web 7A which is overlaid with the web 7B from above and/or below.

20 The upper roller 121 and the lower roller 122 are configured to press the web 7A and the web 7B against each other, by holding the web 7A and the web 7B in a direction crossing the plane of the webs 7A and 7B.

25 The upper roller 121 and the lower roller 122 form a pressing region extending in a direction crossing the conveyance direction MD on the webs 7A and 7B.

 In the embodiment, a rotational axis 121a of the upper roller 121 and a rotational axis 122a of the lower roller 122 are parallel to the cross direction CD orthogonal to the conveyance direction MD.

30 The press mechanism 120 is configured to perform a

pressing step in which the overlaid webs 7A and 7B are pressed against each other in the pressing region extending in the cross direction CD.

5 In Fig. 3, an example of the web 7B is the back sheet 3, and an example of the web 7A is the waterproof sheet 5. A step of placing one or more elastic members (e.g., a gather 6) on the adhesion region 201 and/or the adhesion region 202 formed on the back sheet 3 may be subsequently executed.

10 Next, the configuration of the adhesive ejecting apparatus 100 will be described in detail with reference to Fig. 4 which is a schematic view of the adhesive ejecting apparatus 100.

15 The adhesive ejecting apparatus 100 includes the adhesive reservoir unit 115, the pipe 113, the ejecting mechanism 111, and the ejecting mechanism 112.

Adhesive is stored in the adhesive reservoir unit 115. The pipe 113 is connected to the adhesive reservoir unit 115, and the adhesive stored in the adhesive reservoir unit 115 is caused to flow through the pipe 113.

20 In addition, the pipe 113 is provided with a heating portion (not shown) configured to heat the adhesive flowing through the pipe 113. Each of the ejecting mechanism 111 and the ejecting mechanism 112 is connected to the pipe 113, and is configured to eject the adhesive toward the web 7A. Here, 25 the pipe 113 constitutes a flow pipe.

Thermoplastic polymer materials of a rubber group or an olefin group can be used as the adhesive, and mainly the rubber group can be used. Although the melting temperature varies depends on the material, normally an adhesive which is solid 30 at 40 °C or less, and which melts in a range from 65 °C to 150

°C, can be used. Viscosity of the adhesive can be 10,000 cps or less and normally it is between 2,000 cps to 5,000 cps.

The adhesive reservoir unit 115 has an outlet 115a and an inlet 115b formed therein.

5 The outlet 115a is connected to one end of the pipe 113, and the adhesive stored in the adhesive reservoir unit 115 is sent out to the ejecting mechanism 111 and the ejecting mechanism 112 through the outlet 115a.

10 The inlet 115b is connected to the other end of the pipe 113, and the adhesive flowing through the pipe 113 is returned to the adhesive reservoir unit 115 through the inlet 115b.

Each of the ejecting mechanism 111 and the ejecting mechanism 112 includes: an intake pipe 114a through which the adhesive is taken from the pipe 113; and a discharge pipe 114b
15 through which excess adhesive is sent out to the pipe 113.

Note that, the adhesive reservoir unit 115 in the embodiment constitutes a reservoir unit; the pipe 113 in the embodiment constitutes a flow pipe; and the web 7B in the embodiment constitutes a to-be-joined member.

20 Next, the configuration of each of the ejecting mechanism 111 and the ejecting mechanism 112 will be described in detail with reference to Fig. 5.

Fig. 5 is a schematic view of each of the ejecting mechanism 111 and the ejecting mechanism 112. In some
25 embodiments, the ejecting mechanism 111 and the ejecting mechanism 112 may be used interchangeably without being distinguished from each other. Accordingly, the configuration of the ejecting mechanism 111 will be described below.

30 The ejecting mechanism 111 includes a pump 131, a pump

controller unit 132, a distribution pipe 133, a restricting unit 134, and adhesive nozzles 135a to 135c. In the particularly illustrated embodiment, the ejecting mechanism 111 includes three nozzles.

5 The pump 131 is configured to take the adhesive flowing through the pipe 113 into the ejecting mechanism 111 through the intake pipe 114a. The pump controller unit 132 is configured to control an increase or decrease in the amount of adhesive to be taken in by the pump 131. In other words,
10 the pump 131 and the pump controller unit 132 constitute a supply unit.

 The distribution pipe 133 is configured to send a predetermined amount of adhesive to the adhesive nozzles 135a to 135c from the supply unit. The distribution pipe 133 is
15 also configured to send any unused amount of the supplied adhesive to the discharge pipe 114b. The distribution pipe 133 constitutes a distribution unit.

 The restricting unit 134 is disposed between the distribution pipe 133 and the discharge pipe 114b, and is
20 configured to restrict the amount of adhesive to return to the pipe 113. In one or more embodiments, restricting unit 134 is a controllable valve.

 In one or more embodiments, the restricting unit 134 has such a structure that the amount of adhesive returned to the
25 pipe 113 is adjustable. The opening and closing of the restricting unit 134 is controlled by an unillustrated controller unit. In some embodiments, the pump controller 132 is also configured to control the restricting unit 134.

 Each of the adhesive nozzles 135a to 135c applies the
30 adhesive onto the web 7B in a predetermined pattern while not

coming into contact with the web 7B. The adhesive nozzles 135a to 135c constitute an ejector unit.

In the above-described configuration, the pump 131 and the pump controller unit 132 are configured to take in, from
5 the pipe 113, the adhesive in an amount larger than a specified ejection amount of adhesive to be ejected from each of the adhesive nozzles 135a to 135c, and to supply the adhesive thus taken in to each of the adhesive nozzles 135a to 135c.

In some embodiments, when the specified ejection amount
10 for one adhesive nozzle is 100%, the pump 131 and the pump controller unit 132 are configured to take in the adhesive in an amount of 120% of the specified ejection amount for each adhesive nozzle. In one or more embodiments, restricting unit 134 may be measured by a mass-flow sensor which is not shown
15 in the figure.

In the particularly illustrated embodiment, the ejecting mechanism 111 includes three adhesive nozzles 135a to 135c, each of which ejects the same amount of adhesive. Accordingly, the adhesive in an amount of 360% of the specified ejection
20 amount is taken in from the pipe 113.

The distribution pipe 133 is configured to send the specified ejection amount of adhesive to each of the adhesive nozzles 135a to 135c from the adhesive supplied by the pump 131, and to also supply the rest, that is, 20% of the adhesive
25 back to the pipe 113 all the time during operation.

In the embodiment, a distribution pipe 136 is further connected between the distribution pipe 133 and the adhesive nozzles 135a to 135c.

The distribution pipe 136 may be formed to have an inner
30 diameter smaller than that of the distribution pipe 133. With

the distribution pipe 133, the distribution pipe 136, and the controllable opening of the restricting unit 134, it is possible to adjust the amount of adhesive to be returned to the pipe 113 and the amount of adhesive to be ejected from each
5 of the adhesive nozzles 135a to 135c.

In one or more embodiments, the specified ejection amount is in a coating weight of 1 g/m^2 to 20 g/m^2 . For example, a spray coating nozzle for coating an adhesive without contact with a coating object can be used as the adhesive nozzles 135a
10 to 135c. Specifically, a spiral coating nozzle that enables a continuous spiral coating can be used. An ejecting amount of the adhesive can be adjusted by these nozzles.

If the weight falls below 1 g/m^2 , a secure bonding becomes difficult. On the other hand, if the weight exceeds 20 g/m^2 ,
15 the wear comfort of the product is deteriorated. Moreover, if the weight exceeds 20 g/m^2 , the air permeability of the product is reduced. In further embodiments, the specified ejection amount is from 1 g/m^2 to 10 g/m^2 in terms of coating weight. Further, the ejection amount can be set from 2 g/m^2
20 to 8 g/m^2 in terms of coating weight.

As described above, in each of the ejecting mechanism 111 and the ejecting mechanism 112 in the adhesive ejecting apparatus 100, part of the adhesive taken into the ejecting mechanism 111 and the ejecting mechanism 112 from the pipe 113
25 is always returned to the pipe 113. In other words, the adhesive always circulates between the inside of the pipe 113 and the adhesive reservoir unit 115.

Accordingly, when the adhesive nozzles 135a to 135c are intermittently used, it is possible to reduce the difference
30 in internal pressure between the time at which the adhesive

nozzles 135a to 135c are opened and the time at which the adhesive nozzles 135a to 135c are closed. As a result, the adhesive can be applied in a small weight uniformly onto the to-be-joined member.

5 In the application step where the adhesive nozzles 135a to 135c are individually and intermittently used, the internal pressure applied in each of the adhesive nozzles 135a to 135c varies depending on whether all or some of the adhesive nozzles 135a to 135c are used.

10 For this reason, it has been difficult to make constant the amount of adhesive ejected from each of the adhesive nozzles 135a to 135c, by changing the pressure to be applied to each of the adhesive nozzles 135a to 135c.

 In this regard, the adhesive ejecting apparatus 100
15 according to the embodiment includes the supply unit to control an increase or decrease in the amount of adhesive to be taken in and the distribution unit to return an excess of the adhesive to the pipe 113 all the time.

 Accordingly, the adhesive ejecting apparatus 100 is
20 capable of reducing the difference among the internal pressures generated in the respective adhesive nozzles 135a to 135c even in the application step where the adhesive nozzles 135a to 135c are individually and intermittently used. As a result, the adhesive can be applied in a small weight uniformly
25 onto the to-be-joined member.

 Using the adhesive ejecting apparatus 100 enables the application of adhesive in a small coating amount on the to-be-joined member in manufacturing absorbent articles. Accordingly, it is possible to securely join sheets, or a sheet
30 and another member, to each other without deteriorating the

moisture-permeability of the article.

In addition, since the adhesive ejecting apparatus 100 is capable of the application with a small coating amount, the adhesive ejecting apparatus 100 can join materials, including
5 a sheet and another member, to each other without deteriorating the flexibility of the materials even when the adhesive is applied to the materials.

As a result, the adhesive ejecting apparatus 100 is capable of manufacturing absorbent articles without
10 deteriorating the wear comfort and texture of the product.

As described above, the details of several embodiments have been exemplarily disclosed. However, it should not be understood that the description and drawings which constitute part of this disclosure limit the present invention. From this
15 disclosure, various alternative embodiments, examples, and operation techniques will be easily found by those skilled in the art.

Although the case where the adhesive ejecting apparatus 100 includes two ejecting mechanisms 111 and 112 has been
20 described in the foregoing description, the adhesive ejecting apparatus 100 may include only one ejecting mechanism, or may include more than two ejecting mechanisms.

Although the case where the ejecting mechanism 111 includes three adhesive nozzles 135a to 135c has been described,
25 the ejecting mechanism 111 may include only one or two adhesive nozzles, or may include more than three adhesive nozzles.

Further, the absorbent article manufactured in accordance with the present invention is not limited to a disposable diaper, but may be an absorbent article such as a
30 sanitary napkin or a panty liner, for example, and also may be

any product other than absorbent articles.

As described above, the present invention naturally includes various embodiments which are not described herein. Accordingly, the technical scope of the present invention should be determined only by the matters to define the invention in the scope of claims regarded as appropriate based on the description.

The entire ~~contents~~content of Japanese Patent Applications 2009-048653 (filed on March 2, 2009) and 2010-041933 (filed on February 26, 2010) are incorporated herein by reference.

Industrial Applicability

Therefore, since the adhesive ejecting apparatus of the present invention provides an adhesive ejecting apparatus capable of applying adhesive in a small weight uniformly onto a to-be-joined member, it is useful in manufacturing technology for absorbent articles.

Reference Signs List

- 1 absorbent article
- 2 top surface sheet
- 3 bottom surface sheet
- 4 absorber
- 5 waterproof sheet
- 6 gather
- 6A waist gather
- 6B leg gather
- 7A, 7B web
- 10 front waistline portion

- 20 back waistline portion
- 30 crotch portion
- 40 leg-surrounding openings
- 50 joint portion
- 5 50A joint region
- 60 waistline openings
- 100 adhesive ejecting apparatus
- 111, 112 ejecting mechanism
- 113 pipe
- 10 114a intake pipe
- 114b discharge pipe
- 115 adhesive reservoir
- 115a outlet
- 115b inlet
- 15 120 press mechanism
- 121 upper roller
- 121a rotational axis
- 122 lower roller
- 122a rotational axis
- 20 131 pump
- 132 pump controller
- 133 distribution pipe
- 134 restricting unit
- 135a to 135c adhesive nozzle
- 25 136 distribution pipe
- 201 adhesion region
- 202 adhesion region

CLAIMS

[Claim 1]

An adhesive ejecting apparatus, comprising:

5 a reservoir unit configured to store adhesive to be applied onto a to-be-joined member;

a flow pipe connected to the reservoir unit and through which the adhesive stored in the reservoir unit flows; and

10 at least an ejecting mechanism connected to the flow pipe and configured to eject the adhesive toward the to-be-joined member, wherein

the reservoir unit comprises:

an outlet through which the adhesive stored in the reservoir unit is sent out to the ejecting mechanism; and

15 an inlet through which the adhesive flowing through the flow pipe is returned to the reservoir unit;

one end of the flow pipe is connected to the outlet ;

another end of the flow pipe is connected to the inlet ;

the ejecting mechanism comprises:

20 at least an ejector unit configured to eject the adhesive toward the to-be-joined member;

a supply unit configured to supply the ejector unit with the adhesive flowing from the flow pipe;

25 a distribution unit configured to send a predetermined amount of adhesive supplied by the supply unit to the ejector unit, and to return the rest of the supplied adhesive to the flow pipe; and

30 a restricting unit disposed between the distribution unit and the flow pipe and configured to restrict an amount of adhesive to be returned to the flow pipe; and

the supply unit is configured to supply adhesive from the flow pipe to the ejector unit in an amount larger than a specified ejection amount of adhesive to be ejected by the ejector unit.

5

| [Claim 2]

The adhesive ejecting apparatus according to claim 1, wherein

the ejecting mechanism includes a plurality of the
10 ejector units; and

the distribution unit is configured to distribute the adhesive supplied from the supply unit to the plurality of ejector units.

15 | [Claim 3]

The adhesive ejecting apparatus according to any of claims 1 to 2, further comprising a plurality of the ejecting mechanisms, wherein

the ejecting mechanisms are arranged in parallel to each
20 other in a direction orthogonal to a conveyance direction of the to-be-joined member.

| [Claim 4]

The adhesive ejecting apparatus according to any of
25 claims 1 to 3, wherein

the restricting unit is configured to be adjust the amount of adhesive to be returned to the flow pipe.

| [Claim 5]

30 The adhesive ejecting apparatus according to any of

claims 1 to 4, wherein

the ejecting mechanism is configured to apply adhesive onto the to-be-joined member in a weight of 1 g/m² to 10 g/m².

5 | [Claim 6]

The adhesive ejecting apparatus according to claim 1, wherein

the to-be-joined member is a web formed of a continuous material for forming part of an absorbent article; and

10 | the ejecting mechanism is configured to eject the adhesive toward the web continuously moved in a longitudinal direction thereof as the conveyance direction.

| [Claim 7]

15 | The adhesive ejecting apparatus according to claim 6, wherein

the absorbent article includes at least a moisture-permeable sheet that is permeable to moisture; and

20 | the to-be-joined member is the moisture-permeable sheet.

| [Claim 8]

The adhesive ejecting apparatus according to claim 6, wherein

25 | the absorbent article is a pants-type diaper; and the ejecting mechanism is configured to eject the adhesive toward the web in a region to be processed into at least a front waistline portion and a rear waistline portion of the pants-type diaper.

30

INGLES
RESUMEN

ABSTRACT

An ejecting mechanism (111) includes a pump (131), a pump controller unit (132), a distribution pipe (133), a
5 restricting unit (134), and adhesive nozzles (135a to 135c).
The pump controller unit (132) is configured to control to increase or decrease the amount of adhesive to be taken in by the pump (131). The distribution unit is configured to send a predetermined amount of adhesive to the adhesive nozzles
10 (135a to 135c) out of the adhesive supplied by the pump (131), and to return the rest of adhesive to a discharge pipe (114b) out of the supplied adhesive, except for the predetermined amount of adhesive. The restricting unit (134) is configured to disposed between the distribution unit (133) and the
15 discharge pipe (114b) and configured to restrict an amount of adhesive to be returned to a pipe (113).

INGLES
DIBUJOS

1/4

FIG. 1

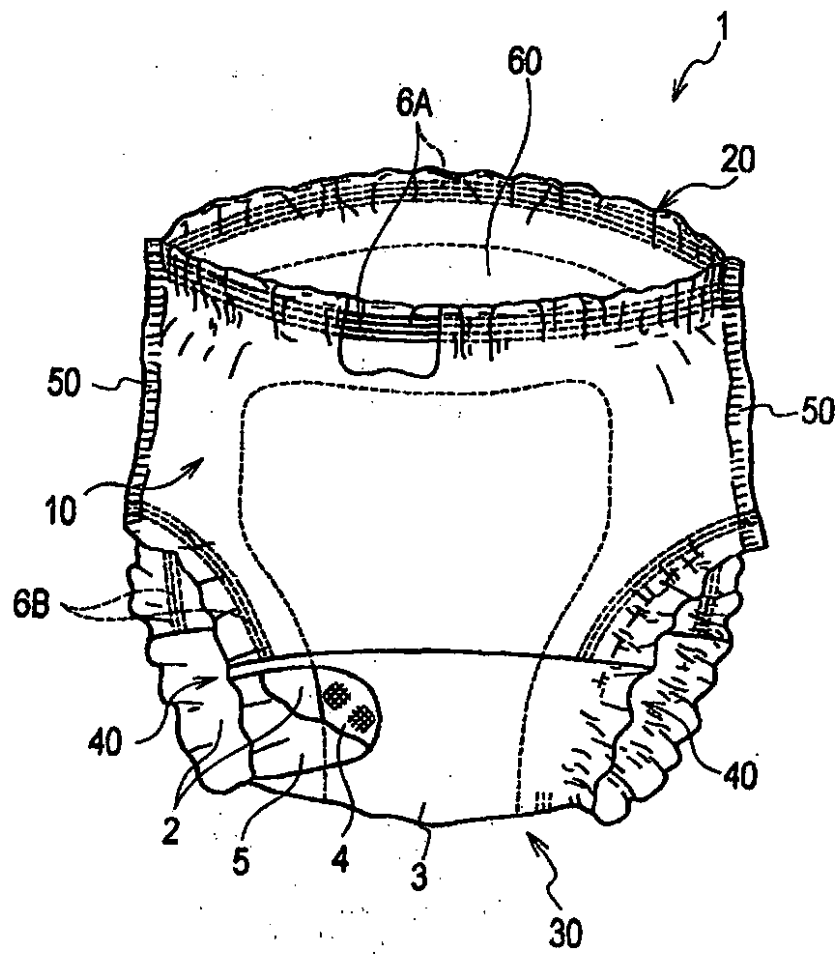


FIG. 2

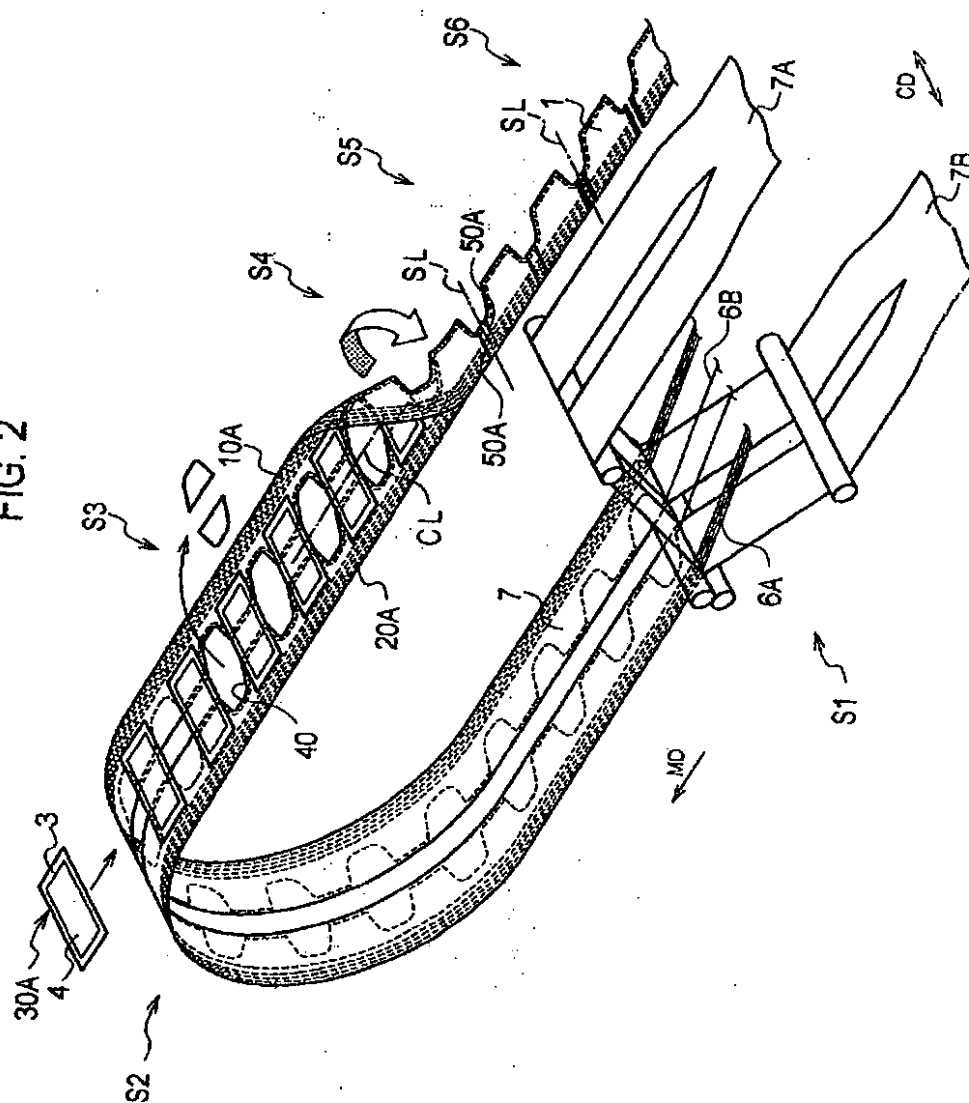


FIG. 3

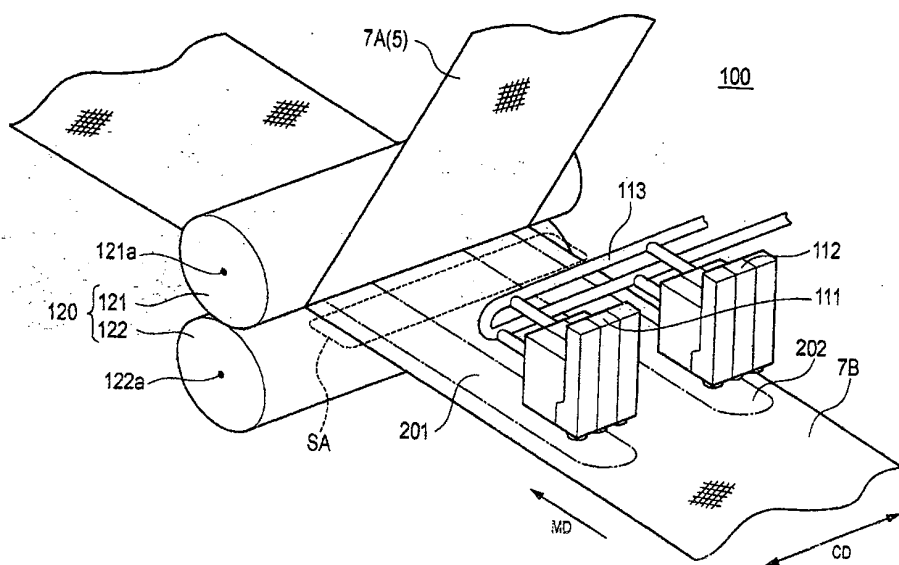


FIG. 4

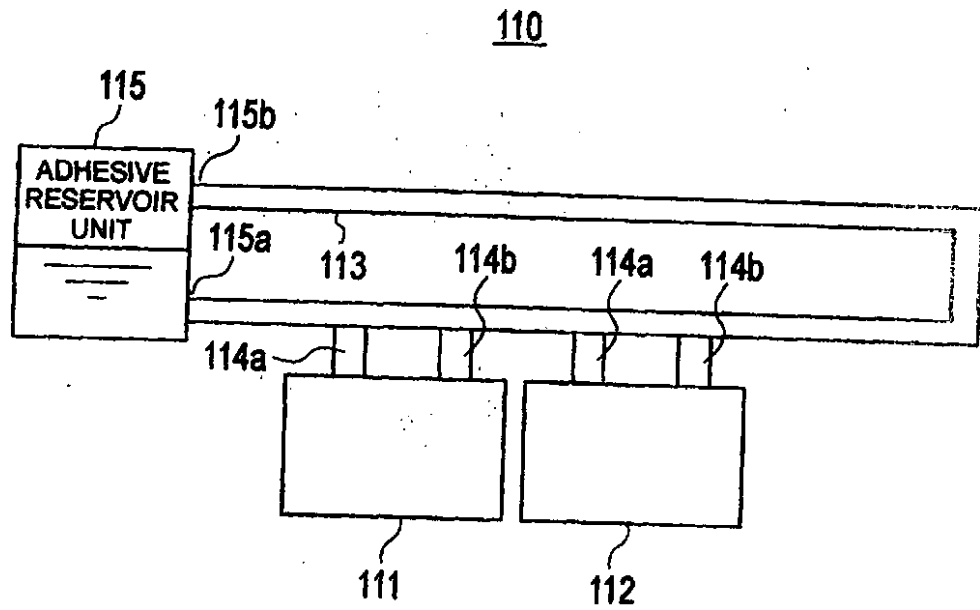
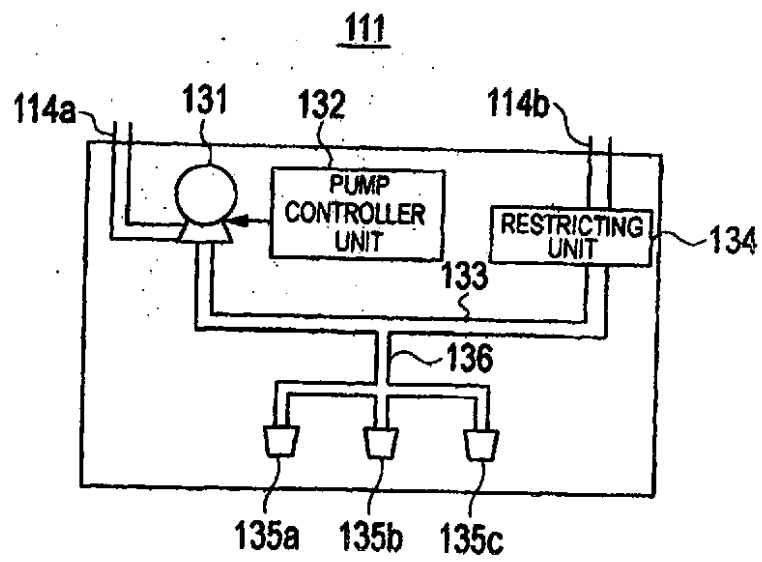


FIG. 5



DOC.
PRESENTACION
SOLICITUD
INTERNACIONAL

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION CONCERNING
SUBMISSION OR TRANSMITTAL
OF PRIORITY DOCUMENT

(PCT Administrative Instructions, Section 411)

Date of mailing (day/month/year) 19 May 2010 (19.05.2010)	To: MIYOSHI, Hidekazu Toranomon Kotohira Tower, 2-8, Toranomon 1-chome, Minato-ku, Tokyo 1050001 JAPON	
Applicant's or agent's file reference JUN-089-PCT		IMPORTANT NOTIFICATION
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International publication date (day/month/year) Not yet published		Priority date (day/month/year) 02 March 2009 (02.03.2009)
Applicant UNICHARM CORPORATION et al		

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<u>Priority date</u>	<u>Priority application No.</u>	<u>Country or regional Office or PCT receiving Office</u>	<u>Date of receipt of priority document</u>
02 March 2009 (02.03.2009)	2009-048653	JP	26 April 2010 (26.04.2010)
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The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Yoshiko Kuwahara e-mail PT07.PCT@WIPO.INT Telephone No. +41 22 338 74 07
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From the INTERNATIONAL BUREAU

PCT

SECOND AND SUPPLEMENTARY NOTICE
INFORMING THE APPLICANT OF THE
COMMUNICATION OF THE INTERNATIONAL
APPLICATION (TO DESIGNATED OFFICES
WHICH APPLY THE 30 MONTH TIME
LIMIT UNDER ARTICLE 22(1))

(PCT Rule 47.1(c))

To:

MIYOSHI, Hidekazu
Toranomon Kotohira Tower, 2-8, Toranomon 1-chome,
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1050001
JAPON

Date of mailing (day/month/year) 07 July 2011 (07.07.2011)		
Applicant's or agent's file reference JUN-089-PCT		IMPORTANT NOTICE
International application No. PCT/JP2010/053732	International filing date (day/month/year) 02 March 2010 (02.03.2010)	Priority date (day/month/year) 02 March 2009 (02.03.2009)
Applicant UNICHARM CORPORATION et al		

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2. Notice is hereby given that the following designated Office(s), for which the time limit under Article 22(1), as in force from 1 April 2002, **does apply**, has/have requested that the communication of the international application, as provided for in Article 20, be effected under Rule 93bis.1. The International Bureau has effected that communication on the date indicated below:
10 September 2010 (10.09.2010)

AU, AZ, BY, CN, CO, DZ, EP, HU, KG, KP, KR, MD, MK, MY, MZ, NA, NG, PG, RU, SY, TM, US

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In accordance with Rule 47.1(c-bis)(ii), those Offices accept the present notice as conclusive evidence that the Contracting State for which that Office acts as a designated Office does not require the furnishing, under Article 22, by the applicant of a copy of the international application.

4. **TIME LIMITS** for entry into the national phase

For the designated or elected Office(s) listed above, the applicable time limit for entering the national phase will, **subject to what is said in the following paragraph**, be **30 MONTHS** from the priority date.

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It is the applicant's **sole responsibility** to monitor all these time limits.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Gijsbertus Beijer
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PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference JUN-089-PCT	FOR FURTHER ACTION	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/JP2010/053732	International filing date(day/month/year) 02.03.2010	(Earliest) Priority Date (day/month/year) 02.03.2009
Applicant UNICHARM CORPORATION		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the language, the international search was carried out on the basis of:

☒ the international application in the language in which it was filed.

☐ a translation of the international application into _____ which is the language of
a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

b. ☐ This international search report has been established taking into account the rectification of an obvious mistake authorized by or notified to this Authority under Rule 91 (Rule 43.6bis(a)).

c. ☐ With regard to any nucleotide and/or amino acid sequence disclosed in the international application, see Box No. I.

2. ☐ Certain claims were found unsearchable (see Box No. II).

3. ☐ Unity of invention is lacking (see Box No. III).

4. With regard to the title,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the drawings,

a. the figure of the drawings to be published with the abstract is Figure No. 5

☒ as suggested by the applicant.

☐ as selected by this Authority, because the applicant failed to suggest a figure.

☐ as selected by this Authority, because this figure better characterizes the invention.

b. ☐ none of the figures is to be published with the abstract.

INTERNATIONAL SEARCH REPORT

 International application No.
 PCT/JP2010/053732

A. CLASSIFICATION OF SUBJECT MATTER Int.Cl. A61F13/15(2006.01)i, A61F13/49(2006.01)i, B05B13/00(2006.01)i, B05C5/04(2006.01)i, B05C11/10(2006.01)n According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) Int.Cl. A61F13/15, A61F13/49, B05B13/00, B05C5/04, B05C11/10 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Published examined utility model applications of Japan 1922-1996 Published unexamined utility model applications of Japan 1971-2010 Registered utility model specifications of Japan 1996-2010 Published registered utility model applications of Japan 1994-2010 Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 2005-329283 A (NISSAN MOTOR CO., LTD) 2005.12.02, paragraphs [0014] - [0024]; figures 1-4 (No Family)	1-8
A	JP 07-185413 A (KANTO AUTO WORKS, LTD.) 1995.07.25, paragraphs [0008] - [0010]; figure 1 (No Family)	1-8
A	JP 01-164463 A (TOYOTA AUTO BODY CO., LTD.) 1989.06.28, page 2, left lower column, line 17 to right lower column, line 14; figure 1 (No Family)	1-8
☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 06.07.2010		Date of mailing of the international search report 13.07.2010
Name and mailing address of the ISA/JP Japan Patent Office 3-4-3, Kasumigaseki, Chiyoda-ku, Tokyo 100-8915, Japan		Authorized officer Shinji DOI Telephone No. +81-3-3581-1101 Ext. 3351

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2010/053732

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 03-296463 A (FUJI PHOTO FILM CO. LTD.) 1991.12.27, page 4, left lower column, lines 4-15; figure 1 & DE 69110948 C	1-8

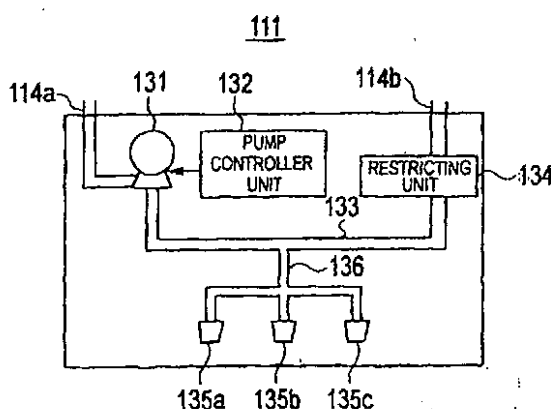


- (51) International Patent Classification:
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- (71) Applicant (for all designated States except US):
UNICHARM CORPORATION [JP/JP]; 182, Shimobun, Kinsei-cho, Shikokuchuo-shi, Ehime, 7990111 (JP).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): YAMAMOTO, Hiroki [JP/JP]; c/o Technical Center of UNICHARM CORPORATION, 1531-7, Wadahama, Toyohama-cho, Kanonji-shi, Kagawa, 7691602 (JP).
- (74) Agents: MIYOSHI, Hidekazu et al.; Toranomon Kotohira Tower, 2-8, Toranomon 1-chome, Minato-ku, Tokyo, 1050001 (JP).
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[Continued on next page]

(54) Title: ADHESIVE EJECTING APPARATUS

FIG. 5



(57) Abstract: An ejecting mechanism (111) includes a pump (131), a pump controller unit (132), a distribution pipe (133), a restricting unit (134), and adhesive nozzles (135a to 135c). The pump controller unit (132) is configured to control to increase or decrease the amount of adhesive to be taken in by the pump (131). The distribution unit is configured to send a predetermined amount of adhesive to the adhesive nozzles (135a to 135c) out of the adhesive supplied by the pump (131), and to return the rest of adhesive to a discharge pipe (114b) out of the supplied adhesive, except for the predetermined amount of adhesive. The restricting unit (134) is configured to disposed between the distribution unit (133) and the discharge pipe (114b) and configured to restrict an amount of adhesive to be returned to a pipe (113).



Published:

— with international search report (Art. 21(3))

— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

DESCRIPTION

Title of Invention

ADHESIVE EJECTING APPARATUS

5

Technical Field

The present disclosure relates to an adhesive ejecting apparatus for ejecting adhesive toward a to-be-joined member.

10 Background Art

An absorbent article, such as a pants-type disposable diaper, generally includes a front waistline region to be fitted to the front waistline of a wearer, a back waistline region to be fitted to the back waistline of the wearer, a crotch region to be fitted to the crotch of the wearer, and
15 leg-surrounding regions (for example, leg holes) respectively at sides of the crotch region.

Such an absorbent article is formed mainly of: a liquid-permeable top sheet configured to come into contact
20 with the skin of a wearer; a back sheet provided outside of the top sheet; and an absorber provided between the top sheet and the back sheet and configured to absorb excretion of the wearer.

The top sheet, the back sheet, and the absorber are bonded
25 together with adhesive.

In consideration of the wear comfort of the absorbent article to the wearer, it is desirable that the adhesive be applied in a small amount.

For example, a technique to apply adhesive in a small
30 amount onto an absorbent article has been disclosed (refer to

PTL 1). In the known technique, adhesive is applied onto a web continuously in a predetermined pattern by partially and periodically opening and closing a plurality of small holes provided in a nozzle.

5 The inventors have discovered that, in the known technique, the internal pressure in the nozzle increases while the small holes are closed. As a result, immediately after the small holes are opened, a large amount of adhesive is likely to be ejected.

10 When a plurality of small holes provided in the nozzle are partially and periodically opened and closed, the ejection amount and ejection pressure may be destabilized to cause adhesive application failure.

15 There is a need to provide an adhesive ejecting apparatus capable of applying adhesive in a small amount yet uniformly.

Citation List

Patent Literature

20 PTL 1: Japanese Patent No. 2619595 (p. 4; Fig. 2 and Fig. 5)

Summary

25 Therefore, the present invention has been made in consideration of the above problems. It is an object of the present invention to provide an adhesive ejecting apparatus capable of applying adhesive in a small weight uniformly onto a to-be-joined member.

30 In an aspect of the present invention, an adhesive ejecting apparatus includes: a reservoir unit, a flow pipe,

at least an ejecting mechanism. The reservoir unit is configured to store adhesive to be applied onto a to-be-joined member. The reservoir unit comprises: an outlet through which the adhesive stored in the reservoir unit is sent out to the ejecting mechanism, and an inlet through which the adhesive flowing through the flow pipe is returned to the reservoir unit. The flow pipe has one end connected to the outlet and another end connected to the inlet, so that the adhesive stored in the reservoir unit flows through the flow pipe. The ejecting mechanism is connected to the flow pipe and configured to eject the adhesive toward the to-be-joined member. The ejecting mechanism includes: at least an ejector unit configured to eject the adhesive toward the to-be-joined member; a supply unit configured to supply the ejector unit with the adhesive flowing through the flow pipe; a distribution unit configured to send a predetermined amount of adhesive supplied by the supply unit to the ejector unit, and to return the rest of the supplied adhesive to the flow pipe; and a restricting unit disposed between the distribution unit and the flow pipe and configured to restrict an amount of adhesive to be returned to the flow pipe. The supply unit is configured to supply adhesive from the flow pipe to the ejector unit in an amount larger than a specified ejection amount of adhesive to be ejected by the ejector unit.

25 According to the characteristics of the present invention, it is possible to provide an adhesive ejecting apparatus capable of applying adhesive in a small weight uniformly onto a to-be-joined member.

Brief Description of Drawings

[Fig. 1] Fig. 1 is a partially cutaway, perspective view of an absorbent article according to one or more embodiments.

[Fig. 2] Fig. 2 is a diagram for explaining a method of
5 manufacturing an absorbent article according to one or more embodiments.

[Fig. 3] Fig. 3 is a perspective view of a relevant part of an apparatus for manufacturing an absorbent article according to one or more embodiments.

10 [Fig. 4] Fig. 4 is a schematic view of an adhesive ejecting apparatus according to one or more embodiments.

[Fig. 5] Fig. 5 is a schematic view for explaining a configuration of an application mechanism in accordance with one or more embodiments.

15

Detailed Description

Hereinafter, a method of and an apparatus for manufacturing an absorbent article, according to one or more embodiments of the present invention, will be described with
20 reference to the drawings.

Note that, in the following description of the drawings, same or similar reference signs denote same or similar elements and portions. In addition, it should be noted that the drawings are schematic are not to scale unless otherwise
25 specified. Therefore, specific dimensions and the like should be determined in consideration of the following description. Moreover, the drawings do not necessarily reflect the real-life dimensional relationships and ratios of components.

First, a structure of an absorbent article 1 according
30 to one or more embodiments will be described with reference

to Fig. 1 which is a partially cutaway perspective view showing the absorbent article 1. In the particularly illustrated embodiment, the absorbent article 1 is a pants-type disposal diaper for adults.

5 As shown in Fig. 1, the absorbent article 1 is formed mainly of a top sheet 2, a back sheet 3, an absorber 4, and a waterproof sheet 5.

The top sheet 2 is configured to come into contact with a skin of a person wearing the absorbent article 1 (hereinafter, referred to as "wearer"). As the top sheet 2, a liquid-permeable sheet, such as a non-woven fabric or a perforated plastic film, is used.

The back sheet 3 is provided outside of the top sheet 2, in other words, the back sheet is provided at the side farther from the wearer than top sheet 2. As the back sheet 3, a non-woven fabric or the like is used.

The absorber 4 is provided between the top sheet 2 and the back sheet 3, and is configured to absorb excretion of the wearer. As the absorber 4, a mixture of comminuted wood pulp and superabsorbent polymer particles, or the like, is used.

The waterproof sheet 5 is provided between the back sheet 3 and the absorber 4, and does not allow excretion of the wearer to permeate therethrough. The waterproof sheet 5 is a liquid-impermeable and moisture-permeable sheet that is impermeable to liquid but permeable to moisture.

The absorbent article 1 is provided with the top sheet 2, the absorber 4, the waterproof sheet 5 and the back sheet 3 in order, from the skin side of the wearer.

The absorbent article 1 as described above is formed by combining: a front waistline portion 10 to be fitted to the

front waist of the wearer; a back waistline portion 20 to be fitted to the back waist of the wearer; and the crotch portion 30 to be fitted to the crotch of the wearer.

Note that, leg-surrounding openings 40 are formed
5 respectively at sides of the crotch portion 30, and the legs of the wearer are to be inserted through the leg-surrounding openings 40.

The front waistline portion 10 and the back waistline portion 20 are united by joint portions 50, and thus form a
10 waistline opening 60 to be fit around the body of the wearer.

A waist gather 6A made of rubber strands or the like having stretchability is provided in the peripheral edges of the front waistline portion 10 and the back waistline portion 20.

For example, the front waistline portion 10 and the back
15 waistline portion 20 may be provided with the waist gather 6A to be thus stretchable in a cross direction crossing a front-to-back direction extending from the front waistline portion 10 to the back waistline portion 20, or may themselves be formed of sheets having stretchability to be thus stretchable
20 in the cross direction.

The crotch portion 30 is provided between the front waistline portion 10 and the back waistline portion 20.

Leg gathers 6B each made of rubber strands or the like having stretchability are provided respectively at the sides
25 of the crotch portion 30.

For example, the crotch portion 30 may be provided with the leg gathers 6B to be thus stretchable in the front-to-back direction of the absorbent article 1, or may itself be formed of a sheet having stretchability to be thus stretchable in the
30 front-to-back direction of the absorbent article 1.

7

Next, a method of manufacturing an absorbent article 1 according to one or more embodiments will be described with reference to Fig. 2 which is an explanatory view for explaining a relevant part of the absorbent article manufacturing method.

5 As shown in Fig. 2, the method of manufacturing the absorbent article 1 includes at least a waistline forming step S1, an absorber transferring step S2, a leg-surrounding forming step S3, a folding step S4, a joining step S5, and a cutting step S6.

10 In the waistline forming step S1 a web 7 is formed by disposing gathers (the waist gather 6A and/or the leg gathers 6B) between a web 7A and a web 7B. The web 7 is to be processed into the front waistline portion 10 and the back waistline portion 20.

15 Note that, the web 7 (the webs 7A and 7B) being conveyed is stretchable in a cross direction CD (a width direction) orthogonal to a conveyance direction MD (Machine Direction) of the web 7.

In addition, the web 7 is asymmetrical with respect to
20 a center line CL that bisects a width in the cross direction CD of the web 7 and extends in the conveyance direction MD of the web 7.

In the absorber transferring step S2, a crotch portion member 30A to be processed into the crotch portion 30 is
25 transferred onto the web 7, specifically, between the front waistline portion 10 and the back waistline portion 20, after the waistline forming step S1. Note that, the crotch portion member 30A is formed of the back sheet 3 and the absorber 4.

In the leg-surrounding forming step S3, the
30 leg-surrounding openings 40 (so-called leg holes) are formed

by cutting the web 7 (the webs 7A and 7B) after the absorber transferring step S2.

Note that, the leg-surrounding openings 40 are not necessarily formed by cutting only the web 7 (the webs 7A and 7B), but may alternatively be formed by cutting the back sheet 3 forming the crotch portion member 30A together with the web 7A and the web 7B.

Here, the absorber transferring step S2 and the leg-surrounding forming step S3 may be performed in the reverse order.

In the folding step S4, the web 7 is folded in half along a folding line extending in the conveyance direction MD of the web 7, by bringing a side edge 10A of the front waistline portion 10 in the web 7 toward a side edge 20A of the back waistline portion 20 in the web 7, after the leg-surrounding forming step S3.

Note that, in the particularly illustrated embodiment, the folding line is the same as the center line CL. Moreover, the folding line does not necessarily coincide with the center line CL, and may be offset from the center line CL toward the side edge 10A or toward the side edge 20A.

In the joining step S5, the folded parts of the web 7 are joined at joint regions 50A to be processed into the joint portions 50 of the absorbent article 1 by an ultrasonic treatment or a heat treatment, after the folding step S4.

Note that the joint regions 50A respectively indicate regions at both sides of an imaginary line SL in the conveyance direction MD. The imaginary line SL indicates a cutting line extending in the width direction CD.

In the cutting step S6, the web 7 in which the joint regions

50A have been joined is cut along the imaginary line SL after the joining step S5. As a result, the absorbent article 1 is manufactured.

In the waistline forming step S1, the web 7A and the web 7B are overlaid one upon another, sandwiching the waist gathers 6A and/or the leg gathers 6B therebetween. Then, the web 7A and the web 7B are joined to each other with adhesive or the like.

In addition, in the absorber transferring step S2, the crotch portion member 30A transferred onto the web 7 (the web formed of the overlaid webs 7B and 7A) having the leg-surrounding opening s 40 formed therein is joined to the web 7 with adhesive or the like.

Herein below, a description will be given of an apparatus for use in any step in which webs are joined to each other or a web and a member (a sheet or a gather) are joined to each other, such as the waistline forming step S1 and the absorber transferring step S2.

Fig. 3 is a perspective view of a relevant part of an adhesive ejecting apparatus 10 for manufacturing the absorbent article 1 according to one or more embodiments.

The adhesive ejecting apparatus 100 includes ejecting mechanisms 111 and 112 each configured to eject a flowable adhesive onto the web 7B, thereby applying the adhesive to the web 7B. A pipe 113 is connected to each of the ejecting mechanisms 111 and 112. The adhesive is supplied to the pipe 113 from an adhesive reservoir unit 115, which is shown in Fig. 4.

In the some embodiments, the adhesive ejecting apparatus 100 includes a plurality of ejecting mechanisms. The ejecting

mechanism 111 and the ejecting mechanism 112 are arranged in parallel in the cross direction CD (the width direction of the web 7B) orthogonal to the conveyance direction MD of the web 7B.

5 In the adhesive ejecting apparatus 100, each of the ejecting mechanism 111 and the ejecting mechanism 112 is configured to eject a flowable adhesive onto the web 7B. In other words, each of the ejecting mechanism 111 and the ejecting mechanism 112 is capable of placing the adhesive on the web
10 7B without coming into contact with the web 7B.

The adhesive ejected from the ejecting mechanism 111 forms an adhesion region 201 on the web 7B. The adhesive ejected from the ejecting mechanism 112 forms an adhesion region 202 on the web 7B.

15 In other words, the ejecting mechanism 111 and the ejecting mechanism 112 are configured to perform an application step in the conveyance direction MD of the web 7B, in which the adhesive is applied onto the web 7B continuously in the conveyance direction MD.

20 Each of the ejecting mechanism 111 and the ejecting mechanism 112 includes adhesive nozzles 135a to 135c (shown in Fig. 5).

In addition, each of the ejecting mechanism 111 and the ejecting mechanism 112 includes air nozzles (not shown)
25 configured to blow air in a plurality of directions to the adhesive ejected from the adhesive nozzles.

Each of the ejecting mechanism 111 and the ejecting mechanism 112 is configured to change the trajectory of the adhesive in the air, by blowing air as appropriate in a
30 plurality of directions to the adhesive ejected from the

adhesive nozzles.

This configuration enables each of the ejecting mechanism 111 and the ejecting mechanism 112 to change the shape of the adhesive placed on the web 7B.

5 In the particularly illustrated embodiment shown in Fig. 3, a press mechanism 120 is disposed adjacent to the adhesive ejecting apparatus 100. The press mechanism 120 is configured to place the web 7A or an absorber onto the web 7B having the adhesive applied thereonto, and then to press the webs 7A and
10 7B against each other.

The press mechanism 120 includes an upper roller 121 and a lower roller 122.

The upper roller 121 and the lower roller 122 are configured to hold the web 7B and the web 7A which is overlaid
15 with the web 7B from above and/or below.

The upper roller 121 and the lower roller 122 are configured to press the web 7A and the web 7B against each other, by holding the web 7A and the web 7B in a direction crossing the plane of the webs 7A and 7B.

20 The upper roller 121 and the lower roller 122 form a pressing region extending in a direction crossing the conveyance direction MD on the webs 7A and 7B.

In the embodiment, a rotational axis 121a of the upper roller 121 and a rotational axis 122a of the lower roller 122
25 are parallel to the cross direction CD orthogonal to the conveyance direction MD.

The press mechanism 120 is configured to perform a pressing step in which the overlaid webs 7A and 7B are pressed against each other in the pressing region extending in the cross
30 direction CD.

In Fig. 3, an example of the web 7B is the back sheet 3, and an example of the web 7A is the waterproof sheet 5. A step of placing one or more elastic members (e.g., a gather 6) on the adhesion region 201 and/or the adhesion region 202 formed on the back sheet 3 may be subsequently executed.

Next, the configuration of the adhesive ejecting apparatus 100 will be described in detail with reference to Fig. 4 which is a schematic view of the adhesive ejecting apparatus 100.

10 The adhesive ejecting apparatus 100 includes the adhesive reservoir unit 115, the pipe 113, the ejecting mechanism 111, and the ejecting mechanism 112.

Adhesive is stored in the adhesive reservoir unit 115. The pipe 113 is connected to the adhesive reservoir unit 115, and the adhesive stored in the adhesive reservoir unit 115 is 15 caused to flow through the pipe 113.

In addition, the pipe 113 is provided with a heating portion (not shown) configured to heat the adhesive flowing through the pipe 113. Each of the ejecting mechanism 111 and 20 the ejecting mechanism 112 is connected to the pipe 113, and is configured to eject the adhesive toward the web 7A. Here, the pipe 113 constitutes a flow pipe.

Thermoplastic polymer materials of a rubber group or an olefin group can be used as the adhesive, and mainly the rubber group can be used. Although the melting temperature varies 25 depends on the material, normally an adhesive which is solid at 40 °C or less, and which melts in a range from 65 °C to 150 °C, can be used. Viscosity of the adhesive can be 10,000 cps or less and normally it is between 2,000 cps to 5,000 cps.

30 The adhesive reservoir unit 115 has an outlet 115a and

an inlet 115b formed therein.

The outlet 115a is connected to one end of the pipe 113, and the adhesive stored in the adhesive reservoir unit 115 is sent out to the ejecting mechanism 111 and the ejecting
5 mechanism 112 through the outlet 115a.

The inlet 115b is connected to the other end of the pipe 113, and the adhesive flowing through the pipe 113 is returned to the adhesive reservoir unit 115 through the inlet 115b.

Each of the ejecting mechanism 111 and the ejecting
10 mechanism 112 includes: an intake pipe 114a through which the adhesive is taken from the pipe 113; and a discharge pipe 114b through which excess adhesive is sent out to the pipe 113.

Note that, the adhesive reservoir unit 115 in the embodiment constitutes a reservoir unit; the pipe 113 in the
15 embodiment constitutes a flow pipe; and the web 7B in the embodiment constitutes a to-be-joined member.

Next, the configuration of each of the ejecting mechanism 111 and the ejecting mechanism 112 will be described in detail with reference to Fig. 5.

20 Fig. 5 is a schematic view of each of the ejecting mechanism 111 and the ejecting mechanism 112. In some embodiments, the ejecting mechanism 111 and the ejecting mechanism 112 may be used interchangeably without being distinguished from each other. Accordingly, the
25 configuration of the ejecting mechanism 111 will be described below.

The ejecting mechanism 111 includes a pump 131, a pump controller unit 132, a distribution pipe 133, a restricting unit 134, and adhesive nozzles 135a to 135c. In the
30 particularly illustrated embodiment, the ejecting mechanism

111 includes three nozzles.

The pump 131 is configured to take the adhesive flowing through the pipe 113 into the ejecting mechanism 111 through the intake pipe 114a. The pump controller unit 132 is
5 configured to control an increase or decrease in the amount of adhesive to be taken in by the pump 131. In other words, the pump 131 and the pump controller unit 132 constitute a supply unit.

The distribution pipe 133 is configured to send a
10 predetermined amount of adhesive to the adhesive nozzles 135a to 135c from the supply unit. The distribution pipe 133 is also configured to send any unused amount of the supplied adhesive to the discharge pipe 114b. The distribution pipe 133 constitutes a distribution unit.

15 The restricting unit 134 is disposed between the distribution pipe 133 and the discharge pipe 114b, and is configured to restrict the amount of adhesive to return to the pipe 113. In one or more embodiments, restricting unit 134 is a controllable valve.

20 In one or more embodiments, the restricting unit 134 has such a structure that the amount of adhesive returned to the pipe 113 is adjustable. The opening and closing of the restricting unit 134 is controlled by an unillustrated controller unit. In some embodiments, the pump controller 132
25 is also configured to control the restricting unit 134.

Each of the adhesive nozzles 135a to 135c applies the adhesive onto the web 7B in a predetermined pattern while not coming into contact with the web 7B. The adhesive nozzles 135a to 135c constitute an ejector unit.

30 In the above-described configuration, the pump 131 and

the pump controller unit 132 are configured to take in, from the pipe 113, the adhesive in an amount larger than a specified ejection amount of adhesive to be ejected from each of the adhesive nozzles 135a to 135c, and to supply the adhesive thus
5 taken in to each of the adhesive nozzles 135a to 135c.

In some embodiments, when the specified ejection amount for one adhesive nozzle is 100%, the pump 131 and the pump controller unit 132 are configured to take in the adhesive in an amount of 120% of the specified ejection amount for each
10 adhesive nozzle. In one or more embodiments, restricting unit 134 may be measured by a mass-flow sensor which is not shown in the figure.

In the particularly illustrated embodiment, the ejecting mechanism 111 includes three adhesive nozzles 135a to 135c,
15 each of which ejects the same amount of adhesive. Accordingly, the adhesive in an amount of 360% of the specified ejection amount is taken in from the pipe 113.

The distribution pipe 133 is configured to send the specified ejection amount of adhesive to each of the adhesive
20 nozzles 135a to 135c from the adhesive supplied by the pump 131, and to also supply the rest, that is, 20% of the adhesive back to the pipe 113 all the time during operation.

In the embodiment, a distribution pipe 136 is further connected between the distribution pipe 133 and the adhesive
25 nozzles 135a to 135c.

The distribution pipe 136 may be formed to have an inner diameter smaller than that of the distribution pipe 133. With the distribution pipe 133, the distribution pipe 136, and the controllable opening of the restricting unit 134, it is
30 possible to adjust the amount of adhesive to be returned to

the pipe 113 and the amount of adhesive to be ejected from each of the adhesive nozzles 135a to 135c.

In one or more embodiments, the specified ejection amount is in a coating weight of 1 g/m^2 to 20 g/m^2 . For example, a
5 spray coating nozzle for coating an adhesive without contact with a coating object can be used as the adhesive nozzles 135a to 135c. Specifically, a spiral coating nozzle that enables a continuous spiral coating can be used. An ejecting amount of the adhesive can be adjusted by these nozzles.

10 If the weight falls below 1 g/m^2 , a secure bonding becomes difficult. On the other hand, if the weight exceeds 20 g/m^2 , the wear comfort of the product is deteriorated. Moreover, if the weight exceeds 20 g/m^2 , the air permeability of the product is reduced. In further embodiments, the specified
15 ejection amount is from 1 g/m^2 to 10 g/m^2 in terms of coating weight. Further, the ejection amount can be set from 2 g/m^2 to 8 g/m^2 in terms of coating weight.

As described above, in each of the ejecting mechanism 111 and the ejecting mechanism 112 in the adhesive ejecting
20 apparatus 100, part of the adhesive taken into the ejecting mechanism 111 and the ejecting mechanism 112 from the pipe 113 is always returned to the pipe 113. In other words, the adhesive always circulates between the inside of the pipe 113 and the adhesive reservoir unit 115.

25 Accordingly, when the adhesive nozzles 135a to 135c are intermittently used, it is possible to reduce the difference in internal pressure between the time at which the adhesive nozzles 135a to 135c are opened and the time at which the adhesive nozzles 135a to 135c are closed. As a result, the
30 adhesive can be applied in a small weight uniformly onto the

to-be-joined member.

In the application step where the adhesive nozzles 135a to 135c are individually and intermittently used, the internal pressure applied in each of the adhesive nozzles 135a to 135c varies depending on whether all or some of the adhesive nozzles 135a to 135c are used.

For this reason, it has been difficult to make constant the amount of adhesive ejected from each of the adhesive nozzles 135a to 135c, by changing the pressure to be applied to each of the adhesive nozzles 135a to 135c.

In this regard, the adhesive ejecting apparatus 100 according to the embodiment includes the supply unit to control an increase or decrease in the amount of adhesive to be taken in and the distribution unit to return an excess of the adhesive to the pipe 113 all the time.

Accordingly, the adhesive ejecting apparatus 100 is capable of reducing the difference among the internal pressures generated in the respective adhesive nozzles 135a to 135c even in the application step where the adhesive nozzles 135a to 135c are individually and intermittently used. As a result, the adhesive can be applied in a small weight uniformly onto the to-be-joined member.

Using the adhesive ejecting apparatus 100 enables the application of adhesive in a small coating amount on the to-be-joined member in manufacturing absorbent articles. Accordingly, it is possible to securely join sheets, or a sheet and another member, to each other without deteriorating the moisture-permeability of the article.

In addition, since the adhesive ejecting apparatus 100 is capable of the application with a small coating amount, the

adhesive ejecting apparatus 100 can join materials, including a sheet and another member, to each other without deteriorating the flexibility of the materials even when the adhesive is applied to the materials.

5 As a result, the adhesive ejecting apparatus 100 is capable of manufacturing absorbent articles without deteriorating the wear comfort and texture of the product.

 As described above, the details of several embodiments have been exemplarily disclosed. However, it should not be
10 understood that the description and drawings which constitute part of this disclosure limit the present invention. From this disclosure, various alternative embodiments, examples, and operation techniques will be easily found by those skilled in the art.

15 Although the case where the adhesive ejecting apparatus 100 includes two ejecting mechanisms 111 and 112 has been described in the foregoing description, the adhesive ejecting apparatus 100 may include only one ejecting mechanism, or may include more than two ejecting mechanisms.

20 Although the case where the ejecting mechanism 111 includes three adhesive nozzles 135a to 135c has been described, the ejecting mechanism 111 may include only one or two adhesive nozzles, or may include more than three adhesive nozzles.

 Further, the absorbent article manufactured in
25 accordance with the present invention is not limited to a disposable diaper, but may be an absorbent article such as a sanitary napkin or a panty liner, for example, and also may be any product other than absorbent articles.

 As described above, the present invention naturally
30 includes various embodiments which are not described herein.

Accordingly, the technical scope of the present invention should be determined only by the matters to define the invention in the scope of claims regarded as appropriate based on the description.

- 5 The entire content of Japanese Patent Applications 2009-048653 (filed on March 2, 2009) and 2010-041933 (filed on February 26, 2010) are incorporated herein by reference.

Industrial Applicability

- 10 Therefore, since the adhesive ejecting apparatus of the present invention provides an adhesive ejecting apparatus capable of applying adhesive in a small weight uniformly onto a to-be-joined member, it is useful in manufacturing technology for absorbent articles.

15

Reference Signs List

- | | |
|-----------|--------------------------|
| 1 | absorbent article |
| 2 | top surface sheet |
| 3 | bottom surface sheet |
| 20 4 | absorber |
| 5 | waterproof sheet |
| 6 | gather |
| 6A | waist gather |
| 6B | leg gather |
| 25 7A, 7B | web |
| 10 | front waistline portion |
| 20 | back waistline portion |
| 30 | crotch portion |
| 40 | leg-surrounding openings |
| 30 50 | joint portion, |

20

- 50A joint region
- 60 waistline openings
- 100 adhesive ejecting apparatus
- 111, 112 ejecting mechanism
- 5 113 pipe
- 114a intake pipe
- 114b discharge pipe
- 115 adhesive reservoir
- 115a outlet
- 10 115b inlet
- 120 press mechanism
- 121 upper roller
- 121a rotational axis
- 122 lower roller
- 15 122a rotational axis
- 131 pump
- 132 pump controller
- 133 distribution pipe
- 134 restricting unit
- 20 135a to 135c adhesive nozzle
- 136 distribution pipe
- 201 adhesion region
- 202 adhesion region

25

CLAIMS

[Claim 1]

An adhesive ejecting apparatus, comprising:

- 5 a reservoir unit configured to store adhesive to be applied onto a to-be-joined member;
- a flow pipe connected to the reservoir unit and through which the adhesive stored in the reservoir unit flows; and
- at least an ejecting mechanism connected to the flow
- 10 pipe and configured to eject the adhesive toward the to-be-joined member, wherein
- the reservoir unit comprises:
- an outlet through which the adhesive stored in the reservoir unit is sent out to the ejecting mechanism; and
- 15 an inlet through which the adhesive flowing through the flow pipe is returned to the reservoir unit;
- one end of the flow pipe is connected to the outlet ;
- another end of the flow pipe is connected to the inlet ;
- the ejecting mechanism comprises:
- 20 at least an ejector unit configured to eject the adhesive toward the to-be-joined member;
- a supply unit configured to supply the ejector unit with the adhesive flowing from the flow pipe;
- a distribution unit configured to send a
- 25 predetermined amount of adhesive supplied by the supply unit to the ejector unit, and to return the rest of the supplied adhesive to the flow pipe; and
- a restricting unit disposed between the distribution unit and the flow pipe and configured to restrict
- 30 an amount of adhesive to be returned to the flow pipe; and

the supply unit is configured to supply adhesive from the flow pipe to the ejector unit in an amount larger than a specified ejection amount of adhesive to be ejected by the ejector unit.

5

[Claim 2]

The adhesive ejecting apparatus according to claim 1, wherein

the ejecting mechanism includes a plurality of the
10 ejector units; and

the distribution unit is configured to distribute the adhesive supplied from the supply unit to the plurality of ejector units.

15

[Claim 3]

The adhesive ejecting apparatus according to any of claims 1 to 2, further comprising a plurality of the ejecting mechanisms, wherein

the ejecting mechanisms are arranged in parallel to each
20 other in a direction orthogonal to a conveyance direction of the to-be-joined member.

[Claim 4]

The adhesive ejecting apparatus according to any of
25 claims 1 to 3, wherein

the restricting unit is configured to be adjust the amount of adhesive to be returned to the flow pipe.

[Claim 5]

30 The adhesive ejecting apparatus according to any of

claims 1 to 4, wherein

the ejecting mechanism is configured to apply adhesive onto the to-be-joined member in a weight of 1 g/m^2 to 10 g/m^2 .

5 [Claim 6]

The adhesive ejecting apparatus according to claim 1, wherein

the to-be-joined member is a web formed of a continuous material for forming part of an absorbent article; and

10 the ejecting mechanism is configured to eject the adhesive toward the web continuously moved in a longitudinal direction thereof as the conveyance direction.

[Claim 7]

15 The adhesive ejecting apparatus according to claim 6, wherein

the absorbent article includes at least a moisture-permeable sheet that is permeable to moisture; and

20 the to-be-joined member is the moisture-permeable sheet.

[Claim 8]

The adhesive ejecting apparatus according to claim 6, wherein

25 the absorbent article is a pants-type diaper; and

the ejecting mechanism is configured to eject the adhesive toward the web in a region to be processed into at least a front waistline portion and a rear waistline portion of the pants-type diaper.

30

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FIG. 1

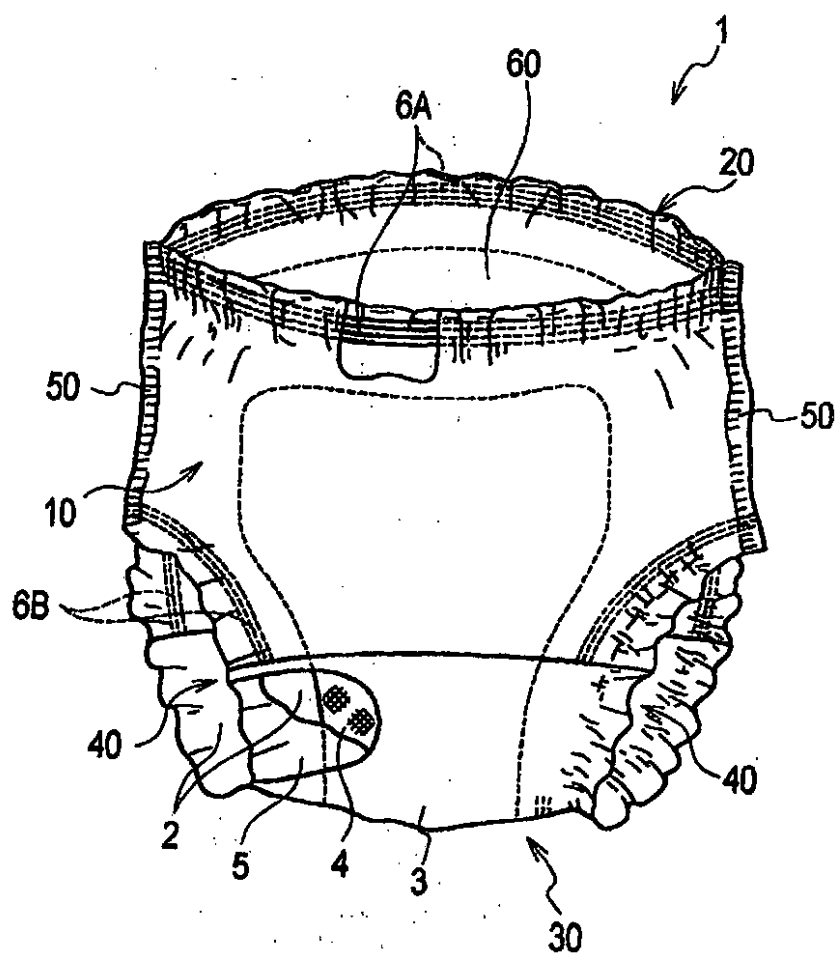
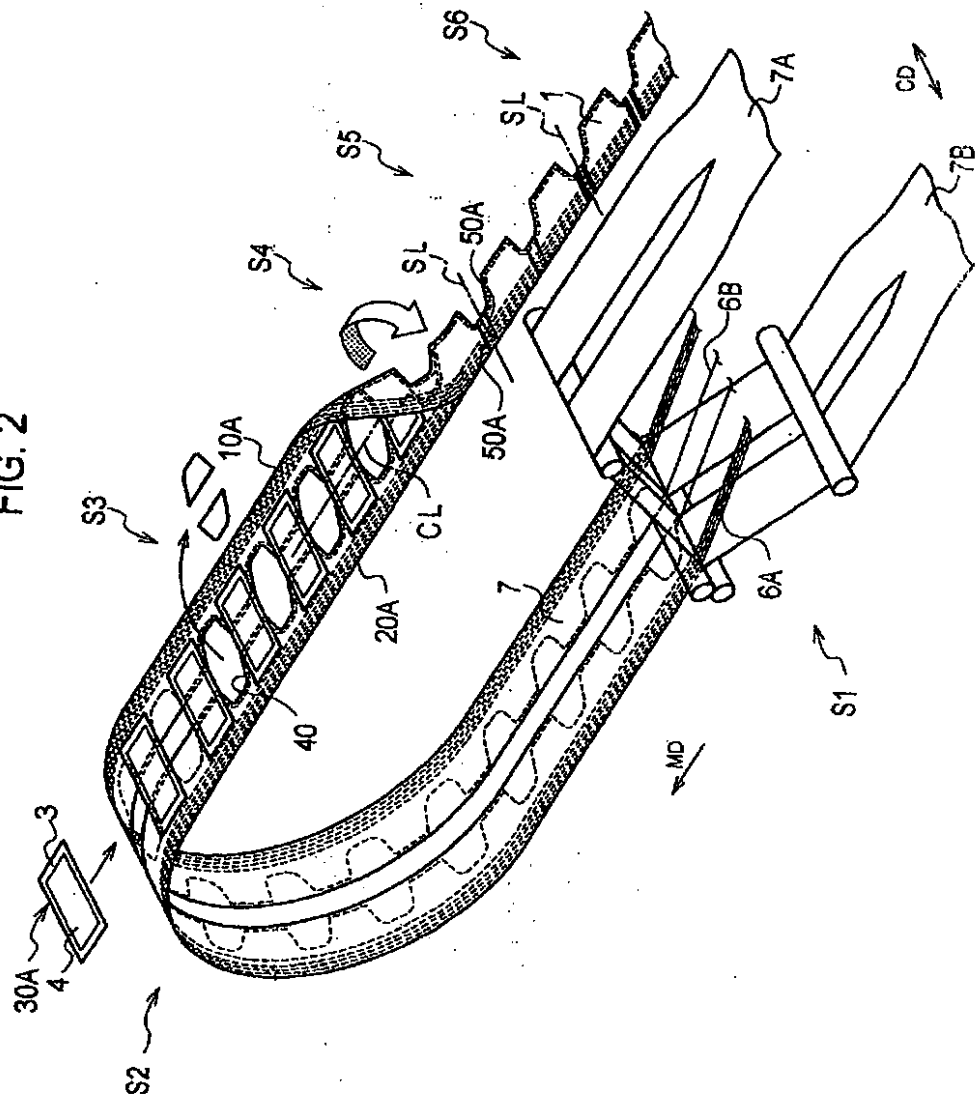


FIG. 2



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FIG. 3

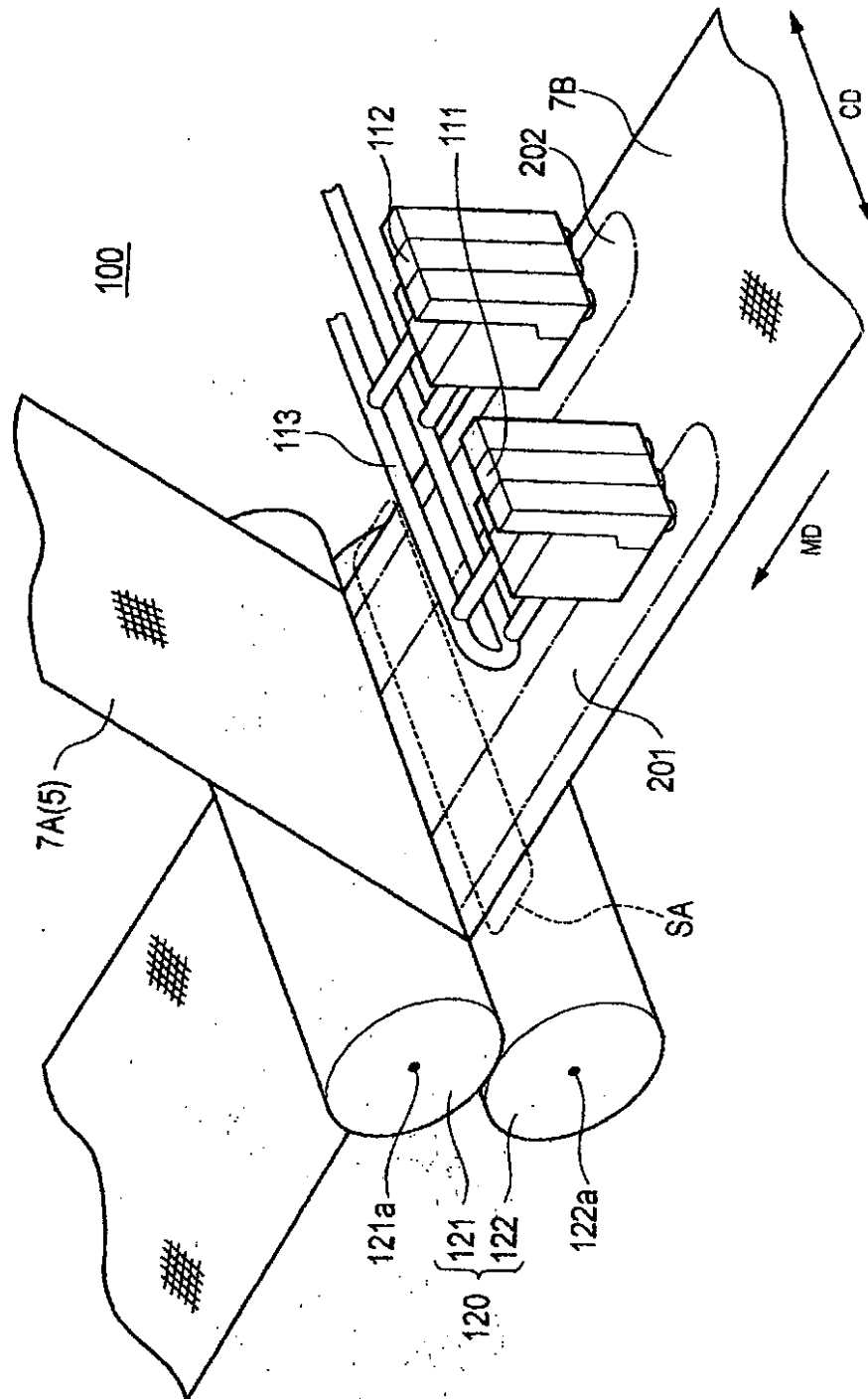


FIG. 4

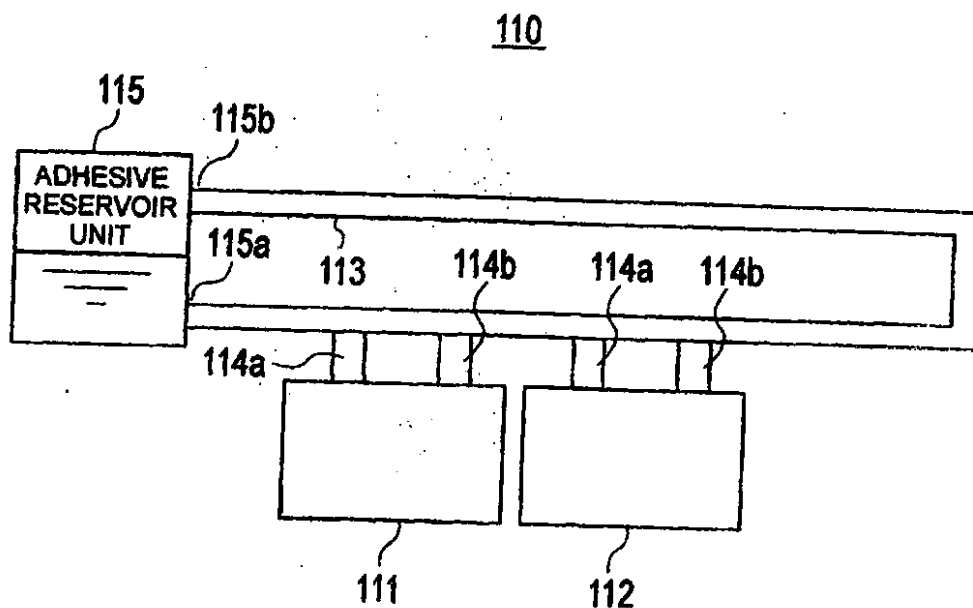
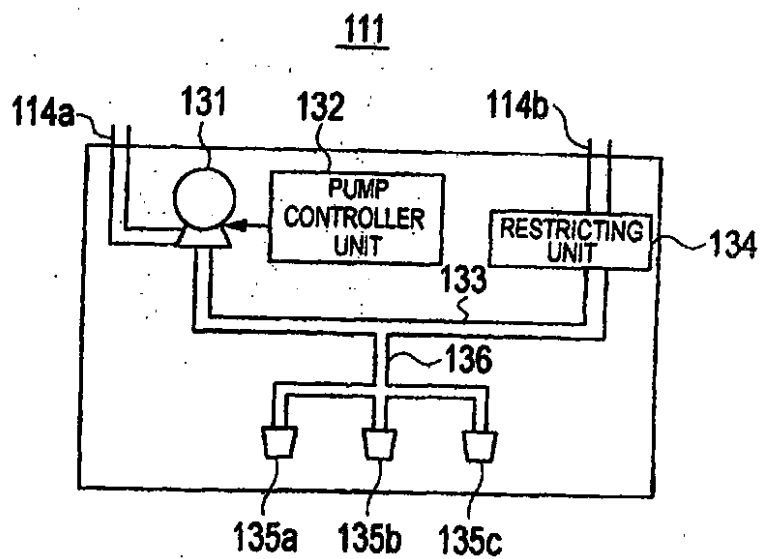
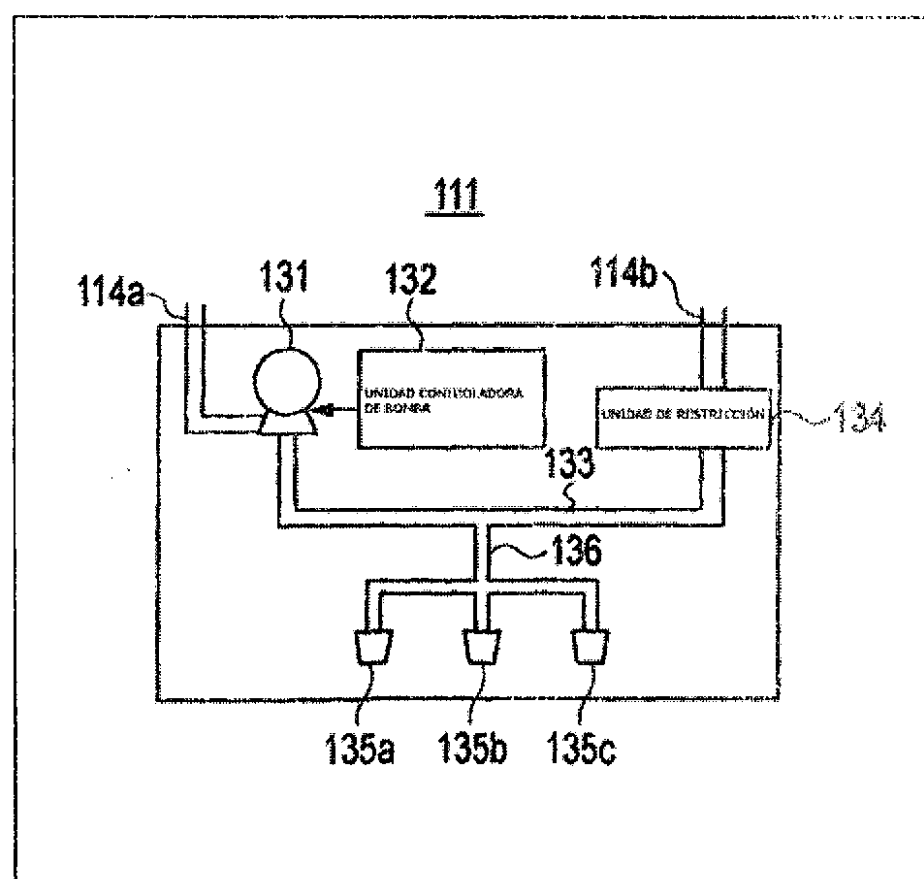
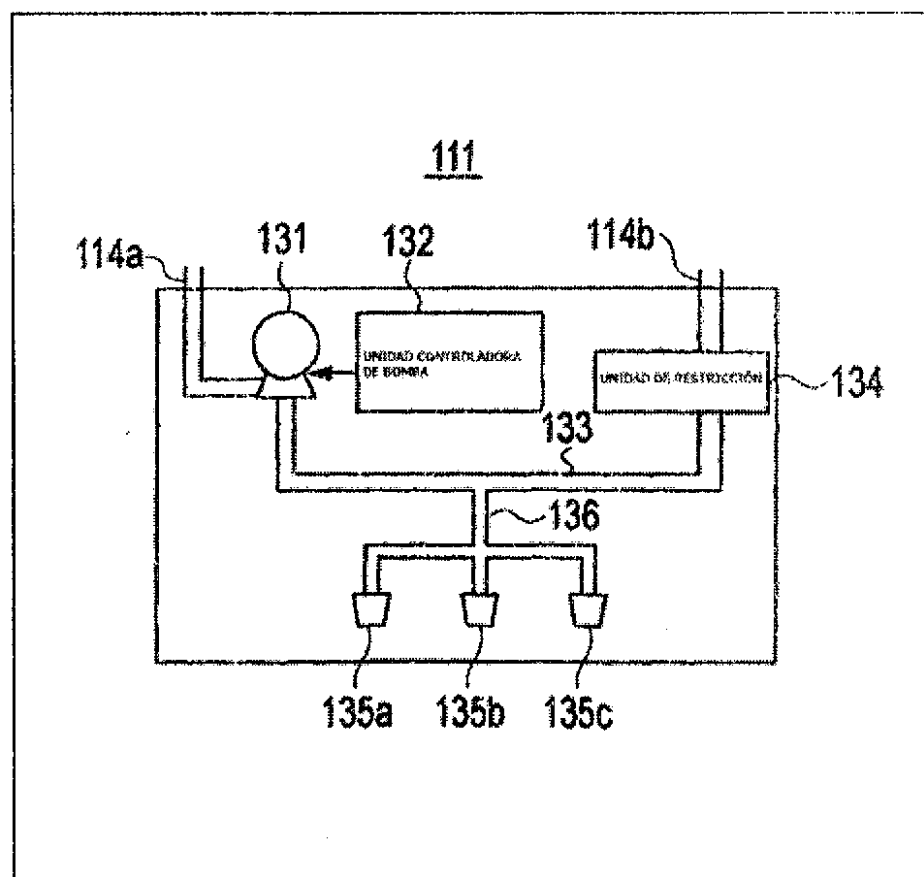


FIG. 5



ARTES 12 X 12





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PATENTE DE INVENCION ☐

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- ☐ Dibujos de ser estos pertinentes
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