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TITULO APARATO Y MÉTODO DE APLICACIÓN

CLASIFICACION INTERNACIONAL _____

SOLICITANTE UNICHARM CORPORATION

DOMICILIO Japón

APODERADO DARIO CARDENAS NAVAS

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SOLICITUD DE:

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Patente de Invención

☐

Patente de Modelo de Utilidad

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Capítulo I

☐

Capítulo II

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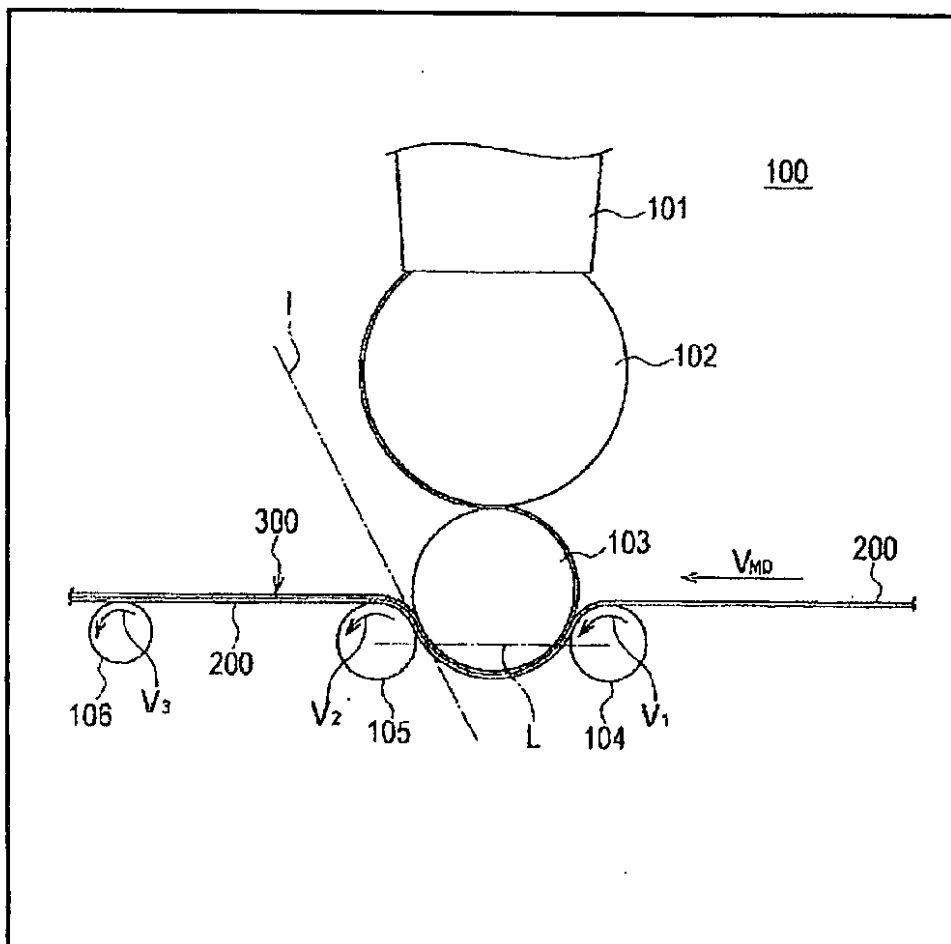
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10 ANEXOS

- ☒ Comprobante de pago de la tasa de presentación de la solicitud.
- ☒ Documento que acredite 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=3AC5F21C522E147EB173BA24EBA49E34.wap.p2?docId=WO2010101284&recNum=1&tab=PCTDocuments&maxRec=&office=&prevFilter=&sortOption=&queryString=>
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11 FIGURA CARATTERISTICA



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SON: **QUINIENTOS SETENTA Y UN MIL PESOS MON'

Responsable: _____

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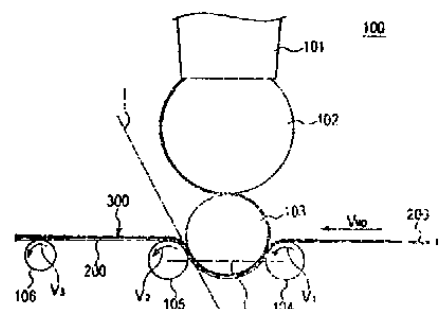
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(54) Título **APARATO Y MÉTODO DE APLICACIÓN**

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(54) Título: **APARATO Y MÉTODO DE APLICACIÓN**

(57) Resumen:
Una trama (200) pasa por un segundo rodillo de compresión (105) mientras es sostenida entre un rodillo de aplicación (103) y el segundo rodillo de compresión (105) es transportado de modo que la trama (200) se incline hacia el segundo rodillo de compresión (105) desde una línea tangente (l) en un punto de contacto entre el rodillo de aplicación (103) y el segundo rodillo de compresión (105). La velocidad de rotación (V1) de un primer rodillo de compresión (104) es igual a la velocidad de transporte (VMD) de la trama (200). La velocidad de rotación (V2) del segundo rodillo de compresión (105) es igual a la velocidad de transporte (VMD) de la trama (200). La velocidad de rotación (V3) del rodillo de alimentación (106) es mayor que la velocidad de transporte (VMD) de la trama (200).

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(31) No. Prioridad	(74) Apoderado: DARIO CARDENAS NAVAS
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(54) Título: APARATO Y MÉTODO DE APLICACIÓN	

Resumen:

Una trama (200) pasa por un segundo rodillo de compresión (105) mientras es sostenida entre un rodillo de aplicación (103) y el segundo rodillo de compresión (105) es transportado de modo que la trama (200) se incline hacia el segundo rodillo de compresión (105) desde una línea tangente (I) en un punto de contacto entre el rodillo de aplicación (103) y el segundo rodillo de compresión (105). La velocidad de rotación (V_1) de un primer rodillo de compresión (104) es igual a la velocidad de transporte (V_{MD}) de la trama (200). La velocidad de rotación (V_2) del segundo rodillo de compresión (105) es igual a la velocidad de transporte (V_{MD}) de la trama (200). La velocidad de rotación (V_3) del rodillo de alimentación (106) es mayor que la velocidad de transporte (V_{MD}) de la trama (200).

ESPAÑOL
DESCRIPCIÓN

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APARATO Y MÉTODO DE APLICACIÓN

Campo técnico

La presente revelación se refiere a un aparato y método de aplicación que aplican un líquido o material licuado o fluido, como un agente adhesivo o un pigmento, a una trama continua.

Antecedentes de la invención

Un artículo absorbente como un pañal descartable tipo bombachita fundamentalmente incluye una lámina superior permeable a los líquidos, una lámina inferior, y un absorbente.

La lámina superior está adaptada para ponerse en contacto con la piel del usuario del artículo absorbente. La lámina inferior está provista fuera de la lámina superior. El absorbente se provee entre la lámina superior y la lámina inferior para absorber la excreción del usuario.

La lámina superior, la lámina inferior, y el absorbente se unen entre si con un agente adhesivo. Algunos pañales descartables para infantes incluyen varios patrones que son impresos sobre una superficie interna o externa de la lámina inferior.

Se conoce un aparato de aplicación en el cual un material, como un agente adhesivo o un pigmento fusionado por calor, es transferido sobre un rodillo de transferencia a través de un recubridor de rodillo, y luego el material transferido al rodillo de transferencia es transferido a una trama como una trama no tejida (consultar, por ejemplo, el Documento Patentario 1).

Los inventores han descubierto que una lámina impermeable a los líquidos como una lámina inferior puede deformarse o romperse por el calor del material fusionado por calor dado que la lámina posee termo-plasticidad.

Por otra parte, bajo ciertas condiciones de

viscosidad del adhesivo (o pigmento en fusión), la resistencia de la lámina, o la velocidad de transporte de la lámina, el material a ser transferido a la lámina puede permanecer pegado a un rodillo, y así la lámina queda enredada con el rodillo. Como resultado de ello, se obtienen productos defectuosos.

Lista de citas

Documentos Patentarios

[Documento Patentario 1] Publicación de Solicitud de Patente Japonesa Número 2001-157691 (p. 3, la Figura 4)

Resumen

En un primer aspecto de la presente invención, un aparato de aplicación para aplicar un material de aplicación a una trama continua transportada en una dirección de transporte, comprende: un rodillo de aplicación configurado para recibir el material y aplicar el material recibido a la trama; y rodillos de compresión provistos sobre una cara opuesta de la trama al rodillo de aplicación y configurados para comprimir la trama contra el rodillo de aplicación. Los rodillos de compresión incluyen un primer rodillo de compresión provisto caudal arriba y un segundo rodillo de compresión provisto caudal abajo respecto del rodillo de aplicación en la dirección de transporte de la trama.

En un segundo aspecto de la presente invención, un método de aplicación de un material a una trama continua transportada en una dirección de transporte, comprende: recibir el material en un rodillo de aplicación; y aplicar el material recibido desde el rodillo de aplicación sobre la trama, mientras se presiona la trama contra el rodillo de aplicación a través de los rodillos de compresión provistos sobre una cara opuesta de la trama al rodillo de

aplicación. Los rodillos de compresión incluyen un primer rodillo de compresión provisto caudal arriba y un segundo rodillo de compresión provisto caudal abajo respecto del rodillo de aplicación en la dirección de transporte de la trama.

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 que ilustra un método de fabricación de un artículo absorbente de acuerdo a una o más realizaciones.

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

La Figura 4 es una vista lateral del aparato de aplicación de la Figura 3 vista a lo largo de un eje de rotación de un primer rodillo de compresión del aparato.

La Figura 5 es un diagrama en bloque del aparato de aplicación.

Descripción detallada

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

Adviértase que, en la siguiente descripción de los dibujos, las mismas o similares referencias denotan los mismos o similares 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 término, se describirá la estructura de un artículo absorbente 1 de acuerdo a una o más realizaciones con referencia a la Figura 1 que es una vista parcialmente recortada en perspectiva que muestra el artículo absorbente 1. En la realización particularmente preferida, el artículo absorbente 1 es un pañal descartable tipo bombacha para adultos.

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

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

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

El absorbente 4 se provee entre la lámina superior 2 y la lámina posterior 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 polímeros superabsorbentes, o similares.

La lámina impermeable 5 está provista entre la lámina posterior 3 y el absorbente 4, y no permite el paso de la excreción del usuario.

El artículo absorbente 1 descrito 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 rodean las piernas 40 se forman respectivamente a los lados de la porción de entrepierna 30, y las piernas del usuario se introducen por tales aberturas que rodean las piernas 40.

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

Un frunce de cintura 6A hecho de filamentos de goma o similares 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 así resultar estirables en una dirección transversal que cruza 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 constituidas por láminas con capacidad de estiramiento para que resulten estirables en la dirección transversal.

La porción de entrepierna 30 está provista entre la porción de línea de cintura anterior 10 y la porción de línea de cintura posterior 20.

Los frunces de pierna 6B hechos de filamentos de goma o similares con capacidad de estiramiento se proveen respectivamente a los lados 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 estirable en la dirección anterior a posterior del artículo absorbente 1, o puede en si misma estar constituida por una

lámina que posea capacidad de estiramiento para así ser estirable en la dirección anterior a posterior del artículo absorbente 1.

A continuación, se describirá un método de fabricación de un artículo absorbente 1 de acuerdo a una o más realizaciones con referencia a la Figura 2 que es una vista ejemplificativa que explica la 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 un paso de formación de una línea de cintura S1, un paso de transferencia del absorbente S2, un paso de formación de las aberturas que rodean las piernas S3, un paso de plegado S4, un paso de empalme S5, y un paso de corte S6.

En el paso de formación de una 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) transportadas son estirables en una dirección transversal CD (a lo ancho) ortogonal a una dirección de transporte MD (Dirección de la Máquina) de la trama 7.

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

En el paso de transferencia del 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 del paso de formación de una línea de cintura S1.

Adviértase que, el elemento de porción de entrepierna 30A está constituido por la lámina posterior 3 y el absorbente 4.

En el paso de formación de las aberturas que rodean las piernas S3, las aberturas que rodean las piernas 40 (denominadas orificios para las piernas) se forman cortando la trama 7 (las tramas 7A y 7B) luego del paso de transferencia del absorbente S2.

Adviértase que, las aberturas que rodean las piernas 40 no necesariamente se forman cortando solamente la trama 7 (las tramas 7A y 7B), sino que alternativamente puede formarse cortando la lámina posterior 3 que conforma el elemento de porción de entrepierna 30A junto con la trama 7A y la trama 7B.

En este caso, el paso de transferencia del absorbente S2 y el paso de formación de las aberturas que rodean las piernas S3 pueden ejecutarse en el orden inverso.

En el paso de plegado S4, la trama 7 se pliega a la mitad a lo largo de 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 del paso de formación de las aberturas que rodean 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 coincide necesariamente con la línea central CL, y puede desplazarse de la línea central CL hacia el borde lateral 10A o hacia el borde lateral 20A.

En el paso de empalme S5, las partes plegadas de la trama 7 se unen en las regiones de empalme 50A para ser procesadas en las porciones de empalme 50 del artículo

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absorbente 1 mediante un tratamiento ultrasónico o un tratamiento por calor, luego del paso de plegado S4.

Adviértase que las regiones de empalme 50A respectivamente indican las 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 el paso de corte S6, la trama 7 en la cual se han unido las regiones de empalme 50A se corta a lo largo de la línea imaginaria SL luego del paso de empalme S5. Como resultado de ello, se obtiene el artículo absorbente 1.

En el paso de formación de una línea de cintura S1, la trama 7A y la trama 7B se superponen entre si, 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 si con adhesivo o similar.

Además, en el paso de transferencia del absorbente S2, el elemento de porción de entrepierna 30A transferido sobre la trama 7 (la trama constituida por las tramas superpuestas 7B y 7A) con las aberturas que rodean las piernas 40 formadas en el mismo se une a la trama 7 con adhesivo o similar.

El elemento de entrepierna 30A incluye la lámina inferior 3 y el absorbente 4. A pesar que no se ilustra en la Figura 2, la lámina impermeable 5 se provee entre la lámina inferior 3 y el absorbente 4. La lámina inferior 3 y el absorbente 4 están unidos entre si con un adhesivo o similar. De manera similar, el absorbente 4 y la lámina impermeable 5 se unen entre si con un adhesivo o similar.

Adviértase que algunos productos incluyen la lámina impermeable 5 que posee patrones como caracteres sobre una superficie interna y similar de la lámina impermeable 5. En tales productos, un pigmento para el dibujo de los patrones a menudo constituye el adhesivo a la vez.

Un aparato de aplicación 100, descripto a continuación, que aplica materiales, como un agente adhesivo o un pigmento puede ser usado en el paso de formación de una línea de cintura S1, el paso de transferencia del absorbente S2, y en un paso de formación de la trama 7B con múltiples láminas dispuestas una sobre la otra y similares en la Figura 2.

La Figura 3 es una vista en perspectiva de un aparato de aplicación 100 de acuerdo a una o más realizaciones. El aparato de aplicación 100 incluye un rodillo de transferencia 102, un rodillo de aplicación 103, un primer rodillo de compresión 104, un segundo rodillo de compresión 105 y un rodillo de alimentación 106 (ver la Figura 4).

El rodillo de transferencia 102 está configurado para recibir un material de un depósito 101 en el cual se almacena el material. El material es transferido a la superficie del rodillo de transferencia 102 desde el almacenamiento 101. El rodillo de transferencia 102 es adyacente al rodillo de aplicación 103 y está configurado para transferir el material recibido al rodillo de aplicación 103.

El rodillo de transferencia 102, por ejemplo, es un aplicador de fotograbado sobre el cual se forma una superficie cóncava-convexa.

El rodillo de aplicación 103 es adyacente al rodillo de transferencia 102. El rodillo de aplicación 103 está configurado para recibir el material del rodillo de transferencia 102.

El rodillo de aplicación 103 posee un mecanismo de enfriamiento que ejecuta el control de modo que la temperatura del material sea menor que aquella al momento que el rodillo de transferencia 102 recibe el material de la unidad de almacenamiento 101.

Luego, el rodillo de aplicación 103 está configurado

para aplicar el material recibido a la trama 200. La trama 200 es equivalente a, por ejemplo, la lámina que constituye el elemento de entrepierna 30A o la trama 7B.

El primer rodillo de compresión 104 y el segundo rodillo de compresión 105 están provistos sobre la cara opuesta de la trama 200 al rodillo de aplicación 103. El primer rodillo de compresión 104 se dispone sobre la cara superior mientras el segundo rodillo de compresión 105 se dispone sobre la cara inferior del rodillo de aplicación 103 en la dirección de transporte de la trama 200.

El primer rodillo de compresión 104 y el segundo rodillo de compresión 105 están configurados para presionar la trama 200 contra el rodillo de aplicación 103.

El segundo rodillo de compresión 105 está provisto por debajo del primer rodillo de compresión 104 en la dirección de transporte MD de la trama 200.

El rodillo de alimentación 106 está provisto por debajo del segundo rodillo de compresión 105 en la dirección de transporte MD de la trama 200.

En el aparato de aplicación 100 antes descrito, el primer rodillo de compresión 104 y el segundo rodillo de compresión 105 están configurados para comprimir la trama 200 contra el rodillo de aplicación 103.

La trama 200 es transportada en la dirección de transporte MD cuando la trama se devana sobre una porción de la circunferencia externa del rodillo de aplicación 103.

A pesar que la trama 200 se devana sobre una porción del rodillo de aplicación 103, el material es transferido del rodillo de aplicación 103 a la trama 200. Así, se forma una región aplicada 300 donde el material se aplica a la trama sobre la superficie de la trama 20.

La Figura 4 es una vista lateral a lo largo de la dirección del eje de rotación del primer rodillo de compresión 104 y el segundo rodillo de compresión 105.

Según se ilustra en la Figura 4, una línea tangente en un punto de contacto entre el rodillo de aplicación 103 y el segundo rodillo de compresión 105 es "1".

El aparato de aplicación 100 está configurado para transportar la trama 200 de modo que la trama 200 se incline hacia el segundo rodillo de compresión 105 desde la línea tangente 1, la trama 200 pasa por el segundo rodillo de compresión 105 mientras es sostenida entre el rodillo de aplicación 103 y el segundo rodillo de compresión 105.

En otras palabras, la dirección de transporte MD de la trama 200 luego que el material se aplica no se superpone con la línea tangente 1.

Además, según se ilustra en la Figura 4, una línea imaginaria L que conecta el eje de rotación del primer rodillo de compresión 104 y el eje de rotación del segundo rodillo de compresión 105 cruza la línea circunferencial externa del rodillo de aplicación 103.

En la Figura 4, la velocidad de rotación V_1 del primer rodillo de compresión 104 es igual a una velocidad de transporte V_{MD} de la trama 200 por arriba del primer rodillo de compresión 104.

La velocidad de rotación V_2 del segundo rodillo de compresión 105 es igual a la velocidad de transporte V_{MD} de la trama 200.

La velocidad de rotación V_3 del rodillo de alimentación 106 es mayor que la velocidad de transporte V_{MD} de la trama 200.

A pesar que no se ilustra en la Figura 4, un rodillo de transmisión que impulsa la trama 200 a la velocidad V_{MD} se provee por debajo del rodillo de alimentación 106.

La Figura 5 es a diagrama en bloque del aparato de aplicación 100.

El aparato de aplicación 100 incluye una unidad enfriadora 121 configurada para enfriar el rodillo de

aplicación 103, y una unidad controladora de temperatura 122 configurada para controlar la temperatura de la unidad enfriadora 121.

Por otra parte, el aparato de aplicación 100 incluye una unidad controladora de la velocidad de rotación 123 configurada para detectar la velocidad de transporte V_{MD} y ejecutar el control de modo que la velocidad de rotación V_3 del rodillo de alimentación 106 sea mayor que la velocidad de transporte V_{MD} de la trama 200.

De acuerdo a la configuración precedente, el rodillo de aplicación 103 está configurado para fijar la temperatura del material por debajo de aquella al momento de recibir el rodillo de transferencia 102 el material de la unidad de almacenamiento 101.

El rodillo de aplicación 103 está configurado para aplicar el material a la menor temperatura a la trama 200.

En otras palabras, en la realización, la unidad enfriadora 121 y la unidad controladora de temperatura 122 constituyen un mecanismo de enfriamiento.

En la realización, el punto de fusión del material es de aproximadamente 40°C. La aplicación tiene viscosidad a los fines del recubrimiento a una temperatura que oscila entre 65 y 150°C. La temperatura del mecanismo de enfriamiento es mayor que el punto de fusión, y es por lo menos 5°C menor que la temperatura de aplicación.

Según se ha descripto, dado que la trama 200 es presionada por el primer rodillo de compresión 104 y el segundo rodillo de compresión 105 contra el rodillo de aplicación 103, la trama 200 puede recibir el material del rodillo de aplicación 103 con firmeza.

Asimismo, el aparato de aplicación 100 de acuerdo a una o más realizaciones transporta la trama 200 de manera que la trama 200 se incline hacia el segundo rodillo de compresión 105 desde la línea tangente 1 en el punto de

contacto entre el rodillo de aplicación 103 y el segundo rodillo de compresión 105, la trama 200 pasa por el segundo rodillo de compresión 105 mientras es sostenida entre el rodillo de aplicación 103 y el segundo rodillo de compresión 105.

Esto permite que la trama 200 reciba con seguridad el material del rodillo de aplicación 103, e impide que la trama 200 luego de la aplicación del material se pegue al rodillo de aplicación 103 y se devane sobre el rodillo de aplicación 103.

Además, la línea imaginaria L que conecta el eje de rotación del primer rodillo de compresión 104 y el eje de rotación del segundo rodillo de compresión 105 cruza la línea circunferencial externa del rodillo de aplicación 103.

Así, la trama 200 se comprime con firmeza contra una porción de la circunferencia del rodillo de aplicación 103, de modo que la trama 200 pueda recibir con seguridad el material del rodillo de aplicación 103.

En el aparato de aplicación 100, dado que la velocidad de rotación V_3 del rodillo de alimentación 106 es controlada de modo que sea más alta que la velocidad de transporte V_{MD} de la trama 200, la trama 200 se estira en la dirección de transporte. En consecuencia, la trama 200 puede desprenderse adecuadamente del rodillo de aplicación 103, sin pegarse al rodillo de aplicación 103 ni devanarse sobre el rodillo de aplicación 103.

Además, el aparato de aplicación 100 incluye el mecanismo de enfriamiento. El mecanismo de enfriamiento ajusta la temperatura del material, mientras mantiene su liquidez, de modo que el material sea aplicable a la trama 200 a la temperatura ajustada.

En consecuencia, es posible impedir que la trama 200 se deforme o rompa por el calor del material. Así, es posible evitar la producción de artículos defectuosos

cuando el material es aplicado a alta temperatura, con lo cual es posible aumentar el rendimiento de producción.

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

Por ejemplo, es posible concebir las siguientes realizaciones adicionales.

Específicamente, resultan aplicables una o más realizaciones cuando se aplica un material distinto de un adhesivo o un pigmento mediante el aparato de aplicación.

El material puede ser una tinta para patrones de impresión como caracteres decorativos sobre prendas, o un indicador que cambie de color y/u otras propiedades visuales con el fin de indicar cuando el artículo (por ejemplo, un pañal) debe ser reemplazado.

Además, una o más realizaciones son aplicables no solamente a la etapa de pegado de las láminas entre so o al pegado de una lámina con un absorbente, sino además a un paso de aplicación de fármacos, lociones, o similares a una superficie de contacto con la piel de por lo menos una porción de la prenda, por ejemplo, un elemento de entrepierna 30A.

Además, el método de fabricación de artículos absorbentes no se limita a la fabricación de pañales descartables, sino que puede ser aplicado a la fabricación de, por ejemplo, toallas higiénicas, protectores femeninos, u otros artículos además de artículos absorbentes.

En la descripción precedente, un mecanismo de enfriamiento por ejemplo, la unidad enfriadora 121, enfría

el rodillo de aplicación 103.

Sin embargo, el mecanismo de enfriamiento puede estar provisto en el primer rodillo de compresión 104 y/o el segundo rodillo de compresión 105.

Alternativamente, el mecanismo de enfriamiento puede estar provisto en cualquiera o todos los siguientes: rodillo de aplicación 103, primer rodillo de compresión 104, y segundo rodillo de compresión 105.

En este caso, la temperatura del material puede reducirse con mayor efectividad que en el caso en el cual el mecanismo de enfriamiento solamente enfría el rodillo de aplicación 103.

En consecuencia, la temperatura del material puede ser ajustada a una temperatura a la cual el material es aplicable a la trama 200. En consecuencia, la trama 200 no se deforma ni se rompe por el calor del material.

Según se ha descrito, la presente invención naturalmente incluye varias realizaciones que no están descritas. 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.

Que incorporada por completo como referencia la Solicitud de Patente Japonesa 2009-048651 (presentada en 2 de Marzo de 2009).

Aplicabilidad industrial

En consecuencia, de acuerdo a la presente invención, es posible proveer un aparato de aplicación capaz de evitar la fabricación de artículos defectuosos cuando se aplica un material líquido como un adhesivo o un pigmento a una trama continua, con lo cual se impide que disminuya el rendimiento de producción.

[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
- 30 porción de entrepierna
- 40 aberturas que circundan las piernas
- 50 porciones de empalme
- 60 aberturas de cintura
- 100 dispositivo de aplicación
- 101 depósito
- 102 rodillo de transferencia
- 103 rodillo de aplicación
- 104 primer rodillo de compresión
- 105 segundo rodillo de compresión
- 106 rodillo de alimentación
- 121 enfriador
- 122 controlador de temperatura
- 123 controlador de velocidad de rotación
- 200 trama
- 300 región aplicada

ESPAÑOL
REIMPRESIONES

Reivindicaciones

1. Un aparato de aplicación configurado para aplicar un material de aplicación a una trama continua transportada, caracterizado porque comprende:

un rodillo de transferencia configurado para recibir el material de aplicación de una unidad de almacenamiento configurada para almacenar el material de aplicación;

un rodillo de aplicación adyacente al rodillo de transferencia y configurado para recibir el material de aplicación del rodillo de transferencia y aplicar el material de aplicación recibido a la trama; y

rodillos de compresión provistos sobre una cara opuesta de la trama al rodillo de aplicación y configurados para presionar la trama al rodillo de aplicación, en tanto

los rodillos de compresión incluyen un primer rodillo de compresión y un segundo rodillo de compresión que se provee por debajo del primer rodillo de compresión en una dirección de transporte de la trama, y

en una vista en planta desde cierta dirección del eje de rotación del primer rodillo de compresión y el segundo rodillo, la trama pasa por el segundo rodillo de compresión mientras es sostenida entre el rodillo de aplicación y el segundo rodillo de compresión es transportado de modo que la trama se incline hacia el segundo rodillo de compresión desde una línea tangente en un punto de contacto entre el rodillo de aplicación y el segundo rodillo de compresión.

2. El aparato de aplicación de acuerdo a la Reivindicación 1, caracterizado porque, en la vista en planta desde la dirección del eje de rotación del primer rodillo de compresión y el segundo rodillo de compresión, una línea imaginaria entre un eje de rotación del primer rodillo de compresión y un eje de rotación del segundo rodillo de compresión cruza una línea circunferencial externa del

rodillo de aplicación.

3. El aparato de aplicación de acuerdo a la Reivindicación 1, caracterizado porque comprende además un rodillo de alimentación provisto por debajo del segundo rodillo de compresión en la dirección de transporte de la trama, en tanto

la velocidad de rotación del rodillo de alimentación es mayor que la velocidad de transporte de la trama.

4. El aparato de aplicación de acuerdo a la Reivindicación 1, caracterizado porque el rodillo de aplicación incluye un mecanismo de enfriamiento configurado para fijar la temperatura del material de aplicación por debajo de aquella al momento de recibir el rodillo de transferencia el material de aplicación del depósito.

Buenos Aires, marzo de 2010

p.p. UNICHARM CORPORATION

Resumen de la invención

Una trama (200) pasa por un segundo rodillo de compresión (105) mientras es sostenida entre un rodillo de aplicación (103) y el segundo rodillo de compresión (105) es transportado de modo que la trama (200) se incline hacia el segundo rodillo de compresión (105) desde una línea tangente (1) en un punto de contacto entre el rodillo de aplicación (103) y el segundo rodillo de compresión (105). La velocidad de rotación (V_1) de un primer rodillo de compresión (104) es igual a la velocidad de transporte (V_{MD}) de la trama (200). La velocidad de rotación (V_2) del segundo rodillo de compresión (105) es igual a la velocidad de transporte (V_{MD}) de la trama (200). La velocidad de rotación (V_3) del rodillo de alimentación (106) es mayor que la velocidad de transporte (V_{MD}) de la trama (200).

FIG. 1

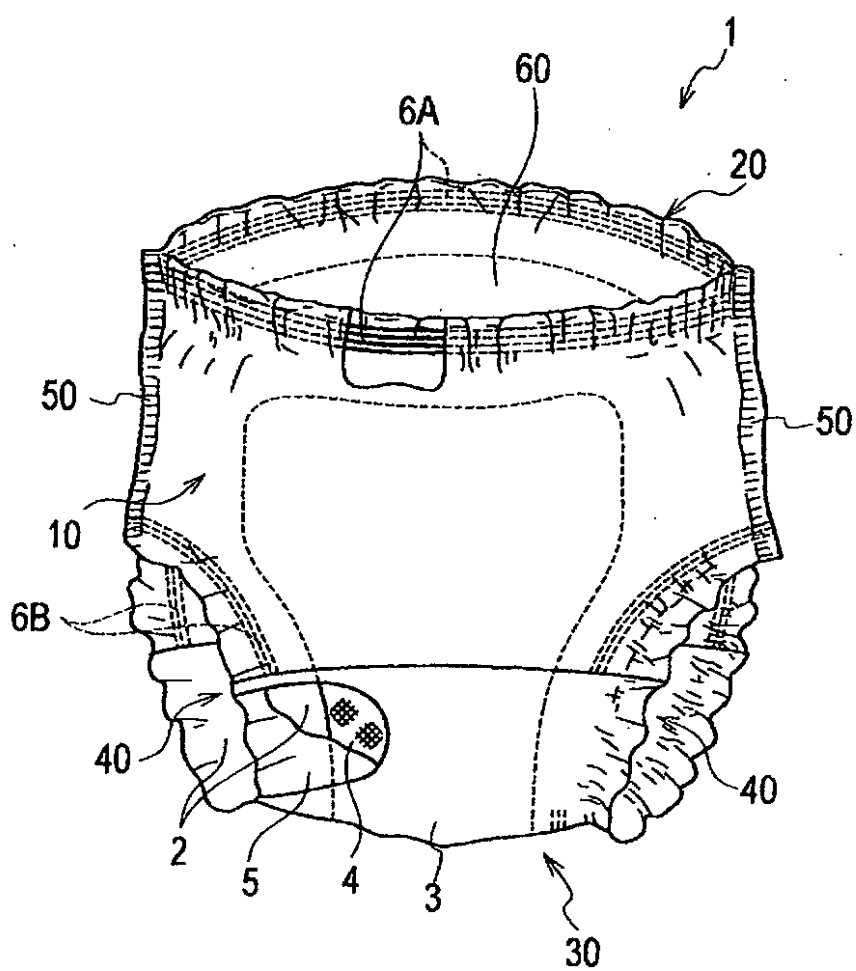


FIG. 2

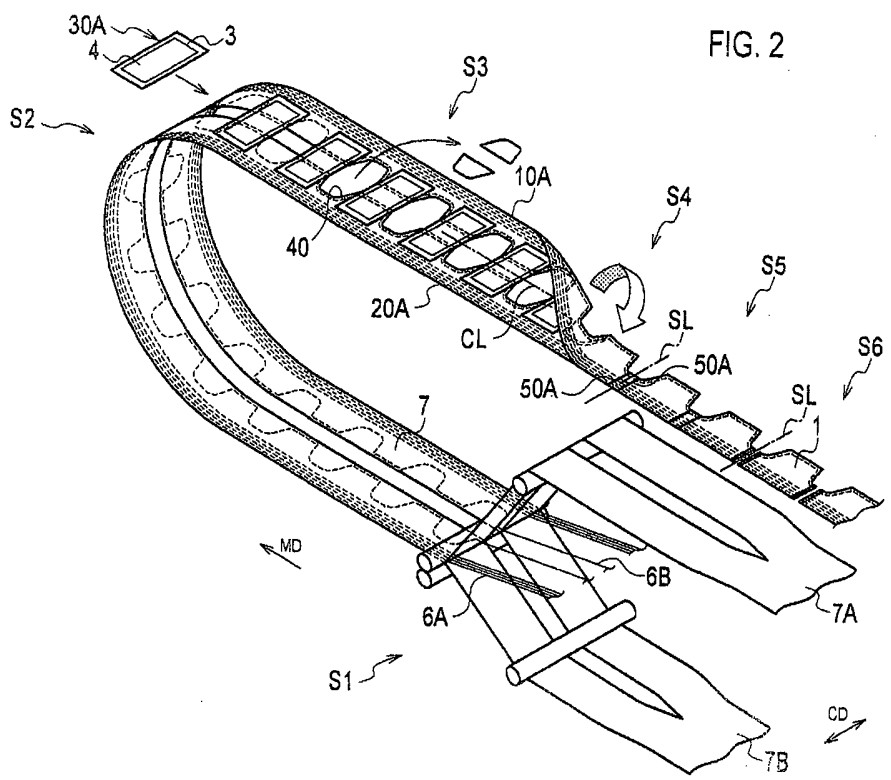


FIG. 3

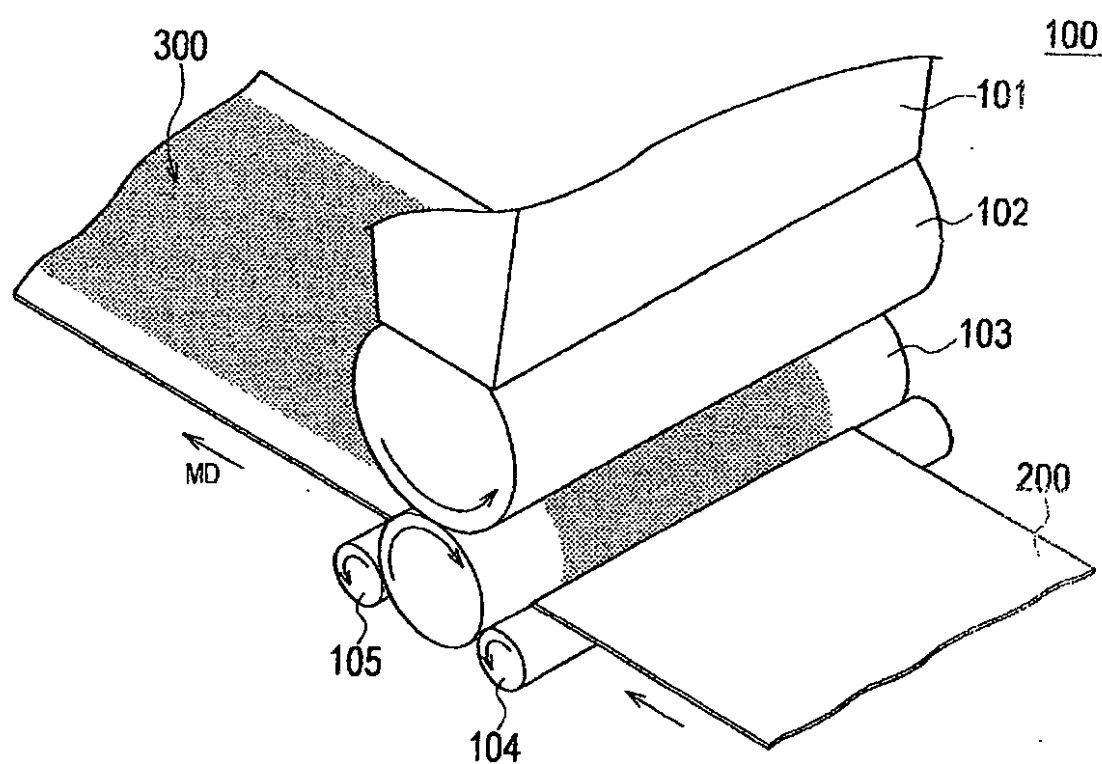
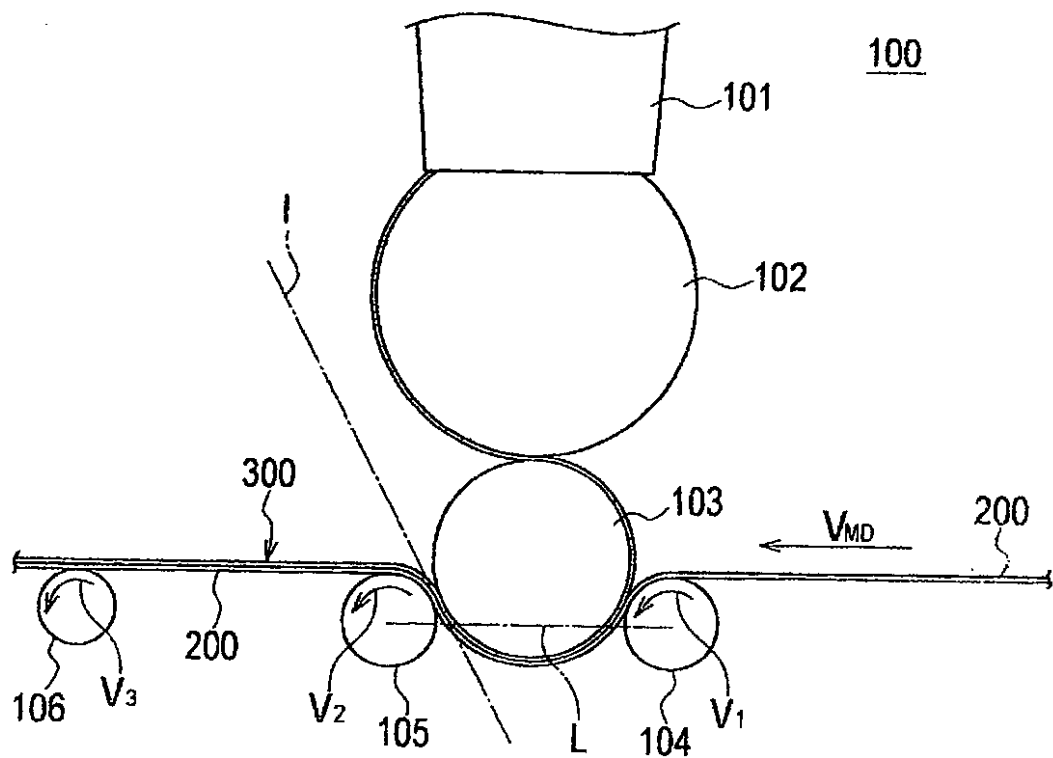
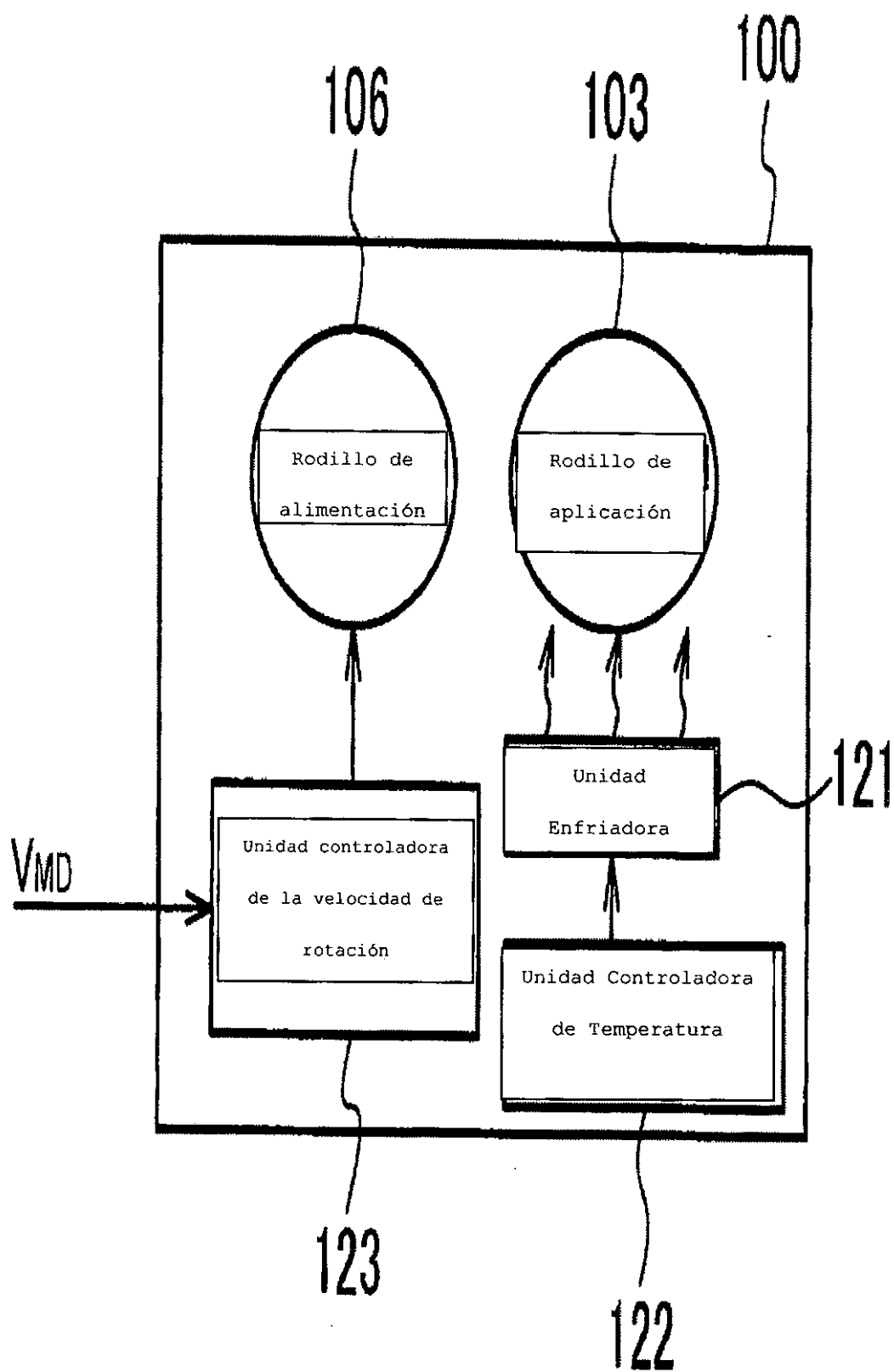


FIG. 4





DESCRIPTIONTitle of Invention

APPLICATION APPARATUS AND METHOD

5

Technical Field

The present disclosure relates to an application apparatus and an application method which apply a liquid or liquefied or fluidic material, such as an adhesive agent or a pigment, to a continuous web.

10

Background Art

An absorbent article such as a disposable pants-type diaper mainly includes a liquid-permeable top sheet, a bottom sheet, and an absorber.

15

The top sheet is adapted to come into contact with the skin of a wearer of the absorbent article. The bottom sheet is provided outside the top sheet. The absorber is provided between the top sheet and the bottom sheet for absorbing excretion from the wearer.

20

The top sheet, the bottom sheet, and the absorber are bonded with each other with an adhesive agent. Some disposable diapers for infants include various patterns which are printed on an inner or outer surface of the bottom sheet.

25

There is a known application apparatus in which a material, such as an adhesive agent or a pigment melt by heat, is transferred onto a transfer roll through a roll coater, and then the material transferred to the transfer roll is transferred to a web such as a nonwoven fabric (see, for example, Patent Literature 1).

30

The inventors have discovered that a liquid-impermeable sheet such as a bottom sheet may be deformed or

broken by the heat of the material melt by heat because the sheet has thermo-plasticity.

Moreover, under certain conditions of viscosity of the adhesive (or melt pigment), strength of the sheet, or a conveyance speed of the web, the material to be transferred to the sheet may remain sticking to a roll, and thus the sheet becomes entangled with the roll. As a result, defective products are produced.

10 Citation List

Patent Literature

~~{Patent Literature~~PTL 1}: Japanese Patent Application Publication No. 2001-157691 (p. 3, Fig. 4)

15

Summary

In a first aspect of the present invention, an application apparatus for applying a material to a continuous web being conveyed in a conveyance direction, comprises: an application roll configured to receive the material and apply the received material to the web; and press rolls provided on an opposite side of the web to the application roll and configured to press the web against the application roll. The press rolls include a first press roll which is provided on an upstream side and a second press roll which is provided on a downstream side of the application roll in the conveyance direction of the web.

In a second aspect of the present invention, an application method of applying a material to a continuous web being conveyed in a conveyance direction, comprises: receiving the material on an application roll; and applying the received material from the application roll onto the web, while pressing the web against the application roll by

press rolls provided on an opposite side of the web to the application roll. The press rolls include a first press roll which is provided on an upstream side and a second press roll which is provided on a downstream side of the application roll in the conveyance direction of the web.

Brief Description of ~~THE~~ Drawings

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

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

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

[Fig. 4] Fig. 4 is a side view of the application apparatus of FIG. 3 as seen along a rotation axis of a first press roll of the apparatus.

20 [Fig. 5] Fig. 5 is a block diagram of the application apparatus.

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 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 and are not to scale unless otherwise 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 to one or more embodiments will be described with reference to Fig. 1 which is a partially cut-away 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 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 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 respectively at sides of the crotch portion 30, and the legs of the wearer are to be inserted through the leg-surrounding openings 40.

5 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 stretchability is provided in the peripheral edges of
10 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
15 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 in the cross direction.

 The crotch portion 30 is provided between the front
20 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
25 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.

30 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 opening 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 opening 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 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 opening forming step S3 may be performed in the reverse order.

5 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 opening forming step S3.

10 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.

15 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.

20 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.

25 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.

30 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 openings 40 formed therein is joined to the web 7 with adhesive or the like.

5 The crotch member 30A includes the bottom sheet 3 and the absorber 4. Although not illustrated in Fig. 2, the waterproof sheet 5 is provided between the bottom sheet 3 and the absorber 4. The bottom sheet 3 and the absorber 4 are bonded with each other with an adhesive or the like.
10 Similarly, the absorber 4 and the waterproof sheet 5 are jointed with each other with an adhesive or the like.

 Note that some products include the waterproof sheet 5 having patterns such as characters on an inner surface and the like of the waterproof sheet 5. In such products, a
15 pigment for drawing the patterns sometimes serves as an adhesive at the same time.

 An application apparatus 100, described below, which applies materials such as an adhesive agent or a pigment can be used in a waistline forming step S1, an absorber
20 transferring step S2, and a step of forming a web 7B by disposing a plurality of sheets and the like in Fig. 2.

 Fig. 3 is a perspective view of an application apparatus 100 according to one or more embodiments. The application apparatus 100 includes a handover roll 102, an
25 application roll 103, a first press roll 104, a second press roll 105 and a feed roll 106 (see Fig. 4).

 The handover roll 102 is configured to receive a material from a storage 101 in which the material is stored. The material is transferred to the surface of the handover
30 roll 102 from the storage 101. The handover roll 102 is provided adjacent to the application roll 103 and is configured to transfer the received material to the application roll 103.

The handover roll 102, for example, is a gravure coater on which concave-convex surface is formed.

The application roll 103 is provided adjacent to the handover roll 102. The application roll 103 is configured
5 to receive the material from the handover roll 102.

The application roll 103 has a cooling mechanism which performs control so that the temperature of the material should be lower than that at the time when the handover roll 102 receives the material from the storage unit 101.

10 Then, the application roll 103 is configured to apply the received material to the web 200. The web 200 is equivalent to, for example, the sheet constituting the crotch member 30A or the web 7B.

The first press roll 104 and the second press roll 105
15 are provided on the opposite side of the web 200 to the application roll 103. The first press roll 104 is positioned on the upstream side while the second press roll 105 is positioned on the downstream side of the application roll 103 in the conveyance direction of the web 200.

20 The first press roll 104 and the second press roll 105 are configured to press the web 200 against the application roll 103.

The second press roll 105 is provided downstream of the first press roll 104 in the conveyance direction MD of
25 the web 200.

The feed roll 106 is provided downstream of the second press roll 105 in the conveyance direction MD of the web 200.

In the above-described application apparatus 100, the
30 first press roll 104 and the second press roll 105 are configured to press the web 200 against the application roll 103.

The web 200 is conveyed in the conveyance direction MD

in the state where the web winds around one portion of the outer circumference of the application roll 103.

While the web 200 winds around the one portion of the application roll 103, the material is transferred from the application roll 103 to the web 200. Thus, an applied region 300 where the material is applied to the web is formed on the surface of the web 20.

Fig. 4 is a side view seen along the rotation axis direction of the first press roll 104 and the second press roll 105.

As shown in Fig. 4, a tangent line at a point of contact between the application roll 103 and the second press roll 105 is "l".

The application apparatus 100 is configured to convey the web 200 in such a manner that the web 200 is inclined toward the second press roll 105 from the tangent line l, the web 200 passing the second press roll 105 while being held between the application roll 103 and the second press roll 105.

In other words, the conveyance direction MD of the web 200 after the material is applied does not overlap with the tangent line l.

Additionally, as shown in Fig. 4, an imaginary line L connecting the rotation axis of the first press roll 104 and the rotation axis of the second press roll 105 intersects the outer circumferential line of the application roll 103.

In Fig. 4, a rotation speed V1 of the first press roll 104 is equal to a conveyance speed V_{MD} of the web 200 upstream of the first press roll 104.

A rotation speed V2 of the second press roll 105 is equal to the conveyance speed V_{MD} of the web 200.

A rotation speed V3 of the feed roll 106 is higher

than the conveyance velocity V_{MD} of the web 200.

Although it is not shown in Fig. 4, a driving roll which drives the web 200 at the speed V_{MD} is provided downstream of the feed roll 106.

5 Fig. 5 is a block diagram of the application apparatus 100.

The application apparatus 100 includes a cooler unit 121 configured to cool the application roll 103, and a temperature controller unit 122 configured to control a
10 temperature of the cooler unit 121.

Moreover, the application apparatus 100 includes a rotation speed controller unit 123 configured to detect the conveyance speed V_{MD} and to perform control so that the rotation speed V_3 of the feed roll 106 should be higher
15 than the conveyance speed V_{MD} of the web 200.

According to the above configuration, the application roll 103 is configured to set the temperature of the material lower than that at the time when the handover roll 102 receives the material from the storage unit 101.

20 The application roll 103 is configured to apply the material at the lowered temperature to the web 200.

In other words, in the embodiment, the cooler unit 121 and the temperature controller unit 122 constitute a cooling mechanism.

25 In the embodiment, a melting point of the material is approximately 40°C. The application has coatable viscosity in an application temperature from 65°C to 150°C. The temperature of the cooling mechanism is higher than the melting point, and is at least 5°C lower than the
30 application temperature.

As described above, since the web 200 is pressed by the first press roll 104 and the second press roll 105 against the application roll 103, the web 200 can receive

the material securely from the application roll 103.

Also, the application apparatus 100 according to one or more embodiments conveys the web 200 in such a manner that the web 200 is inclined toward the second press roll 105 from the tangent line 1 at the point of contact between the application roll 103 and the second press roll 105, the web 200 passing the second press roll 105 while being held between the application roll 103 and the second press roll 105.

This enables the web 200 to securely receive the material from the application roller 103, and prevents the web 200 after the application of the material from sticking to the application roll 103 and winding around the application roll 103.

In addition, the imaginary line L connecting between the rotation axis of the first press roll 104 and the rotation axis of the second press roll 105 intersects the outer circumferential line of the application roll 103.

Thus, the web 200 is securely pressed against one portion of the circumference of the application roll 103, so that the web 200 can securely receive the material from the application roll 103.

In the application apparatus 100, since the rotation speed V_3 of the feed roll 106 is controlled so as to be higher than the conveyance speed V_{MD} of the web 200, the web 200 is stretched in the conveyance direction. Accordingly, the web 200 can securely come off the application roll 103, without sticking to the application roll 103 and winding around the application roll 103. In addition, the application apparatus 100 includes the cooling mechanism. The cooling mechanism adjusts a temperature of the material, while maintaining its liquidity, such that the material is applicable to the web 200 at the adjusted temperature.

Accordingly, the web 200 can be prevented from being deformed or broken by the heat of the material. Thus, the defective products produced when the material is applied at high temperature can be prevented, so that a yield in
5 production can be increased.

As described above, the details of several embodiments of the present invention have been exemplarily disclosed. It should not be understood that the description and drawings which constitute part of this disclosure limit the
10 present invention. Based on this disclosure, those skilled in the art may easily come up with various alternative embodiments, examples and operation techniques.

For example, following additional embodiments can be envisaged.

15 Specifically, one or more embodiments are applicable to the case where a material other than an adhesive or a pigment is applied by the application apparatus.

The material may be an ink for printing patterns such as decorative characters on wearing articles, or an
20 indicator which changes color and/or other visual properties to indicate when the article (e.g., a diaper) needs to be exchanged.

In addition, one or more embodiments are applicable not only to a step of bonding sheets with each other or bonding
25 a sheet with an absorber, but also to a step of applying drugs, lotions, or the like to a skin-contactable surface of at least a portion of the wearing article, e.g., a crotch member 30A.

In addition, the method of manufacturing absorbent
30 articles is not limited to the manufacturing of disposable diapers, but may be used for manufacturing, for example, sanitary napkins, panty liners, or articles other than absorbent articles.

In the foregoing description, a cooling mechanism e.g., the cooler unit 121, cools the application roll 103.

However, the cooling mechanism may be provided in the first press roll 104 and/or the second press roll 105.

5 Alternatively, the cooling mechanism may be provided in any one or all of the application roll 103, the first press roll 104, and the second press roll 105.

In this case, the temperature of the material can be more effectively decreased than in the case where the
10 cooling mechanism only cools the application roll 103.

Accordingly, the temperature of the material can be adjusted to a temperature at which the material is applicable to the web 200. Consequently, the web 200 is prevented from being deformed or broken by the heat of the
15 material.

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
20 invention in the scope of claims regarded as appropriate based on the description.

The entire content of Japanese Patent Application 2009-048651 (filed on March 2, 2009) is incorporated herein by reference.

25

Industrial Applicability

Therefore, according to the present invention, it is possible to provide an application apparatus capable of preventing products from being defective when a liquid
30 material such as an adhesive or a pigment is applied to a continuous web, and whereby capable of preventing a yield in production from decreasing.

Reference ~~Sign~~Signs List

	1	absorbent article
	2	top surface sheet
	3	bottom surface sheet
5	4	absorber
	5	waterproof sheet
	6	gather
	6A	waist gather
	6B	leg gather
10	7A, 7B	web
	10	front waistline portion
	20	back waistline portion
	30	crotch portion
	40	leg-surrounding openings
15	50	joint portions
	60	waistline openings
	100	application device
	101	storage
	102	handover roll
20	103	application roll
	104	first press roll
	105	second press roll
	106	feed roll
	121	cooler
25	122	temperature controller
	123	rotation speed controller
	200	web
	300	applied region

CLAIMS| [Claim 1]

An application apparatus configured to apply an
5 application material to a continuous web being conveyed,
comprising:

a handover roll configured to receive the application
material from a storage unit configured to store the
application material;

10 an application roll provided adjacent to the handover
roll and configured to receive the application material
from the handover roll and apply the received application
material to the web; and

press rolls provided on an opposite side of the web to
15 the application roll and configured to press down the web
to the application roll, wherein

the press rolls include a first press roll and a
second press roll which is provided downstream of the first
press roll in a conveyance direction of the web, and

20 in a plan view seen from a rotation axis direction of
the first press roll and the second roll, the web passing
the second press roll while being held between the
application roll and the second press roll is conveyed in
such a manner that the web is inclined toward the second
25 press roll from a tangent line at a point of contact
between the application roll and the second press roll.

| [Claim 2]

The application apparatus according to claim 1,
30 wherein, in the plan view seen from the rotation axis
direction of the first press roll and the second press roll,
an imaginary line connecting between a rotation axis of the
first press roll and a rotation axis of the second press

roll intersects an outer circumferential line of the application roll.

[Claim 3]

5 The application apparatus according to claim 1, further comprising a feed roll provided downstream of the second press roll in the conveyance direction of the web, wherein

10 a rotation speed of the feed roll is higher than a conveyance speed of the web.

[Claim 4]

15 The application apparatus according to claim 1, wherein the application roll includes a cooling mechanism configured to set a temperature of the application material to be lower than that at the time when the handover roll receives the application material from the storage.

ABSTRACT

A web (200) passing a second press roll (105) while being held between an application roll (103) and the second press roll (105) is conveyed in such a manner that the web (200) is inclined toward the second press roll (105) from a tangent line (1) at a point of contact between the application roll (103) and the second press roll (105). A rotation speed (V_1) of a first press roll (104) is equal to a conveyance speed (V_{MD}) of the web (200). A rotation speed (V_2) of the second press roll (105) is equal to the conveyance speed (V_{MD}) of the web (200). A rotation speed (V_3) of a feed roll (106) is higher than the conveyance speed (V_{MD}) of the web (200).

FIG. 1

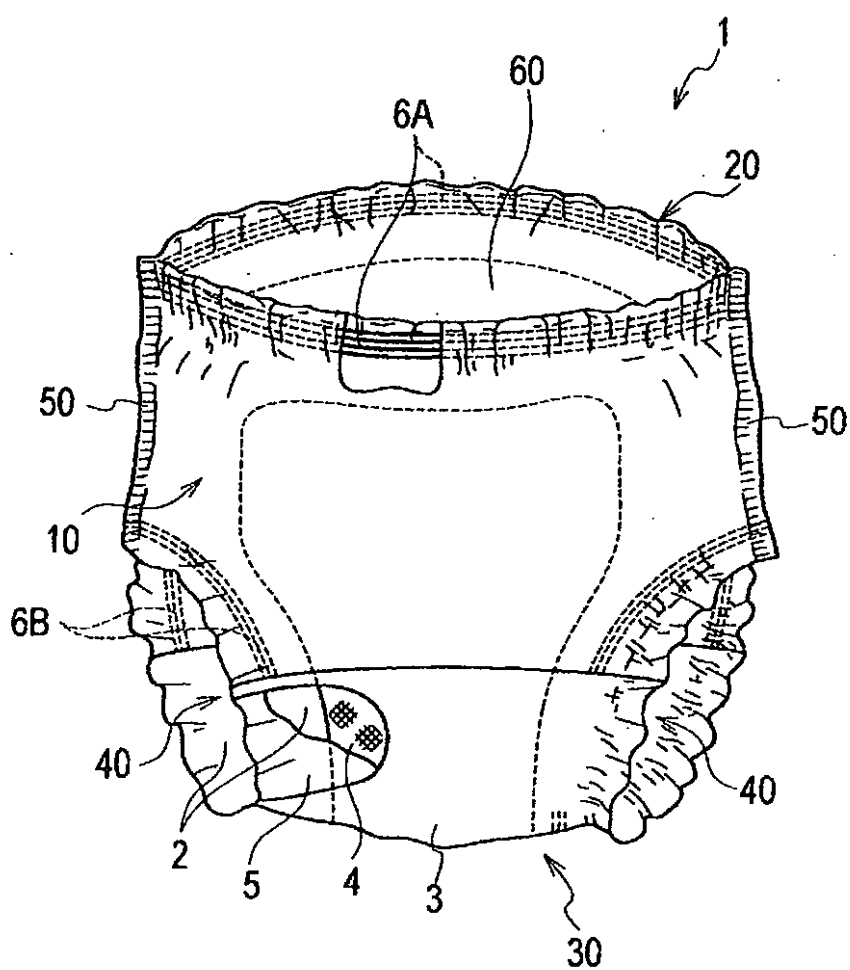


FIG. 2

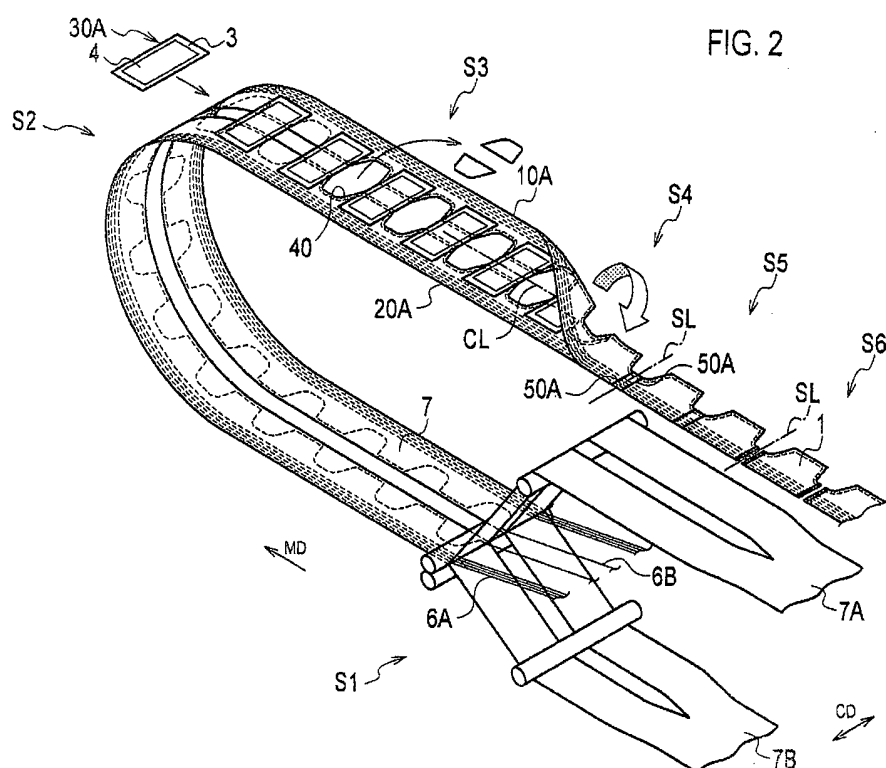


FIG. 3

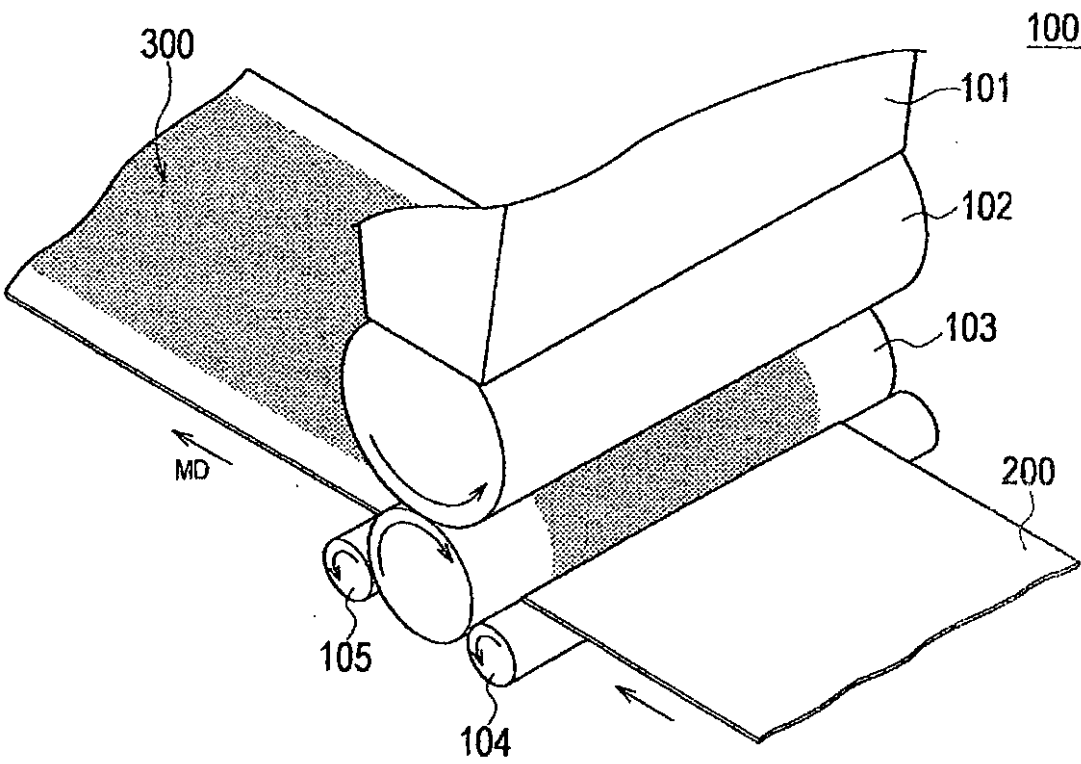


FIG. 4

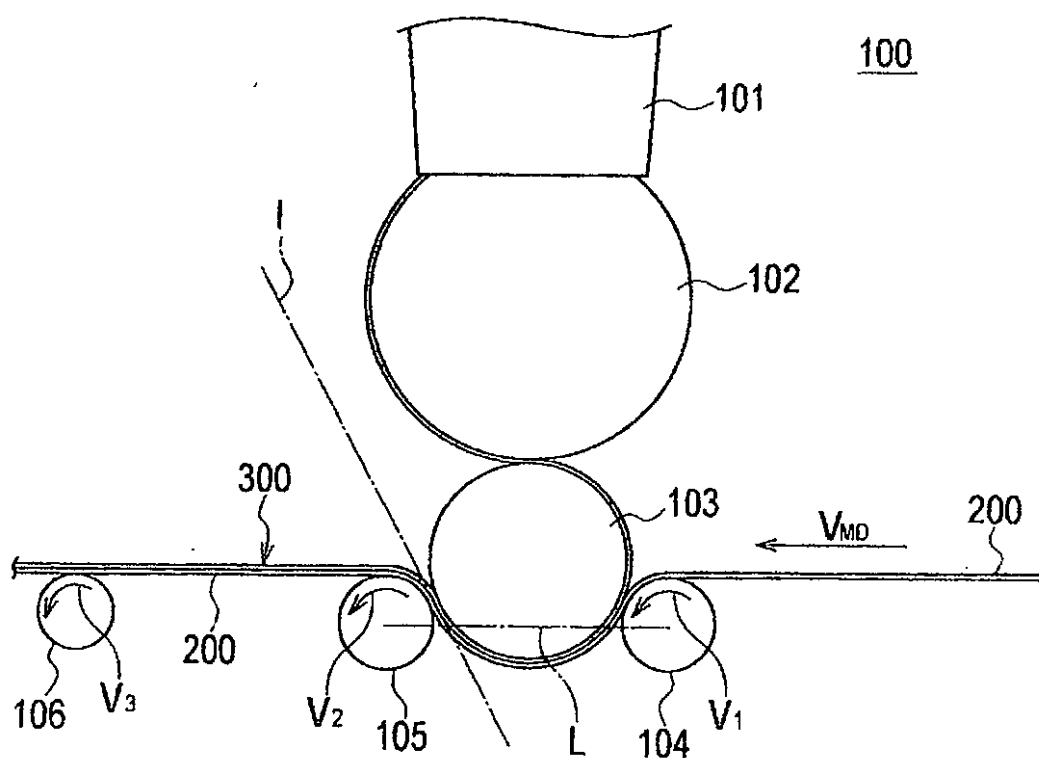
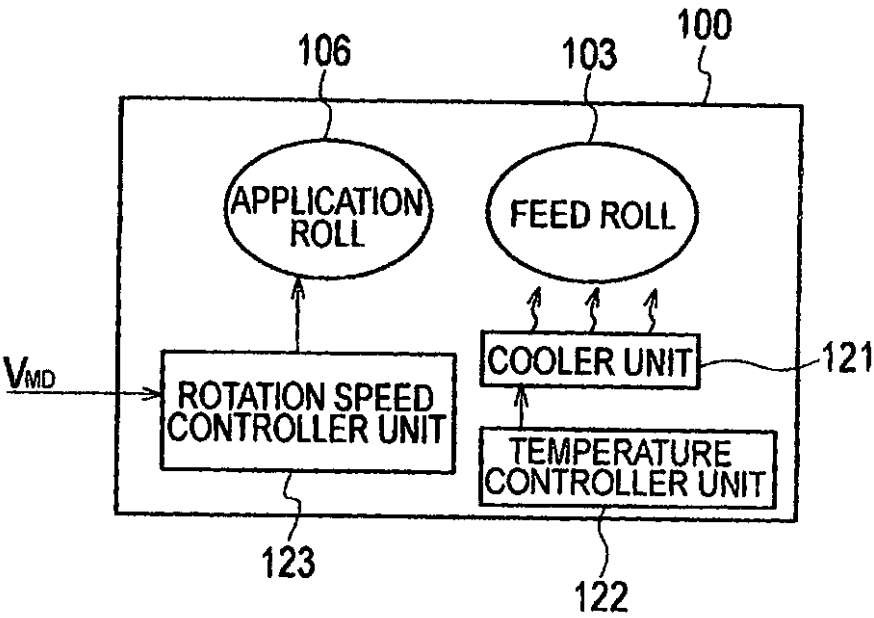


FIG. 5



From the INTERNATIONAL BUREAU

PCTNOTIFICATION CONCERNING
SUBMISSION OR TRANSMITTAL
OF PRIORITY DOCUMENT

(PCT Administrative Instructions, Section 411)

To:

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

Date of mailing (day/month/year) 18 May 2010 (18.05.2010)	
Applicant's or agent's file reference JUN-078-PCT	IMPORTANT NOTIFICATION
International application No. PCT/JP2010/053741	International filing date (day/month/year) 02 March 2010 (02.03.2010)
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	

1. By means of this Form, which replaces any previously issued notification concerning submission or transmittal of priority documents, the applicant is hereby notified of the date of receipt by the International Bureau of the priority document(s) relating to all earlier application(s) whose priority is claimed. Unless otherwise indicated by the letters "NR", in the right-hand column or by an asterisk appearing next to a date of receipt, the priority document concerned was submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b).
2. (If applicable) The letters "NR" appearing in the right-hand column denote a priority document which, on the date of mailing of this Form, had not yet been received by the International Bureau under Rule 17.1(a) or (b). Where, under Rule 17.1(a), the priority document must be submitted by the applicant to the receiving Office or the International Bureau, but the applicant fails to submit the priority document within the applicable time limit under that Rule, the attention of the applicant is directed to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.
3. (If applicable) An asterisk (*) appearing next to a date of receipt, in the right-hand column, denotes a priority document submitted or transmitted to the International Bureau but not in compliance with Rule 17.1(a) or (b) (the priority document was received after the time limit prescribed in Rule 17.1(a) or the request to prepare and transmit the priority document was submitted to the receiving Office after the applicable time limit under Rule 17.1(b)). Even though the priority document was not furnished in compliance with Rule 17.1(a) or (b), the International Bureau will nevertheless transmit a copy of the document to the designated Offices, for their consideration. In case such a copy is not accepted by the designated Office as the priority document, Rule 17.1(c) provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.

Priority date	Priority application No.	Country or regional Office or PCT receiving Office	Date of receipt of priority document
02 March 2009 (02.03.2009)	2009-048651	JP	26 April 2010 (26.04.2010)

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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Facsimile No. +41 22 338 82 70

Form PCT/IB/304 (October 2005)

1/E:GP6WP.D00

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,
Minato-ku, Tokyo
1050001
JAPON

Date of mailing (day/month/year) 07 July 2011 (07.07.2011)		IMPORTANT NOTICE	
Applicant's or agent's file reference JUN-078-PCT			
International application No. PCT/JP2010/053741	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			

1. **ATTENTION:** For any designated Office(s), for which the time limit under Article 22(1), as in force from 1 April 2002 (30 months from the priority date), **does not apply**, please see Form PCT/IB/308(First Notice) issued previously.
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

In accordance with Rule 47.1(c-bis)(i), those Offices will accept the present notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

3. The following designated Offices, for which the time limit under Article 22(1), as in force from 1 April 2002, **does apply**, have not requested, as at the time of mailing of the present notice, that the communication of the international application be effected under Rule 93bis.1:

AE, AG, AL, AM, AO, AP, AT, BA, BB, BG, BH, BR, BW, BZ, CA, CH, CL, CR, CU, CZ, DE, DK, DM, DO, EA, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, ID, IL, IN, IS, KE, KM, KN, KZ, LA, LC, LK, LR, LS, LT, LY, MA, ME, MG, MN, MW, MX, NI, NO, NZ, OA, OM, PE, PH, PL, PT, RO, RS, SC, SD, SE, SG, SK, SL, SM, ST, SV, TH, TJ, TN, TR, TT, UA, UZ, VC, VN, ZA, ZM, ZW

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.

In practice, **time limits other than the 30-month time limit** will continue to apply, for various periods of time, in respect of certain of the designated or elected Office(s) listed above. For **regular updates on the applicable time limits** (30 or 31 months, or other time limit), Office by Office, refer to the *PCT Gazette*, the *PCT Newsletter* and the *PCT Applicant's Guide*, Volume II, National Chapters, all available from WIPO's Internet site, at <http://www.wipo.int/pct/en/index.html>.

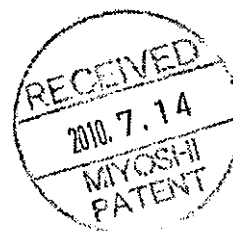
It is the applicant's **sole responsibility** to monitor all these time limits.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70	Authorized officer Gijsbertus Beijer e-mail: pt07.pct@wipo.int
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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-078-PCT	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/JP2010/053741	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 2 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. 4

☒ 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

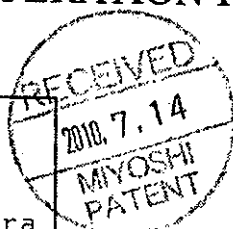
International application No.
PCT/JP2010/053741

A. CLASSIFICATION OF SUBJECT MATTER Int.Cl. B05C1/12 (2006.01) i 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. B05C1/12 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 applications 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.
Y	JP 6-206029 A (KELLER, Martin) 1994.07.26, Full text, Fig.1-9 & EP 0616855 A1	1-4
Y	JP 51-2227 Y2 (SHIMO, Tetsuo) 1976.01.22, Full text, Fig.1-2 (No Family)	1-4
Y	JP 7-31913 A (DAI NIPPON PRINTING CO., LTD.) 1995.02.03, Full text, Fig.1-4 (No Family)	1-4
Y	JP 8-158598 A (SEKISUI CHEMICAL CO., LTD.) 1996.06.18, Full text, Fig.1-2 (No Family)	3
Y	JP 2000-502288 A (GRIFOLL CASANOVAS, Juan) 2000.02.29, Full Text, Fig.1-23 & EP 0893223 A1 & WO 98/16362 A1	4
☒ 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 SHINOHARA, Masayuki Telephone No. +81-3-3581-1101 Ext. 3351
		3F 3226

Form PCT/ISA/210 (second sheet) (July 2009)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY



To:
MIYOSHI, Hidekazu

Toranomon Kotohira
Tower, 2-8, Toranomon
1-chome, Minato-ku, Tokyo
1050001 Japan

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43 bis.1)

Date of mailing (day/month/year)	13.07.2010
-------------------------------------	------------

Applicant's or agent's file reference
JUN-078-PCT

FOR FURTHER ACTION
See paragraph 2 below

International application No. PCT/JP2010/053741	International filing date (day/month/year) 02.03.2010	Priority date (day/month/year) 02.03.2009
--	--	--

International Patent Classification (IPC) or both national classification and IPC
Int.Cl. B05C1/12 (2006.01) i

Applicant
UNICHARM CORPORATION

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43 bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1 bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Date of completion of this opinion		06.07.2010	
Japan Patent Office 3-4-3, Kasumigaseki, Chiyoda-ku, Tokyo 100-8915, Japan		Authorized officer	3F 3226
		SHINOHARA, Masayuki Telephone No. +81-3-3581-1101 Ext. 3351	

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.:

PCT/JP2010/053741

Box No. I	Basis of this opinion
1.	With regard to the language, this opinion has been established 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)).
2.	☐ This opinion has been established taking into account the rectification of an obvious mistake authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(b)).
3.	With regard to any nucleotide and/or amino acid sequence disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished: a. (means) ☐ on paper ☐ in electronic form b. (time) ☐ in the international application as filed ☐ together with the international application in electronic form ☐ subsequently to this Authority for the purposes of search
4.	☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5.	Additional comments:

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/JP2010/053741

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

I. Statement

Novelty (N)	Claims	1-4	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	1-4	NO
Industrial applicability (IA)	Claims	1-4	YES
	Claims		NO

2. Citations and explanations:

D1:JP 6-206029 A (KELLER, Martin) 1994.07.26, Full text, Fig.1-9 & EP 0616855 A1
D2:JP 51-2227 Y2 (SHIMO, Tetsuo) 1976.01.22, Full text, Fig.1-2
D3:JP 7-31913 A (DAI NIPPON PRINTING CO.,LTD.) 1995.02.03, Full text, Fig.1-4
D4:JP 8-158598 A (SEKISUI CHEMICAL CO.,LTD.) 1996.06.18, Full text, Fig.1-2
D5:JP 2000-502288 A (GRIFOLL CASANOVAS, Juan) 2000.02.29, Full Text, Fig.1-23 & EP 0893223 A1 & WO 98/16362 A1

The subject matter of claim 1 and 2 do not appear to involve an inventive step in view of the D1, D2 and D3 cited in the ISR.

D1 and D2 are considered to represent the closest prior art for the subject matter of claim 1. Although a handover roll of claim 1 is disclosed in neither D1 nor D2, D3 discloses roll 11, which is configured to receive application material from storage unit 5 and provide the said application material with roll 3 (see paragraph 0017-0018), and a skilled man in the art would easily the idea of employing the said roll 11 to the application apparatus disclosed in D1 and D2.

The subject matter of claim 3 does not appear to involve an inventive step in view of the D1-3 and D4 cited in the ISR.

D4 discloses second feed roll 41 provided downstream of application apparatus 2 in the conveyance direction of board 1 wherein a rotational speed of the roll 41 is higher than a conveyance speed of the board 1 (see abstract). A skilled man in the art would easily the idea of employing the said roll 41 to the application apparatus disclosed in D1 and D2.

The subject matter of claim 5 does not appear to involve an inventive step in view of the D1-3 and D5 cited in the ISR.

D5 discloses engraving cylinder 4, which is conveniently cooled from inside (see page 10, line 19), and a skilled man in the art would easily the idea of employing the said cylinder 4 to the application apparatus disclosed in D1 and D2.

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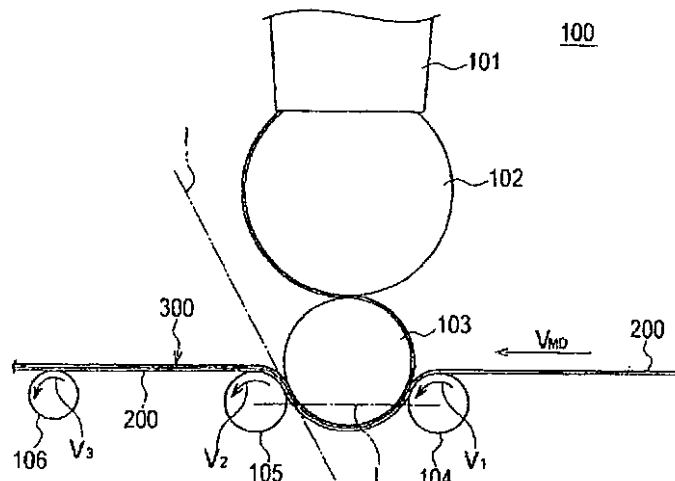
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[Continued on next page]

(54) Title: APPLICATION APPARATUS AND METHOD

FIG. 4



(57) Abstract: A web (200) passing a second press roll (105) while being held between an application roll (103) and the second press roll (105) is conveyed in such a manner that the web (200) is inclined toward the second press roll (105) from a tangent line (L) at a point of contact between the application roll (103) and the second press roll (105). A rotation speed (V1) of a first press roll (104) is equal to a conveyance speed (VMD) of the web (200). A rotation speed (V2) of the second press roll (105) is equal to the conveyance speed (VMD) of the web (200). A rotation speed (V3) of a feed roll (106) is higher than the conveyance speed (VMD) of the web (200).

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DESCRIPTION

Title of Invention

APPLICATION APPARATUS AND METHOD

5

Technical Field

The present disclosure relates to an application apparatus and an application method which apply a liquid or liquefied or fluidic material, such as an adhesive agent or a pigment, to a continuous web.

10

Background Art

An absorbent article such as a disposable pants-type diaper mainly includes a liquid-permeable top sheet, a bottom sheet, and an absorber.

15

The top sheet is adapted to come into contact with the skin of a wearer of the absorbent article. The bottom sheet is provided outside the top sheet. The absorber is provided between the top sheet and the bottom sheet for absorbing excretion from the wearer.

20

The top sheet, the bottom sheet, and the absorber are bonded with each other with an adhesive agent. Some disposable diapers for infants include various patterns which are printed on an inner or outer surface of the bottom sheet.

25

There is a known application apparatus in which a material, such as an adhesive agent or a pigment melt by heat, is transferred onto a transfer roll through a roll coater, and then the material transferred to the transfer

roll is transferred to a web such as a nonwoven fabric
(see, for example, Patent Literature 1).

The inventors have discovered that a liquid-
impermeable sheet such as a bottom sheet may be deformed
5 or broken by the heat of the material melt by heat because
the sheet has thermo-plasticity.

Moreover, under certain conditions of viscosity of
the adhesive (or melt pigment), strength of the sheet, or
a conveyance speed of the web, the material to be
10 transferred to the sheet may remain sticking to a roll,
and thus the sheet becomes entangled with the roll. As a
result, defective products are produced.

Citation List

15

Patent Literature

PTL 1: Japanese Patent Application Publication No. 2001-
157691 (p. 3, Fig. 4)

20 Summary

In a first aspect of the present invention, an
application apparatus for applying a material to a
continuous web being conveyed in a conveyance direction,
comprises: an application roll configured to receive the
25 material and apply the received material to the web; and
press rolls provided on an opposite side of the web to the
application roll and configured to press the web against
the application roll. The press rolls include a first
press roll which is provided on an upstream side and a

second press roll which is provided on a downstream side of the application roll in the conveyance direction of the web.

In a second aspect of the present invention, an
5 application method of applying a material to a continuous web being conveyed in a conveyance direction, comprises: receiving the material on an application roll; and applying the received material from the application roll onto the web, while pressing the web against the
10 application roll by press rolls provided on an opposite side of the web to the application roll. The press rolls include a first press roll which is provided on an upstream side and a second press roll which is provided on a downstream side of the application roll in the
15 conveyance direction of the web.

Brief Description of Drawings

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

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

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

[Fig. 4] Fig. 4 is a side view of the application apparatus of FIG. 3 as seen along a rotation axis of a first press roll of the apparatus.

[Fig. 5] Fig. 5 is a block diagram of the application apparatus.

Detailed Description

5 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.

Note that, in the following description of the
10 drawings, same or similar reference signs denote same or similar elements and portions. In addition, it should be noted that the drawings are schematic and are not to scale unless otherwise specified. Therefore, specific dimensions and the like should be determined in
15 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 to one or more embodiments will be described
20 with reference to Fig. 1 which is a partially cut-away 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
25 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 the top sheet 2, in other words, the back sheet is provided at the side
5 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
10 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.

15 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.

20 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 openings 40.

The front waistline portion 10 and the back waistline
25 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 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 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.

10 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 of the crotch portion 30.

15 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 front-to-back direction of the absorbent article 1.

20 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.

25 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 opening 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
5 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
10 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.

15 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
20 crotch portion member 30A is formed of the back sheet 3 and the absorber 4.

In the leg-surrounding opening 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
25 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 opening forming step S3 may be performed in the reverse order.

5 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-
10 surrounding opening 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
15 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
20 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
25 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
5 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 openings 40 formed therein is joined to
10 the web 7 with adhesive or the like.

The crotch member 30A includes the bottom sheet 3 and the absorber 4. Although not illustrated in Fig. 2, the waterproof sheet 5 is provided between the bottom sheet 3 and the absorber 4. The bottom sheet 3 and the
15 absorber 4 are bonded with each other with an adhesive or the like. Similarly, the absorber 4 and the waterproof sheet 5 are jointed with each other with an adhesive or the like.

Note that some products include the waterproof sheet
20 5 having patterns such as characters on an inner surface and the like of the waterproof sheet 5. In such products, a pigment for drawing the patterns sometimes serves as an adhesive at the same time.

An application apparatus 100, described below, which
25 applies materials such as an adhesive agent or a pigment can be used in a waistline forming step S1, an absorber transferring step S2, and a step of forming a web 7B by disposing a plurality of sheets and the like in Fig. 2.

Fig. 3 is a perspective view of an application

apparatus 100 according to one or more embodiments. The application apparatus 100 includes a handover roll 102, an application roll 103, a first press roll 104, a second press roll 105 and a feed roll 106 (see Fig. 4).

5 The handover roll 102 is configured to receive a material from a storage 101 in which the material is stored. The material is transferred to the surface of the handover roll 102 from the storage 101. The handover roll 102 is provided adjacent to the application roll 103 and
10 is configured to transfer the received material to the application roll 103.

 The handover roll 102, for example, is a gravure coater on which concave-convex surface is formed.

 The application roll 103 is provided adjacent to the
15 handover roll 102. The application roll 103 is configured to receive the material from the handover roll 102.

 The application roll 103 has a cooling mechanism which performs control so that the temperature of the material should be lower than that at the time when the
20 handover roll 102 receives the material from the storage unit 101.

 Then, the application roll 103 is configured to apply the received material to the web 200. The web 200 is equivalent to, for example, the sheet constituting the
25 crotch member 30A or the web 7B.

 The first press roll 104 and the second press roll 105 are provided on the opposite side of the web 200 to the application roll 103. The first press roll 104 is positioned on the upstream side while the second press

roll 105 is positioned on the downstream side of the application roll 103 in the conveyance direction of the web 200.

The first press roll 104 and the second press roll
5 105 are configured to press the web 200 against the application roll 103.

The second press roll 105 is provided downstream of the first press roll 104 in the conveyance direction MD of the web 200.

10 The feed roll 106 is provided downstream of the second press roll 105 in the conveyance direction MD of the web 200.

In the above-described application apparatus 100, the first press roll 104 and the second press roll 105 are
15 configured to press the web 200 against the application roll 103.

The web 200 is conveyed in the conveyance direction MD in the state where the web winds around one portion of the outer circumference of the application roll 103.

20 While the web 200 winds around the one portion of the application roll 103, the material is transferred from the application roll 103 to the web 200. Thus, an applied region 300 where the material is applied to the web is formed on the surface of the web 20.

25 Fig. 4 is a side view seen along the rotation axis direction of the first press roll 104 and the second press roll 105.

As shown in Fig. 4, a tangent line at a point of contact between the application roll 103 and the second

press roll 105 is "1".

The application apparatus 100 is configured to convey the web 200 in such a manner that the web 200 is inclined toward the second press roll 105 from the tangent
5 line 1, the web 200 passing the second press roll 105 while being held between the application roll 103 and the second press roll 105.

In other words, the conveyance direction MD of the web 200 after the material is applied does not overlap
10 with the tangent line 1.

Additionally, as shown in Fig. 4, an imaginary line L connecting the rotation axis of the first press roll 104 and the rotation axis of the second press roll 105 intersects the outer circumferential line of the
15 application roll 103.

In Fig. 4, a rotation speed V_1 of the first press roll 104 is equal to a conveyance speed V_{MD} of the web 200 upstream of the first press roll 104.

A rotation speed V_2 of the second press roll 105 is
20 equal to the conveyance speed V_{MD} of the web 200.

A rotation speed V_3 of the feed roll 106 is higher than the conveyance velocity V_{MD} of the web 200.

Although it is not shown in Fig. 4, a driving roll which drives the web 200 at the speed V_{MD} is provided
25 downstream of the feed roll 106.

Fig. 5 is a block diagram of the application apparatus 100.

The application apparatus 100 includes a cooler unit 121 configured to cool the application roll 103, and a

temperature controller unit 122 configured to control a temperature of the cooler unit 121.

Moreover, the application apparatus 100 includes a rotation speed controller unit 123 configured to detect
5 the conveyance speed V_{MD} and to perform control so that the rotation speed V_3 of the feed roll 106 should be higher than the conveyance speed V_{MD} of the web 200.

According to the above configuration, the application roll 103 is configured to set the temperature
10 of the material lower than that at the time when the handover roll 102 receives the material from the storage unit 101.

The application roll 103 is configured to apply the material at the lowered temperature to the web 200.

15 In other words, in the embodiment, the cooler unit 121 and the temperature controller unit 122 constitute a cooling mechanism.

In the embodiment, a melting point of the material is approximately 40°C. The application has coatable
20 viscosity in an application temperature from 65°C to 150°C. The temperature of the cooling mechanism is higher than the melting point, and is at least 5°C lower than the application temperature.

As described above, since the web 200 is pressed by
25 the first press roll 104 and the second press roll 105 against the application roll 103, the web 200 can receive the material securely from the application roll 103.

Also, the application apparatus 100 according to one or more embodiments conveys the web 200 in such a manner

that the web 200 is inclined toward the second press roll 105 from the tangent line l at the point of contact between the application roll 103 and the second press roll 105, the web 200 passing the second press roll 105 while
5 being held between the application roll 103 and the second press roll 105.

This enables the web 200 to securely receive the material from the application roller 103, and prevents the web 200 after the application of the material from
10 sticking to the application roll 103 and winding around the application roll 103.

In addition, the imaginary line L connecting between the rotation axis of the first press roll 104 and the rotation axis of the second press roll 105 intersects the
15 outer circumferential line of the application roll 103.

Thus, the web 200 is securely pressed against one portion of the circumference of the application roll 103, so that the web 200 can securely receive the material from the application roll 103.

20 In the application apparatus 100, since the rotation speed V_3 of the feed roll 106 is controlled so as to be higher than the conveyance speed V_{MD} of the web 200, the web 200 is stretched in the conveyance direction. Accordingly, the web 200 can securely come off the
25 application roll 103, without sticking to the application roll 103 and winding around the application roll 103.

In addition, the application apparatus 100 includes the cooling mechanism. The cooling mechanism adjusts a temperature of the material, while maintaining its

liquidity, such that the material is applicable to the web 200 at the adjusted temperature.

Accordingly, the web 200 can be prevented from being deformed or broken by the heat of the material. Thus, the defective products produced when the material is applied at high temperature can be prevented, so that a yield in production can be increased.

As described above, the details of several embodiments of the present invention have been exemplarily disclosed. It should not be understood that the description and drawings which constitute part of this disclosure limit the present invention. Based on this disclosure, those skilled in the art may easily come up with various alternative embodiments, examples and operation techniques.

For example, following additional embodiments can be envisaged.

Specifically, one or more embodiments are applicable to the case where a material other than an adhesive or a pigment is applied by the application apparatus.

The material may be an ink for printing patterns such as decorative characters on wearing articles, or an indicator which changes color and/or other visual properties to indicate when the article (e.g., a diaper) needs to be exchanged.

In addition, one or more embodiments are applicable not only to a step of bonding sheets with each other or bonding a sheet with an absorber, but also to a step of applying drugs, lotions, or the like to a skin-contactable

surface of at least a portion of the wearing article, e.g., a crotch member 30A.

In addition, the method of manufacturing absorbent articles is not limited to the manufacturing of disposable
5 diapers, but may be used for manufacturing, for example, sanitary napkins, panty liners, or articles other than absorbent articles.

In the foregoing description, a cooling mechanism e.g., the cooler unit 121, cools the application roll 103.

10 However, the cooling mechanism may be provided in the first press roll 104 and/or the second press roll 105.

Alternatively, the cooling mechanism may be provided in any one or all of the application roll 103, the first press roll 104, and the second press roll 105.

15 In this case, the temperature of the material can be more effectively decreased than in the case where the cooling mechanism only cools the application roll 103.

Accordingly, the temperature of the material can be adjusted to a temperature at which the material is
20 applicable to the web 200. Consequently, the web 200 is prevented from being deformed or broken by the heat of the material.

As described above, the present invention naturally includes various embodiments which are not described
25 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 content of Japanese Patent Application

2009-048651 (filed on March 2, 2009) is incorporated herein by reference.

Industrial Applicability

5 Therefore, according to the present invention, it is possible to provide an application apparatus capable of preventing products from being defective when a liquid material such as an adhesive or a pigment is applied to a continuous web, and whereby capable of preventing a yield
10 in production from decreasing.

Reference Signs List

	1	absorbent article
	2	top surface sheet
15	3	bottom surface sheet
	4	absorber
	5	waterproof sheet
	6	gather
	6A	waist gather
20	6B	leg gather
	7A, 7B	web
	10	front waistline portion
	20	back waistline portion
	30	crotch portion
25	40	leg-surrounding openings
	50	joint portions
	60	waistline openings
	100	application device
	101	storage

102 handover roll
103 application roll
104 first press roll
105 second press roll
5 106 feed roll
121 cooler
122 temperature controller
123 rotation speed controller
200 web
10 300 applied region

CLAIMS

[Claim 1]

An application apparatus configured to apply an
5 application material to a continuous web being conveyed,
comprising:

a handover roll configured to receive the
application material from a storage unit configured to
store the application material;

10 an application roll provided adjacent to the
handover roll and configured to receive the application
material from the handover roll and apply the received
application material to the web; and

press rolls provided on an opposite side of the web
15 to the application roll and configured to press down the
web to the application roll, wherein

the press rolls include a first press roll and a
second press roll which is provided downstream of the
first press roll in a conveyance direction of the web, and

20 in a plan view seen from a rotation axis direction
of the first press roll and the second roll, the web
passing the second press roll while being held between the
application roll and the second press roll is conveyed in
such a manner that the web is inclined toward the second
25 press roll from a tangent line at a point of contact
between the application roll and the second press roll.

[Claim 2]

The application apparatus according to claim 1,

wherein, in the plan view seen from the rotation axis direction of the first press roll and the second press roll, an imaginary line connecting between a rotation axis of the first press roll and a rotation axis of the second
5 press roll intersects an outer circumferential line of the application roll.

[Claim 3]

The application apparatus according to claim 1,
10 further comprising a feed roll provided downstream of the second press roll in the conveyance direction of the web, wherein

a rotation speed of the feed roll is higher than a conveyance speed of the web.

15

[Claim 4]

The application apparatus according to claim 1, wherein the application roll includes a cooling mechanism configured to set a temperature of the application
20 material to be lower than that at the time when the handover roll receives the application material from the storage.

FIG. 1

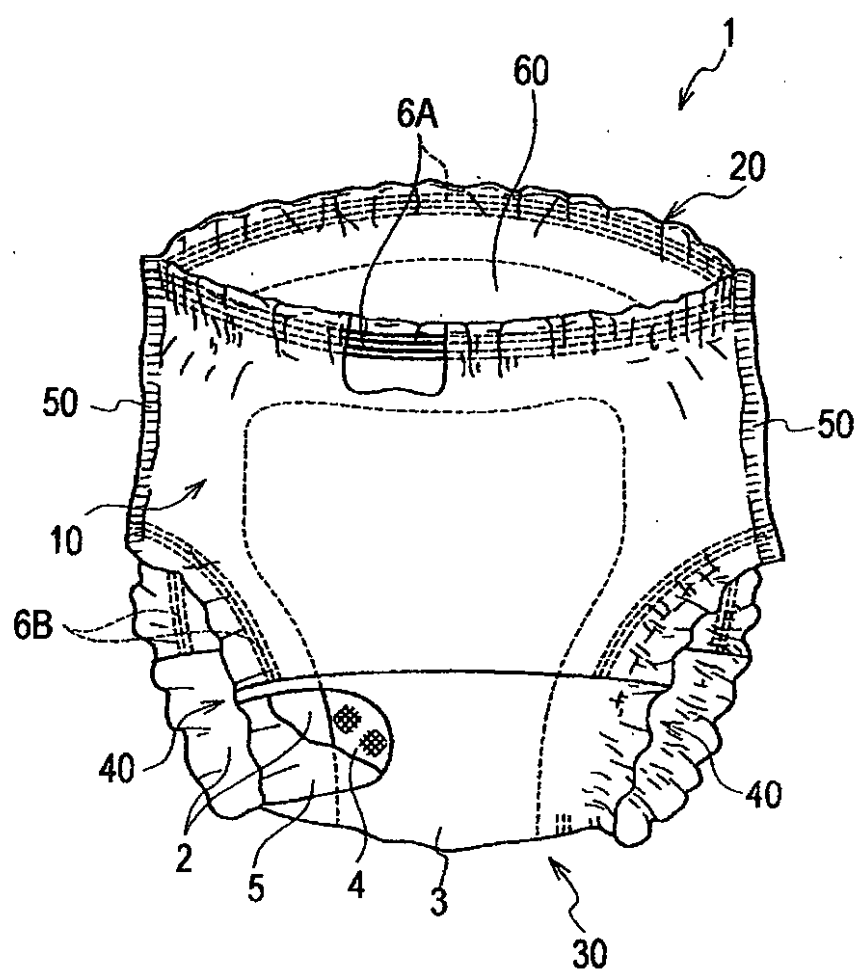
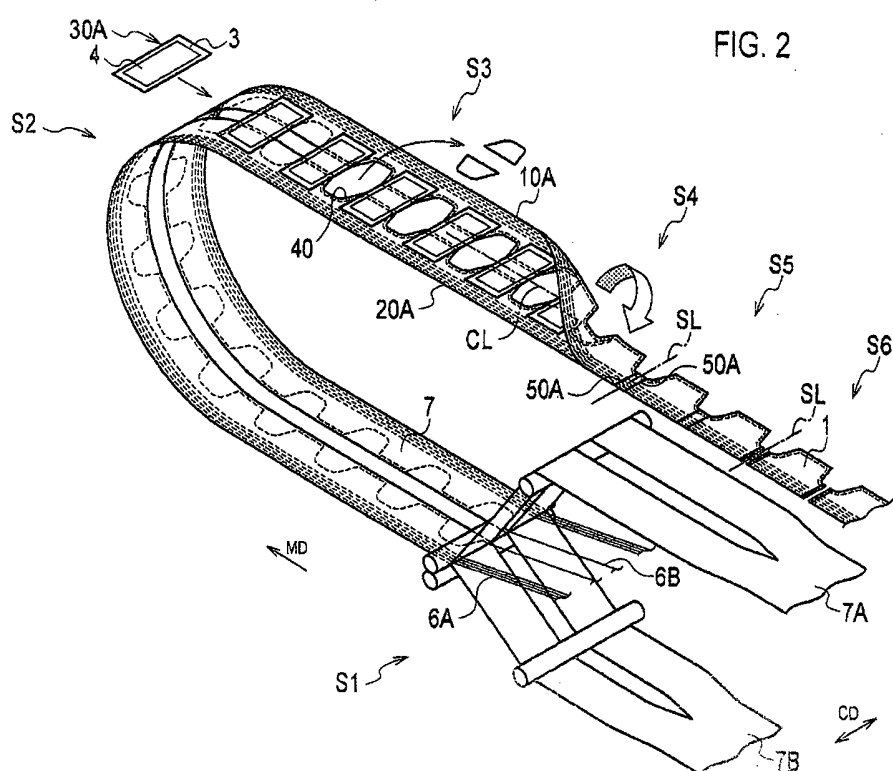


FIG. 2



3/5

FIG. 3

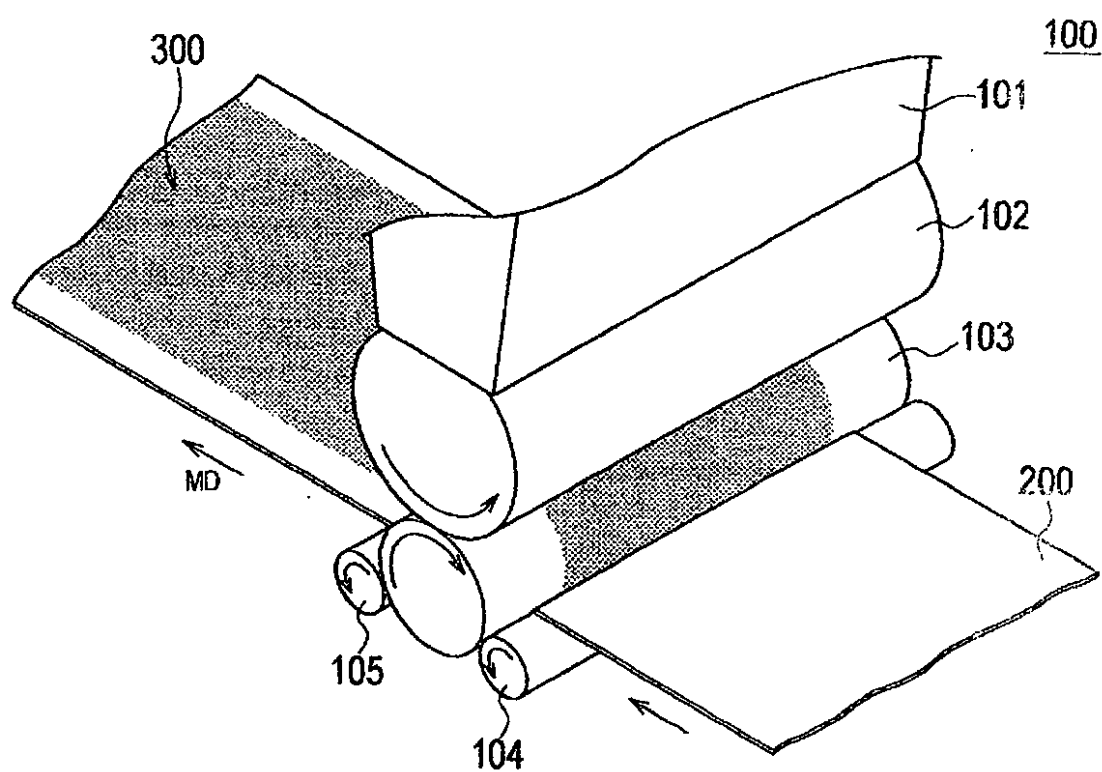


FIG. 4

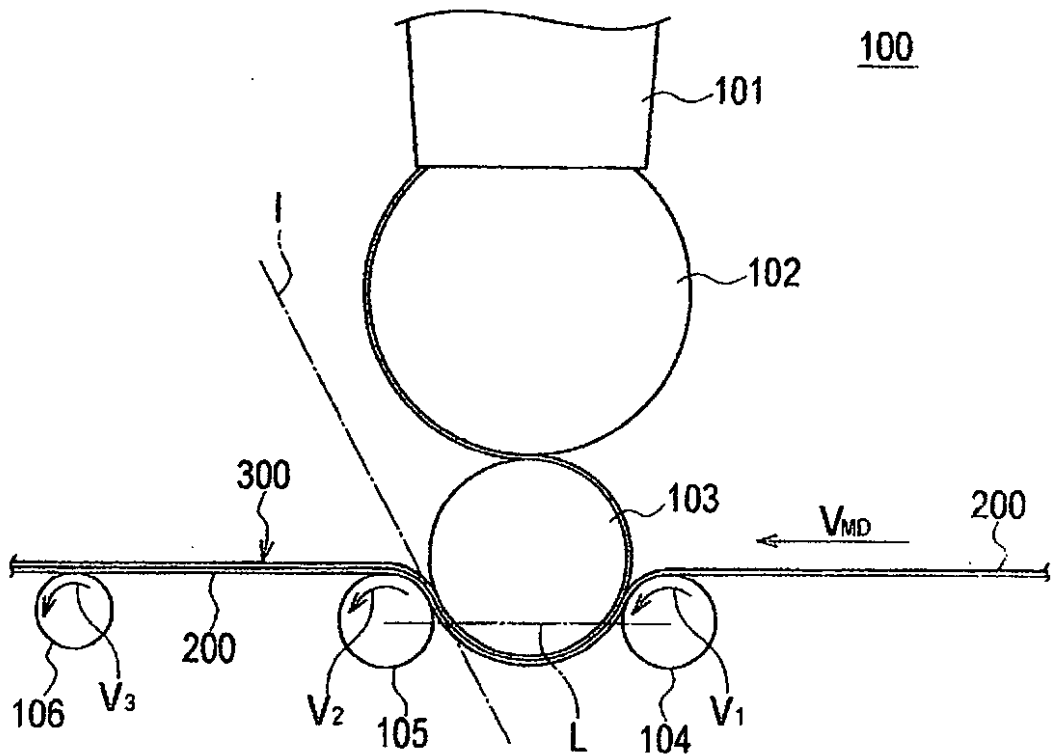
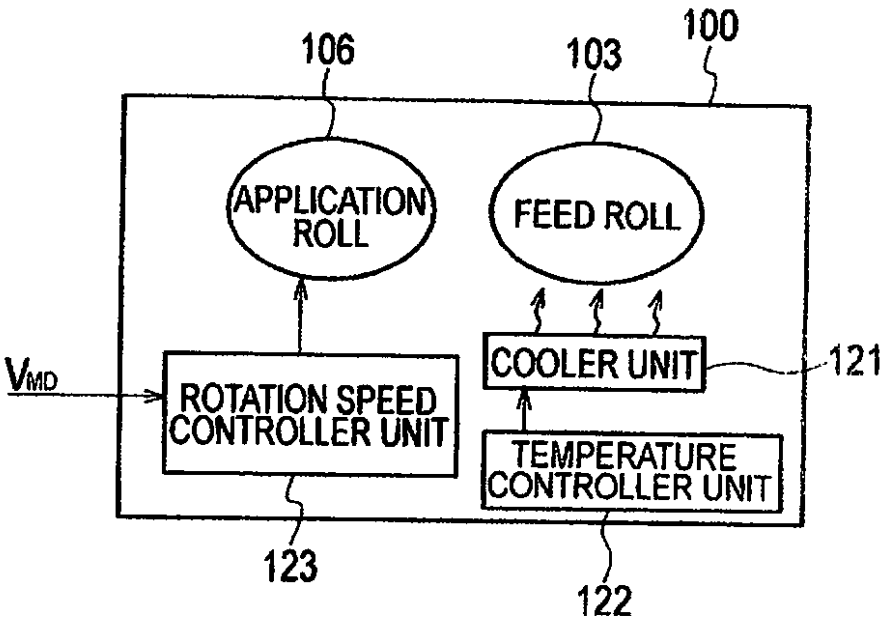
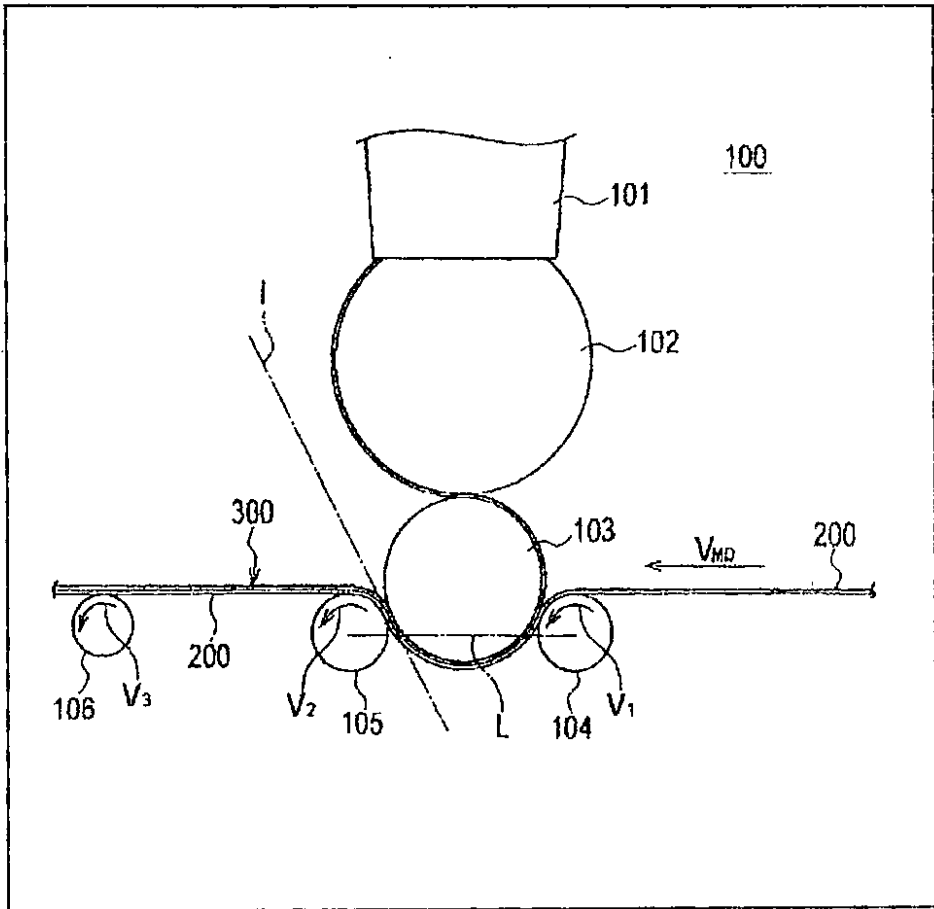
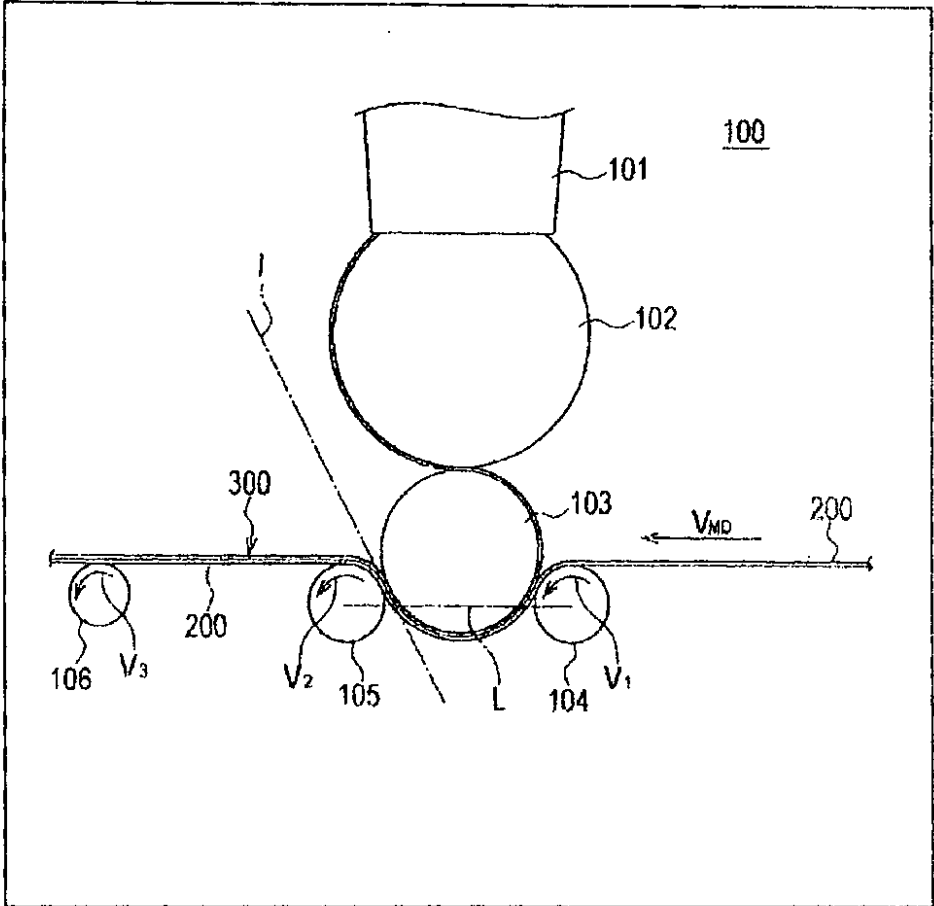


FIG. 5







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☐	Dibujos de ser estos pertinentes
☐	Comprobante de pago de las tasas establecidas (De ser el caso formato de descuento)
Completa ☐	Incompleta ☐

PATENTE DE INVENCION PCT ☒ MODELO DE UTILIDAD PCT ☐ Art.33 Decisión 486/00, Circular Única

☒	Indicación que se solicita una PCT
☒	Copia de la solicitud en español, tal como fue presentada inicialmente (capítulo descriptivo, reivindicatorio, resumen)
☒	Dibujos de ser estos pertinentes
☒	Comprobante de pago de las tasas establecidas (de ser el caso formato de descuento)
Completa ☒	Incompleta ☐

DISEÑO INDUSTRIAL ☐

(Art. 119 Decisión 486/00)

☐	Indicación que se solicita Diseño industrial
☐	Datos de identificación del solicitante o de la persona que presenta la solicitud
☐	Representación gráfica y fotográfica del Diseño industrial o muestra del material que incorpora el diseño
☐	Comprobante de pago de las tasas establecidas
Completa ☐	Incompleta ☐

ESQUEMA DE TRAZADO ☐

(Art. 92 Decisión 486/00)

☐	Indicación que se solicita un esquema de trazado
☐	Datos de identificación del solicitante o de la persona que presenta la solicitud
☐	Representación gráfica de un esquema de trazado
☐	Comprobante de pago de las tasas establecidas
Completa ☐	Incompleta ☐