



No. 11-122083- -00000-0000

Fecha: 2011-09-20 09:35:28 Dep. 2020 DIR.NUEVASCR
Tra. 11 PATENTEIYII Eve: 378 FASENACIONALI
Act. 411 PRESENTACION Folios: 118



Industria y Comercio

SUPERINTENDENCIA

DELEGATURA PROPIEDAD INDUSTRIAL

SOLICITUD
REGISTRO DE PATENTE DE INVENCION
PCT

EXPEDIENTE No _____

TITULO TRANSPORTADOR Y MÉTODO DE
FABRICACIÓN DE ARTÍCULO ABSORBENTE

CLASIFICACION INTERNACIONAL _____

SOLICITANTE UNICHARM CORPORATION

DOMICILIO Japón

APODERADO DARIO CARDENAS NAVAS

BOGOTA D.C. _____

PETITORIO



SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



No. 11-122083-00000-0000

Fecha: 2011-09-20 09:35:28 Dep. 2020 DIR.NUEVASCOR
Tra. 11 PATENTEIYII Eve: 378 FASENACIONALI
Act. 411 PRESENTACION Folios: 118

FORMULARIO UNICO DE SOLICITUD DE PATENTE PCT ENTRADA EN FASE NACIONAL

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SOLICITUD DE:

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Patente de Invención

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Patente de Modelo de Utilidad

☒

Capítulo I

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Capítulo II

②

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⑤

PCT (86)

Solicitud Internacional No. PCT/JP2010/053739 Fecha 02.03.2010

Publicación Internacional No. WO 2010/101282 A1 Fecha 10.09.2010

⑥

Título(54):

TRANSPORTADOR Y MÉTODO DE FABRICACIÓN DE ARTÍCULO
ABSORBENTE

⑦

Clasificación Internacional (51):

⑧

Prioridad

(33)País de Origen

(32)Fecha

(31)N° de Solicitud

JP

02.03.2009

2009-048418

JP

26.02.2010

2010-042003

SI ☒ NO ☐

⑨

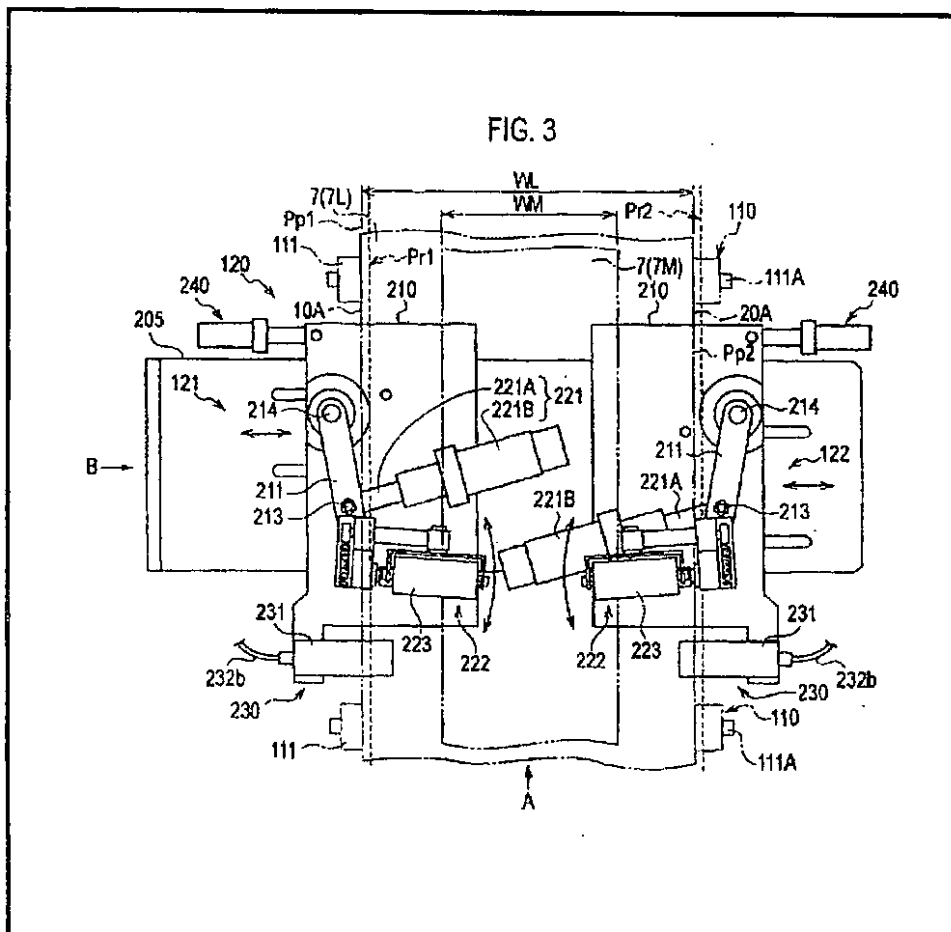
Comprobante de Pago No.: 11-0090498

Fecha 14.09.2011

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=FC181D3DB68C486C4C28FC350A4882B1.wap1?docId=W02010101282&recNum=1&tab=PCTDocuments&maxRec=&office=&prevFilter=&sortOption=&queryString=>
- ☐ Recibo de reivindicaciones adicionales

11 FIGURA CARACTERISTICA



12

Solicito la Concesión de la patente

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C.S.J.

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SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
NIT : 800.176.089-2
- / -



RECIBO DE CAJA

No. 11 - 0090498

Bogotá D.C., Septiembre 14 de 2011 - 15:40:44

RECIBIDO DE : CARDENAS & CARDENAS ABOGADOS PI LTDA NI 830.083.491

*** Soporte del Pago ***

TIPO PAGO	BANCO	CUENTA	No. PAGO	FECHA PAGO	VR. PAGO
CONSIGNACION	BANCO DE BOGOTA	062754387	411763531	14/09/2011	5.559.000.00

*** Conceptos Pagados ***

CANT.	RENTISTICO	CONCEPTO	Vr. UNDITARIO	Vr. CONCEPTO
1	50005-01-01 SOLICITUDES	1 TRAMITES DE SOL. DE PATENTE DE INVENCIÓN	571.000.00	571.000.00
				\$571.000.00

SON: **QUINIENTOS SETENTA Y UN MIL PESOS MONEDA CORRIENTE**

Responsable: _____
Recibo de Caja Aplicado al Expediente No. _____

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

No. 11-122083-00000-0000
Fecha: 2011-09-20 09:35:28 Dep. 2020 DIR.NUEVASCR
Tra. 11 PATENTEIYII Eve: 378 FASENACIONALI
Act. 411 PRESENTACION Folios: 118

CARDENAS & CARDENAS
ABOGADOS



Industria y Comercio

SUPERINTENDENCIA

(21) N° de solicitud:

(22) Fecha de solicitud:

(51) Clasificación Internacional:

(71) Solicitante(s) **UNICHARM CORPORATION**

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(30) Prioridad	(31) No. Prioridad	(32) Fecha	(33) País
	2009-048418	02.03.2009	JP
	2010-042003	26.02.2010	JP

(85) Fecha inicio fase nacional: 02.10.2011

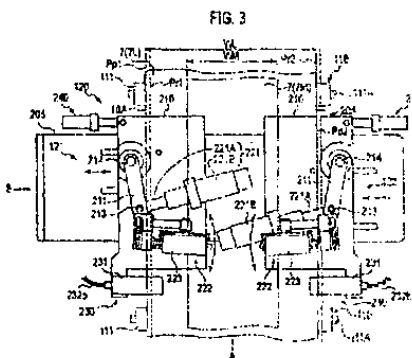
(86) Datos relativos a la presentación de la solicitud PCT

Fecha de presentación de la solicitud: 02.03.2010

No. de solicitud **PCT/JP2010/053739**

(54) Título **TRANSPORTADOR Y MÉTODO DE FABRICACIÓN DE ARTÍCULO ABSORBENTE**

(21) N° de solicitud:		(22) Fecha de solicitud:	
(51) Clasificación Internacional :			
(71) Solicitante(s) UNICHARM CORPORATION			
(72) Inventor(es) Hiroki Yamamoto			
(74) Apoderado: DARIO CARDENAS NAVAS			
(30) Prioridad	(31) No. Prioridad	32) Fecha	(33) País
	2009-048418	02.03.2009	JP
	2010-042003	26.02.2010	JP
(85) Fecha límite inicio fase nacional: 02.10.2011		(87) Publicación internacional:	
(86) Datos relativos a la presentación de la solíc. PCT		Fecha: 10.09.2010	
Fecha de presentación de la solicitud: 02.03.2010		No. Publicación WO2010/101282 A1	
No. de solicitud PCT/JP2010/053739			



(54) Título: TRANSPORTADOR Y MÉTODO DE FABRICACIÓN DE ARTÍCULO ABSORBENTE

(57) Resumen.

El transportador de trama 100 de acuerdo a la presente invención transporta una trama continua 7L para el tamaño L y una trama continua 7M para el tamaño M. El transportador 100 incluye un mecanismo orientador 220 que cambia una posición de paso de una porción lateral terminal de una trama 7, un mecanismo de detección 230 que detecta la posición de paso de la porción lateral de la trama 7, y un mecanismo de transmisión 240 que desplaza el mecanismo orientador 220 y el mecanismo de detección 230 juntos en la dirección transversal CD (dirección a lo ancho) de la trama 7 de acuerdo al tamaño como tamaño L o tamaño M, entrando en contacto con un primera porción lateral terminal 10A y una segunda porción lateral terminal 20A de la trama 7. El mecanismo de transmisión 240 mueve el mecanismo orientador 220 y el mecanismo de detección 230 a través de una distancia de desplazamiento igual en la dirección transversal CD de la trama.

 Industria y Comercio SUPERINTENDENCIA		SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO DIVISION DE NUEVAS CREACIONES EXTRACTO PARA PUBLICACIÓN SOLICITUD DE PATENTE DE INVENCION	
(21) N° de solicitud:		(51) Int Cl:	
22) Fecha de solicitud:		(71) Solicitante(s) UNICHARM CORPORATION	
(30) Prioridad	(31) No. Priodidad	32) Fecha	(33) País
	2009-048418	02.03.2009	JP
	2010-042003	26.02.2010	JP
		(72) Inventor(es) Hiroki Yamamoto	
		(74) Apoderado: DARIO CARDENAS NAVAS	
(54) Título: TRANSPORTADOR Y MÉTODO DE FABRICACIÓN DE ARTÍCULO ABSORBENTE			

Resumen:

El transportador de trama 100 de acuerdo a la presente invención transporta una trama continua 7L para el tamaño L y una trama continua 7M para el tamaño M. El transportador 100 incluye un mecanismo orientador 220 que cambia una posición de paso de una porción lateral terminal de una trama 7, un mecanismo de detección 230 que detecta la posición de paso de la porción lateral de la trama 7, y un mecanismo de transmisión 240 que desplaza el mecanismo orientador 220 y el mecanismo de detección 230 juntos en la dirección transversal CD (dirección a lo ancho) de la trama 7 de acuerdo al tamaño como tamaño L o tamaño M, entrando en contacto con un primera porción lateral terminal 10A y una segunda porción lateral terminal 20A de la trama 7. El mecanismo de transmisión 240 mueve el mecanismo orientador 220 y el mecanismo de detección 230 a través de una distancia de desplazamiento igual en la dirección transversal CD de la trama.

ESPAÑOL
DESCRIPCIÓN

126.899

**TRANSPORTADOR Y MÉTODO DE FABRICACIÓN DE ARTÍCULO
ABSORBENTE**

Campo técnico

La presente revelación se refiere a un transportador y a un método de fabricación de un artículo absorbente que usa el transportador para selectivamente transportar tramas continuas de distintos tamaños.

Arte previo

Un método de fabricación de un artículo absorbente como un pañal tipo bombacha, una toalla higiénica y un protector higiénico se implementa en una línea de montaje. Por ejemplo, una trama continua que incluye un conjunto de láminas superiores y un conjunto de láminas inferiores para formar artículo absorbentes es transportada bajo tensión en una dirección de transporte de trama por un transportador. Luego, elementos componentes como un frunce (elemento elástico) y una película impermeable se colocan sobre la trama transportada bajo tensión en la dirección de transporte de trama.

En algunos casos, una porción lateral terminal de una trama durante el transporte puede desalinearse en una dirección transversal (la dirección de la trama a lo ancho) perpendicular a una dirección de transporte de trama. Para abordar este problema, se conoce un transportador configurado para ajustar la posición de paso a la cual una porción lateral terminal de una trama pasa durante el transporte (Consultar el documento patentario 1, por ejemplo). Específicamente, el transportador incluye rodillos de compresión, un accionador y un sensor como mecanismo de detección.

Los rodillos de compresión incluyen dos rodillos configurados para sujetar al menos una de las porciones laterales terminales de una trama. Los rodillos de

compresión giran respectivamente sobre un extremo de un eje en una vista en planta de la trama. El accionador está acoplado a los rodillos de compresión a través de un brazo y similar, y hace girar los rodillos de compresión. El sensor detecta la posición de paso de la porción lateral terminal de la trama luego de pasar entre los rodillos de compresión.

En el transportador así configurado, cuando el sensor determina que la posición de paso de la porción lateral terminal de la trama está desalineada respecto de una posición predeterminada, los rodillos de compresión son girados por el accionador para orientar la porción lateral terminal de la trama hacia el exterior o interior en la dirección de la trama a lo ancho. En consecuencia, el transportador puede ajustar la posición de paso de la porción lateral terminal de la trama.

Los artículos absorbentes se fabrican en distintos tamaños, como tamaño S, M y L. A este respecto, el transportador antes mencionado puede transportar tramas de varios tamaños mediante el desplazamiento del accionador acoplado a los rodillos de compresión, y el sensor independientemente en la dirección transversal de la trama.

Los inventores han descubierto que cuando el tamaño de una trama a ser transportada se modifica por uno distinto, y el accionador y el sensor se desplazan independientemente en la dirección transversal de la trama, y por lo tanto los rodillos de compresión (el accionador) y el sensor pueden desalinearse adoptando una relación posición inadecuada. En este caso, la relación posicional inadecuada hace que los rodillos de compresión roten en un grado erróneo. Para evitar esto, la relación posicional entre los rodillos de compresión y el sensor debe ser ajustada a una relación predeterminada, que, a su vez, requiere de un control complicado al efecto. Es necesario proveer un transportador

y un método de fabricación artículo absorbentes capaces de transportar selectivamente tramas de distintos tamaños cambiando la posición de paso de una porción lateral terminal de la trama, sin tener que realizar un control y/o ajuste complicado.

Bajo estas circunstancias, la presente invención tiene por objeto proveer un transportador y un método de fabricación de un artículo absorbente capaces de de selectivamente transportar tramas de dos o más tamaños cambiando con facilidad la posición de paso de una porción lateral terminal de la trama sin tener que ejecutar un control complicado.

Lista de Citas

[Documentos Patentario]

[Documento Patentario 1]

Publicación de Solicitud de Patente Japonesa Número 2004-262556 (pp. 2 y 3, Figuras 2 y 3)

Resumen

Con el fin de solucionar el problema antes descripto, la presente invención tiene los siguientes aspectos. Un aspecto de la presente invención provee un transportador que transporta selectivamente una trama continua para un primer tamaño y una trama continua para un segundo tamaño, que comprende: un mecanismo orientador configurado para cambiar un posición de paso de al menos una de las porciones laterales terminales de la trama entrando en contacto con la porción lateral terminal de la trama; un mecanismo de detección configurado para detectar la posición de paso de la porción lateral terminal de la trama; y un mecanismo de transmisión configurado para desplazar el mecanismo orientador y el mecanismo de detección en una dirección transversal perpendicular a una dirección de transporte de la trama de acuerdo al primer tamaño o el segundo tamaño una distancia de desplazamiento

igual en la dirección transversal de la trama.

De acuerdo a un aspecto de la presente invención, es posible proveer un transportador y un método de fabricación de un artículo absorbente capaces de selectivamente transportar tramas para dos o más tamaños cambiando con facilidad la posición de paso de una porción lateral terminal de la trama sin tener que ejecutar un control complicado.

Breve descripción de los dibujos

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

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

La Figura 3 es una vista en planta de un transportador de acuerdo a una o más realizaciones.

La Figura 4 es una vista anterior del transportador de la Figura 3.

La Figura 5 es una vista lateral del transportador de la Figura 3.

La Figura 6 es una vista lateral de un mecanismo de ajuste del borde lateral de acuerdo al Ejemplo Modificado 1.

La Figura 7 es una vista anterior de un mecanismo de ajuste del borde lateral de acuerdo al Ejemplo Modificado 2.

La Figura 8 es una vista en perspectiva de un transportador de acuerdo al Ejemplo Modificado 3.

Descripción detallada

En adelante, un transportador y un método de fabricación de un artículo absorbente de acuerdo a una o más realizaciones de la presente invención serán descriptos con referencia a los dibujos que se acompañan. Adviértase que, en la siguiente descripción de los dibujos, las mismas referencias denotan los mismos elementos y porciones.

Además, debe advertirse que los dibujos son esquemáticos y no están a escala salvo indicación en contrario. En consecuencia, las dimensiones específicas y similares deben determinarse en consideración a la siguiente descripción. Por otra parte, los dibujos no necesariamente reflejan las relaciones de dimensiones y proporciones de los componentes reales.

En primer lugar, la configuración de un artículo absorbente 1 de acuerdo a una o más realizaciones será explicada con referencia a la Figura 1 que es una vista en perspectiva parcialmente recortada que ilustra el artículo absorbente 1. En esta realización particularmente ilustrada, el artículo absorbente 1 es un pañal descartable tipo bombacha para adultos. El artículo absorbente 1 puede tener distintos tamaños, como tamaño L (primer tamaño) y tamaño M (segundo tamaño).

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

La lámina superior 2 está adaptada para ponerse en contacto con la piel de una persona que usa el artículo absorbente 1 (en adelante, "usuario"). La lámina superior 2 está hecha de una lámina permeable a los líquidos como una trama no tejida o una película plástica perforada. La lámina inferior 3 se provee fuera de la lámina superior 2 (sobre la cara opuesta al usuario). La lámina inferior 3 está hecha de una trama no tejida o similar.

El absorbente 4 se provee entre la lámina superior 2 y la lámina inferior 3, y para absorber las excreciones del usuario. El absorbente 4 está hecho de una mezcla de pulpa molida y partículas de polímero superabsorbente, o similar. La lámina impermeable 5 se provee entre la lámina inferior 3 y el absorbente 4, para bloquear el paso de las

excreciones del usuario hacia el exterior del artículo absorbente 1. La lámina impermeable 5 está hecha de una lámina impermeable a los líquidos.

El artículo absorbente 1 así configurado incluye, en combinación, una porción de línea de cintura anterior 10 que calza en la cintura anterior de un usuario, una porción de línea de cintura posterior 20 que calza en la cintura posterior del usuario, y una porción de entrepierna 30 que calza en la entrepierna del usuario. A propósito, las aberturas que circundan las piernas 40 en las cuales se insertan las piernas del usuario se forman a ambos lados de la porción de entrepierna 30.

La porción de línea de cintura anterior 10 y la porción de línea de cintura posterior 20 están unidas mediante porciones de empalme 50, por medio de lo cual se forma una abertura para la cintura que calza alrededor del cuerpo del usuario. Un frunce de cintura 6A hecho de un filamento de goma estirable o similar se provee en un borde periférico completo de la porción de línea de cintura anterior 10 y la porción de línea de cintura posterior 20.

Por ejemplo, para hacer la porción de línea de cintura anterior 10 y la porción de línea de cintura posterior 20 estirables en la dirección transversal perpendicular a la dirección anterior a posterior desde la porción de línea de cintura anterior 10 hacia la porción de línea de cintura posterior 20, 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, o pueden en sí mismas estar hechas de una lámina estirable.

La porción de entrepierna 30 se provee entre la porción de línea de cintura anterior 10 y la porción de línea de cintura posterior 20. Los frunces de pierna 6B hechos de hebras de goma estirables o similar se proveen sobre ambos lados de la porción de entrepierna 30.

Por ejemplo, para hacer la porción de entrepierna 30 estirable la región que circunda las piernas, la porción de entrepierna 30 puede estar provista de los frunces de pierna 6B, o puede estar en si misma constituida por una lámina estirable.

En segundo lugar, un método de fabricación artículo absorbentes de acuerdo a una o más realizaciones será explicado con referencia a la Figura 2 que es un diagrama para explicar una parte relevante del método de fabricación de un artículo absorbente.

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

En la etapa de formación de la línea de cintura S1, los frunces (un frunce de cintura 6A y/o un frunce de pierna 6B) se colocan entre una trama 7A y una trama 7B, por medio de lo cual una trama 7 preparada para formar la porción de línea de cintura anterior 10 y la porción de línea de cintura posterior 20 se configura.

Adviértase que la trama 7 (tramas 7A, 7B) durante el transporte es estirable en una dirección transversal CD (dirección a lo ancho) perpendicular a una dirección de transporte MD (dirección de la máquina) de la trama 7. Además, la trama 7 es asimétrica con respecto a una línea central CL que divide un ancho en la dirección transversal CD de la trama 7 y se extiende en la dirección de transporte MD de la trama 7.

En la etapa de transferencia de absorbente S2, un elemento de porción de entrepierna 30A para formar la porción de entrepierna 30 es transferido sobre la trama 7, más específicamente, entre la porción de línea de cintura

anterior 10 y la porción de línea de cintura posterior 20 luego de la etapa de formación de la línea de cintura S1. En este caso, el elemento de porción de entrepierna 30A incluye la lámina inferior 3 y el absorbente 4.

En la etapa de formación de circundado de las piernas S3, las aberturas que circundan las piernas 40 (denominadas orificios para las piernas) se forman cortando la trama 7 (tramas 7A, 7B) luego de la etapa de transferencia de absorbente S2. En este caso, la formación de la abertura que rodea las piernas 40 no necesariamente comprende cortar solamente la trama 7A y la trama 7B, sino que además puede comprender el corte, junto con la trama 7A y la trama 7B, de la lámina inferior 3 que constituye el elemento de porción de entrepierna 30A.

Adviértase que la etapa de transferencia de absorbente S2 y la etapa de formación de circundado de las piernas S3 pueden ejecutarse en el orden inverso.

En la etapa de plegado S4, la trama 7 es plegada en dos partes a lo largo una línea de pliegue que se extiende en la dirección de transporte MD de la trama 7 puenteando un porción lateral terminal (primera porción lateral terminal 10A) de la porción de línea de cintura anterior 10 hacia una porción lateral terminal (segunda porción lateral terminal 20A) de la porción de línea de cintura posterior 20, luego de la etapa de formación de circundado de las piernas S3.

Adviértase que, en esta realización particularmente ilustrada, la línea de pliegue es la línea central CL. Sin embargo, la línea de pliegue no es necesariamente la línea central CL, y puede desplazarse desde la línea central CL hacia la primera porción lateral terminal 10A y la segunda porción lateral terminal 20A.

En la etapa de empalme S5, las partes plegadas de la trama 7 se unen en las regiones de empalme 50A a través de

un tratamiento ultrasónico o tratamiento por calor luego de la etapa de plegado S4. La región de empalme 50A se extiende en la dirección de transporte MD a través de una línea imaginaria SL que indica una posición a cortar y se extiende en la dirección transversal CD de la trama 7.

En la etapa de corte S6, la trama 7 unida en las regiones de empalme 50A se corta a lo largo de las líneas imaginarias SL luego de la etapa de empalme S5. En consecuencia, se obtiene el artículo absorbente 1.

En este caso, el método de fabricación de artículo absorbentes incluye las etapas de transporte entre las etapas (S1 a S6). En cada una de las etapas de transporte, la trama 7 a ser procesada en el artículo absorbente 1 es transportada por un transportador 100, que se describirá a continuación. Esta etapa de transporte incluye una etapa de cambio que modifica la posición de paso de una porción lateral terminal de la trama continua 7 a ser procesada en el artículo absorbente 1 durante el transporte de la trama 7.

En adelante, se describirá una configuración del transportador 100 usado en la etapa de transporte y la etapa de cambio con referencia a las Figuras 3-5. La Figura 3 es una vista en planta del transportador 100 de acuerdo a una o más realizaciones. La Figura 4 es una vista anterior del transportador 100 visto en la dirección de la flecha A en la Figura 3. La Figura 5 es una vista lateral del transportador 100 vista en la dirección de la flecha B en la Figura 3.

Dado que los transportadores 100 usados en las etapas de transporte antes de las etapas (S1 a S6) tienen la misma configuración, la descripción procederá tomando, por ejemplo, el transportador 100 que transporta la trama 7 antes de la etapa de formación de la línea de cintura S1.

Según se ilustra en las Figuras 3 a 5, el

transportador 100 transporta la trama 7 bajo tensión en la dirección de transporte MD de la trama 7. El transportador 100 puede transportar tramas 7 de distintos tamaños (es decir, anchos) como una trama 7L para el tamaño L o una trama 7M para el tamaño M. En la Figura 3, el transportador 100 se ilustra transportando la trama 7L para el tamaño L. El transportador 100 incluye un mecanismo transportador 110 y un mecanismo de ajuste del borde lateral 120.

El mecanismo transportador 110 incluye múltiples rodillos 111 configurados para rotar junto con el desplazamiento de la trama 7. Al menos un rodillo 111 de los múltiples rodillos 111 es accionado para rotar sobre un eje 111A mediante una unidad de transmisión (no ilustrada). La unidad de transmisión incluye un motor, o similar, configurado para rotar el rodillo 111 sobre el eje 111A.

El mecanismo de ajuste del borde lateral 120 cambia la posición de paso (Figura 3, posición Pr1, Pr2) de una porción lateral terminal (la primera porción lateral terminal 10A o la segunda porción lateral terminal 20A) de la trama 7 transportada por el mecanismo transportador 110. El mecanismo de ajuste del borde lateral 120 incluye un primer mecanismo de ajuste 121 y un segundo mecanismo de ajuste 122. El primer mecanismo de ajuste 121 está configurado para cambiar la posición de paso (Figura 3, posición Pr1) de la primera porción lateral terminal 10A de la trama 7 durante el transporte, y el segundo mecanismo de ajuste 122 está configurado para cambiar la posición de paso (Figura 3, posición Pr2) de la segunda porción lateral terminal 20A de la trama 7 durante el transporte.

El primer mecanismo de ajuste 121 y el segundo mecanismo de ajuste 122 están fijados a una placa base 205 a través de la cual la trama 7 se desplaza. El primer mecanismo de ajuste 121 y el segundo mecanismo de ajuste 122 operan independientemente entre si, pero prácticamente

tienen la misma configuración. Por esta razón, solamente la configuración del primer mecanismo de ajuste 121 será descripta a continuación. En los dibujos, las mismas referencias numéricas denotan los mismos elementos o porciones en el primer mecanismo de ajuste 121 y el segundo mecanismo de ajuste 122.

El primer mecanismo de ajuste 121 incluye una placa móvil 210, un mecanismo orientador 220, un mecanismo de detección 230 y un mecanismo de transmisión 240. La placa móvil 210 está fijada a la placa base 205 para poder desplazarse en la dirección transversal CD de la trama 7.

El mecanismo orientador 220 está fijado a la placa móvil 210. El mecanismo orientador 220 cambia la posición de paso de la primera porción lateral terminal 10A de la trama 7. Específicamente, el mecanismo orientador 220 incluye un accionador 221 y una unidad de rodillos 222.

En la vista en planta de la trama 7 (ver la Figura 3), el accionador 221 gira un rodillo de compresión superior 223 y un rodillo de compresión inferior 224, que se describirán a continuación, sobre un extremo de un eje 223A del rodillo de compresión superior 223 y un extremo de un eje 224A del rodillo de compresión inferior 224, respectivamente. El accionador 221 incluye un brazo de deslizamiento 221A, un servomotor 221B configurado para extender y contraer el brazo de deslizamiento 221A, y una unidad de empalme a tornillo a bola (no ilustrada) interpuesta entre el servomotor 221B y el brazo de deslizamiento 221A.

Una porción terminal del brazo de deslizamiento 221A está conectada a una porción terminal 212 de un brazo oscilante 211 con un eje de conexión 213. El brazo oscilante 211 está fijado a la placa móvil 210, más específicamente, está fijado a la placa móvil 210 con capacidad de rotación con un eje fijo 214.

La unidad de rodillos 222 está unida a la porción terminal 212 del brazo oscilante 211. La unidad de rodillos 222 incluye el rodillo de compresión superior 223 y el rodillo de compresión inferior 224. El rodillo de compresión superior 223 gira sobre el eje 223A, y se pone en contacto con una de las superficies (superficie superior) de la trama 7. El rodillo de compresión inferior 224 gira sobre el eje 224A y se pone en contacto con la otra superficie (superficie inferior) de la trama 7. En otras palabras, el rodillo de compresión inferior 224 enfrenta al rodillo de compresión superior 223 a través de la trama 7.

El mecanismo de detección 230 se provee por debajo del mecanismo orientador 220 en la dirección de transporte MD de la trama 7. El mecanismo de detección 230 está eléctricamente conectado al accionador 221, y detecta la posición de paso de la primera porción lateral terminal 10A de la trama 7. El mecanismo de detección 230 compara la posición de paso detectada de la primera porción lateral terminal 10A de la trama 7 (Figura 3, posición Pr1) con una posición predeterminada por donde se supone que pasa la primera porción lateral terminal 10A de la trama 7 (Figura 3, posición Pp1) en el proceso de fabricación del artículo absorbente 1. El mecanismo de detección 230 calcula una dirección y una distancia necesarias para desplazar la primera porción lateral terminal 10A hacia la posición predeterminada.

El mecanismo de detección 230 incluye un proyector 231a montado sobre un brazo superior 231, y un fotodetector 232a provisto por debajo del proyector 231a a través de la trama 7 y montado sobre un brazo inferior 232. El fotodetector 232a está conectado al accionador 221 a través de un cable de salida 232b. El mecanismo de detección 230 detecta la luz emitida desde el proyector superior 231a

usando el fotodetector 232a. Específicamente, el mecanismo de detección 230 detecta la posición de la trama 7 en base a la cantidad de luz detectada por el fotodetector 232a. A propósito, el proyector 231a puede montarse en el brazo inferior 232. Además, el fotodetector 232a puede montarse en el brazo superior 231. En la Figura 4, el mecanismo de detección 230 del segundo mecanismo de ajuste 122 ha sido omitido.

En este caso el mecanismo orientador 220 y el mecanismo de detección 230 están acoplados entre si mediante la placa móvil 210. En otras palabras, el mecanismo orientador 220 y el mecanismo de detección 230 se desplazan juntos en la dirección transversal CD de la trama 7 a través del mecanismo de transmisión 240 según se revela. En este caso, este movimiento conjunto incluye un movimiento en el cual el mecanismo orientador 220 y el mecanismo de detección 230 se desplazan juntos, y además un movimiento en la cual el mecanismo orientador 220 y el mecanismo de detección 230 se desplazan juntos mientras se cambia la posición de paso de la porción lateral terminal de la trama 7.

El mecanismo de transmisión 240 mueve la placa móvil 210 por medio de lo cual se desplaza el mecanismo orientador 220 y el mecanismo de detección 230 juntos en la dirección transversal CD de la trama 7 de acuerdo al tamaño de la trama 7, como tamaño L o tamaño M. Más específicamente, el mecanismo de transmisión 240 mueve el mecanismo orientador 220 y el mecanismo de detección 230 juntos desplazando la placa móvil 210 en la dirección transversal CD de la trama 7 de acuerdo al ancho W_L de la trama 7 para el tamaño L, o al ancho W_M de la trama 7 para el tamaño M.

Así, el mecanismo de transmisión 240 mueve el mecanismo orientador 220 y el mecanismo de detección 230 a

través de la misma distancia de desplazamiento en la dirección transversal CD de la trama 7. El mecanismo de transmisión 240 incluye un accionador o similar eléctricamente conectado al mecanismo de detección 230.

En adelante, se describirá el funcionamiento del primer mecanismo de ajuste 121 precedente con referencia a las Figuras 3 a 5. Específicamente, la siguiente descripción del primer mecanismo de ajuste 121 hará referencia al cambio de tamaño del artículo absorbente 1 fabricado.

Según se ilustra en las Figuras 3 a 5, el mecanismo de detección 230 compara la posición de paso detectada de la primera porción lateral terminal 10A contra una posición predeterminada para un tamaño predeterminado del artículo absorbente 1. El mecanismo de transmisión 240 mueve el mecanismo orientador 220 y el mecanismo de detección 230 en la dirección transversal CD de la trama 7 de acuerdo al tamaño como tamaño L o tamaño M, es decir, de acuerdo a una instrucción del mecanismo de detección 230. Luego, el mecanismo orientador 220 gira la unidad de rodillos 222 bajo cierto ángulo operando el accionador 221 de acuerdo a la instrucción del mecanismo de detección 230.

Cuando el tamaño M se cambia a tamaño L, por ejemplo, la posición predeterminada es modificada para que corresponda con el tamaño L. En otras palabras, el transportador 100 cambia del transporte de la trama 7M para el tamaño M al transporte de la trama 7L para el tamaño L. Para este cambio, el mecanismo de transmisión 240 mueve el mecanismo orientador 220 y el mecanismo de detección 230 hacia el exterior en la dirección transversal CD de la trama 7. Luego, rotando la unidad de rodillos 222 en cierto ángulo, el mecanismo orientador 220 puede desplazar, con una fuerza adecuada, los bordes 10A, 20A de la trama 7 a las posiciones deseadas para aumentar o reducir el ancho W_L

o W_M de la trama 7.

Según se revela, el mecanismo de transmisión 240 mueve el mecanismo orientador 220 y el mecanismo de detección 230 juntos en la dirección transversal CD de la trama 7 (dirección a lo ancho) de acuerdo al tamaño como tamaño L o tamaño M, y además compensa las distancias de desplazamiento del mecanismo orientador 220 y el mecanismo de detección 230 entre si en la dirección transversal CD de la trama 7. En este caso, el mecanismo orientador 220 (el accionador 221 y la unidad de rodillos 222) y el mecanismo de detección 230 no se desalinean adoptando una relación posicional inadecuada, a diferencia del caso en el cual el mecanismo orientador 220 y el mecanismo de detección 230 se desplazan independientemente. En consecuencia, aún cuando el tamaño del artículo absorbente 1 a fabricar se modifique, la unidad de rodillos 222 no gira en un grado erróneo, y no es necesario realizar ajuste alguno tendiente a corregir la relación posicional entre el mecanismo orientador 220 y el mecanismo de detección 230 a la relación predeterminada. Así, la posición de pasos de la primera porción lateral terminal 10A y la segunda porción lateral terminal 20A de la trama 7 puede alterarse sin necesidad de realizar un control complicado.

Según se revela, el mecanismo orientador 220 y el mecanismo de detección 230 están acoplados entre si mediante la placa móvil simple 210, y se desplazan en la dirección transversal CD de la trama 7 a través del mecanismo de transmisión 240. Con esta configuración, el mecanismo orientador 220 y el mecanismo de detección 230 se desplazan adecuadamente a través de la misma distancia en la dirección transversal CD de la trama 7. Así, el mecanismo orientador 220 y el mecanismo de detección 230 no se desalinean adoptando una relación posicional inadecuada.

Según se revela, el mecanismo orientador 220 se mueve

sobre la placa móvil 210 en la dirección transversal CD de la trama 7. Con esta configuración, el mecanismo orientador 220 es capaz de realizar un ajuste fino de los cambios en la posición de pasos de la primera porción lateral terminal 10A y la segunda porción lateral terminal 20A de la trama 7. En consecuencia, la posición de pasos de la primera porción lateral terminal 10A y la segunda porción lateral terminal 20A de la trama 7 pueden modificarse con mayor facilidad.

Ejemplos Modificados

El mecanismo de ajuste del borde lateral 120 de acuerdo a la descripción precedente puede modificarse de la siguiente manera. En este caso, la descripción hará referencia fundamentalmente a las diferencias respecto de la descripción precedente, usándose las mismas o similares referencias para los mismos o similares elementos.

Ejemplo Modificado 1

La Figura 6 es una vista lateral de un mecanismo de ajuste del borde lateral 120A de acuerdo al Ejemplo Modificado 1. En la descripción precedente, el mecanismo orientador 220 y el mecanismo de detección 230 están acoplados a la placa móvil simple 210. Contrariamente, en el Ejemplo Modificado 1, un mecanismo orientador 220 y un mecanismo de detección 230 son independientes entre si.

Específicamente, tal como se ilustra en la Figura 6, el mecanismo orientador 220 y el mecanismo de detección 230 no están acoplados entre si por la placa móvil 210. El mecanismo orientador 220 está acoplado a una placa móvil 210A, y puede desplazarse en la dirección transversal CD de la trama 7 a través de un mecanismo de transmisión 240A. El mecanismo de detección 230 está acoplado a una placa móvil 210B, y puede desplazarse en la dirección transversal CD de la trama 7 mediante un mecanismo de transmisión 240B.

Los mecanismos de transmisión 240A y 240B mueven en forma independiente el mecanismo orientador 220 y el

mecanismo de detección 230, respectivamente, con la condición que el mecanismo orientador 220 y el mecanismo de detección 230 se desplazan a través de la misma distancia en la dirección transversal CD de la trama 7. Así, los mecanismos de transmisión 240A y 240B son capaces de proveer un ajuste fino del mecanismo orientador 220 y el mecanismo de detección 230 independientemente, sin desalinearse el mecanismo orientador 220 y el mecanismo de detección 230 bajo una relación posicional inadecuada. En consecuencia, la posición de pasos de la primera porción lateral terminal 10A y la segunda porción lateral terminal 20A de la trama 7 pueden modificarse con facilidad.

Ejemplo Modificado 2

La Figura 7 es una vista anterior de un mecanismo de ajuste del borde lateral 120B de acuerdo al Ejemplo Modificado 2. En la descripción precedente, la unidad de rodillos 222 incluye el rodillo de compresión superior 223 y el rodillo de compresión inferior 224. Contrariamente, en el Ejemplo Modificado 2, una unidad de rodillos 222 incluye solamente un rodillo de compresión inferior 224.

Específicamente, tal como se ilustra en la Figura 7, el rodillo de compresión inferior 224 está inclinado en dirección ascendente hacia la trama 7 en orden ejercer presión contra la trama 7 desde abajo. Con esta configuración, el rodillo de compresión inferior 224 es capaz de orientar la primera porción lateral terminal 10A de la trama 7 a la posición predeterminada. La inclinación del rodillo de compresión inferior 224 puede ajustarse en una medida adecuada de acuerdo a propiedades, como la flexibilidad, capacidad de estiramiento, y el resbaladizo de la superficie, de la trama 7.

La unidad de rodillos 222 no necesariamente incluye solamente el rodillo de compresión inferior 224, sino que además puede incluir un rodillo de compresión superior 223.

En este caso, el rodillo de compresión superior 223 está inclinado en dirección descendente hacia la trama 7 en orden ejercer presión por contacto con la trama 7 desde arriba.

En el Ejemplo Modificado 2, que posee solamente el rodillo de compresión superior 223 o el rodillo de compresión inferior 224, la unidad de rodillos 222 es capaz de procurar los mismos efectos beneficiosos que en la descripción precedente.

Ejemplo Modificado 3

La Figura 8 es una vista en perspectiva de un transportador 100A de acuerdo al Ejemplo Modificado 3. En la descripción precedente, el transportador 100 es usado entre las etapas (S1 A S6). Contrariamente, el transportador 100 A en el Ejemplo Modificado 3 es utilizado en la etapa de plegado S4.

Específicamente, tal como se ilustra en la Figura 8, el transportador 100A se provee en un punto donde la trama 7 se pliega a lo largo la línea de pliegue llevando la primera porción lateral terminal 10A hacia la segunda porción lateral terminal 20A. Para ser más precisos, se proveen una placa móvil 210 no ilustrada, un mecanismo orientador 220, un mecanismo de detección 230 y un mecanismo de transmisión 240 no ilustrado para la primera porción lateral terminal 10A y la segunda porción lateral terminal 20A.

En el Ejemplo Modificado 3, en la etapa de plegado S4, se usa el transportador 100A y produce los mismos efectos beneficiosos que en la descripción precedente aún cuando el tamaño del artículo absorbente 1 cambie. Como resultado de ello, el transportador 100A permite que la primera porción lateral terminal 10A se coloque exactamente sobre la segunda porción lateral terminal 20A en la trama 7.

Otras Realizaciones

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

Por ejemplo, es posible contemplar las siguientes realizaciones adicionales. Específicamente, el artículo absorbente 1 descrito posee la porción de línea de cintura anterior 10, la porción de línea de cintura posterior 20 y la porción de entrepierna 30. El artículo absorbente 1 no se limita a esta configuración, sino que puede estar formado por completo por una sola pieza. En este caso, obviamente, se emplea un método de fabricación distinto de este artículo absorbente.

Adicionalmente, se ha descrito el transportador 100 usado en la fabricación de un pañal descartable tipo bombacha. Sin embargo, el transportador 100 no se limita a este uso. Por ejemplo, el transportador 100 puede ser usado para fabricar otro producto como un pañal descartable tipo abierto, una toalla higiénica y un protector higiénico, por ejemplo. En otras palabras, el transportador 100 puede ser utilizado en el transporte de cualquier trama 7 que sea estirable en la dirección transversal CD de la trama 7, no necesariamente para la fabricación del artículo absorbente 1. En la medida en que el transportador 100 transporte una estirable trama 7, el transportador 100 puede ser empleado entre otras etapas además de las etapas descriptas con respecto a la Figura 2.

Por otra parte, el transportador 100 descrito se usa para transportar una trama simple 7. Sin embargo, el transportador 100 no se limita a este uso. Por ejemplo, cuando una trama que incluye un conjunto de porciones de

línea de cintura anterior 10 y una trama que incluye un conjunto de porciones de línea de cintura posterior 20 son transportadas simultáneamente, es posible usar un transportador 100 para cada una de ellas o ambas. Además, es posible proveer múltiples transportadores 100 entre cualquiera de las dos etapas de proceso.

Además, el artículo absorbente 1 adopta distintos tamaños como el tamaño L y el tamaño M. Las variaciones de tamaño no se limitan a estas, sino que pueden incluirse dos o más tamaños diferentes. Por ejemplo, las variaciones de tamaño pueden incluir tres tamaños como tamaño L, tamaño M y tamaño S.

Además, el mecanismo transportador 110 ha sido descrito como incluyendo múltiples rodillos 111. Sin embargo, el mecanismo transportador 110 no debe limitarse a esta configuración, y puede adoptar otra, como un transportador a cinta, en la medida en que se permita que el mecanismo transportador 110 transporte la trama 7.

El mecanismo de ajuste del borde lateral 120 ha sido descrito como que incluye el primer mecanismo de ajuste 121 y el segundo mecanismo de ajuste 122. Sin embargo, el mecanismo de ajuste del borde lateral 120 no debe limitarse a esta configuración, y puede incluir únicamente uno de los mecanismos de ajuste. En otras palabras, el mecanismo de ajuste del borde lateral 120 puede estar provisto de al menos una de las porciones laterales terminales de la trama 7.

Adicionalmente, a pesar que la placa móvil 210 ha sido descrita como acoplando al mecanismo orientador 220 y el mecanismo de detección 230 entre si, es posible usar una estructura capaz de acoplar (fijar) el mecanismo orientador 220 y el mecanismo de detección 230 entre si en lugar de de la placa móvil 210.

Además, no hay limitación alguna en cuanto a la

relación posicional entre el mecanismo orientador 220, el mecanismo de detección 230 y el mecanismo de transmisión 240, con lo cual es posible seleccionar cualquier relación posicional adecuada en la medida de lo deseado.

Además, el material, la condición del acabado de superficie, y la longitud y diámetro de los rodillos de compresión pueden seleccionarse adecuadamente de acuerdo a las condiciones de la trama 7 como el procesamiento, y el adhesivo aplicado a la misma de antemano. Por ejemplo, los materiales que pueden usarse en la superficie de los rodillos incluyen goma de poliuretano o goma de silicona, una esponja hecha de esta goma, y un metal.

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

Quedan incorporadas por completo como referencia las Solicitudes de Patente Japonesa 2009-048418 (presentada en 2 de Marzo de 2009) y 2010-042003 (presentada en 26 de Febrero de 2010).

Aplicabilidad industrial

En consecuencia, dado que el transportador y el método de fabricación de artículos absorbentes de la presente invención son capaces de transportar selectivamente tramas de dos o más tamaños cambiando con facilidad la posición de paso de una porción lateral terminal de la trama sin tener que ejecutar un control complicado, resultan de utilidad en la tecnología de fabricación de artículos absorbentes.

[Listado de referencias]

- 1 artículo absorbente
- 2 lámina superior

- 3 lámina inferior
- 4 absorbente
- 5 lámina impermeable
- 6 frunce
- 6A frunce de cintura
- 6B frunce de pierna
- 7, 7A, 7B, 7L, 7M trama
- 10 porción de línea de cintura anterior
- 10A primer borde lateral
- 20 porción de línea de cintura posterior
- 20A segundo borde lateral
- 30 porción de entrepierna
- 30A elemento de porción de entrepierna
- 40 aberturas que circundan las piernas
- 50 porciones de empalme
- 50A región de empalme
- 60 aberturas de cintura
- 100, 100A transportador
- 110 mecanismo transportador
- 111 rodillo
- 111A centro de eje
- 120 (120A, 120B) mecanismo de ajuste del borde lateral
- 121 primer mecanismo de ajuste
- 122 segundo mecanismo de ajuste
- 205 placa base
- 210 placa móvil
- 220 mecanismo guía
- 221 accionador
- 222 unidad de rodillos
- 223 rodillo de compresión superior
- 224 rodillo de compresión inferior
- 230 mecanismo de detección
- 231 brazo superior
- 231a proyector superior

232 brazo inferior

232a proyector inferior

232b cable de salida

240 (240A, 240B) mecanismo de transmisión

Reivindicaciones

1. Un transportador que transporta selectivamente una trama continua para un primer tamaño y una trama continua para un segundo tamaño, caracterizado porque comprende:

un mecanismo orientador configurado para cambiar una posición de paso de al menos una de las porciones laterales terminales de la trama entrando en contacto con la porción lateral terminal de la trama;

un mecanismo de detección configurado para detectar la posición de paso de la porción lateral terminal de la trama; y

un mecanismo de transmisión configurado para desplazar el mecanismo orientador y el mecanismo de detección en una dirección transversal perpendicular a una dirección de transporte de la trama de acuerdo al primer tamaño o el segundo tamaño una distancia de desplazamiento igual en la dirección transversal de la trama, en tanto

el mecanismo de transmisión mueve el mecanismo orientador y el mecanismo de detección

2. El transportador de acuerdo a la Reivindicación 1, caracterizado porque el mecanismo de transmisión mueve el mecanismo orientador y el mecanismo de detección independientemente entre si.

3. El transportador de acuerdo a la Reivindicación 1, caracterizado porque

el mecanismo orientador y el mecanismo de detección están acoplados a una sola estructura, y

el mecanismo de transmisión mueve la estructura en la dirección transversal de la trama.

4. El transportador de acuerdo a la Reivindicación 3, caracterizado porque

el mecanismo orientador puede desplazarse sobre la estructura en la dirección transversal de la trama.

5. El transportador de acuerdo a cualquiera de las Reivindicaciones 1 a 4, caracterizado porque

el mecanismo orientador incluye

una unidad de rodillos de compresión que entran en contacto con la porción lateral terminal de la trama, y

un accionador configurado para rotar un centro de eje de la unidad de rodillos de compresión sobre un extremo del centro de eje de la unidad de rodillos de compresión en una vista en planta de la trama.

6. El transportador de acuerdo a la Reivindicación 5, caracterizado porque

la unidad de rodillos de compresión incluye

un primer rodillo de compresión configurado para entrar en contacto con una de las superficies de la trama, y

un segundo rodillo de compresión orientado hacia el primer rodillo de compresión a través de la trama y configurado para ponerse en contacto con la otra superficie de la trama.

7. Un método de fabricación de un artículo absorbente que posee al menos un primer tamaño y un segundo tamaño, caracterizado porque comprende el paso de cambiar una posición de paso de una porción lateral terminal de una trama continua mientras la trama es transportada por un transportador que comprende un mecanismo orientador, un mecanismo de detección y un mecanismo de transmisión, la trama ha de ser procesada en el artículo absorbente, en tanto

el mecanismo orientador cambia una posición de paso de

al menos una de las porciones laterales terminales de la trama entrando en contacto con la porción lateral terminal de la trama;

el mecanismo de detección detecta la posición de paso de la porción lateral terminal de la trama; y

el mecanismo de transmisión mueve el mecanismo orientador y el mecanismo de detección en una dirección transversal perpendicular a la dirección de transporte de la trama de acuerdo al primer tamaño y al segundo tamaño una distancia de desplazamiento igual en la dirección transversal de la trama.

8. El método de fabricación de un artículo absorbente de acuerdo a la Reivindicación 7, caracterizado porque comprende además el paso de plegar la trama a lo largo de una posición de pliegue que se extiende en la dirección de transporte de la trama llevando una de las porciones laterales terminales de la trama hacia la otra porción lateral terminal de la trama, en tanto

el mecanismo guía, el mecanismo de detección y el mecanismo de transmisión se proveen para cada una de las porciones laterales terminales de la trama.

Resumen de la invención

El transportador de trama 100 de acuerdo a la presente invención transporta una trama continua 7L para el tamaño L y una trama continua 7M para el tamaño M. El transportador 100 incluye un mecanismo orientador 220 que cambia una posición de paso de una porción lateral terminal de una trama 7, un mecanismo de detección 230 que detecta la posición de paso de la porción lateral de la trama 7, y un mecanismo de transmisión 240 que desplaza el mecanismo orientador 220 y el mecanismo de detección 230 juntos en la dirección transversal CD (dirección a lo ancho) de la trama 7 de acuerdo al tamaño como tamaño L o tamaño M, entrando en contacto con una primera porción lateral terminal 10A y una segunda porción lateral terminal 20A de la trama 7. El mecanismo de transmisión 240 mueve el mecanismo orientador 220 y el mecanismo de detección 230 a través de una distancia de desplazamiento igual en la dirección transversal CD de la trama.

FIG. 1

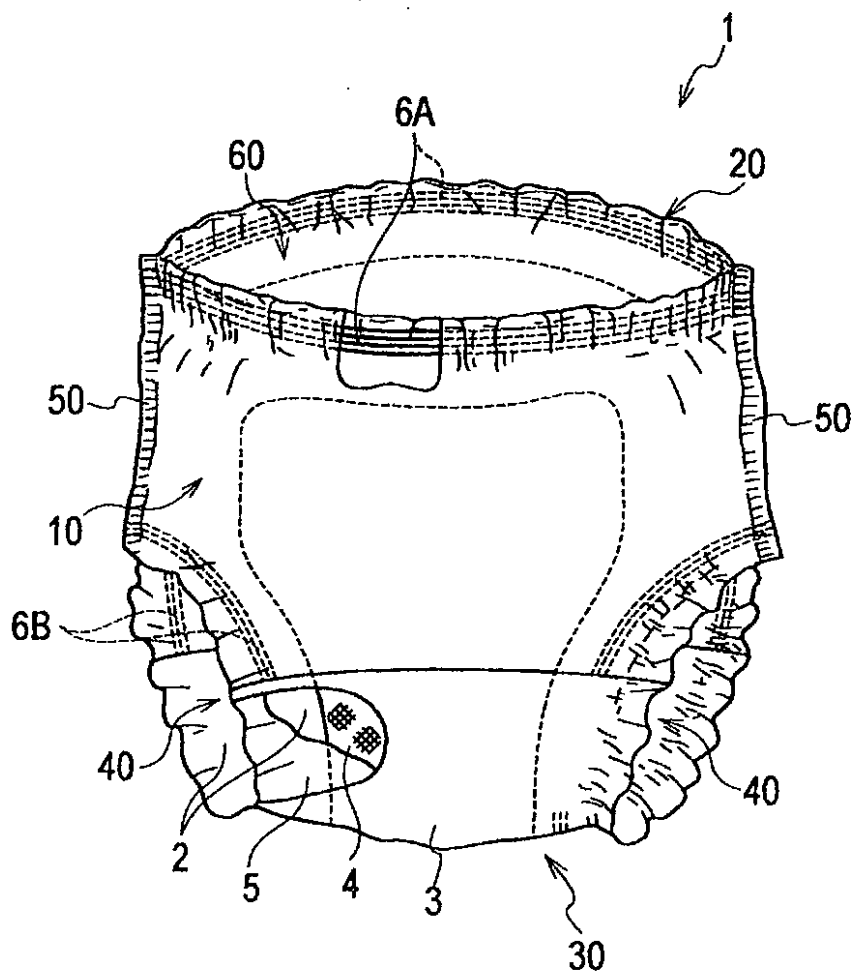


FIG. 2

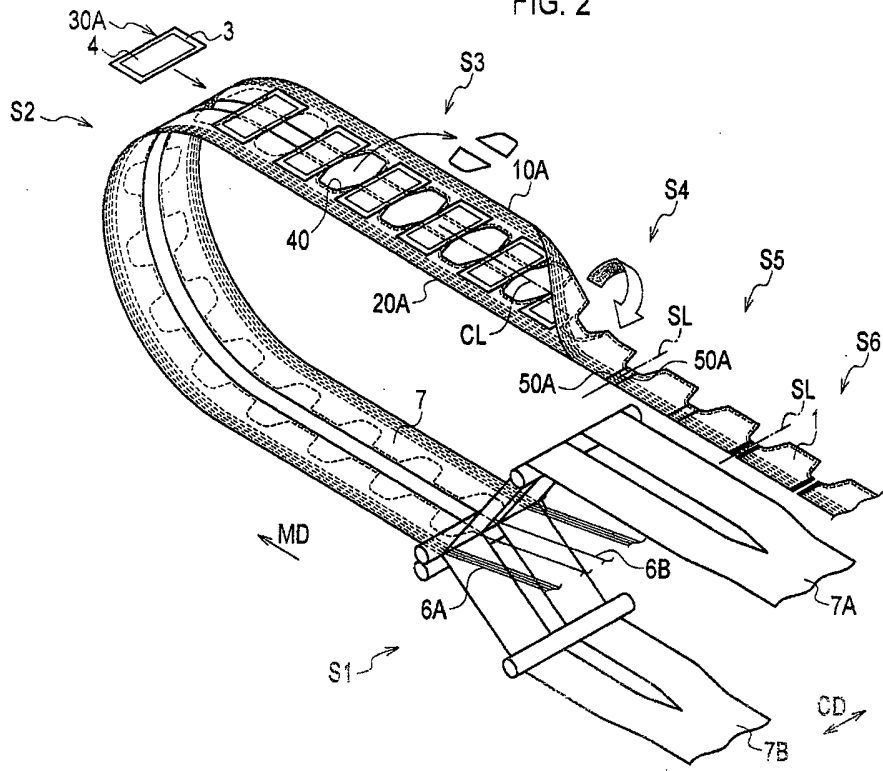


FIG. 3

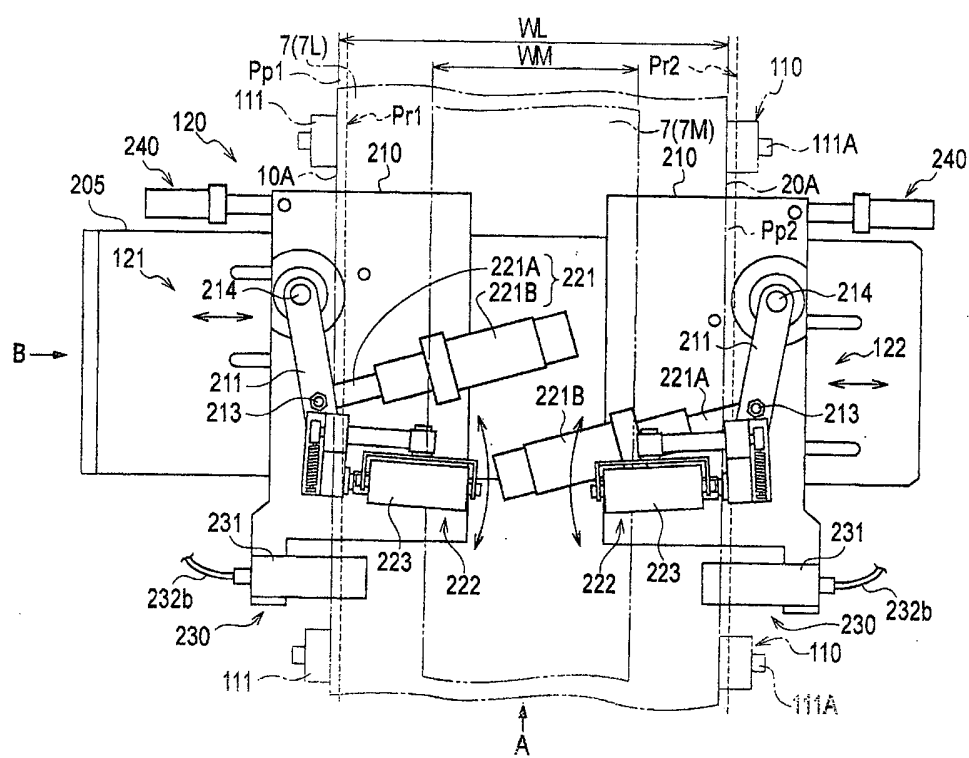


FIG. 4

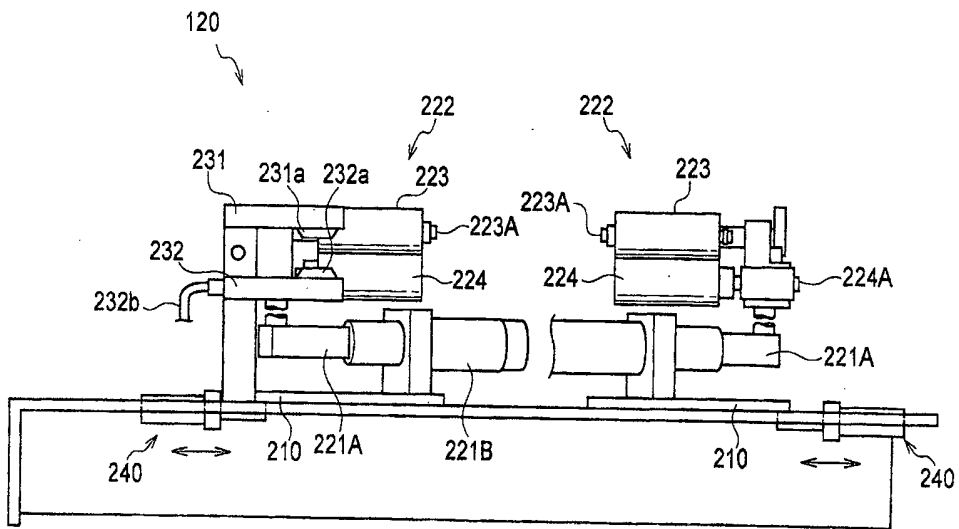


FIG. 5

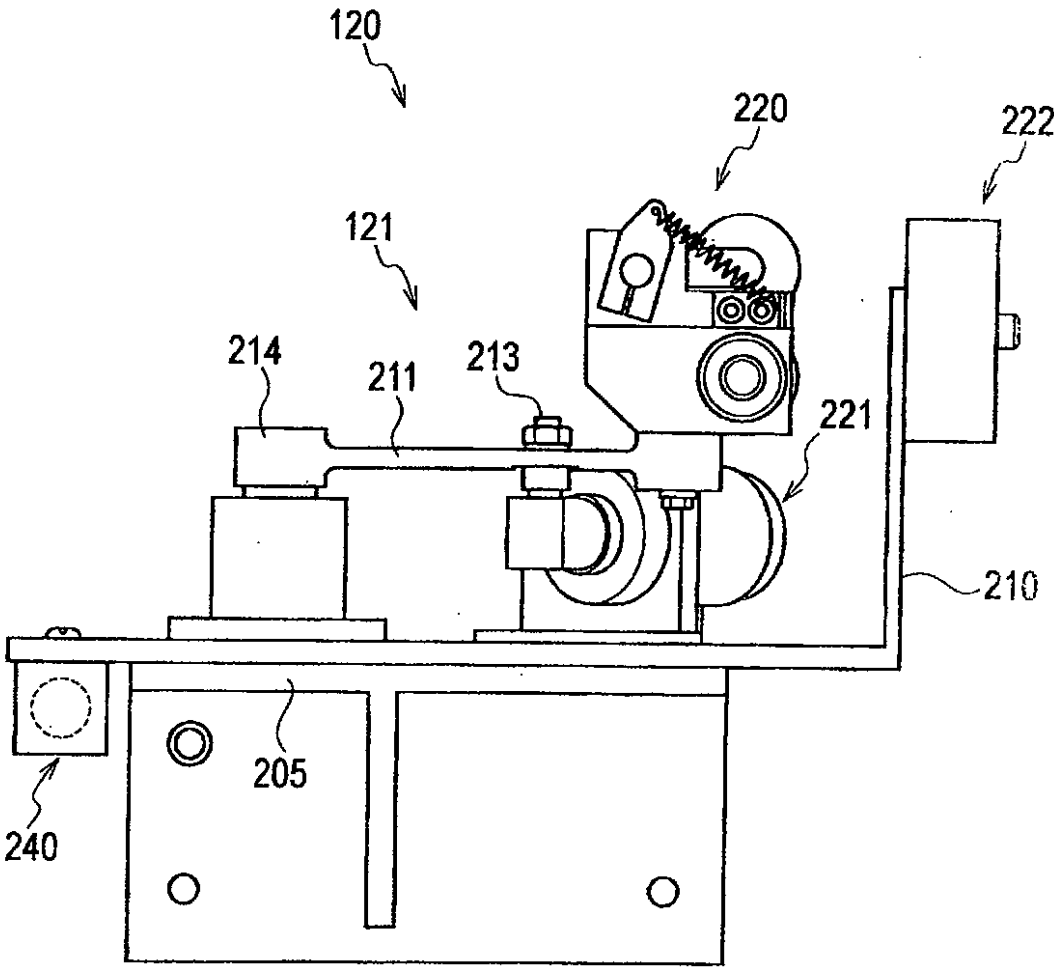


FIG. 6

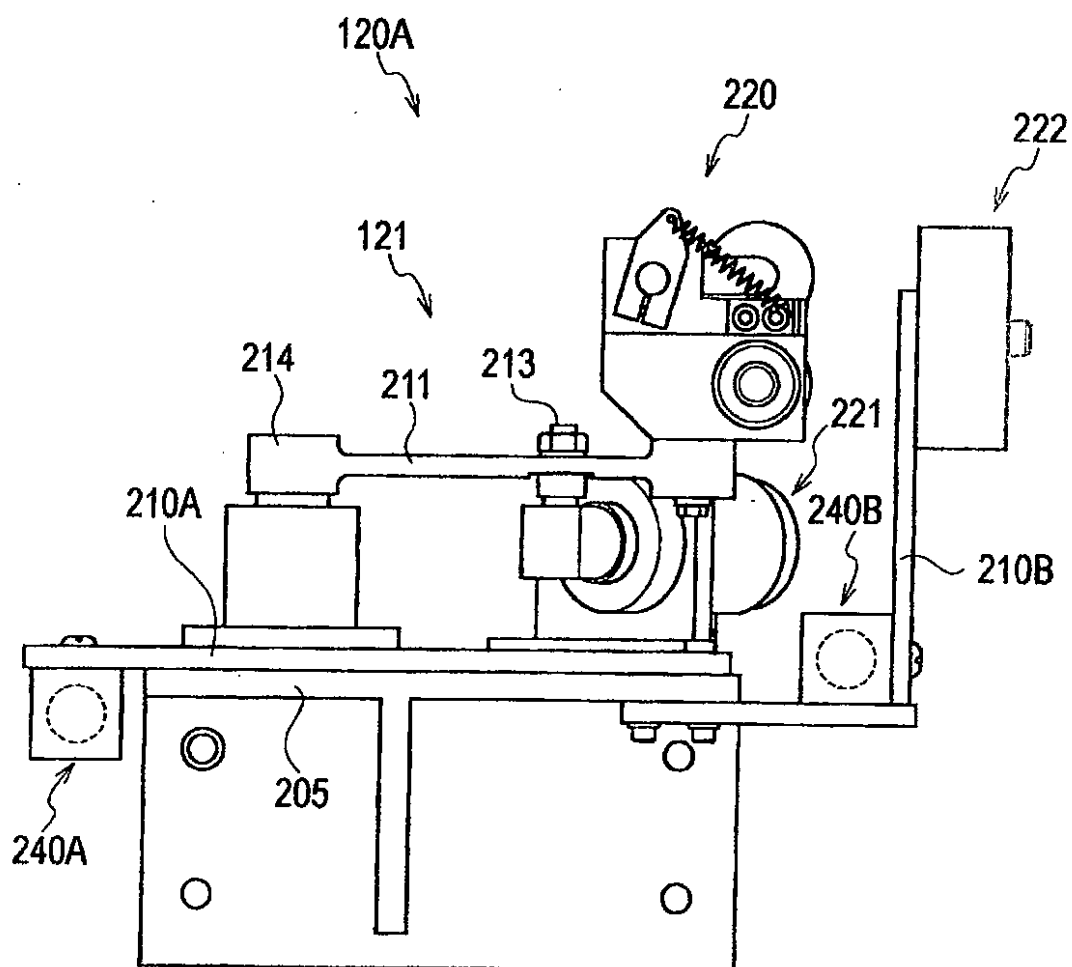
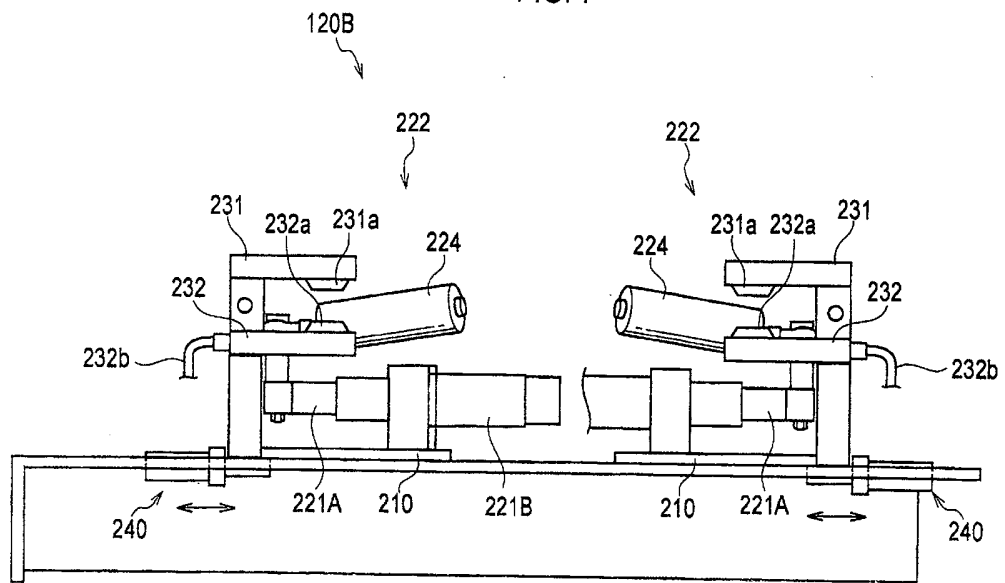


FIG. 7



DESCRIPTION**Title of Invention**

CONVEYOR AND METHOD OF MANUFACTURING ABSORBENT ARTICLE

5

Technical Field

The present disclosure relates to a conveyor and a method of manufacturing an absorbent article using such a conveyor to selectively convey continuous webs of different sizes.

10

Background Art

A method of manufacturing an absorbent article such as a pants-type diaper, a sanitary napkin and a panty liner is implemented in an assembly line. For instance, a continuous web including a continuum of top sheets and a continuum of back sheets to form absorbent articles is conveyed under tension in a web conveyance direction by a conveyor. Then, component members such as a gather (elastic member) and a waterproof film are placed on the web being conveyed under tension in the web conveyance direction.

20

In some cases, a side edge portion of a web during conveyance may be misaligned in a cross direction (a web width direction) perpendicular to a web conveyance direction. To address this problem, there is a known conveyor configured to adjust the passing position where a side edge portion of a web passes during conveyance (see ~~Patent Literature~~ PTL 1, for example). Specifically, the conveyor includes nip rollers, an actuator and a sensor as a detection mechanism.

25

The nip rollers include two rollers configured to hold at least one of side edge portions of a web. The nip rollers are each rotatable about one end of a shaft in a plan view of the web. The actuator is coupled to the nip rollers through an arm and the like, and rotates the nip rollers. The sensor detects

30

the passing position of the side edge portion of the web after passing between the nip rollers.

In the conveyor thus configured, when the sensor determines that the passing position of the side edge portion of the web is misaligned from a predetermined position, the nip rollers are rotated by the actuator to guide the side edge portion of the web outward or inward in the web width direction. Thereby, the conveyor can adjust the passing position of the side edge portion of the web.

Absorbent articles are manufactured in different sizes, such as S size, M size and L size. In this regard, the aforementioned conveyor can convey webs of various sizes by moving the actuator coupled to the nip rollers, and the sensor independently of each other in the web cross direction.

The inventors have discovered that when the size of a web to be being conveyed is changed to a different one, and the actuator and the sensor are independently moved in the web cross direction, and therefore the nip rollers (the actuator) and the sensor may be sometimes misaligned in an inappropriate positional relationship. In this case, the inappropriate positional relationship causes the nip rollers to be rotated by an erroneous amount. To avoid this, the positional relationship between the nip rollers and the sensor needs to be adjusted to a predetermined relationship, which, in turn, requires complicated control for this adjustment. It is desirable to provide a conveyor and a method of manufacturing absorbent articles which are capable of selectively conveying webs of different sizes by changing a passing position of a side edge portion of the web, without having to perform complicated control and/or adjustment.

Under these circumstances, the present invention is aimed to provide a conveyor and a method of manufacturing an absorbent article which are capable of selectively conveying any of webs

for two or more sizes by easily changing a passing position of a side edge portion of the web without having to perform complicated control.

5 Citation List

{Patent Literature}

~~{Patent Literature}~~PTL 1}

——: Japanese Patent Application Publication No. 2004-262556

10 (pp. 2 and 3, Figs. 2 and 3)

Summary

To solve the above-described problem, the present invention has the following aspects. A aspect of the present invention provides a conveyor that conveys selectively one of
15 a continuous web for a first size and a continuous web for a second size, comprising: a guide mechanism configured to change a passing position of at least one of side edge portions of the web by being in contact with the side edge portion of the web;
20 a detection mechanism configured to detect the passing position of the side edge portion of the web; and a drive mechanism configured to move the guide mechanism and the detection mechanism in a cross direction perpendicular to a conveyance direction of the web according to any one of the first size and
25 the second size by an equal traveling distance in the cross direction of the web.

According to the aspect of the present invention, there can be provided a conveyor and a method of manufacturing an absorbent article which are capable of selectively conveying
30 any of webs for two or more sizes by easily changing a passing position of a side edge portion of the web without having to perform complicated control.

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.

[Fig. 2] Fig. 2 is a diagram for explaining a relevant part of a method of manufacturing absorbent articles according to one or more embodiments.

[Fig. 3] Fig. 3 is a plan view of a conveyor according to one or more embodiments.

[Fig. 4] Fig. 4 is a front view of the conveyor of FIG. 3.

[Fig. 5] Fig. 5 is a side view of the conveyor of FIG. 3.

[Fig. 6] Fig. 6 is a side view of a side edge adjusting mechanism according to a Modified Example 1.

[Fig. 7] Fig. 7 is a front view of a side edge adjusting mechanism according to a Modified Example 2.

[Fig. 8] Fig. 8 is a perspective view of a conveyor according to a Modified Example 3.

Detailed Description

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

Firstly, a configuration of an absorbent article 1 according to one or more embodiments will be explained with reference to Fig. 1 which is a partially cutaway perspective

view showing the absorbent article 1. In this particularly illustrated embodiment, the absorbent article 1 is a disposable pants-type diaper for adults. The absorbent article 1 may have different sizes, such as L size (first size) and M size (second size).

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

The top sheet 2 is adapted to come into contact with the skin of a person to wear the absorbent article 1 (hereinafter, "wearer"). The top sheet 2 is made of a liquid permeable sheet such as a nonwoven fabric or a perforated plastic film. The back sheet 3 is provided outside the top sheet 2 (on the side facing away from the wearer). The back sheet 3 is made of a nonwoven fabric or the like.

The absorber 4 is provided between the top sheet 2 and the back sheet 3, and for absorbing excretion discharged from the wearer. The absorber 4 is made of a mixture of ground pulp and superabsorbent polymer particles, or the like. The waterproof sheet 5 is provided between the back sheet 3 and the absorber 4, for blocking the permeation of the excretion from the wearer to the outside of the absorbent article 1. The waterproof sheet 5 is made of a liquid impermeable sheet.

The absorbent article 1 thus configured includes, in combination, a front waistline portion 10 to be fitted to the front waist of a wearer, a back waistline portion 20 to be fitted to the back waist of the wearer, and a crotch portion 30 to be fitted to the crotch of the wearer. Incidentally, leg-surrounding openings 40 into which the legs of the wearer are inserted are formed at both sides of the crotch portion 30.

The front waistline portion 10 and the back waistline portion 20 are joined together by joint portions 50, and thereby form a waist opening to be fit around the body of the wearer.

A waist gather 6A made of a stretchable rubber strand or the like is provided to an entire peripheral edge of the front waistline portion 10 and the back waistline portion 20.

For example, to make the front waistline portion 10 and the back waistline portion 20 stretchable in the cross direction perpendicular to the front-to-back direction from the front waistline portion 10 toward the back waistline portion 20, the front waistline portion 10 and the back waistline portion 20 may be provided with the waist gather 6A, or may themselves be made of a stretchable sheet—.

The crotch portion 30 is provided between the front waistline portion 10 and the back waistline portion 20. Leg gathers 6B made of stretchable rubber strands or the like are provided on both sides of the crotch portion 30.

For example, to make the crotch portion 30 stretchable in the leg-encircling, the crotch portion 30 may be provided with the leg gathers 6B, or may itself be made of a stretchable sheet—.

Secondly, a method of manufacturing absorbent articles according to one or more embodiments will be explained with reference to Fig. 2 which is a diagram for explaining a relevant part of the absorbent article manufacturing method.

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

In the waistline forming step S1, gathers (a waist gather 6A and/or a leg gather 6B) are placed between a web 7A and a web 7B, and thereby a web 7 prepared to form the front waistline portion 10 and the back waistline portion 20 is formed.

Note that the web 7 (webs 7A, 7B) during conveyance is stretchable in a cross direction CD (width direction) perpendicular 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.

5 In the absorber transferring step S2, a crotch portion member 30A to form the crotch portion 30 is transferred onto the web 7, more specifically, between the front waistline portion 10 and the back waistline portion 20 after the waistline forming step S1. Here, the crotch portion member 30A includes the back sheet 3 and the absorber 4.

10 In the leg-surrounding forming step S3, the leg-surrounding openings 40 (so-called leg holes) are formed by cutting the web 7 (webs 7A, 7B) after the absorber transferring step S2. Here, the formation of the leg-surrounding opening 40 does not necessarily involve cutting only the web 7A and the
15 web 7B, but may involve cutting, together with the web 7A and the web 7B, the back sheet 3 constituting the crotch portion member 30A.

Note that the absorber transferring step S2 and the leg-surrounding forming step S3 may be performed in the reverse
20 order.

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

Note that, in this particularly illustrated embodiment, the folding line is the center line CL. However, the folding line is not necessarily the center line CL, and may be shifted
30 from the center line CL toward either of the first side edge portion 10A and the second side edge portion 20A.

In the joining step S5, the folded parts of the web 7 are joined together in joint regions 50A through ultrasonic

treatment or heat treatment after the folding step S4. The joint region 50A extends in the conveyance direction MD across an imaginary line SL that indicates a to-be-cut position and extends in the cross direction CD of the web 7.

5 In the cutting step S6, the web 7 joined in the joint regions 50A is cut along the imaginary lines SL after the joining step S5. Thereby, the absorbent article 1 is manufactured.

 Here, the method of manufacturing absorbent articles includes conveying steps between the steps (S1 to S6). In each
10 of the conveying steps, the web 7 to be processed into the absorbent article 1 is conveyed by a conveyor 100, which will be described later. This conveying step includes a changing step of changing the passing position of a side edge portion of the continuous web 7 to be processed into the absorbent article
15 1 during conveyance of the web 7.

 Hereinafter, a configuration of the conveyor 100 used in the conveying step and the changing step will be described with reference to Figs. 3-5. Fig. 3 is a plan view of the conveyor 100 according to one or more embodiments. Fig. 4 is a front view
20 of the conveyor 100 as seen in the direction of arrow A in Fig. 3. Fig. 5 is a side view of the conveyor 100 as seen in the direction of arrow B in Fig. 3.

 Since the conveyors 100 used in the conveying steps before the steps (S1 to S6) have the same configuration, the description
25 will be provided by taking, as an example, the conveyor 100 that conveys the web 7 before the waistline forming step S1.

 As shown in Figs. 3 to 5, the conveyor 100 conveys the web 7 under tension in the conveyance direction MD of the web 7. The conveyor 100 can convey webs 7 of different sizes (i.e.,
30 widths) such as a web 7L for L size or a web 7M for M size. In Fig. 3, the conveyor 100 is illustrated as conveying the web 7L for L size. The conveyor 100 includes a conveyor mechanism 110 and a side edge adjusting mechanism 120.

The conveyor mechanism 110 includes multiple rollers 111 configured to rotate along with conveyance of the web 7. At least one roller 111 of the multiple rollers 111 is driven to rotate about a shaft 111A by a drive unit (unillustrated). The drive unit includes a motor, or the like, configured to rotate the roller 111 through the shaft 111A.

The side edge adjusting mechanism 120 changes the passing position (Fig. 3 position Pr1, Pr2) of a side edge portion (the first side edge portion 10A or the second side edge portion 20A) of the web 7 being conveyed by the conveyor mechanism 110. The side edge adjusting mechanism 120 includes a first adjusting mechanism 121 and a second adjusting mechanism 122. The first adjusting mechanism 121 is configured to change the passing position (Fig. 3 position Pr1) of the first side edge portion 10A of the web 7 during conveyance, and the second adjusting mechanism 122 is configured to change the passing position (Fig. 3 position Pr2→) of the second side edge portion 20A of the web 7 during conveyance.

The first adjusting mechanism 121 and the second adjusting mechanism 122 are attached to a base plate 205 across which the web 7 travels. The first adjusting mechanism 121 and the second adjusting mechanism 122 operate independently of each other, but practically have the same configuration. For this reason, only the configuration of the first adjusting mechanism 121 will be mainly described below. In the drawings, the same reference numerals denote the same elements or portions in the first adjusting mechanism 121 and the second adjusting mechanism 122.

The first adjusting mechanism 121 includes a movable plate 210, a guide mechanism 220, a detection mechanism 230 and a drive mechanism 240. The movable plate 210 is attached to the base plate 205 so as to be movable in the cross direction CD of the web 7.

The guide mechanism 220 is attached to the movable plate

210. The guide mechanism 220 changes the passing position of the first side edge portion 10A of the web 7. Specifically, the guide mechanism 220 includes an actuator 221 and a roller unit 222.

5 In the plan view of the web 7 (see Fig. 3), the actuator 221 rotates an upper nip roller 223 and a lower nip roller 224, which will be described later, about one end of a shaft 223A of the upper nip roller 223 and one end of a shaft 224A of the lower nip roller 224, respectively. The actuator 221 includes
10 a slide arm 221A, a servomotor 221B configured to extend and contract the slide arm 221A, and a ball screw joint unit (unillustrated) interposed between the servomotor 221B and the slide arm 221A.

An end portion of the slide arm 221A is connected to an
15 end portion 212 of a swing arm 211 with a connecting shaft 213. The swing arm 211 is attached to the movable plate 210, more specifically, is rotatably attached to the movable plate 210 with a fixed shaft 214.

The roller unit 222 is attached to the end portion 212 of
20 the swing arm 211. The roller unit 222 includes the upper nip roller 223 and the lower nip roller 224. The upper nip roller 223 rotates about the shaft 223A, and comes into contact with one of the surfaces (upper surface) of the web 7. The lower nip roller 224 rotates about the shaft 224A and comes into contact
25 with the other surface (lower surface) of the web 7. In other words, the lower nip roller 224 faces the upper nip roller 223 across the web 7.

The detection mechanism 230 is provided downstream of the guide mechanism 220 in the conveyance direction MD of the web
30 7. The detection mechanism 230 is electrically connected to the actuator 221, and detects the passing position of the first side edge portion 10A of the web 7. The detection mechanism 230 compares the detected passing position of the first side edge

portion 10A of the web 7 (Fig. 3 position Pr1) with a predetermined position where the first side edge portion 10A of the web 7 (Fig. 3 position Pp1+) is supposed to pass in the manufacturing process of the absorbent article 1. The detection mechanism 230

5 calculates a direction and a distance which are necessary to move the first side edge portion 10A to the predetermined position.

The detection mechanism 230 includes ~~ana~~ projector 231a mounted on an upper arm 231, and a photodetector 232a provided
10 below the projector 231a across the web 7 and mounted on a lower arm 232. The photodetector 232a is connected to the actuator 221 through an output cord 232b. The detection mechanism 230 detects the light emitted from the upper projector 231a using the photodetector 232a. Specifically, the detection mechanism
15 230 detects the position of the web 7 based on the amount of light detected by the ~~notodetector~~ photodetector 232a.

Incidentally, the projector 231a may be mounted on the lower arm 232. Further, the photodetector 232a may be mounted on the upper arm 231. In Fig. 4, the detection mechanism 230 of the
20 second adjusting mechanism 122 is omitted.

Here the guide mechanism 220 and the detection mechanism 230 are coupled to each other by the movable plate 210. In other words, the guide mechanism 220 and the detection mechanism 230 are moved together in the cross direction CD of the web 7 by
25 the drive mechanism 240 as disclosed herein. Here, this together movement includes a movement in which the guide mechanism 220 and the detection mechanism 230 move together, and also a movement in which the guide mechanism 220 and the detection mechanism 230 move together while changing the passing
30 position of the side edge portion of the web 7.

The drive mechanism 240 moves the movable plate 210 thereby to move the guide mechanism 220 and the detection mechanism 230 together in the cross direction CD of the web 7 according to

a size of the web 7, such as L size or M size. More specifically, the drive mechanism 240 moves the guide mechanism 220 and the detection mechanism 230 together by moving the movable plate 210 in the cross direction CD of the web 7 according to a width
5 W_L of the web 7 for L size, or a width W_M of the web 7 for M size.

Thus, the drive mechanism 240 moves the guide mechanism 220 and the detection mechanism 230 by the same traveling distance in the cross direction CD of the web 7. The drive mechanism 240 includes an actuator or the like electrically
10 connected to the detection mechanism 230.

Hereinafter, an operation of the foregoing first adjusting mechanism 121 will be described with reference to Figs. 3 to 5. Specifically, the following description will be provided for an operation of the first adjusting mechanism 121 in changing
15 the size of the absorbent article 1 being manufactured.

As shown in Figs. 3 to 5, the detection mechanism 230 compares the detected passing position of the first side edge portion 10A with a predetermined position for a predetermined size of the absorbent article 1. The drive mechanism 240 moves
20 the guide mechanism 220 and the detection mechanism 230 in the cross direction CD of the web 7 according to the size such as L size or M size, that is, according to an instruction from the detection mechanism 230. Then, the guide mechanism 220 rotates the roller unit 222 by a certain angle by driving the actuator
25 221 according to the instruction from the detection mechanism 230.

In the case where the M size is changed to the L size, for example, the predetermined position is changed to correspond to the L size. In other words, the conveyor 100 is switched from
30 the conveyance of the web 7M for M size to the conveyance of the web 7L for L size. For this switching, the drive mechanism 240 moves the guide mechanism 220 and the detection mechanism 230 outward in the cross direction CD of the web 7. Then, by

rotating the roller unit 222 by a certain angle, the guide mechanism 220 can move, with an appropriate force, the edges 10A, 20A of the web 7 to the desired positions to increase or reduce the width W_L or W_M of the web 7.

5 As disclosed herein, the drive mechanism 240 moves the guide mechanism 220 and the detection mechanism 230 together in the cross direction CD of the web 7 (width direction) according to the size such as L size or M size, and also equalizes the traveling distances of the guide mechanism 220 and the detection
10 mechanism 230 to each other in the cross direction CD of the web 7. In this case, the guide mechanism 220 (the actuator 221 and the roller unit 222) and the detection mechanism 230 are prevented from being misaligned in an inappropriate positional relationship, unlike the case where the guide mechanism 220 and
15 the detection mechanism 230 are independently moved. Accordingly, even when the size of the absorbent article 1 to be manufactured is changed, the roller unit 222 is prevented from rotating by an erroneous amount, and no adjustment is needed to correct the positional relationship between the guide
20 mechanism 220 and the detection mechanism 230 to the predetermined relationship. Thus, the passing positions of the first side edge portion 10A and the second side edge portion 20A of the web 7 can be changed without a need to perform complicated control.

25 As disclosed herein, the guide mechanism 220 and the detection mechanism 230 are coupled to each other by the single movable plate 210, and are moved in the cross direction CD of the web 7 by the drive mechanism 240. With this configuration, the guide mechanism 220 and the detection mechanism 230 are moved
30 surely by the same travelling distance in the cross direction CD of the web 7. Thus, the guide mechanism 220 and the detection mechanism 230 are more surely prevented from being misaligned in an inappropriate positional relationship.

As disclosed herein, the guide mechanism 220 moves above the movable plate 210 in the cross direction CD of the web 7. With this configuration, the guide mechanism 220 is capable of fine adjustment in changes in the passing positions of the first side edge portion 10A and the second side edge portion 20A of the web 7. Therefore, the passing positions of the first side edge portion 10A and the second side edge portion 20A of the web 7 can be changed more easily.

10 **Modified Examples**

The side edge adjusting mechanism 120 according to the foregoing description may be modified as follows. Here, the description will be provided mainly for the differences from the foregoing description, with the same or similar reference signs denoting the same or similar elements.

Modified Example 1

Fig. 6 is a side view of a side edge adjusting mechanism 120A according to a Modified Example 1. In the aforementioned description, the guide mechanism 220 and the detection mechanism 230 are coupled to the single movable plate 210. In contrast, in the Modified Example 1, a guide mechanism 220 and a detection mechanism 230 are independent of each other.

Specifically, as shown in Fig. 6, the guide mechanism 220 and the detection mechanism 230 are not coupled to each other by the movable plate 210. The guide mechanism 220 is coupled to a movable plate 210A, and is movable in the cross direction CD of the web 7 by a drive mechanism 240A. The detection mechanism 230 is coupled to a movable plate 210B, and is movable in the cross direction CD of the web 7 by a drive mechanism 240B.

The drive mechanisms 240A and 240B independently move the guide mechanism 220 and the detection mechanism 230, respectively, on the condition that the guide mechanism 220 and

the detection mechanism 230 move by the same traveling distance in the cross direction CD of the web 7. Thus, the drive mechanisms 240A and 240B are capable of finely adjusting the guide mechanism 220 and the detection mechanism 230

5 independently, without misaligning the guide mechanism 220 and the detection mechanism 230 in an inappropriate positional relationship. Accordingly, the passing positions of the first side edge portion 10A and the second side edge portion 20A of the web 7 can be changed easily.

10

Modified Example 2

Fig. 7 is a front view of a side edge adjusting mechanism 120B according to a Modified Example 2. In the aforementioned description, the roller unit 222 includes the upper nip roller 223 and the lower nip roller 224. In contrast, in the Modified Example 2, a roller unit 222 includes only a lower nip roller 224.

Specifically, as shown in Fig. 7, the lower nip roller 224 is inclined to have a slope upward toward the web 7 in order to come into pressure contact with the web 7 from below. With this configuration, the lower nip roller 224 is capable of guiding the first side edge portion 10A of the web 7 to the predetermined position. The slope of the lower nip roller 224 can be adjusted to a degree appropriate according to properties, such as the flexibility, the stretchability, and the surface slipperiness, of the web 7.

The roller unit 222 does not necessarily include only the lower nip roller 224, but may include only an upper nip roller 223. In this case, the upper nip roller 223 is inclined to have a slope downward toward the web 7 in order to come into pressure contact with the web 7 from above.

In the Modified Example 2, having only any one of the upper nip roller 223 and the lower nip roller 224, the roller unit

222 is capable of obtaining the same advantageous effects as in the aforementioned description.

Modified Example 3

5 Fig. 8 is a perspective view of a conveyor 100A according to a Modified Example 3. In the aforementioned description, the conveyor 100 is used between the steps (S1 to S6). In contrast, the conveyor 100 A in the Modified Example 3 is used in the folding step S4.

10 Specifically, as shown in Fig. 8, the conveyor 100A is provided in a location where the web 7 is folded along the folding line by bringing the first side edge portion 10A toward the second side edge portion 20A. To be more precise, an unillustrated movable plate 210, a guide mechanism 220, a detection mechanism
15 230 and an unillustrated drive mechanism 240 are provided to each of the first side edge portion 10A and the second side edge portion 20A.

 In the Modified Example 3, in the folding step S4, the conveyor 100A is used and produces the same advantageous effects
20 as in the aforementioned description even when the size of the absorbent article 1 is changed. As a result, the conveyor 100A allows the first side edge portion 10A to be surely placed exactly
| on the ~~the~~ second side edge portion 20A in the web 7.

Further Embodiments

25 As described above, the details of several embodiments 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
30 disclosure, those skilled in the art may easily come up with various alternative embodiments, examples and operation techniques.

 For example, the following additional embodiments can be

envisaged. Specifically, the absorbent article 1 has been described as including, in combination, the front waistline portion 10, the back waistline portion 20 and the crotch portion 30. The absorbent article 1 is not limited to this configuration, but may be formed entirely as a single unit. In this case, needless to say, a different method of manufacturing such an absorbent article is employed.

Additionally, the description has been provided for the conveyor 100 used in the manufacturing of a pants-type disposal diaper. However, the conveyor 100 is not limited to such use. For example, the conveyor 100 may be used to manufacture another product such as an open-type disposal diaper, a sanitary napkin and a panty liner, for example. In other words, the conveyor 100 may be used at least for the conveyance of any web 7 that is stretchable in the cross direction CD of the web 7, not necessarily for the manufacturing of the absorbent article 1. As long as the conveyor 100 conveys a stretchable web 7, the conveyor 100 may be used between steps other than the steps described with respect to Fig. 2.

Moreover, the description has been provided for the conveyor 100 used to convey a single web 7. However, the conveyor 100 is not limited to such use. For example, when a web including a continuum of the front waistline portions 10 and a web including a continuum of the back waistline portions 20 are conveyed simultaneously, a single conveyor 100 may be provided for each or both of the webs. In addition, multiple conveyors 100 may be provided between any two of the process steps.

In addition, the absorbent article 1 has been described as having size variations such as L size and M size. The size variations are not limited to these sizes, but may include two or more different sizes. For example, the size variations may include three sizes such as L size, M size and S size.

Further, the conveyor mechanism 110 has been described as

one including multiple rollers 111. However, the conveyor mechanism 110 should not be limited to this configuration, and may have another configuration, such as a belt conveyor, as long as the configuration allows the conveyor mechanism 110 to convey the web 7.

The side edge adjusting mechanism 120 has been described as one including the first adjusting mechanism 121 and the second adjusting mechanism 122. However, the side edge adjusting mechanism 120 should not be limited to this configuration, and may include only one of the adjusting mechanisms. In other words, the side edge adjusting mechanism 120 may be provided to at least one of the side edge portions of the web 7.

Additionally, although the movable plate 210 has been described as one coupling the guide mechanism 220 and the detection mechanism 230 to each other, a frame capable of coupling (fixing) the guide mechanism 220 and the detection mechanism 230 to each other may be used instead of the movable plate 210.

Further, there is no limitation to any positional relationship between the guide mechanism 220, the detection mechanism 230 and the drive mechanism 240, and thereby any appropriate positional relationship can be selected as desired.

Furthermore, a material, a condition of surface finishing, and the length and diameter of the nip rollers can be appropriately selected according to conditions of the web 7 such as a processed condition of the web 7, and an adhesive-applied condition of an adhesive agent that is applied to the web 7 in advance. For example, materials usable as the surface material of the rollers include polyurethane rubber or silicone rubber, a sponge made of such rubber, and a metal.

As described above, the present invention naturally includes various embodiments which are not described herein. Accordingly, the technical scope of the present invention should

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

The entire ~~contents~~content of Japanese Patent Applications 2009-048418 (filed on March 2, 2009) and 2010-042003 (filed on February 26, 2010) are incorporated herein by reference.

Industrial Applicability

Therefore, since the conveyor and method of manufacturing absorbent article of the present invention provides is capable of selectively conveying any of webs for two or more sizes by easily changing a passing position of a side edge portion of the web without having to perform complicated control, it is useful in manufacturing technology for absorbent articles.

Reference Signs List

- 1 absorbent article
- 2 top sheet
- 20 3 back sheet
- 4 absorber
- 5 waterproof sheet
- 6 gather
- 6A waist gather
- 25 6B leg gather
- 7, 7A, 7B, 7L, 7M web
- 10 front waistline portion
- 10A first side edge
- 20 back waistline portion
- 30 20A second side edge
- 30 crotch portion
- 30A crotch portion member
- 40 leg-surrounding openings

- 50 joint portions
- 50A joint region
- 60 waist openings
- 100, 100A conveyor
- 5 110 conveyor mechanism
- 111 roller
- 111A shaft core
- 120 (120A, 120B) side edge adjusting mechanism
- 121 first adjusting mechanism
- 10 122 second adjusting mechanism
- 205 base plate
- 210 movable plate
- 220 guide mechanism
- 221 actuator
- 15 222 roller unit
- 223 upper nip roller
- 224 lower nip roller
- 230 detection mechanism
- 231 upper arm
- 20 231a upper projector
- 232 lower arm
- 232a lower projector
- 232b output cord
- 240 (240A, 240B) drive mechanism

CLAIMS

[Claim 1]

5 A conveyor that conveys selectively one of a continuous web for a first size and a continuous web for a second size, comprising:

a guide mechanism configured to change a passing position of at least one of side edge portions of the web by being in contact with the side edge portion of the web;

10 a detection mechanism configured to detect the passing position of the side edge portion of the web; and

a drive mechanism configured to move the guide mechanism and the detection mechanism in a cross direction perpendicular to a conveyance direction of the web according to any one of
15 the first size and the second size by an equal traveling distance in the cross direction of the web, wherein
~~, wherein~~

the drive mechanism moves the guide mechanism and the
20 detection mechanism.

[Claim 2]

The conveyor according to claim 1, wherein the drive mechanism moves the guide mechanism and the detection mechanism independently of each other.

[Claim 3]

The conveyor according to claim 1, wherein
the guide mechanism and the detection mechanism are coupled to a single frame, and

30 the drive mechanism moves the frame in the cross direction of the web.

[Claim 4]

The conveyor according to claim 3, wherein
the guide mechanism is movable on the frame in the cross
direction of the web.

5 [Claim 5]

The conveyor according to any one of claims 1 to 4, wherein
the guide mechanism includes

a nip roller unit to be in contact with the side edge
portion of the web, and

10 an actuator configured to rotate a shaft core of the
nip roller unit about one end of the shaft core of the nip roller
unit in a planar view of the web.

[Claim 6]

15 The conveyor according to claim 5, wherein
the nip roller unit includes

a first nip roller configured to be in contact with
one of surfaces of the web, and

a second nip roller facing the first nip roller
20 across the web and configured to be in contact with the other
surface of the web.

[Claim 7]

A method of manufacturing an absorbent article having at
25 least a first size and a second size, the method comprising the
step of changing a passing position of a side edge portion of
a continuous web while the web is being conveyed by a conveyor
comprising a guide mechanism, a detection mechanism and a drive
mechanism, the web being to be processed into the absorbent
30 article, wherein

the guide mechanism changes a passing position of
at least one of side edge portions of the web by being in contact
with the side edge portion of the web;

the detection mechanism detects the passing position of the side edge portion of the web; and

the drive mechanism moves the guide mechanism and the detection mechanism in a cross direction perpendicular to
5 the conveyance direction of the web according to any one of the first size and the second size
by an equal traveling distance in the cross direction of the web.

10 [Claim 8]

The method of manufacturing an absorbent article according to claim 7, further comprising the step of folding the web along a folding position extending in the conveyance direction of the web by bringing one of the side edge portions of the web toward
15 the other side edge portion of the web, wherein

the guide mechanism, the detection mechanism and the drive mechanism are provided for each of the one and other side edge portions of the web.

ABSTRACT

The web conveyor 100 conveys a continuous web 7L for L size and a continuous web 7M for M size. The conveyor 100 includes
5 a guide mechanism 220 changing a passing position of a side edge portion of a web 7, a detection mechanism 230 detecting the passing position of the edge portion of the web 7, and a drive mechanism 240 moving the guide mechanism 220 and the detection mechanism 230 together in the cross direction CD (width
10 direction) of the web 7 according to a size such as L size or M size, by being in contact with a first side edge portion 10A and a second side edge portion 20A of the web 7. The drive mechanism 240 moves the guide mechanism 220 and the detection mechanism 230 by an equal traveling distance in the cross
15 direction CD of the web.

FIG. 1

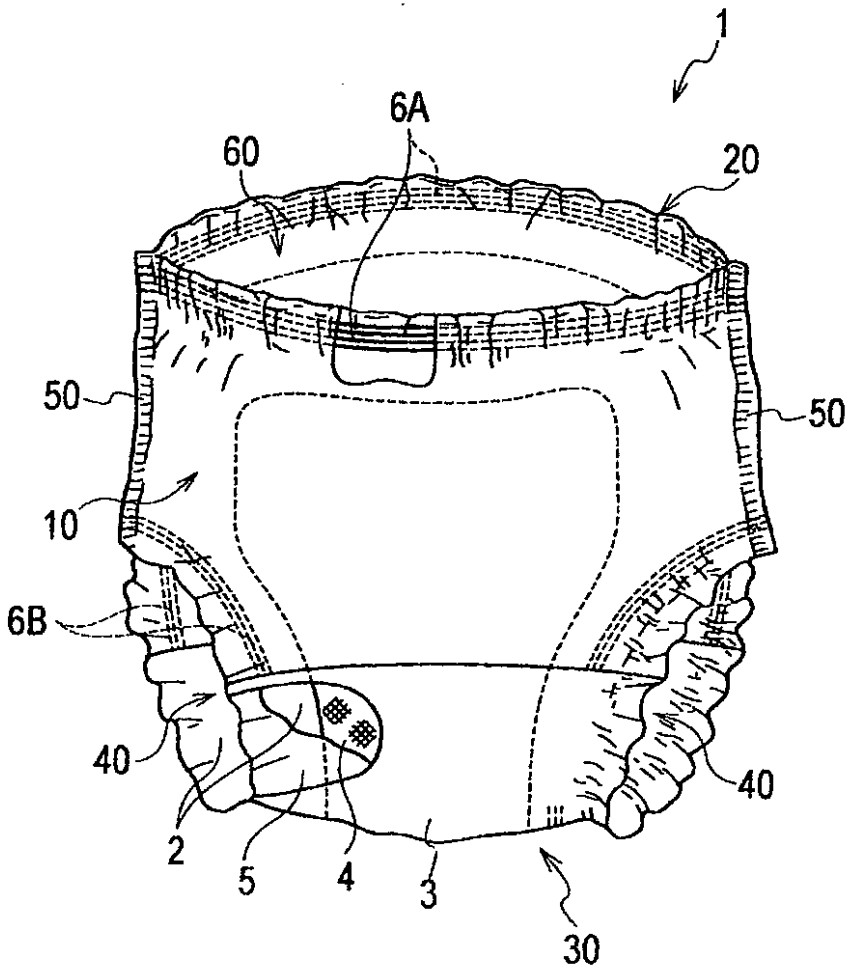


FIG. 2

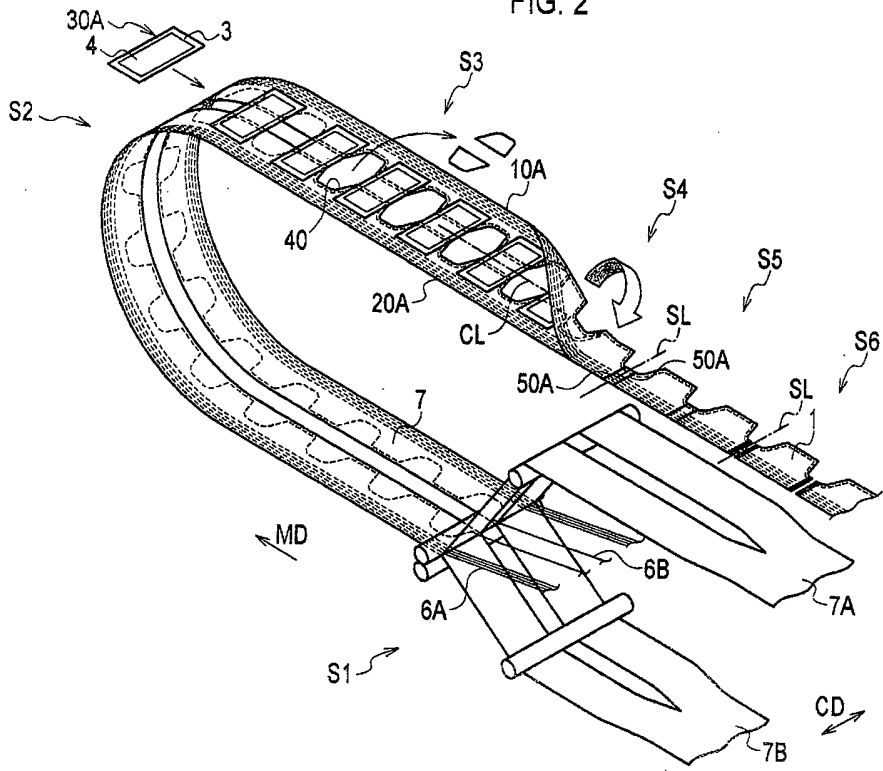


FIG. 3

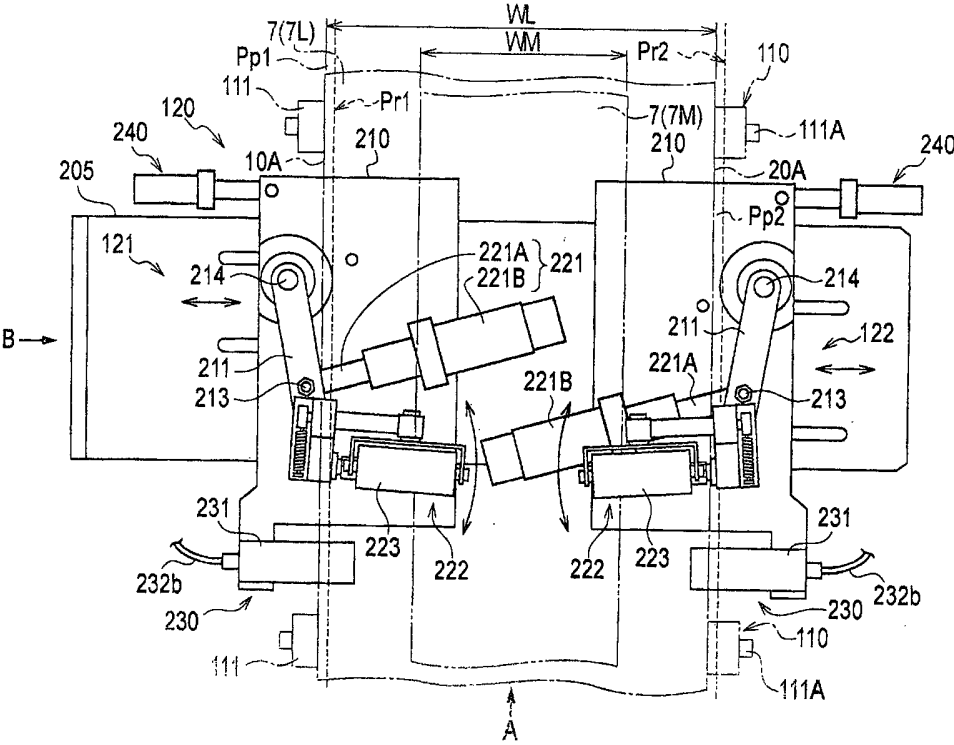


FIG. 4

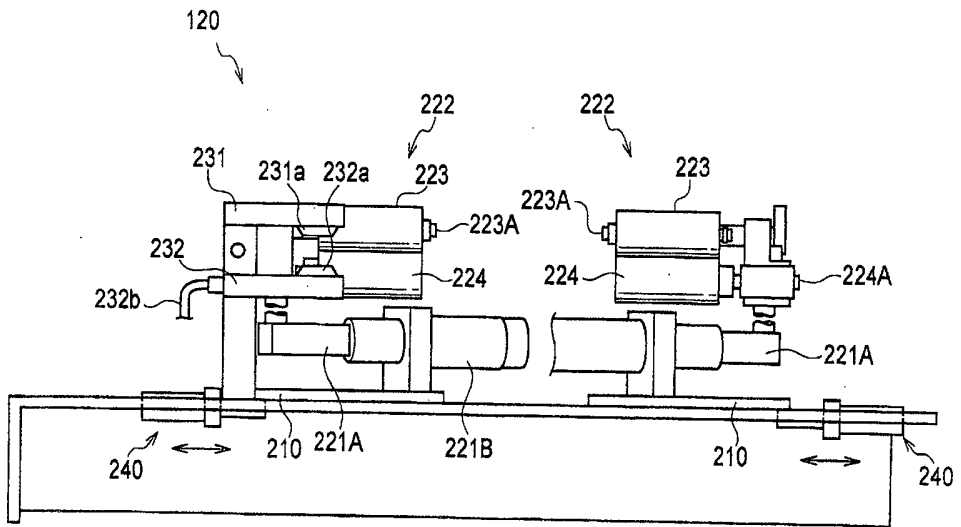


FIG. 5

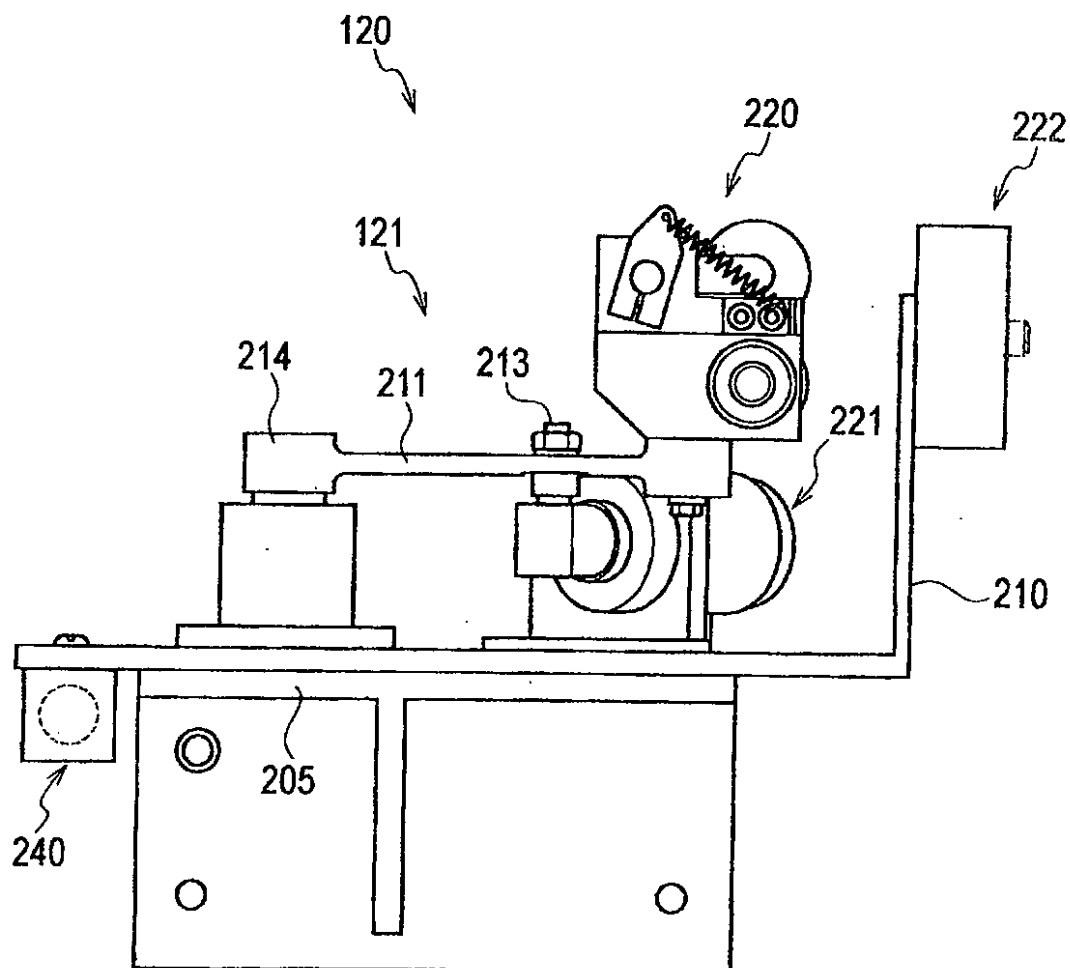


FIG. 6

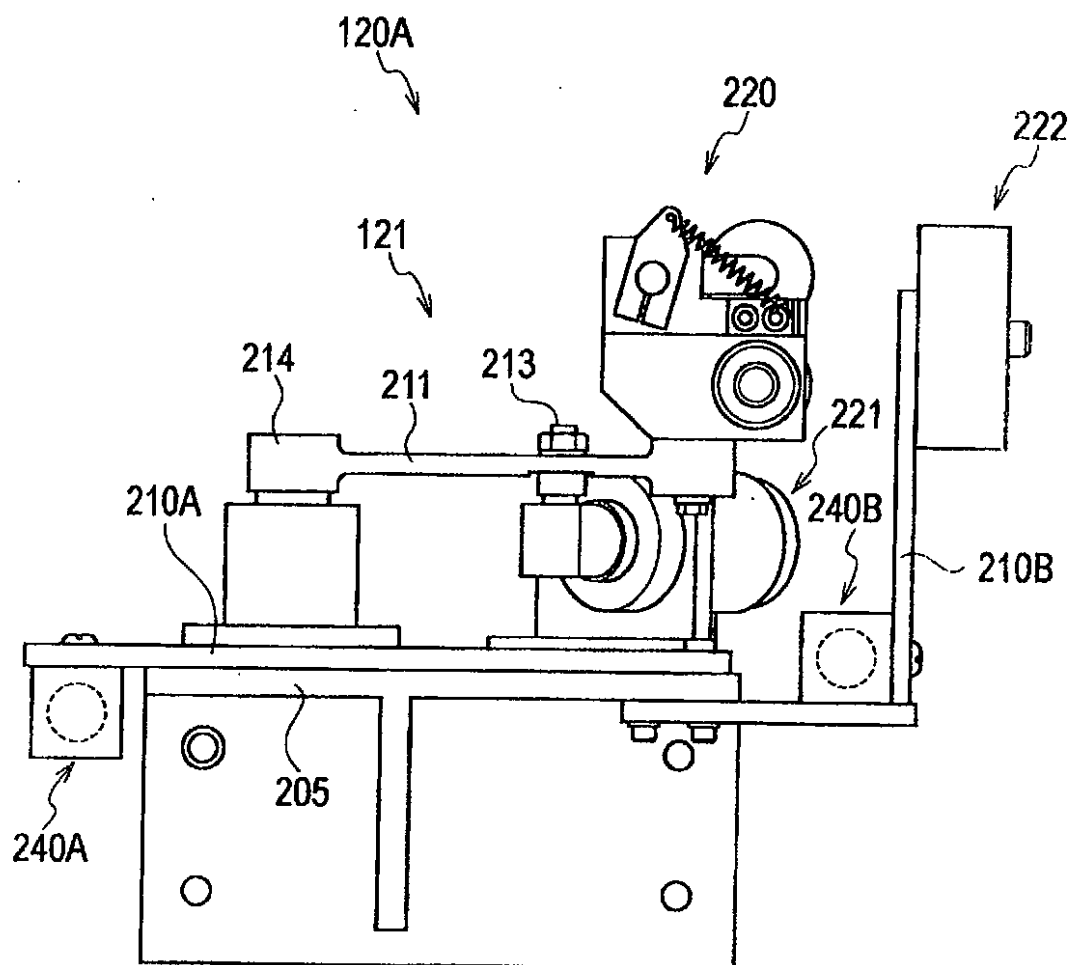


FIG. 7

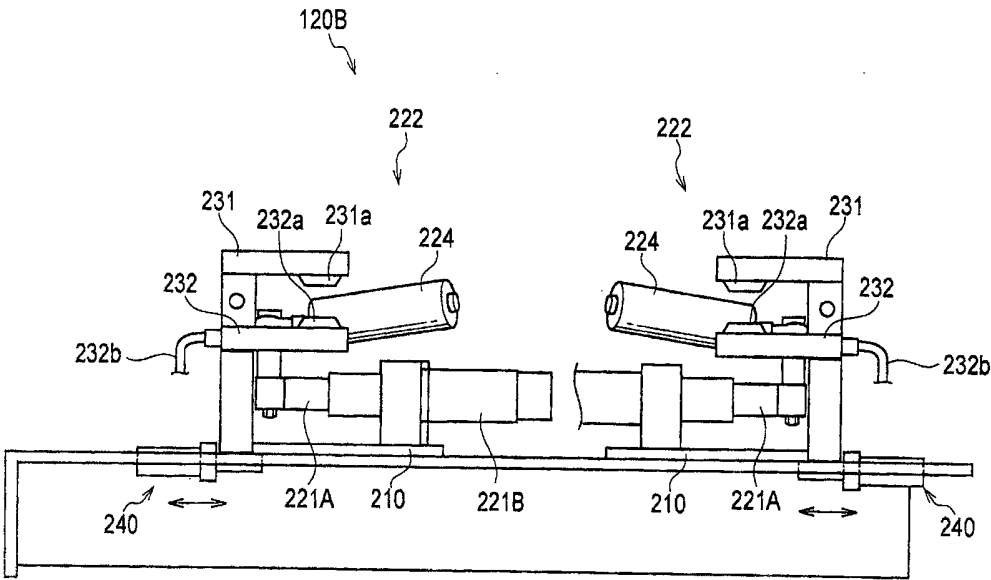
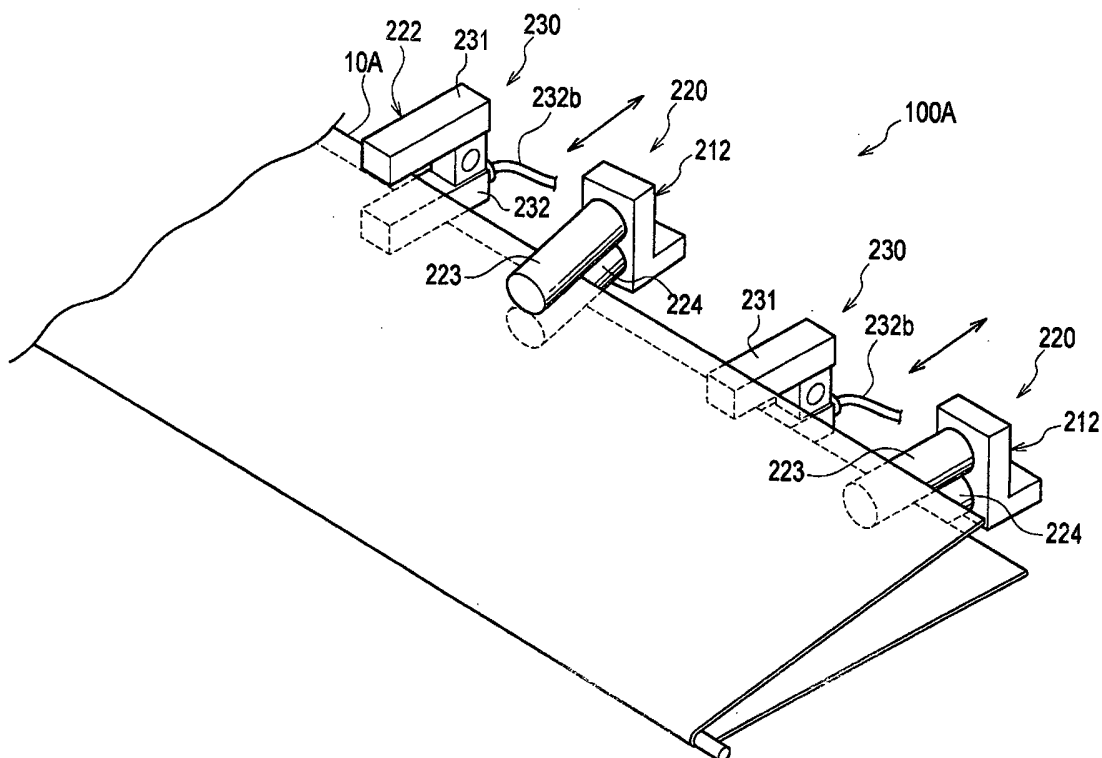


FIG. 8



PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:
MIYOSHI, Hidekazu

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

RECEIVED

2010. 6. 2

MIYOSHI
PATENT

PCT

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

Date of mailing
(day/month/year) 01.06.2010

Applicant's or agent's file reference
JUN-088-PCT

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/JP2010/053739

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. B65H23/038(2006.01) i, A61F13/15(2006.01) i, A61F13/49(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 43bis 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 66.1bis(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		24.05.2010	
Name and mailing address of the ISA/JP Japan Patent Office 3-4-3, Kasumigaseki, Chiyoda-ku, Tokyo 100-8915, Japan		Authorized officer	3B 3 6 1 6
		Tatsuto Kimura Telephone No. +81-3-3581-1101 Ext. 3320	

Form PCT/ISA/237 (cover sheet) (July 2009)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/JP2010/053739

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 43 *bis*.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/JP2010/053739

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

1. Statement

Novelty (N)	Claims	1-8	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	1-8	NO
Industrial applicability (IA)	Claims	1-8	YES
	Claims		NO

2. Citations and explanations:

D1: US 1591906 A (WOOD, Abraham et al.) 1926.07.06,
page 1, lines 73 to 88; page 2, lines 22 to 28; Figs. 1, 2, and 6.
D2: GB 352670 A (DURRANT, Cyril Latham et al.) 1931.07.16,
page 2, lines 7 to 24; Figs. 1 to 3.
D3: US 2005/0056678 A1 (NOMURA, Hironori et al.) 2005.03.17,
paragraph [0038]; Figs. 3 to 5.
D4: US 2006/0196594 A1 (SHIMIZU, Masaru et al.) 2006.09.07,
paragraphs [0019], [0039], [0058], and [0059]; claim 4; Figs. 3 and 5.
D5: DE 1944633 A1 (ERHARDT & LEIMER KG) 1971.03.04,
page 9, lines 5 to 16; page 11, line 24 to page 12, line 3; Fig. 2.

The subject matters of claims 1, 2, 3, and 4 do not involve an inventive step in view of documents D1 and D2 cited in the ISR. D1 discloses a cloth guider comprising guide rollers (k1, k2) and a feeler lever (e). The rollers (k1, k2) and the lever (e) are mounted on a box (f) which is able to slide along a bar (g) extending across the machine. D1, however, failed to disclose a mechanism for driving the box (f) across the machine. On the other hand, D2 discloses a cloth guider having guiding heads (e). A chain (a), toothed wheels (b, b1), shafts (c, c1), and a hand wheel (h) are provided for moving the guiding heads (e) across the machine. The person skilled in the art would easily conceive the idea of employing a guiding head traversing mechanism as described in D2 for driving the box (f) disclosed in D1.

(Continued in the Supplemental Box)

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: Box No. V

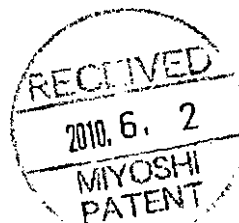
The subject matters of claims 5 and 6 do not involve an inventive step in view of documents D1, D2, and D3 cited in the ISR. D3 discloses an edge position controller (40) for guiding a running web (21). A roll unit (63) of the controller (40) is swung by an actuator (48) and the other roll unit (163) is swung in the same manner. The person skilled in the art would easily conceive the idea of replacing the guide rollers (k1, k2) disclosed in D1 with roll units as described in D3.

The subject matters of claims 7 and 8 do not involve an inventive step in view of documents D4 and D5 cited in the ISR. D4 discloses a method for producing sanitary napkins, disposable diapers, and the like. In this method, an apparatus comprising rollers (91) and sensors (41) controls the edge position of a running web (W) which is being folded longitudinally. D5 discloses an apparatus for aligning the edges of a web being folded longitudinally, the apparatus comprising units (13) equipped with a pair of rollers (5, 6) and a contact sensor (7, 8). The position of each unit (13) is adjusted by a handle (16) or a motor (not shown in the drawings). The person skilled in the art would easily conceive the idea of replacing the edge position controlling apparatus disclosed in D4 with units as described in D5.

PATENT COOPERATION TREATY PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)



Applicant's or agent's file reference JUN-088-PCT	FOR FURTHER ACTION	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/JP2010/053739	International filing date(<i>day/month/year</i>) 02.03.2010	(Earliest) Priority Date (<i>day/month/year</i>) 02.03.2009
Applicant UNICHARM CORPORATION		

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

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

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

1. **Basis of the report**

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

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

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

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

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

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

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

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

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

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

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

6. With regard to the **drawings**,

a. the figure of the **drawings** to be published with the abstract is Figure No. 3

☒ 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/JP2010/053739

A. CLASSIFICATION OF SUBJECT MATTER

Int.Cl. B65H23/038 (2006.01) i, A61F13/15 (2006.01) i, A61F13/49 (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. A61F13/15-13/84, B65H23/02-23/038, D06C3/06

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Published examined utility model applications of Japan 1922-1996
 Published unexamined utility model applications of Japan 1971-2010
 Registered utility model specifications of Japan 1996-2010
 Published registered utility model applications of Japan 1994-2010

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 1591906 A (WOOD, Abraham et al.) 1926.07.06, page 1, lines 73 to 88; page 2, lines 22 to 28; Figs. 1, 2, and 6 (Family: none)	1-6
Y	GB 352670 A (DURRANT, Cyril Latham et al.) 1931.07.16, page 2, lines 7 to 24; Figs. 1 to 3 (Family: none)	1-6

☒ 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

24.05.2010

Date of mailing of the international search report

01.06.2010

Name and mailing address of the ISA/JP

Japan Patent Office

3-4-3, Kasumigaseki, Chiyoda-ku, Tokyo 100-8915, Japan

Authorized officer

Tatsuto Kimura

Telephone No. +81-3-3581-1101 Ext. 3320

3B

3 6 1 6

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2010/053739

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2005/0056678 A1 (NOMURA, Hironori et al.) 2005.03.17, paragraph [0038]; Figs. 3 to 5 & EP 1595835 A1 & JP 2004-262556 A & WO 2004/063069 A1	5-6
Y	US 2006/0196594 A1 (SHIMIZU, Masaru et al.) 2006.09.07, paragraphs [0019], [0039], [0058], and [0059]; claim 4; Figs. 3 and 5 & CN 1767992 A & CN 100475675 C & EP 1607357 A1 & EP 1607357 A4 & EP 1607357 B1 & US 7632366 B2 & WO 2004/085300 A1	7-8
Y	DE 1944633 A1 (ERHARDT & LEIMER KG) 1971.03.04, page 9, lines 5 to 16; page 11, line 24 to page 12, line 3; Fig. 2 (Family: none)	7-8

PATENT COOPERATION TREATY

WO 2010/101282
PCT/JP2010/053739

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)		
Applicant's or agent's file reference JUN-088-PCT		IMPORTANT NOTICE
International application No. PCT/JP2010/053739	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	Authorized officer Gijsbertus Beijer
Facsimile No. +41 22 338 82 70	e-mail: pt07.pct@wipo.int

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) 31 May 2010 (31.05.2010)	
Applicant's or agent's file reference JUN-088-PCT	IMPORTANT NOTIFICATION
International application No. PCT/JP2010/053739	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.
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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)	2009-048418	JP	26 April 2010 (26.04.2010)
26 February 2010 (26.02.2010)	2010-042003	JP	26 April 2010 (26.04.2010)

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(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
10 September 2010 (10.09.2010)



(10) International Publication Number
WO 2010/101282 A1

(51) International Patent Classification:
B65H 23/038 (2006.01) A61F 13/49 (2006.01)
A61F 13/15 (2006.01)

(21) International Application Number:
PCT/JP2010/053739

(22) International Filing Date:
2 March 2010 (02.03.2010)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2009-048418 2 March 2009 (02.03.2009) JP
2010-042003 26 February 2010 (26.02.2010) JP

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(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ,
CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO,
DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,
HN, HR, HU, ID, IL, IN, IS, KE, KG, KM, KN, KP, KR,
KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME,
MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO,
NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE,
SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT,
TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

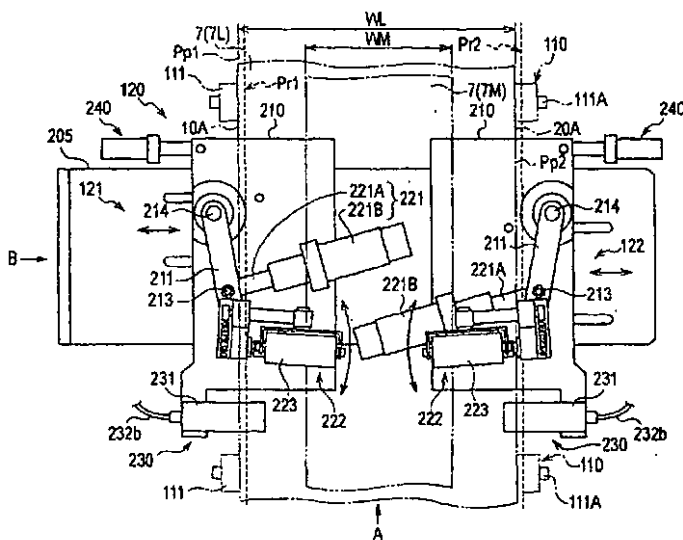
(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ,
TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV,
MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, SM,
TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
ML, MR, NE, SN, TD, TG).

Published:

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

(54) Title: CONVEYOR AND METHOD OF MANUFACTURING ABSORBENT ARTICLE

FIG. 3



(57) Abstract: The web conveyor 100 conveys a continuous web 7L for L size and a continuous web 7M for M size. The conveyor 100 includes a guide mechanism 220 changing a passing position of a side edge portion of a web 7, a detection mechanism 230 detecting the passing position of the edge portion of the web 7, and a drive mechanism 240 moving the guide mechanism 220 and the detection mechanism 230 together in the cross direction CD (width direction) of the web 7 according to a size such as L size or M size, by being in contact with a first side edge portion 10A and a second side edge portion 20A of the web 7. The drive mechanism 240 moves the guide mechanism 220 and the detection mechanism 230 by an equal traveling distance in the cross direction CD of the web.

WO 2010/101282 A1

DESCRIPTION**Title of Invention**

CONVEYOR AND METHOD OF MANUFACTURING ABSORBENT ARTICLE

5

Technical Field

The present disclosure relates to a conveyor and a method of manufacturing an absorbent article using such a conveyor to selectively convey continuous webs of different sizes.

10

Background Art

A method of manufacturing an absorbent article such as a pants-type diaper, a sanitary napkin and a panty liner is implemented in an assembly line. For instance, a continuous web including a continuum of top sheets and a continuum of back sheets to form absorbent articles is conveyed under tension in a web conveyance direction by a conveyor. Then, component members such as a gather (elastic member) and a waterproof film are placed on the web being conveyed under tension in the web conveyance direction.

20

In some cases, a side edge portion of a web during conveyance may be misaligned in a cross direction (a web width direction) perpendicular to a web conveyance direction. To address this problem, there is a known conveyor configured to adjust the passing position where a side edge portion of a web passes during conveyance (see PTL 1, for example). Specifically, the conveyor includes nip rollers, an actuator and a sensor as a detection mechanism.

25

The nip rollers include two rollers configured to hold

at least one of side edge portions of a web. The nip rollers are each rotatable about one end of a shaft in a plan view of the web. The actuator is coupled to the nip rollers through an arm and the like, and rotates the nip rollers. The sensor
5 detects the passing position of the side edge portion of the web after passing between the nip rollers.

In the conveyor thus configured, when the sensor determines that the passing position of the side edge portion of the web is misaligned from a predetermined position, the
10 nip rollers are rotated by the actuator to guide the side edge portion of the web outward or inward in the web width direction. Thereby, the conveyor can adjust the passing position of the side edge portion of the web.

Absorbent articles are manufactured in different sizes,
15 such as S size, M size and L size. In this regard, the aforementioned conveyor can convey webs of various sizes by moving the actuator coupled to the nip rollers, and the sensor independently of each other in the web cross direction.

The inventors have discovered that when the size of a
20 web to be being conveyed is changed to a different one, and the actuator and the sensor are independently moved in the web cross direction, and therefore the nip rollers (the actuator) and the sensor may be sometimes misaligned in an inappropriate positional relationship. In this case, the inappropriate
25 positional relationship causes the nip rollers to be rotated by an erroneous amount. To avoid this, the positional relationship between the nip rollers and the sensor needs to be adjusted to a predetermined relationship, which, in turn, requires complicated control for this adjustment. It is

desirable to provide a conveyor and a method of manufacturing absorbent articles which are capable of selectively conveying webs of different sizes by changing a passing position of a side edge portion of the web, without having to perform
5 complicated control and/or adjustment.

Under these circumstances, the present invention is aimed to provide a conveyor and a method of manufacturing an absorbent article which are capable of selectively conveying any of webs for two or more sizes by easily changing a passing
10 position of a side edge portion of the web without having to perform complicated control.

Citation List

15 Patent Literature

PTL 1: Japanese Patent Application Publication No.
2004-262556 (pp. 2 and 3, Figs. 2 and 3)

Summary

20 To solve the above-described problem, the present invention has the following aspects. A aspect of the present invention provides a conveyor that conveys selectively one of a continuous web for a first size and a continuous web for a second size, comprising: a guide mechanism configured to
25 change a passing position of at least one of side edge portions of the web by being in contact with the side edge portion of the web; a detection mechanism configured to detect the passing position of the side edge portion of the web; and a drive mechanism configured to move the guide mechanism and the

detection mechanism in a cross direction perpendicular to a conveyance direction of the web according to any one of the first size and the second size by an equal traveling distance in the cross direction of the web.

5 According to the aspect of the present invention, there can be provided a conveyor and a method of manufacturing an absorbent article which are capable of selectively conveying any of webs for two or more sizes by easily changing a passing position of a side edge portion of the web without having to
10 perform complicated control.

Brief Description of Drawings

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

15 [Fig. 2] Fig. 2 is a diagram for explaining a relevant part of a method of manufacturing absorbent articles according to one or more embodiments.

[Fig. 3] Fig. 3 is a plan view of a conveyor according to one or more embodiments.

20 [Fig. 4] Fig. 4 is a front view of the conveyor of FIG. 3.

[Fig. 5] Fig. 5 is a side view of the conveyor of FIG. 3.

[Fig. 6] Fig. 6 is a side view of a side edge adjusting mechanism according to a Modified Example 1.

[Fig. 7] Fig. 7 is a front view of a side edge adjusting
25 mechanism according to a Modified Example 2.

[Fig. 8] Fig. 8 is a perspective view of a conveyor according to a Modified Example 3.

Detailed Description

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

Firstly, a configuration of an absorbent article 1 according to one or more embodiments will be explained with reference to Fig. 1 which is a partially cutaway perspective view showing the absorbent article 1. In this particularly illustrated embodiment, the absorbent article 1 is a disposable pants-type diaper for adults. The absorbent article 1 may have different sizes, such as L size (first size) and M size (second size).

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

The top sheet 2 is adapted to come into contact with the skin of a person to wear the absorbent article 1 (hereinafter, "wearer"). The top sheet 2 is made of a liquid permeable sheet such as a nonwoven fabric or a perforated plastic film. The back sheet 3 is provided outside the top sheet 2 (on the side

facing away from the wearer). The back sheet 3 is made of a nonwoven fabric or the like.

The absorber 4 is provided between the top sheet 2 and the back sheet 3, and for absorbing excretion discharged from the wearer. The absorber 4 is made of a mixture of ground pulp and superabsorbent polymer particles, or the like. The waterproof sheet 5 is provided between the back sheet 3 and the absorber 4, for blocking the permeation of the excretion from the wearer to the outside of the absorbent article 1. The waterproof sheet 5 is made of a liquid impermeable sheet.

The absorbent article 1 thus configured includes, in combination, a front waistline portion 10 to be fitted to the front waist of a wearer, a back waistline portion 20 to be fitted to the back waist of the wearer, and a crotch portion 30 to be fitted to the crotch of the wearer. Incidentally, leg-surrounding openings 40 into which the legs of the wearer are inserted are formed at both sides of the crotch portion 30.

The front waistline portion 10 and the back waistline portion 20 are joined together by joint portions 50, and thereby form a waist opening to be fit around the body of the wearer. A waist gather 6A made of a stretchable rubber strand or the like is provided to an entire peripheral edge of the front waistline portion 10 and the back waistline portion 20.

For example, to make the front waistline portion 10 and the back waistline portion 20 stretchable in the cross direction perpendicular to the front-to-back direction from the front waistline portion 10 toward the back waistline portion 20, the front waistline portion 10 and the back

waistline portion 20 may be provided with the waist gather 6A, or may themselves be made of a stretchable sheet.

The crotch portion 30 is provided between the front waistline portion 10 and the back waistline portion 20. Leg
5 gathers 6B made of stretchable rubber strands or the like are provided on both sides of the crotch portion 30.

For example, to make the crotch portion 30 stretchable in the leg-encircling, the crotch portion 30 may be provided with the leg gathers 6B, or may itself be made of a stretchable
10 sheet.

Secondly, a method of manufacturing absorbent articles according to one or more embodiments will be explained with reference to Fig. 2 which is a diagram for explaining a relevant part of the absorbent article manufacturing method.

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

20 In the waistline forming step S1, gathers (a waist gather 6A and/or a leg gather 6B) are placed between a web 7A and a web 7B, and thereby a web 7 prepared to form the front waistline portion 10 and the back waistline portion 20 is formed.

Note that the web 7 (webs 7A, 7B) during conveyance is
25 stretchable in a cross direction CD (width direction) perpendicular 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 form the crotch portion 30 is transferred onto the web 7, more specifically, between the front waistline portion 10 and the back waistline portion 20 after the waistline forming step S1. Here, the crotch portion member 30A includes the back sheet 3 and the absorber 4.

In the leg-surrounding forming step S3, the leg-surrounding openings 40 (so-called leg holes) are formed by cutting the web 7 (webs 7A, 7B) after the absorber transferring step S2. Here, the formation of the leg-surrounding opening 40 does not necessarily involve cutting only the web 7A and the web 7B, but may involve cutting, together with the web 7A and the web 7B, the back sheet 3 constituting the crotch portion member 30A.

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

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

Note that, in this particularly illustrated embodiment, the folding line is the center line CL. However, the folding line is not necessarily the center line CL, and may be shifted from the center line CL toward either of the first side edge

portion 10A and the second side edge portion 20A.

In the joining step S5, the folded parts of the web 7 are joined together in joint regions 50A through ultrasonic treatment or heat treatment after the folding step S4. The
5 joint region 50A extends in the conveyance direction MD across an imaginary line SL that indicates a to-be-cut position and extends in the cross direction CD of the web 7.

In the cutting step S6, the web 7 joined in the joint regions 50A is cut along the imaginary lines SL after the
10 joining step S5. Thereby, the absorbent article 1 is manufactured.

Here, the method of manufacturing absorbent articles includes conveying steps between the steps (S1 to S6). In each of the conveying steps, the web 7 to be processed into the
15 absorbent article 1 is conveyed by a conveyor 100, which will be described later. This conveying step includes a changing step of changing the passing position of a side edge portion of the continuous web 7 to be processed into the absorbent article 1 during conveyance of the web 7.

Hereinafter, a configuration of the conveyor 100 used
20 in the conveying step and the changing step will be described with reference to Figs. 3-5. Fig. 3 is a plan view of the conveyor 100 according to one or more embodiments. Fig. 4 is a front view of the conveyor 100 as seen in the direction of
25 arrow A in Fig. 3. Fig. 5 is a side view of the conveyor 100 as seen in the direction of arrow B in Fig. 3.

Since the conveyors 100 used in the conveying steps before the steps (S1 to S6) have the same configuration, the description will be provided by taking, as an example, the

conveyor 100 that conveys the web 7 before the waistline forming step S1.

As shown in Figs. 3 to 5, the conveyor 100 conveys the web 7 under tension in the conveyance direction MD of the web 7. The conveyor 100 can convey webs 7 of different sizes (i.e., widths) such as a web 7L for L size or a web 7M for M size. In Fig. 3, the conveyor 100 is illustrated as conveying the web 7L for L size. The conveyor 100 includes a conveyor mechanism 110 and a side edge adjusting mechanism 120.

The conveyor mechanism 110 includes multiple rollers 111 configured to rotate along with conveyance of the web 7. At least one roller 111 of the multiple rollers 111 is driven to rotate about a shaft 111A by a drive unit (unillustrated). The drive unit includes a motor, or the like, configured to rotate the roller 111 through the shaft 111A.

The side edge adjusting mechanism 120 changes the passing position (Fig. 3 position Pr1, Pr2) of a side edge portion (the first side edge portion 10A or the second side edge portion 20A) of the web 7 being conveyed by the conveyor mechanism 110. The side edge adjusting mechanism 120 includes a first adjusting mechanism 121 and a second adjusting mechanism 122. The first adjusting mechanism 121 is configured to change the passing position (Fig. 3 position Pr1) of the first side edge portion 10A of the web 7 during conveyance, and the second adjusting mechanism 122 is configured to change the passing position (Fig. 3 position Pr2) of the second side edge portion 20A of the web 7 during conveyance.

The first adjusting mechanism 121 and the second adjusting mechanism 122 are attached to a base plate 205 across

which the web 7 travels. The first adjusting mechanism 121 and the second adjusting mechanism 122 operate independently of each other, but practically have the same configuration. For this reason, only the configuration of the first adjusting
5 mechanism 121 will be mainly described below. In the drawings, the same reference numerals denote the same elements or portions in the first adjusting mechanism 121 and the second adjusting mechanism 122.

The first adjusting mechanism 121 includes a movable
10 plate 210, a guide mechanism 220, a detection mechanism 230 and a drive mechanism 240. The movable plate 210 is attached to the base plate 205 so as to be movable in the cross direction CD of the web 7.

The guide mechanism 220 is attached to the movable plate
15 210. The guide mechanism 220 changes the passing position of the first side edge portion 10A of the web 7. Specifically, the guide mechanism 220 includes an actuator 221 and a roller unit 222.

In the plan view of the web 7 (see Fig. 3), the actuator
20 221 rotates an upper nip roller 223 and a lower nip roller 224, which will be described later, about one end of a shaft 223A of the upper nip roller 223 and one end of a shaft 224A of the lower nip roller 224, respectively. The actuator 221 includes a slide arm 221A, a servomotor 221B configured to extend and
25 contract the slide arm 221A, and a ball screw joint unit (unillustrated) interposed between the servomotor 221B and the slide arm 221A.

An end portion of the slide arm 221A is connected to an end portion 212 of a swing arm 211 with a connecting shaft 213.

The swing arm 211 is attached to the movable plate 210, more specifically, is rotatably attached to the movable plate 210 with a fixed shaft 214.

The roller unit 222 is attached to the end portion 212
5 of the swing arm 211. The roller unit 222 includes the upper nip roller 223 and the lower nip roller 224. The upper nip roller 223 rotates about the shaft 223A, and comes into contact with one of the surfaces (upper surface) of the web 7. The lower nip roller 224 rotates about the shaft 224A and comes
10 into contact with the other surface (lower surface) of the web 7. In other words, the lower nip roller 224 faces the upper nip roller 223 across the web 7.

The detection mechanism 230 is provided downstream of the guide mechanism 220 in the conveyance direction MD of the
15 web 7. The detection mechanism 230 is electrically connected to the actuator 221, and detects the passing position of the first side edge portion 10A of the web 7. The detection mechanism 230 compares the detected passing position of the first side edge portion 10A of the web 7 (Fig. 3 position Pr1)
20 with a predetermined position where the first side edge portion 10A of the web 7 (Fig. 3 position Pp1) is supposed to pass in the manufacturing process of the absorbent article 1. The detection mechanism 230 calculates a direction and a distance which are necessary to move the first side edge portion 10A
25 to the predetermined position.

The detection mechanism 230 includes a projector 231a mounted on an upper arm 231, and a photodetector 232a provided below the projector 231a across the web 7 and mounted on a lower arm 232. The photodetector 232a is connected to the actuator

221 through an output cord 232b. The detection mechanism 230 detects the light emitted from the upper projector 231a using the photodetector 232a. Specifically, the detection mechanism 230 detects the position of the web 7 based on the amount of light detected by the photodetector 232a.

Incidentally, the projector 231a may be mounted on the lower arm 232. Further, the photodetector 232a may be mounted on the upper arm 231. In Fig. 4, the detection mechanism 230 of the second adjusting mechanism 122 is omitted.

Here the guide mechanism 220 and the detection mechanism 230 are coupled to each other by the movable plate 210. In other words, the guide mechanism 220 and the detection mechanism 230 are moved together in the cross direction CD of the web 7 by the drive mechanism 240 as disclosed herein. Here, this together movement includes a movement in which the guide mechanism 220 and the detection mechanism 230 move together, and also a movement in which the guide mechanism 220 and the detection mechanism 230 move together while changing the passing position of the side edge portion of the web 7.

The drive mechanism 240 moves the movable plate 210 thereby to move the guide mechanism 220 and the detection mechanism 230 together in the cross direction CD of the web 7 according to a size of the web 7, such as L size or M size. More specifically, the drive mechanism 240 moves the guide mechanism 220 and the detection mechanism 230 together by moving the movable plate 210 in the cross direction CD of the web 7 according to a width W_L of the web 7 for L size, or a width W_M of the web 7 for M size.

Thus, the drive mechanism 240 moves the guide mechanism

220 and the detection mechanism 230 by the same traveling distance in the cross direction CD of the web 7. The drive mechanism 240 includes an actuator or the like electrically connected to the detection mechanism 230.

5 Hereinafter, an operation of the foregoing first adjusting mechanism 121 will be described with reference to Figs. 3 to 5. Specifically, the following description will be provided for an operation of the first adjusting mechanism 121 in changing the size of the absorbent article 1 being
10 manufactured.

As shown in Figs. 3 to 5, the detection mechanism 230 compares the detected passing position of the first side edge portion 10A with a predetermined position for a predetermined size of the absorbent article 1. The drive mechanism 240 moves
15 the guide mechanism 220 and the detection mechanism 230 in the cross direction CD of the web 7 according to the size such as L size or M size, that is, according to an instruction from the detection mechanism 230. Then, the guide mechanism 220 rotates the roller unit 222 by a certain angle by driving the
20 actuator 221 according to the instruction from the detection mechanism 230.

In the case where the M size is changed to the L size, for example, the predetermined position is changed to correspond to the L size. In other words, the conveyor 100
25 is switched from the conveyance of the web 7M for M size to the conveyance of the web 7L for L size. For this switching, the drive mechanism 240 moves the guide mechanism 220 and the detection mechanism 230 outward in the cross direction CD of the web 7. Then, by rotating the roller unit 222 by a certain

angle, the guide mechanism 220 can move, with an appropriate force, the edges 10A, 20A of the web 7 to the desired positions to increase or reduce the width W_L or W_M of the web 7.

As disclosed herein, the drive mechanism 240 moves the
5 guide mechanism 220 and the detection mechanism 230 together in the cross direction CD of the web 7 (width direction) according to the size such as L size or M size, and also equalizes the traveling distances of the guide mechanism 220 and the detection mechanism 230 to each other in the cross
10 direction CD of the web 7. In this case, the guide mechanism 220 (the actuator 221 and the roller unit 222) and the detection mechanism 230 are prevented from being misaligned in an inappropriate positional relationship, unlike the case where the guide mechanism 220 and the detection mechanism 230 are
15 independently moved. Accordingly, even when the size of the absorbent article 1 to be manufactured is changed, the roller unit 222 is prevented from rotating by an erroneous amount, and no adjustment is needed to correct the positional relationship between the guide mechanism 220 and the detection
20 mechanism 230 to the predetermined relationship. Thus, the passing positions of the first side edge portion 10A and the second side edge portion 20A of the web 7 can be changed without a need to perform complicated control.

As disclosed herein, the guide mechanism 220 and the
25 detection mechanism 230 are coupled to each other by the single movable plate 210, and are moved in the cross direction CD of the web 7 by the drive mechanism 240. With this configuration, the guide mechanism 220 and the detection mechanism 230 are moved surely by the same travelling distance in the cross

direction CD of the web 7. Thus, the guide mechanism 220 and the detection mechanism 230 are more surely prevented from being misaligned in an inappropriate positional relationship.

As disclosed herein, the guide mechanism 220 moves above
5 the movable plate 210 in the cross direction CD of the web 7. With this configuration, the guide mechanism 220 is capable of fine adjustment in changes in the passing positions of the first side edge portion 10A and the second side edge portion 20A of the web 7. Therefore, the passing positions of the first
10 side edge portion 10A and the second side edge portion 20A of the web 7 can be changed more easily.

Modified Examples

The side edge adjusting mechanism 120 according to the
15 foregoing description may be modified as follows. Here, the description will be provided mainly for the differences from the foregoing description, with the same or similar reference signs denoting the same or similar elements.

20 Modified Example 1

Fig. 6 is a side view of a side edge adjusting mechanism 120A according to a Modified Example 1. In the aforementioned description, the guide mechanism 220 and the detection mechanism 230 are coupled to the single movable plate 210. In
25 contrast, in the Modified Example 1, a guide mechanism 220 and a detection mechanism 230 are independent of each other.

Specifically, as shown in Fig. 6, the guide mechanism 220 and the detection mechanism 230 are not coupled to each other by the movable plate 210. The guide mechanism 220 is

coupled to a movable plate 210A, and is movable in the cross direction CD of the web 7 by a drive mechanism 240A. The detection mechanism 230 is coupled to a movable plate 210B, and is movable in the cross direction CD of the web 7 by a drive
5 mechanism 240B.

The drive mechanisms 240A and 240B independently move the guide mechanism 220 and the detection mechanism 230, respectively, on the condition that the guide mechanism 220 and the detection mechanism 230 move by the same traveling
10 distance in the cross direction CD of the web 7. Thus, the drive mechanisms 240A and 240B are capable of finely adjusting the guide mechanism 220 and the detection mechanism 230 independently, without misaligning the guide mechanism 220 and the detection mechanism 230 in an inappropriate positional
15 relationship. Accordingly, the passing positions of the first side edge portion 10A and the second side edge portion 20A of the web 7 can be changed easily.

Modified Example 2

20 Fig. 7 is a front view of a side edge adjusting mechanism 120B according to a Modified Example 2. In the aforementioned description, the roller unit 222 includes the upper nip roller 223 and the lower nip roller 224. In contrast, in the Modified Example 2, a roller unit 222 includes only a lower nip roller
25 224.

Specifically, as shown in Fig. 7, the lower nip roller 224 is inclined to have a slope upward toward the web 7 in order to come into pressure contact with the web 7 from below. With this configuration, the lower nip roller 224 is capable of

guiding the first side edge portion 10A of the web 7 to the predetermined position. The slope of the lower nip roller 224 can be adjusted to a degree appropriate according to properties, such as the flexibility, the stretchability, and the surface slipperiness, of the web 7.

The roller unit 222 does not necessarily include only the lower nip roller 224, but may include only an upper nip roller 223. In this case, the upper nip roller 223 is inclined to have a slope downward toward the web 7 in order to come into pressure contact with the web 7 from above.

In the Modified Example 2, having only any one of the upper nip roller 223 and the lower nip roller 224, the roller unit 222 is capable of obtaining the same advantageous effects as in the aforementioned description.

15

Modified Example 3

Fig. 8 is a perspective view of a conveyor 100A according to a Modified Example 3. In the aforementioned description, the conveyor 100 is used between the steps (S1 to S6). In contrast, the conveyor 100 A in the Modified Example 3 is used in the folding step S4.

Specifically, as shown in Fig. 8, the conveyor 100A is provided in a location where the web 7 is folded along the folding line by bringing the first side edge portion 10A toward the second side edge portion 20A. To be more precise, an unillustrated movable plate 210, a guide mechanism 220, a detection mechanism 230 and an unillustrated drive mechanism 240 are provided to each of the first side edge portion 10A and the second side edge portion 20A.

In the Modified Example 3, in the folding step S4, the conveyor 100A is used and produces the same advantageous effects as in the aforementioned description even when the size of the absorbent article 1 is changed. As a result, the
5 conveyor 100A allows the first side edge portion 10A to be surely placed exactly on the second side edge portion 20A in the web 7.

Further Embodiments

10 As described above, the details of several embodiments 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
15 various alternative embodiments, examples and operation techniques.

For example, the following additional embodiments can be envisaged. Specifically, the absorbent article 1 has been described as including, in combination, the front waistline
20 portion 10, the back waistline portion 20 and the crotch portion 30. The absorbent article 1 is not limited to this configuration, but may be formed entirely as a single unit. In this case, needless to say, a different method of manufacturing such an absorbent article is employed.

25 Additionally, the description has been provided for the conveyor 100 used in the manufacturing of a pants-type disposal diaper. However, the conveyor 100 is not limited to such use. For example, the conveyor 100 may be used to manufacture another product such as an open-type disposal diaper, a sanitary napkin

and a panty liner, for example. In other words, the conveyor 100 may be used at least for the conveyance of any web 7 that is stretchable in the cross direction CD of the web 7, not necessarily for the manufacturing of the absorbent article 1.

5 As long as the conveyor 100 conveys a stretchable web 7, the conveyor 100 may be used between steps other than the steps described with respect to Fig. 2.

Moreover, the description has been provided for the conveyor 100 used to convey a single web 7. However, the

10 conveyor 100 is not limited to such use. For example, when a web including a continuum of the front waistline portions 10 and a web including a continuum of the back waistline portions 20 are conveyed simultaneously, a single conveyor 100 may be provided for each or both of the webs. In addition,

15 multiple conveyors 100 may be provided between any two of the process steps.

In addition, the absorbent article 1 has been described as having size variations such as L size and M size. The size variations are not limited to these sizes, but may include two

20 or more different sizes. For example, the size variations may include three sizes such as L size, M size and S size.

Further, the conveyor mechanism 110 has been described as one including multiple rollers 111. However, the conveyor mechanism 110 should not be limited to this configuration, and

25 may have another configuration, such as a belt conveyor, as long as the configuration allows the conveyor mechanism 110 to convey the web 7.

The side edge adjusting mechanism 120 has been described as one including the first adjusting mechanism 121 and the

second adjusting mechanism 122. However, the side edge adjusting mechanism 120 should not be limited to this configuration, and may include only one of the adjusting mechanisms. In other words, the side edge adjusting mechanism 5 120 may be provided to at least one of the side edge portions of the web 7.

Additionally, although the movable plate 210 has been described as one coupling the guide mechanism 220 and the detection mechanism 230 to each other, a frame capable of 10 coupling (fixing) the guide mechanism 220 and the detection mechanism 230 to each other may be used instead of the movable plate 210.

Further, there is no limitation to any positional relationship between the guide mechanism 220, the detection 15 mechanism 230 and the drive mechanism 240, and thereby any appropriate positional relationship can be selected as desired.

Furthermore, a material, a condition of surface finishing, and the length and diameter of the nip rollers can 20 be appropriately selected according to conditions of the web 7 such as a processed condition of the web 7, and an adhesive-applied condition of an adhesive agent that is applied to the web 7 in advance. For example, materials usable as the surface material of the rollers include polyurethane 25 rubber or silicone rubber, a sponge made of such rubber, and a metal.

As described above, the present invention naturally includes various embodiments which are not described herein. Accordingly, the technical scope of the present invention

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

The entire content of Japanese Patent Applications
5 2009-048418 (filed on March 2, 2009) and 2010-042003 (filed on February 26, 2010) are incorporated herein by reference.

Industrial Applicability

Therefore, since the conveyor and method of
10 manufacturing absorbent article of the present invention provides is capable of selectively conveying any of webs for two or more sizes by easily changing a passing position of a side edge portion of the web without having to perform complicated control, it is useful in manufacturing technology
15 for absorbent articles.

Reference Signs List

- 1 absorbent article
- 2 top sheet
- 20 3 back sheet
- 4 absorber
- 5 waterproof sheet
- 6 gather
- 6A waist gather
- 25 6B leg gather
- 7, 7A, 7B, 7L, 7M web
- 10 front waistline portion
- 10A first side edge
- 20 back waistline portion

- 20A second side edge
- 30 crotch portion
- 30A crotch portion member
- 40 leg-surrounding openings
- 5 50 joint portions
- 50A joint region
- 60 waist openings
- 100, 100A conveyor
- 110 conveyor mechanism
- 10 111 roller
- 111A shaft core
- 120 (120A, 120B) side edge adjusting mechanism
- 121 first adjusting mechanism
- 122 second adjusting mechanism
- 15 205 base plate
- 210 movable plate
- 220 guide mechanism
- 221 actuator
- 222 roller unit
- 20 223 upper nip roller
- 224 lower nip roller
- 230 detection mechanism
- 231 upper arm
- 231a upper projector
- 25 232 lower arm
- 232a lower projector
- 232b output cord
- 240 (240A, 240B) drive mechanism

CLAIMS

[Claim 1]

A conveyor that conveys selectively one of a continuous
5 web for a first size and a continuous web for a second size,
comprising:

a guide mechanism configured to change a passing position
of at least one of side edge portions of the web by being in
contact with the side edge portion of the web;

10 a detection mechanism configured to detect the passing
position of the side edge portion of the web; and

a drive mechanism configured to move the guide mechanism
and the detection mechanism in a cross direction perpendicular
to a conveyance direction of the web according to any one of
15 the first size and the second size by an equal traveling
distance in the cross direction of the web, wherein

the drive mechanism moves the guide mechanism and the
detection mechanism.

20 [Claim 2]

The conveyor according to claim 1, wherein the drive
mechanism moves the guide mechanism and the detection
mechanism independently of each other.

25 [Claim 3]

The conveyor according to claim 1, wherein
the guide mechanism and the detection mechanism are
coupled to a single frame, and
the drive mechanism moves the frame in the cross

direction of the web.

[Claim 4]

The conveyor according to claim 3, wherein
5 the guide mechanism is movable on the frame in the cross
direction of the web.

[Claim 5]

The conveyor according to any one of claims 1 to 4,
10 wherein
the guide mechanism includes
a nip roller unit to be in contact with the side
edge portion of the web, and
an actuator configured to rotate a shaft core of
15 the nip roller unit about one end of the shaft core of the nip
roller unit in a planar view of the web.

[Claim 6]

The conveyor according to claim 5, wherein
20 the nip roller unit includes
a first nip roller configured to be in contact with
one of surfaces of the web, and
a second nip roller facing the first nip roller
across the web and configured to be in contact with the other
25 surface of the web.

[Claim 7]

A method of manufacturing an absorbent article having
at least a first size and a second size, the method comprising

the step of changing a passing position of a side edge portion of a continuous web while the web is being conveyed by a conveyor comprising a guide mechanism, a detection mechanism and a drive mechanism, the web being to be processed into the absorbent article, wherein

the guide mechanism changes a passing position of at least one of side edge portions of the web by being in contact with the side edge portion of the web;

the detection mechanism detects the passing position of the side edge portion of the web; and

the drive mechanism moves the guide mechanism and the detection mechanism in a cross direction perpendicular to the conveyance direction of the web according to any one of the first size and the second size by an equal traveling distance in the cross direction of the web.

[Claim 8]

The method of manufacturing an absorbent article according to claim 7, further comprising the step of folding the web along a folding position extending in the conveyance direction of the web by bringing one of the side edge portions of the web toward the other side edge portion of the web, wherein

the guide mechanism, the detection mechanism and the drive mechanism are provided for each of the one and other side edge portions of the web.

FIG. 1

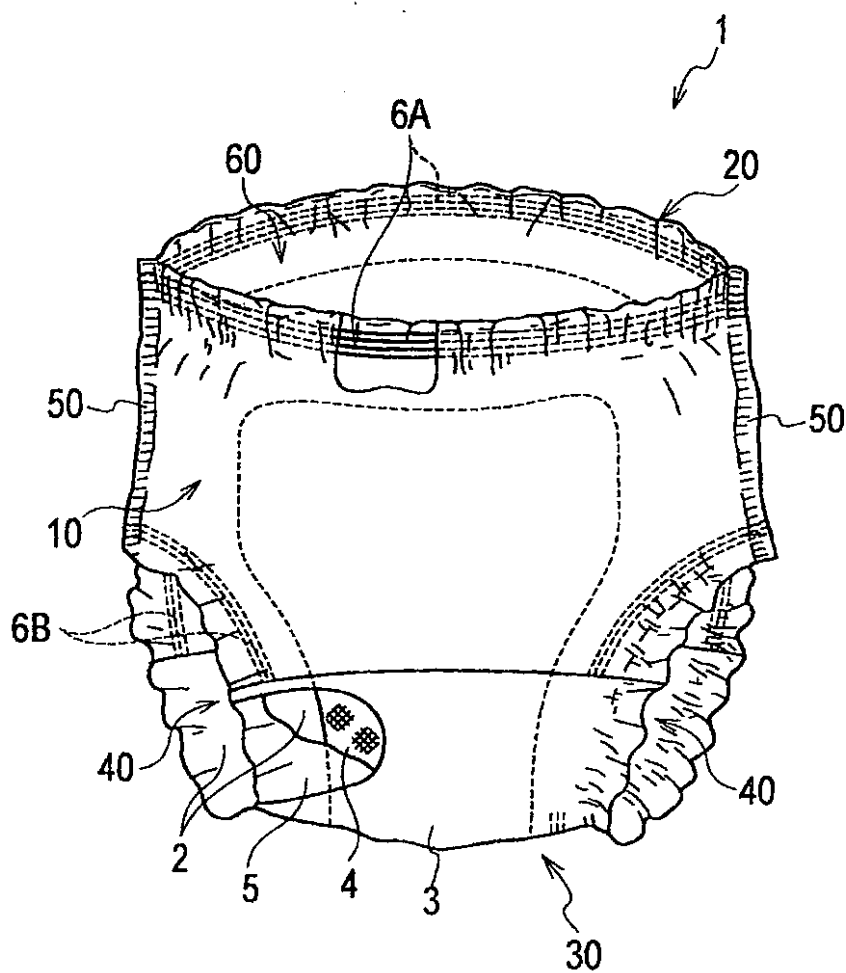


FIG. 3

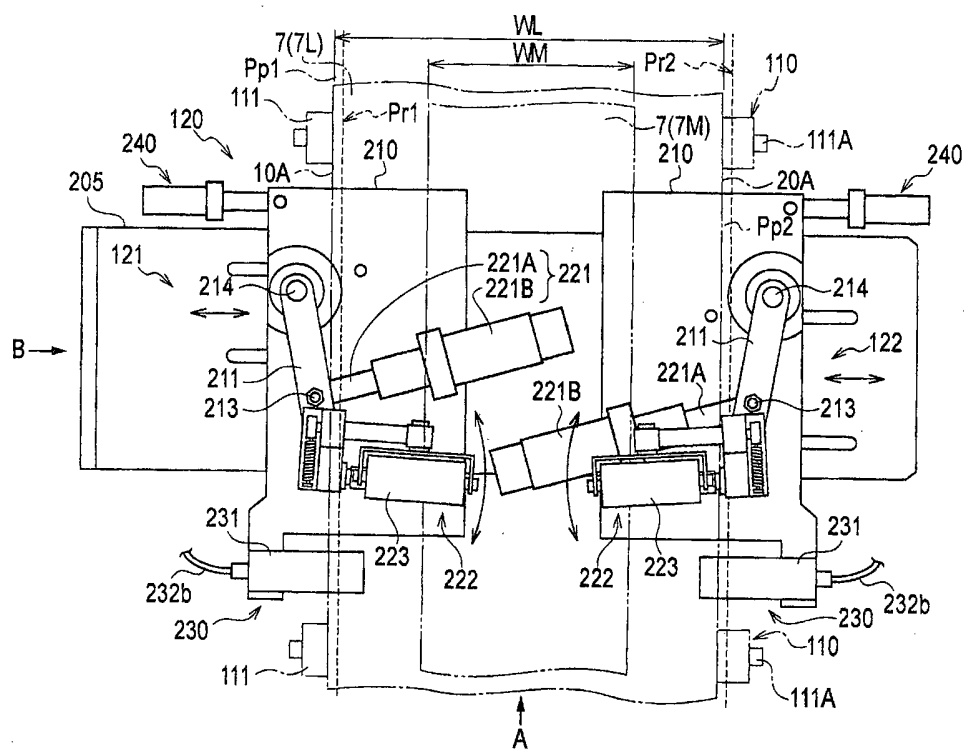


FIG. 4

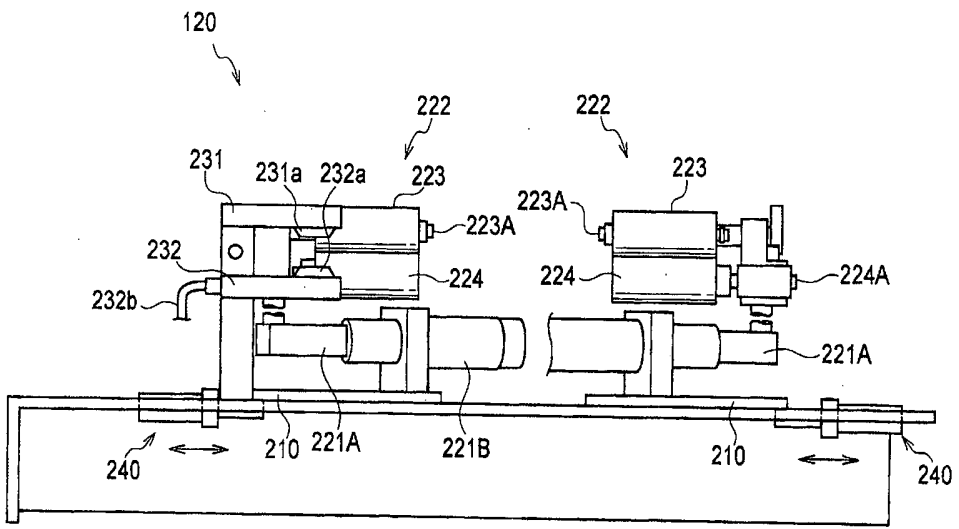


FIG. 5

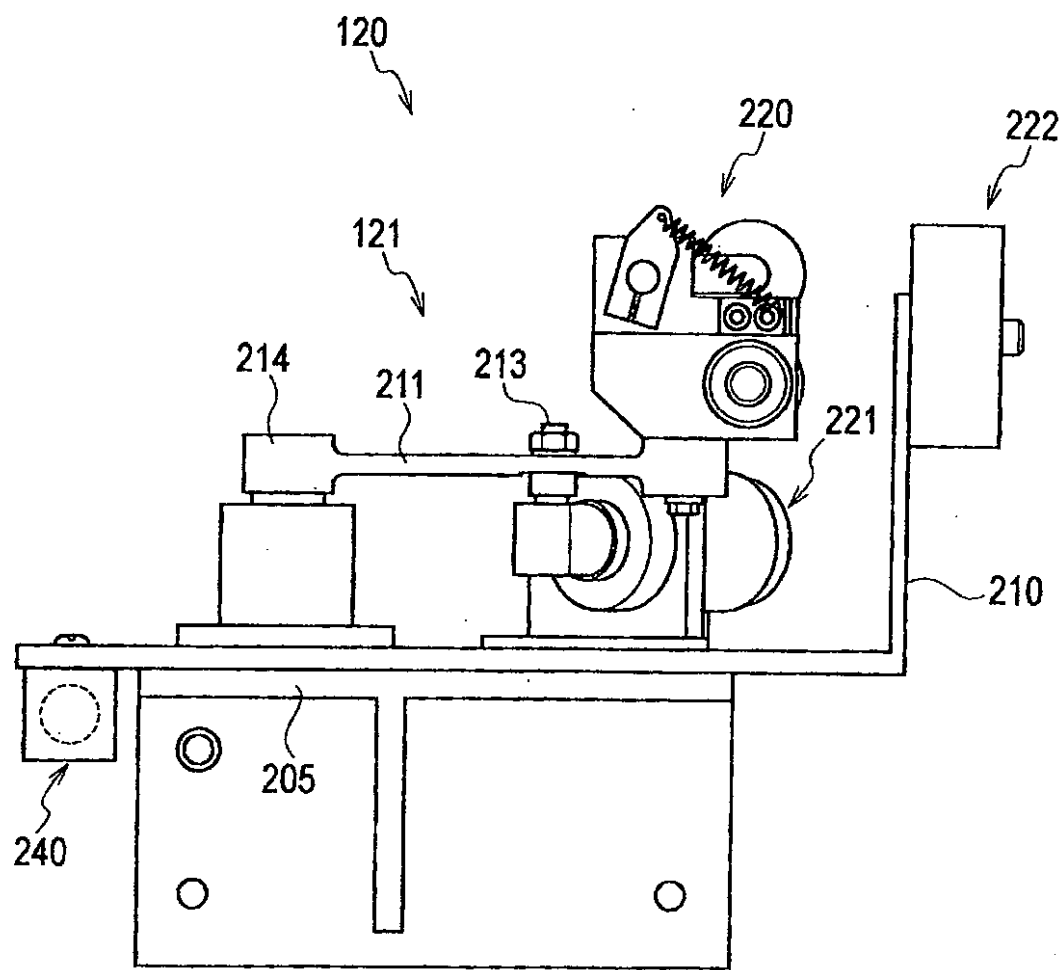


FIG. 6

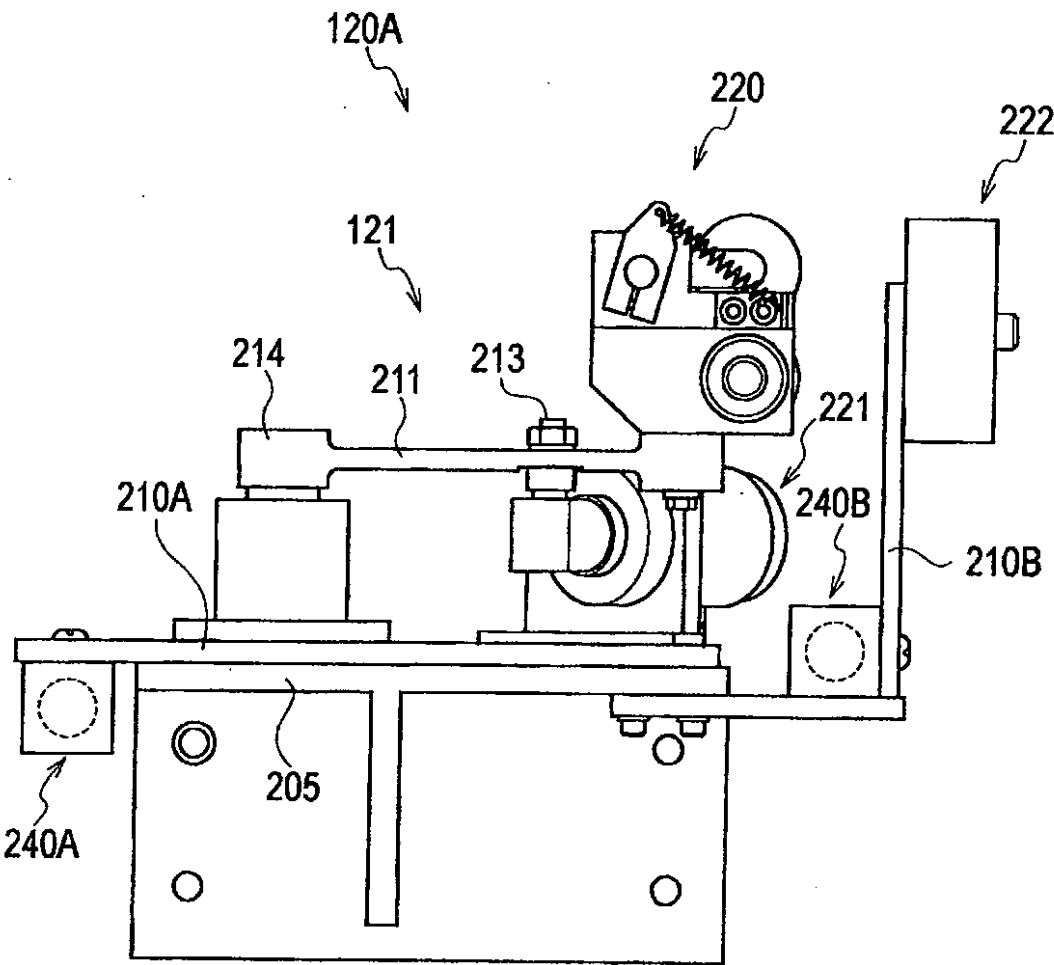


FIG. 7

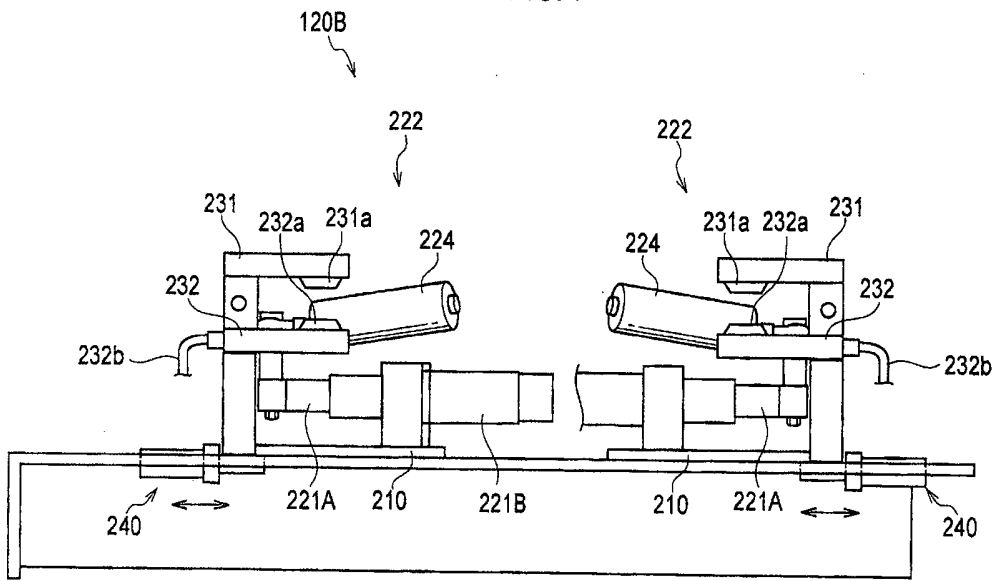
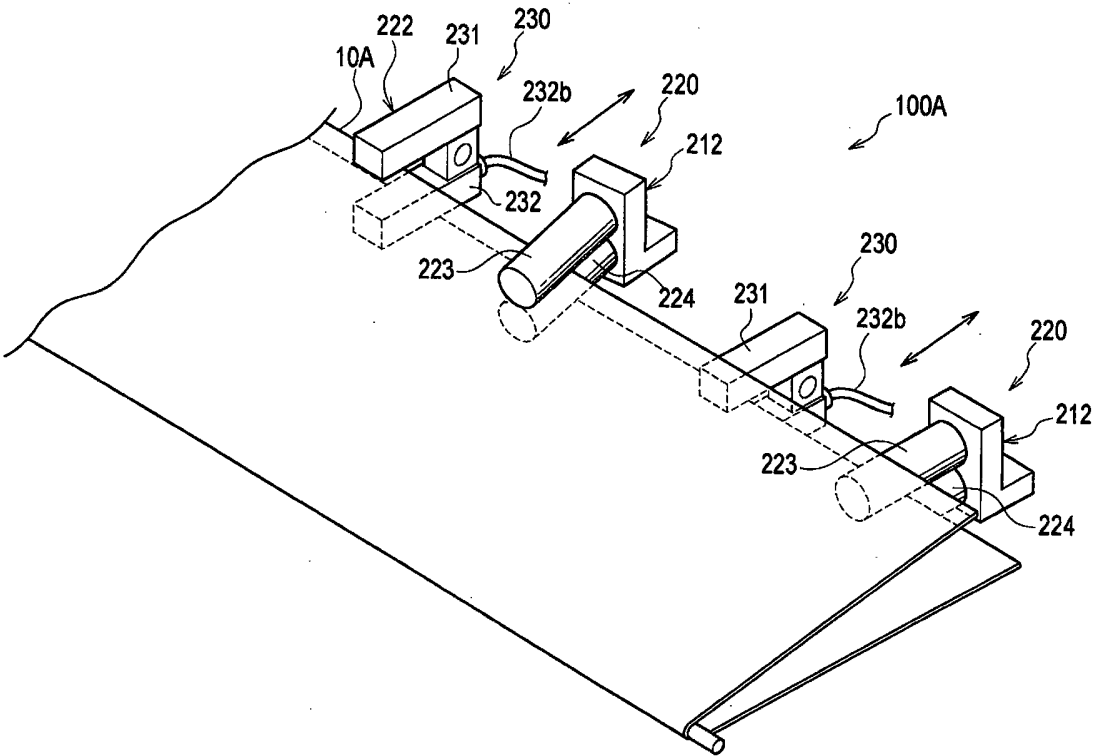


FIG. 8



ARTES 12 X 12

 Industria y Comercio SUPERINTENDENCIA	SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO  No. 11-122083-00000-0000 Fecha: 2011-09-20 09:35:28 Dep. 2020 DIR.NUEVASCR Tra. 11 PATENTEIYII Eve: 378 FASENACIONALI Act. 411 PRESENTACION Folios: 118
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PATENTE DE INVENCION ☐

MODELO DE I

☐	Indicación que se solicita una patente.
☐	Datos de identificación del solicitante o de la persona que presenta la solicitud
☐	Descripción de la invención
☐	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)

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☐	Datos de identificación del solicitante o de la persona que presenta la solicitud
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ESQUEMA DE TRAZADO ☐

(Art. 92 Decisión 486/00)

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