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FORMULARIO ÚNICO DE SOLICITUD DE PATENTE
PCT
ENTRADA EN FASE NACIONAL

1

SOLICITUD DE

☒ Patente de Invención

☐ Patente de Modelo de Utilidad

☐ Capítulo I

☒ Capítulo II

2

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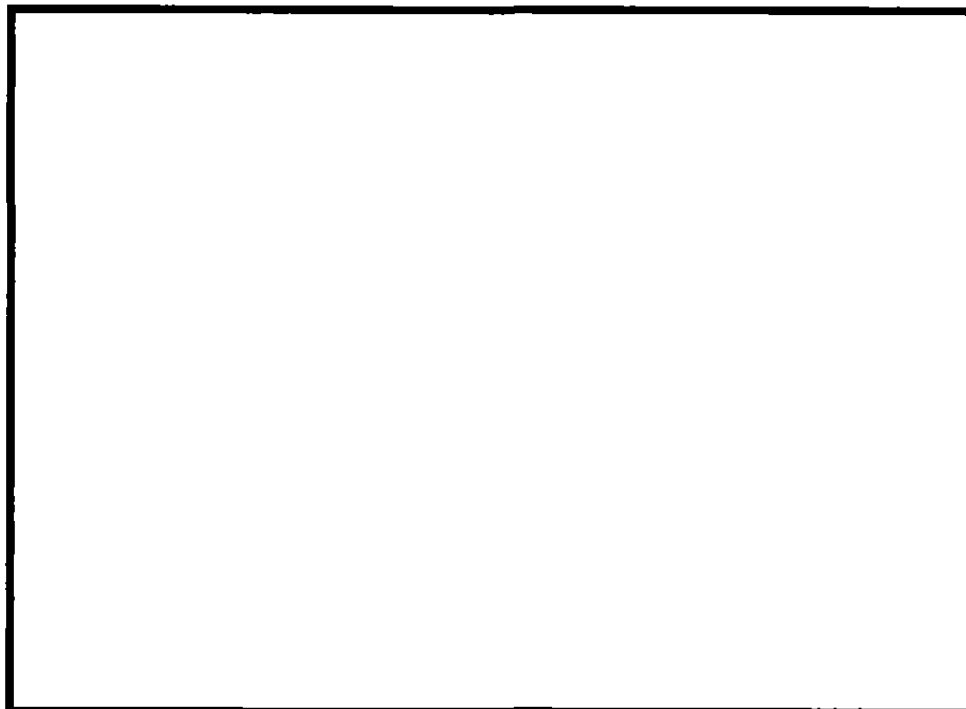
Instrucciones para el diligenciamiento del presente formulario, ver reverso de esta página

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ANEXOS

- ☒ Comprobante de pago de la tasa de presentación de la solicitud \$378.000
- ☒ Comprobante de pago por reivindicación de prioridad \$106 000
- ☐ Documento que acredita la existencia y representación legal cuando el solicitante sea persona jurídica.
- ☒ Poderes, al fuere el caso. Protocolo No. 131
- ☐ Documento de cesión del inventor al solicitante o a su causante.
- ☐ Declaraciones
- ☒ Copia de la solicitud internacional. (Resumen, descripción, reivindicaciones, dibujos)
- ☒ Traducción de la solicitud internacional al castellano. (Resumen, descripción, reivindicaciones, dibujos)
- ☒ Copia del examen preliminar efectuado por la IPEA.
- ☐ Traducción del examen preliminar efectuado por la IPEA.
- ☐ De ser el caso, copia del contrato de acceso.
- ☐ De ser el caso, documento que acredita 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.
- ☐ Otros

11 FIGURA CARACTERÍSTICA.



12 Solicito la concesión de la patente,

NOMBRE. RAMIRO CASTRO DUQUE

FIRMA:

C.C 170.322 de Bogotá J.P 1003 del C.S.J.

Instrucciones para la presentación de los anexos, ver reverso de esta página



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Dependencia 2020 DIVISION DE NUEVAS CREACIONES

RECIBO OFICIAL DE CAJA 02 - 63 901
FECHA SEPTIEMBRE 25 DE 2002

***** CONSIGNACION *****

DEPOSITANTE	TIPO PAGO	BANCO	CUENTA	No PAGO	FECHA PGO	Vr PAGO
BRIGARD & CASTRO LTDA	CONSIGNACION	BANCO POPULAR	050-00110-6	1324140	24/09/2002	3,270,000 00

***** CONCEPTO *****

CANT	DETALLE	CONCEPTO	TOTAL CONCEPTO
1	30005-01-01 SOLICITUDES	7 TRAMITES DE SOL DE DISENOS INDUS	378,000 00
		TOTAL	\$ 378,000 00

SON TRESCIENTOS SETENTA Y OCHO MIL PESOS

RESPONSABLE 

RECIBO DE CAJA APLICADO AL EXPEDIENTE No _____

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Industria y Comercio

SUPERINTENDENCIA

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Dependencia 2020 DIVISION DE NUEVAS CREACIONES

***** CONSIGNACION *****

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BRIGARD & CASTRO LTDA	CONSIGNACION	BANCO POPULAR	050-00110-6	5163191	18/09/2002	13,210,000 00

***** CONCEPTO *****

CANT	RENTISTICO	CONCEPTO	TOTAL CONCEPTO
1	50005-01-01 SOLICITUDES	82 INVOCACION DE UNA PRIORIDAD EN NU	106,000 00
		TOTAL	\$ 106,000 00

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RECIPIENTE CON VALVULA DE MEMORIA DE FORMA

Campo de la Invención

Esta invención se relaciona con un recipiente de dispensado termo formado que tiene una válvula de memoria de forma de sello positivo. Esta invención se relaciona adicionalmente con un recipiente que tiene una válvula compuesta de un canal donde una succión en retroceso puede diseñarse dentro de la válvula por lo cual el recipiente de dispensado puede retener sustancialmente su forma original.

Antecedentes de la Invención

La presente invención se dirige al problema de sellar un recipiente una vez que se ha abierto y una porción del contenido se ha retirado. Estos recipientes usualmente se abren retirando una parte del recipiente para exponer una abertura. Esta es usualmente una proyección de retro rasgado. Ante la colocación de presión en el cuerpo principal del recipiente, algo del contenido puede dispensarse. El resto del contenido permanece en el recipiente. La presente invención proporciona un arreglo de válvula de sello positivo en forma tal que después de cada dispensado el contenido se sella positivamente dentro del cuerpo del recipiente. La válvula está compuesta de un canal con una única válvula de memoria de forma colocada en el canal.

El recipiente termo formado en una modalidad pueden tener también una característica de succión en retroceso. Por succión en retroceso se significa que después de un dispensado de algo del producto del recipiente, el aire es dirigido a través de la válvula para remplazar el

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producto que ha sido dispensado. En esta forma el recipiente retiene sustancialmente su forma original. El grado de succión en retroceso se determinará por la reología del material que se dispensa, la estructura de la válvula y la resiliencia del material del recipiente.

Varios tipos de válvulas para recipientes termo formados se conocen. Dichos recipientes con válvulas de canal planas se divulgan en la Patente U S 3,184,121, Patente U S 4,491,157 y Patente U S 5,529,224. En la Figura 6 de la Patente U S 3,184,121 se muestra dos hojas planas paralelas de material que se abren para dispensar un producto mediante una fuerza sobre las paredes del recipiente. Un mecanismo de válvula relacionado se muestra en la Patente U S 4,917,567. La Figura 5C de esta patente muestra la válvula en una condición de dispensado. La Patente U S 5,529,224 se dirige a varias modalidades de válvulas de canal plano en combinación con un recipiente termo formado. Las válvulas de canal plano son bien conocidas en el arte. Sin embargo, tienen la desventaja de que no pueden proporcionar un sello positivo. Adicionalmente, el espesor y otras características de los materiales del recipiente termo formado deben diseñarse cercanamente para proporcionar un sello razonablemente bueno. Una mejora sobre dichas válvulas de canal se divulga en la Patente U S 5,839,609 la cual divulga un arreglo de válvula de reborde para una válvula de canal.

Otro tipo de sello es un sello deformable. Este se describe en la Patente U S 3,635,376, la Patente U S 4,928,852 y en una extensión en la Patente U S 5,529,224, Figuras 26 a 30. En este tipo de válvula una hoja, usualmente la hoja superior, se diseña para tener una integridad suficiente para moverse manualmente desde una posición abierta hacia una posición cerrada. La hoja superior se mueve manualmente desde una

posición superior donde la válvula está abierta hacia una posición inferior donde la válvula está cerrada. La abertura y cerrado manual de este tipo de válvula se muestra más claramente en la Figura 7 de la Patente U S 4,928,852

La Patente U S 5,839,609 divulga un recipiente termo formado con una válvula de reborde. Este es el tipo de una válvula de canal plano con la integridad del sello mejorada con depresiones a cualquier lado de la estructura de reborde en forma tal que la pared superior puede dirigirse hacia abajo en un mejor contacto con el reborde por la elasticidad de la hoja superior de plástico y la tensión superficial de la sustancia que está siendo dispensada la cual está contenida en las depresiones a cada lado del reborde.

A pesar de los esfuerzos de los inventores de los mecanismos de la válvula de estas patentes, no se ha logrado una válvula de sello positivo, simple, automática, para un recipiente. Las válvulas que requieren manipulación manual o requieren una persona para recordar el sello del recipiente, mientras que las válvulas de canal plano no son de sello positivo. Una válvula de reborde proporciona buen sello pero tiene una estructura compleja y es en parte una válvula de canal plano con algunos de los mismos inconvenientes.

Breve Resumen de la Invención

Los recipientes para almacenar y dispensar los volúmenes relativamente pequeños de sustancias fluidas pueden elaborarse no costosos mediante termo formado. Sin embargo, un problema en el uso de recipientes para uso de más de una dosis es una válvula o cierre para

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cortar positivamente el flujo de la sustancia fluente después de un dispensado. Adicionalmente, con el fin de evitar el dispensado inadvertido el esfuerzo para el dispensado debe ser uno que no se pueda encontrar en la manipulación normal del recipiente. Sin embargo, el esfuerzo de dispensado no puede ser tal de hacer difícil para las personas con baja resistencia manual dispensar el producto del recipiente. El presente recipiente está compuesto de una porción de cuerpo y una sección de válvula. El recipiente está sellado sustancialmente alrededor de su periferia. La porción corporal está compuesta de una cámara de esencialmente cualquier forma con un canal de puerto de salida que contiene una válvula para el dispensado de cantidades de una sustancia fluente. El extremo del canal puede sellarse mediante una proyección de retiro rasgado o una estructura equivalente que puede retirarse para abrir el canal de puerto de salida.

La porción de válvula está compuesta del canal que tiene una pared superior y una pared de fondo. El canal puede ser esencialmente de cualquier forma y usualmente será de una forma circular o elíptica. Sin embargo puede ser de forma poligonal que tiene dos, tres o más lados. Si el canal es circular la sección superior de 180° comprenderá una pared superior y la sección inferior de 180° comprenderá la pared de fondo. Esto se aplicará similarmente a una forma elíptica donde la pared encima del eje mayor comprenderá una pared superior y debajo del eje mayor una pared de fondo. Adicionalmente, en un canal de dispensado en un punto a una distancia establecida desde la cámara que sostiene la sustancia a ser dispensada, la pared ya sea superior o de fondo estarán formadas para estar inclinadas en una posición para estar en cercano contacto con la otra pared siendo deprimida contra la otra pared durante o después de la formación del recipiente. Esto resulta en una memoria de forma de las

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paredes de la válvula. Por memoria de forma se significa que la pared que está colocada en contacto con otras paredes tendrá una memoria de la forma en la cual se ha formado. Cuando se desplaza de esta forma dentro de la cual se ha formado mediante una fuerza aplicada, tal como la causada por un dispensado, la pared desplazada volverá a ganar rápidamente su forma anterior ante el retiro de la fuerza aplicada. Esto es el resultado de la memoria de forma.

La sustancia fluente es dispensada desde el recipiente presionando las paredes de la cámara conjuntamente para disminuir el volumen de la cámara. Esto fuerza la sustancia fluente desde la cámara dentro del canal que comprende la válvula. A una fuerza dada la válvula se abre mediante una pared de canal o paredes que se desplazan fuera del contacto con otra pared de canal o paredes. Ante el retiro de la fuerza sobre la cámara, la pared de canal vuelve nuevamente en contacto íntimo como resultado de la memoria de forma de uno o más de las paredes de canal y el dispensado de la sustancia fluente se detiene.

Los recipientes pueden también diseñarse para tener una característica de succión en retroceso. En esta forma el recipiente retendrá su forma después de cada dispensado. La cantidad de producto será remplazada por aire que es dirigido dentro del recipiente parte del recipiente a través de la válvula. La reología del producto determinará la estructura de la válvula del recipiente y la cámara del producto del recipiente con el fin de obtener una suficiente succión en retroceso. En adición puede haber una región más estrecha antes de la válvula para proporcionar un venturi a través del cual el producto y aire debe fluir.

Este recipiente con esta válvula puede usarse para dispensar líquidos, geles, lociones, aceites, pastas y esencialmente cualquier sustancia fluente. La estructura del recipiente puede modificarse para las necesidades de una sustancia particular en el ambiente en el cual se va a usar el recipiente.

Un recipiente preferido es un termo formado. La presente válvula con una memoria formada estará en un extremo del recipiente. La válvula usualmente se formará en el mismo momento del recipiente y estará en forma de una sección unitaria con el recipiente. La válvula es muy útil en recipientes termo formados puesto que es una forma efectiva para elaborar un recipiente termo formado un recipiente de múltiples dosis. Sin un arreglo de válvula efectiva los recipientes termo formados pueden usarse únicamente como recipientes de una sola dosis.

Aunque los recipientes termo formados son los recipientes preferidos, recipientes moldeados mediante otras técnicas pueden también usar efectivamente la presente válvula. En estas otras modalidades los recipientes y las válvulas de memoria de forma pueden moldearse como una pieza o moldearse en dos o más piezas y ensamblarse.

Breve Descripción de los Dibujos

La Figura 1 es una vista en planta superior de una modalidad de un recipiente termo formado del presente invención.

La Figura 2 es una vista lateral en elevación del recipiente termo formado de la Figura 1.

La Figura 3 es una vista en sección transversal de la válvula del recipiente termo formado de la Figura 2, a lo largo de la línea 3-3

La Figura 4 es una vista en sección transversal de la válvula del recipiente termo formado de la Figura 2 a lo largo de la línea 4-4

La Figura 4B es una vista en sección transversal de la válvula de la válvula termo formada de la Figura 4A en un modo de dispensado abierto

La Figura 5A muestra una primera modalidad alternativa para la abertura de la válvula del recipiente de la Figura 1

La Figura 5B muestra una segunda modalidad alternativa para la abertura de la válvula del recipiente de la Figura 1

La Figura 5C muestra una tercera modalidad alternativa para la abertura de la válvula del recipiente de la Figura 1

La Figura 6 es una vista en planta superior del recipiente termo formado con una cámara elíptica y un canal de válvula acortado

La Figura 7 es una vista en planta superior del recipiente termo formado con una cámara circular y un canal de válvula alargado

La Figura 8 es una primera modalidad alternativa de la válvula del recipiente de la Figura 1

La Figura 9 es una segunda modalidad alternativa de la válvula del recipiente de la Figura 1

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La Figura 10 es una tercera modalidad alternativa de la válvula del recipiente de la Figura 1

La Figura 11 es una cuarta modalidad alternativa de la válvula del recipiente de Figura 1

La Figura 12 es una quinta modalidad alternativa de la válvula del recipiente de Figura 1

La Figura 13 es una quinta modalidad alternativa de la válvula del recipiente de la Figura 1 en condición abierta

La Figura 14 muestra una sexta modalidad alternativa de la válvula de la Figura 1

La Figura 15 muestra una séptima modalidad alternativa de la válvula de la Figura 1

La Figura 16 es una vista en elevación de un recipiente de cámara dual que incorpora la presente válvula

La Figura 17 es una vista en sección transversal de la válvula del recipiente de cámara dual de la Figura 16

La Figura 18 divulga una válvula alternativa para el recipiente de la Figura 16

La Figura 19 es una vista en sección transversal de una estructura alternativa para un recipiente de cámara dual

La Figura 20 divulga una válvula para el recipiente de la Figura 19

La Figura 21 es una vista en elevación de una botella que incorpora la presente válvula

Descripción Detallada de los Dibujos

La modalidad preferida de la presente invención se describirá ahora en mayor detalle con referencia a los dibujos anexos y con respecto a recipientes termo formados. Sin embargo deberá entenderse que la válvula de memoria de forma no está restringida al uso con recipientes termo formados. La forma y el tamaño de los recipientes puede también variar como pueden la forma y el tamaño de los componentes de los recipientes y aun estar dentro del concepto de la presente invención.

El recipiente termo formado 10 de las Figuras 1 a 4 tiene una cámara 12 de sustancia fluente y una porción 14 de válvula de memoria de forma. La periferia 20 del recipiente es un área de sello. La línea de escoriado 18 está localizada entre la proyección de sello 16 y el resto del recipiente. El recipiente 10 se muestra en más detalle en la Figura 2. La cámara de sustancia 12 tiene paredes laterales 22 y 26 y paredes transversales 24 y 28. La porción de válvula 14 tiene una pared superior 30 y una pared inferior 32.

La pared superior 30 se ahusa hacia abajo hacia un contacto arco con la pared inferior 32 para proporcionar una válvula de memoria de forma. En esta modalidad particular el canal 14 termina en un área más profunda 36 dentro de la cual se ajusta la sección de pared superior 30.

Sin embargo, no se requiere que haya una sección 36 más profunda. Esta puede ser de la misma concavidad del resto de la pared 32. La superficie inferior de la sección 30 de pared superior tiene una forma convexa y contacta íntimamente la superficie superior de forma cóncava del área 36 más profunda de la pared inferior. Este contacto sella la sustancia fluente en la cámara 12 de ser dispensada no intencionalmente después del retiro de la proyección de sello 16. El área de la válvula se muestra en más detalle en las Figuras 4A y 4B. Sin embargo, como se nota, una región más profunda no se requiere.

La Figura 3 muestra en sección transversal la forma del canal de válvula 14 antes de la porción 36 más profunda. Esta se muestra como elíptica pero puede ser circular o de una forma poligonal. Cuando es poligonal puede tener dos o más lados. Las Figuras 4A y 4B muestran la válvula en un modo de operación. En la Figura 4A la válvula está en descanso. La válvula se cierra y no hay dispensado. En la Figura 4B hay dispensado con parte de la pared superior 30 de la válvula forzada fuera del contacto con parte de la pared inferior 32, permitiendo que sea dispensada una sustancia almacenada en la cámara 12. Ante el cese de presión en la cámara la pared superior 32 vuelve a ganar cercano contacto con la pared inferior y sella la cámara 12 como resultado de la memoria de forma de la pared superior 30.

En la Figura 2 la salida de la cámara 12 relativamente ancha es una sección estrecha 21 que abre a un canal ancho. Este flujo ancho-estrecho-ancho de la sustancia desde la cámara 12 tiene un efecto venturi que promueve la succión en retroceso de aire a través de la válvula y dentro de la cámara 12 después del dispensado de algo de la sustancia desde la cámara 12. En esta forma la cámara 12 retendrá su forma después de que

14 15

cada cantidad de la sustancia es dispensada. Este modo de operación es útil para sustancias que no se afectan por la presencia de aire

Las Figuras 5A, 5B y 5C muestran tres modos de operación de la válvula del recipiente 10 de la Figura 1. En la Figura 5A se muestra que la pared 30 proporciona y crea una abertura 31(a) ante la aplicación de una fuerza de dispensado la cuerpo del recipiente que sostiene la sustancia a ser dispensada. En la Figura 5B se muestra que la pared 32 proporciona y crea una abertura 31(b) ante la aplicación de una fuerza de dispensado al cuerpo el cual sostiene la sustancia a ser dispensada. En la Figura 5C se muestra que tanto la pared 30 como la pared 32 proporcionan para crear una abertura 31(c) para dispensar la sustancia en la porción del recipiente. La pared o paredes que han sido alargadas y adelgazadas en la elaboración de la válvula usualmente será la pared por lograr ante la aplicación de la fuerza de dispensado. Sin embargo la pared que no se ha alargado y adelgazado puede también distorsionarse para crear la abertura para proporcionar el dispensado. En las Figuras 5A, 5B y 5C se asume que los espesores de la pared superior 30 y la pared inferior 32 son iguales.

Sin embargo este no necesita ser el caso. La pared que ha sido alargada y adelgazada puede no ser la pared más delgada y consecuentemente no será la pared para lograr ante la aplicación de una fuerza de dispensado la cuerpo del recipiente. Puede inicialmente haber sido más gruesa que la otra pared. En general la pared más delgada será la pared para lograr en un modo de dispensado.

La Figura 6 muestra una modalidad donde la cámara del recipiente termo formado es de forma elíptica. Este recipiente 40 tiene una cámara

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corporal 42 para una sustancia fluente, una porción 44 de válvula acortada, una proyección de sello 46 y una línea escomada 48 La periferia 50 del recipiente termo formado es un área de sello Además en esta modalidad la válvula 35 está en la unión de la cámara corporal 42 y el canal 44 Preferiblemente por lo menos la mitad de la válvula está en el canal Más preferiblemente toda la válvula está en el canal

La Figura 7 muestra un recipiente 60 con una cámara 62 que es de forma circular y una porción 64 de canal alargado La línea de escomado 68 separa la proyección de sello 66 del resto del recipiente La periferia 70 es un área de sello Esta modalidad muestra la válvula 65 localizada en la unión del canal y la salida del canal Preferiblemente por lo menos la mitad de la válvula está en el canal Más preferiblemente toda la válvula está en el canal

Las Figures 8 a 14 divulgan varias formas para el área de válvula del canal alargado Estas pueden ser de una forma 32(a) de canal semi-circular de gran radio como se muestra en la Figura 8, una forma 32(b) semi-circular de menor radio de la Figura 9, una forma hiperbólica 32(c) en la Figura 19, o una forma 32(d) en la Figura 11 que es parabólica En cada una de estas formas la pared superior 30(a), 30(b), 30(c), y 30(d) de la válvula se conformaran respectivamente a la forma de la superficie inferior 32(a), 32(b), 32(c) y 32(d) cuando la válvula se cierra Sin embargo, cuando un producto debe ser dispensado, la pared superior 30(a), 30(b), 30(c), y 30(d) usualmente se moverá fuera de contacto con la pared inferior mediante la fuerza de dispensado que se está aplicando al cuerpo del recipiente Ante un relajamiento de la fuerza de dispensado la pared 30(a), 30(b), 30(c) y 30(d) contactarán en ultimas la pared 32(a), 32(b), 32(c) y 32(d) de la válvula y el flujo de la sustancia desde el cuerpo

del recipiente cesará La pared superior se moverá puesto que esta es la pared con la memoria de forma

La Figura 12 muestra una válvula que es de forma poligonal La pared superior 30(e) y la pared inferior 32(e) tiene cada una tres lados La válvula se muestra en descanso en la Figura 12 y abierta en la Figura 13 Aunque como de tres lados la válvula puede tener esencialmente cualquier numero de lados Cuando el numero de lados se incrementa la forma de la válvula se aproxima a una forma circular

La Figura 14 es una vista en sección transversal de una válvula que tiene una forma sinusoidal La pared superior 30(f) es alargada para contactar la pared inferior 32(f) Esta es una estructura opcional para la válvula

La Figura 15 divulga una válvula con una pluralidad de porciones de memoria de forma Se muestra en una vista magnificada con las porciones de memoria de forma de menos de 25% a alrededor del ancho como se muestra Las porciones de memoria de forma también pueden ser de una forma modificada tal como sinusoidal La pared superior 30(h) se forma en una pluralidad de secciones que se extienden hacia abajo y la pared inferior una pluralidad de secciones que se extienden hacia arriba Cada una de las secciones extendidas tiene memoria de forma Es decir, cada sección extendida ha sido alargada y adelgazada En el dispensado una o más de las secciones extendidas se descolocarán de su posición formada Esta válvula será útil para dispensar más grandes volúmenes de líquidos

La Figura 16 muestra un recipiente 70 de cámara dual con la presente válvula. El recipiente está sellado a lo largo del borde periférico 78. Hay dos cámaras 72 y 74. Estas cámaras son creadas mediante el sellado de las paredes frontal y trasera en un punto medio 76. Se forman dos canales 71 y 73. Cada canal tiene una válvula que se muestra en más detalle en la Figura 17. Al final de los canales hay una proyección de sello 77 con perforaciones 75 para facilitar el retiro de la proyección de sello. Cada una de las válvulas tiene una pared superior 30 y una pared inferior 32. La pared superior y la pared inferior están selladas conjuntamente en 79 para mantener los canales separados hasta que salen de los canales. Puesto que la pared 30 y la pared 32 son del mismo espesor, las válvulas se abrirán a sustancialmente las mismas presiones de dispensado. La válvula en la Figura 14 también puede usarse. Esta es una válvula del tipo sinusoidal que puede adaptarse para el recipiente de cámara dual.

La Figura 18 divulga una modalidad alternativa a la válvula de la Figura 17. En esta válvula, la válvula se forma donde las válvulas están invertidas de canal a canal. En el canal 73, la pared inferior es alargada y adelgazada, mientras que en el canal 71, la pared superior es alargada y adelgazada. Esta es una válvula útil para un recipiente de cámara dual.

La Figura 19 muestra en sección transversal un recipiente de cámara dual que difiere del de la Figura 16 en que la pared divisoria se extiende desde una pared lateral hacia otra pared lateral más que desde la pared frontal a la pared trasera. La pared divisoria 76(a) divide el recipiente en cámaras 72(a) y 74(a). La pared divisoria se extiende dentro del borde periférico 78(a), el cual es además un área de sello. La Figura 20 muestra una válvula para este recipiente. Esta válvula tendrá tres paredes que comprenden las paredes exteriores 80 y 82 y la pared divisoria 76(a).

18 19

La pared divisoria usualmente será de un espesor reducido en comparación con la pared 80 y la pared 82. La válvula funcionará en la misma forma de la otra válvula de memoria de formas descrita. Es decir, una porción que usualmente es de porción más adelgazada logrará y proporcionará dispensado.

La Figura 21 muestra la presente válvula de memoria de forma incorporada dentro de un recipiente similar a botella. Este recipiente 50 tiene una cámara de producto 52 y un borde sellado 54 alrededor de la cámara de producto. En un extremo superior está un canal 53 con una válvula de memoria de forma 55. Encima de la válvula está una proyección 56 de rotura separada del resto del recipiente por cierras 58. La proyección 58 de rotura se retira para el dispensado del producto desde la cámara de producto 52 y a través del canal 53. La válvula de memoria de forma 55 regulará el flujo del producto.

El recipiente termo formado de la Figura 1 se elabora termo formando separadamente una hoja superior de película y una hoja inferior de película. Cada hoja tendrá una parte de la cámara, una parte del canal alargado y una porción de válvula de memoria de forma, la proyección de sello y el área de sello de periferia. Una hoja en forma registrada se superpone en la otra para formar el recipiente por calor o sellando adhesivamente la periferia de las hojas de película. Los recipientes pueden llenarse en el momento de formar los recipientes o en una operación subsecuente. La válvula se construye en el mismo momento en el que se elabora el recipiente. Cuando la hoja superior termo formada se une a la hoja inferior termo formada, y mientras los materiales en hoja están en condición calentada, una pared del canal es deprimida dentro de un contacto cercano con la otra pared. Esto puede ser una depresión de la

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pared superior o pared inferior en contacto con la otra pared. Ante el enfriamiento del material en hoja del recipiente éste decrece en flexibilidad y retiene su inclinación mejorada para la forma dentro de la cual se ha formado, es decir, paredes del canal para permanecer en un cercano contacto íntimo. Esto forma la válvula del canal. Las hojas superior e inferior de plástico que comprenden el recipiente pueden ser del mismo o diferente espesor. Este espesor puede ser de desde alrededor de 0,01 mm hasta alrededor de 3 mm, y preferiblemente alrededor de 0,2 mm hasta alrededor de 1 mm.

Las paredes del canal tendrán una memoria de forma a la forma dentro de la cual han sido formadas. Permanecerán en esa forma y volverán a ganar esa forma ante cualquier desplazamiento. Como se notó, la pared de la válvula que ha sido alargada y adelgazada será usualmente la pared para flexión y desplazamiento durante un dispensado.

Las válvulas que se han descrito pueden usarse en esencialmente cualquier recipiente. Los recipientes pueden hacerse mediante esencialmente cualquier técnica de moldeo y pueden ser esencialmente de cualquier forma y contener esencialmente cualquier número de cámaras. Las válvulas pueden ser integrales con el recipiente o pueden ser un conjunto separado al recipiente. No hay limitación a este respecto. El concepto es crear una memoria de forma en forma tal que una superficie de la válvula retornará a descanso en cercano contacto con la otra superficie después del cese de una fuerza de dispensado.

Reivindicaciones

Lo que se reivindica es

1 Un recipiente que comprende una porcion que contiene una sustancia y una porción de valvula, dicho recipiente que está sellado sustancialmente alrededor de su periferia, dicha porción que contiene una sustancia en comunicación con dicha porción de válvula en un extremo, dicha porción de valvula que comprende por lo menos un canal que tiene por lo menos una porción de una pared que esta formada para estar en cercano contacto con por lo menos una porción de otra pared, dicha por lo menos una porción de una pared que tiene una memoria de forma donde una dada fuerza de depresión se requiere para que dicha primera pared se mueva del contacto con dicha porción de otra pared y ante el retiro de dicha fuerza dada de dispensado dicha válvula se cierre y selle la porción que contiene la sustancia de dicho recipiente mediante dicha por lo menos una porcion de una pared que retorna al contacto con dicha por lo menos una porción de dicha otra pared

2 Un recipiente como en la reivindicacion 1 donde en el extremo de dicha porción de válvula distante de dicha porción que contiene una sustancia hay una proyección de rotura que forma un sello protector antes de un uso inicial

3 Un recipiente como en la reivindicación 1 donde dicha porción de válvula está compuesta de una porción del canal, el canal que es de una sección transversal circular

4 Un recipiente como en la reivindicación 1 donde dicha porción de válvula está compuesta de una porción del canal, el canal que es de una sección transversal elíptica

5 Un recipiente como en la reivindicación 1 donde dicha porción de válvula está compuesta de una porción del canal, el canal que es de una sección transversal poligonal

6 Un recipiente como en la reivindicación 1 donde dicha porción de válvula está compuesta de una porción del canal y está localizada adyacente a dicha porción que contiene la sustancia

7 Un recipiente como en la reivindicación 1 donde dicha porción de válvula está compuesta de una porción del canal y está localizada espaciada de dicha porción que contiene la sustancia

8 Un recipiente como en la reivindicación 1 donde dicha porción de válvula está compuesta de una porción del canal y está localizada en la unión de dicha porción que contiene una sustancia y dicha porción de válvula

9 Un recipiente como en la reivindicación 1 donde dicha porción de válvula está compuesta de una porción del canal y esta localizada en la unión del canal y una salida desde dicho canal

10 Un recipiente como en la reivindicación 1 donde la por lo menos una porción de una pared y por lo menos una porción de otra pared de dicha porción de válvula son del mismo espesor excepto por la porción de memoria de forma de una pared, la porción de memoria de forma de dicha

por lo menos una porción de una pared que es de un espesor reducido en relación a la por lo menos una porción de otra pared donde está en un cercano contacto

11 Un recipiente como en la reivindicación 1 donde la por lo menos una porción de una pared y la por lo menos una porción de otra pared de dicha porción de válvula difieren en espesor, la porción de memoria de forma de dicha por lo menos una porción de una pared que es de un espesor el de la por lo menos una porción de otra pared donde está en cercano contacto

12 Un recipiente como en la reivindicación 1 donde la por lo menos una porción de una pared y la por lo menos una porción de otra pared de dicha porción de válvula difieren en espesor, la porción de la por lo menos una porción de una pared que tiene la memoria de forma que es de un espesor mayor de la por lo menos una porción de otra pared donde está en un cercano contacto

13 Un recipiente como en la reivindicación 1 donde una pared de dicha cámara que contiene la sustancia en un extremo opuesto a dicha porción de válvula es sustancialmente plana.

14 Un recipiente como en la reivindicación 1 donde el recipiente es un recipiente termo formado en forma tal que dicho recipiente puede ser soportado recto vertical en dicho extremo opuesto a dicha porción de válvula

15 Un recipiente como en la reivindicación 1 donde hay una región mas estrecha en sección transversal en la unión de dicha porción que

contiene una sustancia y dicho canal para formar así un venturi por lo cual se crea una succión en retroceso de aire dentro de la porción que contiene la sustancia después de un dispensado de algo de la sustancia desde la porción que contiene la sustancia

16 Un recipiente como en la reivindicación 1 donde dicha por lo menos una porción de una pared tiene una forma cóncava y dicha por lo menos una porción de otra pared tiene una forma convexa

17 Un recipiente como en la reivindicación 1 donde dicho recipiente has por lo menos dos cámaras, cada cámara que tiene una porción de válvula en dicho un extremo

18 Un recipiente como en la reivindicación 17 donde la porción de válvula en dicho un extremo de una cámara que tiene una estructura invertida con relación a la porción de válvula en dicho un extremo de una segunda cámara.

19 Un recipiente como en la reivindicación 1 donde una pluralidad de porciones de una pared se forman para estar en cercano contacto de emparejado con una pluralidad de porciones de otra pared

20 Un recipiente como en la reivindicación 19 donde dicha primera pared tiene una pluralidad de porciones formadas

21 Un recipiente como en la reivindicación 20 donde dicha pluralidad de porciones formadas son porciones formadas concavas

22 Un recipiente termo formado que comprende una porción que contiene una sustancia y una porción de válvula, dicho recipiente que está sellado sustancialmente alrededor de su periferia, dicha porción que contiene una sustancia en comunicación con dicha porción de válvula en un extremo, dicha porción de válvula que comprende un canal que tiene por lo menos una porción de una pared que se forma para estar en cercano contacto con por lo menos una porción de otra pared, dicha por lo menos una porción de una pared que tiene una memoria de forma por lo cual una dada fuerza de depresión se requiere para que dicha por lo menos una porción de una pared se mueva del contacto con dicha por lo menos una porción de otra pared y ante el retiro de dicha dada fuerza de dispensado dicha válvula se cierre y selle la porción que contiene la sustancia de dicho recipiente mediante dicha por lo menos una porción de una pared que retorna al contacto con dicha por lo menos una porción de otra pared, dicha por lo menos una porción de una pared que tiene una forma convexa y dicha otra pared que tiene una forma cóncava

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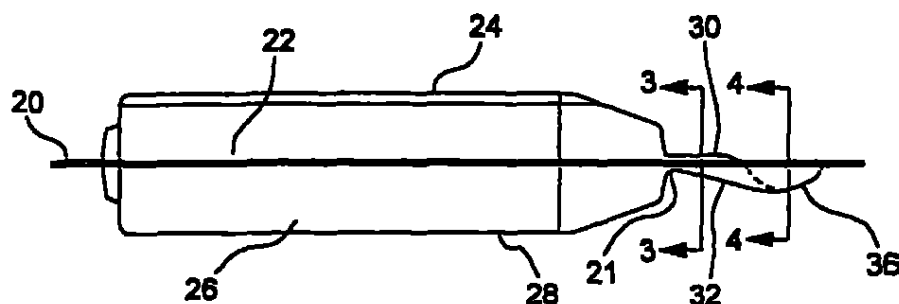
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(54) Title CONTAINER WITH FORMED MEMORY VALVE



(57) Abstract. The container (10) has a varied sized substance body chamber (12) with a channel (14) at an exit end. Within the channel (14) is a positive seal valve (14) that can reseal the container (10) after it has initially been opened. This valve (14) is comprised of an upper wall (30) of the channel being in a close contact with the lower wall (32). The lower wall (32) usually will have a concave shape, with the upper wall contacting the lower wall with a mating convex shape. When a compressive pressure is applied to the substance holding chamber (12), the substance flows down the channel to the valve (14). When the liquid pressure reaches a given level, the concave upper wall (30) of the valve moves out of contact with the convex lower wall (32) and some of the substance is dispensed. Upon the cessation of pressure the convex and concave portions come back into contact to cut off the flow of the substance.

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CONTAINER WITH FORMED MEMORY VALVEField of the Invention

5 This invention relates to a thermoformed dispensing container that has a positive seal formed memory valve. This invention further relates to a container having a valve comprised of a channel wherein a suckback can be designed into the valve whereby the dispensing container can substantially retain its original shape.

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Background of the Invention

15 The present invention is directed to the problem of sealing a container once it has been opened and a portion of the contents removed. These containers usually are opened by removing a part of the container to expose an opening. This usually is a tear away tab. Upon putting pressure on the main body of the container, some of the contents can be dispensed. The remainder of the contents stay in the container. The present invention provides a positive
20 sealing valve arrangement so that after each dispensing the contents are positively sealed within the body of the container. The valve is comprised of a channel with a unique formed memory valve disposed in the channel.

25 The thermoformed container in one embodiment also can have a suckback feature. By suckback is meant that after a dispensing of some of the product from the container, air is drawn in through the valve to replace the product that has been dispensed. In this way the container substantially retains its original shape. The degree of suckback will be determined by the rheology of the material being dispensed, the structure of the valve and the resiliency of the
30 material of the container.

 Various types of valves for thermoformed containers are known. Such containers with flat channel valves are disclosed in U.S. Patent 3,184,121; U.S. Patent 4,491,157 and U.S. Patent 5,529,224. In Figure 6 of U.S.

Patent 3,184,121 there is shown two parallel flat sheets of material that are opened to dispense a product by a force on the walls of the container. A related valve mechanism is shown in U.S. Patent 4,917,567. Figure 5C of this patent shows the valve in a dispensing condition. U.S. Patent 5,529,224 is directed to various embodiments of flat channel valves in combination with a thermoformed container. Flat channel valves are well known in the art. However, they have a disadvantage in that they do not provide a positive sealing. Further, the thickness and other characteristics of the thermoformed container materials must be closely designed to provide a reasonably good seal. An improvement over such channel valves is disclosed in U.S. Patent 5,839,609 which discloses a ridge valve arrangement for a channel valve.

Another type of seal is a deformable seal. This is described in U.S. Patent 3,635,376, U.S. Patent 4,928,852 and to an extent in U.S. Patent 5,529,224, figures 26 through 30. In this type of valve one sheet, usually the upper sheet, is designed to have a sufficient integrity to be moved manually from an open position to a closed position. The top sheet is moved manually from an upper position where the valve is open to a lower position where the valve is closed. The manual opening and closing of this type of valve is more clearly shown in Figure 7 of U.S. Patent 4,928,852.

U.S. Patent 5,839,609 discloses a thermoformed container with a ridge valve. This is a type of a flat channel valve with the integrity of the seal enhanced with depressions on either side of the ridge structure so that the top wall can be drawn downward into a better contact with the ridge by the elasticity of the upper sheet of plastic and the surface tension of the substance being dispensed which is contained in the depressions on either side of the ridge.

Despite the efforts of the inventors of the valve mechanisms of these patents, there has not been achieved a simple, automatic, positive sealing valve for a container. The valves that require manual manipulation or require a person to remember to seal the container, while flat channel valves are not positive sealing. A ridge valve provides good sealing but it has a complex structure and is in part a flat channel valve with some of the same shortcomings.

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Brief Summary of the Invention

Containers for the storing and dispensing of relatively small volumes of flowable substances can be made inexpensively by thermoforming. However, a problem in the use of containers for other than single dose use is a valve or closure to positively cut off the flow of the flowable substance after a dispensing. Further, in order to avoid inadvertent dispensing the effort to dispense must be one that would not be encountered in the normal handling of the container. However, the dispensing effort cannot be such as to make it difficult for people with lower hand strength to dispense product from the container. The present container is comprised of a body portion and a valve section. The container is sealed substantially around its periphery. The body portion is comprised of a chamber of essentially any shape with an outlet channel that contains a valve for the dispensing of amounts of a flowable substance. The end of the channel can be sealed by a tear-off tab or an equivalent structure that can be removed to open the outlet channel.

The valve portion is comprised of the channel having a top wall and a bottom wall. The channel can be of essentially any shape and usually will be of a circular or elliptical shape. However it can be polygonal in shape having two, three or more sides. If the channel is circular the upper 180° section will comprise a top wall and the lower 180° section will comprise the bottom wall. This likewise will apply to an elliptical shape where the wall above the major axis will comprise a top wall and below the major axis a bottom wall. Further, in a dispensing channel at a point a set distance from the chamber which holds the substance to be dispensed, either the top or bottom wall will be shaped to be biased in a position to be in close contact with the other wall by being depressed against the other wall during or after the forming of the container. This results in a formed memory of the walls of the valve. By formed memory is meant that the wall that is placed into contact with other walls will have a memory of the shape into which it has been formed. When displaced from this shape into which it has been formed by an applied force, such as that caused by a dispensing, the displaced wall will rapidly regain its former shape upon the removal of the applied force. This is the result of the formed memory.

The flowable substance is dispensed from the container by pressing the walls of the chamber together to decrease the volume of the chamber. This forces the flowable substance from the chamber into the channel which comprises the valve. At a given force the valve opens by one channel wall or walls being displaced out of contact with other channel wall or walls. Upon the removal of the force on the chamber, the channel walls again come into intimate contact as a result of the formed memory of one or more of the channel walls and the dispensing of the flowable substance stops.

The containers also can be designed to have a suckback feature. In this way the container will retain its shape after each dispensing. The amount of product will be replaced by air that is drawn into the container part of the container through the valve. The rheology of the product will determine the structure of the container valve and container product chamber in order to get a sufficient suckback. In addition there should be a narrowed region prior to the valve to provide a venturi through which the product and air must flow.

This container with this valve can be used to dispense liquids, gels, lotions, oils, pastes and essentially any flowable substance. The structure of the container can be modified for the needs of a particular substance or the environment in which the container is to be used.

A preferred container is a thermoformed container. The present valve with a formed memory will be at one end of the container. The valve usually will be formed at the same time as the container and will be in the form of a unitary section with the container. The valve is very useful on thermoformed containers since it is an effective way to make a thermoformed container a multi-dose container. Without an effective valve arrangement thermoformed containers can only be used as single dose containers.

Although thermoformed containers are the preferred containers, containers molded by other techniques can also effectively use the present valve. In these other embodiments the containers and the formed memory valves can be molded as one piece or molded in two or more pieces and assembled.

Brief Description of the Drawings

Figure 1 is a top plan view of an embodiment of a thermoformed container of the present invention

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Figure 2 is a side elevational view of the thermoformed container of Figure 1

Figure 3 is a cross-sectional view of the valve of the thermoformed container of Figure 2 along line 3-3

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Figure 4 is a cross-sectional view of the valve of the thermoformed container of Figure 2 along line 4-4

Figure 4B is a cross-sectional view of the valve of the thermoformed valve of Figure 4A in an open dispensing mode

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Figure 5A shows a first alternate embodiment for the opening of the valve of the container of Figure 1

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Figure 5B shows a second alternate embodiment for the opening of the valve of the container of Figure 1

Figure 5C shows a third alternate embodiment for the opening of the valve of the container of Figure 1

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Figure 6 is a top plan view of the thermoformed container with an elliptical chamber and a shortened valve channel

Figure 7 is a top plan view of the thermoformed container with a circular chamber and an elongated valve channel

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Figure 8 is a first alternate embodiment of the valve of the container of Figure 1

Figure 9 is a second alternate embodiment of the valve of the container of Figure 1

Figure 10 is a third alternate embodiment of the valve of the container of Figure 1

Figure 11 is a fourth alternate embodiment of the valve of the container of Figure 1

Figure 12 is a fifth alternate embodiment of the valve of the container of Figure 1.

Figure 13 is the fifth alternate embodiment of the valve of the container of Figure 1 in an open condition.

Figure 14 shows a sixth alternate embodiment of the valve of Figure 1

Figure 15 shows a seventh alternate embodiment of the valve of Figure 1.

Figure 16 is an elevational view of a dual chamber container incorporating the present valve.

Figure 17 is a cross-sectional view of the valve of the dual chamber container of Figure 16

Figure 18 discloses an alternate valve for the container of Figure 16.

Figure 19 is a cross-sectional view of an alternate structure for a dual chamber container.

Figure 20 discloses a valve for the container of Figure 19

Figure 21 is an elevational view of a bottle incorporating the present valve.

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Detailed Description of the Drawings

The preferred embodiment of the present invention will now be described in more detail with reference to the attached drawings and with regard to thermoformed containers. However it is to be understood that the formed memory valve is not restricted to use with thermoformed containers. The shape and size of the containers also can vary as can the shape and size of the components of the containers and yet be within the concept of the present invention

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The thermoformed container 10 of Figures 1 to 4 has a flowable substance chamber 12 and a formed memory valve portion 14. The periphery 20 of the container is a seal area. Score line 18 is located between seal tab 16 and the remainder of the container. The container 10 is shown in more detail in Figure 2. The substance chamber 12 has sidewalls 22 and 26 and transverse walls 24 and 28. The valve portion 14 has an upper wall 30 and a lower wall 32. Upper wall 30 tapers downwardly to a close contact with lower wall 32 to provide the formed memory valve. In this particular embodiment the channel 14 ends in a deepened area 36 into which the upper wall section 30 fits. However, it is not required that there be a deepened section 36. This may be of the same concavity as the remainder of wall 32. The lower surface of upper wall section 30 has a convex shape and intimately contacts the concave shaped upper surface of lower wall deepened area 36. This contact seals the flowable substance in chamber 12 from being unintentionally dispensed after the removal of seal tab 16. The valve area is shown in more detail in Figure 4A and 4B. However, as noted, a deepened region is not required

Figure 3 shows in cross-section the shape of the valve channel 14 prior to the deepened portion 36. This is shown as being elliptical but it can be circular or of a polygonal shape. When polygonal it can have two or more sides. Figures

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4A and 4B show the valve in one mode of operation. In Figure 4A the valve is at rest. The valve is closed and there is no dispensing. In Figure 4B there is a dispensing with part of the upper wall 30 of the valve being forced out of contact with part of the lower wall 32, thus permitting a substance stored in chamber 12 to be dispensed. Upon the cessation of pressure on the chamber 12 the upper wall 32 regains close contact with the lower wall and seals the chamber 12 as a result of the formed memory of the upper wall 30.

In Figure 2 the exit of the relatively wide chamber 12 is a narrow section 21 opening to a wide channel. This wide-narrow-wide flow of substance from the chamber 12 has a venturi effect that promotes the suckback of air through the valve and into the chamber 12 after the dispensing of some of the substance from the chamber 12. In this way chamber 12 will retain its shape after each quantity of the substance is dispensed. This mode of operation is useful for substances that are not affected by the presence of air.

Figures 5A, 5B and 5C show three modes of operation of the valve of the container 10 of Figure 1. In Figure 5A it is shown that the wall 30 gives and creates an opening 31(a) upon the application of a dispensing force to the body of the container which holds the substance to be dispensed. In Figure 5B it is shown that the wall 32 gives and creates an opening 31(b) upon the application of a dispensing force to the body which holds the substance to be dispensed. In Figure 5C it is shown that both the wall 30 and the wall 32 give to create an opening 31(c) to dispense the substance in the container portion. The wall or walls that have been stretched and thinned in the making of the valve usually will be the wall to yield upon the application of the dispensing force. However the wall that is not stretched and thinned may also distort to create the opening to provide for the dispensing. In Figures 5A, 5B and 5C it is assumed that the thicknesses of the upper wall 30 and the lower wall 32 is the same. However this need not be the case. The wall that has been stretched and thinned may yet not be the thinner wall and consequently it will not be the wall to yield upon the application of a dispensing force to the body of the container. It may initially have been thicker than the other wall. In general the thinner wall of the valve will be the wall to yield in a dispensing mode.

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Figure 6 shows an embodiment where the chamber of the thermoformed container is elliptical in shape. This container 40 has body chamber 42 for a flowable substance, a shortened valve portion 44, a seal tab 46 and a score line 48. The periphery 50 of the thermoformed container is a seal area. Also in this embodiment the valve 35 is at the junction of the body chamber 42 and the channel 44. Preferably at least half of the valve is in the channel. Most preferably the full valve is in the channel.

Figure 7 shows a container 60 with a chamber 62 that is circular in shape and an elongated channel portion 64. Score line 68 separates seal tab 66 from the remainder of the container. The periphery 70 is a seal area. This embodiment shows the valve 65 being located at the junction of the channel and the channel ext. Preferably at least half of the valve is in the channel. Most preferably the full valve is in the channel.

Figures 8 to 14 disclose several shapes for the valve area of the elongated channel. These can be of a large radius semi-circular channel shape 32(a) as shown in Figure 8, a smaller radius semi-circular shape 32(b) of Figure 9, a hyperbolic shape 32(c) in Figure 10, or a shape 32(d) in Figure 11 that is parabolic. In each of these shapes the upper wall 30(a), 30(b), 30(c), and 30(d) of the valve will conform respectively to the shape of the lower surface 32(a), 32(b), 32(c) and 32(d) when the valve is closed. However, when a product is to be dispensed, the upper wall 30(a), 30(b), 30(c), and 30(d) usually will move out contact with the lower wall by the dispensing force being applied to the container body. Upon a relaxation of the dispensing force the wall 30(a), 30(b), 30(c) and 30(d) will ultimately contact the wall 32(a), 32(b), 32(c) and 32(d) of the valve and flow of substance from the container body will cease. The upper wall will move since it is the wall with the formed memory.

Figure 12 shows a valve that is polygonal in shape. The upper wall 30(e) and the lower wall 32(e) each have three sides. The valve is shown at rest in Figure 12 and opened in Figure 13. Although shown as three sided the valve can have essentially number of sides. As the number of sides increases the shape of the valve approaches a circular shape.

Figure 14 is a cross-sectional view of a valve having a sinusoidal shape. Upper wall 30(f) is stretched to contact lower wall 32(f). This is an optional structure for the valve.

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Figure 15 discloses a valve with a plurality of formed memory portions. This is shown in an enlarged view with the formed memory portions being from less than 25% to about the width as shown. The formed memory portions also may be of a modified shape such as sinusoidal. The upper wall 30(h) is formed into a plurality of downwardly extending sections and the lower wall a plurality of upwardly extending sections. Each of the extended sections has formed memory. That is, each extended section has been stretched and thinned. On a dispensing, one or more of the extended sections will be dislocated from its formed position. This valve will be useful for dispensing larger volumes of liquids.

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Figure 16 shows a dual chamber container 70 with the present valve. The container is sealed along peripheral edge 78. There are two chambers 72 and 74. These chambers are created by sealing the front and rear walls together at a mid-point 76. There are formed two channels 71 and 73. Each channel has a valve which is shown in more detail in Figure 17. At the end of the channels is seal tab 77 with perforations 75 to facilitate the removal of the seal tab. Each of the valves has upper wall 30 and lower wall 32. The upper wall and the lower wall are sealed together at 79 to maintain the channels separate until the exits of the channels. Since the wall 30 and the wall 32 are of the same thickness the valves will open at substantially the same dispensing pressures. The valve in Figure 14 also can be used. This is a sinusoidal type valve which can be adapted for the dual chamber container.

Figure 18 discloses an alternate embodiment to the valve of Figure 17. In this valve the valve is formed where the valves are inverted from channel to channel. In channel 73 the lower wall is stretched and thinned while in channel 71 the upper wall is stretched and thinned. This is a useful valve for a dual chamber container.

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Figure 19 shows in cross-section a dual chamber container that differs from that of Figure 16 in that the divider wall extends from one sidewall to another sidewall rather than from front wall to rear wall. The divider wall 76(a) divides the container into chambers 72(a) and 74(a). The divider wall extends into the peripheral edge 78(a) which also is a seal area. Figure 20 shows a valve for this container. This valve will have three walls comprised of outer walls 80 and 82 and the divider wall 76(a). The divider wall usually will be of a reduced thickness in comparison to wall 80 and wall 82. The valve will function in the same manner as the other described formed memory valves. That is, one portion which usually is the most thinned portion will yield and provide for a dispensing.

Figure 21 shows the present formed memory valve incorporated into a bottle-like container. This container 50 has a product chamber 52 and a sealed edge 54 around the product chamber. At an upper end is a channel 53 with a formed memory valve 55. Above the valve is breakaway tab 56 separated from the remainder of the container by serrations 58. Breakaway tab 58 is removed for the dispensing of the product from the product chamber 52 and through channel 53. Formed memory valve 55 will regulate the flow of product.

The thermoformed container of Figure 1 is made by separately thermoforming an upper sheet of film and a lower sheet of film. Each sheet will have a part of the chamber, a part of the elongated channel and formed memory valve portion, the seal tab and the periphery seal area. One sheet in a registered form is overlayed on the other to form the container by heat or adhesively sealing the periphery of the sheets of film. The containers can be filled at the time of forming the containers or in a subsequent operation. The valve is constructed at the same time that the container is made. As the thermoformed upper sheet is being bonded to the thermoformed lower sheet, and while the sheet materials are in a heated condition, one wall of the channel is depressed into a close contact with the other wall. This can be a depressing of the top wall or bottom wall into contact with the other wall. Upon the sheet material of the container cooling it decreases in flexibility and retains an enhanced bias for the shape into which it has been formed, i.e., walls of the channel to remain in a close, intimate contact. This forms the valve of the channel. The upper and lower sheets of plastic that comprise the container can be of the same or

different thickness. This thickness can be from about 0.01 mm to about 3 mm, and preferably about 0.2 mm to about 1 mm

5 The walls of the channel will have a formed memory to the shape into which they have been formed. They will remain in that shape and regain that shape upon any displacement. As noted, the valve wall that has been stretched and thinned usually will be the wall to flex and be displaced during a dispensing.

10 The valves that have been described can be used on essentially any container. The containers can be made by essentially any molding technique and can be of essentially any shape and contain essentially any number of chambers. The valves can be integral to the container or can be a separate assembly as to the container. There is no limitation in this regard. The concept is to create a
15 formed memory so that one surface of the valve will return to rest in close contact with the other surface after the cessation of a dispensing force.

Claims

What is claimed is:

- 1 A container comprising a substance containing portion and a valve
5 portion, said container being sealed substantially around the periphery
thereof, said substance containing portion in communication with said
valve portion at one end, said valve portion comprising at least one
channel having at least a portion of one wall being formed to be in a close
10 contact with at least a portion of another wall, said at least a portion of
one wall having a formed memory whereby a given depressing force is
required for said first wall to move from contact with said portion of
another wall and upon the removal of said given dispensing force said
valve closes and seals the substance containing portion of said container
15 by said at least a portion of one wall returning to contact with said at least
a portion of said another wall
2. A container as in claim 1 wherein at an end of said valve portion distant
from said substance containing portion there is a breakaway tab that forms
a protective seal prior to an initial use
3. A container as in claim 1 wherein said valve portion is comprised of a
20 portion of the channel, the channel being of a circular cross-section.
4. A container as in claim 1 wherein said valve portion is comprised of a
portion of the channel, the channel being of an elliptical cross-section
- 5 A container as in claim 1 wherein said valve portion is comprised of a
portion of the channel, the channel being of a polygonal cross-section
- 25 6 A container as in claim 1 wherein said valve portion is comprised of a
portion of the channel and is located adjacent to said substance containing
portion.
7. A container as in claim 1 wherein said valve portion is comprised of a
portion of the channel and is located spaced from said substance
30 containing portion
- 8 A container as in claim 1 wherein said valve portion is comprised of a
portion of the channel and is located at the junction of said substance
containing portion and said valve portion

- 9 A container as in claim 1 wherein said valve portion is comprised of a portion of the channel and is located at the junction of the channel and an exit from said channel
- 5 10. A container as in claim 1 wherein the at least a portion of one wall and at least a portion of another wall of said valve portion are the same thickness except for the formed memory portion of the one wall, the formed memory portion of said at least a portion of one wall being of a reduced thickness in relation to the at least a portion of another wall in which it is in a close contact.
- 10 11 A container as in claim 1 wherein the at least a portion of one wall and the at least a portion of another wall of said valve portion differ in thickness, the formed memory portion of said at least a portion of one wall being of a thickness substantially that of the at least a portion of another wall in which it is in a close contact.
- 15 12 A container as in claim 1 wherein the at least a portion of one wall and the at least a portion of another wall of said valve portion differ in thickness, the portion of the at least a portion of one wall having the formed memory being of a thickness greater than that of the at least a portion of another wall in which it is in a close contact.
- 20 13 A container as in claim 1 wherein a wall of said substance containing chamber at an end opposite said valve portion is substantially planar
- 14 A container as in claim 1 wherein the container is a thermoformed container so that said container can be supported upright on said end opposite said valve portion
- 25 15 A container as in claim 1 wherein there is a narrowed cross-sectional region at the junction of said substance containing portion and said channel to thereby form a venturi whereby there is created a suckback of air into the substance containing portion after a dispensing of some of the substance from the substance containing portion
- 30 16. A container as in claim 1 wherein said at least a portion of one wall has a concave shape and said at least a portion of another wall has a convex shape
17. A container as in claim 1 wherein said container has at least two chambers, each chamber having a valve portion at said one end

18. A container as in claim 17 wherein the valve portion at said one end of one chamber having an inverted structure with relation to the valve portion at said one end of a second chamber.
- 5 19 A container as in claim 1 wherein a plurality of portions of one wall are formed to be in a close mating contact with a plurality of portions of another wall.
- 20 A container as in claim 19 wherein said first wall has a plurality of shaped portions
- 10 21. A container as in claim 20 wherein said plurality of shaped portions are concave shaped portions
- 15 22 A thermoformed container comprising a substance containing portion and a valve portion, said container being sealed substantially around the periphery thereof, said substance containing portion in communication with said valve portion at one end, said valve portion comprising a channel having at least a portion of one wall being formed to be in a close contact with at least a portion of another wall, said at least a portion of one wall having a formed memory whereby a given depressing force is required for said at least a portion of one wall to move from contact with said at least a portion of another wall and upon the removal of said given dispensing force said valve closes and seals the substance containing portion of said container by said at least a portion of one wall returning to contact with said at least a portion of another wall, said at least a portion of one wall having a convex shape and said another wall having a concave shape
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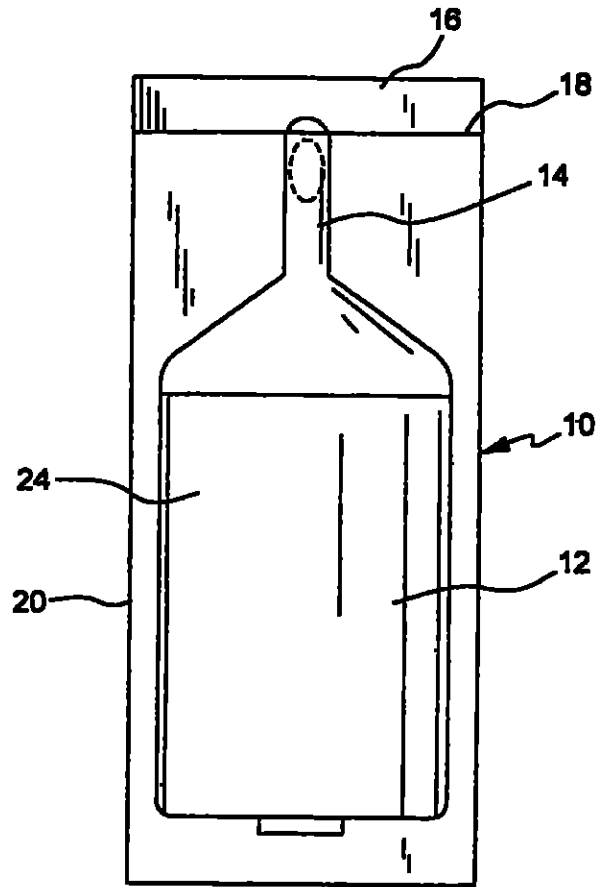


FIG 1

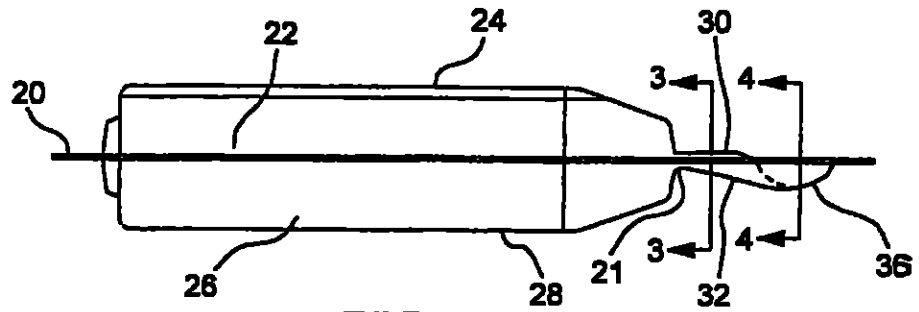
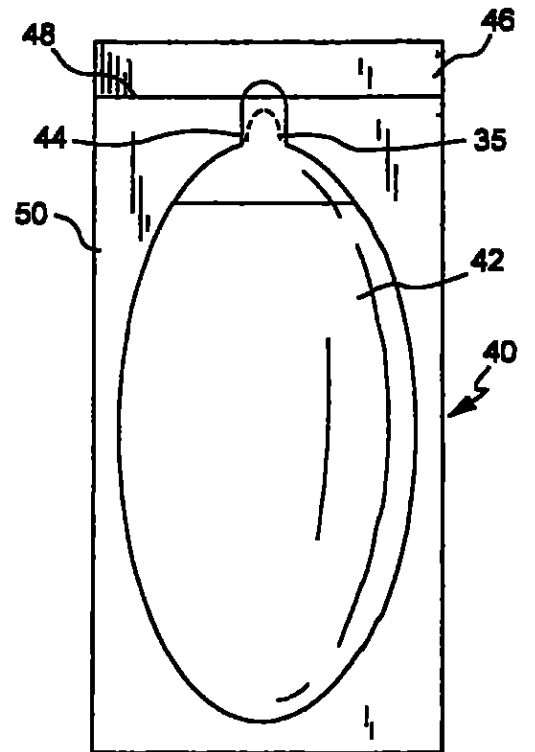
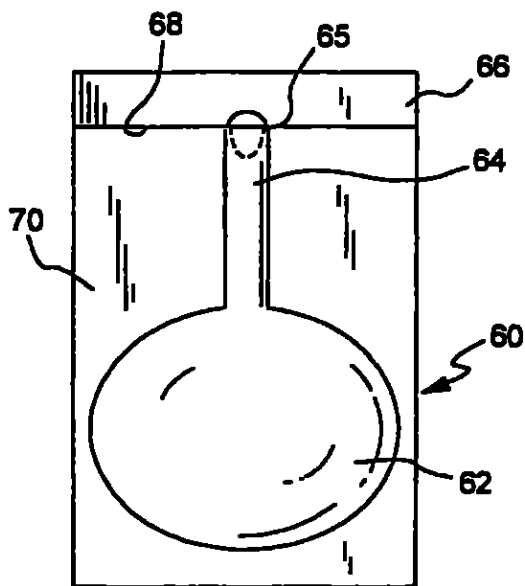
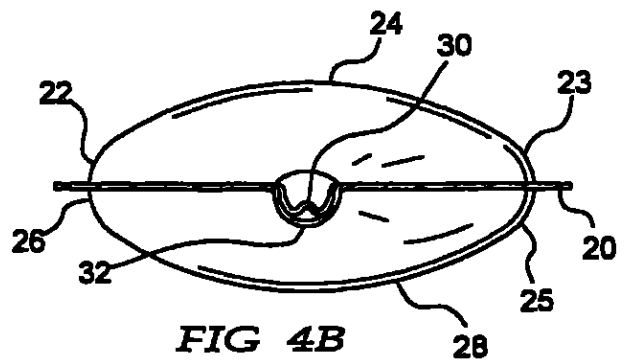
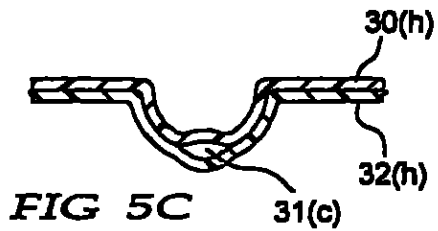
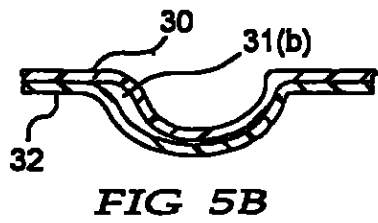
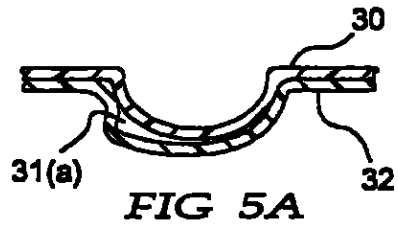
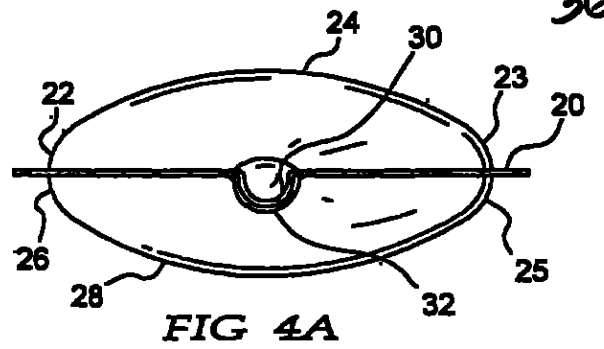
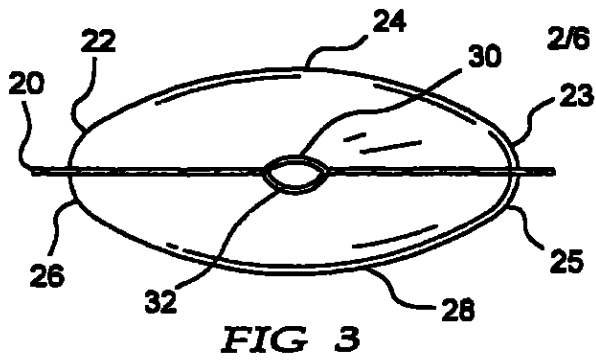


FIG 2



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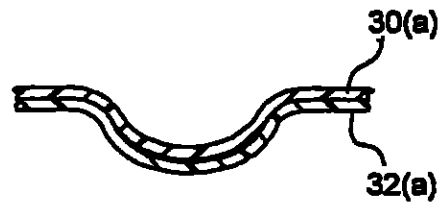


FIG 8

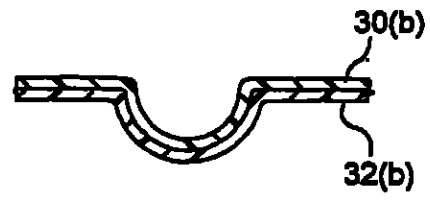


FIG 9

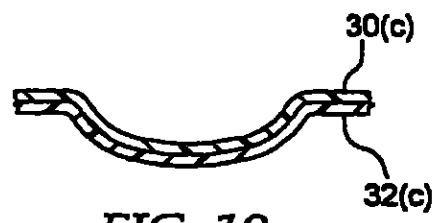


FIG 10

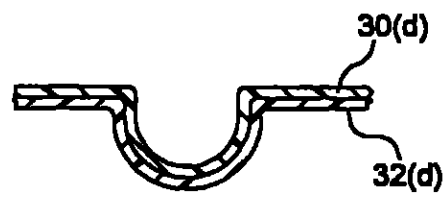


FIG 11

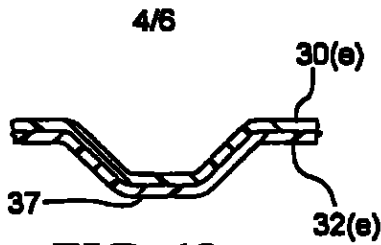


FIG 12

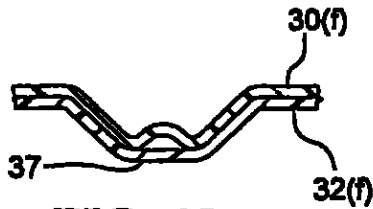


FIG 13



FIG 14

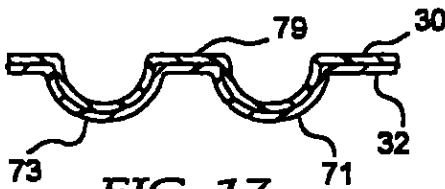


FIG 17

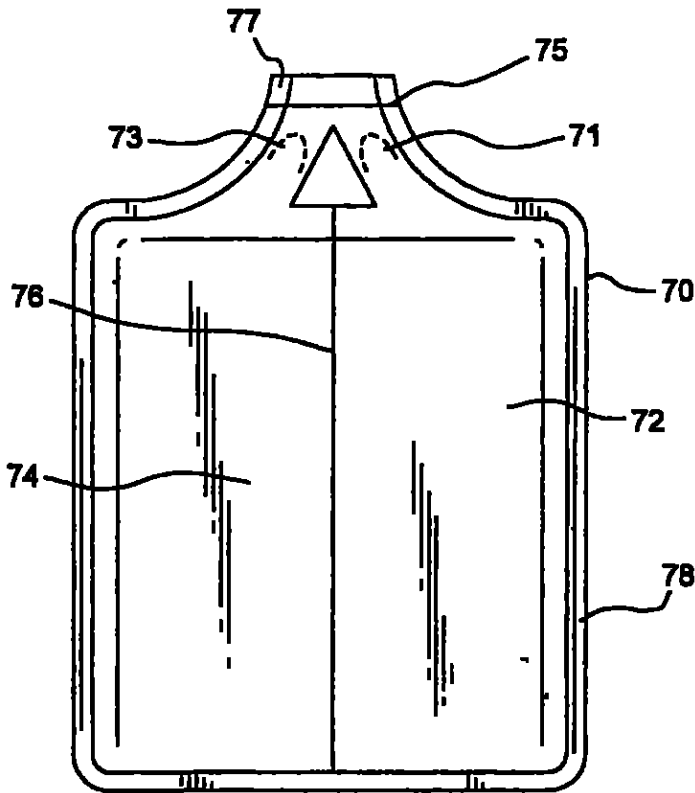
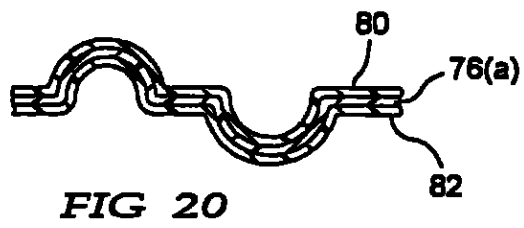
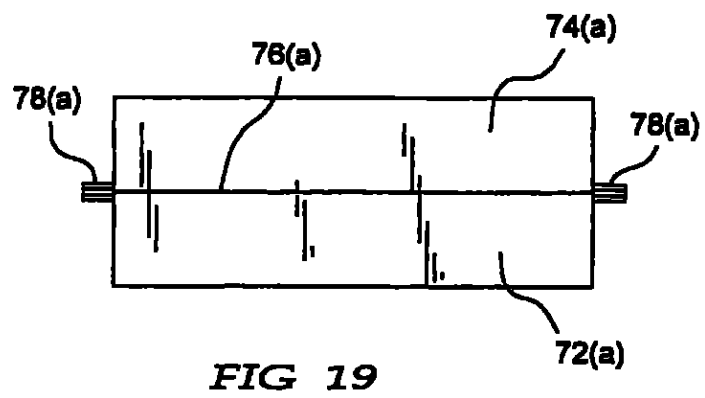
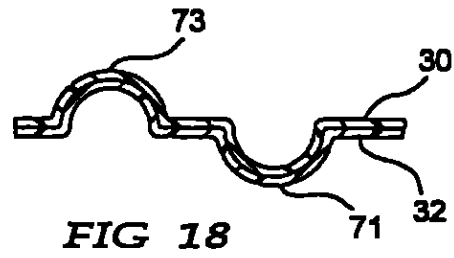
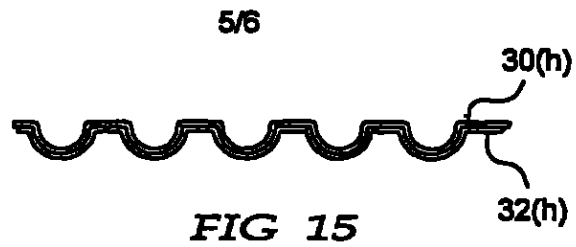


FIG 16



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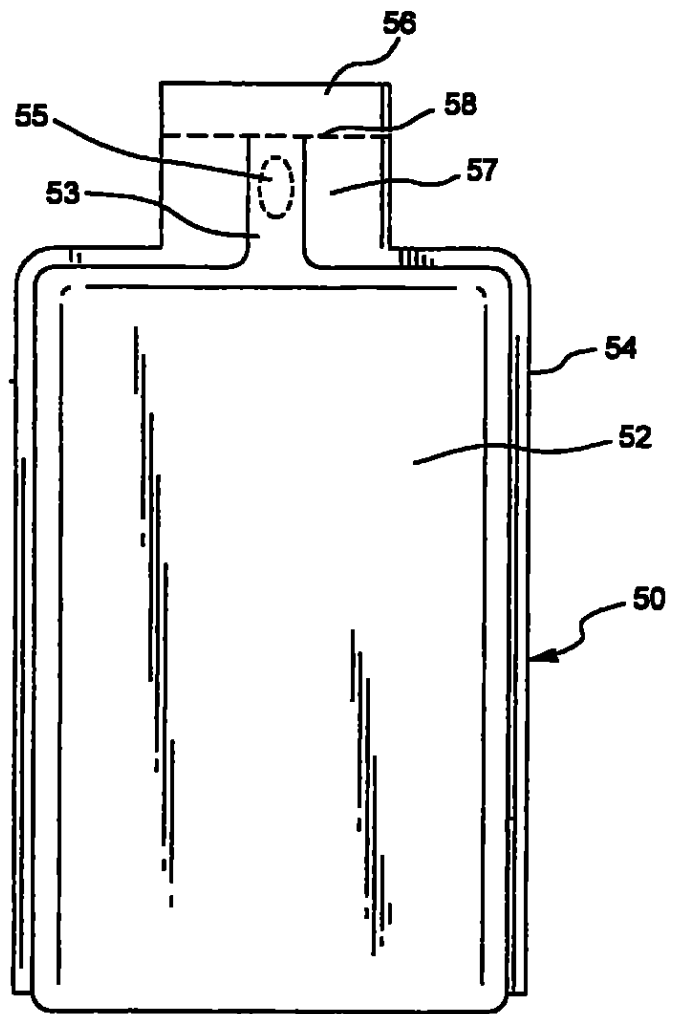


FIG 21

PCT REQUEST

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6422-00

Original (for SUBMISSION) printed on 05.04 2001 01 50 08 PM

0	For receiving Office use only	
0-1	International Application No	
0-2	International Filing Date	
0-3	Name of receiving Office and "PCT International Application	
0-4	Form - PCT/RO/101 PCT Request	
0-4-1	Prepared using	PCT-EASY Version 2 91 (updated 01 01 2001)
0-5	Petition The undersigned requests that the present International application be processed according to the Patent Cooperation Treaty	
0-6	Receiving Office (specified by the applicant)	United States Patent and Trademark Office (USPTO) (RO/US)
0-7	Applicant's or agent's file reference	6422-00
I	Title of invention	CONTAINER WITH FORMED MEMORY VALVE
II	Applicant	
II 1	This person is	applicant only
II-2	Applicant for	all designated States
II-4	Name	COLGATE-PALMOLIVE COMPANY
II-5	Address	300 Park Avenue New York, NY 10022 United States of America
II-6	State of nationality	US
II-7	State of residence	US
II-8	Telephone No.	732-878-7152
II-9	Facsimile No	732-878-7853
III-1	Applicant and/or inventor	
III 1 1	This person is	inventor only
III 1-4	Name (LAST First)	ZAKSENBERG, Issac
III-1-5	Address	950 Raritan Road Scotch Plains, NJ 07076 United States of America

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6422-00

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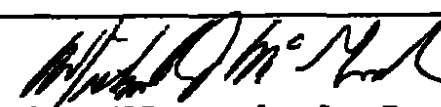
IV-1	Agent or common representative or address for correspondence The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as	agent
IV 1 1	Name (LAST First)	MC GREAL, Michael, J
IV-1 2	Address	Colgate-Palmolive Company 909 River Road P O Box 1343 Piscataway, NJ 08855-1343 United States of America
IV 1-3	Telephone No	732-878-7152
IV-1 4	Facsimile No	732-878-7853
IV 1-5	e-mail	mike_mcgreale@colpal.com
V	Designation of States	
V-1	Regional Patent (other kinds of protection or treatment if any are specified between parentheses after the designation(s) concerned)	AP GH GM KE LS MN MZ SD SL SZ TZ UG ZW and any other State which is a Contracting State of the Harare Protocol and of the PCT EA AM AZ BY KG KZ MD RU TJ TM and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT EP AT BE CH&LI CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR and any other State which is a Contracting State of the European Patent Convention and of the PCT OA BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG and any other State which is a member State of OAPI and a Contracting State of the PCT
V-2	National Patent (other kinds of protection or treatment, if any are specified between parentheses after the designation(s) concerned)	AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH&LI CN CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG UZ VN YU ZA ZW
V-3	National Patent (States which have become party to the PCT after the issuance of this version of EASY)	Co Colombia

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V-5	Precautionary Designation Statement In addition to the designations made under items V 1, V-2 and V-3 the applicant also makes under Rule 4 8(b) all designations which would be permitted under the PCT except any designation(s) of the State(s) indicated under item V-6 below. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit.	
V-6	Exclusion(s) from precautionary designations	NONE
VI-1	Priority claim of earlier national application	
VI-1-1	Filing date	06 April 2000 (06 04 2000)
VI-1-2	Number	09/543,797
VI-1-3	Country	US
VI-2	Priority document request The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) identified above as item(s)	VI-1
VII 1	International Searching Authority Chosen	European Patent Office (EPO) (ISA/EP)
VIII	Check list	number of sheets electronic file(s) attached
VIII 1	Request	4 -
VIII-2	Description	12 -
VIII-3	Claims	3 -
VIII-4	Abstract	1 - EZABST00 TXT
VIII-5	Drawings	6 -
VIII 7	TOTAL	26
VIII-6	Accompanying items	paper document(s) attached electronic file(s) attached
VIII-6	Fee calculation sheet	✓ -
VIII-16	PCT-EASY diskette	- diskette
VIII 18	Figure of the drawings which should accompany the abstract	2
VIII-19	Language of filing of the international application	English
IX-1	Signature of applicant or agent	
IX 1 1	Name (LAST First)	MC GREAL, Michael, J

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10-1	Date of actual receipt of the purported international application	
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10-2	Drawings	
10-2 1	Received	
10-2-2	Not received	
10-3	Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application	
10-4	Date of timely receipt of the required corrections under PCT Article 11(2)	
10-5	International Searching Authority	ISA/EP
10-6	Transmittal of search copy delayed until search fee is paid	

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11 1	Date of receipt of the record copy by the International Bureau	
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CONTAINER WITH FORMED MEMORY VALVE

Field of the Invention

5 This invention relates to a thermoformed dispensing container that has a positive seal formed memory valve. This invention further relates to a container having a valve comprised of a channel wherein a suckback can be designed into the valve whereby the dispensing container can substantially retain its original shape

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Background of the Invention

15 The present invention is directed to the problem of sealing a container once it has been opened and a portion of the contents removed. These containers usually are opened by removing a part of the container to expose an opening. This usually is a tear away tab. Upon putting pressure on the main body of the container, some of the contents can be dispensed. The remainder of the contents stay in the container. The present invention provides a positive
20 sealing valve arrangement so that after each dispensing the contents are positively sealed within the body of the container. The valve is comprised of a channel with a unique formed memory valve disposed in the channel.

25 The thermoformed container in one embodiment also can have a suckback feature. By suckback is meant that after a dispensing of some of the product from the container, air is drawn in through the valve to replace the product that has been dispensed. In this way the container substantially retains its original shape. The degree of suckback will be determined by the rheology of the material being dispensed, the structure of the valve and the resiliency of the
30 material of the container.

 Various types of valves for thermoformed containers are known. Such containers with flat channel valves are disclosed in U.S. Patent 3,184,121, U.S. Patent 4,491,157 and U.S. Patent 5,529,224. In Figure 6 of U.S.

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Patent 3,184,121 there is shown two parallel flat sheets of material that are opened to dispense a product by a force on the walls of the container. A related valve mechanism is shown in U.S. Patent 4,917,567. Figure 5C of this patent shows the valve in a dispensing condition. U.S. Patent 5,529,224 is directed to various embodiments of flat channel valves in combination with a thermoformed container. Flat channel valves are well known in the art. However, they have a disadvantage in that they do not provide a positive sealing. Further, the thickness and other characteristics of the thermoformed container materials must be closely designed to provide a reasonably good seal. An improvement over such channel valves is disclosed in U.S. Patent 5,839,609 which discloses a ridge valve arrangement for a channel valve.

Another type of seal is a deformable seal. This is described in U.S. Patent 3,635,376, U.S. Patent 4,928,852 and to an extent in U.S. Patent 5,529,224, figures 26 through 30. In this type of valve one sheet, usually the upper sheet, is designed to have a sufficient integrity to be moved manually from an open position to a closed position. The top sheet is moved manually from an upper position where the valve is open to a lower position where the valve is closed. The manual opening and closing of this type of valve is more clearly shown in Figure 7 of U.S. Patent 4,928,852.

U.S. Patent 5,839,609 discloses a thermoformed container with a ridge valve. This is a type of a flat channel valve with the integrity of the seal enhanced with depressions on either side of the ridge structure so that the top wall can be drawn downward into a better contact with the ridge by the elasticity of the upper sheet of plastic and the surface tension of the substance being dispensed which is contained in the depressions on either side of the ridge.

Despite the efforts of the inventors of the valve mechanisms of these patents, there has not been achieved a simple, automatic, positive sealing valve for a container. The valves that require manual manipulation or require a person to remember to seal the container, while flat channel valves are not positive sealing. A ridge valve provides good sealing but it has a complex structure and is in part a flat channel valve with some of the same shortcomings.

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Brief Summary of the Invention

Containers for the storing and dispensing of relatively small volumes of flowable substances can be made inexpensively by thermoforming. However, a problem in the use of containers for other than single dose use is a valve or closure to positively cut off the flow of the flowable substance after a dispensing. Further, in order to avoid inadvertent dispensing the effort to dispense must be one that would not be encountered in the normal handling of the container. However, the dispensing effort cannot be such as to make it difficult for people with lower hand strength to dispense product from the container. The present container is comprised of a body portion and a valve section. The container is sealed substantially around its periphery. The body portion is comprised of a chamber of essentially any shape with an outlet channel that contains a valve for the dispensing of amounts of a flowable substance. The end of the channel can be sealed by a tear-off tab or an equivalent structure that can be removed to open the outlet channel.

The valve portion is comprised of the channel having a top wall and a bottom wall. The channel can be of essentially any shape and usually will be of a circular or elliptical shape. However it can be polygonal in shape having two, three or more sides. If the channel is circular the upper 180° section will comprise a top wall and the lower 180° section will comprise the bottom wall. This likewise will apply to an elliptical shape where the wall above the major axis will comprise a top wall and below the major axis a bottom wall. Further, in a dispensing channel at a point a set distance from the chamber which holds the substance to be dispensed, either the top or bottom wall will be shaped to be biased in a position to be in close contact with the other wall by being depressed against the other wall during or after the forming of the container. This results in a formed memory of the walls of the valve. By formed memory is meant that the wall that is placed into contact with other walls will have a memory of the shape into which it has been formed. When displaced from this shape into which it has been formed by an applied force, such as that caused by a dispensing, the displaced wall will rapidly regain its former shape upon the removal of the applied force. This is the result of the formed memory.

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The flowable substance is dispensed from the container by pressing the walls of the chamber together to decrease the volume of the chamber. This forces the flowable substance from the chamber into the channel which comprises the valve. At a given force the valve opens by one channel wall or walls being displaced out of contact with other channel wall or walls. Upon the removal of the force on the chamber, the channel walls again come into intimate contact as a result of the formed memory of one or more of the channel walls and the dispensing of the flowable substance stops.

The containers also can be designed to have a suckback feature. In this way the container will retain its shape after each dispensing. The amount of product will be replaced by air that is drawn into the container part of the container through the valve. The rheology of the product will determine the structure of the container valve and container product chamber in order to get a sufficient suckback. In addition there should be a narrowed region prior to the valve to provide a venturi through which the product and air must flow.

This container with this valve can be used to dispense liquids, gels, lotions, oils, pastes and essentially any flowable substance. The structure of the container can be modified for the needs of a particular substance on the environment in which the container is to be used.

A preferred container is a thermoformed container. The present valve with a formed memory will be at one end of the container. The valve usually will be formed at the same time as the container and will be in the form of a unitary section with the container. The valve is very useful on thermoformed containers since it is an effective way to make a thermoformed container a multi-dose container. Without an effective valve arrangement thermoformed containers can only be used as single dose containers.

Although thermoformed containers are the preferred containers, containers molded by other techniques can also effectively use the present valve. In these other embodiments the containers and the formed memory valves can be molded as one piece or molded in two or more pieces and assembled.

Brief Description of the Drawings

Figure 1 is a top plan view of an embodiment of a thermoformed container of the present invention

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Figure 2 is a side elevational view of the thermoformed container of Figure 1

Figure 3 is a cross-sectional view of the valve of the thermoformed container of Figure 2 along line 3-3

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Figure 4 is a cross-sectional view of the valve of the thermoformed container of Figure 2 along line 4-4

Figure 4B is a cross-sectional view of the valve of the thermoformed valve of Figure 4A in an open dispensing mode

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Figure 5A shows a first alternate embodiment for the opening of the valve of the container of Figure 1

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Figure 5B shows a second alternate embodiment for the opening of the valve of the container of Figure 1

Figure 5C shows a third alternate embodiment for the opening of the valve of the container of Figure 1

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Figure 6 is a top plan view of the thermoformed container with an elliptical chamber and a shortened valve channel

Figure 7 is a top plan view of the thermoformed container with a circular chamber and an elongated valve channel

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Figure 8 is a first alternate embodiment of the valve of the container of Figure 1.

Figure 9 is a second alternate embodiment of the valve of the container of Figure 1

Figure 10 is a third alternate embodiment of the valve of the container of Figure 1

Figure 11 is a fourth alternate embodiment of the valve of the container of Figure 1

Figure 12 is a fifth alternate embodiment of the valve of the container of Figure 1

Figure 13 is the fifth alternate embodiment of the valve of the container of Figure 1 in an open condition

Figure 14 shows a sixth alternate embodiment of the valve of Figure 1

Figure 15 shows a seventh alternate embodiment of the valve of Figure 1

Figure 16 is an elevational view of a dual chamber container incorporating the present valve

Figure 17 is a cross-sectional view of the valve of the dual chamber container of Figure 16

Figure 18 discloses an alternate valve for the container of Figure 16.

Figure 19 is a cross-sectional view of an alternate structure for a dual chamber container

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Figure 20 discloses a valve for the container of Figure 19.

Figure 21 is an elevational view of a bottle incorporating the present valve

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Detailed Description of the Drawings

The preferred embodiment of the present invention will now be described in more detail with reference to the attached drawings and with regard to thermoformed containers. However it is to be understood that the formed memory valve is not restricted to use with thermoformed containers. The shape and size of the containers also can vary as can the shape and size of the components of the containers and yet be within the concept of the present invention

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The thermoformed container 10 of Figures 1 to 4 has a flowable substance chamber 12 and a formed memory valve portion 14. The periphery 20 of the container is a seal area. Score line 18 is located between seal tab 16 and the remainder of the container. The container 10 is shown in more detail in Figure 2. The substance chamber 12 has sidewalls 22 and 26 and transverse walls 24 and 28. The valve portion 14 has an upper wall 30 and a lower wall 32. Upper wall 30 tapers downwardly to a close contact with lower wall 32 to provide the formed memory valve. In this particular embodiment the channel 14 ends in a deepened area 36 into which the upper wall section 30 fits. However, it is not required that there be a deepened section 36. This may be of the same concavity as the remainder of wall 32. The lower surface of upper wall section 30 has a convex shape and intimately contacts the concave shaped upper surface of lower wall deepened area 36. This contact seals the flowable substance in chamber 12 from being unintentionally dispensed after the removal of seal tab 16. The valve area is shown in more detail in Figure 4A and 4B. However, as noted, a deepened region is not required

Figure 3 shows in cross-section the shape of the valve channel 14 prior to the deepened portion 36. This is shown as being elliptical but it can be circular or of a polygonal shape. When polygonal it can have two or more sides. Figures

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4A and 4B show the valve in one mode of operation. In Figure 4A the valve is at rest. The valve is closed and there is no dispensing. In Figure 4B there is a dispensing with part of the upper wall 30 of the valve being forced out of contact with part of the lower wall 32, thus permitting a substance stored in chamber 12 to be dispensed. Upon the cessation of pressure on the chamber 12 the upper wall 32 regains close contact with the lower wall and seals the chamber 12 as a result of the formed memory of the upper wall 30.

In Figure 2 the exit of the relatively wide chamber 12 is a narrow section 21 opening to a wide channel. This wide-narrow-wide flow of substance from the chamber 12 has a venturi effect that promotes the suckback of air through the valve and into the chamber 12 after the dispensing of some of the substance from the chamber 12. In this way chamber 12 will retain its shape after each quantity of the substance is dispensed. This mode of operation is useful for substances that are not affected by the presence of air.

Figures 5A, 5B and 5C show three modes of operation of the valve of the container 10 of Figure 1. In Figure 5A it is shown that the wall 30 gives and creates an opening 31(a) upon the application of a dispensing force to the body of the container which holds the substance to be dispensed. In Figure 5B it is shown that the wall 32 gives and creates an opening 31(b) upon the application of a dispensing force to the body which holds the substance to be dispensed. In Figure 5C it is shown that both the wall 30 and the wall 32 give to create an opening 31(c) to dispense the substance in the container portion. The wall or walls that have been stretched and thinned in the making of the valve usually will be the wall to yield upon the application of the dispensing force. However the wall that is not stretched and thinned may also distort to create the opening to provide for the dispensing. In Figures 5A, 5B and 5C it is assumed that the thicknesses of the upper wall 30 and the lower wall 32 is the same. However this need not be the case. The wall that has been stretched and thinned may yet not be the thinner wall and consequently it will not be the wall to yield upon the application of a dispensing force to the body of the container. It may initially have been thicker than the other wall. In general the thinner wall of the valve will be the wall to yield in a dispensing mode.

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Figure 6 shows an embodiment where the chamber of the thermoformed container is elliptical in shape. This container 40 has body chamber 42 for a flowable substance, a shortened valve portion 44, a seal tab 46 and a score line 48. The periphery 50 of the thermoformed container is a seal area. Also in this embodiment the valve 35 is at the junction of the body chamber 42 and the channel 44. Preferably at least half of the valve is in the channel. Most preferably the full valve is in the channel.

Figure 7 shows a container 60 with a chamber 62 that is circular in shape and an elongated channel portion 64. Score line 68 separates seal tab 66 from the remainder of the container. The periphery 70 is a seal area. This embodiment shows the valve 65 being located at the junction of the channel and the channel exit. Preferably at least half of the valve is in the channel. Most preferably the full valve is in the channel.

Figures 8 to 14 disclose several shapes for the valve area of the elongated channel. These can be of a large radius semi-circular channel shape 32(a) as shown in Figure 8, a smaller radius semi-circular shape 32(b) of Figure 9, a hyperbolic shape 32(c) in Figure 10, or a shape 32(d) in Figure 11 that is parabolic. In each of these shapes the upper wall 30(a), 30(b), 30(c), and 30(d) of the valve will conform respectively to the shape of the lower surface 32(a), 32(b), 32(c) and 32(d) when the valve is closed. However, when a product is to be dispensed, the upper wall 30(a), 30(b), 30(c), and 30(d) usually will move out contact with the lower wall by the dispensing force being applied to the container body. Upon a relaxation of the dispensing force the wall 30(a), 30(b), 30(c) and 30(d) will ultimately contact the wall 32(a), 32(b), 32(c) and 32(d) of the valve and flow of substance from the container body will cease. The upper wall will move since it is the wall with the formed memory.

Figure 12 shows a valve that is polygonal in shape. The upper wall 30(e) and the lower wall 32(e) each have three sides. The valve is shown at rest in Figure 12 and opened in Figure 13. Although shown as three sided the valve can have essentially number of sides. As the number of sides increases the shape of the valve approaches a circular shape.

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Figure 14 is a cross-sectional view of a valve having a sinusoidal shape. Upper wall 30(f) is stretched to contact lower wall 32(f). This is an optional structure for the valve.

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Figure 15 discloses a valve with a plurality of formed memory portions. This is shown in an enlarged view with the formed memory portions being from less than 25% to about the width as shown. The formed memory portions also may be of a modified shape such as sinusoidal. The upper wall 30(h) is formed into a plurality of downwardly extending sections and the lower wall a plurality of upwardly extending sections. Each of the extended sections has formed memory. That is, each extended section has been stretched and thinned. On a dispensing, one or more of the extended sections will be dislocated from its formed position. This valve will be useful for dispensing larger volumes of liquids.

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Figure 16 shows a dual chamber container 70 with the present valve. The container is sealed along peripheral edge 78. There are two chambers 72 and 74. These chambers are created by sealing the front and rear walls together at a mid-point 76. There are formed two channels 71 and 73. Each channel has a valve which is shown in more detail in Figure 17. At the end of the channels is seal tab 77 with perforations 75 to facilitate the removal of the seal tab. Each of the valves has upper wall 30 and lower wall 32. The upper wall and the lower wall are sealed together at 79 to maintain the channels separate until the exits of the channels. Since the wall 30 and the wall 32 are of the same thickness the valves will open at substantially the same dispensing pressures. The valve in Figure 14 also can be used. This is a sinusoidal type valve which can be adapted for the dual chamber container.

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Figure 18 discloses an alternate embodiment to the valve of Figure 17. In this valve the valve is formed where the valves are inverted from channel to channel. In channel 73 the lower wall is stretched and thinned while in channel 71 the upper wall is stretched and thinned. This is a useful valve for a dual chamber container.

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Figure 19 shows in cross-section a dual chamber container that differs from that of Figure 16 in that the divider wall extends from one sidewall to another sidewall rather than from front wall to rear wall. The divider wall 76(a) divides the container into chambers 72(a) and 74(a). The divider wall extends into the peripheral edge 78(a) which also is a seal area. Figure 20 shows a valve for this container. This valve will have three walls comprised of outer walls 80 and 82 and the divider wall 76(a). The divider wall usually will be of a reduced thickness in comparison to wall 80 and wall 82. The valve will function in the same manner as the other described formed memory valves. That is, one portion which usually is the most thinned portion will yield and provide for a dispensing.

Figure 21 shows the present formed memory valve incorporated into a bottle-like container. This container 50 has a product chamber 52 and a sealed edge 54 around the product chamber. At an upper end is a channel 53 with a formed memory valve 55. Above the valve is breakaway tab 56 separated from the remainder of the container by serrations 58. Breakaway tab 58 is removed for the dispensing of the product from the product chamber 52 and through channel 53. Formed memory valve 55 will regulate the flow of product.

The thermoformed container of Figure 1 is made by separately thermoforming an upper sheet of film and a lower sheet of film. Each sheet will have a part of the chamber, a part of the elongated channel and formed memory valve portion, the seal tab and the periphery seal area. One sheet in a registered form is overlaid on the other to form the container by heat or adhesively sealing the periphery of the sheets of film. The containers can be filled at the time of forming the containers or in a subsequent operation. The valve is constructed at the same time that the container is made. As the thermoformed upper sheet is being bonded to the thermoformed lower sheet, and while the sheet materials are in a heated condition, one wall of the channel is depressed into a close contact with the other wall. This can be a depressing of the top wall or bottom wall into contact with the other wall. Upon the sheet material of the container cooling it decreases in flexibility and retains an enhanced bias for the shape into which it has been formed, i.e., walls of the channel to remain in a close, intimate contact. This forms the valve of the channel. The upper and lower sheets of plastic that comprise the container can be of the same or

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different thickness This thickness can be from about 0.01 mm to about 3 mm, and preferably about 0.2 mm to about 1 mm

5 The walls of the channel will have a formed memory to the shape into which they have been formed. They will remain in that shape and regain that shape upon any displacement. As noted, the valve wall that has been stretched and thinned usually will be the wall to flex and be displaced during a dispensing

10 The valves that have been described can be used on essentially any container. The containers can be made by essentially any molding technique and can be of essentially any shape and contain essentially any number of chambers. The valves can be integral to the container or can be a separate assembly as to the container. There is no limitation in this regard. The concept is to create a
15 formed memory so that one surface of the valve will return to rest in close contact with the other surface after the cessation of a dispensing force

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Claims

What is claimed is

- 1 A container comprising a substance containing portion and a valve
5 portion, said container being sealed substantially around the periphery
thereof, said substance containing portion in communication with said
valve portion at one end, said valve portion comprising at least one
channel having at least a portion of one wall being formed to be in a close
10 contact with at least a portion of another wall, said at least a portion of
one wall having a formed memory whereby a given depressing force is
required for said first wall to move from contact with said portion of
another wall and upon the removal of said given dispensing force said
valve closes and seals the substance containing portion of said container
15 by said at least a portion of one wall returning to contact with said at least
a portion of said another wall
2. A container as in claim 1 wherein at an end of said valve portion distant
from said substance containing portion there is a breakaway tab that forms
a protective seal prior to an initial use
- 3 A container as in claim 1 wherein said valve portion is comprised of a
20 portion of the channel, the channel being of a circular cross-section.
- 4 A container as in claim 1 wherein said valve portion is comprised of a
portion of the channel, the channel being of an elliptical cross-section
- 5 A container as in claim 1 wherein said valve portion is comprised of a
portion of the channel, the channel being of a polygonal cross-section
- 25 6 A container as in claim 1 wherein said valve portion is comprised of a
portion of the channel and is located adjacent to said substance containing
portion
- 7 A container as in claim 1 wherein said valve portion is comprised of a
portion of the channel and is located spaced from said substance
30 containing portion
- 8 A container as in claim 1 wherein said valve portion is comprised of a
portion of the channel and is located at the junction of said substance
containing portion and said valve portion

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- 9 A container as in claim 1 wherein said valve portion is comprised of a portion of the channel and is located at the junction of the channel and an exit from said channel
- 5 10. A container as in claim 1 wherein the at least a portion of one wall and at least a portion of another wall of said valve portion are the same thickness except for the formed memory portion of the one wall, the formed memory portion of said at least a portion of one wall being of a reduced thickness in relation to the at least a portion of another wall in which it is in a close contact.
- 10 11 A container as in claim 1 wherein the at least a portion of one wall and the at least a portion of another wall of said valve portion differ in thickness, the formed memory portion of said at least a portion of one wall being of a thickness substantially that of the at least a portion of another wall in which it is in a close contact.
- 15 12 A container as in claim 1 wherein the at least a portion of one wall and the at least a portion of another wall of said valve portion differ in thickness, the portion of the at least a portion of one wall having the formed memory being of a thickness greater than that of the at least a portion of another wall in which it is in a close contact.
- 20 13 A container as in claim 1 wherein a wall of said substance containing chamber at an end opposite said valve portion is substantially planar
- 14 A container as in claim 1 wherein the container is a thermoformed container so that said container can be supported upright on said end opposite said valve portion
- 25 15. A container as in claim 1 wherein there is a narrowed cross-sectional region at the junction of said substance containing portion and said channel to thereby form a venturi whereby there is created a suckback of air into the substance containing portion after a dispensing of some of the substance from the substance containing portion.
- 30 16 A container as in claim 1 wherein said at least a portion of one wall has a concave shape and said at least a portion of another wall has a convex shape
- 17 A container as in claim 1 wherein said container has at least two chambers, each chamber having a valve portion at said one end

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- 18 A container as in claim 17 wherein the valve portion at said one end of one chamber having an inverted structure with relation to the valve portion at said one end of a second chamber
- 5 19 A container as in claim 1 wherein a plurality of portions of one wall are formed to be in a close mating contact with a plurality of portions of another wall
- 20 A container as in claim 19 wherein said first wall has a plurality of shaped portions
- 10 21 A container as in claim 20 wherein said plurality of shaped portions are concave shaped portions
- 15 22 A thermoformed container comprising a substance containing portion and a valve portion, said container being sealed substantially around the periphery thereof, said substance containing portion in communication with said valve portion at one end, said valve portion comprising a channel having at least a portion of one wall being formed to be in a close contact with at least a portion of another wall, said at least a portion of one wall having a formed memory whereby a given depressing force is required for said at least a portion of one wall to move from contact with said at least a portion of another wall and upon the removal of said given dispensing force said valve closes and seals the substance containing portion of said container by said at least a portion of one wall returning to contact with said at least a portion of another wall, said at least a portion of one wall having a convex shape and said another wall having a concave shape
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Abstract

The container has a varied sized substance body chamber with a channel at an exit end. This channel is sealed by a breakaway tab at an end distant from the chamber. Within the channel is a positive seal valve that can reseal the container after it has initially been opened. This valve is comprised of an upper wall of the channel being in a close contact with the lower wall. The lower wall usually will have a concave shape, with the upper wall contacting the lower wall with a mating convex shape. However this is not required with the channel having many differing shapes and dimensions. This valve can be separated from the substance holding body chamber by a portion of the channel, can be at the junction of the storing chamber and the channel or can be at the junction of the exit of the channel. When a compressive pressure is applied to the substance holding chamber, the substance flows down the channel to the valve. When the liquid pressure reaches a given level, the concave upper wall of the valve moves out of contact with the convex lower wall and some of the substance is dispensed. Upon the cessation of pressure the convex and concave portions come back into contact to cut off the flow of the substance. This valve produces a positive seal which provides a positive seal for the thermoformed container.

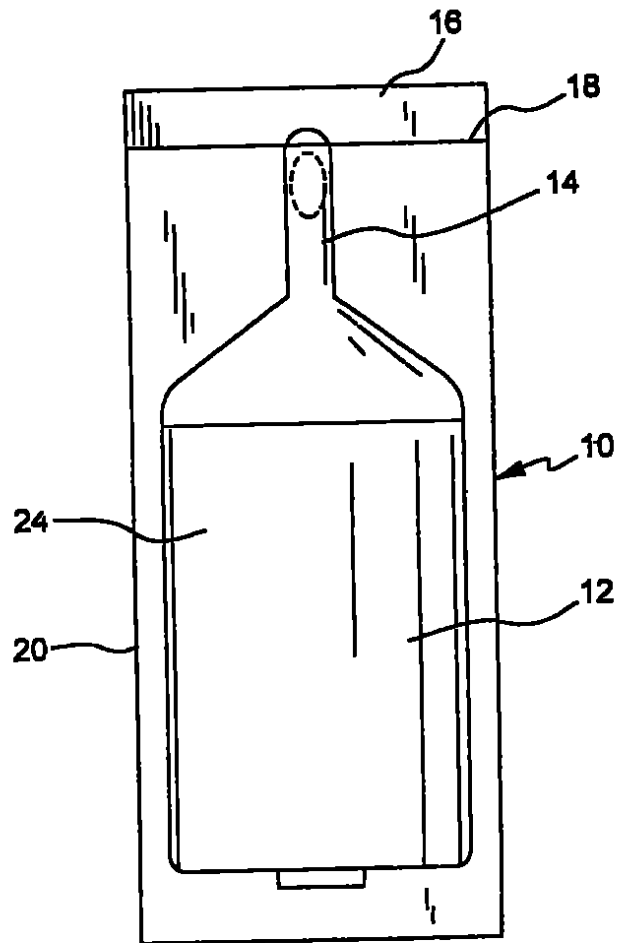


FIG 1

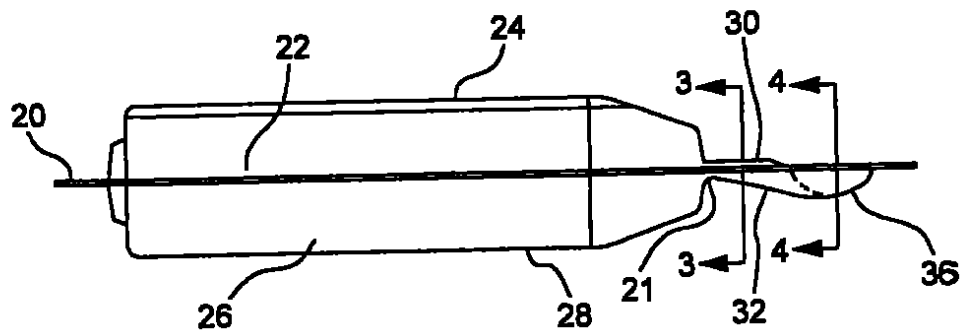


FIG 2

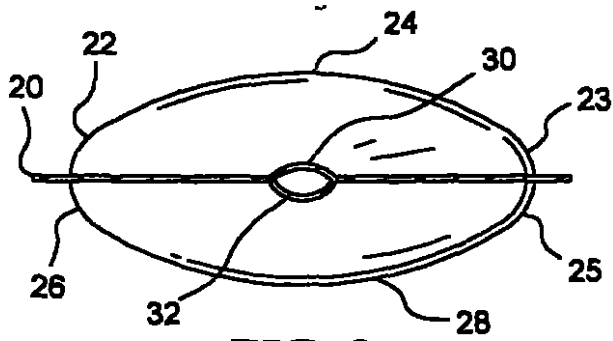


FIG 3

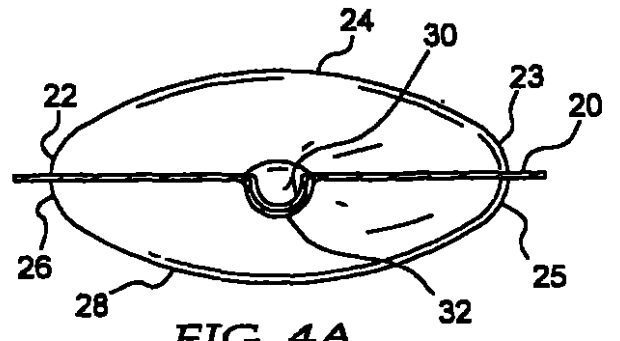


FIG 4A



FIG. 5A

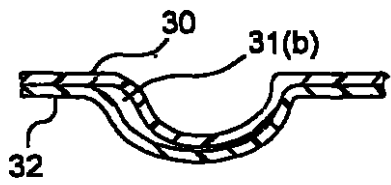


FIG. 5B

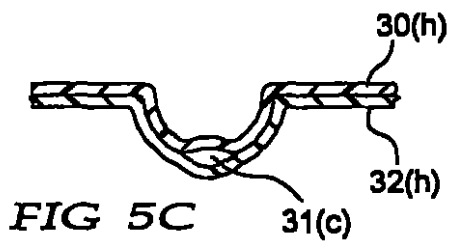


FIG 5C

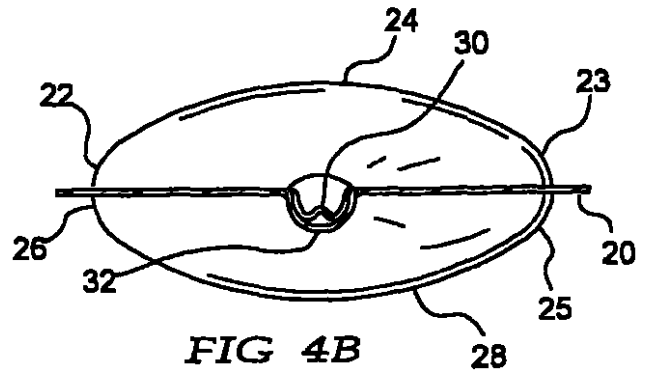


FIG 4B

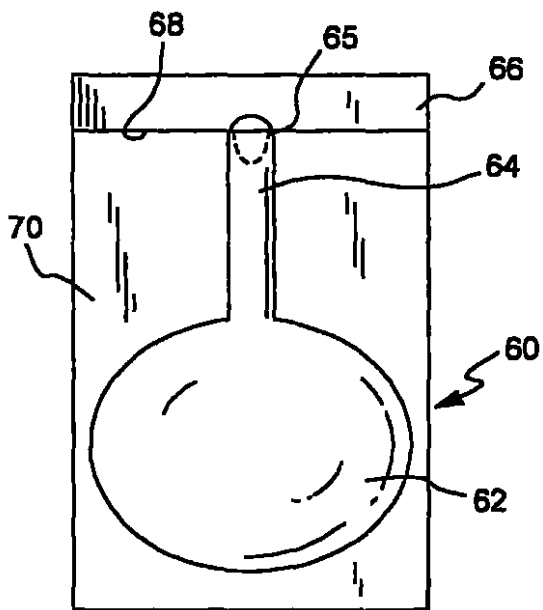


FIG 7

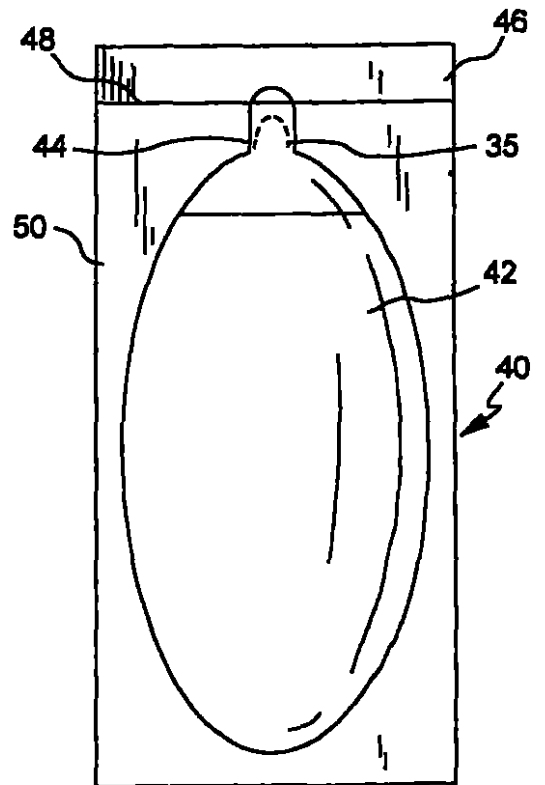


FIG 6

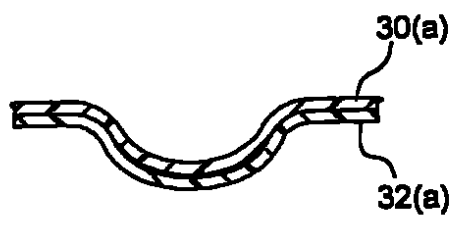


FIG. 8

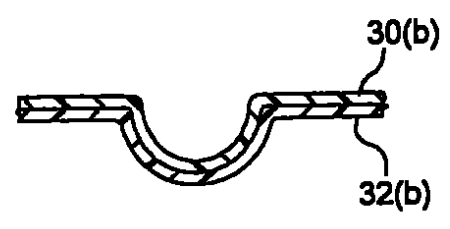


FIG 9

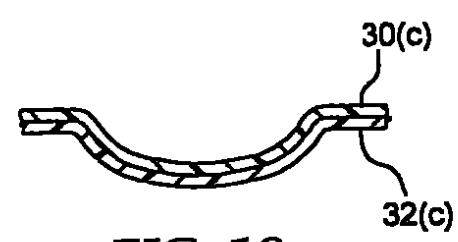


FIG 10

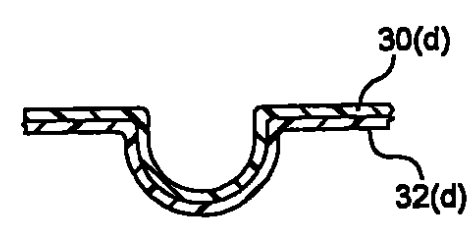


FIG 11

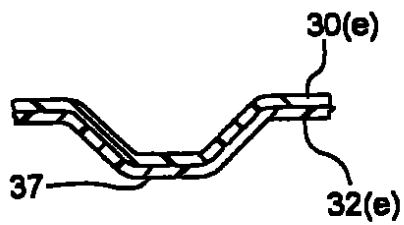


FIG 12

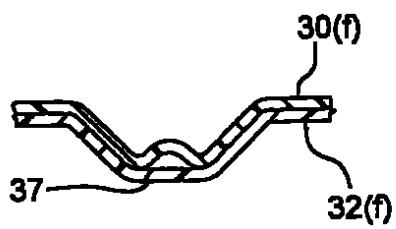


FIG 13

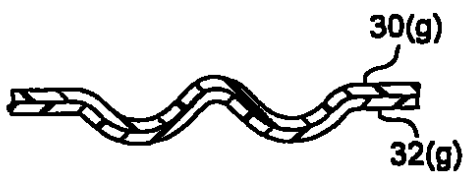


FIG 14

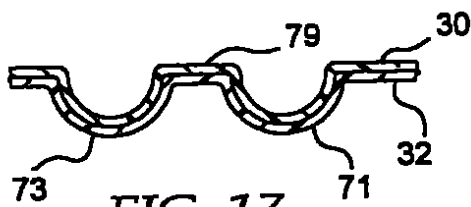


FIG 17

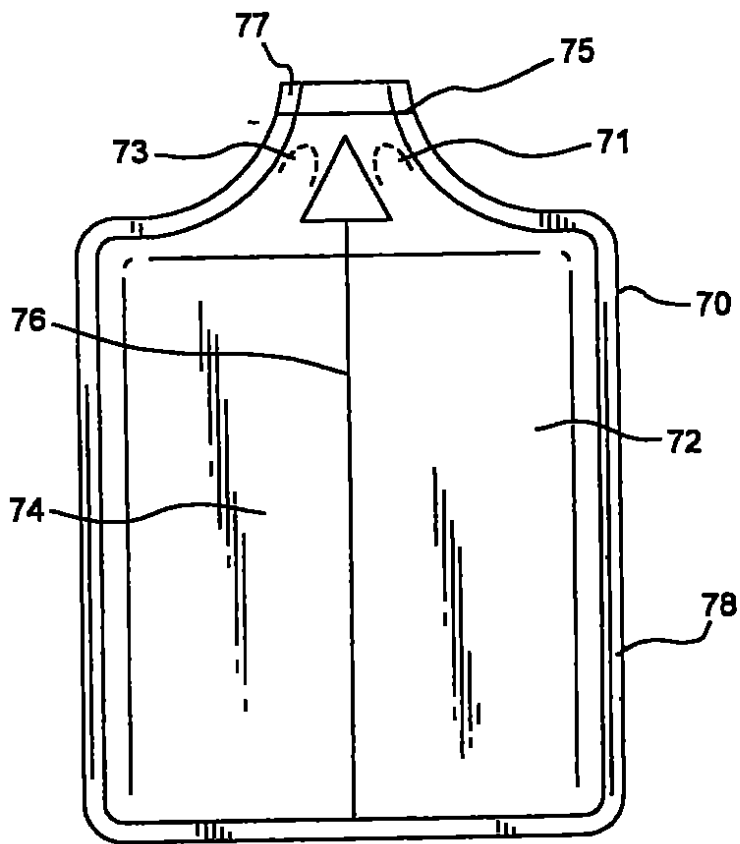


FIG 16



FIG 15

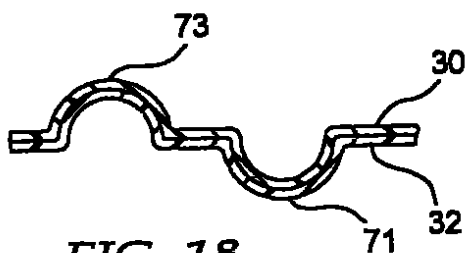


FIG 18

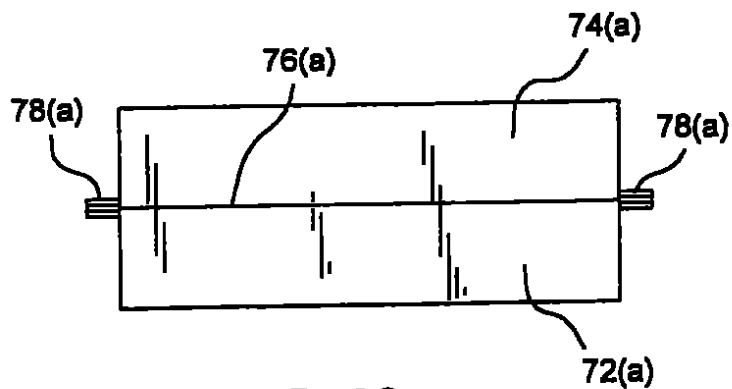


FIG 19

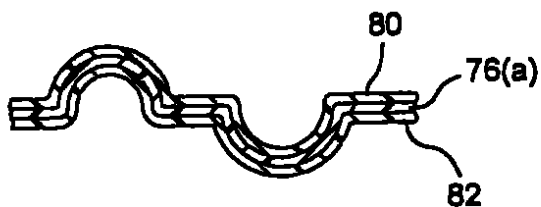
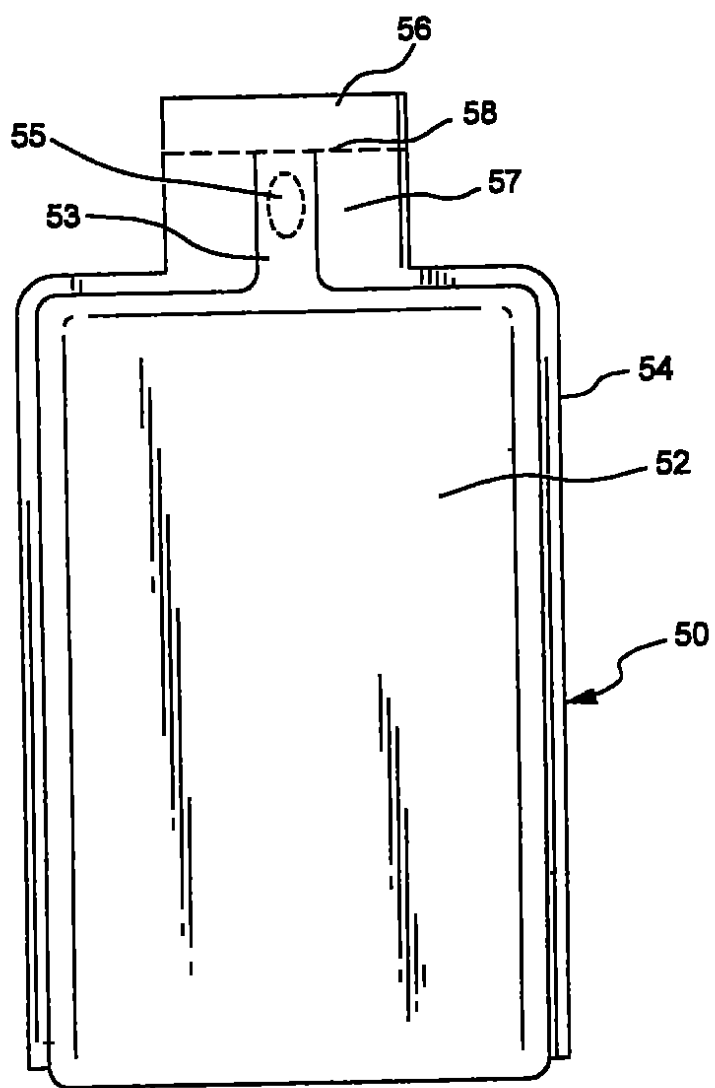


FIG 20

**FIG 21**

GENERAL POWER OF ATTORNEY

(for several international applications filed under the Patent Cooperation Treaty)

(PCT Rule 90.5)

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(Family name followed by given name for a full legal entity full official designation. The address must include postal code and name of country.)

COLGATE PALMOLIVE COMPANY
300 Park Avenue
New York New York 10022
United States of America

hereby appoint(s) the following person as

☒ agent☐ common representative

Name and address

(Family name followed by given name for a legal entity full official designation. The address must include postal code and name of country.)

Martin B. Barancik, Henry S. Goldfine, Bernard Lieberman, Michael J. McGreal, Rosemary M. Miano, Richard E. Nanfeldt
and Paul Shapiro of

COLGATE-PALMOLIVE COMPANY
909 River Road
P.O. Box 1343
Piscataway New Jersey 08855 1343
United States of America

to represent the undersigned before

☒ all the competent International Authorities☐ the International Searching Authority only☐ the International Preliminary Examining Authority only

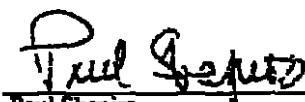
in connection with any and all international applications filed by the undersigned with the following Office

RO/US

as receiving Office

and to make or receive payments on behalf of the undersigned.

Signature(s) (where there are several persons each of them must sign, next to each signature indicate the name of the person signing and the capacity in which the person signs if such capacity is not obvious from reading this power)



Paul Shapiro
Vice President
Chief Patent Counsel

Date

November 1 2000

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0-1	International Application No	
0-2	Date stamp of the receiving Office	
0-4	Form PCT/RO/101 (Annex) PCT Fee Calculation Sheet	
0-4-1	Prepared using	PCT-EASY Version 2 91 (updated 01 01 2001)
0-9	Applicant's or agent's file reference	6422-00
2	Applicant	COLGATE-PALMOLIVE COMPANY
12	Calculation of prescribed fees	fee amount/multiplier total amounts (USD)
12 1	Transmittal fee T	⇒ 240
12 2	Search fee S	⇒ 846
12-3	International fee	
	Basic fee (first 30 sheets) b1	382
12-4	Remaining sheets	0
12-5	Additional amount (X)	9
12-6	Total additional amount b2	0
12 7	b1 + b2 = B	382
12-8	Designation fees	
	Number of designations contained in international application	87
12-9	Number of designation fees payable (maximum 6)	6
12 10	Amount of designation fee (X)	82
12-11	Total designation fees D	492
12 12	PCT-EASY fee reduction R	-117
12 13	Total international fee (B+D-R) I	⇒ 757
12-14	Fee for priority document	
	Number of priority documents requested	1
12 15	Fee per document (X)	15
12 16	Total priority document fee P	⇒ 15
12-17	TOTAL FEES PAYABLE (T+S+I+P)	⇒ 1,858
12-19	Mode of payment	authorization to charge deposit account
12-20	Deposit account instructions	
	The receiving Office	United States Patent and Trademark Office (USPTO) (RO/US)
12-20-1	Is hereby authorized to charge the total fees indicated above to my deposit account	✓

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PCT (ANNEX - FEE CALCULATION SHEET)

8422-00

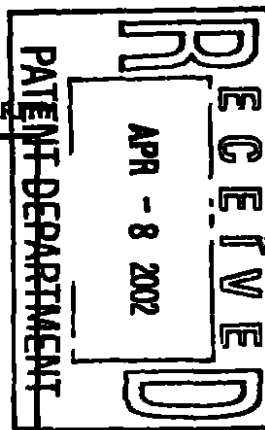
Original (for SUBMISSION) printed on 05 04 2001 01 50 08 PM

12-20-2	is hereby authorized to charge any deficiency or credit any over-payment in the total fees indicated above to my deposit account	✓
12-20-3	is hereby authorized to charge the fee for preparation and transmittal of the priority document to the International Bureau of WIPO to my deposit account	✓
12-21	Deposit account No	03-2457
12-22	Date	05 April 2001 (05 04 2001)
12-23	Name and signature	DUNNE, Elizabeth, M <i>Elizabeth M Dunne</i>

VALIDATION LOG AND REMARKS

13-2-2	Validation messages States	Green? More designations could be made The following States have not been designated US Please verify
		Yellow! Additional national designation added Obtain updated maintenance tables rather than using this field
13-2-6	Validation messages Contents	Yellow! The power of attorney or a copy of the general power of attorney will need to be furnished unless all applicants sign the request form
		Green? The abstract shall be as concise as the disclosure permits (preferably 50 to 150 words if it is in English or when translated into English)
13-2-8	Validation messages Payment	Green? Please ensure that you have a valid deposit account with the receiving Office selected

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY



PCT

WRITTEN OPINION

(PCT Rule 66)

2 April 2002

To:

McGreal, Michael J
COLGATE-PALMOLIVE COMPANY
909 River Road
Piscataway, New Jersey 08855-1343
ETATS-UNIS D'AMERIQUE

Date of mailing
(day/month/year)

02.04.02

Applicant's or agent's file reference

IR 6422-00

REPLY DUE

within 2 / 00 months/days
from the above date of mailing

International application No.

PCT/US 01/ 11174

International filing date (day/month/year)

05/04/2001

Priority date (day/month/year)

06/04/2000

International Patent Classification (IPC) or both national classification and IPC

B65D75/58

Applicant

COLGATE-PALMOLIVE COMPANY

1 This written opinion is the first drawn up by this International Preliminary Examining Authority

2 This opinion contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☒ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(i) with regard to novelty, inventive step or industrial applicability, citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

3 The applicant is hereby invited to reply to this opinion.

When? See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d).

How? By submitting a written reply accompanied, where appropriate, by amendments according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

Also: For an additional opportunity to submit amendments, see Rule 66.4.
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4bis.
For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.

4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is:

06/08/2002

Name and mailing address of the IPEA/



European Patent Office
D-80298 Munich
Tel (+49-89) 2399-0 Tx 523656 epmu d
Fax (+49-89) 2399-4465

Authorized officer

Examiner

Formalities officer

(incl. extension of time limits)
Tel (+49-89) 2399 2828



I Basis of the opinion

The basis of this written opinion is the application as originally filed

III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The question of whether the claimed invention appears to be novel, to involve an inventive step, or to be industrially applicable has not been and will not be the subject of the international preliminary examination in respect of the claims corresponding to inventions or group of inventions for which additional search fees may have not been paid and consequently may have not been searched (Article 17(3)(a) and Rule 66 1(e) PCT, see also international search report)

IV Lack of unity of invention

The objection as to lack of unity raised in the international search report is maintained
The reasons for the objection are the same as those indicated in the international search report

V Reasoned statement under Rule 66 2(a)(ii) with regard to novelty, inventive step or industrial applicability

- 1 To the extent that the international preliminary examination has been carried out (see item III above), the following is pointed out
- 2 In light of the documents cited in the international search report, it is considered that the invention as defined in at least some of the claims, which have been the subject of an international search report, does not appear to meet the criteria mentioned in Article 33(1) PCT, i.e. does not appear to be novel and/or to involve an inventive step (see international search report, in particular the documents cited X and/or Y and corresponding claim references)
- 3 If amendments are filed, the applicant should comply with the requirements of Rule 66 8 PCT and indicate the basis of the amendments in the documents of the application as originally filed (Article 34 (2) (b) PCT) otherwise these amendments may not be taken into consideration for the establishment of the international preliminary examination report. The attention of the applicant is drawn to the fact that if the application contains an unnecessary plurality of independent claims, no examination of any of the claims will be carried out

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BY FAX

Subject

In re the application of Colgate-Palmolive Company
Applicants File Reference No IR 6422-00
International Application No PCT/US 01/ 11174
International Filing Date 05/04/2001 (day/month/yr)

Title Container With Formed Memory Valve

European Patent Office
D-80298 Munich
Germany

Fax Number 9011-49-89-2399-4465

REPLY TO PCT WRITTEN OPINION UNDER CT RULE 66

Dear Examiner

In response to the PCT First Written Opinion dated April 2, 2002, with respect to the subject case, Applicant through its agent hereby submits this timely reply in accordance with Rule 66 3 and before the due date of June 2, 2002. The First Written Opinion has been received and reviewed by the applicant. In response to this Opinion, please proceed with a detailed and full Preliminary Examination of subject application.

Respectfully submitted,



Michael J. McGreal
Attorney for Applicant(s)
USPTO Registration Number 25, 356
732-878- 7152

Colgate-Palmolive Company
909 River Road
P O Box 1343
Piscataway, NJ 08855-1343
USA
April 12, 2002

PATENT COOPERATION TREATY

73 73

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To: McGreal, Michael J COLGATE-PALMOLIVE COMPANY 909 River Road Piscataway, New Jersey 08855-1343 ETATS-UNIS D'AMERIQUE
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PCT

**NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**
(PCT Rule 71 1)

Date of mailing (day/month/year)	10 05 2002
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Applicant's or agent's file reference IR 6422-00

IMPORTANT NOTIFICATION

International application No PCT/US01/11174	International filing date (day/month/year) 05/04/2001	Priority date (day/month/year) 06/04/2000
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Applicant COLGATE-PALMOLIVE COMPANY
--

- 1 The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application

- 2 A copy of the report and its annexes, if any is being transmitted to the International Bureau for communication to all the elected Offices

- 3 Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices

4 REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301)

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide

Name and mailing address of the IPEA/ European Patent Office D-80298 Munich Tel +49 89 2399 0 Tx 523656 epmu d Fax +49 89 2399 4465	Authorized officer Loeper, S Tel +49 89 2399-2569
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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference IR 6422-00		FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No PCT/US01/11174	International filing date (day/month/year) 05/04/2001	Priority date (day/month/year) 06/04/2000	
International Patent Classification (IPC) or national classification and IPC B85D75/58			
Applicant COLGATE-PALMOLIVE COMPANY			
1 This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36 2 This REPORT consists of a total of 4 sheets, including this cover sheet. ☐ This report is also accompanied by ANNEXES i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70 16 and Section 607 of the Administrative Instructions under the PCT) These annexes consist of a total of sheets			
3. This report contains indications relating to the following items I ☒ Basis of the report II ☐ Priority III ☐ Non-establishment of opinion with regard to novelty inventive step and industrial applicability IV ☐ Lack of unity of invention V ☒ Reasoned statement under Article 35(2) with regard to novelty inventive step or industrial applicability; citations and explanations supporting such statement VI ☐ Certain documents cited VII ☐ Certain defects in the international application VIII ☐ Certain observations on the international application			
Date of submission of the demand 02/11/2001		Date of completion of this report 10.05.2002	
Name and mailing address of the international preliminary examining authority  European Patent Office D-80298 Munich Tel +49 89 2399 0 Tlx 523858 epmu d Fax +49 89 2399 4485		Authorized officer Janc, G Telephone No. +49 89 2399 2553 	

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No PCT/US01/11174

I Basis of the report

- 1** With regard to the elements of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70 16 and 70 17)*):

Description, pages

1-12 as originally filed

Claims, No.

1-22 as originally filed

Drawings, sheets

1-6 as originally filed

- 2** With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item

These elements were available or furnished to this Authority in the following language , which is

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23 1(b))
☐ the language of publication of the international application (under Rule 48 3(b))
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55 2 and/or 55 3)

- 3** With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing

- ☐ contained in the international application in written form
☐ filed together with the international application in computer readable form
☐ furnished subsequently to this Authority in written form
☐ furnished subsequently to this Authority in computer readable form
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

- 4** The amendments have resulted in the cancellation of

- ☐ the description, pages
☐ the claims, Nos.

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No **PCT/US01/1117**

☐ the drawings, sheets

- 5 ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c))

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report)

- 6 Additional observations, if necessary

V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability, citations and explanations supporting such statement

1 Statement

Novelty (N)	Yes	Claims	1-22
	No	Claims	
Inventive step (IS)	Yes	Claims	1-22
	No	Claims	
Industrial applicability (IA)	Yes	Claims	1-22
	No	Claims	

- 2 Citations and explanations
see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No PCT/US01/11174

V Closest prior art is found to be US-A-4 328 912, Haggar, already disclosing a flexible container with a dispensing channel the walls of which being partially deformed so as to provide a valve, this valve can be opened by a depressing force acting from the outside, and reclosed by a reversed depressing force from the outside

There is no suggestion in this or any other available document to provide for a "formed memory" as defined in the application (see especially page 3, line 30 ff) allowing automatic reclosure of the valve when the force is removed

Although it is as such known in the art to provide for valves opening upon an interior force due to compressed product and automatic reclosure once said pressure it s released (US-A-3 184 121), it is not an obvious modification to apply this principle to a dispensing channel valve of the kind defined

Remarks It is does not appear to be appropriate to cover the subject matter of the application by more than one independent claims of the same category - Rule 13 3 The claims are not in the two part form and do not contain reference numerals - Rules 6 3b and 6 2b PCT The closest document it s not discussed in the description

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 6422-00	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below	
International application No PCT/US 01/ 11174	International filing date (day/month/year) 05/04/2001	(Earliest) Priority Date (day/month/year) 06/04/2000
Applicant COLGATE-PALMOLIVE COMPANY		
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 <u>06</u> 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, unless otherwise indicated under this item. ☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)). b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing. ☐ contained in the international application in written form ☐ filed together with the international application in computer readable form ☐ furnished subsequently to this Authority in written form. ☐ furnished subsequently to this Authority in computer readable form ☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished ☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished 2. ☐ Certain claims were found unsearchable (See Box I) 3. ☒ Unity of invention is lacking (see Box II) 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(b) by this Authority as it appears in Box III. The applicant may within one month from the date of mailing of this international search report, submit comments to this Authority. 6. The figure of the drawings to be published with the abstract is Figure No <u>2</u> ☒ as suggested by the applicant. ☐ because the applicant failed to suggest a figure ☐ because this figure better characterizes the invention ☐ None of the figures		

INTERNATIONAL SEARCH REPORT

International application No

PCT/US 01/11174

Box III TEXT OF THE ABSTRACT (Continuation of item 5 of the first sheet)

The container (10) has a varied sized substance body chamber (12) with a channel (14) at an exit and Within the channel (14) is a positive seal valve (14) that can reseal the container (10) after it has initially been opened This valve (14) is comprised of an upper wall (30) of the channel being in a close contact with the lower wall (32) The lower wall (32) usually will have a concave shape, with the upper wall contacting the lower wall with a mating convex shape When a compressive pressure is applied to the substance holding chamber (12), the substance flows down the channel to the valve (14) When the liquid pressure reaches a given level, the concave upper wall (30) of the valve moves out of contact with the convex lower wall (32) and some of the substance is dispensed Upon the cessation of pressure the convex and concave portions come back into contact to cut off the flow of the substance

INTERNATIONAL SEARCH REPORT

International application No
PCT/US 01/11174

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

- 1 ☐ Claims Nos. because they relate to subject matter not required to be searched by this Authority, namely
- 2 ☐ Claims Nos. because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically
- 3 ☐ Claims Nos. because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this International application as follows.

see additional sheet

- 1 ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
- 2 ☐ As all searchable claims could be searched without effort justifying an additional fee this Authority did not invite payment of any additional fee
- 3 ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.
- 4 ☐ No required additional search fees were timely paid by the applicant. Consequently this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows

1 Claims 1-12,16,19-22

Container comprising a valve formed by a channel

**1 1 Claim 2
Breakaway tab**

**1 2 Claims 3-12,16,19-21
Channel structure**

2 Claims 13,14

Container comprising a valve formed by a channel, the container having a planar bottom

3 Claim 15

Container comprising a valve having a venturi channel

4 Claims 17,18

Multi-compartment container comprising a valve formed by a channel

Please note that all inventions mentioned under item 1, although not necessarily linked by a common inventive concept, could be searched without effort justifying an additional fee

NOTES TO FORM PCT/ISA/220

These Notes are intended to give the basic instructions concerning the filing of amendments under article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the PCT Applicant's Guide, a publication of WIPO.

In these Notes, Article, Rule and Section refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions, respectively.

INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g., the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only.

What parts of the international application may be amended?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 26 or, where applicable, Article 41.

When?

Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

How?

Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Administrative Instructions, Section 205(b)).

The amendments must be made in the language in which the international application is to be published.

What documents must/may accompany the amendments?

Letter (Section 205(b))

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the Statement under Article 19(1) (see below, under Statement under Article 19(1)).

The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.

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NOTES TO FORM PCT/ISA/220 (continued)

The letter must indicate the differences between the claims as filed and the claims as amended. It must in particular indicate in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped) whether

- (i) the claim is unchanged
- (ii) the claim is cancelled
- (iii) the claim is new
- (iv) the claim replaces one or more claims as filed
- (v) the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter

1. [Where originally there were 48 claims and after amendment of some claims there are 51]
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers, claims 30, 33 and 36 unchanged, new claims 49 to 51 added"
2. [Where originally there were 15 claims and after amendment of all claims there are 11]
"Claims 1 to 15 replaced by amended claims 1 to 11"
3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]
"Claims 1 to 6 and 14 unchanged, claims 7 to 13 cancelled, new claims 15, 16 and 17 added, or
"Claims 7 to 13 cancelled, new claims 15, 16 and 17 added, all other claims unchanged"
4. [Where various kinds of amendments are made]
"Claims 1, 10 unchanged, claims 11 to 13, 16 and 19 cancelled, claims 14, 15 and 18 replaced by amended claim 14, claim 17 subdivided into amended claims 15, 16 and 17, new claims 20 and 21 added"

"Statement under article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

It must be in the language in which the international application is to be published.

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)".

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations relevant to a given claim contained in the international search report may be made only in connection with an amendment of that claim.

Consequence if a demand for international preliminary examination has already been filed

If at the time of filing any amendments and any accompanying statement, under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the time of filing the amendments (and any statement) with the International Bureau, also file with the International Preliminary Examining Authority a copy of such amendments (and of any statement) and, where required, a translation of such amendments for the procedure before that Authority (see Rules 55.3(a) and 62.2, first sentence). For further information, see the Notes to the demand form (PCT/IPEA/401).

Consequence with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see Volume II of the PCT Applicant's Guide.

INTERNATIONAL SEARCH REPORT

International Application No.

PCT/US 01/11174

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 B65D75/58 B65D81/32

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)

IPC 7 B65D

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

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

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 3 635 376 A (HELLSTROM HAROLD RICHARD) 18 January 1972 (1972-01-18) cited in the application	1,3,4, 6-9,12, 16,22
Y	column 6, line 40 - line 44, figures 1,2,16	2,13-15, 17
A	column 7, line 17 - line 22	5,10,11
Y	US 3 184 121 A (VOLCKENING LLOYD I) 18 May 1965 (1965-05-18) cited in the application	2
	column 1, line 44 - line 59 column 2, line 66 - line 70, figure 1	
Y	WO 97 48619 A (UNIFILL INT AG, BARTOLI ANDREA (IT)) 24 December 1997 (1997-12-24) page 4, line 3 - line 4 page 5, line 1 - line 5, figure 7	13,14
	-/-	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in 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 document but published on or after the international filing date
- L document which may throw doubt 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
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Date of the actual completion of the international search

9 January 2002

Date of mailing of the international search report

23.01.2002

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							APS	OTHER
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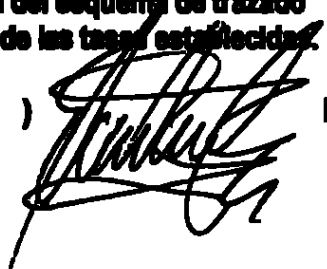
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REQUISITOS NECESARIOS PARA PRESENTACION Y AGILIZACION DEL
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