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Señor

**SUPERINTENDENTE DE INDUSTRIA Y COMERCIO
DIVISIÓN DE NUEVAS CREACIONES**

E. _____ S. _____ D. _____

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

Rad: 05-076827- -00006-0000

Fec: 2007-03-08 10:58:30 Dep. 2020 NUECREACIONES

Tra. 2 PATENTES

Eve: 1 REGDEPOSITO

Act 538 PETICION

Folios: 3

REF: Expediente No.:

05-076.827

Patente de Invención:

**"PAJILLA PARA BEBER PROVISTA
DE UN REFUERZO"**

Titular:

GRÜNENTHAL GmbH

**Publicada en la Gaceta de la Propiedad Industrial No.
570 de 30 de noviembre de 2.006**

SOLICITUD DE EXAMEN DE PATENTABILIDAD

HUMBERTO RUBIO CAMACHO, mayor de edad, domiciliado en Bogotá, D.C., identificado con la cédula de ciudadanía número 17.192.062 de Bogotá, abogado Titulado con Tarjeta Profesional No. 50.007 del Consejo Superior de la Judicatura, actuando en carácter de **APODERADO** de la Sociedad **GRÜNENTHAL GmbH**, respetuosamente solicito a esa Dependencia:

- 1.- De conformidad con lo establecido en el Artículo 44 de la Decisión 486 de la Comisión de la Comunidad Andina y estando dentro del término legal de seis (6) meses contados desde la fecha de publicación en la Gaceta No. 570 de 30 de noviembre de 2.006, de la solicitud de la patente de la referencia, solicito se sirvan proceder a efectuar el examen de patentabilidad de la Invención.
- 2.- Para que la presente petición sea viable, estoy anexando los siguientes documentos:
 - 2.1. Recibos de pago No. 06-81,513 de 23 de octubre de 2.006; y 07-345 de 03 de enero de 2.007; de acuerdo con la Resolución No. 36155 de 28 de diciembre de 2.006.
- 3.- Por lo anterior solicito se continúe con el trámite correspondiente.

Del Señor Superintendente,



HUMBERTO RUBIO CAMACHO

C.C. 17.192.062 de Bogotá

**T.P. 50.007 Consejo Superior
de la Judicatura**

COD. 4134

**05/1249/P000288
cpfm.-**

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

NIT : 800176089-2

**EXAMEN DE PATENTABILIDAD
PATENTE DE INVENCION: "PAJILLA
PARA BEBER PROVISTA DE UN
REFUERZO"**

RECIBO OFICIAL DE CAJA : 06 - 81,513
FECHA : OCTUBRE 23 DE 2006

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
Rad: 05-076827- -00006-0000
Fec: 2007-03-08 10:58:30 Dep. 2020 NUECREACIONES
Tra. 2 PATENTES
Eve: 1 REGDEPOSITO
Act 538 PETICION Folios: 3

***** CONSIGNACION *****

DEBITANTE	TIPO PAGO	BANCO	CUENTA	No. PAGO	FECHA PGO	Vr. PAGO
HUMBERTO RUBIO CANACHO	CONSIGNACION	BANCO POPULAR	050-00110-6	36046965	23/10/2006	1,535,000.00

***** C O N C E P T O *****

CANT.	RENTISTICO	CONCEPTO	TOTAL CONCEPTO
1	50005-01-01	SOLICITUDES	
		05 EXAMEN DE PATENTABILIDAD DE INVEN	388,000.00
		TOTAL :	\$ 388,000.00

SON: TRESCIENTOS OCHENTA Y OCHO MIL PESOS

RESPONSABLE : _____

RECIBO DE CAJA APLICADO AL EXPEDIENTE No. _____

70 3

**EXAMEN DE PATENTABILIDAD
PATENTE DE INVENCION: "PAJILLA
PARA BEBER PROVISTA DE UN
REFUERZO"**

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

NIT : 800176089-2

RECIBO OFICIAL DE CAJA : 07 - 345
FECHA : ENERO 3 DE 2007

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
Rad: 05-076827- -00006-0000
Fec: 2007-03-08 10:58:30 Dep. 2020 NUECREACIONES
Tra. 2 PATENTES
Eve: 1 REGDEPOSITO
Act 536 PETICION Folios: 3

***** CONSIGNACION *****

DEPOSITANTE	TIPO PAGO	BANCO	CUENTA	Nº. PAGO	FECHA PGO	Vr. PAGO
HUMBERTO RUBIO CAMACHO	CONSIGNACION	BANCO POPULAR	050-00110-6	36562039	03/01/2007	1,106,000.00

***** CONCEPTO *****

CANT.	RENTISTICO	CONCEPTO	TOTAL CONCEPTO
1	50005-01-09	OTROS SERVICIOS DE PROPIEDAD I	998 VALOR COMPLEMENTO TARIFA AÑO ANTR
			TOTAL : \$ 16,000.00

DIEZ Y SEIS MIL PESOS

RESPONSABLE : _____

RECIBO DE CAJA APLICADO AL EXPEDIENTE No. _____

DIVISIÓN DE NUEVAS CREACIONES

RADICACIÓN EXPEDIENTE No. 05-76827

EL EXTRACTO DE LA PRESENTE SOLICITUD DE **PATENTE DE INVENCION**

FUE PUBLICADO EN LA GACETA DE PROPIEDAD INDUSTRIAL No **570** DE

FECHA **30 DE NOVIEMBRE DE 2006** EL TÉRMINO HÁBIL SEÑALADO POR LA

LEY EXPIRA EL **01 DE MARZO DE 2007**

NOTA: Dentro del plazo de los seis (6) meses siguientes a partir de la fecha de publicación en la gaceta de Propiedad Industrial, deberá solicitar y cancelar el examen de patentabilidad so pena de que la solicitud caiga en abandono, de acuerdo con lo establecido en el Artículo 44 de la Decisión 486/2000.

SE PRESENTARON OPOSICIONES POR PARTE DE TERCEROS.

SI _____

NO X

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
DIVISIÓN DE NUEVAS CREACIONES

2020
Bogotá, D.C.,

Abogado
Humberto Rubio C.
(Apoderado)

ASUNTO Radicación 05 – 76 827
 Trámite 002
 Evento 001
 Actuación 430
 Oficio 15744
 Folios 033

Patente de Invención ☒ Patente de Modelo de Utilidad ☐
Vía Nacional ☐
Vía PCT (fase nacional) ☐ Cap. I ☐ Cap. II ☐
Solicitud Internacional n.º _____
Fecha de Presentación Intrnl. _____

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

- 1. **Documentos estudiados**
 - 1.1 Descripción: Folios 8 a 14 como se radicó inicialmente
 - 1.2 Reivindicaciones: Folios 15 a 17 como se radicó inicialmente
 - 1.3 Dibujos: Folios 18 a 23 como se radicó inicialmente
 - 1.4 Prioridad: Folios 35 a 52; 2005-01-28, DE, 10 2005 0004 256

2. Objeto de la invención

- Título de la solicitud: *Pajilla para beber, provista de un refuerzo*, folio 1.
- El objeto de la presente solicitud de patente de invención consiste en:

Reivindicaciones 1 a 11: Una pajilla para beber con un tabique, y dos extremos **caracterizada** porque exhibe un refuerzo en un extremo o en ambos.

Reivindicaciones 12 a 17: Un procedimiento para fabricar una pajilla para beber como la de arriba **caracterizado** porque el refuerzo se moldea en el tabique de la pajilla.

El problema planteado en esta solicitud es satisfacer la necesidad de evitar que en los pitillos que tienen una sustancia almacenada, dicha sustancia se altere o deforme antes del uso.

Para solucionar este problema técnico la solicitud en estudio proporciona un pitillo que tiene uno de los extremos, o los dos, formando una pestaña o una acanaladura hacia dentro del pitillo y además tiene un soporte interno (denominado controlador por el solicitante).

- Clasificación Internacional de Patentes (IPC) asignada:
\ A47G 21/18, A61J 15/00

3. De la solicitud de Patente

3.1 Descripción (artículo 28 D. 486)

- Durante el análisis del texto de la descripción y de las ilustraciones anexadas, se observaron los siguientes defectos:
- 1) El domicilio del solicitante, según aparece en el folio 1, sería *Aachen*, pero, según el *Diccionario panhispánico de dudas* de la Real Academia Española y de la Asociación de Academias de la Lengua Española, primera edición, octubre de 2005, páginas 4 y 61, corresponde esta denominación a *Aquisgrán*. El solicitante debe hacer la corrección respectiva.
 - 2) Si bien el término *pajilla*, empleado en el título y a lo largo del texto de la solicitud, es correcto, en Colombia se emplea *pitillo* para designar al mismo artículo, por lo que se le sugiere al solicitante que sustituya la designación.
 - 3) El texto de la solicitud no se encuentra debidamente paginado, por lo que se dificulta hacer las referencias.
 - 4) En el folio 8 aparece por primera vez la expresión *y/o*. Al respecto, el *Diccionario panhispánico de dudas* de la Real Academia Española y de la Asociación de Academias de la Lengua Española, primera edición, octubre de 2005, página 681, dice:
y/o: Hoy es frecuente el empleo conjunto de las conjunciones copulativa y disyuntiva separadas por una barra oblicua, calco del inglés «and/or», con la intención de hacer explícita la posibilidad de elegir entre la suma o la alternativa de dos opciones: «Se necesitan traductores de inglés y/o francés». Se olvida que la conjunción 'o' puede expresar en español ambos valores conjuntamente
El examinador ha subrayado la última frase, que se aplica al caso.
 - 5) En el mismo folio 8 aparece por primera vez el término *controladores*, pero sólo hasta el folio 10 se define su significado dentro de la solicitud: Cuerpos de un material permeable al gas o al líquido que impiden que una sustancia sólida salga del pitillo y que pueden servir como indicadores de que se ha consumido dicha sustancia. Entonces, en primer lugar, la aclaración sobre el significado del término debería aparecer en la primera ocasión en que se emplee; y, en segundo lugar, a juzgar por la definición dada por el solicitante, no parece apropiada esta designación, porque el cuerpo en cuestión no *controla* nada. Se sugiere sustituir el término objetado (y sus derivados) por *filtro* o por *dispositivo de soporte* u otra expresión que se ajuste mejor al contexto.

- 6) En el mismo folio 8, aparece el término *dilucida* cuyo significado, según se deduce del Diccionario de la Real Academia Española (DRAE), no concuerda con el contexto.
- 7) En el folio 9 aparece por primera vez la expresión [el pitillo tiene un refuerzo] *en su primer extremo y/o en el segundo extremo*. Lo mismo se puede decir: [el pitillo tiene un refuerzo] *en uno de los extremos o en ambos*. Se prefiere esta forma porque dentro de la solicitud no hay una diferencia marcada entre los extremos, lo mismo da un extremo que el otro, por lo que no hay porqué diferenciarlos designándolos como *primero* o *segundo*.
- 8) En el mismo folio 9 aparece por primera vez la expresión *140°C* que no concuerda con el contexto, porque se está hablando de ángulos planos, no de temperatura termodinámica.
- 9) En el mismo folio 9 aparece la expresión *una deformación del tabique* en la cual no se sabe a qué *tabique* se refiere, porque es la primera vez que se menciona.
- 10) En el mismo folio 9, adelante, aparece la expresión *el tabique exhibe un radio en sus correspondientes extremos* que carece de sentido, porque si, al parecer, el *tabique* es la misma pared cilíndrica del pitillo, tendría el mismo radio a lo largo de ella, no habría porqué hacer referencia únicamente a los extremos. Pero, la cuestión se vuelve más confusa adelante, en el folio 13, donde, haciendo referencia a la figura 2 (del folio 19) se dice: *A través del radio (5) se evitan los daños al paciente (...)* porque el número (5) está señalando hacia un pliegue o un doblez del extremo del pitillo, no hacia un *radio*. Entonces, claramente, el solicitante le da un sentido a la palabra *radio* que no corresponde al sentido natural. Dicho *radio* vuelve a aparecer al final del capítulo descriptivo en el listado, folio 14.
- 11) En el folio 10 aparece la expresión *más de 1 mm, preferentemente 1-2 mm*, en la cual, en primer lugar, los signos de puntuación están mal colocados: deben estar separados del símbolo de la unidades por un espacio; y, en segundo lugar, se ignora qué significado le da el solicitante a *más de (...)* *1-2 mm* porque $1-2 = -1$.
- 12) En el folio 12 aparece la expresión *En la figura 1 (...) exhibe el refuerzo (7)*, pero, en dicha figura, folio 18, no se encuentra el número de referencia (7). Además, en la misma figura 1 se encuentran dos números de referencia (2) señalando hacia dos partes diferentes de lo ilustrado, lo cual no es admisible.
- 13) En el mismo folio 12 aparece la expresión *el medio de control (8) que se encuentra por sobre el refuerzo, tampoco se deforma, por lo que ya no exhibe su funcionamiento* que carece de sentido.
- 14) En el folio 13 aparece la expresión *La figura 3 exhibe (...) con forma de estrella* pero, la forma ilustrada allí, ver folio 20, corresponde a la de un pentágono, no una estrella.
- 15) En el mismo folio 13 aparece la expresión *La figura 5 exhibe (...) como tope para el controlador (8)* pero, en la figura 5, folio 22, no está señalado el número de referencia (8).
- 16) En el mismo folio 13 aparece la expresión *La figura 6 exhibe (...) la sustancia (10)* pero, en la figura 6, folio 23, no está señalado el número de referencia (10).
- 17) En el listado del folio 14 aparece la expresión *9. Diámetro interno con forma de estrella* que carece de significado. También en el listado aparece el término *Encrimpado* que adolece del mismo defecto.

- La descripción no cumple con los requisitos de claridad y divulgación completa, lo que dificulta o impide su comprensión y ejecución de acuerdo al art. 28 de la Decisión 486

3.2 Reivindicaciones (artículo 30 D 486)

- Durante el análisis del texto de las reivindicaciones se observaron los siguientes defectos:
 - 1) En la reivindicación 1, folio 15, aparece por primera vez en el capítulo reivindicatorio la expresión *y/o* que fue objetada arriba, con relación a la descripción, pero que, aquí, afecta negativamente la concisión.
 - 2) En la reivindicación 3, folio 15, aparece por primera vez en el capítulo reivindicatorio la expresión *140°C* que no concuerda con el contexto.
 - 3) En la reivindicación 5, folio 15 aparece la expresión *exhibe un radio* (5) que no corresponde al contexto, ver la objeción 3.1 10) arriba. Lo mismo ocurre en la reivindicación 6, folio 16.
 - 4) En la misma reivindicación 6 se encuentra la expresión *más de 1 mm, preferentemente 1-2 mm.* que fue objetada arriba, ver 3.1 11)
 - 5) Aunque en la reivindicación 12, folio 16, se reclama un procedimiento, sólo se define una etapa, lo cual no es admisible, porque el procedimiento se refiere a un método, una manera de hacer con orden ciertas cosas. Además, al ejecutar el *procedimiento* 'definido' en la reivindicación, no se obtiene lo que se reclama, esto es, una pajilla -un pitillo-.
 - 6) En las reivindicaciones 15, 16 y 17, folio 17, se reclama un *procedimiento de acuerdo con una de las reivindicaciones precedentes* pero, entre las *reivindicaciones precedentes* se encuentran las reivindicaciones 1 a 11 que no reclaman un procedimiento y, en consecuencia, hay una inconsistencia, por lo que el solicitante debe precisar a qué reivindicaciones se remite.
 - 7) En la reivindicación 17, folio 17, se reclama un *procedimiento de acuerdo con una de las reivindicaciones precedentes, caracterizado porque la deformación (...)* pero, como en las reivindicaciones 12 a 15 -para limitarnos a las que reclaman un procedimiento- no se menciona nada relativo a una *deformación*, la reivindicación 17 está mal definida. En la reivindicación 16, folio 17, se habla de que el pitillo se calienta para **deformarlo**, pero tampoco se menciona una *deformación*, como tal. Resumiendo, la reivindicación 17 carece de definición.
- Las reivindicaciones no cumplen con los requisitos de definición, claridad, concisión o sustento por la descripción de acuerdo al art. 30 de la Decisión 486. Debe entenderse que las reivindicaciones dependientes de las reivindicaciones objetadas son, asimismo, objetadas, por razones análogas.

Se deben presentar, entonces, nuevos capítulos descriptivo y reivindicatorio, ambos completos, junto con un nuevo juego de dibujos, donde se hayan corregido todas las objeciones que se han hecho arriba. Esto con el fin de evitar -cuando solo se presentan algunas páginas sueltas corregidas- que el lector tenga que desplazarse desde un sitio a otro de la solicitud y luego regresar a donde estaba antes sin perder la ilación de la lectura, porque esto produce confusión y afecta negativamente la claridad de dichos capítulos.

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Se le advierte al solicitante que por lo menos parte de las modificaciones sugeridas podrían resultar inconducentes a raíz de las eventuales objeciones a la patentabilidad, como se insinúan adelante.

4. Determinación del Estado de la Técnica

- La fecha que se ha tenido en cuenta para determinar el Estado de la Técnica es la

Fecha de presentación de la solicitud prioritaria 05-01-28

- Se realizó la búsqueda en el estado de la técnica de documentos relacionados con la solicitud teniendo en cuenta la fecha indicada; y durante la búsqueda de anterioridades se encontraron los siguientes documentos, que forman parte de la familia de patentes de la presente solicitud: Publicación US 2008/0011869 A1 del 08-06-17; publicación WO 2006/079648 A1 del 06-08-03; publicación EP 1 843 683 A1 del 07-10-17. Se anexa la copia de las primeras páginas de estos documentos junto con la copia del Informe de Búsqueda Internacional. También se encontraron los siguientes documentos que forman parte del estado de la técnica más cercano al objeto de la solicitud:

n.º	Documento	Título	Fecha de publicación
D1	Patente US 2 036 773, cuyo inventor es Theodore M. Prudden	«Drinking straw or the like»(Un pitillo o lo similar)	1936-04-07
D2	Publicación WO 98/17228, cuyos inventores son James W. Horvarth, Vincent J. Ferrari, Patrick S. Wong, Joyce C. Anthony, Radomir Vukadin, Jeffrey W. Etter y Christopher M. G. Ohms, quienes le cedieron sus derechos a la Alza Corporation corresponde a la Patente US 6 096 003 y a la Patente US 6 595 951 B1	«Closure system for an active agent delivery device»(Un sistema de cierre para un dispositivo suministrador de un agente activo)	1998-04-30 2000-08-01 2003-07-22
D3	Patente US 6 032 831, cuyos inventores son Gary D. Gardner, Robert Choi y Cynthia A. Peters, quienes le cedieron sus derechos a la CamelBak Products, Inc.	«Personal hydration system with an improved mouthpiece»(Un sistema de hidratación personal con una boquilla mejorada)	2000-03-07
D4	Publicación WO 03/049583 A1, cuyo inventor es Kjetil Næsje	«Method and device for preventing the inadvertent outflow of a fluid from a drinking container»(Un método y un dispositivo para evitar el derrame inadvertido de un fluido desde un recipiente de bebida)	2003-06-19

Se anexa la copia de las páginas pertinentes de estos documentos

NOTAS: No se realizaron las evaluaciones de los demás requisitos de patentabilidad, porque se hicieron algunas objeciones respecto a la definición, la claridad, la concisión y el sustento por la descripción de las reivindicaciones.

A pesar de lo anterior, con base en las enseñanzas de los documentos encontrados hasta ahora, en especial del Informe de Búsqueda Internacional

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citado arriba, se prevén objeciones respecto a la novedad o respecto al nivel inventivo del objeto de la solicitud.

Teniendo en cuenta lo anterior, se le sugiere al solicitante que, si considera que el objeto de la solicitud reúne los requisitos para ello -en especial los determinados por el artículo 81 de la Decisión 486-, cambie la modalidad de su solicitud a patente de modelo de utilidad. De aceptar esta sugerencia, deberá expresarlo así y deberá realizar los ajustes que considere necesarios en el capítulo reivindicatorio para que no se encuentre ninguna objeción previsible -en el momento en que la Oficina examine su solicitud para verificar el cumplimiento de los requisitos, bajo esta nueva modalidad-.

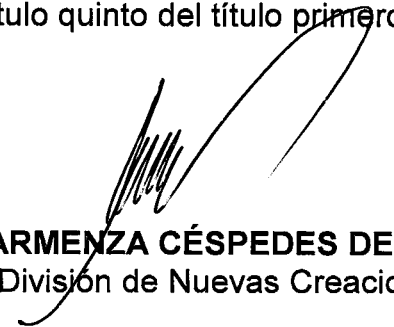
Esta sugerencia se hace teniendo en cuenta lo dispuesto en el artículo 35 de la mencionada Decisión.

5. Conclusión:

Los requisitos de patentabilidad de la presente solicitud se encuentran afectados negativamente por la falta de claridad de la descripción y las reivindicaciones y por la falta de definición, de sustento y de concisión de estas últimas.

En cumplimiento del artículo 45 de la Decisión 486 de la Comisión de la Comunidad Andina, se le indica que debe dar respuesta dentro del término de sesenta días contados a partir de la fecha de notificación de la presente comunicación. En caso de no dar respuesta al presente requerimiento, o si a pesar de la respuesta subsistieran los impedimentos para la concesión, se denegará la patente.

Notifíquese el presente oficio conforme a lo dispuesto en el número 5.2, letra e), del capítulo quinto del título primero de la Circular Única n.º 10 de 2001.


ALIX CARMENZA CÉSPEDES DE VERGEL
Jefe de División de Nuevas Creaciones

El anterior requerimiento fue notificado por fijación en lista, de fecha 11 DIC. 2008

CONCEPTO TÉCNICO n.º 3583	EXAMINADOR TÉCNICO Código n.º 202009
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US 20080011869A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2008/0011869 A1**
Sternberger et al. (43) **Pub. Date: Jan. 17, 2008**

(54) **DRINKING STRAW COMPRISING A REINFORCED SECTION**

(75) **Inventors:** Elke Sternberger, Wuerselen (DE);
Dieter Schatelkis, Stolberg (DE);
Johannes Bartholomaeus, Aachen (DE)

Correspondence Address:
CROWELL & MORING LLP
INTELLECTUAL PROPERTY GROUP
P.O. BOX 14300
WASHINGTON, DC 20044-4300 (US)

Related U.S. Application Data

(63) Continuation of application No. PCT/EP06/50471, filed on Jan. 26, 2006.

(30) **Foreign Application Priority Data**

Jan. 28, 2005 (DE)..... 10 2005 004 256.2

Publication Classification

(51) **Int. Cl.**
A47G 21/18 (2006.01)
(52) **U.S. Cl.** 239/33

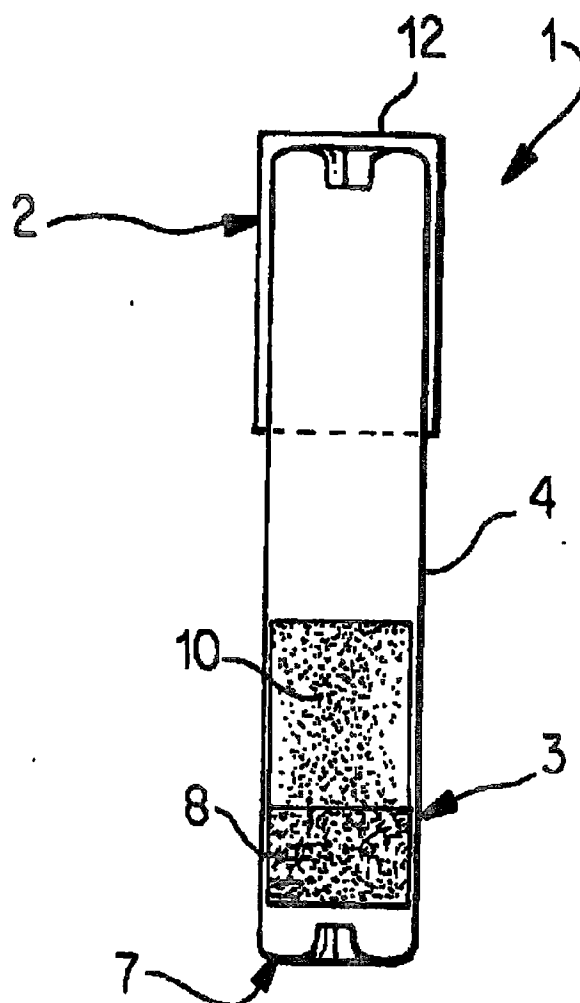
(73) **Assignee:** Gruenenthal GmbH, Aachen (DE)

(21) **Appl. No.:** 11/829,573

(22) **Filed:** Jul. 27, 2007

(57) **ABSTRACT**

A drinking straw with a wall having a first and a second end, wherein the drinking straw comprises a reinforced section at its first and/or second end. A method for producing a drinking straw is also provided.



(12) NACH DEM VERTRAG ÜBER DIE INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES
PATENTWESENS (PCT) VERÖFFENTLICHTE INTERNATIONALE ANMELDUNG

(19) Weltorganisation für geistiges Eigentum
Internationales Büro



(43) Internationales Veröffentlichungsdatum
3. August 2006 (03.08.2006)

PCT

(10) Internationale Veröffentlichungsnummer
WO 2006/079648 A1

(51) Internationale Patentklassifikation:
A47G 21/18 (2006.01) A61G 7/00 (2006.01)

(21) Internationales Aktenzeichen: PCT/EP2006/050471

(22) Internationales Anmeldedatum:
26. Januar 2006 (26.01.2006)

(25) Einreichungssprache: Deutsch

(26) Veröffentlichungssprache: Deutsch

(30) Angaben zur Priorität:
10 2005 004 256.2 28. Januar 2005 (28.01.2005) DE

(71) Anmelder (für alle Bestimmungsstaaten mit Ausnahme von
US): GRUENENTHAL GMBH [DE/DE]; Zieglerstr. 6,
52078 Aachen (DE).

(72) Erfinder; und

(75) Erfinder/Anmelder (nur für US): STERNBERGER,
Elke [DE/DE]; Grindelstr. 43, 52146 Würselen (DE).
SCHATEIKIS, Dieter [DE/DE]; Winterstr. 13, 52223
Stolberg (DE). BARTHOLOMÄUS, Johannes [DE/DE];
Burghöhenweg 5, 52080 Aachen (DE).

(74) Anwälte: BROSCH, Oliver usw.; Theodor-Heuss-Ring
23, 50668 Köln (DE).

(81) Bestimmungsstaaten (soweit nicht anders angegeben, für
jede verfügbare nationale Schutzrechtsart): AB, AG, AL,
AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH,
CN, CO, CR, CU, CZ, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,
KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV,
LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI,
NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG,
SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US,
UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Bestimmungsstaaten (soweit nicht anders angegeben, für
jede verfügbare regionale Schutzrechtsart): ARIPO (BW,
GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG,
ZM, ZW), eurasisches (AM, AZ, BY, KG, KZ, MD, RU,
TJ, TM), europäisches (AT, BE, BG, CH, CY, CZ, DE, DK,
EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC,
NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG,
CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

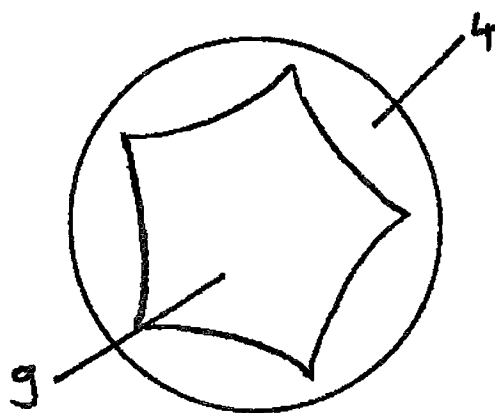
Veröffentlicht:

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Frist; Veröffentlichung wird wiederholt, falls Änderungen
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Zur Erklärung der Zweibuchstaben-Codes und der anderen Ab-
kürzungen wird auf die Erklärungen ("Guidance Notes on Co-
des and Abbreviations") am Anfang jeder regulären Ausgabe der
PCT-Gazette verwiesen.

(54) Title: DRINKING STRAW COMPRISING A REINFORCED SECTION

(54) Bezeichnung: TRINKHALM MIT EINER VERSTEIFUNG



(57) Abstract: The invention relates to a drinking straw comprising a
wall (4) with a first and a second end. The first and/or second end of the
drinking straw comprises a reinforced section, in addition to a stellate in-
ner cross-section. The invention also relates to a method for producing
said drinking straw.

(57) Zusammenfassung: Die vorliegende Erfindung betrifft einen Trink-
halm mit einer Wandung (4) mit einem ersten und einem zweiten Ende,
wobei der Trinkhalm an seinem ersten und/oder zweiten Ende eine Verstei-
fung sowie einen steinförmigen inneren Querschnitt aufweist. Des weite-
ren betrifft die vorliegende Erfindung ein Verfahren zur Herstellung des
erfindungsgemäßen Trinkhalms.

WO 2006/079648 A1

INTERNATIONALER RECHERCHENBERICHT

Internationales Aktenzeichen

PCT/EP2006/050471

A. KLASSIFIZIERUNG DES ANMELDUNGSGEGENSTANDES
INV. A47G21/18 A61G7/00

Nach der Internationalen Patentklassifikation (IPC) oder nach der nationalen Klassifikation und der IPC

B. RESEARCHIERTE GEBIETE

Recherchierte Mindestprüfstoff (Klassifikationssystem und Klassifikationssymbole)
A47G A61G

Recherchierte, aber nicht zum Mindestprüfstoff gehörende Veröffentlichungen, soweit diese unter die recherchierten Gebiete fallen

Während der internationalen Recherche konsultierte elektronische Datenbank (Name der Datenbank und evtl. verwandte Suchbegriffe)

EPO-Internal

C. ALS WESENTLICH ANGESEHENE UNTERLAGEN

Kategorie*	Bezeichnung der Veröffentlichung, soweit erforderlich unter Angabe der in Betracht kommenden Teile	Betr. Anspruch Nr.
X	WO 03/049583 A (NAESJE, KJETIL) 19. Juni 2003 (2003-06-19)	1,3-5,8
Y	Seite 9, Absatz 4 - Seite 10, Absatz 3; Abbildung 1	6,7
A		9
X	US 2 036 773 A (PRUDDEN THEODORE M) 7. April 1936 (1936-04-07)	1,3,4,8
A	Spalte 1, Zeile 26 - Spalte 3, Zeile 3; Abbildungen	9
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	Spalte 7, Zeile 44 - Spalte 8, Zeile 62; Abbildungen 18-23	
	-/-	



Weitere Veröffentlichungen sind der Fortsetzung von Feld C zu entnehmen



Siehe Anhang Patentfamilie

* Besondere Kategorien von angegebenen Veröffentlichungen :

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Datum des Abschlusses der internationalen Recherche

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INTERNATIONALER RECHERCHENBERICHT

Internationales Aktenzeichen
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C. (Fortsetzung) ALS WESENTLICH ANGESEHENE UNTERLAGEN

Kategorie*	Bezeichnung der Veröffentlichung, soweit erforderlich unter Angabe der in Betracht kommenden Teile	Betr. Anspruch Nr.
Y	WO 98/17228 A (ALZA CORPORATION) 30. April 1998 (1998-04-30)	6,7
A	Seite 9, Zeile 16 - Seite 17, Zeile 13; Abbildungen	4,5,9,10
A	US 6 405 938 B1 (SUSINI ETIENNE) 18. Juni 2002 (2002-06-18)	

INTERNATIONALER RECHERCHENBERICHT

Angaben zu Veröffentlichungen, die zur selben Patentfamilie gehören

Internationales Aktenzeichen

PCT/EP2006/050471

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(54) TRINKHALM MIT EINER VERSTEIFUNG

(87) This international application for which the EPO is a designated office has not been republished by the EPO according to article 158(1) EPC.

Cette demande internationale pour laquelle l'OEB est office désigné n'a pas été republiée par l'OEB en vertu de l'article 158(1) CBE.

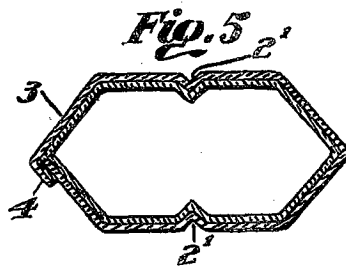
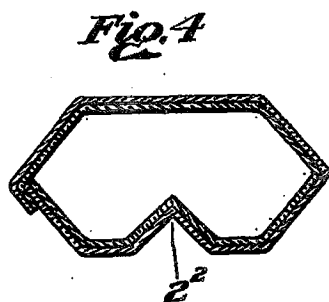
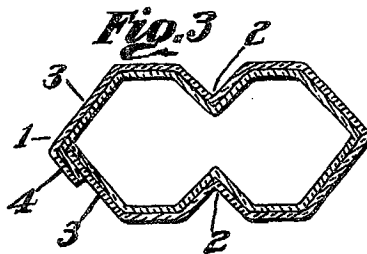
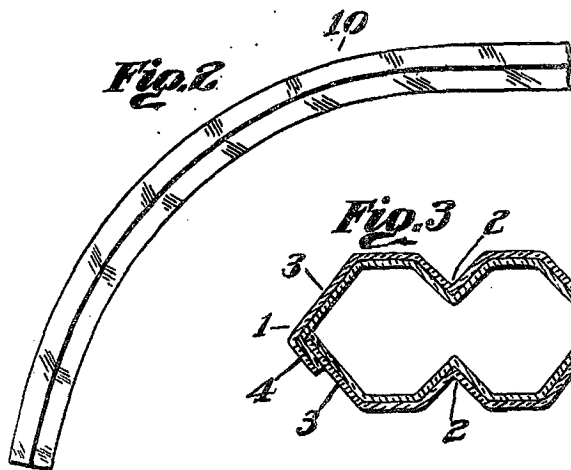
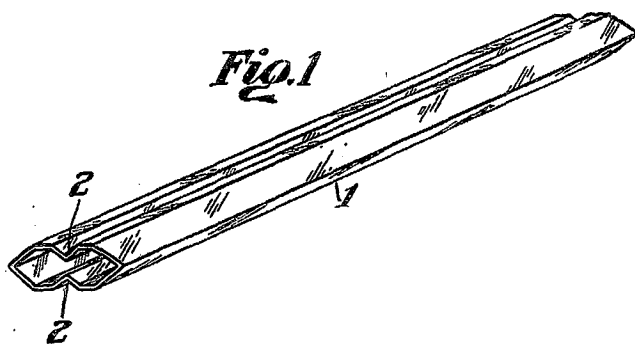
Diese internationale Anmeldung, für die das EPA Bestimmungsamt ist, würde, gemäß Artikel 158(1) EPÜ, vom EPA nicht wieder veröffentlicht.

EP 1 843 683 A1

84 84
D2
April 7, 1936.

T. M. PRUDDEN
DRINKING STRAW OR THE LIKE
Filed Dec. 30, 1932

2,036,773



Inventor
Theodore M. Prudden
Oliver Spear
By Attorney

UNITED STATES PATENT OFFICE

2,036,773

DRINKING STRAW OR THE LIKE

Theodore M. Prudden, Hingham Center, Mass.

Application December 30, 1932, Serial No. 649,496

3 Claims. (Cl. 138-78)

In the development of the etiquette of beverage drinking in public as at soda fountains and spas, the use of straws for potation has come to be more and more a custom. There is theoretically at least an increased pleasure in sipping the beverages coupled perhaps with a more leisurely enjoyment and a greater assurance of a sanitary condition than when the same beverage is quaffed direct from the edge of a tumbler or cup.

The early natural straws have been largely displaced by waxed paper straws and it is one of the objects of my present invention to further improve the artificial straws by introducing a novel feature of improvement by making them of transparent cellulosic material so that the beverage which is usually of characteristic color may be watched as well as tasted.

In addition to the transparency of my straws, I provide for an increased display of the beverage as it is sucked through the straw. This I accomplish by providing longitudinal facets or surfaces disposed to increase the apparent surface of the stream and at the same time attain an increased stiffness in these comparatively flexible or elastic tubes.

One difficulty in a fabricated straw of such material lies in the necessity of providing these small thin tubes of sufficient strength to prevent collapse under suction and yet have a sufficient elasticity or springiness to resume shape if slightly compressed by the lips. It is also to be noted that where transparency is to be attained any seams must be invisible or as inconspicuous as possible.

I also contemplate straws of cross sectional capacity of two ordinary straws. The simultaneous use of a pair of straws has become common practice to give increased capacity and ensure the availability of drinking means even after one of the straws has collapsed under lip pressure. At least one of a pair of straws usually becomes flattened by the repeated application of the lips as where a beverage like cold coffee is sipped from time to time throughout a meal.

My invention contemplates straws of such character as will appear from the disclosure of the specification and reference to the accompanying drawing. In the drawing:

Fig. 1 shows a characteristic straight straw.

Fig. 2 a curved or bent straw for prone potation.

Fig. 3 a characteristic section enlarged.

Fig. 4 a modified section form, and

Fig. 5 a further modified section.

While my straw may be made in almost any de-

sired form, certain structural shapes are of peculiar advantage and lend themselves particularly to the concept. In the types shown in the drawing preference is given to an angular cross section such as the hexagon shown, but this is modified by one or more V-shaped grooves 2. This gives the increased display of the beverage and strengthens the straw 1 and gives to it facets or longitudinal surfaces 3. These surfaces 3 being transparent and glossy increase the display values and make for increased attractiveness. Such a form (particularly as in Fig. 3) also suggests to the user that the straw is of double capacity so that two separate straws of the type of my invention are not necessary to meet the present general practice of using two separate round straws instead of one.

The straws are preferably made up of two or more layers or sheets of the cellulosic material, as indicated in the section and are given a predetermined set by heat and pressure.

Cellulosic material of the class including cellulose esters, cellulose ethers or hydrated, regenerated or other cellulosic material capable of being formed into thin sheets is very transparent and has a natural resilient flexibility but in certain of them these characteristics are modified by the molding effect of the heat and pressure. By heating say above 200° F., in their manufacture, my straws are produced in a sterile state.

Where seams or overlaps as at 4 are necessary they are preferably disposed at lateral angles and if transparent cement is used are practically unnoticeable. The heat and pressure produce a close adherence of the laminae and the combined sheets have a smooth surface and reflective sheen which makes an attractive display of the beverage.

If V-shaped ribs 2 are used they may be opposite and deep as in Fig. 3, or may be shallow as at 2¹ (Fig. 5) or the groove may be on one face only as at 2² (Fig. 4) as its reflective effect is visible from the other side.

In the form of straw 10 shown in Fig. 2, the material is molded into a bent or curved form as for use in beds, hammocks or other places where the user is in a prone position. In this form the moldability of the material is of great importance as it can be given a permanent curve or bend without appreciably reducing the cross section. The bend is preferably continuous and less sharply bent than the glass tubes used in hospitals.

Being clean and sterile they are well adapted to the sick room and being of single service use do away with the washing and sterilizing which

caused so much breakage. They are also lighter than the glass tubes and easier for a weak or feeble patient to use.

In whatever type or form such straws are attractive and add an aesthetic touch to their utilitarian qualities.

In my specification of materials above that may be used in accordance with my invention I have excluded nitrocellulosic materials containing camphor compounds, such as celluloids or like commercial products commonly used in the industries, as not being adapted for the manufacture of straws according to my concept. The materials indicated by me are capable of providing in such straws characteristics of extreme transparency, non-brittleness and waterproofness and are not subject to degeneration by atmospheric changes or reactive tendencies with acid carbonated or alcoholic beverages.

What I therefore claim and desire to secure by Letters Patent is:—

1. As a novel article of manufacture, a thin transparent resilient tubular article of a plurality of sheets of cellulosic material of the class including cellulose esters, cellulose ethers, hydrated, regenerated or other cellulosic material capable of yielding transparent sheets or films, said sheets having interfacial adherence with a substantially transparent cement without substantial diminution of the transparency.

2. As a novel article of manufacture, an artificial soda straw for the potation of colored beverages, comprising a thin transparent resilient tube of a plurality of sheets of cellulosic material of the class including cellulose esters, cellulose ethers, or hydrated, regenerated or other cellulosic material capable of yielding transparent sheets or films, said sheets having interfacial adherence without substantial diminution of the transparency.

3. As a novel article of manufacture, a thin transparent resilient tubular member of a plurality of sheets of hydrated cellulosic material of

the class including cellulose esters, cellulose ethers, or hydrated, regenerated or other cellulosic material capable of yielding transparent sheets or films, plasticizable by heat, said sheets having interfacial adherence without substantial diminution of the transparency.

4. As a novel article of manufacture, an artificial soda straw for the potation of beverages, comprising a thin transparent tube of lustrous cellulosic material having the characteristics of extreme transparency, non-brittleness and waterproofness, said tube having flat longitudinal surfaces reflectively disposed with reference to the flow of the beverage.

5. As a novel article of manufacture, an artificial soda straw for the potation of beverages, comprising a thin transparent tube of lustrous cellulosic material having the characteristics of extreme transparency, non-brittleness and waterproofness, said tube having flat longitudinal facets, reflectively disposed with reference to the flow of the beverage.

6. As a novel article of manufacture, an artificial soda straw for the potation of beverages, comprising a thin transparent tube of lustrous cellulosic material having the characteristics of extreme transparency, non-brittleness and waterproofness, said tube having a cross section of polygonal cross section having a central longitudinal valley forming flat longitudinal facets reflectively disposed with reference to the flow of the beverage.

7. A single service drinking straw consisting of a tube of thin, transparent, resilient material and of definite, persistent predetermined cross section, and having flat longitudinal facets reflectively disposed with reference to the flow of the beverage.

8. A drinking straw, consisting of a plurality of sheets of transparent material having their edges overlapped and secured together to produce a resilient tube.

THEODORE M. PRUDDEN.

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WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau



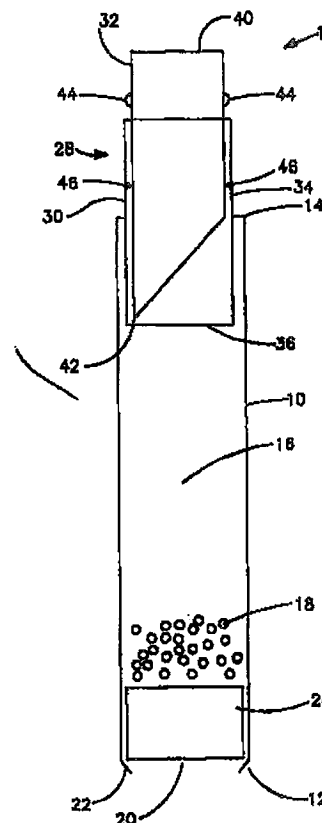
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : A61J 7/00, A47G 21/18		A1	(11) International Publication Number: WO 98/17228
			(43) International Publication Date: 30 April 1998 (30.04.98)
(21) International Application Number: PCT/US97/18778 (22) International Filing Date: 14 October 1997 (14.10.97) (30) Priority Data: 60/028,703 18 October 1996 (18.10.96) US (71) Applicant: ALZA CORPORATION [US/US]; 950 Page Mill Road, P.O. Box 10950, Palo Alto, CA 94303-0802 (US). (72) Inventors: HORVATH, James, W.; 1627 Husted Avenue, San Jose, CA 95125 (US). FERRARI, Vincent, J.; 161 Trimaran Court, Foster City, CA 94404 (US). WONG, Patrick, S., -L.; 2030 Cornell Street, Palo Alto, CA 94306 (US). ANTHONY, Joyce, C.; 35 Roan Place, Woodside, CA 94062 (US). VUKADIN, Radomir, N., M.; 10387 Vista Knoll Boulevard, Cupertino, CA 95014 (US). ETTER, Jeffrey, W.; 21103 Gary Drive #305, Castro Valley, CA 94546 (US). OHMS, Christopher, M., G.; 4251 George Avenue #4, San Mateo, CA 94403 (US). (74) Agents: DHUEY, John, A. et al.; Alza Corporation, 950 Page Mill Road, P.O. Box 10950, Palo Alto, CA 94303-0802 (US).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.	

(54) Title: CLOSURE SYSTEM FOR AN ACTIVE AGENT DELIVERY DEVICE

(57) Abstract

The present invention is directed to a closure system for an oral active agent delivery device. The device comprises an elongate tubular member (10) having first (12) and second (14) ends. The closure system includes a deformable closure means (28) adapted to allow delivery of the active agent upon deformation. The closure system prevents spillage and maintains the integrity of the dose within the device. In use, the closure system is deformed and separated from the second end of the tubular member, liquid is drawn up into the first end of the member, and the liquid and active agent are drawn out of the second end of the member and into the patient's mouth.





US006096003A

United States Patent [19]
Wong et al.

[11] **Patent Number:** **6,096,003**
[45] **Date of Patent:** **Aug. 1, 2000**

- [54] **CLOSURE SYSTEM FOR AN ACTIVE AGENT DELIVERY DEVICE**
- [75] **Inventors:** Patrick S.-L. Wong, Burlingame; James Horvath, San Jose; Radomir N. M. Vukadin, Cupertino; Joyce C. Anthony, Woodside; Vincent J. Ferrari, Foster City; Jeffrey W. Etter, Castro Valley; Christopher M. G. Ohms, San Mateo, all of Calif.

- [73] **Assignee:** ALZA Corporation, Mountain View, Calif.

- [21] **Appl. No.:** 08/950,016

- [22] **Filed:** Oct. 14, 1997

Related U.S. Application Data

- [60] **Provisional application No.** 60/028,703, Oct. 18, 1996.
- [51] **Int. Cl.⁷** A61M 37/00
- [52] **U.S. Cl.** 604/85; 604/78
- [58] **Field of Search** 604/81, 57, 90, 604/77, 85, 185, 133, 247, 257, 83, 89, 78; 424/451, 453, 455, 468, 472, 473

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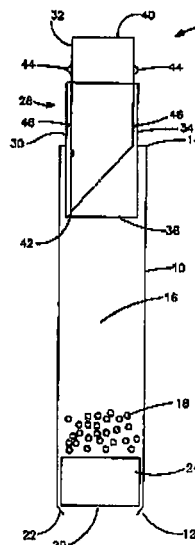
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Primary Examiner—Wynn Wood Coggins
Assistant Examiner—A. T. Nguyen
Attorney, Agent, or Firm—Andrea G. Reister; Howrey Simon Arnold & White, LLP

- [57] **ABSTRACT**

The present invention is directed to a closure system for an oral active agent delivery device. The device comprises an elongate tubular member having first and second ends. The closure system includes a deformable closure means adapted to allow delivery of the active agent upon deformation. The closure system prevents spillage and maintains the integrity of the dose within the device. In use, the closure system is deformed and separated from the second end of the tubular member, liquid is drawn up into the first end of the member, and the liquid and active agent are drawn out of the second end of the member and into the patient's mouth.

14 Claims, 5 Drawing Sheets





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Wong et al.

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(45) **Date of Patent: Jul. 22, 2003**

(D2³)
D4³

- (54) **CLOSURE SYSTEM FOR AN ACTIVE AGENT DELIVERT DEVICE**
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- (73) **Assignee:** Alza Corporation, Palo Alto, CA (US)
- (*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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(74) **Attorney, Agent, or Firm**—Andrea G. Reister; Covington & Burling

(57) **ABSTRACT**

The present invention is directed to a closure system for an oral active agent delivery device. The device comprises an elongate tubular member having first and second ends. The closure system includes a deformable closure means adapted to allow delivery of the active agent upon deformation. The closure system prevents spillage and maintains the integrity of the dose within the device. In use, the closure system is deformed and separated from the second end of the tubular member, liquid is drawn up into the first end of the member, and the liquid and active agent are drawn out of the second end of the member and into the patient's mouth.

2 Claims, 5 Drawing Sheets

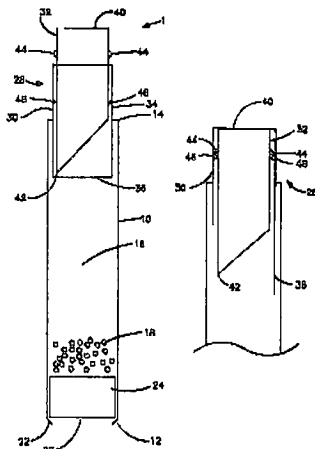
Related U.S. Application Data

- (62) Division of application No. 08/950,016, filed on Oct. 14, 1997, now Pat. No. 6,096,003.
- (60) Provisional application No. 60/028,703, filed on Oct. 18, 1996.
- (51) **Int. Cl.**⁷ **A61M 37/00**
- (52) **U.S. Cl.** **604/85; 604/83**
- (58) **Field of Search** **604/77, 78, 81, 604/83, 85, 133, 185, 89, 247, 257**

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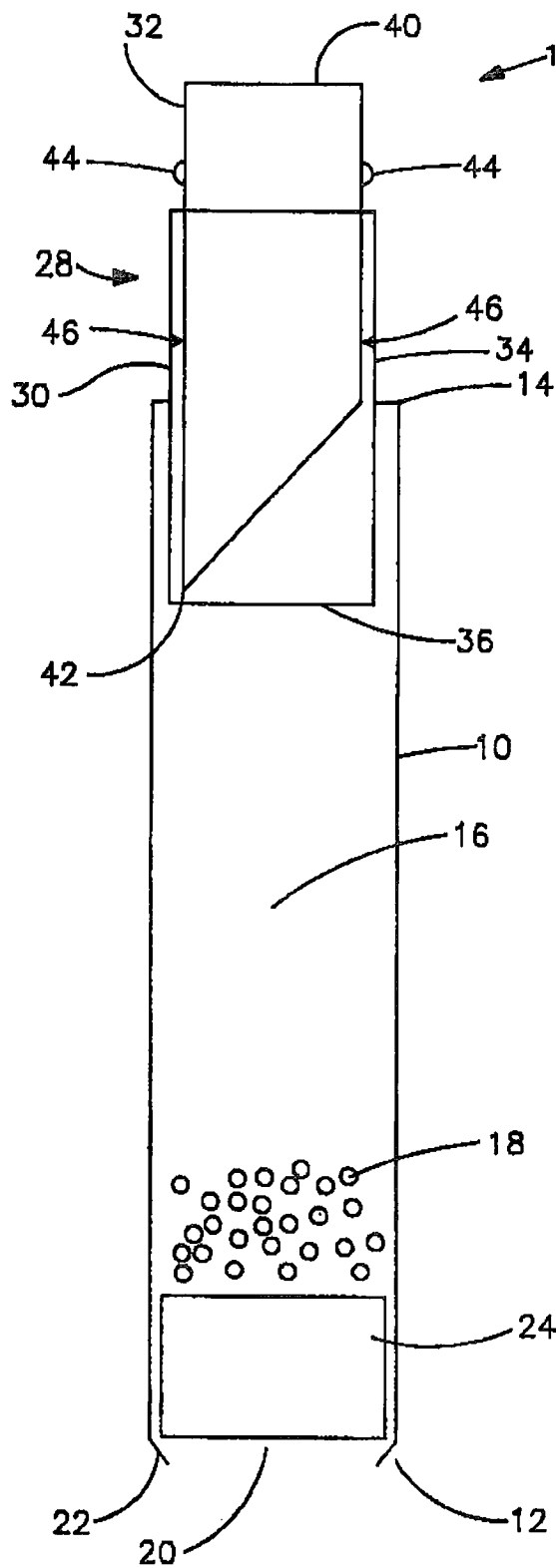


FIG. 1

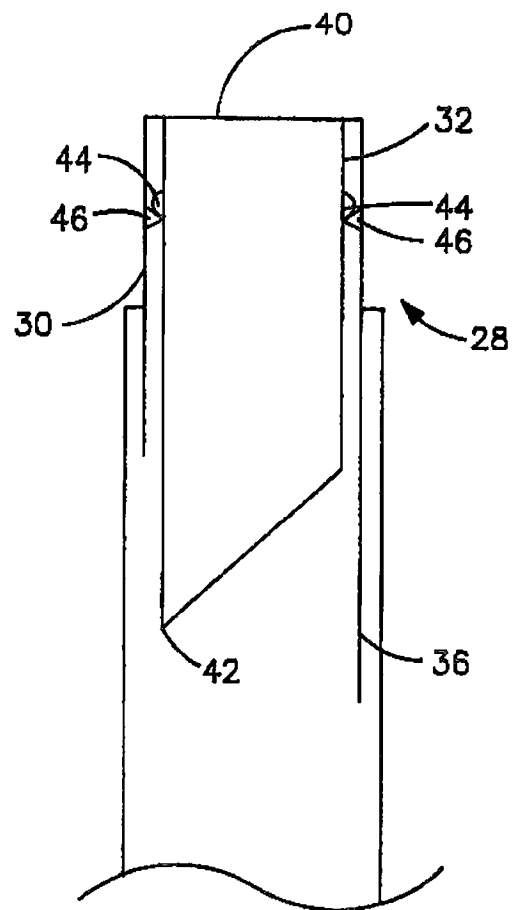


FIG. 2

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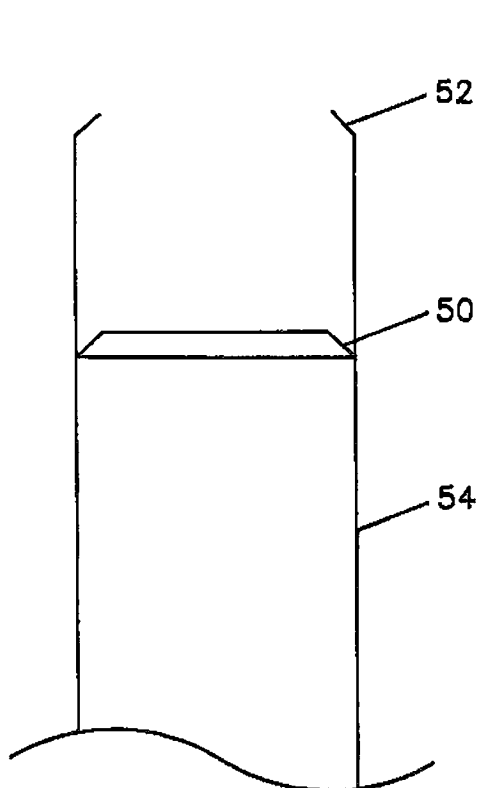


FIG. 3

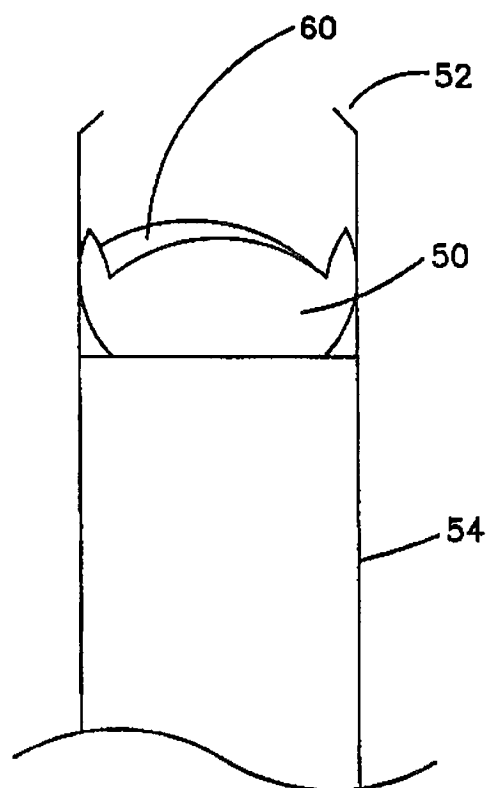


FIG. 4

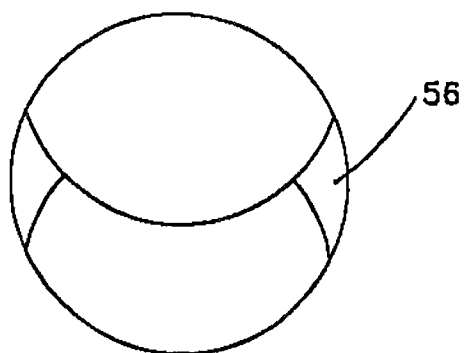


FIG. 5

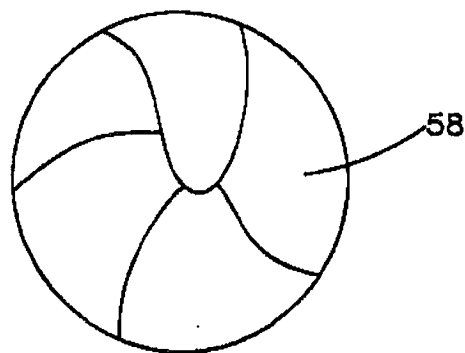


FIG. 6

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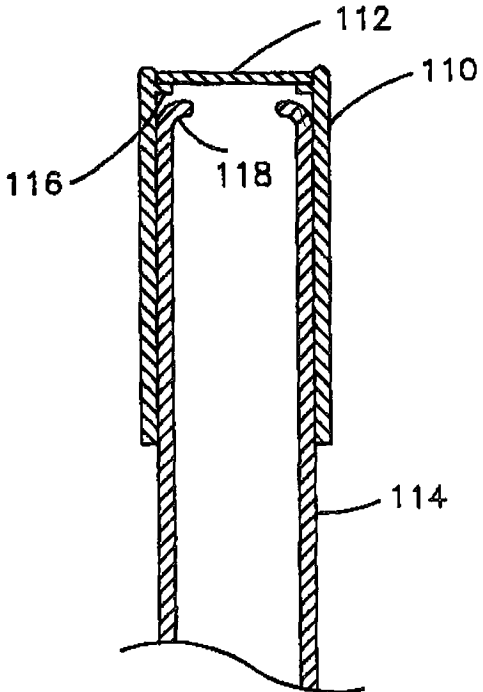


FIG. 11A

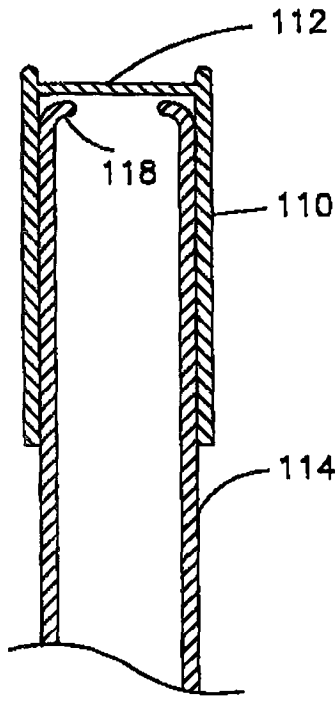


FIG. 11B

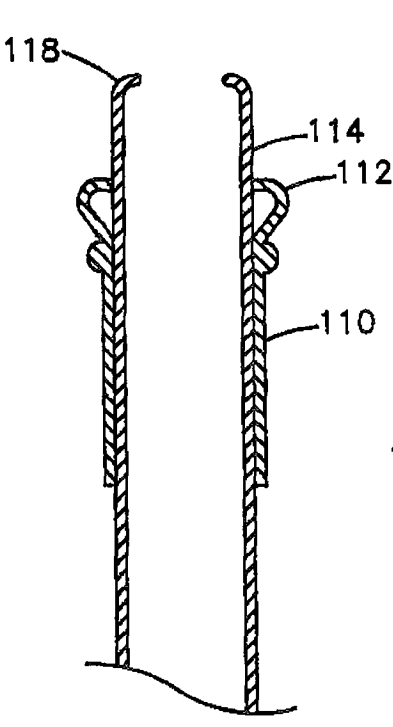


FIG. 13

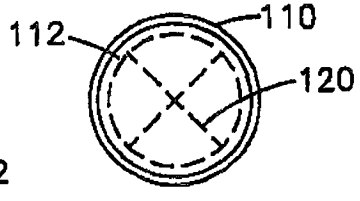


FIG. 12A

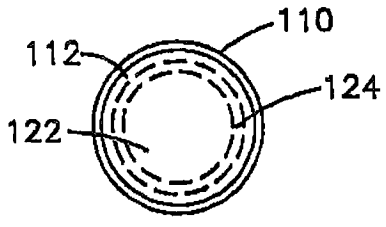


FIG. 12B

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and is openable in order to permit a patient to suck up the active agent from the second end of the device after the first end has been inserted into a fluid.

In still another aspect, the invention is a method for preventing loss of an active agent from an active agent delivery device. The method comprises providing a tubular member with a first end and a closed second end, opening the second end in order to expose the active agent and placing the second end in the mouth to deliver the agent by sucking. The portions of the device that remain following delivery are too large to be swallowed by the patient.

DESCRIPTION OF THE DRAWINGS

The figures are not drawn to scale, but are set forth to illustrate various embodiments of the invention. Like numbers refer to like structures.

FIG. 1 is a side view of one embodiment of an active agent delivery device with a closure system containing a membrane according to the invention.

FIG. 2 is a side view of the device closure system of FIG. 1 following rupture of the membrane.

FIG. 3 is a side view of a second embodiment of the device closure system of the invention.

FIG. 4 is a side view of the closure system of FIG. 3 following opening of the closure system.

FIG. 5 is a top view of the device closure system of FIGS. 3 and 4.

FIG. 6 is an alternative top view of the closure system of FIGS. 3 and 4.

FIGS. 7, 8, 9 and 10 are side views of other embodiments of the device closure system according to the invention.

FIGS. 11A and 11B are side, cross-sectional views of another embodiment of the closure system of the invention.

FIGS. 12A and 12B are top views of preferred forms of the embodiment of the closure system of FIGS. 11A and 11B.

FIG. 13 is a side, cross-sectional view of the device of FIGS. 11A and 11B after opening of the closure system.

DETAILED DESCRIPTION OF THE INVENTION

The present invention provides closure systems for oral active agent delivery devices. The active agent is in the form of discrete units and is contained within the lumen of an active agent delivery device. The closure systems prevent spillage of the agent from the device, allow for convenient and accurate delivery of a measured dose of active agent to a patient and provide an indication of prior use or misuse of the device.

Definitions

The term "discrete units" intends the active agent in solid or particulate form.

The term "oral dosage form" means that the active agent is placed in a discrete unit that is delivered orally and is capable of maintaining its physical configuration and chemical integrity while housed within the delivery device.

The term "therapeutically effective amount" means the amount of the active agent needed to effect the desired pharmacologic, often beneficial, result.

The term "fluid passing active agent retainer" means a valve, plug, grid, restriction or the like that allows for passage of fluid but does not allow for passage of other

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ingredients such as the active agent that is contained in the delivery device.

The term "deformable" means capable of being either wholly or partially altered in shape or form.

The dispensing devices of the invention find use where it is inconvenient or unsafe to use oral dosage forms such as capsules or tablets. The devices may be particularly useful in geriatric or pediatric patient populations, but they may also be useful for those who have difficulty swallowing capsules or tablets. A single delivery device or several devices can be administered to a patient during a therapeutic program.

The closure system of the present invention comprises a deformable closure means that is adapted upon deformation to open an end of the delivery device for access by a patient and allow transport of the active agent therethrough. Deformation of the closure means preferably is irreversible and provides an indication of prior use or misuse of the delivery device. Such an indication is beneficial since the dose of active agent to be delivered typically is in the form of discrete units, such as granules or powder, and the correct quantity of active agent to be delivered cannot often be determined by visual observation alone. Accordingly, should the delivery device be opened and partially used (i.e., not all of the dose dispensed) or some of the active agent removed, the deformable closure means will provide an indication of such use. Particularly when the deformation is irreversible, observation of the deformation is easily made and appropriate procedures to prevent any deleterious effects from any prior use or misuse can be undertaken. As an added benefit, the closure system of the present invention facilitates efficiency and economy in manufacture and use of the systems. Various embodiments of the closure system comprising a deformable closure means are described below.

FIG. 1 depicts, in a side view, one embodiment of the delivery device according to the invention. The device is in prepared form prior to placement in a fluid. Dispensing device 1 is shown in FIG. 1 to comprise an elongate tubular member 10 with a first end 12 and a second end 14. Contained within tubular member 10 is a lumen 16 that contains an active agent 18 and a fluid passing active agent retainer 20. The fluid passing active agent retainer 20 comprises a restriction 22 and a plug 24. The restriction 22 is formed by crimping the end of tubular member 10. The inner diameter of the restriction 22 is smaller than the outside diameter of the plug 24 such that the active agent 18 and plug 24 are retained within the tubular member 10 but plug 24 can slide upwardly in lumen 16 as fluid is drawn therethrough.

FIG. 1 further shows a closure system for the delivery device. A second tubular member 30 comprises an inner portion 32 and an outer portion 34. The outer portion 34 fits inside the second end of the first tubular member and has a frangible membrane 36 that seals the lumen 16 of the first tubular member 10. The inner portion 32 comprises a lumen and has a blunt end 40 and a cutting edge 42. The inner portion 32 further has two or more detents 44. When in use, the blunt end 40 of the inner portion 32 of the second tubular member 30 is depressed. The cutting edge 42 pierces the membrane 36. Resistance to further depression will occur when the detents 44 reach corresponding detents 46 of the second tubular member 30. FIG. 2 shows the second end 14 of the first tubular member and the closure system 28 after depression of the inner portion 32 of the second tubular member 30 and the rupture of membrane 36. Following rupture of membrane 36, the first end 12 of the device 1 is then placed in a fluid and the second end 14 is placed in the

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mouth of a patient. The patient begins to suck and fluid is drawn up through lumen 16. The discrete units are entrained in the fluid drawn through lumen 16 and easily swallowed. Rupture of membrane 36 results in membrane 36 being irreversibly deformed and provides an indication of use of the device.

FIGS. 3, 4, 5 and 6 show a second embodiment of a device closure system according to the invention. In this embodiment, the closure system comprises a valve 50 near the second end 52 of the first tubular member 54. Alternative valve designs are shown as an overleaf valve 56 (FIG. 5) and an aperture valve 58 (FIG. 6). When in use, the second end 52 of the first tubular member 54 is placed into the mouth of a patient and by virtue of the sucking and fluid pressure exerted, the valve 50 will open and the dose will be delivered through the opening 60 created in the valve 56 (see FIG. 4). Suction and flow of liquid through the valve result in its deformation.

FIGS. 7 and 8 show further embodiments of the device closure system of the invention. In these embodiments, a second tubular member 70 is placed over the second end 72 of the first tubular member 74. The second tubular member 70 has a first end 76 that contains a protuberance 78 for easy handling of the member 70. The second end 80 is closed to seal the lumen 82 of the first tubular member 74. The second tubular member is long enough (between 2 and 12 cm preferably between about 3 and 8 cm) to prevent inadvertent swallowing of the member 70. In the embodiment shown in FIG. 8, a flexible member 84 inside the first tubular member aids in retaining the second tubular member 70 on the first tubular member 74. Although the flexible member 84 is shown to be a two-prong member, it may comprise a solid or cylindrical plug or other configuration that can hold the member 70 in place. In use, the patient or care giver will grab the protuberance 78, lift the second tubular member 70 off of the first tubular member 74 and insert the second end 72 of the first tubular member 74 into the mouth of the patient to suck for delivery of the dose of active agent entrained in a liquid drawn through the first end of the first tubular member 74. Generally, the force applied to protuberance 78 and second tubular member 70 during removal will result in deformation to the protuberance 78 and to second tubular member 70 as well.

FIG. 9 shows another embodiment of a closure system of the invention. In this embodiment, the second end 90 of the first tubular member 92 itself comprises the closure system. A perforation 94 in the member 92 allows for cutting or tearing of the member 92, exposure of the active agent containing lumen 96 and delivery of the active agent by sucking. Again, the portion 90 of the member 92 that is removed is between 2 and 8 cm, preferably about 3 and 6 cm such that it is too large to be inadvertently swallowed.

FIG. 10 shows a further embodiment of the closure system of the invention. In this embodiment, a tab 100 on the second tubular member 102 can be pulled to remove a strip 104 of the member 102 extending the length of the member 102 over the top of the member 102 and down its other side. In this way, the member 102 will be divided into two pieces and fall away from the first tubular member 106. The second end 108 of the first tubular member 106 can then be placed into the mouth of the patient. Again, the remaining pieces of the second tubular member 102 are large enough to prevent inadvertent swallowing. Removal of strip 104 results in the irreversible deformation of the member 102.

FIGS. 11-13 show further embodiments of the closure system of the invention. In this embodiment a second tubular

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member 110 comprising a frangible membrane 112 extends over first tubular member 114. As shown in FIG. 11A, frangible membrane 112 can be formed separately from second tubular member 110 and heat sealed, welded, glued or otherwise sealed to a projection 116 formed on the internal surface of second tubular member 110 near its top end. Optionally, the seal can be formed such that it will release the membrane from the second tubular member 110 when second tubular member 110 is moved downwardly toward the bottom end of first tubular member 114. The membrane itself may not rupture but the effect is equivalent. Such a configuration is contemplated within the term "frangible membrane" as used herein. In those configurations wherein the seal releases, the thickness of the membrane may be chosen more for manufacturing efficiency and economy without regard to considerations relating to the rupture of the membrane itself. Alternatively, as illustrated in FIG. 11B, frangible membrane 112 may be integrally formed with second tubular member 110 such as by injection molding. In each case, frangible membrane 112 has a thickness that permits the membrane to be broken and irreversibly deformed when second tubular member 110 is pushed downwardly along first tubular member 114.

The upper end 118 of first tubular member 114 will contact and break membrane 112 as second tubular member 110 is pushed toward the bottom end of first tubular member 114, as illustrated in FIG. 13. To facilitate breaking of membrane 112, membrane 112 can be formed with one or more weakened portions, illustrated by score lines 120 in FIG. 12A. Preferably membrane 112 is formed with a thicker center portion 122 and a thinner annular ring 124 near the outside edge of membrane 112, as shown in FIG. 12B, to promote tearing and rupture of membrane 112 upon movement of second tubular member 110 toward the bottom end of first tubular member 114. When first tubular member 114 breaks membrane 112, membrane 112 will open about the outer circumference of first tubular member 114 and move downwardly with second tubular member 110 out of the way of the upper end 118, thereby providing unencumbered access to the upper end 118 for placement into the mouth of the patient. Since the second tubular member 110 and frangible membrane 112 are retained on first tubular member 114, swallowing of the remainder of the second tubular member 110 and frangible membrane 112 by a patient is prevented.

The active agent itself may be in liquid, solid, or semisolid form and formulated into discrete units. The agents may be soluble and insoluble charged or uncharged molecules, components of molecular complexes or nonirritating, pharmacologically acceptable salts and may contain additional material such as binders, coating materials, or stabilizers such that the active agent is formed into one or more discrete units. The discrete units may be designed in a multitude of ways to provide a specific drug delivery profile. One embodiment comprises an active agent that is in particulate form. These particulates are generally between about 50 and 2000 μm in diameter, usually between about 100-500 μm in diameter. Where the particulate has an unpleasant taste, the particulate may be taste masked by methods that are well known in the art. The particulates may be designed to provide immediate delivery of the active agent, they may be coated to provide for prolonged release or delayed pulse release of the active agent, or they may be designed to provide for a combination of immediate, pulsed and/or prolonged delivery of active agent. The particulates may be coated with an enteric coating to provide for targeted release of the active agent.

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In other embodiments, the active agent may be in liquid form and may be contained within a soft gelatin capsule or within a solid oral dosage form. These dosage forms may include, matrix or other types of tablets, pellets and elongated tablets where the height to diameter ratio exceeds one, capsules, microcapsules, elementary osmotic pumps, such as those described in U.S. Pat. No. 3,845,770, mini osmotic pumps such as those described in U.S. Pat. Nos. 3,995,631, 4,034,756, and 4,111,202, and multichamber osmotic systems referred to as push-pull and push-melt osmotic pumps, such as those described in U.S. Pat. Nos. 4,320,759, 4,327,725, 4,449,983, and 4,765,989 all of which are incorporated herein by reference.

The term "active agent" refers to an agent, drug, compound, composition of matter or mixture thereof which provides some pharmacologic, often beneficial, effect. This includes foods, food supplements, nutrients, drugs, vitamins, and other beneficial agents. As used herein, the terms further include any physiologically or pharmacologically active substance that produces a localized or systemic effect in a patient. The active drug that can be delivered includes antibiotics, antiviral agents, anepileptics, analgesics, anti-inflammatory agents and bronchodilators, and may be inorganic and organic compounds, including, without limitation, drugs which act on the peripheral nerves, adrenergic receptors, cholinergic receptors, the skeletal muscles, the cardiovascular system, smooth muscles, the blood circulatory system, synaptic sites, neuroeffector junctional sites, endocrine and hormone systems, the immunological system, the reproductive system, the skeletal system, autacoid systems, the alimentary and excretory systems, the histamine system and the central nervous system. Suitable agents may be selected from, for example, polysaccharides, steroids, hypnotics and sedatives, psychic energizers, tranquilizers, anticonvulsants, muscle relaxants, antiparkinson agents, analgesics, anti-inflammatories, muscle contractants, antimicrobials, antimalarials, hormonal agents including contraceptives, sympathomimetics, polypeptides and proteins capable of eliciting physiological effects, diuretics, lipid regulating agents, antiandrogenic agents, antiparasitics, neoplastics, antineoplastics, hypoglycemics, nutritional agents and supplements, growth supplements, fats, ophthalmics, antienteritis agents, electrolytes and diagnostic agents.

Examples of active agents useful in this invention include prochlorperazine edisylate, ferrous sulfate, aminocaproic acid, mecamlamine hydrochloride, procainamide hydrochloride, amphetamine sulfate, methamphetamine hydrochloride, benzphetamine hydrochloride, isoproterenol sulfate, phenmetrazine hydrochloride, bethanechol chloride, methacholine chloride, pilocarpine hydrochloride, atropine sulfate, scopolamine bromide, isopropamide iodide, trihexethyl chloride, phenformin hydrochloride, methylphenidate hydrochloride, theophylline choline, cephalixin hydrochloride, diphenidol, meclizine hydrochloride, prochlorperazine maleate, phenoxylbenzamine, thiethylperazine maleate, anisindione, diphenadione erythrityl tetranitrate, digoxin, isofluorophate, acetazolamide, methazolamide, bendroflumethiazide, chlorpropamide, tolazamide, chlormadinone acetate, phenaglycodol, allopurinol, aluminum aspirin, methotrexate, acetyl sulfisoxazole, hydrocortisone, hydrocortisone acetate, cortisone acetate, dexamethasone and its derivatives such as betamethasone, triamcinolone, methyltestosterone, 17 β -estradiol, ethinyl estradiol, ethinyl estradiol 3-methyl ether, prednisolone, 17 β -hydroxyprogesterone acetate, 19-norprogesterone, norgestrel, norethindrone, norethisterone,

norethiderone, progesterone, norgesterone, norethynodrel, aspirin, acetaminophen, indomethacin, naproxen, fenoprofen, sulindac, indoprofen, nitroglycerin, isosorbide dinitrate, propranolol, timolol, atenolol, alprenolol, cimetidine, clonidine, imipramine, levodopa, chlorpromazine, methylidopa, dihydroxyphenylalanine, calcium gluconate, ketoprofen, ibuprofen, cephalixin, erythromycin, haloperidol, zomepirac, ferrous lactate, vincamine, phenoxybenzamine, diltiazem, milrinone, captopril, mandol, guanabenz, hydrochlorothiazide, ranitidine, flurbiprofen, fenbufen, fluprofen, tolmetin, alclofenac, mefenamic, flufenamic, difuninal, nimodipine, nitrendipine, nisoldipine, nicardipine, felodipine, lidoflazine, tiapamil, gallopamil, amlodipine, miflozine, lisinopril, enalapril, captopril, ramipril, enalaprilat, famotidine, nizatidine, sucralfate, etintidine, tertatolol, minoxidil, chlordiazepoxide, diazepam, amitriptyline, tetracycline, metronidazole, acyclovir, zidovudine and imipramine. Further examples are proteins and peptides which include, but are not limited to, insulin, coichicine, glucagon, thyroid stimulating hormone, parathyroid and pituitary hormones, calcitonin, renin, prolactin, corticotrophin, thyrotropic hormone, follicle stimulating hormone, chorionic gonadotropin, gonadotropin releasing hormone, bovine somatotropin, porcine somatotropin, oxytocin, vasopressin, prolactin, somatostatin, lyppressin, pancreozymin and luteinizing hormone.

It is to be understood that more than one active agent may be delivered in a device of this invention, and that the use of the term "agent" in no way excludes the use of two or more such agents. Combination products such as those described, for example, in U.S. Pat. No. 5,256,684 for the treatment of ulcers (tetracycline, metronidazole and bismuth subsalicylate) and for the treatment of AIDS (zidovudine (AZT), a protease inhibitor and 3TC) are particularly suited for delivery using the present invention.

The amount of active agent employed in the delivery device will be that amount necessary to deliver a therapeutically effective amount of the agent to achieve the desired result. In practice, this will vary widely depending upon the particular agent, the severity of the condition, and the desired therapeutic effect. However, the device is generally useful for active agents that must be delivered in fairly large doses of from about 100 mg to 5000 mg, usually in the range of from about 250 mg to about 2500 mg. However, since the devices may also be useful in pediatric patients, doses in the ranges of 25 to 250 mg are also contemplated herein.

Representative materials for forming devices including the active agent formulation chamber, the elongated tubular member and the closure systems, include, without limitation, paper, plastic such as propylene/styrene copolymers, polypropylene, high density polyethylene, low density polyethylene, ethylene vinyl acetate copolymer and the like. The devices usually have an outer diameter of between about 5 and 15 mm. The lumen has a diameter that is usually between about 4 and 14 mm and often between about 5 and 12 mm. The devices are between about 10 and 30 cm in length. Preferred materials for forming the membrane when it is integrally formed with the second tubular member are polypropylene and polymers from that polyolefin family. The thickness of the membrane typically is on the order of 0.075–0.25 mm. In those configurations where the membrane is sealed to the second tubular member, the membrane can be formed from frangible materials such as metallic foils, e.g., aluminum, aluminized plastic, uncoated and coated papers, e.g., waxed paper, and the like. The thickness of the materials will be chosen so that the force



US006032831A

United States Patent [19]
Gardner et al.

[11] **Patent Number:** **6,032,831**
[45] **Date of Patent:** **Mar. 7, 2000**

[54] **PERSONAL HYDRATION SYSTEM WITH AN IMPROVED MOUTHPIECE**

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[73] Assignee: **CamelBak Products, Inc.**, Petaluma, Calif.

[21] Appl. No.: **09/151,493**

[22] Filed: **Sep. 11, 1998**

Related U.S. Application Data

[63] Continuation-in-part of application No. 09/118,196, Jul. 17, 1998.

[51] Int. Cl.⁷ **B67D 5/64**

[52] U.S. Cl. **222/175; 222/529; 220/703**

[58] Field of Search **222/175, 512, 222/527, 529, 92; 224/148.4, 148.5, 148.6; 220/703**

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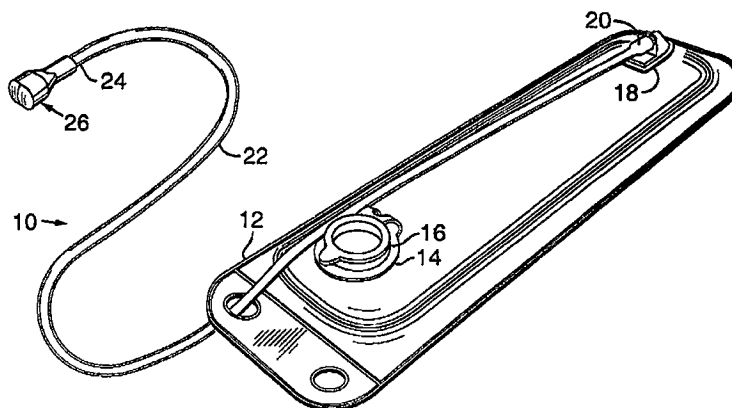
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Primary Examiner—Gregory L. Huson
Attorney, Agent, or Firm—Kolisich, Hartwell, Dickinson, McCormack & Heuser

[57] **ABSTRACT**

A personal hydration system with an improved mouthpiece for use in providing fluid for delivery to a user. The mouthpiece includes a neck that is adapted to be mounted on a supply tube to a hydration system and which is joined to a resilient head. The head includes a dispensing face with a pair of lips that define a normally closed slit, through which fluid is dispensed from the mouthpiece, a perimeter and a minimum dimension between opposed points on the perimeter. The bite region extends from the perimeter to a shoulder, which joins the bite region and the neck. From a closed position, in which the lips extend against each other to close the slit and prevent fluid from being dispensed through the slit, the mouthpiece is deformable to a dispensing position in which the lips are spread at least partially away from each other to allow fluid to be dispensed through the lips.

18 Claims, 4 Drawing Sheets



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FIG. 18

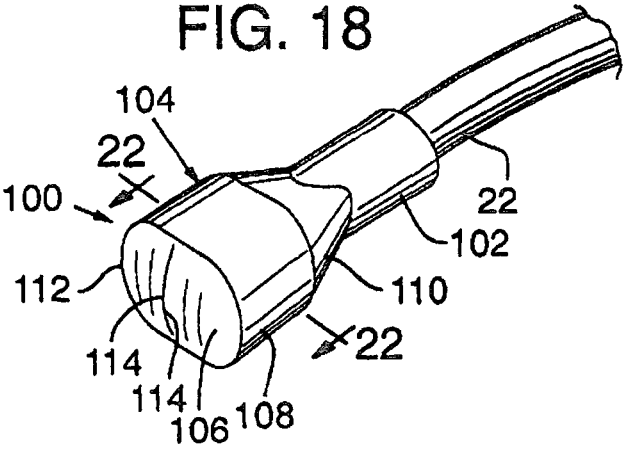


FIG. 19

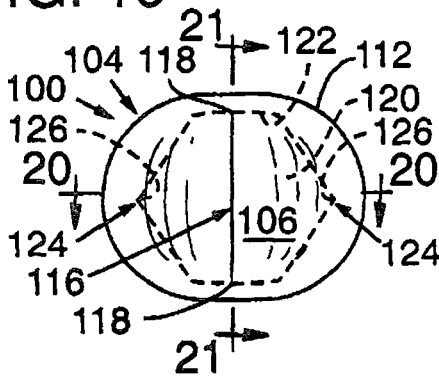


FIG. 20

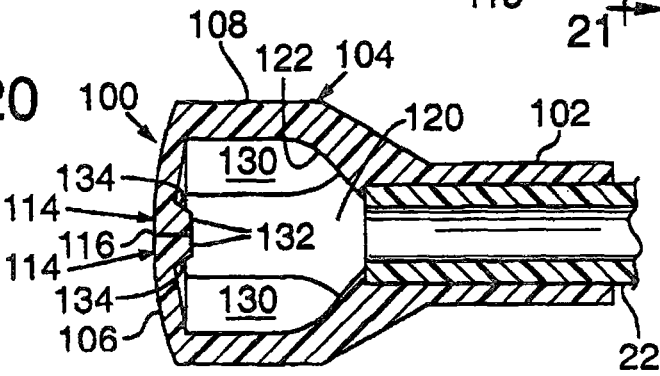


FIG. 21

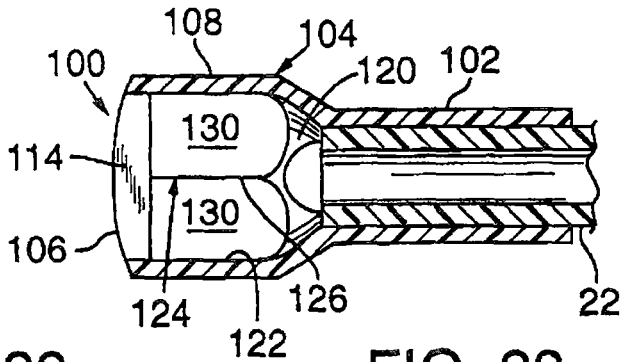


FIG. 22

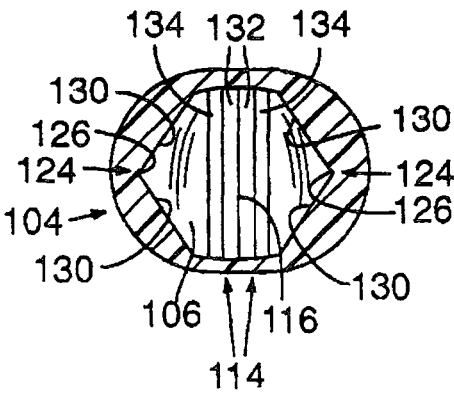
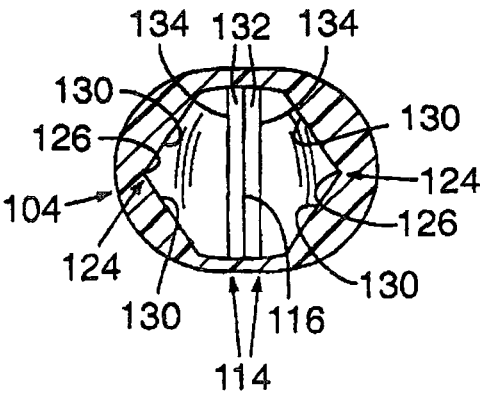


FIG. 23



scope of the invention that ribs 82 could alternatively extend along the outer surface of face 32. Each rib 82 extends from a respective one of the lips at a first position, and returns to the lip at a second position spaced-apart from the first. When mouthpiece 80 is in its dispensing position, ribs 82 are bent or deformed from the resting position shown in FIGS. 12 and 13 to a dispensing position shown in FIG. 14. As such, ribs 82 further bias the mouthpiece, and especially face 32 and lips 50 to return to the closed position. Preferably, ribs 82 include ends 84 that extend from lips 50 as described above and taper to an intermediate region 86 of narrower cross-section than ends 84. The reduced size of intermediate region 86, which extends in a portion of face 32 that undergoes significant bending or deformation, minimizes the amount of additional force needed to deform mouthpiece 80 to its dispensing position, while still providing a continuous, curved support for lips 50. In variations of this embodiment, intermediate region 86 is substantially or completely coplanar with inner surface 52.

In FIGS. 15-17, another alternate embodiment of the invented mouthpiece is shown and indicated generally at 90. Unless otherwise indicated, mouthpiece 90 has the same components, dimensions and properties as mouthpiece 26, including a neck 28 and a head 30 that includes a dispensing face 32 (with a pair of lips that define a normally closed slit 38), a bite region 44, a transition region 46, and a supply chamber 48 defined by the dispensing face and the bite region. In FIGS. 15-17, the inner surface of face 32 is generally indicated at 92, and it can be seen that surface 92 has a convex cross-sectional configuration generally transverse to slit 38.

As shown, the thickness of face 32 distal slit 38 is between approximately 0.06 inches and approximately 0.14 inches, similar to the faces of the previously discussed mouthpieces. A thickness distal slit 38 of approximately 0.8 inches has proven to perform particularly well. As surface 92 extends from bite region 44 toward slit 38, it can be seen in FIGS. 15 and 17 that face 32 increases in thickness and extends into the supply chamber until it forms a pair of lips 94 that define slit 38. The radius of curvature of surface 92 is approximately 0.75 inches, although it should be understood that larger or small radii of curvature may be acceptable as well.

Another embodiment of the present invention is shown in FIGS. 18-23 and indicated generally at 100. As shown, mouthpiece 100 has outer dimensions that correspond with the previously disclosed embodiments, including a neck 102 and a head 104 with a dispensing face 106, bite region 108 and lip-receiving shoulder 110. Face 106 extends to an outer perimeter 112, where it is joined to a bite region 108, and includes a pair of opposed lips 114 that define a slit 116 (indicated in FIG. 19) extending therebetween. As shown in FIG. 19, slit 116 is elongate and has a pair of ends 118 adjacent perimeter 112. Unless otherwise specified, mouthpiece 100 has the same elements and subelements as any of the above embodiments, including the shapes, 10 properties and possible variations discussed with respect to the mouthpieces shown in FIGS. 1-17.

Similar to the above-described embodiments, bite region 108 extends from head 104 to form the internal surface, or side wall, 122 of a supply chamber 120, into which fluid is received prior to being dispensed from face 106. As shown in FIGS. 19-21, side wall 122 encircles the supply chamber and forms plural corners 124 distal slit 116. At their apexes 126, corners 124 define fold lines that extend away from face 106 generally transverse to slit 116. Side wall 122 may alternatively be described as including plural discontinuities

because the otherwise smooth, or actuate, inner wall is broken by the apexes of the corners.

As perhaps best seen in FIGS. 19 and 21, side wall 122 includes regions 130 that have generally planar configurations and meet to form apexes 126 distal slit 116. When mouthpiece 100 is deformed to its dispensing position, abutting regions 130 are pivoted toward each other about apex 126. Regions 130 give side wall 122 a generally polygonal configuration in a plane parallel to perimeter 112, and as shown in FIGS. 19 and 22, generally resembles a hexagon. It should be understood, however, that there may still be some curvature to portions of side wall 120. For example, a slight curvature proximate ends 118 of slit 116 promotes easier opening of slit 116 when a user bites upon bite region 104. Abutting regions 130 extend at an angle with respect to each other that is between approximately 80° and approximately 130°, preferably between approximately 90° and approximately 125°, and more preferably between approximately 100° and approximately 120°. Angles outside of this range are also within the scope of the present invention, however the above-discussed angular ranges are presently preferred. In mouthpiece 100 shown in FIGS. 19-22, regions 130 extend at an angle of approximately 114° with respect to each other, with side wall 120 having a thickness at apex 126 of approximately 0.16 inches. This thickness is measured from the supply chamber outwardly to the closest point on the outer surface of the bite region.

At apex 126 of each corner 124, bite region 108 has a reduced thickness than the corresponding regions adjacent apex 126. This thinner, generally pointed configuration of the apexes 126, along which the corresponding fold lines extend, enables the mouthpiece to flex or pivot about the apex to the dispensing position when a user bites upon region 108. Because of the reduced thickness at the apex, the mouthpiece deforms substantially by pivoting about the apex instead of by compressing a relatively thick, or even thickest, portion of the bite region. This enables the slit to create a hydraulic orifice with a larger area, without requiring the slit to be lengthened. Upon removal of the deforming force, the mouthpiece is biased to spring back to its original, unstressed position in which slit 116 is closed and no fluid is dispensed therethrough.

Experiments using mouthpiece 100 have demonstrated that fluid may be dispensed from dispensing face 106 at a rate greater than 40 ml/sec, including flowrates of approximately 45 ml/sec, under the normal operating conditions discussed previously.

As shown in FIGS. 20 and 22, lips 114 extend into supply chamber 120 beyond dispensing face 106. Furthermore, lips 114 include end walls 132 and side walls 134 that extend at an angle between face 106 and the corresponding end wall 132. End walls 132 and side walls 134 of lips 114 may include any of the configurations and shapes described above with respect to end walls 54 and side walls 56, including side walls that extend generally transverse to face 106, as shown in FIG. 23. Side walls that extend at an angle of between approximately 30° and approximately 60° are currently preferred because they promote more laminar flow of the fluid as it is received within supply chamber 120 and dispensed through slit 116, however, the invented lips encompass any of the configurations of lips disclosed herein.

The foregoing description of the preferred embodiments of the invention has been presented for purposes of illustration and description. It is not intended to be exhaustive or to limit the invention to the precise form disclosed, and many modifications and variations are possible in light of

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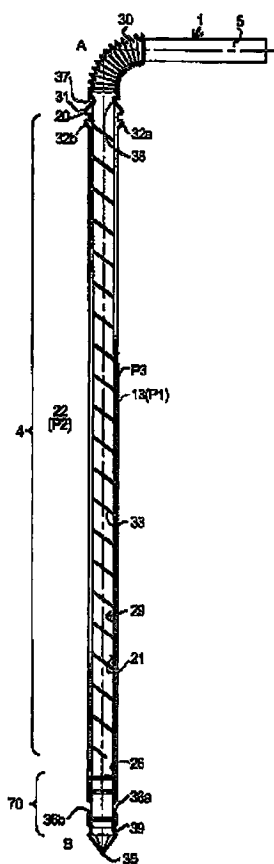
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(54) Title: METHOD AND DEVICE FOR PREVENTING THE INADVERTENT OUTFLOW OF A FLUID FROM A DRINKING CONTAINER



(57) Abstract: A method and device for preventing unintended liquid flow from drinking containers are achieved by means of securing an inner tube (29) provided with a bellows (4) within an outer tube (1) and terminating one end of the inner tube (29) as a valve (70, 70'), whereby the suction force from the user provides a pressure difference across the bellows (4), causing the bellows (4) to move the valve (70, 70') with sufficient force to open. When the suction force ceases, the valve (70, 70') closes, and it remains closed, even when the liquid in the drinking container (61) is pressurized with pressure (P3).

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Figures 13 and 14 show a schematic principle drawing of the method and the operation of the device;

Figures 15, 16a and 16b show an alternative embodiment of the outer tube of the device; and

Figures 17a and 17b show a further embodiment of the outer tube of the device.

Figure 1 shows a preferred embodiment, in which an outer tube 1 is provided with an inner tube 29. The tube 29 is partially formed as a bellows 4 having a helical pattern 33. By means of the bellows 4 the tube 29 may contract longitudinally upon the pressure P2 on the inside 22 of the tube 29 becoming lower than the pressure P1 on the outside 13 of the tube 29. At its lower end B the tube 29 terminates as a valve head 26, cf. Figure 3a. By means of its shape the valve head 26 functions, among other things, as a seal against the inside 21 of the tube 1, but also as a valve 70 together with the valve openings 36a, 36b.

In its closed position the valve 70 will be sealed, even if the liquid pressure P3 within an associated drinking container exceeds the atmospheric pressure P1.

When assembling the outer tube 1 and its inner tube 29, a connecting groove 38 at the upper end A of the tube 29 will engage a complementarily shaped groove 37 of the outer tube 1. Thereby the tube 29 is attached pressure-sealingly to the inside of the outer tube 1. The grooves 37, 38 possibly may

be formed through heating subsequent to having fitted the parts together in a mutually fixed position.

At the lower end of the outer tube 1 the tube 1 is squeezed together into a tight and rigid point 35 for puncturing a drinking container, for example. The outer tube 1 also is provided with a ring 39, the purpose of which is to stabilize the extent of the folds resulting from the end 35 being squeezed together. Moreover, the device is provided with a stop flange 31 and four barbs 32a, 32b, 32c, 32d that ensure correct application, and that prevent the device from being forced out of the container when subjected to overpressure. In one of the barbs 32a, 32b, 32c, 32d a slit 2 has been cut forming a one-way and continuous air inlet mechanism into the drinking container 61. The outer tube 1 is provided with a vent 20 that delivers atmospheric pressure P_1 via the slit 2 to the outside 13 of the tube 29 and to the inside of the drinking container 61.

Otherwise, the outer tube 1 is formed with a flexible joint 30, enabling a longitudinal portion 5 of the outer tube 1 to be folded parallel to the remaining length of the outer tube 1 when being packed.

Figure 2 shows a section of the device shown in Figure 1 after being inserted into a drinking container 61.

Figure 3a shows a section from a similar device to that of Figure 1, but having a valve portion 70, in which the valve head 26 is provided with the gaskets 41a, 41b and 41c that maintain proper sealing between the valve head 26, the outer

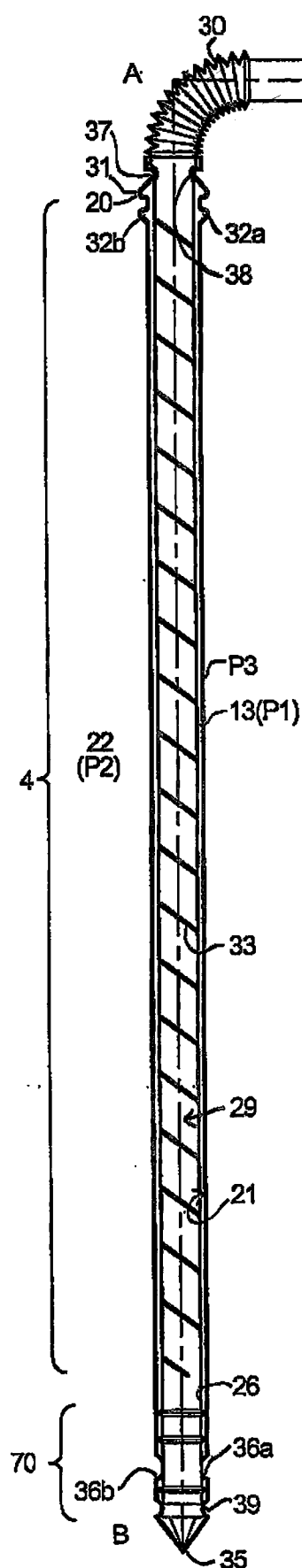


Fig. 1

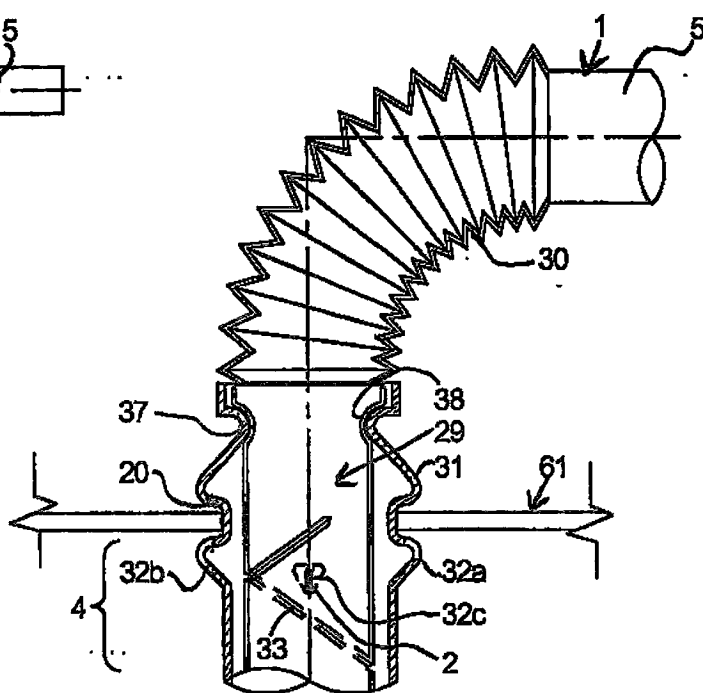


Fig. 2

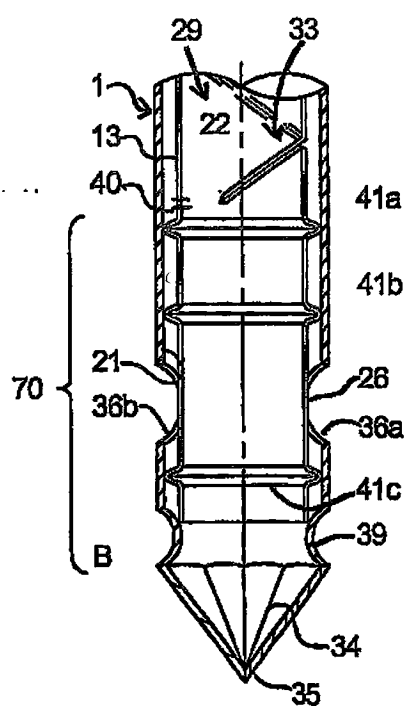


Fig. 3a