SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO	
RAD: 12-152485- -7	**FECHA**: 2014-02-03 10:08:50
DEP: 2020 DIRECCION DE NUEVAS CREACIONES	**EVE:** 1 REGISTRO/DEPOSITO/CONCESION/DEPOSITO
TRA: 3 PATENTES DE MODELO DE UTILIDAD	**FOLIOS**: 7
ACT: 519 PRESENTACION	

DIRECCIÓN DE NUEVAS CREACIONES

2020
Bogotá, D.C.,

Abogado(a)/Señor(a)
CARLOS MARIO MONTOYA JIMENEZ

Asunto: Radicación: 12-152485- -7
Trámite: 3
Evento: 1
Actuación: 519
Oficio: 1146
Folios: 7

Patente de Invención				Patente de Modelo de Utilidad	X
Vía Nacional	**X**				
Vía PCT (Fase Nacional)		Capítulo I		Capítulo II	
No. Solicitud Internacional					
Fecha de Presentación Internacional					

Como resultado del Examen de Fondo realizado, con fundamento en el artículo 85 y en concordancia con el artículo 45 de la Decisión 486 de la Comisión de la Comunidad Andina, se le comunica:

1. **Documentos estudiados**

Descripción:	Rad. N° 12-152485-00000-0000	06/Septiembre/2012
	Rad. N° 12-152485-00002-0000	14/Noviembre/2012
Reivindicaciones:	Rad. N° 12-152485-00000-0000	06/Septiembre/2012
	Rad. N° 12-152485-00002-0000	14/Noviembre/2012
Dibujos:	Rad. N° 12-152485-00000-0000	06/Septiembre/2012
	Rad. N° 12-152485-00002-0000	14/Noviembre/2012

2. Objeto de la invención

En el presente documento se aplicará lo establecido en la Circular Única en su Título X, con respecto a que cuando la solicitud contenga más de diez (10) reivindicaciones y no se haya pagado la tasa complementaria, sólo se estudiarán las cubiertas por la tasa pagada al momento de realizar el examen de patentabilidad consagrado en el artículo 45 de la Decisión 486.

Título de la solicitud: “Tapón dispensador” (Fl. 1).

El problema planteado en esta solicitud, consiste en lograr un tapón dispensador para botellones de agua, cuyo diseño impida cualquier fuga de líquido.

Para resolver este problema técnico, la solicitud en estudio propone un tapón dispensador, que consta de un cuerpo principal, que al ser rotado causa el movimiento axial de un cilindro móvil. Dicho cilindro móvil, consta de unos orificios de entrada y salida de líquido.

El objeto de la presente Solicitud se relaciona con la Clasificación Internacional de Patentes (CIP): B 65 D 47/26.

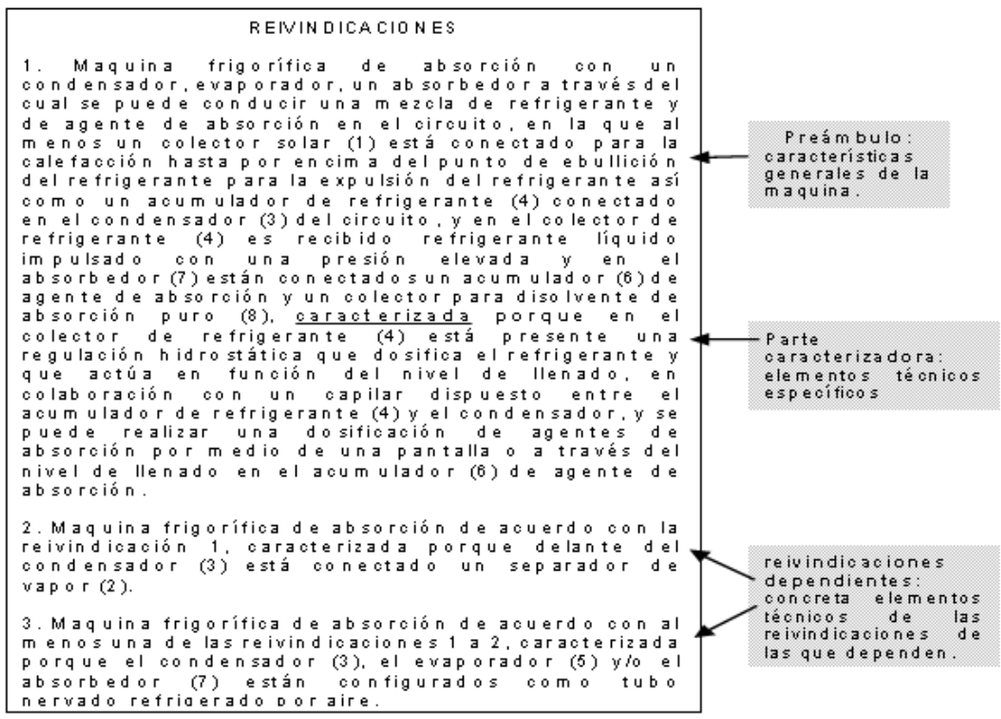
3. **De la Solicitud de Patente**

Reivindicaciones (Art 30 D 486, Art 22 PCT)

El capítulo reivindicatorio no es claro porque:

1- El capítulo reivindicatorio no contiene materia patentable, debido a que se centra en exponer funciones, ventajas, efectos, usos o resultados a alcanzar del tapón dispensador reclamado. Este tipo de aspectos no pueden ser objeto de protección en una patente de modelo de utilidad. Según el Artículo 81 de la Decisión 486, un modelo de utilidad se define por medio de *“toda nueva forma, configuración o disposición de elementos”*, es decir, solo se protegen las características estructurales (tangibles) del producto para el cual se solicita protección. De acuerdo con lo anterior, se sugiere al solicitante replantear el capítulo reivindicatorio describiendo el producto reclamado mediante sus características estructurales (tangibles), sin incluir los aspectos mencionados anteriormente.

2- La reivindicación presentada no está estructurada correctamente. Por su estructura, el preámbulo y la parte característica de la reivindicación deben ir en un solo párrafo, y deben separarse mediante la expresión “caracterizado por”. De acuerdo con lo anterior, se sugiere al solicitante replantear el capítulo reivindicatorio siguiendo los ejemplos y aclaraciones presentadas en el anexo 1 de este documento. A continuación se muestra un ejemplo guía, donde se muestra la estructura correcta del capítulo reivindicatorio:



3- La expresión *"El diseño del tapón"*, es de carácter general y sugiere de forma imprecisa que la protección se extiende a otras posibles variaciones o modificaciones, lo que no permite compararlo con el estado de la técnica. Lo anterior, debido a que no se describen las características estructurales del tapón reclamado. Es decir, la expresión citada no es suficiente para entender la configuración de dicho producto. De acuerdo con lo anterior, se sugiere al solicitante replantear el capítulo reivindicatorio, describiendo el tapón dispensador mediante sus características técnicas.

Al replantear el capítulo reivindicatorio, se sugiere tener en cuenta las siguientes aclaraciones:

- Como puede observarse en el ejemplo anterior, el capítulo reivindicatorio puede conformarse de reivindicaciones dependientes e independientes. En la reivindicación independiente se describen las características técnicas que se desean proteger, mientras que en las reivindicaciones dependientes se incluyen características particulares de algún elemento mencionado en la reivindicación independiente.

- El preámbulo de las reivindicaciones contiene materia ya contenida en el estado de la técnica y sitúa al examinador en el campo técnico al cual pertenece la invención. En general, el preámbulo coincide con el título de la solicitud. Por su parte, en la parte característica de la reivindicación, se incluyen las características técnicas que el solicitante desea proteger y que pueden dar novedad al producto reclamado.

- Los materiales o las propiedades de los mismos no pueden ser objeto de protección vía modelo de utilidad. Como se mencionó anteriormente, solo se protegen las características constructivas del producto para el cual se solicita protección. Por ende, utilizar expresiones que hacen referencia a materiales o a sus propiedades no pueden ser incluidas dentro de la reivindicación independiente como una característica esencial de la invención. Cabe agregar, que pueden incluirse como características particulares en reivindicaciones dependientes, pero no afectan el examen de patentabilidad.

  De igual forma, las características de procedimiento, los procesos o los métodos, tampoco son materia que pueda ser susceptible de protección, por lo tanto, en el capítulo reivindicatorio no pueden ser incluidas expresiones que se refieran a este tipo de aspectos.

- Con el fin de facilitar la identificación de las características técnicas reclamadas en los dibujos y en el resto de la solicitud, se sugiere al solicitante incluir los números de referencia de todas las características incluidas en las reivindicaciones. Se recomienda verificar que los números de referencia que se incluyan, concuerden con los presentados en la descripción y en los dibujos de la solicitud.

- De acuerdo con el artículo 30 de la Decisión 486, las reivindicaciones deben ser claras, concisas y estar enteramente sustentadas en la descripción. Por lo tanto, todas las características que se incluyan en las reivindicaciones, también deben ser mencionadas en la descripción.

- Al hacer alguna modificación a la solicitud, no se debe ampliar la materia de la misma. Por ende, las características que se incluyan en las modificaciones, deben ser las mismas que las divulgadas en la presentación inicial, sin incluir características adicionales.

Descripción (Art 28 D 486)

En la descripción se utilizan los números de referencia 7 y 13 para identificar el *"Orificio por donde sale el líquido"*, se sugiere al solicitante utilizar un único número de referencia para cada una de las características del tapón reclamado.

4. Determinación del Estado de la Técnica

El estado de la técnica se determinó con base en la fecha de presentación de la solicitud de patente nacional: septiembre 06 de 2012, y se encontraron los siguientes documentos que anticipan el objeto de esta solicitud:

Ítem	Documento	Título	Fecha de Publicación
D1	US 5'004.127	'Cap with a rotating casing for flasks, tubes and similar containers'	02/Abril/1991
D2	US 5'431.305	'Tamper evident liquid dispensing package'	11/Julio/1995

El documento D1 [1] divulga un tapón que comprende una carcasa montada rotativamente en un contenedor. Dicha carcasa comprende una campana que a su vez está conectada por medio de una rosca helicoidal a un asiento en el contenedor (resumen).

El documento D2 [2] divulga un tapón que comprende una tapa, que esta rotativamente acoplada al final de un contenedor, la cual consta de una abertura que está alineada con los canales de líquido de una boquilla (resumen).

5. **Examen de Patentabilidad** (Art 14 D486)

Como se mencionó en el numeral 3 de este documento, el capítulo reivindicatorio no contiene materia que pueda ser objeto de protección, sin embargo, el examen de patentabilidad que se muestra a continuación, se realiza con base en las características estructurales encontradas en la descripción.

Novedad (Art 16 D486)

La reivindicación 1 consiste en: *"El diseño del tapón que diseñamos, no permite que el usuario tenga contacto con la parte del tapón…"* (Ver páginas 4 y 5 incluida en el radicado bajo No. Rad. N° 12-152485-00002-0000).

Comparación de las características técnicas **esenciales**, con las del Estado de la Técnica:

Características esenciales	D1	D2
Tapón caracterizado por:	Tapón caracterizado por:	Tapón caracterizado por:
Cilindro móvil.	Elemento en forma de campana (11), que comprende un bloque (10) que interactúa con la ranura helicoidal (9), cuando la carcasa (5) es rotada, causando un movimiento axial de dicha campana (11). (Figs. 7 y 8, 11 y 12, Col. 5, líneas 17 y 23; Col. 6, líneas 22 y 25).	Elemento de boquilla (112) que comprende unos pines (120) que interactúan con las ranuras helicoidales (128), de tal manera que al momento de rotar la carcasa (114) con respecto al contenedor (100), el elemento (112) se levante (Figs. 13 a 16; Col. 8, líneas 27 a 35).
Tapa giratoria.	Carcasa (5) giratoria (Figs. 7 y 8, 11 y 12, Col. 5, líneas 17 y 23; Col. 6, líneas 22 y 25).	Carcasa (114) giratoria (Figs. 13 a 16; Col. 8, líneas 27 a 35).
Cuerpo del tapón.	Cuerpo de la carcasa (Figs. 7	Cuerpo de la carcasa (Figs. 13

1 https://www.google.com/patents/US5004127?dq=5004127&hl=en&sa=X&ei=w0PZUpyBEOHgsATQv4LwAg&sqi=2&pjf=1&ved=0CDcQ6AEwAA

2 https://www.google.com/patents/US5431305?pg=PA4&dq=5431305&hl=en&sa=X&ei=40PZUuPrOMnRsASdg4GwBw&ved=0CDcQ6AEwAA

	y 8, 11 y 12).	a 16; Col. 8, líneas 27 a 35).
Orificios de entrada y salida del cilindro móvil.	Elemento en forma de campana (11) con boca del dispensador (44), con abertura (44a) o abertura (52),receso (53), abertura (52a) y salida (54) (Col. 5, líneas 1 y 2).	El elemento de boquilla (112) tiene un pasaje axial (112a) que termina en una serie de pasajes radiales (112d) (Fig. 16; Col. 7, líneas 54 a 59)
Superficie en la cual se desplaza el cuerpo móvil.	Camisa (45) de la carcasa (5) donde se desliza el elemento cilíndrico (43a) de la campana (11) (Figs. 7 y 8, 11 y 12; Col. 4, líneas 64 a 68; Col. 5, líneas 1 a 5).	Superficie en la cual se desplaza el elemento de boquilla (112) (Figs. 13 a 16).
Superficie de contacto con el botellón.	Superficie de contacto con el contenedor (Figs. 7 y 8, 11 y 12).	Superficie de contacto con el contenedor (Figs. 13 a 16).
Superficie que limita el sello del cuerpo móvil.	Con la falda (40) del elemento (11), acoplada con parte (41) del asiento (8a) de la carcasa (5), se evitan las fugas de fluido (Fig. 7; Col. 5, líneas 11 a 16)	La aleta (118) interactúa con la cama (108) para bloquear el flujo del producto del contenedor (100) (Fig. 13; Col. 7, líneas 65 a 68).
Superficie inferior de ajuste entre el tapón y el botellón.	Superficie inferior de ajuste entre el tapón y el contenedor (Figs. 7 y 8, 11 y 12).	Superficie inferior de ajuste entre el tapón y el contenedor (Figs. 13 a 16).
Límite del cuerpo móvil para la posición abierto.	Límite del elemento en forma de campana (11) para la posición abierto (Figs. 7 y 8, 11 y 12).	Límite del elemento de boquilla (112) para la posición abierto (Figs. 13 a 16).

Las características **esenciales** del tapón dispensador de la reivindicación 1 habían sido divulgadas previamente en D1 y D2. En consecuencia, la reivindicación 1 no es nueva.

Por su parte, el hecho de que el tapón dispensador comprenda una superficie de contacto con el botellón, razón por la cual no comprende el liner, no puede dar novedad al producto reclamado, toda vez que los documentos antecedentes D1 y D2 comprenden una superficie de contacto con el botellón (D1: Figs. 7 y 8, 11 y 12; D2: Figs. 13 a 16). Adicionalmente, ninguno de los tapones divulgados comprende dicho liner.

A continuación, se muestran las figuras de los documentos antecedentes, con sus respectivas características señaladas:

Figura 7 del Documento D1

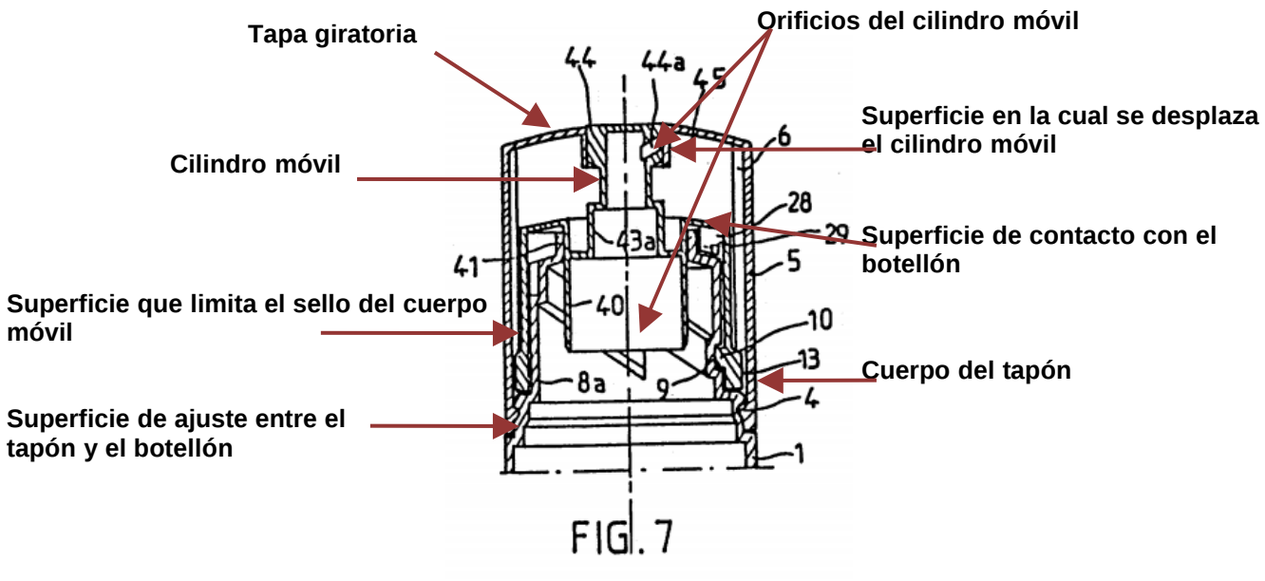
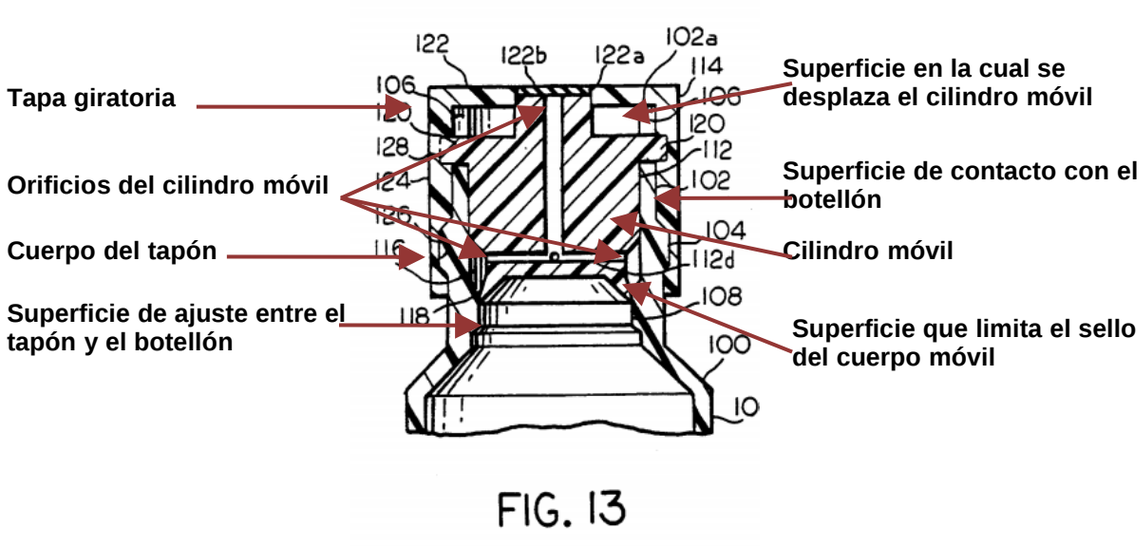


Figura 13 del Documento D2



6. Conclusión

Los requisitos de Patentabilidad de la presente Solicitud están afectados así:

Item	Documento	Reivindicaciones afectadas	Requisito que afecta
D1	US 5’004.127	1	Novedad
D2	US 5’431.305	1	Novedad

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 treinta (30) días contados a partir del día siguiente 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.

Se invita al solicitante se sirva indicar, si así lo considera, su renuncia al término faltante de treinta (30) días para dar respuesta a este requerimiento y presentarla por escrito.

Finalmente, se le recuerda al solicitante que si como respuesta a este requerimiento llegara a modificar el capítulo reivindicatorio y éste contenga más de diez (10) reivindicaciones, no pagará la tasa de modificación voluntaria pero sí la correspondiente al pago por reivindicación adicional.

Notifíquese el presente oficio conforme a lo dispuesto en el numeral 5.2, literal e), del capítulo quinto del título primero de la Circular Única No. 10 de 2001.

JESUS FERNEL GARCÍA GARCÍA
Director de Nuevas Creaciones (E)

El anterior requerimiento fue notificado por fijación en lista, de fecha 2014-02-11

Elaboró: Monica Andrea Gutierrez Almonacid
Revisó: Sonia Andrea Diaz Pirazan

United States Patent [19]

Morel

[11] **Patent Number: 5,004,127**

[45] **Date of Patent: Apr. 2, 1991**

[54] **CAP WITH A ROTATING CASING FOR FLASKS, TUBES AND SIMILAR CONTAINERS**

[76] Inventor: **Simone Morel**, 11 rue du Faubourg de Paris, 51210 Montmirail, Marne, France

[21] Appl. No.: **350,280**

[22] Filed: **May 10, 1989**

[30] **Foreign Application Priority Data**

May 11, 1988 [FR] France 88 06381
Mar. 17, 1989 [FR] France 89 03544

[51] **Int. Cl.**[5] **B67D 5/32**

[52] **U.S. Cl.** **222/521**; 222/83; 222/91; 222/505; 222/531

[58] **Field of Search** 222/505, 509, 519-526, 222/531, 532, 537, 548, 549, 555, 83, 91

[56] **References Cited**

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2,711,271	6/1955	Schlicksupp	222/521 X
2,769,582	11/1956	Schlicksupp	222/521 X
3,372,833	3/1968	Baranne	222/525 X
4,314,656	2/1982	Kessler	222/525 X
4,380,310	4/1983	Schneiter et al.	222/525 X
4,383,623	5/1983	Page, III	222/525 X
4,469,249	9/1984	Malpas et al.	222/83
4,690,304	9/1987	Morel	222/520 X
4,779,764	10/1988	Debetencourt	222/521 X
4,805,807	2/1989	Perne et al.	222/521 X

FOREIGN PATENT DOCUMENTS

209483	7/1940	Switzerland	222/524

Primary Examiner—Kevin P. Shaver
Attorney, Agent, or Firm—Browdy And Neimark

[57] **ABSTRACT**

The cap comprises a casing rotatively mounted on a container with a groove being provided to prevent said casing from axially sliding. The casing is connected slidably to a bell which is itself connected by a helicoidal thread to a sheath mounted on the container. The bell is provided with a neck having a wall bordering an opening for containing a stopper connected to the container.

15 Claims, 5 Drawing Sheets

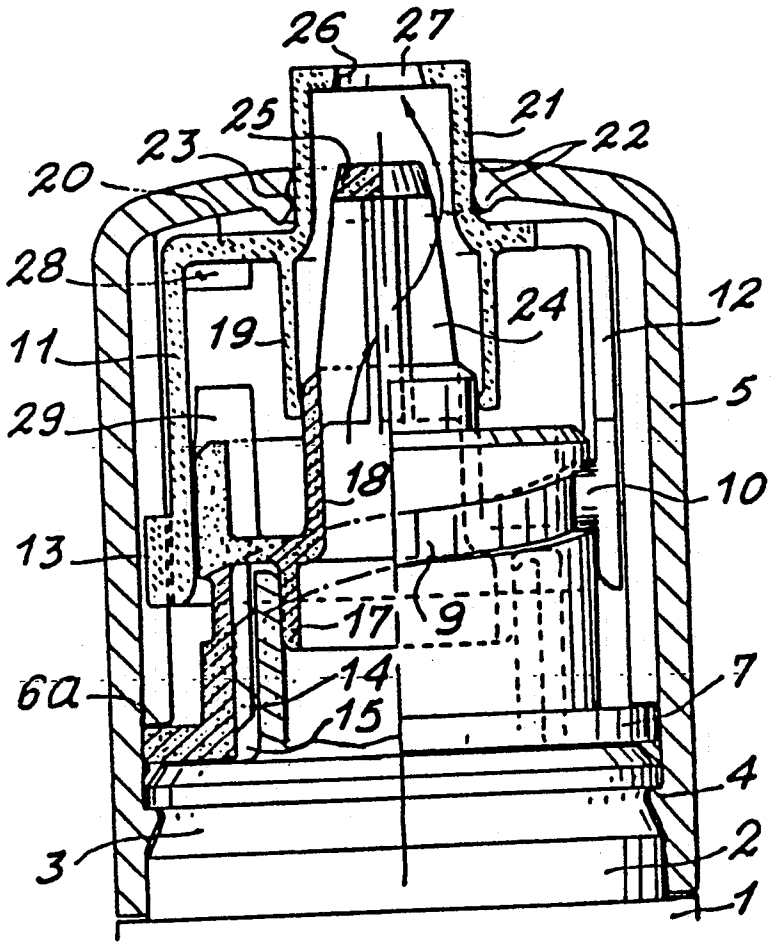

FIG. 1

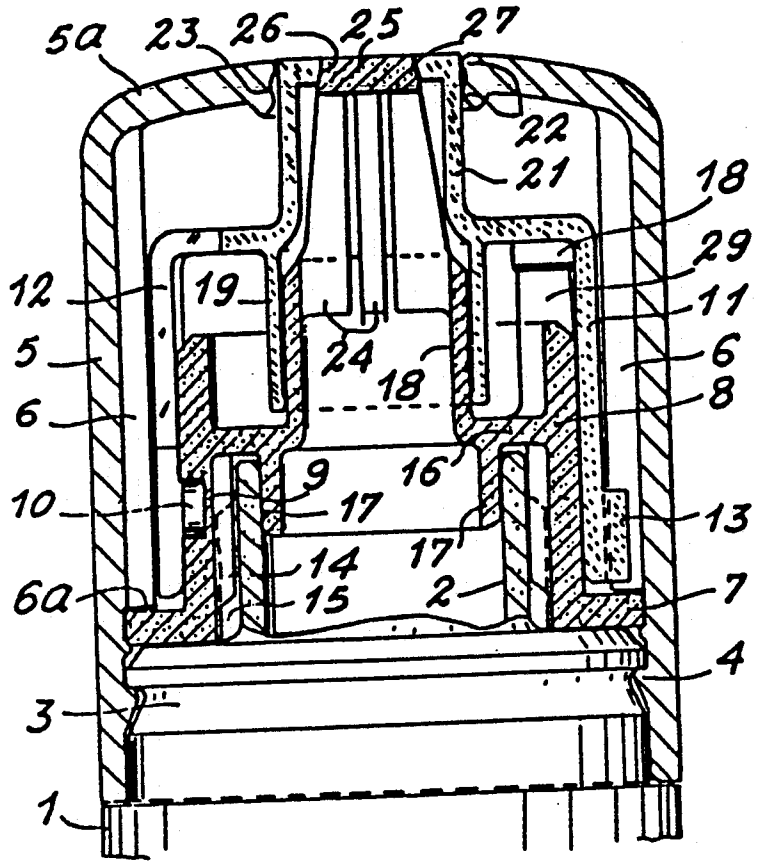
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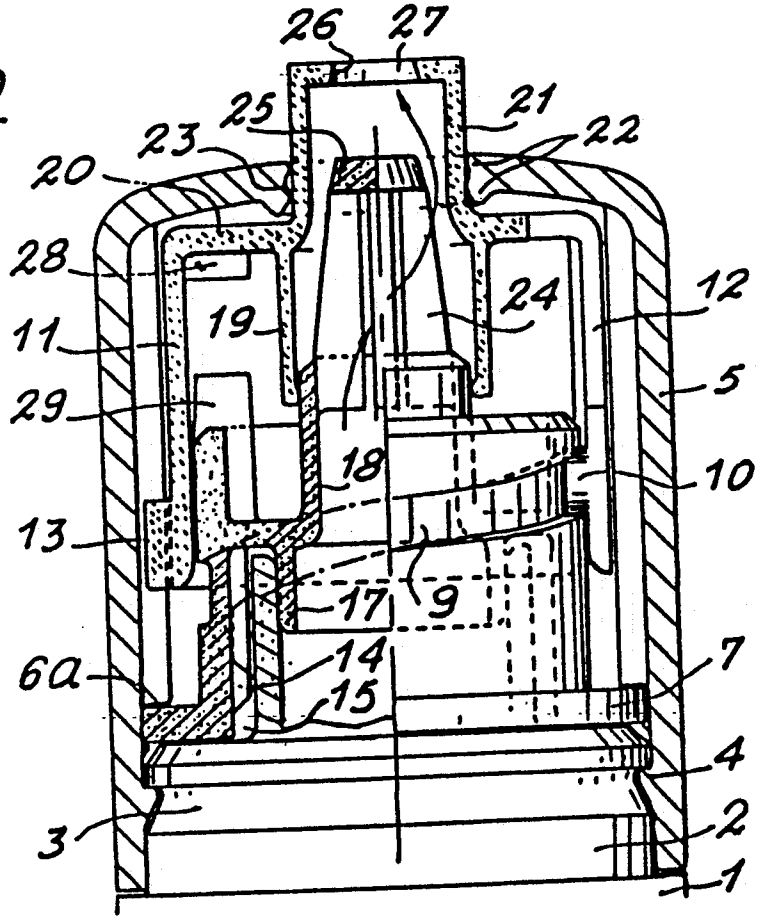
FIG. 2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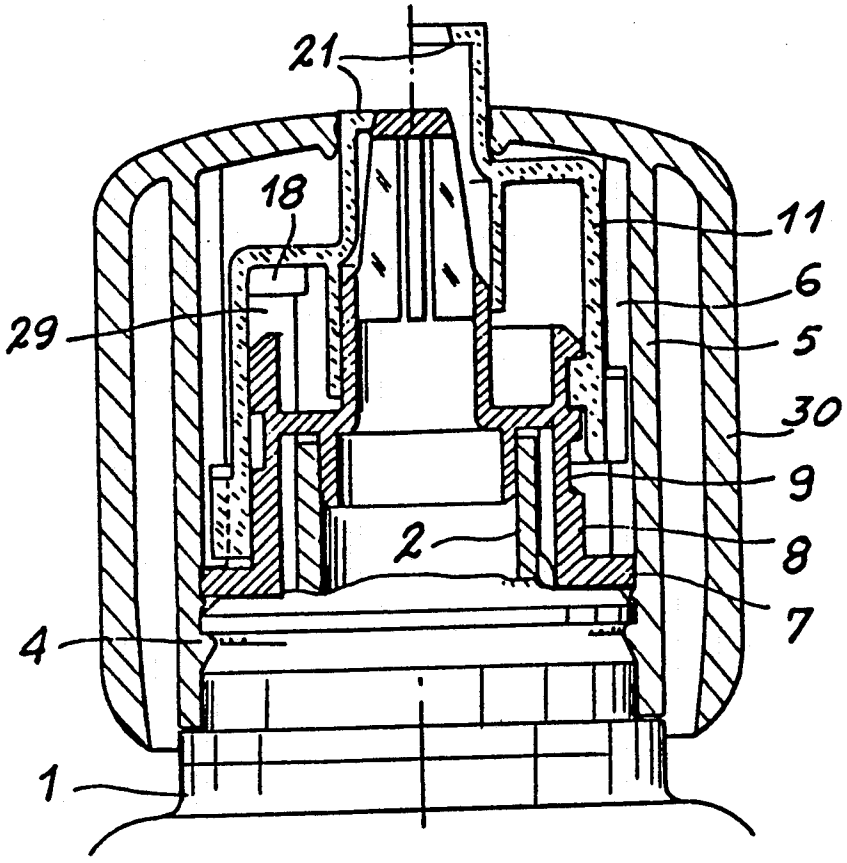


FIG. 3

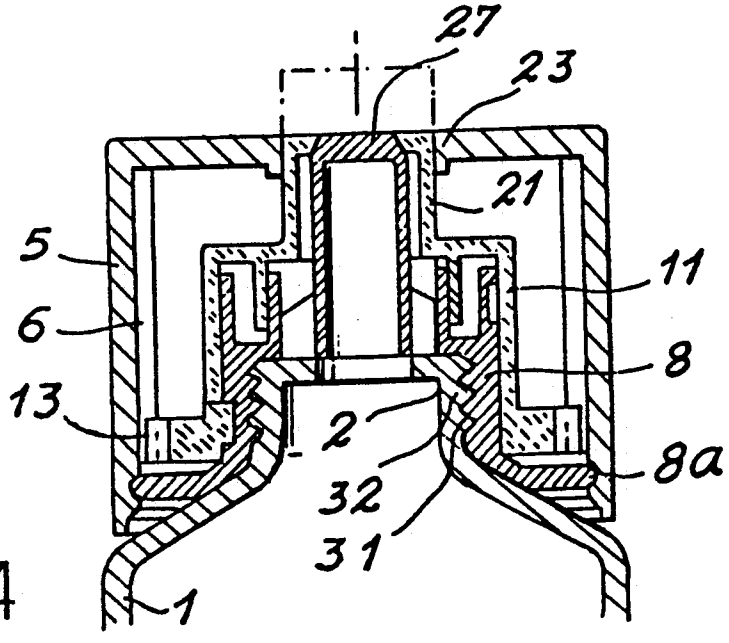
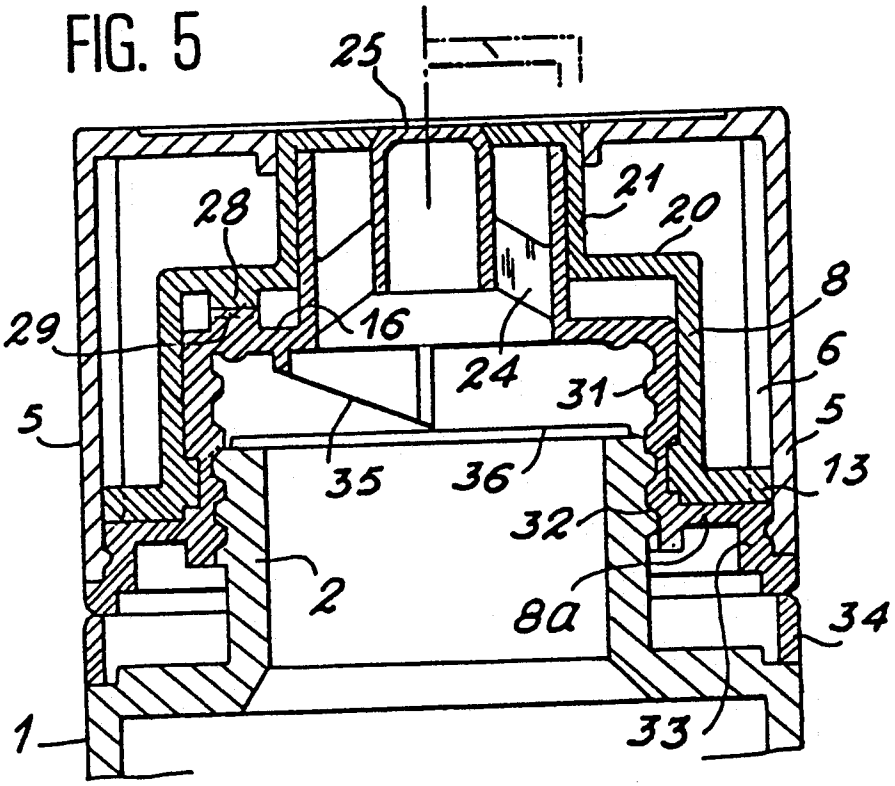


FIG. 4

FIG. 5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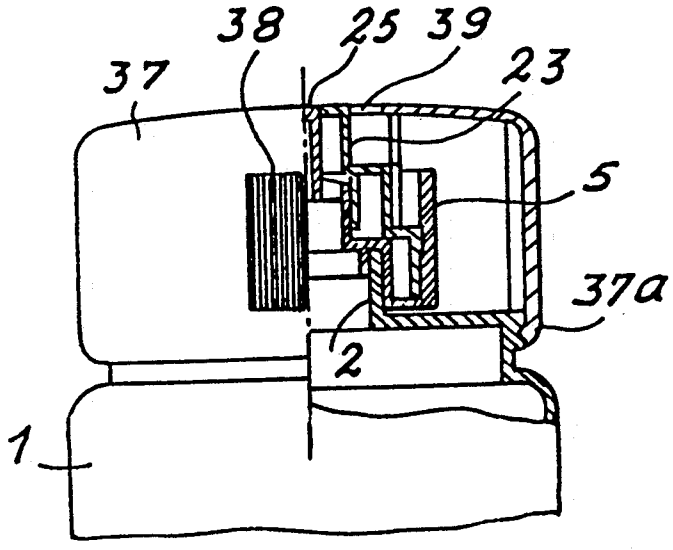
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FIG. 6

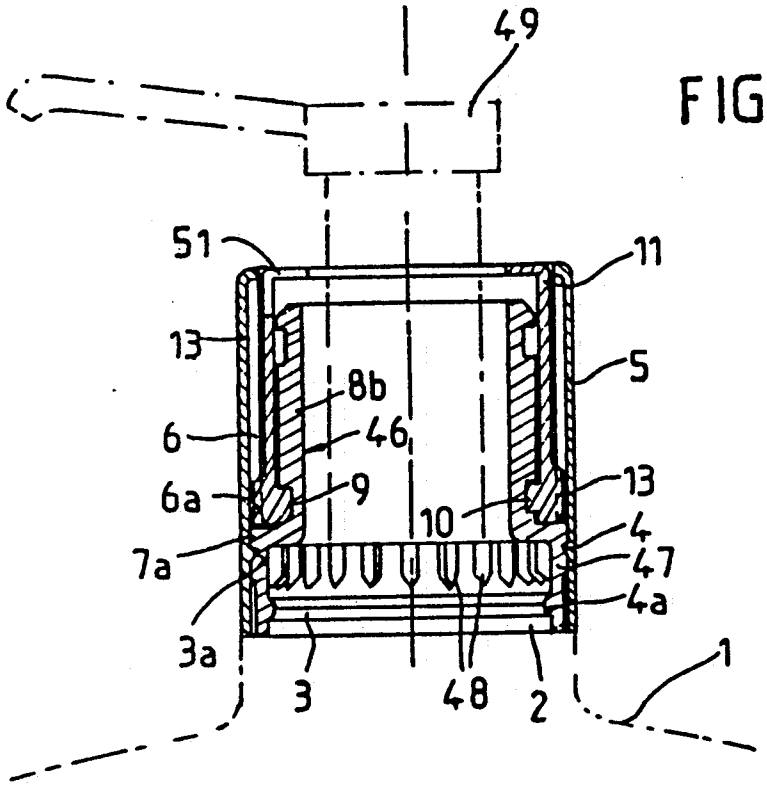

FIG. 9

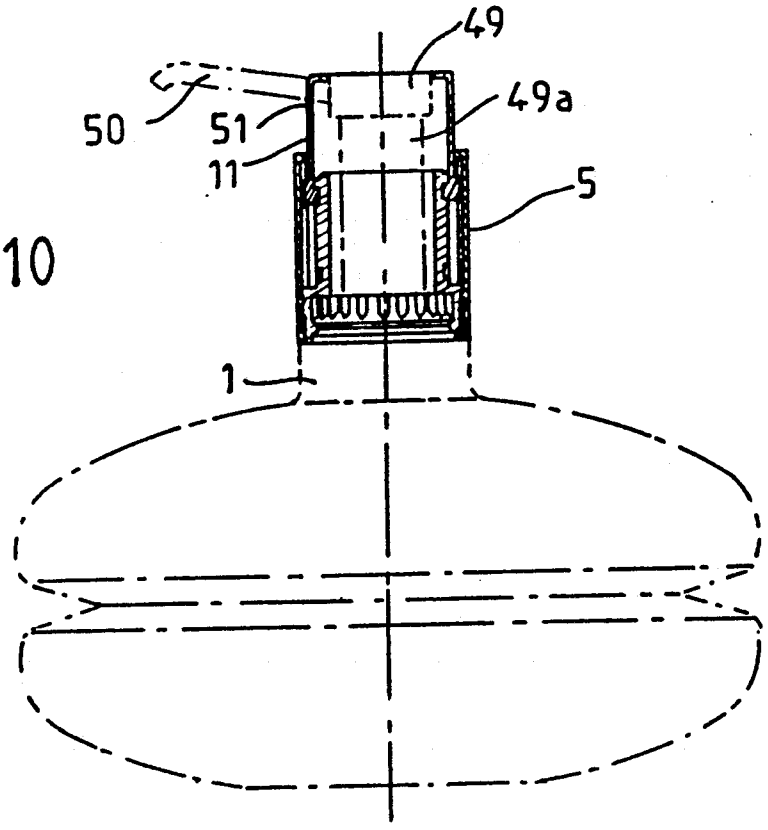

FIG. 10

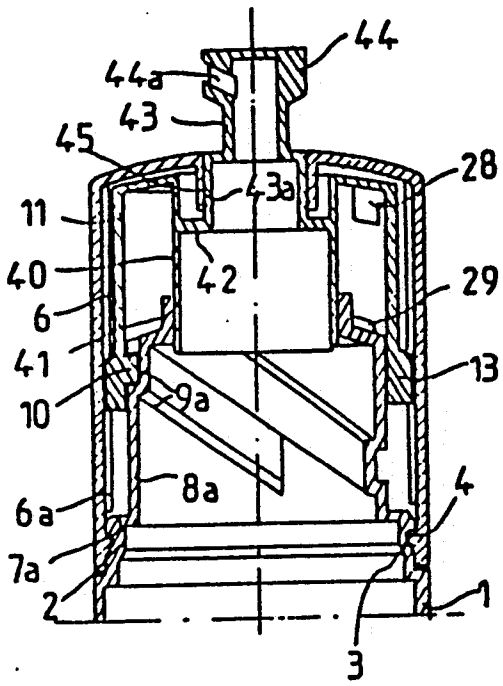

FIG. 8

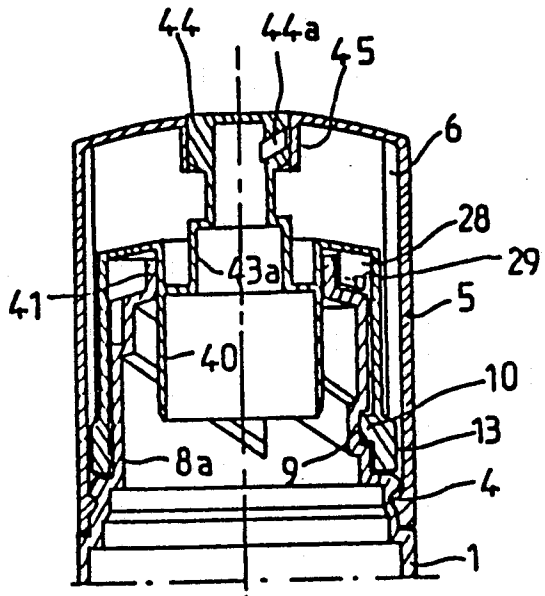

FIG. 7

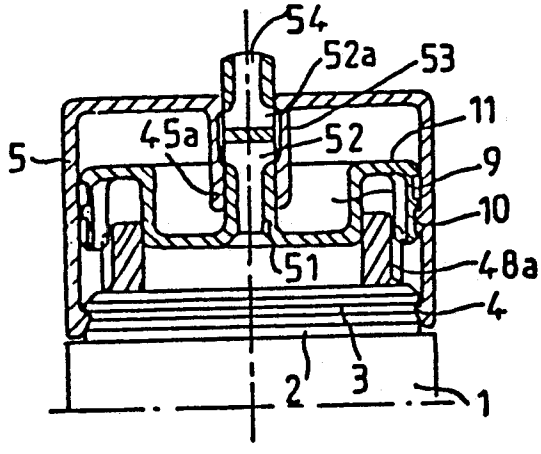

FIG. 12

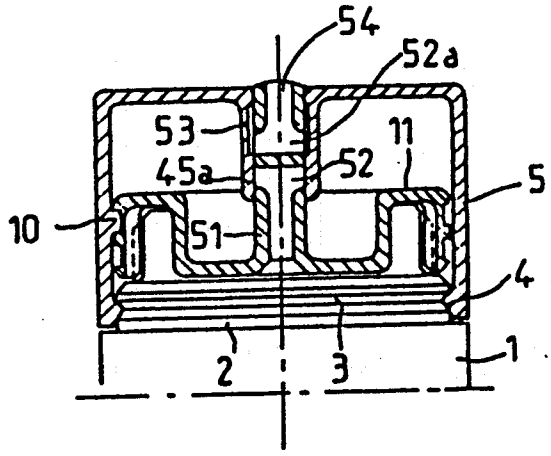

FIG. 11

CAP WITH A ROTATING CASING FOR FLASKS, TUBES AND SIMILAR CONTAINERS

BACKGROUND AND SUMMARY OF THE INVENTION

The present invention concerns caps for the closing of various containers such as flasks and tubes.

In particular, the invention applies to the caps which are permanently mounted on the container so as to allow an opening and closing of the container by simply rotating the external part of the cap.

The cap of the invention has for its purpose to ensure that the cap internally forms a continuous conduit for the flowing of a fluid contained in the container, and this both the cap is applies to both in the closing position and in the opening position, for which opening position it may form a pouring element.

Moreover, the purpose of the invention is to ensure that the conduit delimited inside the cap, and whose length varies between the closing and the opening position, is always fully fluid tight and, in order to achieve this result, the invention starts with the surprising discovery that it is necessary, upon each opening and closing movement of the cap, to wipe dry some parts of the conduit which slide with respect to one other. Therefore the contents of the cap cannot accidentally flow out or be made in contact with the atmosphere.

Moreover, in order to provide a proper wiping dry of the parts of the conduit, it has been observed that it is not sufficient that these parts are displaced axially with respect to one other as this tends to form streaks, whereas a more effective wiping dry is obtained when the parts of the conduit having to be moved with respect to one another follow a helicoidal movement.

The invention further allows for an implementation of various types of stoppers which can ensure a controlled flowing of the product contained in the flask or tube or even a spraying and an atomization of this product, the cap ensuring always a fully effective closing of the flask or tube and, whenever applicable, preventing an activation of a spraying or atomizing stopper.

In accordance with the invention, the cap with a rotating casing for flasks and similar containers is characterized in that the casing is rotatively mounted on the flask, means being provided to prevent the casing from sliding axially, and the casing being connected by sliding means to a bell shaped member, which bell shaped member is itself connected by helicoidal means either to a sheath or to the neck of a flask, this bell shaped member being provided with a neck having a wall bordering an opening so as to contain a fixed stopper connected to the container.

Various further features of the invention will moreover be revealed from the following detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

By way of examples in no way restrictive, some embodiments of the invention are represented with reference to the accompanying drawings, in which:

FIG. 1 is an elevation cross section of the rotating casing cap of the invention;

FIG. 2 is a half cross section, partly in elevation corresponding to FIG. 1, but showing a characteristic position of the elements of the cap;

FIG. 3 shows two half cross sections of a variant of the cap;

FIG. 4 is an elevation cross section showing another variant of the cap;

FIG. 5 is an elevation cross section of a further variant;

FIG. 6 is an elevation, partly in cross section, showing one additional characteristic;

FIG. 7 is an elevation cross section of the cap showing another embodiment;

FIG. 8 is a cross section similar to FIG. 7 showing a characteristic position of the cap;

FIG. 9 is a cross section similar to FIG. 7 of a modification;

FIG. 10 is a cross section similar to FIG. 9 showing one characteristic position;

FIG. 11 is a cross section of a variant of embodiment;

FIG. 12 is a cross section similar to FIG. 11 showing one characteristic position.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The cap of the invention is intended to be mounted on a flask **1** or other container which comprises a neck **2** having a groove **3** for a retainer ring **4** of a casing **5** thus able to rotate with respect to the flask **1** but without being able to move axially.

The casing **5** is provided with internal axial ribs **6** whose base **6***a* supports a collar **7** formed at a foot of a sheath **8** having a helicoidal rib **9** inside its external wall.

The helicoidal rib **9** serves to house a block **10** formed inside a bell shaped member **11** preferably near a slot **12** of the bell shaped member **11**, the lower part of which therefore is flexible. The wall of the bell shaped member **11** has at least one key **13** housed between two ribs **6** of the casing **5**, so that the bell shaped member **11** is integrally rotated with the casing **5**.

It can be seen from the above disclosure that, by making the casing **5** to rotate, it results in the bell shaped member **11** rotating, and therefore the block **10** will move inside the helicoidal rib **9**, which causes a raising or a lowering of the bell shaped member **9** according to the rotation direction of the casing **5**.

To prevent rotation of the sheath **8**, means are provided which may be constituted by ribs **14** and grooves **15** formed respectively from the internal wall of the sheath **8** and the outer wall of the neck **2**.

It is also possible that the sheath **8** is merely forcingly engaged onto the neck **2**, or even that the collar **7** is sufficiently tightened onto the neck **2** so that the sheath **8** cannot rotate to any significant extent. Finally, the sheath **8** can be screwed onto the neck **2**.

The drawings show that the sheath **8** forms an internal shoulder **16** from which a lower ring **17** and an upper ring **18** are respectively formed. The lower ring **17** is pushed against the internal wall of the neck **2** and consequently ensures a fluid tightness with the neck **2**. The upper ring **18** is, for its part, pushed against a skirt **19** formed inside the bell shaped member **11** from the upper part **20** of the bell shaped member **11**.

The skirt **19** is extended upwards by a neck **21** which is guided inside a labyrinth gasket **22** formed by bordering an opening **23** formed in this upper part **5***a*.

The upper ring **18** of the sheath **8** is provided with lamellas **24**, radial lamellas for example, forming a support for a stopper **25**, preferably of a conical shape, intended to cooperate with a complementary wall **26** forming an opening **27** at top of the neck **21**.

As explained above, when the casing **5** is rotatively driven whilst the various elements previously described are in the position illustrated in FIG. **1**, the block **10** is rotated and consequently follows the helicoidal groove **9**, which causes the bell shaped member **11** to raise and, consequently, the neck **21** of the bell shaped member **11** will slide between the gaskets **22** which ensures a fluid tightness with its external wall, so that the cap is then in the position illustrated in FIG. **2**.

FIG. **2** shows that the stopper **25**, which is fixed, is then separated from the wall **26** of the opening **27** so that a continuous passage is created from the inside of the flask **1** to the opening **27**.

The drawings also clearly show that the passage formed from the inside of the container is a passage having a fluid tight wall. Actually, the lower ring **17** ensures a fluid tightness with the neck **2**, the upper ring **18** ensures a fluid tightness with the skirt **19**, and the neck **21** extends to the opening **27**.

Thus, the fluid contained within the flask **1** cannot spread inside the cap, which prevents it from being soiled and similarly prevents leaks to occur when the fluid is poured through the opening **27**.

To ensure closing, the casing **5** is rotated in a direction opposite to that corresponding to the opening until the moment when the wall **26** of the neck **21** is applied against the stopper **25**. During this movement, the skirt **19** slides on the wall of the upper ring **18**, so that a fluid tightness is always provided.

To avoid an accidental opening, it is advantageous that a stop **28** is formed from the internal wall of the upper part **20** of the bell shaped member **11** and that a flexible tongue **29** is formed from the sheath **8**.

FIG. **1** shows in this respect that in the closing position of the cap, the stop **28** rests against the tongue **29**, thus creating a brake preventing opening, since a sufficient effort must be exerted on the casing **5** to cause it to rotate by elastically deforming the tongue **29** at the start of rotation of the casing **5**. Although not positively shown, the sheath **8** can obviously be directly formed by an extension of the neck **2** of the flask **1**, the skirt **19** of the bell shaped member **11** then taking support on the internal wall of an extension of the neck **2** so as to ensure fluid tightness when the bell shaped member **11** moves.

The embodiment as described above provides for low cost production by means of thermoplastic resin injection molding. Actually, the casing **5**, the bell shaped member **11** and the sheath **8**, whenever the sheath **8** is separate from the neck **2**, constitute three parts which can be easily produced by injection molding technique.

As regards mounting of the cap, this is very simple and can be mechanically embodied. Actually, the sheath **8**, whenever there is such a sheath **8**, is only engaged on the neck **2**, the bell shaped member **11** is itself engaged on the sheath **8**, the block **10** being engaged into the helicoidal groove **9** by elastic deformation caused by the presence of the slot **12**, and finally the casing **5** is itself engaged onto the bell shaped member **11**, the retainer ring **4** being snapped by elastic deformation into the groove **3**.

In FIGS. **3-6**, the same reference numerals designate the same elements as in FIGS. **1-2**.

In FIG. **3**, the casing **5** of the cap of the invention is made by a part provided with an external mantle **30** having an external form which advantageously corresponds to that of the flask **1** or other container. The control of the cap is ensured by manually causing a rotation of the mantle **30** whose rotative movement is transmitted to the casing **5** and, by means of the casing **5**, to the other elements described above.

In FIG. **4**, the casing **5** of the cap of the invention is connected to the neck **2** of the flask **1** by means of a sheath **8** having a base which forms a disk **8***a* on which the casing **5** is snapped.

In this embodiment, the sheath **8** comprises an internal screw thread **31** enabling for the sheath **8** to be screwed onto a corresponding threading **32** of the neck **2**. The other parts of the cap are embodied similarly as described in reference with FIGS. **1** and **2**. This embodiment provides for the cap to be possibly mounted and dismounted, since it is possible to screw and unscrew the sheath **8**.

FIG. **5** illustrates a development of the embodiment of FIG. **4**, in which the sheath **8** supports the casing **5** by means of a ring **33** extending the disk **8***a*.

Also and as shown in FIG. **4**, the sheath **8** comprises an internal screw thread **31** intended for screwing the sheath **8** onto a threading **32** of the neck **2** of the flask **1**.

The ring **33** is extended by a rupture ring **34** forming at the same time an inviolability device and a brace between the cap and the flask **1**.

In addition to the above description, the cap of FIG. **5** comprises, underneath the internal shoulder **16** of the sheath **8**, a blade-shaped perforating device **35**, which is placed over a film **36** sealing the neck of the flask **1**.

In order to have access to the product contained in the flask **1**, the rupture ring **34** is removed, then the cap is screwed by acting on its casing **5** until the internal shoulder **16** of the sheath **8** comes to rest on the top part of the neck **2**. During this movement, the perforating device **35** breaks the film **36**. The cap is then ready to be used in the same way as previously described.

FIG. **6** illustrates a developing stage of the invention, wherein the casing **5** of one of the embodiments of the cap of the above-mentioned figures is covered by a cover **37** directly fixed by its base **37***a* to the flask **1**, via snapping means for example. The cover **37** comprises at least one aperture **38**, preferably two apertures, giving access to the casing **5** whose peripheral surface is advantageously knurled or otherwise rendered rough. The cover **37** forms on its top part a hole **39** for the passage of the neck **21** when the neck **21** is lifted when the casing **38** is moved as previously described.

It should be noted that the top part of the neck **21** can be provided to have several openings such as the opening **27** of the preceding figures each of which openings corresponding to a stopper **25** but, in this case, the various stoppers **25** are made of a flexible material so that they can be elastically deformed during the helicoidal movement causing opening and closing of these stoppers required for each opening **27**. The above-mentioned sheath **8** can further be directly formed by the neck **2** of a tube or other bottom-filled container.

In FIGS. **7-10**, the casing **5** is provided with internal axial ribs **6** having a base **6***a* resting on a collar **7***a* formed by the neck **2** which forms, above the collar **7***a*, a sheath **8***a* having in its wall a helicoidal groove **9**. Therefore, the sheath **8***a* is formed by an extension of the neck **2** of the flask **1**.

The groove **9** houses at least one block **10** formed inside a bell shaped member **11**.

In the embodiment of FIGS. **7** and **8**, the bell shaped member **11** internally forms a skirt **40** which is engaged with a slight friction in a cylindrical contracted part **41** of the sheath **8***a*. Furthermore, the skirt **40** is connected by means of a ring **42** to a stopper forming a spout

joining piece 43 with a lateral spout mouth 44 whose opening is shown at 44a.

The stopper forming the spout joining piece 43 on a part of its height a cylindrical element 43a of slidable inside a sleeve 45 of the casing 5.

As shown in FIG. 7, in the rest position, the block 10 is placed at the base of the helicoidal groove 9 and, consequent)y, the lateral spout mouth 44 of the stopper forming the spout joining piece 43 is placed inside the sleeve 45, thus ensuring closing.

With the skirt 40 being engaged in the cylindrical contracted part 41 of the sheath 8a, this 5 ensures a fluid tightness with the sheath 8a so that the product contained inside the flask 1 can neither leak nor soil the inside of the bell shaped member 11, nor the inside of the casing 5.

By making the casing 5 to rotate with respect to the flask 1, the internal axial ribs 6 of the casing 5 drive at least one key 13 which is outside on the bell shaped member 11 which is thus rotatively driven. This results in the block 11 circulating in the helicoidal groove 9 of the sheath 8a by causing the axial movement of the bell as far as the position shown in FIG. 8 is obtained. The stopper forming the lateral spout mouth 44 is then in the operative position, and so that the product contained inside the flask 1 can flow.

It is advantageous that the bell shaped member 11 is internally provided with a flexible stop 28 and that the sheath 8a comprises a tongue 29, the stop 28 and the tongue 29 cooperating together in the closing position as illustrated in FIG. 7, thus avoiding an ill-timed functioning of the cap by the locking so made.

In the above-mentioned description, the sheath 8a is shown as being formed by an extension of the neck 2. It is however possible to bring the sheath 8a onto the upper part of the neck 2, to make the sheath 8a in the form of an independent part and as in the embodiment of FIGS. 1–6.

According to the modification of FIGS. 9 and 10, a sheath 8b has a smooth internal wall 46, the helicoidal groove 9 being formed in the thickness of the sheath 8b.

At its base, the sheath 8b forms a sleeve 47 having an internal wall which forms a retainer ring 4a entering the groove 3 of the neck 2. Moreover, the sleeve 47 forms ribs and grooves 48 cooperating with the corresponding ribs and grooves of the neck 2 so that the sheath 8b is rigidly connected to the neck 2 without being able to either rotate or slide axially

The sleeve 47 has also a groove 3a for the retainer ring 4 of the casing 5.

It is also obviously possible to make the sheath 8b from the neck 2 in a same manner as that illustrated in FIGS. 7 and 8.

Also, in FIGS. 9 and 10 and as represented in FIGS. 7 and 8, the sheath 8b is surrounded by a bell shaped member 11 whose upward and downward movements are provided in the same manner as described above with reference to FIGS. 7 and 8. Thus the bell shaped member 11 is rotatively driven when the casing 5 is itself rotated, the rotative movement being transmitted to the bell shaped member 11 by the key or keys 13 engaged with the internal axial ribs 6.

In the illustrated embodiment, the bell shaped member 11 is open at its top to give access to a stopper constituted by the head 49 of a pump or a valve fixed inside the neck 2 of the flask 1 by any means known in the art so as to allow for spraying or atomization of a liquid product contained inside the flask which possibly contains a propulsive gas when the head 49 is intended to activate a valve.

As shown in FIG. 10, when the head 49 forming the stopper is fitted with a nozzle 50, a notch 51 may be provided in the lateral wall of the bell shaped member 11.

As illustrated in the drawing, when the pump or valve controlled by the head 49 is not to be activated, the casing 5 is rotated so that the bell shaped member 11 is found in the upper position (FIG. 10) and it is not possible to significantly move the head 49. On the contrary, when the pump or valve has to be activated by the head 49, the casing 5 is firstly made to rotate so as to lower the bell shaped member 11 until the position shown in FIG. 9 is reached.

FIGS. 11 and 12 illustrate a simplified embodiment in which the casing 5 directly forms the block(s), 10 whereas the helicoidal groove 9 is formed by the bell shaped member 11 which internally has notches and grooves 48 in contact with notches and grooves 48a of the neck 2.

In the embodiment of FIGS. 11 and 12 by making the casing 5 to rotate, this causes a lifting and a lowering, respectively, of the casing 11 which is axially guided by the notches and grooves 48, 48a.

The bell shaped member 11 can be made in accordance with one of the embodiments previously described, or it may comprise a stopper constituted by a hollow core 51 with a lateral aperture 52 able to be sealed off by the base of sleeve 45a formed by the casing 5, which sleeve 45a has a in its wall a recess 53 opposite which can be brought shown in FIG. 12.

The above description shows that in the position illustrated in FIG. 11, the base of the sleeve 45a seals off the aperture 52 of the stopper, which avoids any flow of the product contained in the flask 1, whereas in the position shown in FIG. 12 a flow of the product is possible, the product passing through the aperture 52, the recess 53 and the aperture 52a in order to escape through the opening 54.

The invention is not limited to the embodiments shown and described in detail, since various modifications thereof may be carried out thereto without departing from the scope of the invention. In particular, the hollow core 51 can comprise, as shown in FIGS. 7–8, a lateral flow by-channel instead of the opening 54.

What is claimed is:

1. A cap for a neck of a container, said cap comprising a casing having a dispensing aperture, means for rotatably mounting said casing to said neck and for preventing axially longitudinal movement of said casing relative to said neck, a bell shaped member between said casing and said neck, said bell shaped member having an open position and a closed position, means of said bell shaped member and said casing for slidably connecting said bell shaped member to said casing, a sheath connected to said neck at one end and terminated by a stopper at the other end, helicoidal guiding means of said bell shaped member and said sheath for connecting said bell shaped member to said sheath, said bell shaped member having a neck part slidably disposed within said aperture upon rotation of said casing, and said neck part having an opening which is closed by said stopper when said bell is in said closed position.

2. A cap according to claim 1, wherein the bell shaped member further includes a tubular skirt below said neck part in slidable contact with a conduit of said sheath during movement of the bell shaped member

caused by rotation of the casing.

3. A cap according to claim 2, wherein the sheath includes a lower ring engaged within the neck of the container and an upper ring and said upper ring being said conduit in sliding contact with the skirt of the bell shaped member.

4. A cap according to claim 3, wherein the stopper is carried by lamellas extending from the upper ring of the sheath.

5. A cap according to claim 1, wherein the helicoidal guiding means (10) shaped member comprises at least one block formed by the bell shaped member and engaged in a helicoidal groove of said sheath.

6. A cap according to claim 5, wherein the sheath is fixed with respect to the neck.

7. A cap according to claim 1, wherein the sheath comprises a collar connected to the container neck by means of ribs formed inside the casing.

8. A cap according to claim 1, wherein the sheath is non-rotatably connected to the container by means of ribs and grooves.

9. A cap according to claim 1, wherein the bell shaped member is laterally provided with at least one slot.

10. A cap according to claim 1, wherein at least one locking stop is formed inside the bell shaped member so as to cooperate with a flexible lamella of the sheath for rotatively blocked the casing when said casing is rotated to said closed position of the bell shaped member.

11. A cap according to claim 1, wherein the neck of the bell shaped member is slidably sealed in said aperture of the casing by seal formations of said casing.

12. A cap according to claim 1, wherein the casing has a shape corresponding to the shape of the container.

13. A cap according to claim 1, wherein said means for rotatably mounting the casing comprises a disk of the sheath, said sheath having an internal thread screwed onto a threads of the container.

14. A cap according to claim 13, wherein the disk (8*a*) of the sheath is extended by a ring over which the casing is rotatively mounted, said ring being extended by a rupture ring forming a brace between the cap and the container.

15. A cap according to claim 14, wherein a perforating element is provided on the sheath said perforating element extending over a closing film of the neck of the container as long as the rupture ring is not removed and as long as the sheath is not thoroughly screwed on the threads of said container.

* * * * *

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United States Patent [19]

Kaminski

[11] Patent Number: 5,431,305

[45] Date of Patent: Jul. 11, 1995

[54] **TAMPER EVIDENT LIQUID DISPENSING PACKAGE**

[75] Inventor: **Ronald S. Kaminski**, Bowling Green, Ohio

[73] Assignee: **Owens-Illinois Plastic Products Inc.**, Toledo, Ohio

[21] Appl. No.: **228,049**

[22] Filed: **Apr. 15, 1994**

[51] **Int. Cl.**[6] **B67D 1/16**

[52] **U.S. Cl.** **222/109**; 222/153.06; 222/507; 222/521; 222/524; 222/525; 222/541.6; 222/549

[58] **Field of Search** 222/109, 153, 212, 503, 222/507, 519, 520, 521, 522, 523, 524, 525, 541, 549

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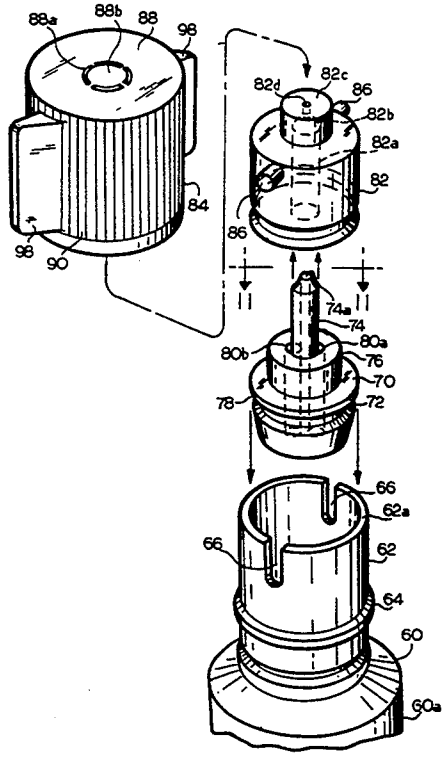
Primary Examiner—Andres Kashnikow
Assistant Examiner—Joseph A. Kaufman

[57] **ABSTRACT**

A liquid dispensing package includes a container whose finish has an opposed pair of slots extending vertically from a free end thereof. A nozzle element with a dispensing passage extending therethrough is positioned within the finish and has an opposed pair of pins which extend into and through the slots of the finish to permit the nozzle element to translate, but not rotate, with respect to the finish, the translation being between a sealed, non-dispensing position and an unsealed, dispensing position. A cap element is rotatably affixed to the finish and has an opening in a top central panel which is aligned with the dispensing passage of the nozzle element. A skirt of the cap element has part helical grooves on its inside surface, and these grooves receive the free ends of the pins of the nozzle element. Thus, rotation of the cap element results in translation of the nozzle element. The opening of the central panel of the cap element has a frangible portion which is ruptured by contact with a boss at a free end of the nozzle element upon the first opening or attempted opening of the package to provide the package with tamper evident opening characteristics.

15 Claims, 6 Drawing Sheets



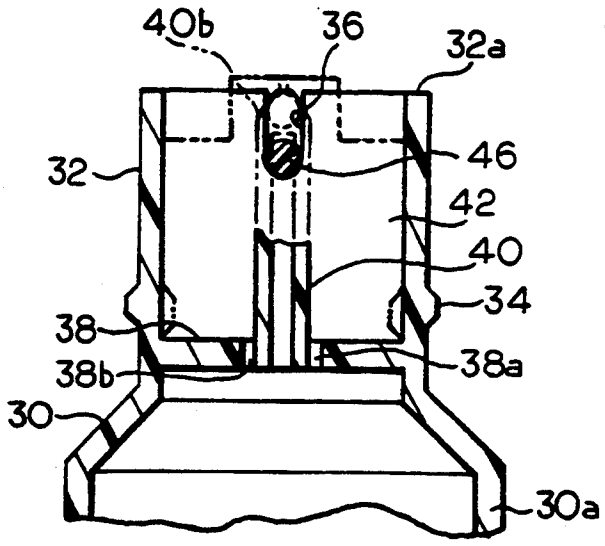


FIG. 1

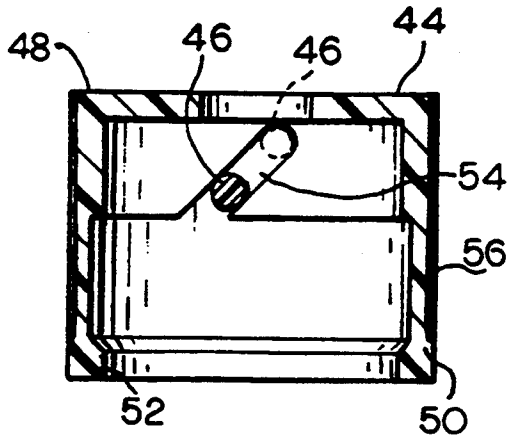


FIG. 2

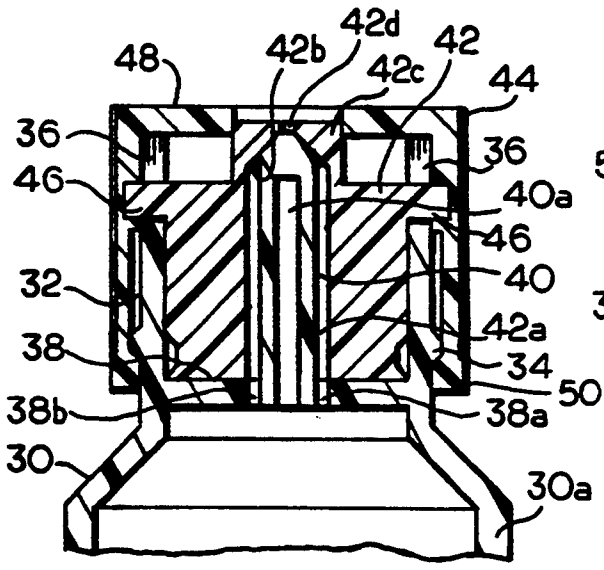


FIG. 3

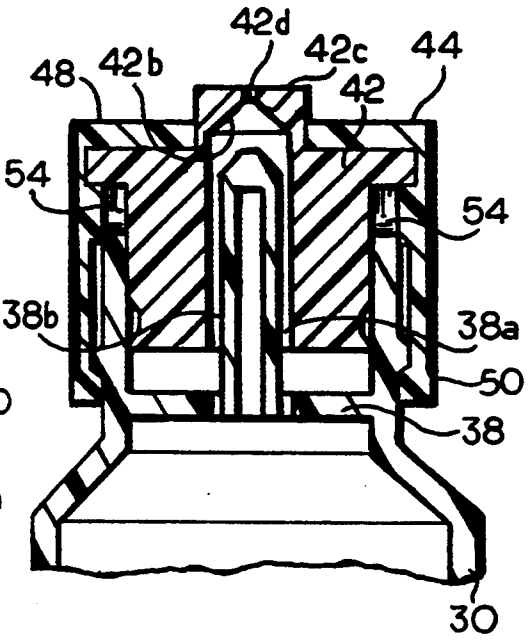
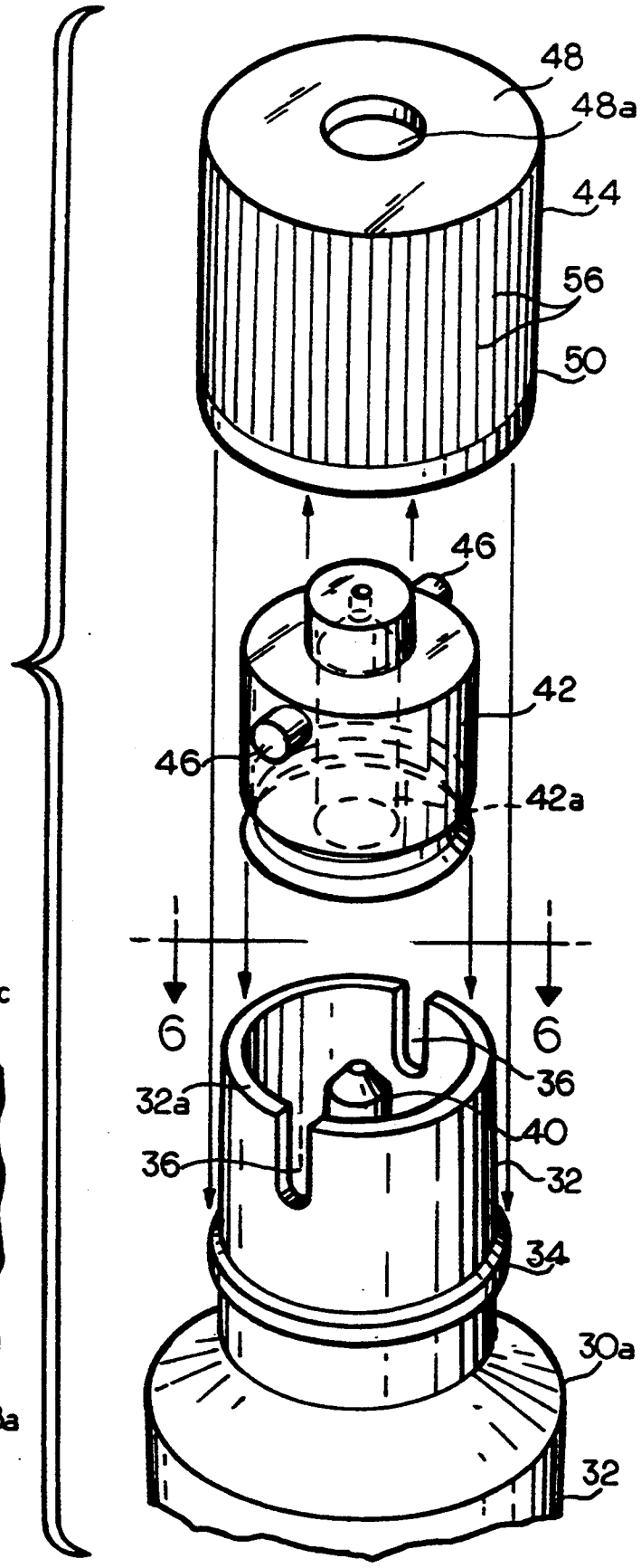


FIG. 4


48
48a
44
56
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46
42
46
42a
6
6
36
32a
40
36
32
34
30a
32

FIG. 5

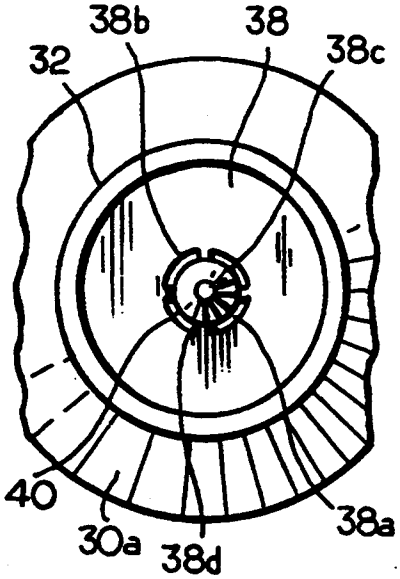

38b
38
38c
32
40
30a
38d
38a

FIG. 6

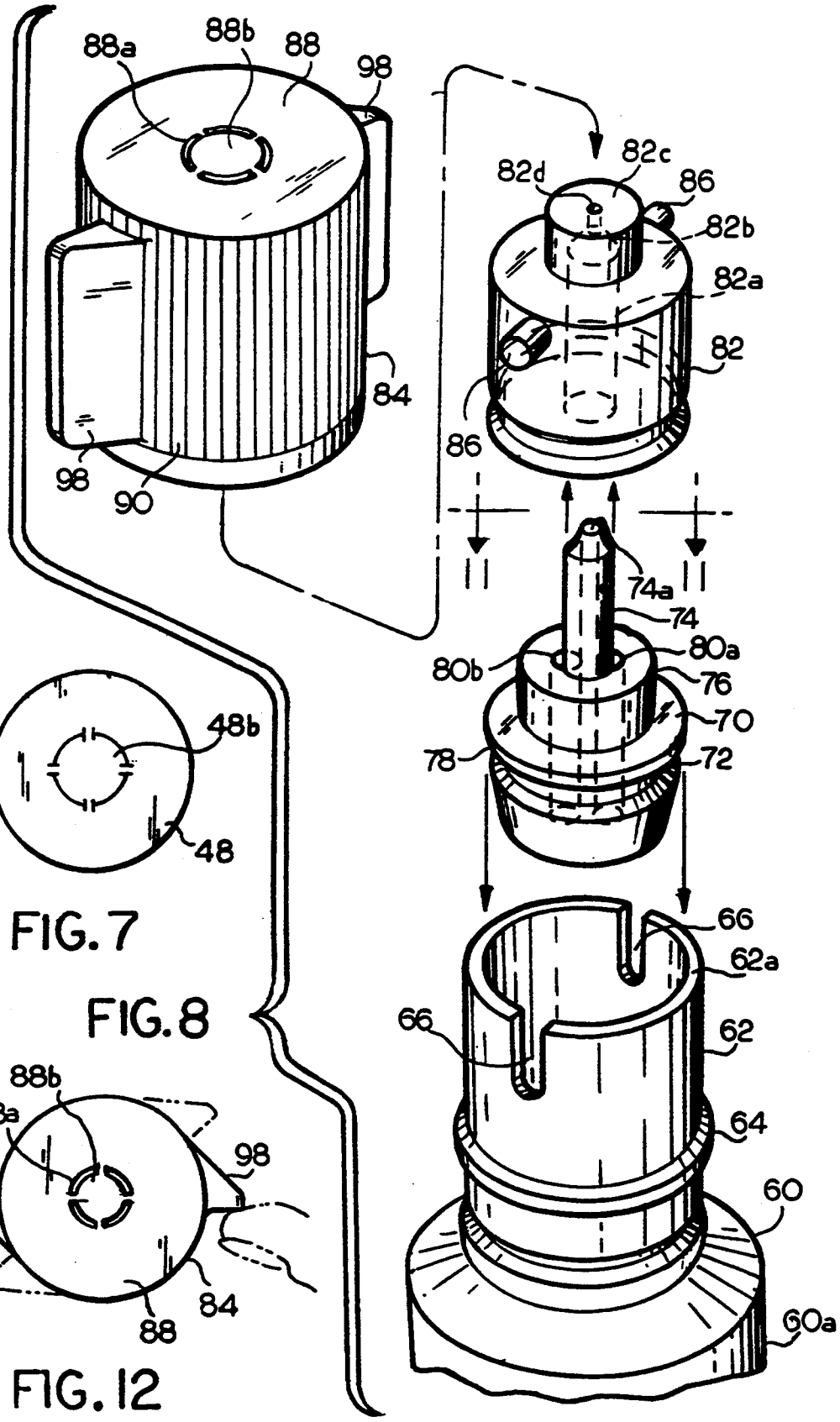


FIG. 8

FIG. 7

FIG. 12

FIG. 9

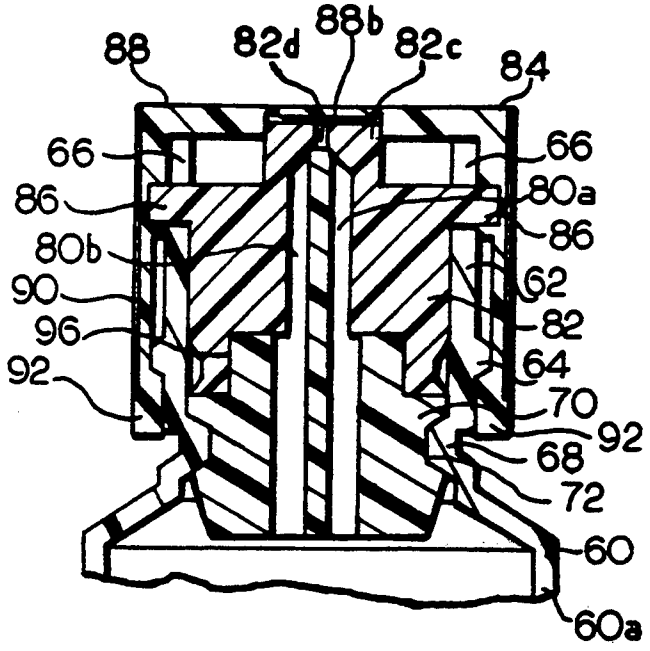


FIG. 10

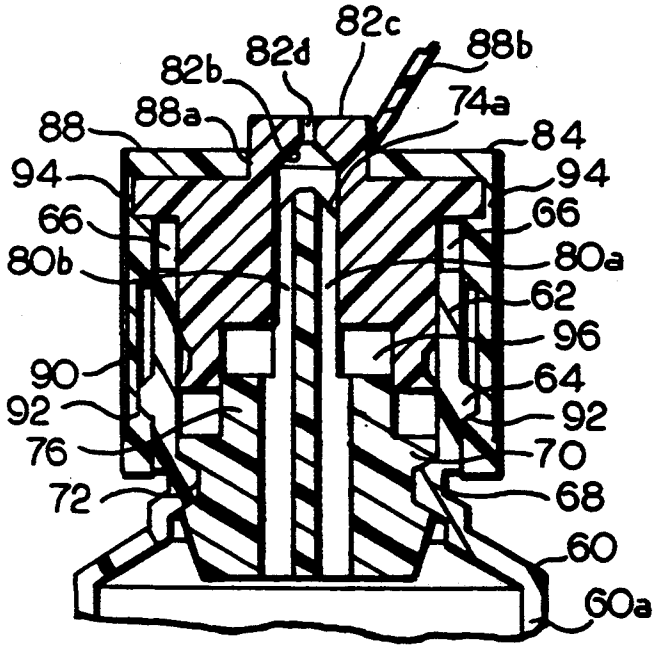
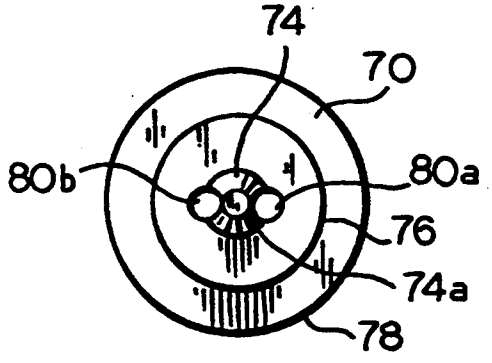


FIG. 11



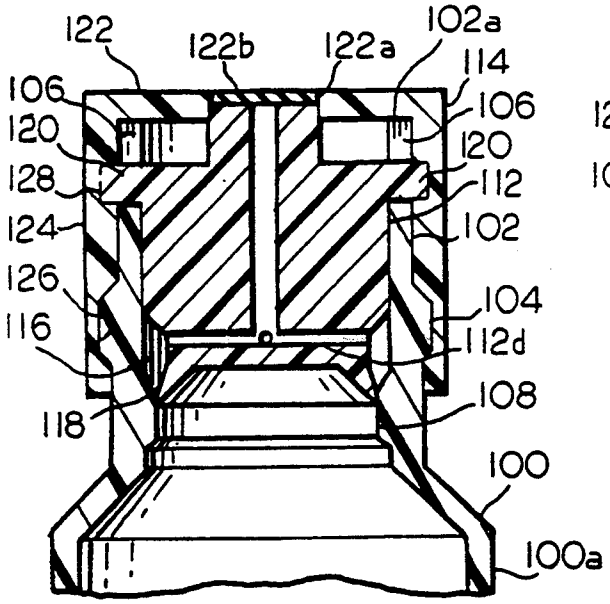


FIG. 13

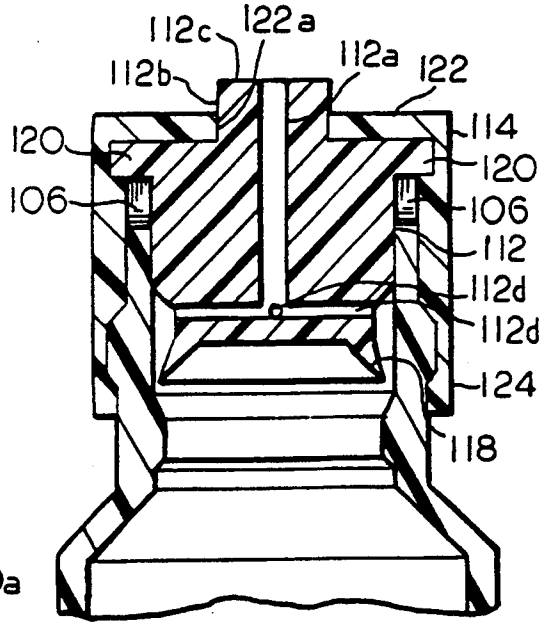


FIG. 14

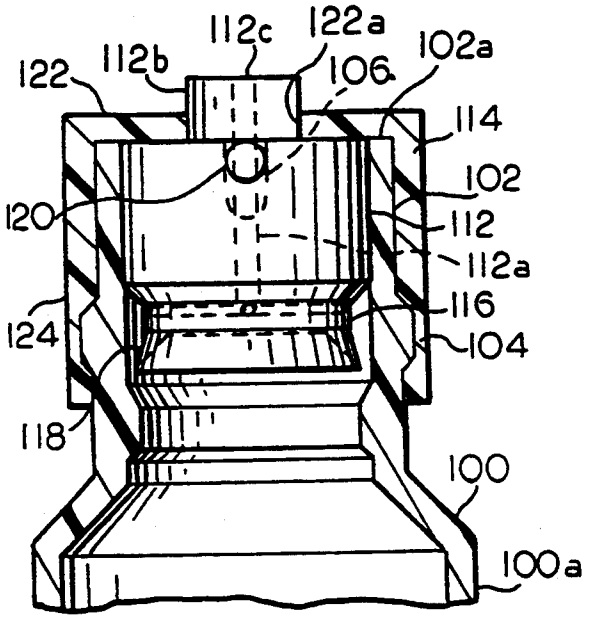


FIG. 15

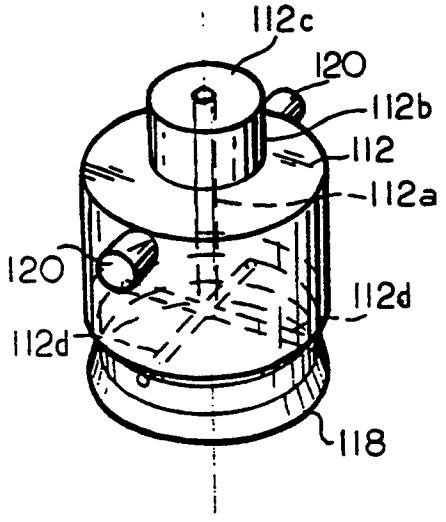


FIG. 16

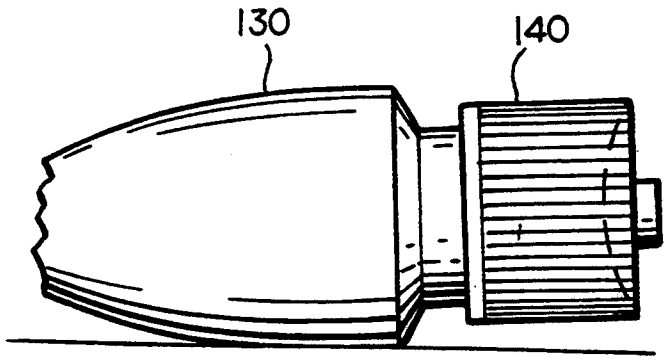


FIG. 18

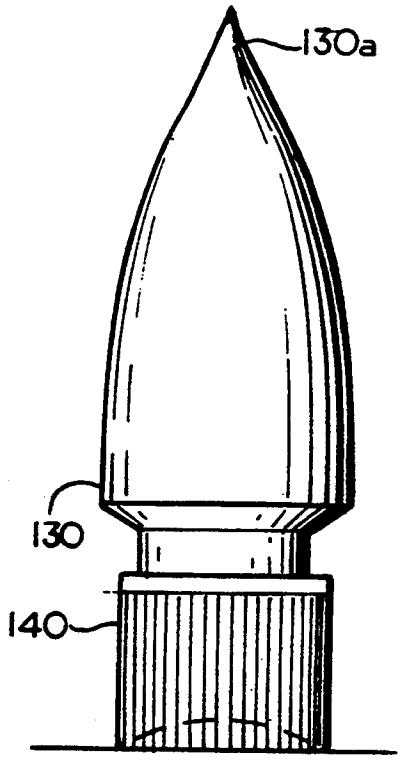


FIG. 17

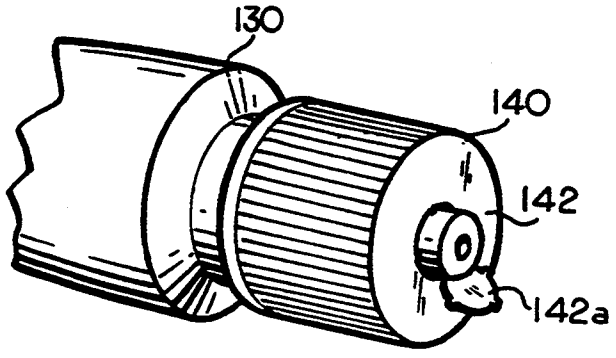


FIG. 19

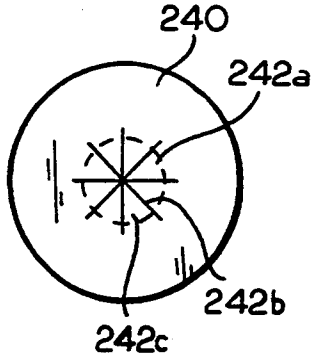


FIG. 21

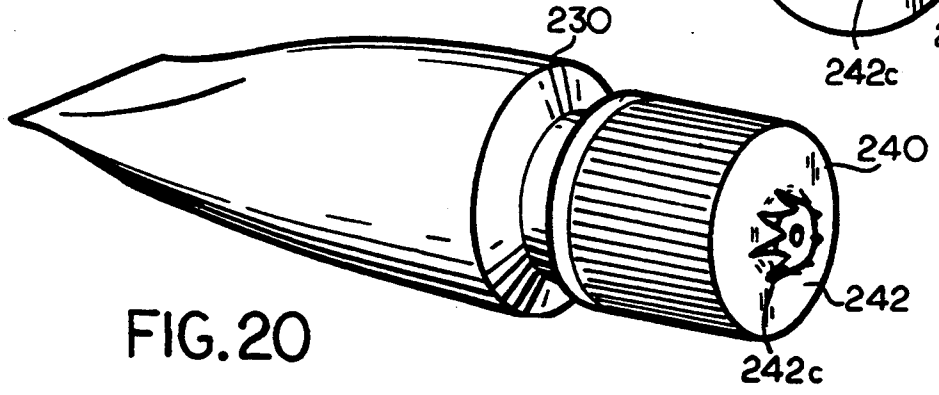


FIG. 20

TAMPER EVIDENT LIQUID DISPENSING PACKAGE

FIELD OF THE INVENTION

This invention relates to a liquid dispensing package with tamper evident opening characteristics. More particularly, this invention relates to a liquid dispensing package of the foregoing character which is made up of a container with a closure receiving finish portion in combination with a dispensing closure with a pop-up nozzle or valve element affixed to such finish portion.

BACKGROUND OF THE INVENTION

U.S. Pat. No. 4,408,700 (William E. Fillmore et al.) discloses a dispensing package which is made up of a container having an externally threaded finish portion with a closure threadably secured to such finish portion. The closure includes an axially shiftable or pop-up valve element which is movable with respect to the other structure of the closure between a closed, flow blocking, position and an open, flow permitting, position. The package of this reference does not incorporate tamper evident features, and such a package cannot be stored in an inverted position on its closure due to the fact that the top of the dispensing valve element extends beyond the surrounding structure of the closure, even in the closed position of the valve element. Further, a package of the type described in the aforesaid U.S. Patent requires that a user use both hands in opening and closing the package in a normal fashion, one hand to grasp a container and the other hand to manipulate the valve element, due to the fact that the valve element can only be moved by the application of a force extending along its longitudinal axis.

SUMMARY OF THE INVENTION

According to the present invention there is provided a liquid dispensing package which is made up of a container and a molded plastic closure with a molded plastic pop-up nozzle affixed to the finish portion of the container. The pop-up nozzle of the closure, which serves as a valve element, is stored entirely within the outline of the other structure of the closure, which is in the form of a cap with a central opening in a transversely extending panel portion thereof, in the closed, non-dispensing, position of such valve element. This permits molding the cap portion of the closure with a frangible tamper evident portion in alignment with the valve element, so that the fact of an initial opening attempt will thereafter be evident to all users of the package. Further, the positioning of the valve element of the closure entirely within the outline of the cap portion of the closure in the closed, non-dispensing, position of the valve element permits the package to be stored in an inverted position, on the closure, with the outermost tip of the valve element or nozzle out of contact with the supporting surface, such as the top surface of a table or counter, on which the package is stored.

A closure for a package according to the present invention is provided with an opposed pair of part helical or otherwise inclined grooves on the inside surface of a skirt portion of the cap portion thereof, and the axially shiftable valve element is provided with an opposed pair of radial projections that are received in such inclined grooves. Thus, the axial translation of such valve element occurs as a result of the application of a tangential or rotational force to the cap portion of the closure, which is non-threadably rotationally secured to the container finish. This facilitates the opening and closing of the closure in a single-handed manner, which is much more convenient for people with impaired hand function due to injury or arthritis, especially elderly people.

Accordingly, it is an object of the present invention to provide an improved liquid dispensing package. More particularly, it is an object of the present invention to provide a liquid dispensing package with tamper evident first opening attempt characteristics. It is also an object of the present invention to provide a package of the foregoing character which may be stored in an inverted position, on a closure element of such package. It is also an object of the present invention to provide a package of the foregoing character whose closure may be readily provided with single-handed opening and closing characteristics.

For a further understanding of the present invention and the objects thereof, attention is directed to the drawing and the following brief description thereof, to the detailed description of the preferred embodiment and to the appended claims.

BRIEF DESCRIPTION OF THE DRAWING

FIG. **1** is a fragmentary elevational view, partly in cross-section, of a container according to the preferred embodiment of the present invention with a valve or nozzle element of a closure according to the preferred embodiment of the present invention inserted therein;

FIG. **2** is an elevational view, in cross-section, of a cap element of a closure according to the preferred embodiment of the present invention for affixing to the container of FIG. **1**;

FIG. **3** is a fragmentary view, in cross-section, of a package made up of the cap portion of FIG. **2** in assembled relationship to the container and nozzle element of FIG. **1**, taken at right angles to the positions of such elements in FIGS. **1** and **2** and showing the nozzle element in its closed, non-dispensing, position;

FIG. **4** is a view similar to FIG. **3** but showing the nozzle element in its open, dispensing, position;

FIG. **5** is an exploded perspective view of the package elements of the embodiment of FIGS. **1–4**;

FIG. **6** is a fragmentary view, at an enlarged scale, taken on line **6—6** of FIG. **5**;

FIG. **7** is a plan view of an element of the embodiment of FIGS. **1–6** before a first opening attempt;

FIG. **8** is a view similar to FIG. **3** of an alternate embodiment of a package according to the present invention;

FIG. **9** is a view similar to FIG. **3** of the embodiment of the present invention of FIG. **8**;

FIG. **10** is a view similar to FIG. **4** of the embodiment of the present invention of FIGS. **8** and **9**;

FIG. **11** is a view taken on line **11—11** of FIG. **8**;

FIG. **12** is a plan view of an element of the embodiment of the present invention of FIGS. **8–11**;

FIG. **13** is a view similar to FIGS. **3** and **9** of yet another embodiment of the present invention in the closed, non-dispensing, position of such embodiment;

FIG. **14** is a view similar to FIGS. **4** and **10** of the embodiment of the present invention of FIG. **13**;

FIG. **15** is a view of the embodiment of the present invention of FIGS. **13** and **14** which is similar to the

view of FIG. 13, but at right angles thereto and in the open, dispensing, position of such embodiment;

FIG. 16 is a perspective view of an element of the embodiment of the present invention of FIGS. 13–15;

FIG. 17 is an elevational view of a top standing liquid dispensing package in a closed, nondispensing condition, which otherwise may be in accordance with any of the embodiments of FIGS. 1–7, 8–12, or 13–16, respectively;

FIG. 18 is a fragmentary view of the dispensing package of FIG. 17 in an open, dispensing condition of the package;

FIG. 19 is a perspective view of the package of the embodiment of FIGS. 17 and 18 in the FIG. 18 condition of the package;

FIG. 20 is a view similar to FIG. 19 of an alternative embodiment of a liquid dispensing package according to the present invention; and

FIG. 21 is plan view of the package of FIG. 20 before its first opening attempt.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

A package according to the embodiment of the present invention of FIGS. 1–7 includes a container 30 having an annular finish portion 32 surrounding an opening into a body portion 30*a* of the container 30, the other end of the container 30, not shown, being closed in a known manner. The finish portion 32 has a radially outwardly projecting annular bead 34 spaced inwardly from a free end 32*a* of the finish portion 32, and it further has a diametrically opposed pair of slots 36 extending vertically from the free end 32*a* of the finish portion 32 partly to the annular bead 34. The finish portion 32 also has a radial web portion 38 extending thereacross at a location spaced inwardly from the free end 32*a* of the finish portion 32 and preferably inwardly of the location of the annular bead 34. The finish portion 32 further has an elongate spout 40 extending from the radial web portion 38 upwardly toward the free end 32*a* of the finish portion 32. The elongate spout 40, which is shown as having a blind end opening 40*a*, has a free end 40*b* which is conical in configuration. The radial web 38 is provided with a series of circumferentially spaced apart apertures 38*a*, 38*b*, 38*c*, 38*d* (FIG. 6) surrounding the elongate spout 40. These apertures 38*a*, 38*b*, 38*c*, 38*d* provide a drain back feature to permit excess liquid being dispensed from the container 30 to drain back into the body portion 30*a* of the container 30.

As illustrated and described, a container 30 can be formed integrally in a single piece from a suitable thermoplastic material, such as high density polyethylene or polyvinyl chloride, on known types of molding machines, such as a molding machine of the injection blow molding type.

A dispensing closure for the container 30 is made up of a nozzle element 42 and a cap element 44. The nozzle element 42 is an annular element with an opening 42*a* that surrounds the exterior of the elongate spout 40, when the nozzle element 42 is positioned within the finish of the container, with sufficient radial clearance to permit liquid within the container 30 to be dispensed through an annular opening within the opening 42*a*. The nozzle element 42 further has an externally projecting opposed pair of pins 46 each of which is freely slidably received in one of the slots 36 of the finish portion 32 of the container 30. As shown, each of the pins 46 is of sufficient length to extend through the slot 36 which receives it and for a finite distance therebeyond. The opening 42*a* of the nozzle element 42 has a frustoconical surface portion 42*b* which is designed to engage the conical surface 40*b* of the elongate spout 40 in surface to surface sealing engagement when the nozzle element 42 is at its lowermost position within the finish portion 32 of the container 30, as shown in FIGS. 1 and 3. In this position, no liquid can be dispensed from the container 30. The nozzle element 42 also has a boss 42*c* at its free end and an aperture 42*d* extending through the boss 42*c* into communication with the opening 42*a*. As shown in FIGS. 1, 3 and 4, the outside diameter of the nozzle element 42 is large enough to fit snugly, but slidably, within the inside diameter of the finish portion 32 to substantially prevent the dispensing of liquid from the container 30 therebetween.

As illustrated and described, a nozzle element 42 can be formed integrally in a single piece from a suitable thermoplastic material, such as high density polyethylene or polypropylene, on known types of molding machines, such as an injection molding machine.

The cap element 44 has a radially extending top panel portion 48 and an annular skirt portion 50 which depends from the periphery of the top panel portion 48. The skirt portion 50 has a radially inwardly projecting annular bead 52 near its lower extremity. The annular bead 52 has an inner diameter which is slightly greater than an outer diameter of the annular bead 34 of the finish portion 32 of the container 30, so that the cap element 44 may be rotatably secured to the finish portion 32 of the container 30 by a snap fit between the annular bead 34 and the annular bead 52.

The skirt portion 50 of the cap element 44 has a diametrically opposed pair of partial depth part helical or otherwise inclined slots 54 on its interior surface. The slots 54 receive the free ends of the pins 46 of the nozzle element 42. Thus, by turning the cap element 44 in a first direction with respect to the container 30, for example, in a counterclockwise direction, the nozzle element 42 will be lifted with respect to the container 30 from its closed position, as shown in FIG. 3, where sealing contact between the surface 40*b* of the spout 40 and the surface 42*b* of the nozzle element 42 prevents dispensing from the container 30, to its open position, as shown in FIG. 4, where liquid may be dispensed from the container 30 through an annulus in the opening 42*a* of the nozzle element 42 and then through the aperture 42*d*. Of course, when the cap element 44 is turned in a reverse direction with respect to the container 30, the nozzle element 42 will be moved from its FIG. 4 open, dispensing, position to its FIG. 3 closed, nondispensing, position.

To provide tamper indicating characteristics to the embodiment of FIGS. 1–7, the top panel 48 of the cap element 44 is provided with an opening 48*a* which is aligned with the boss 42*c* of the nozzle element 42. The opening 48*a* is large enough to permit the boss 42*c* to pass thereinto during the opening of the package, the free end of the boss 42*c* being entirely within the interior of the opening 48*a* of the cap element 44 in the FIG. 3 closed condition of the package. The opening 48*a* is initially closed with a frangible portion 48*b*. The frangible portion 48*b* ruptures from the top panel 48 upon the first opening of the package of FIGS. 1–7, in changing from its FIG. 3 condition to its FIG. 4 condition, thereby indicating a previous opening or opening attempt of the package to a purchaser thereof.

The exterior of the skirt portion **50** of the cap element **44** preferably is provided with a circumferential series of vertically extending grooves **56** extending therearound. The grooves **56** serve to increase friction between the exterior of the skirt portion **50** and the hand of a user to assist in the opening and in the closing of the cap element **44** with respect to the container **30**.

As illustrated and described, a cap element **44**, including the frangible portion **48***b*, can be formed integrally in a single piece from a suitable thermoplastic material, such as high density polyethylene or polypropylene, on known types of molding machines, such as an injection molding machine. When formed in this manner, the skirt **50** of the cap element **44** will have sufficient elasticity to permit the cap element **44** to be rotatably secured to the finish portion **32** of the container **30**, notwithstanding the snap fit between the annular bead **52** and the annular bead **34**.

An alternate embodiment of the invention of this application is illustrated in FIGS. **8–12**, where the dispensing package of such embodiment includes a container **60**. The container **60** has a finish portion **62** with a free end **62***a*, and the finish portion **62** further has a radially outwardly projecting annular bead **64** spaced inwardly from the free end **62***a*. The other end of a main body portion **60***a* of the container **60**, not shown, is closed in a known manner. The finish portion **62** also has a diametrically opposed pair of slots **66** extending vertically from the free end **62***a* partly to the annular bead **64**. The container **60** also has a radially inwardly projecting annular bead **68** spaced further from the free end **62***a* than the annular bead **64**. The inside diameter of the annular bead **68** defines an opening into the body portion **60***a* of the container **60**.

As illustrated and described, a container **60** can be formed integrally in a single piece from a suitable thermoplastic material, such as high density polyethylene or polyvinyl chloride, on known types of molding machines, such as a molding machine of the injection blow molding type.

The container **60** is fitted with a fitment **70** which has an annular groove **72** that receives the annular bead **68** of the container **60** in a snap fit. The fitment **70** has a spout **74** which extends upwardly therefrom, the spout **74** having a free end **74***a* which is frustoconical in configuration. A reduced diameter boss **76** is positioned between the opposed end of the spout **74** and a main body portion **78** of the fitment **70**, the groove **72** being located in the main body portion **78**. The fitment **70** is provided with an opposed pair of passages **80***a*, **80***b* on opposite sides of the spout **74**. The passages **80***a*, **80***b* extend through the boss **76** and the main body portion **78**, and provide openings for dispensing liquid from the container **60** through the fitment **70** and a drain back feature to permit excess liquid being dispensed from the container **60** to drain back into its main body portion **60***a*.

As illustrated and described, a fitment **70**, including its spout **74**, boss **76** and main body portion **78**, can be formed integrally in a single piece from a suitable thermoplastic material, such as high density polyethylene or polypropylene, on known types of molding machines, such as an injection molding machine.

The package of FIGS. **8–12** also includes a dispensing closure which is made up of a nozzle element **82** and a cap element **84**. A nozzle element **82** is an annular element with an opening **82***a* that surrounds the exterior of the spout **74** of the fitment **70** with sufficient radial clearance to permit liquid being dispensed from the container **60** through the passages **80***a*, **80***b* of the fitment **70** to pass through the opening **82***a*. The opening **82***a* of the nozzle element **82** has a frustoconical surface portion **82***b*, which is designed to engage the frustoconical surface **74***a* of the spout **74** in surface to surface sealing engagement when the nozzle element **82** is at its lowermost position within the finish portion **62** of the container **60**, as shown in FIG. **10**. In this position, no liquid can be dispensed from the container **60**.

The nozzle element **82** further has an externally projecting opposed pair of pins **86** each of which is freely slidably received in one of the slots **66** of the finish portion **62** of the container **60** as shown. Each of the pins **86** is of sufficient length to extend through the slot **66** which receives it and for a finite distance therebeyond. The nozzle element **82** also has a boss **82***c* at its free end and an aperture **82***d* extending through the boss **82***c* into communication with the opening **82***a*. As is shown in FIGS. **9** and **10**, the outside diameter of the nozzle element **82** is large enough to fit snugly, but slidably, within the inside diameter of the finish portion **62** to substantially prevent the dispensing of liquid from the container **60** therebetween.

As illustrated and described, a nozzle element **82** can be formed integrally in a single piece from a suitable thermoplastic material, such as high density polyethylene or polypropylene, on known types of molding machines, such as an injection molding machine.

The cap element **84** has a radially extending top panel portion **88** and an annular skirt portion **90** which depends from the periphery of the top panel portion **88**. The skirt portion **90** has a radially inwardly projecting annular bead **92** near its lower extremity. The annular bead **92** has an inner diameter which is slightly greater than an outer diameter of the annular bead **64** of the finish portion **62** of the container **60**, so that the cap element **84** may be rotatably secured to the finish portion **62** of the container **60** by a snap fit between the annular bead **64** and the annular bead **92**.

The skirt portion **90** of the cap element **84** has a diametrically opposed pair of partial depth part helical or otherwise inclined slots **94** on its interior surface. The slots **94** receive the free ends of the pins **86** on the nozzle element **82**. Thus, by turning the cap element **84** in a first direction with respect to the container **60**, for example, in a counterclockwise direction, the nozzle element **82** will be lifted with respect to the container **60** from its closed position, as shown in FIG. **9**, where sealing contact between the surface **74***b* of the spout **74** and the surface **82***b* of the nozzle element **82** prevents dispensing from the container **60**, to its open position, shown in FIG. **10**, where liquid may be dispensed from the container **60** through an annulus in the opening **82***a* of the nozzle element **82** and then through the aperture **82***d*. Of course, when the cap element **84** is turned in a reverse direction with respect to the container **60**, the nozzle element **82** will be moved from its FIG. **10** open, dispensing, position to its FIG. **3** closed, nondispensing, position. As is shown in FIGS. **9** and **10**, the nozzle element **82** is further provided with a recess **96** which snugly but slidably receives the boss **76** of the fitment **70** to substantially prevent the dispensing of liquid from the container **60** therebetween.

To provide tamper indicating characteristics to the embodiment of FIGS. **8–12**, the top panel portion **88** of the cap element **84** is provided with an opening **88***a* which is aligned with the boss **82***c* of the nozzle element

82. The opening 88*a* is large enough to permit the boss 82*c* to pass thereinto during the opening of the package, the free end of the boss 82*c* being entirely within the interior of the opening 88*a* in the FIG. 9 closed condition of the package. The opening 88*a* is initially closed with a frangible portion 88*b*. The frangible portion 88*b* ruptures from the top panel 88 upon the first opening of the package of FIGS. 8–12, in changing from its FIG. 9 condition to its FIG. 10 condition, thereby indicating a previous opening or opening attempt of the package to a purchaser thereof.

The exterior of the skirt 90 of the cap element 84 may be provided with a diametrically opposed pair of tabs 98 projecting outwardly therefrom. The tabs 98 serve to provide purchase to the thumb of a hand of a user to assist in the opening and of the closing of the cap element 84 with respect to the container 60, as shown in FIG. 12. The tabs 98 of the embodiment of the invention of FIGS. 8–12, thus, serve a similar function to the grooves 56 of the embodiment of FIGS. 1–7. These features may be used interchangeably with one another depending on the torque required to open and close a package according to either of such embodiments.

As illustrated and described, the cap element 84 can be formed integrally in a single piece from a suitable thermoplastic material, such as high density polyethylene or polypropylene, on known types of molding machines, such as an injection molding machine.

Another alternate embodiment of the invention of this application is illustrated in FIGS. 13–16, where the dispensing package of such embodiment includes a container 100. The container 100 has a finish portion 102 with a free end 102*a*. The other end of a main body portion 100*a* of the container 100, not shown, is closed in a known manner.

The finish portion 102 of the container 100 has a radially outwardly projecting annular bead 104 spaced inwardly from free end 102*a* of the finish portion 102. The finish portion 102 also has a diametrically opposed pair of slots 106 extending vertically from the free end 102*a* partly to the annular bead 104. The container 100 also has a radially inwardly projecting annular bead 108 spaced further from the free end 102*a* of the finish portion 102 and the annular bead 104. The inside diameter of the annular bead 108 defines an opening into the body portion 100*a* of the container 100.

As illustrated and described, a container 100 can be formed integrally in a single piece from a suitable thermoplastic material, such as high density polyethylene or polyvinyl chloride, on known types of molding machines, such as a molding machine of the injection blow molding type.

A dispensing closure for the container 100 is made up of a nozzle element 112 and a cap element 114. The nozzle element 112 has an axially extending passage 112*a* extending from a free end 112*c* of an external boss 112*b* of the nozzle element 112 to a juncture with a coplanar series of radial passages 112*d* extending through an interior portion of a nozzle element 112. The radial passages 112*d* are aligned with an inwardly projecting annular recess 116 in the nozzle element 112, and the nozzle element 112 is provided with an outwardly and downwardly projecting tapered annular sealing fin 118 below the level of the radial passages 112*d*. The sealing fin 118 sealingly engages the annular bead 108 of a container 100 in the FIG. 13 condition of the package, to block the flow of product from within the container 100 outwardly through the nozzle element 112. However, in the condition of the package shown in FIGS. 14 and 15, products can flow from the container 100 into the recess 116 of the nozzle element 112, from whence it can be dispensed through the radial passages 112*d* and the axial passage 112*a*.

The nozzle element 112 further has an externally projecting opposed pair of pins 120 each of which is freely slidably received in the slots 106 of the finish portion 102 of the container 100. Each of the pins 120 is of sufficient length to extend through the slot 106 which receives it and for a finite distance there beyond.

As illustrated and described, a nozzle element 112 can be formed integrally in a single piece from a suitable thermoplastic material, such as high density polyethylene or polypropylene, on known types of molding machines, such as an injection molding machine.

The cap element 114 has a radially extending top panel portion 122 and an annular skirt portion 124 which depends from the periphery of the top panel portion 122. The skirt portion 124 has an annular recess 126 projecting radially thereinto, and the annular recess 126 receives the annular bead 104 of the finish portion 102 of the container 100 in a snap fit when the cap element 114 is affixed to the container 100 to provide for a rotatable fit between the cap element 114 and the container 100.

The skirt portion 124 of the cap element 114 has a diametrically opposed pair of partial depth part helical or otherwise inclined slots 128 on its interior surface. The slots 128 receive the free ends of the pins 120 of the nozzle element 112. Thus, by turning the cap element 114 with respect to the container 100, for example, in a counterclockwise direction, the nozzle element 112 will be lifted from its closed position with respect to the container 100, from its closed position, as shown in FIG. 13, where sealing contact between the sealing fin 118 and the annular bead 108 prevents dispensing from the container 100, to its open position, as shown in FIGS. 14 and 15, where liquid may be dispensed from the container 100 through the radial passages 112*d* and the axial passage 112*a* of the nozzle element 112.

To provide tamper indicating characteristics to the embodiment of FIGS. 13–16, the top panel 122 of the cap element 114 is provided with an opening 122*a* which is aligned with the boss 112*b* of the nozzle element 112, the free end of the boss 112*b* being entirely within the opening 122*a* of the cap element 114 in the FIG. 13, closed, condition of the package. The opening 122*a* is initially closed with a frangible portion 122*b*. The frangible portion 122*b* ruptures from the top panel 122 upon the first opening of the package of FIGS. 13–16 in changing from its FIG. 13 condition to its condition of FIGS. 14 and 15, thereby indicating a previous opening or opening attempt of the package to a purchaser thereof.

While not shown, the exterior of the skirt 124 of the cap element may be provided with grooves corresponding to the grooves 56 of the embodiment of FIGS. 1–7 or with tabs corresponding to the tabs 98 of the embodiment of FIGS. 8–12 to assist in the opening or closing thereof, and such opening or closing may also thereby be easily accomplished in a single-handed manner.

As illustrated and described, a cap element 114 can be formed integrally in a single piece from a suitable thermoplastic material, such as high density polyethylene or polypropylene, on known types of molding machines, such as an injection molding machine. When formed in this manner, the skirt portion 124 of the cap element 114

will have sufficient elasticity to permit the cap element **114** to be rotatably secured to the finish portion **102** of the container **100**, notwithstanding the snap fit between the annular bead **104** of the finish portion **102** of the container **100** and the annular recess **126** of the skirt portion **124** of the cap element **114**.

The embodiment of the invention FIGS. **13–15** is advantageous with respect to the embodiment of FIGS. **8–12** in that the embodiment of FIGS. **13–15** is made up of only three elements, namely the container **100**, the nozzle element **112** and the cap element **114**, whereas the embodiment of FIGS. **8–12** requires four elements, namely the container **60**, the fitment **70**, the nozzle element **82** and the cap element **84**. However, the molding of the nozzle element **112** of the embodiment of FIGS. **13–15** is somewhat more complex than the molding of the nozzle element **82** of the embodiment of FIGS. **8–12**, because of the requirement that the nozzle element **112** be provided with radial passages **112***d* as well as an axial passage **112***a*.

The embodiment of FIGS. **1–7**, like the embodiment of FIGS. **13–15**, is also made up of only three elements, namely the container **30**, the nozzle element **42** and the cap element **44**, and is somewhat advantageous with respect to the embodiment of FIGS. **13–15** in that the nozzle element **42** does not require radial passages corresponding to the radial passages **112***d* from the nozzle element **112**. However, the finish portion **32** of the container **30** is more complex than the finish portion **102** of the container **100**, by a virtue of its requirement of a radial web portion **38** and a spout **40**.

FIG. **17** illustrates a container **130** having a dispensing closure **140** affixed to a finish portion thereof. The container **130** has a pinched opposed end **130***a*, and is adapted to be stored in an inverted position, resting on its dispensing closure **140**, which may correspond in construction to any of the dispensing closures of the embodiments of FIGS. **1–7**, **8–12**, or **13–16**, respectively. The fact that the boss **42***c* of the embodiment of FIGS. **1–7** is entirely within the opening **48***a* of the cap element **44** thereof in the closed, nondispensing, condition of such package makes the dispensing closure of FIGS. **1–7** suitable for use in a package which is to be stored in its inverted position. Likewise, the fact that the boss **82***c* of the nozzle element **82** of the embodiment of FIGS. **8–12** is entirely within the opening **88***a* of the cap element **84** thereof in the closed, nondispensing, condition of such package makes the dispensing closure of FIGS. **8–12** suitable for use in a package which is to be stored in its inverted position, and the fact that the boss **112***c* of the nozzle element **112** of the embodiment of FIGS. **13–16** is entirely within the opening **122***a* of the cap element **114** in the closed, nondispensing condition of such package also makes the dispensing closure of FIGS. **13–16** suitable for use in a package which is to be stored in its inverted position.

The closure **140** of the package of FIGS. **17–19** is shown as having a frangible portion **142***a* in a top panel portion **142** thereof. The frangible portion **142***a* may be considered to correspond in function and construction to the frangible portion **48***b* of the embodiment of FIGS. **1–7**, to the frangible portion **88***b* of the embodiment of FIGS. **8–12** or to the frangible portion **122***b* of the embodiment of FIGS. **13–16**. A disadvantage of such a frangible portion **142***a*, **48***b*, **88***b* or **122***b* is that it separates entirely from the package upon the first opening of the package, creating a requirement for care in the handling of the package to ensure proper disposition of such frangible portion. This requirement can be overcome with the embodiment of FIGS. **20** and **21** where a container **230**, otherwise corresponding to the container **130** of the embodiment of FIGS. **17–19**, is fitted with a dispensing closure **240**. The dispensing closure **240** differs from the dispensing closure **140** of the embodiment of FIGS. **17–19**, in that it has a frangible portion **242***a* which is formed by a series of intersecting radial scores **242***b* in a top panel portion **242** thereof. These radial scores define deflectable triangular tabs **242***c* which rupture from one another along the scores **242***b* upon the first opening or attempted opening of the package of FIGS. **20** and **21**, but which do not separate from the top panel portion **242** because they are not scored along the bases thereof.

Although the best mode contemplated by the inventor for carrying out the present invention as of the filing date hereof has been shown and described herein, it will be apparent to those skilled in the art that suitable modifications, variations, and equivalents may be made without departing from the scope of the invention, such scope being limited solely by the terms of the following claims.

What is claimed is:

1. A liquid dispensing package comprising:

a container having a finish portion with at least one slot opening in said finish portion, said slot opening extending generally parallel to a longitudinal axis of the finish portion;

a nozzle element positioned within said finish portion, said nozzle element having passage means extending therethrough to permit the dispensing of liquid within the container through said nozzle element, said nozzle element further having at least one pin extending therefrom into and through said at least one slot opening in said finish portion, said nozzle element being non-rotatable with respect to said finish portion and being translatable with respect to said finish portion along the longitudinal axis thereof between a first position and a second position; and

a cap element having a top panel portion and an annular skirt portion extending perpendicularly from said top panel portion, said top panel portion having an opening therein, said cap element being rotatable with respect to said finish portion of said container with a substantial portion of said annular skirt portion surrounding a portion of said finish portion, and with said opening in said top panel portion in alignment with said passage means of said nozzle element, said annular skirt portion having at least one inclined groove on an inside surface thereof, said at least one inclined groove receiving a free end portion of said at least one pin, whereby rotation of said cap element with respect to said container in a first rotational direction will translate said nozzle element in a first linear direction along the longitudinal axis of said finish portion and rotation of said cap element with respect to said container in an opposed rotational direction will translate said nozzle element in an opposed linear direction along the longitudinal axis of said finish portion.

2. A liquid dispensing package according to claim **1** and further comprising:

sealing means associated with said container, said sealing means engaging said nozzle element in one of said first position and said second position.

3. A liquid dispensing package according to claim 2 wherein said annular skirt portion of said cap element comprises tab means projecting radially outwardly therefrom, said tab means facilitating single handed turning of said cap element with respect to said container.

4. A liquid dispensing package according to claim 2 wherein said container comprises a radial web portion extending thereacross at a location spaced inwardly from a free end of said finish portion and an elongate member extending from said radial portion of said container toward said free end of said finish portion, said elongate member being received within said passage means of said nozzle element and defining an annular flow passage therewith, wherein said elongate member has a free end within said passage means of said nozzle element and said passage means of the nozzle element has an annular sealing surface, and wherein said sealing means associated with said container comprises said free end of said elongate member, said free end of said elongate member sealingly engaging said annular sealing surface of said nozzle means in said one of said first position and said second position.

5. A liquid dispensing package according to claim 4 wherein said container, said finish portion, said radial web portion and said elongate member are formed integrally in a single piece from a thermoplastic material, wherein said nozzle element, including said at least one pin, is formed integrally in a single piece from a thermoplastic material and wherein said cap element, including said top panel portion and said annular skirt portion, is formed integrally in a single piece from a thermoplastic material.

6. A liquid dispensing package according to claim 5 wherein said radial web portion of said container comprises aperture means extending therethrough, said aperture means permitting excess liquid dispensed from said container to drain back thereinto.

7. A liquid dispensing package according to claim 2 wherein said nozzle element has a boss at a free end thereof, said passage means extending through said boss, said boss being entirely within said top panel portion of said cap element in said one of said first position and said second position, said boss projecting through said opening in the other of said one of first position and said second position, said opening originally being closed by a frangible portion which is visually damaged upon a first movement of said nozzle element from said one of said first position and said second position to the other of said first position and said second position.

8. A liquid dispensing package according to claim 7 wherein said frangible portion is defined by a multiplicity of intersecting radial scores, said scores defining a circumferential series of triangular tabs, said tabs remaining with said top panel portion following rupturing of such scores as a result of said first movement of said nozzle element.

9. A package according to claim 1 wherein said finish portion has at least two circumferentially spaced apart slot openings therein, wherein said nozzle element has at least two circumferentially spaced apart pins projecting therefrom, each of said pins extending from said nozzle element into and through one of said slot openings in said finish portion, and wherein said annular skirt portion of said closure has at least two circumferentially spaced apart inclined grooves on an inside surface thereof, each of said inclined grooves receiving a free end portion of one of said pins.

10. A liquid dispensing package according to claim 2 wherein said package further comprises a fitment positioned within and frictionally engaging said finish portion of said container, said fitment having a main body portion and a spout extending from said main body portion toward said free end of said finish portion of said container, said spout having a free end;

wherein said spout of said fitment is received within said passage means of said nozzle element;

wherein said nozzle element has an annular sealing surface in its passage means; and

wherein said sealing means comprises said free end of said spout, said free end of said spout sealingly engaging said annular sealing surface of said passage means of said nozzle element in said one of said first position and said second position.

11. A liquid dispensing package according to claim 10 wherein said container, including said finish portion, is formed integrally in a single piece from a thermoplastic material, wherein said nozzle element, including said at least one pin, is formed integrally in a single piece from a thermoplastic material, wherein said fitment, including said spout, is formed integrally in a single piece from a thermoplastic material, and wherein said cap element, including said top panel portion and said annular skirt portion, is formed integrally in a single piece from a thermoplastic material.

12. A liquid dispensing package according to claim 11 wherein fitment further comprises passage means extending therethrough, said passage means of said fitment permitting excess liquid dispensed from said container to drain back thereinto.

13. A liquid dispensing package according to claim 11 wherein said nozzle element has a recess in an inner end thereof, and wherein said fitment has a boss extending from an outer end thereof, said boss of said fitment being slidably received within said recess of said nozzle element at least in said one of said first position and said second position.

14. A liquid dispensing package according to claim 2 wherein said nozzle element comprises an annular recess in an outer surface thereof and a sealing fin projecting outwardly and downwardly from said nozzle element at a location further from a free of said finish portion of said container, wherein said sealing means comprises an annular bead of said container projecting radially inwardly from said finish portion, wherein said passage means of said nozzle element comprises radial passage means extending from said annular recess into said nozzle element and longitudinal passage means extending from said radial passage means to a free end of said nozzle element, said sealing fin of said nozzle element sealingly engaging said annular bead of said container in said one of said first position and said second position.

15. A liquid dispensing package according to claim 14 wherein said container, including said finish portion, is formed integrally in a single piece from a thermoplastic material, wherein said nozzle element, including said at least one pin, is formed integrally in a single piece from a thermoplastic material, and wherein said cap element, including said top panel portion and said annular skirt portion, is formed integrally in a single piece from a thermoplastic material.

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