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(54) **MULTIPLE-DOSE BOTTLE WITH DOSAGE SPOUT FOR PRODUCTS, PARTICULARLY  
MEDICINES**

MEHRFACHDOSIERUNGFLASCHE MIT DOSIERAUSGIESSER FÜR MEDIKAMENTE

FLACON DISTRIBUTEUR DE DOSES MULTIPLES A BEC DOSEUR SURTOUT DESTINE AUX  
MEDICAMENTS

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(56) References cited:  
**CH-A- 528 415 GB-A- 2 048 827**  
**US-A- 3 618 825 US-A- 4 739 906**  
**US-A- 5 727 892 US-A- 5 743 441**

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**Description**Technical Field

**[0001]** The present invention relates to a multiple-dose bottle with dosage spout for products, particularly for medicines.

Background Art

**[0002]** It is known that some products, such as for example medicines, if contained in multiple-dose bottles, use preservatives in order to avoid any likely bacterial contaminations caused by direct contact of the contained product with the surrounding air.

**[0003]** Currently applicable statutory provisions require, in the near future, the elimination of these preservatives from multiple-dose bottles and this disadvantageously entails the inadequacy of known kinds of bottle, which do not ensure complete asepsis of the product.

**[0004]** As an alternative, in order to obviate this drawback of known kinds of multiple-dose bottle, single-dose bottles which are used only once and therefore require no preservatives are used for the dosage of these products.

**[0005]** However, even these single-dose bottles are not free from drawbacks, including the fact that the asepsis of the product is ensured at the cost of wasting material, since the single-dose bottle is discarded after a single application of the product.

**[0006]** A dispensing bottle suitable for storing a sterile solution is disclosed in US-A-4 739 906.

**[0007]** Further examples of containers provided with applicators, suitable for preserving substances, are available from US-A-5 727 892, US-A-5 743 441 and CH-A-528 415.

Disclosure of the Invention

**[0008]** The aim of the present invention is to eliminate the above drawbacks of conventional bottles, providing a multiple-dose bottle with dosage spout for products, particularly medicines, which allows to fully eliminate the use of preservatives which are harmful to human health, to contain an aseptic product which can be used even more than once, and to reduce the waste of material and therefore the manufacturing and packaging costs of bottles for an equal volume of contained product.

**[0009]** Within the scope of this technical aim, an object of the present invention is to achieve the above aim with a structure which is simple, relatively easy to provide in practice, safe in use, effective in operation and relatively cheap.

**[0010]** This aim and this object are both achieved by the present multiple-dose bottle with dosage spout for products, particularly medicines, having the features set forth in the appended claims.

Brief description of the drawings

**[0011]** Further characteristics and advantages of the present invention will become apparent from the detailed description of a preferred but not exclusive embodiment of a multiple-dose bottle with dosage spout for products, particularly medicines, according to the invention, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

Figure 1 is a partially sectional front view of a multiple-dose bottle with dosage spout for products, particularly medicines, according an embodiment similar to the invention;

Figure 2 is a sectional view of the nozzle of the bottle of figure 1;

Figure 3 is a sectional view of the cap of the bottle of figure 1;

Figure 4 is a top view of the cap of figure 3;

Figure 5 is a partially sectional front view of the ring for coupling the cap and the nozzle to the bottle of figure 1;

Figure 6 is a partially sectional front view of a second possible embodiment of the bottle according to the invention;

Figure 7 is a sectional view of the nozzle of the bottle of figure 6;

Figure 8 is a sectional view of the cap of the bottle of figure 6;

Figure 9 is a partially sectional front view of the ring for coupling the nozzle and the cap to the bottle of figure 6;

Figure 10 is a partially sectional front view of a third possible embodiment of the bottle according to the invention;

Figure 11 is a schematic sectional view of a hood for closing the cap, provided with a ring and with a partial casing for supporting the bottle according to the invention;

Figure 12 is a top view of the hood of figure 11;

Figure 13 is a partially sectional front view of a fourth possible embodiment of the bottle according to the invention;

Figure 14 is a partially sectional front view of a fifth possible embodiment of the bottle according to the invention;

Figures 15, 16 and 17 are three sectional views of further, possible embodiments of a cap and of a nozzle of the bottle according wherein figures 15 and 16 refer to the invention;

Figure 18 is a perspective view of the nozzle of figure 15;

Figure 19 is a perspective view of the cap of figure 15;

Figure 20 is a top view of the cap of figure 16;

Figure 21 is a top view of the cap of figure 17.

## Ways of carrying out the Invention

**[0012]** With particular reference to the above figures, the reference numeral 1 generally designates a multiple-dose bottle for products, particularly medicines, according to the invention.

**[0013]** The multiple-dose bottle 1 is constituted by a conventional bellows-like part S, made of a material of a deformable type, and comprises a dosage spout 2 constituted by a nozzle 3 on which a cap 4 is fitted hermetically: compression of the bellows-like part S causes the liquid to seep between the nozzle 3 and the cap 4.

**[0014]** The nozzle 3 is made of substantially rigid material, is ogive-shaped and is crossed by at least one aperture 5 for the outflow of the liquid; the cap 4 is made of flexible material and has a dispensing port 6 formed at an external protrusion 7 which is substantially nipple-shaped.

**[0015]** Advantageously, the nozzle 3 and the cap 4 are both made of a material such as plastic and/or rubber and must be sterilizable, inert and impermeable to liquids.

**[0016]** In its tip region 8, proximate to the protrusion 7, the cap 4 is thinner, so as to allow the liquid to seep between the aperture 5 and the port 6.

**[0017]** The cap 4 is thicker in the intermediate region 9, so as to ensure a better hermetic clamping against the surface of the nozzle 3; said nozzle is rigidly coupled to the mouth 10 of the bottle 1, which is in turn surmounted by the base 11 of the cap 4.

**[0018]** Figures 1 to 5 illustrate a first embodiment of the bottle 1 and some of its components in detail: the nozzle 3 has two apertures 5 and the port 6 of the cap 4 is constituted by a diametrical slit 12 on the top of the protrusion 7.

**[0019]** As an alternative to the slit 12, and in a manner which is fully equivalent thereto, the port 6 might also be constituted by a star-shaped arrangement of cuts or by a capillary tube formed on the protrusion 7.

**[0020]** Conveniently, a ring 13 is secured to the base of the cap 4 and is adapted to keep the cap 4 and the nozzle 3 rigidly coupled to the mouth 10 of the bottle 1.

**[0021]** Figures 6 to 9 illustrate a second embodiment of the bottle 1, showing its main components: in this case, the nozzle 3 is provided with two apertures 5 and is axially provided with a pin 14 which is adapted to close the port 6, which in this case is constituted by a substantially circular hole 15 of the protrusion 7.

**[0022]** Figure 10 illustrates an embodiment of the bottle 1 in which a ring 16 is coupled to the mouth 10 of said bottle; said ring is connected, by conventional sealing means 17, to a hood 18 for closing the cap 4 and can be eliminated once the sealing means 17 have been removed.

**[0023]** In figure 13, the ring 16 is rigidly coupled to the mouth 10 and protrudes downwards with a partial containment body 19 which is adapted to support the bottle 1 in vertical position.

**[0024]** In the bottle 1 of figure 14, the ring 16 is internally provided with conventional means for coupling to a securing ring 13 interposed between the ring and the mouth 10.

**[0025]** Said coupling means are generally removable and are constituted by a portion which is coupled, by pressing or by interlocking, to the ring 13 or by a threaded portion which can be screwed on a correspondingly threaded portion of the ring 13.

**[0026]** Figures 15 to 21 are views of some additional possible embodiments of the nozzle 3 and of the cap 4 which are fully equivalent to one another.

**[0027]** The use of the bottle according to the invention is as follows: when inactive, the cap 4 adheres perfectly to the nozzle 3, preventing any possible external contamination and any possible outflow of liquid contained in the bottle 1.

**[0028]** During use, by applying an adapted pressure to the bellows-like part S, the end portion 8 of the cap 4 lifts off the nozzle 3 so as to allow the liquid to seep from at least one aperture 5 to the dispensing port 6.

**[0029]** Once the pressure of the bellows-like part S has ceased, the portion 8 of the cap rests again in close contact with the nozzle 3, thus closing the apertures 5 for the outflow of the liquid and simultaneously preventing the inflow of external contaminants.

**[0030]** The invention thus conceived is susceptible of numerous modifications and variations all of which are within the scope of the appended claims.

**[0031]** In practice, the materials used, as well as the shapes and the dimensions, may be any within the scope of the protection of the appended claims.

**[0032]** Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the whole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

## Claims

1. Multiple-dose bottle with dosage spout for liquid products, particularly medicines, said bottle being deformable and said spout (2) comprising: a nozzle (3) sealingly connected to said bottle (1, S) at a base part thereof and having an external surface ending with a top part, said nozzle (3) being made of substantially rigid material and being crossed, at said surface, between said base and top parts thereof, by at least one aperture (5) for the outflow of the liquid product; and a cap (4), made of flexible material, which is provided at a region thereof corresponding to said top part of the nozzle (3) with a dispensing port (6), said flexible cap (4) fitting elastically over said external surface of the nozzle (3), so as to seal at least at a region including said at

- least one aperture (5), compression of the bottle (1) causing liquid to seep between the nozzle (3) and the cap (4), said dispensing port (6) being formed at an external protrusion (7) of the cap (4) which is nipple-shaped, said nozzle being provided axially with a pin (14) adapted to close said port (6).
2. Multi-dose bottle according to claim 1, **characterized in that** said nozzle (3) is substantially ogive-shaped.
  3. Multi-dose bottle according to one or more of the preceding claims, **characterized in that** the port (6) of said cap (4) formed at said external protrusion (7) which is nipple-shaped is substantially axial.
  4. Multi-dose bottle according to one or more of the preceding claims, **characterized in that** said flexible cap (4) fitting elastically over said external surface of the nozzle (3) prevents entry of any external contaminants and forms hermetically closed seals both at said at least one aperture (5) and at said dispensing port (6), said seals being opened upon compression of the bottle (1, S), with said cap (4) swelling off said external surface, at said at least one aperture (5) and at said dispensing port (6), to allow the liquid product to seep out between the nozzle (3) and the cap (4) to said dispensing port (6), and closed when bottle compression is discontinued, with the seal at said at least one aperture (5) being restored by close contact of the cap (4) with the nozzle.
  5. Multi-dose bottle according to one or more of the preceding claims, **characterized in that** said port (6) is constituted by a diametrical slit (12) of said protrusion (7).
  6. Multi-dose bottle according to one or more of the preceding claims, **characterized in that** said port (6) is constituted by a star-shaped arrangement of cuts in said protrusion (7).
  7. Multi-dose bottle according to one or more of the preceding claims, **characterized in that** said port (6) is constituted by a capillary tube of said protrusion (7).
  8. Multi-dose bottle according to one or more of the preceding claims, **characterized in that** said port (6) is constituted by a substantially circular hole (15).
  9. Multi-dose bottle according to one or more of the preceding claims, **characterized in that** said nozzle (3) is made of a material such as plastic which can be sterilized and is inert and impermeable to liquids.
  10. Multi-dose bottle according to one or more of the preceding claims, **characterized in that** said cap (4) is made of a material such as rubber which can be sterilized and is inert and impermeable to liquids.
  11. Multi-dose bottle according to one or more of the preceding claims and as an alternative to claim 10, **characterized in that** said cap (4) is made of a material such as plastic which can be sterilized and is inert and impermeable to liquids.
  12. Multi-dose bottle according to one or more of the preceding claims, **characterized in that** said cap (4) is thinner at its end region in order to allow the liquid to seep, while it is thicker in its intermediate region in order to secure itself hermetically against the surface of the nozzle (3).
  13. Multi-dose bottle according to one or more of the preceding claims, **characterized in that** said nozzle (3) is rigidly coupled to the mouth (10) of said bottle (1) and **in that** the base (11) of said cap (4) surmounts said mouth (10).
  14. Multi-dose bottle according to one or more of the preceding claims, **characterized in that** a ring (13) for rigidly coupling the cap (4) and the nozzle (3) to said bottle (1) is secured to the base (11) of said cap (4).
  15. Multi-dose bottle according to one or more of the preceding claims, **characterized in that** a ring (16) is rigidly coupled to the mouth (10) of the bottle (1) and is connected, by removable sealing means (17), to a hood (18) for closing said cap (4).
  16. Multi-dose bottle according to one or more of the preceding claims and as an alternative to claim 15, **characterized in that** it comprises an annular ring element (16) which is internally provided with removable means for coupling to said ring (13).
  17. Multi-dose bottle according to one or more of the preceding claims, **characterized in that** said annular ring element (16) extends downwards with a partial containment body (19) for supporting said bottle (1) in vertical position.
  18. Multi-dose bottle according to claim 16, **characterized in that** said removable coupling means are constituted by a threaded portion which can be screwed on a corresponding threaded portion of said ring (13).
  19. Multi-dose bottle according to claim 16, **characterized in that** said removable coupling means are constituted by a portion which is pressure-coupled to said ring (13).

20. Multi-dose bottle according to claim 16, **characterized in that** said removable coupling means are constituted by a portion which is coupled by interlocking to said ring (13).

#### Patentansprüche

1. Mehrfachdosis-Flasche mit Dosiertülle für flüssige Produkte, insbesondere Arzneimittel, wobei die Flasche verformbar ist und die Tülle (2) Folgendes umfasst: eine Düse (3), die mit der Flasche (1, S) an ihrem unteren Teil versiegelnd verbunden ist und ein Außenflächenende mit einem oberen Teil aufweist, wobei die Düse (3) aus einem im Wesentlichen starren Material besteht und an der Fläche zwischen dem unteren und dem oberen Teil durch mindestens eine Öffnung (5) zum Heraustreten des flüssigen Produktes gekreuzt wird, eine Kappe (4) aus einem biegsamen Material in einem dem oberen Teil der Düse (3) entsprechenden Bereich mit einer Abgabeöffnung (6), wobei die biegsame Kappe (4) zum Verschließen mindestens eines Bereiches mit der mindestens einen Öffnung (5) elastisch über die Außenfläche der Düse (3) passt, wobei das Zusammendrücken der Flasche (1) bewirkt, dass die Flüssigkeit zwischen der Düse (3) und der Kappe (4) heraussickert, die Abgabeöffnung (6) an einem nippelförmigen externen Vorsprung (7) der Kappe (4) ausgebildet ist und die Düse axial mit einer zum Schließen der Öffnung (6) angepassten Nadel (14) versehen ist.
2. Mehrfachdosis-Flasche nach Anspruch 1, **dadurch gekennzeichnet, dass** die Düse (3) im Wesentlichen spitzkegelig ist.
3. Mehrfachdosis-Flasche nach einem oder mehreren der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** die Öffnung (6) der Kappe (4) an dem nippelförmigen externen Vorsprung (7) im Wesentlichen axial ist.
4. Mehrfachdosis-Flasche nach einem oder mehreren der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** die biegsame Kappe (4), die elastisch über die Außenfläche der Düse (3) passt, das Eindringen äußerer Verunreinigungen verhindert und hermetisch verschlossene Versiegelungen zwischen mindestens einer Öffnung (5) und der Abgabeöffnung (6) bildet, wobei die Versiegelungen beim Zusammendrücken der Flasche (1, S) geöffnet werden und die Kappe (4) an der mindestens einen Öffnung (5) und der Abgabeöffnung (6) von der Außenfläche weg schwillt, damit das flüssige Produkt zwischen der Düse (3) und der Kappe (4) in die Abgabeöffnung (6) sickern kann, und geschlossen werden, wenn das Zusammendrücken

der Flasche beendet ist, wobei die Versiegelung an der mindestens einen Öffnung (5) durch den engen Kontakt der Kappe (4) mit der Düse wiederhergestellt wird.

5. Mehrfachdosis-Flasche nach einem oder mehreren der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** die Öffnung (6) durch einen diametralen Schlitz (12) des Vorsprungs (7) gebildet ist.
6. Mehrfachdosis-Flasche nach einem oder mehreren der vorangegangenen Ansprüche; **dadurch gekennzeichnet, dass** die Öffnung (6) durch eine sternförmige Anordnung von Schnitten in dem Vorsprung (7) gebildet ist.
7. Mehrfachdosis-Flasche nach einem oder mehreren der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** die Öffnung (6) durch ein Kapillarrohr des Vorsprungs (7) gebildet ist.
8. Mehrfachdosis-Flasche nach einem oder mehreren der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** die Öffnung (6) durch ein im Wesentlichen kreisförmiges Loch (15) gebildet ist.
9. Mehrfachdosis-Flasche nach einem oder mehreren der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** die Düse (3) aus einem Material wie z.B. Kunststoff gebildet ist, das sterilisiert werden kann, inert und für Flüssigkeiten undurchlässig ist.
10. Mehrfachdosis-Flasche nach einem oder mehreren der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** die Kappe (4) aus einem Material wie z.B. Gummi gebildet ist, das sterilisiert werden kann, inert und für Flüssigkeiten undurchlässig ist.
11. Mehrfachdosis-Flasche nach einem oder mehreren der vorangegangenen Ansprüche und als Alternative zu Anspruch 10, **dadurch gekennzeichnet, dass** die Kappe (4) aus einem Material wie z.B. Kunststoff gebildet ist, das sterilisiert werden kann, inert und für Flüssigkeiten undurchlässig ist.
12. Mehrfachdosis-Flasche nach einem oder mehreren der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** die Kappe (4) in ihrem Endabschnitt dünner ist, damit die Flüssigkeit heraussickern kann, wohingegen sie in ihrem Mittelabschnitt dicker ist, damit sie gegen die Oberfläche der Düse (3) hermetisch verschlossen ist.
13. Mehrfachdosis-Flasche nach einem oder mehreren der vorangegangenen Ansprüche, **dadurch ge-**

**kennzeichnet, dass** die Düse (3) mit der Flaschenöffnung (10) der Flasche (1) starr gekoppelt ist und die Basis (11) der Kappe (4) über die Flaschenöffnung (10) hinausragt.

14. Mehrfachdosis-Flasche nach einem oder mehreren der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** ein Ring (13) zum starren Koppeln der Kappe (4) und der Düse (3) an die Flasche (1) an der Basis (11) der Kappe (4) befestigt ist.

15. Mehrfachdosis-Flasche nach einem oder mehreren der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** ein Ring (16) an die Flaschenöffnung (10) der Flasche (1) starr gekoppelt ist und über entfernbare Versiegelungsmittel (17) mit einer Blende (18) zum Schließen der Kappe (4) verbunden ist.

16. Mehrfachdosis-Flasche nach einem oder mehreren der vorangegangenen Ansprüche und als Alternative zu Anspruch 15, **dadurch gekennzeichnet, dass** sie ein ringförmiges Ringelement (16) umfasst, das innen mit entfernbaren Mitteln zum Koppeln des Ringes (13) versehen ist.

17. Mehrfachdosis-Flasche nach einem oder mehreren der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** sich das ringförmige Ringelement (16) mit einem Teileinschlusskörper (19) zum Abstützen der Flasche (1) in vertikaler Position nach unten erstreckt.

18. Mehrfachdosis-Flasche nach Anspruch 16, **dadurch gekennzeichnet, dass** die entfernbaren Kopplungsmittel durch einen Gewindeabschnitt gebildet sind, der auf einen entsprechenden Gewindeabschnitt des Ringes (13) ausgeschraubt werden kann.

19. Mehrfachdosis-Flasche nach Anspruch 16, **dadurch gekennzeichnet, dass** die entfernbaren Kopplungsmittel durch einen Abschnitt gebildet sind, der mittels Druck an den Ring (13) gekoppelt wird.

20. Mehrfachdosis-Flasche nach Anspruch 16, **dadurch gekennzeichnet, dass** die entfernbaren Kopplungsmittel durch einen Abschnitt gebildet sind, der durch Verzahnung an den Ring (13) gekoppelt wird.

## Revendications

1. Flacon distributeur de doses multiples comprenant un bec doseur pour des produits liquides, en parti-

culier des médicaments, ledit flacon étant déformable et ledit bec (2) comprenant : une buse (3) connectée de manière hermétique audit flacon (1, S) sur une partie inférieure de celui-ci, et présentant une surface externe se terminant par une partie supérieure, ladite buse (3) étant réalisée dans un matériau sensiblement rigide et étant traversée, sur ladite surface, entre lesdites parties inférieure et supérieure de celui-ci, par au moins une ouverture (5) pour l'écoulement du produit liquide ; et un capuchon (4), réalisé dans un matériau flexible, qui est équipé sur une région de celui-ci correspondant à ladite partie supérieure de la buse (3) d'un orifice de distribution (6), ledit capuchon flexible (4) s'ajustant de manière élastique au-dessus de ladite surface externe de la buse (3), de manière à se sceller au moins sur une région comprenant au moins l'une des ouvertures (5), la compression du flacon (1) faisant suinter le liquide entre la buse (3) et le capuchon (4), ledit orifice de distribution (6) étant formé sur une protubérance (7) externe du capuchon (4) qui est en forme de mamelon, ladite buse étant équipée dans le sens axial d'une goupille (14) adaptée pour fermer ledit orifice (6).

2. Flacon distributeur de doses multiples selon la revendication 1, **caractérisé en ce que** ladite buse (3) est sensiblement en forme d'ogive.

3. Flacon distributeur de doses multiples selon l'une ou plusieurs des revendications précédentes, **caractérisé en ce que** l'orifice (6) dudit capuchon (4) formé sur ladite protubérance (7) externe qui est en forme de mamelon est sensiblement axial.

4. Flacon distributeur de doses multiples selon l'une ou plusieurs des revendications précédentes, **caractérisé en ce que** ledit capuchon (4) flexible s'ajustant de manière élastique au-dessus de ladite surface externe de la buse (3) empêche la pénétration d'un contaminant externe quelconque et forme des joints hermétiquement fermés à la fois sur l'une desdites ouvertures (5) et sur ledit orifice de distribution (6), lesdits joints étant ouverts lors de la compression du flacon (1, S), ledit capuchon (4) gonflant pour sortir de ladite surface externe, sur au moins l'une desdites ouvertures (5) et sur ledit orifice de distribution (6), pour permettre au produit liquide de suinter entre la buse (3) et le capuchon (4) vers ledit orifice de distribution (6), et fermé lorsque la compression du flacon s'arrête, le joint sur une desdites ouvertures (5) étant rétabli par le contact étroit du capuchon (4) avec la buse.

5. Flacon distributeur de doses multiples selon l'une ou plusieurs des revendications précédentes, **caractérisé en ce que** ledit orifice (6) est constitué par une fente (12) diamétrale de ladite protubérance.

- ce (7).
6. Flacon distributeur de doses multiples selon l'une ou plusieurs des revendications précédentes, **caractérisé en ce que** ledit orifice (6) est constitué par un agencement en forme d'étoile d'entailles dans ladite protubérance (7). 5
  7. Flacon distributeur de doses multiples selon l'une ou plusieurs des revendications précédentes, **caractérisé en ce que** ledit orifice (6) est constitué par un tube capillaire de ladite protubérance (7). 10
  8. Flacon distributeur de doses multiples selon l'une ou plusieurs des revendications précédentes, **caractérisé en ce que** ledit orifice (6) est constitué par un trou (15) sensiblement circulaire. 15
  9. Flacon distributeur de doses multiples selon l'une ou plusieurs des revendications précédentes, **caractérisé en ce que** ladite buse (3) est réalisée dans un matériau tel que du plastique qui peut être stérilisé et est inerte et imperméable aux liquides. 20
  10. Flacon distributeur de doses multiples selon l'une ou plusieurs des revendications précédentes, **caractérisé en ce que** ledit capuchon (4) est réalisé dans un matériau tel que du caoutchouc qui peut être stérilisé et est inerte et imperméable aux liquides. 25
  11. Flacon distributeur de doses multiples selon l'une ou plusieurs des revendications précédentes, et en variante de la revendication 10, **caractérisé en ce que** ledit capuchon (4) est réalisé dans un matériau tel que du plastique qui peut être stérilisé et est inerte et imperméable aux liquides. 30
  12. Flacon distributeur de doses multiples selon l'une ou plusieurs des revendications précédentes, **caractérisé en ce que** ledit capuchon (4) est plus mince sur sa région d'extrémité afin de permettre au liquide de suinter, tandis qu'il est plus épais dans sa région intermédiaire, afin de se fixer de manière hermétique contre la surface de la buse (3). 35 40 45
  13. Flacon distributeur de doses multiples selon l'une ou plusieurs des revendications précédentes, **caractérisé en ce que** ladite buse (3) est rigidement couplée à l'embouchure (10) dudit flacon (1) et **en ce que** la base (11) dudit capuchon (4) surmonte ladite embouchure (10). 50
  14. Flacon distributeur de doses multiples selon l'une ou plusieurs des revendications précédentes, **caractérisé en ce qu'une** bague (13) pour coupler rigidement le capuchon (4) et la buse (3) audit flacon (1) est fixée à la base (11) dudit capuchon (4). 55
  15. Flacon distributeur de doses multiples selon l'une ou plusieurs des revendications précédentes, **caractérisé en ce qu'une** bague (16) est couplée rigidement à l'embouchure (10) du flacon (1) et est connectée, par des moyens formant joint amovibles (17), à un capot protecteur (18) pour fermer ledit capuchon (4).
  16. Flacon distributeur de doses multiples selon l'une ou plusieurs des revendications précédentes et en variante de la revendication 15, **caractérisé en ce qu'il** comprend un élément de bague annulaire (16) qui est équipé dans sa partie intérieure de moyens amovibles pour le couplage à ladite bague (13).
  17. Flacon distributeur de doses multiples selon l'une ou plusieurs des revendications précédentes, **caractérisé en ce que** ledit élément de bague annulaire (16) s'étend vers le bas avec un corps de confinement partiel (19) pour soutenir ledit flacon (1) en position verticale.
  18. Flacon distributeur de doses multiples selon la revendication 16, **caractérisé en ce que** lesdits moyens de couplage amovibles sont constitués par une partie filetée, qui peut être vissée sur une partie filetée correspondante de ladite bague (13).
  19. Flacon distributeur de doses multiples selon la revendication 16, **caractérisé en ce que** lesdits moyens de couplage amovibles sont constitués par une partie qui est couplée par pression à ladite bague (13).
  20. Flacon distributeur de doses multiples selon la revendication 16, **caractérisé en ce que** lesdits moyens de couplage amovibles sont constitués par une partie qui est couplée par l'enclenchement avec ladite bague (13).

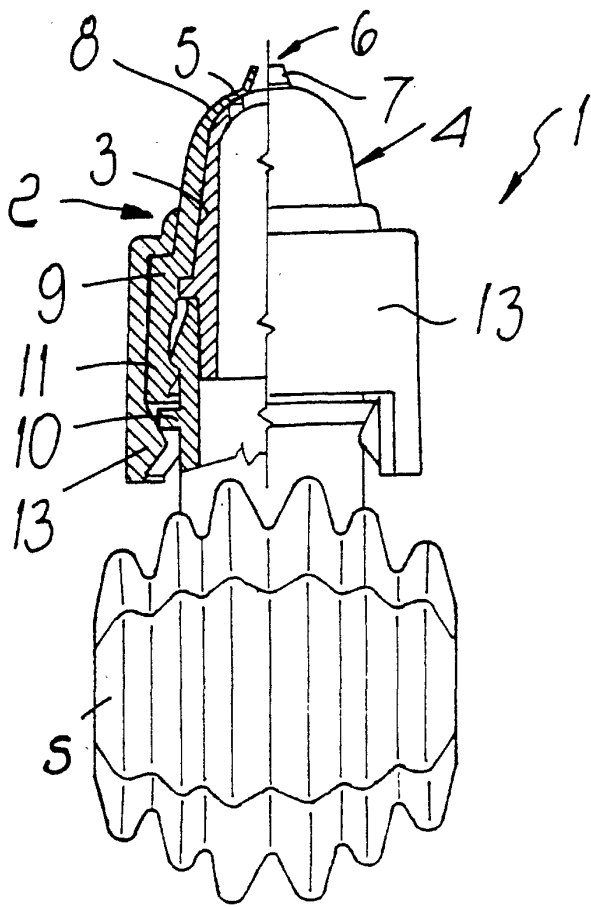


Fig. 1

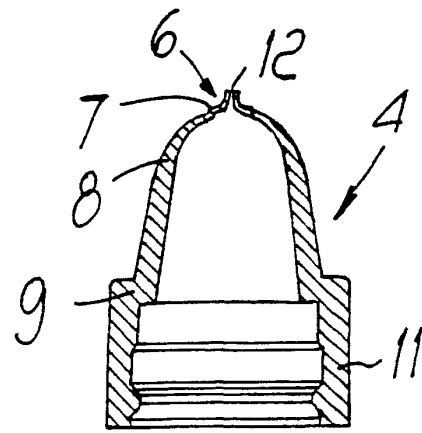


Fig. 3

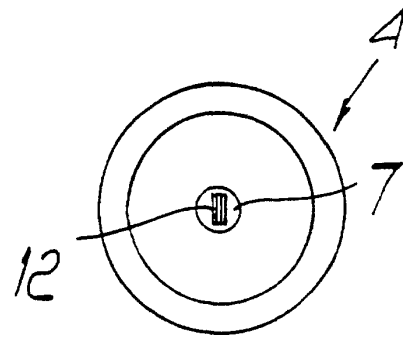


Fig. 4

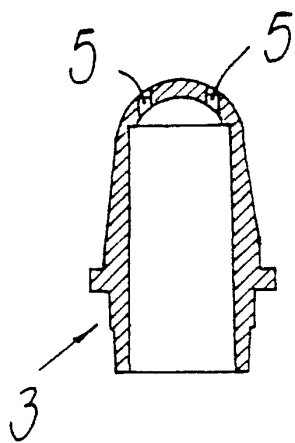


Fig. 2

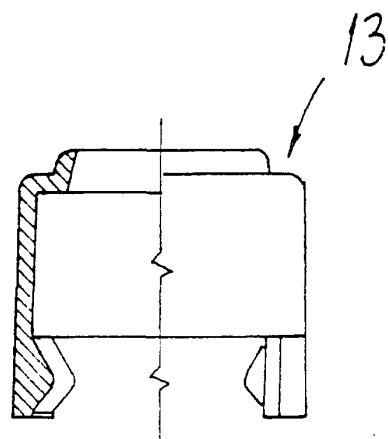


Fig. 5



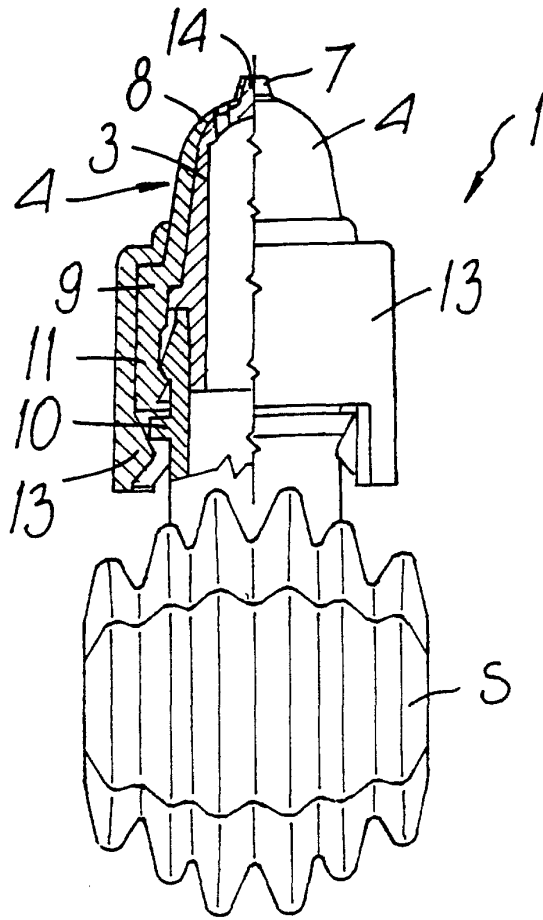


Fig. 6

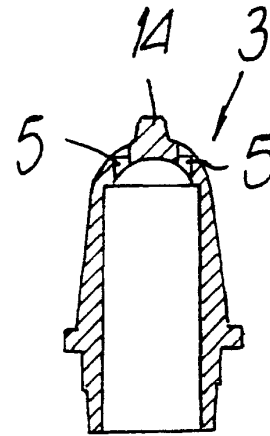


Fig. 7

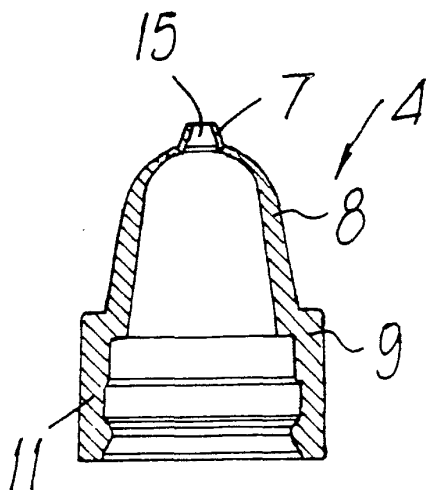


Fig. 8

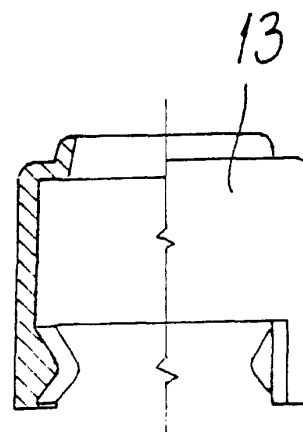


Fig. 9

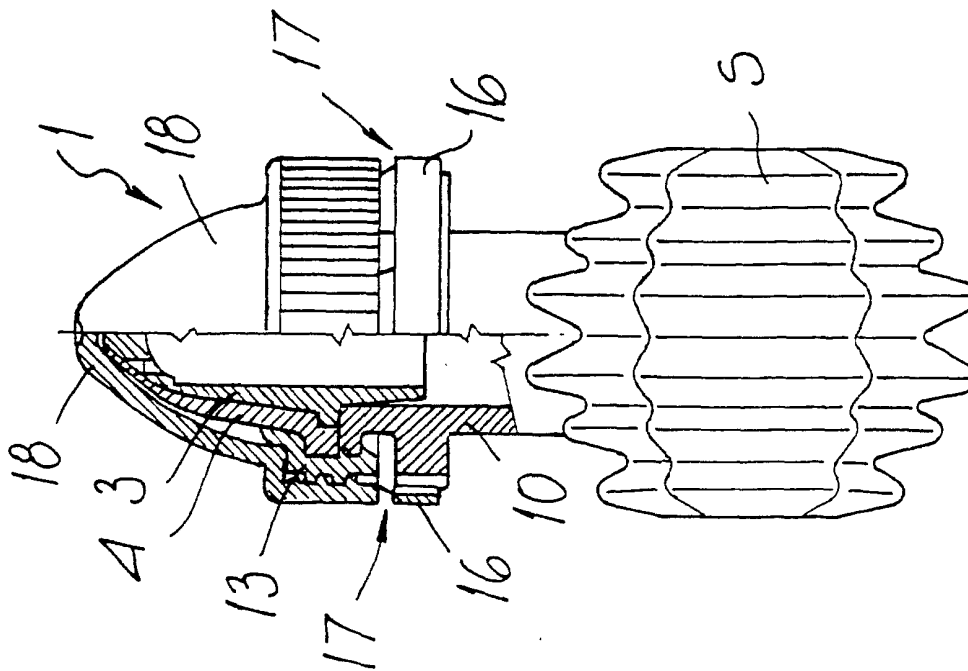


Fig. 10

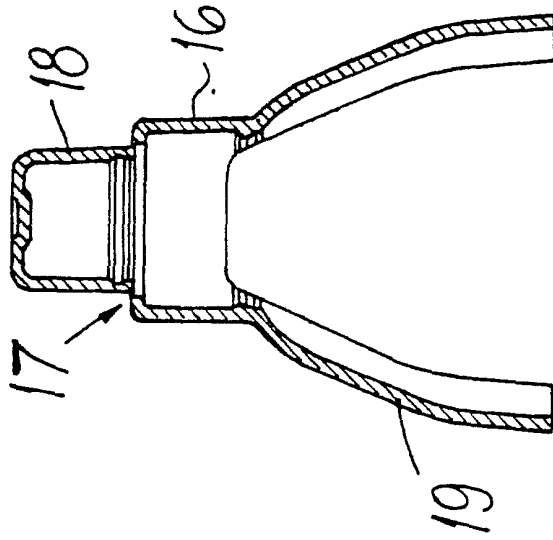


Fig. 11

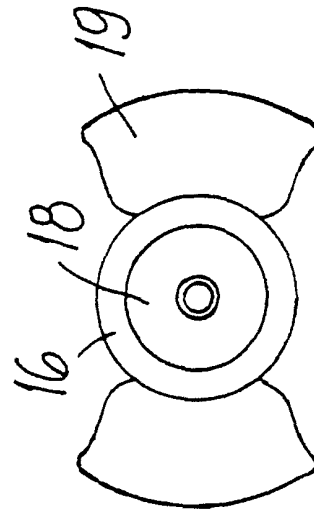


Fig. 12

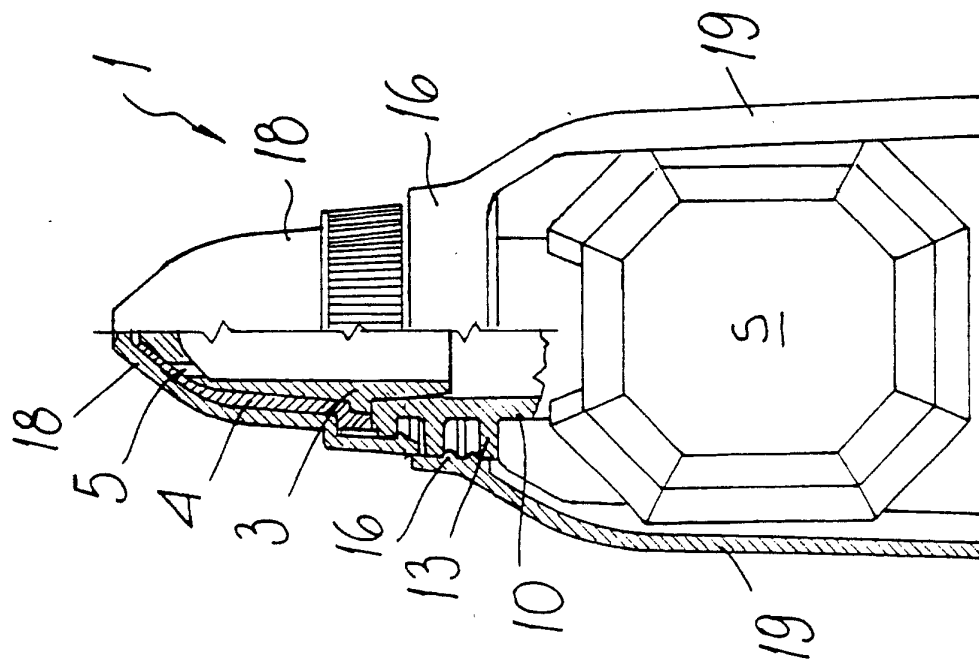


Fig. 13

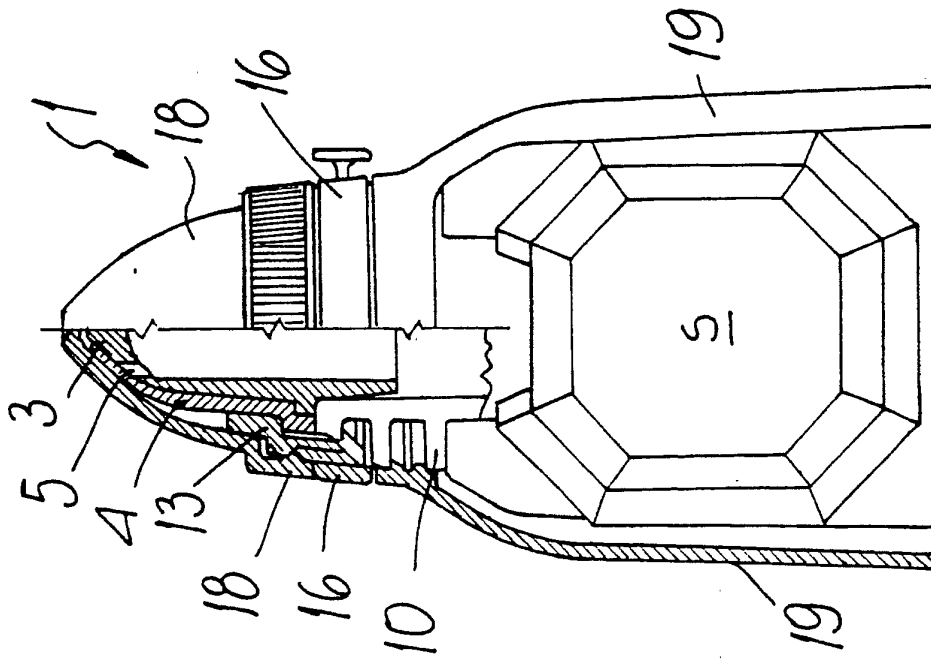


Fig. 14

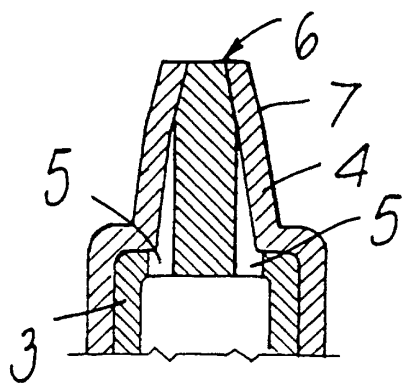


Fig. 15

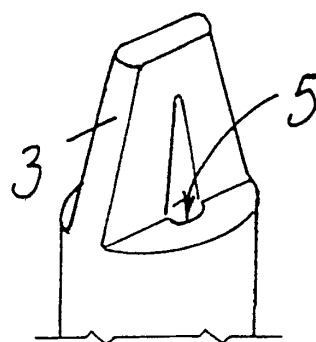


Fig. 18

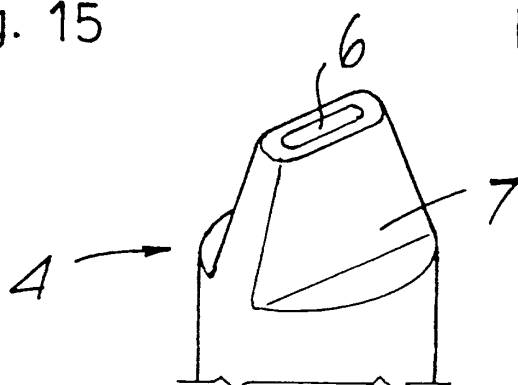


Fig. 19

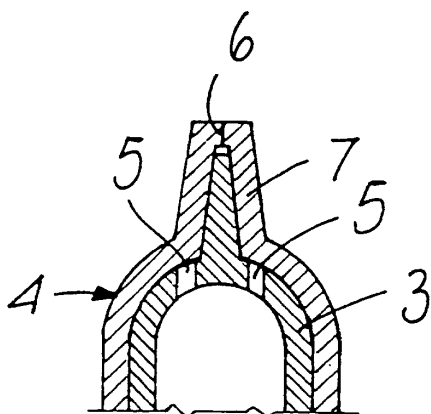


Fig. 16

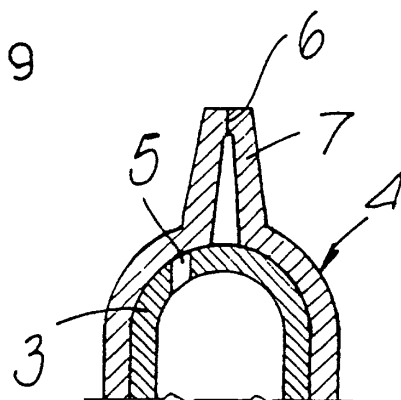


Fig. 17

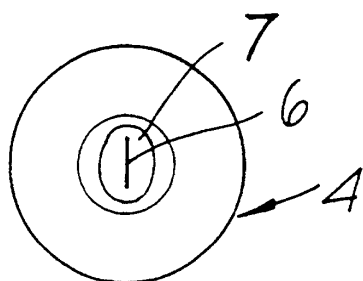


Fig. 20

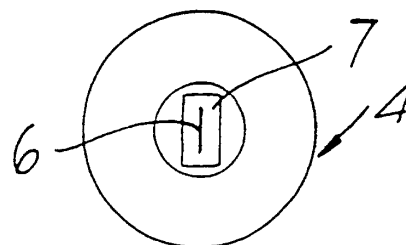


Fig. 21