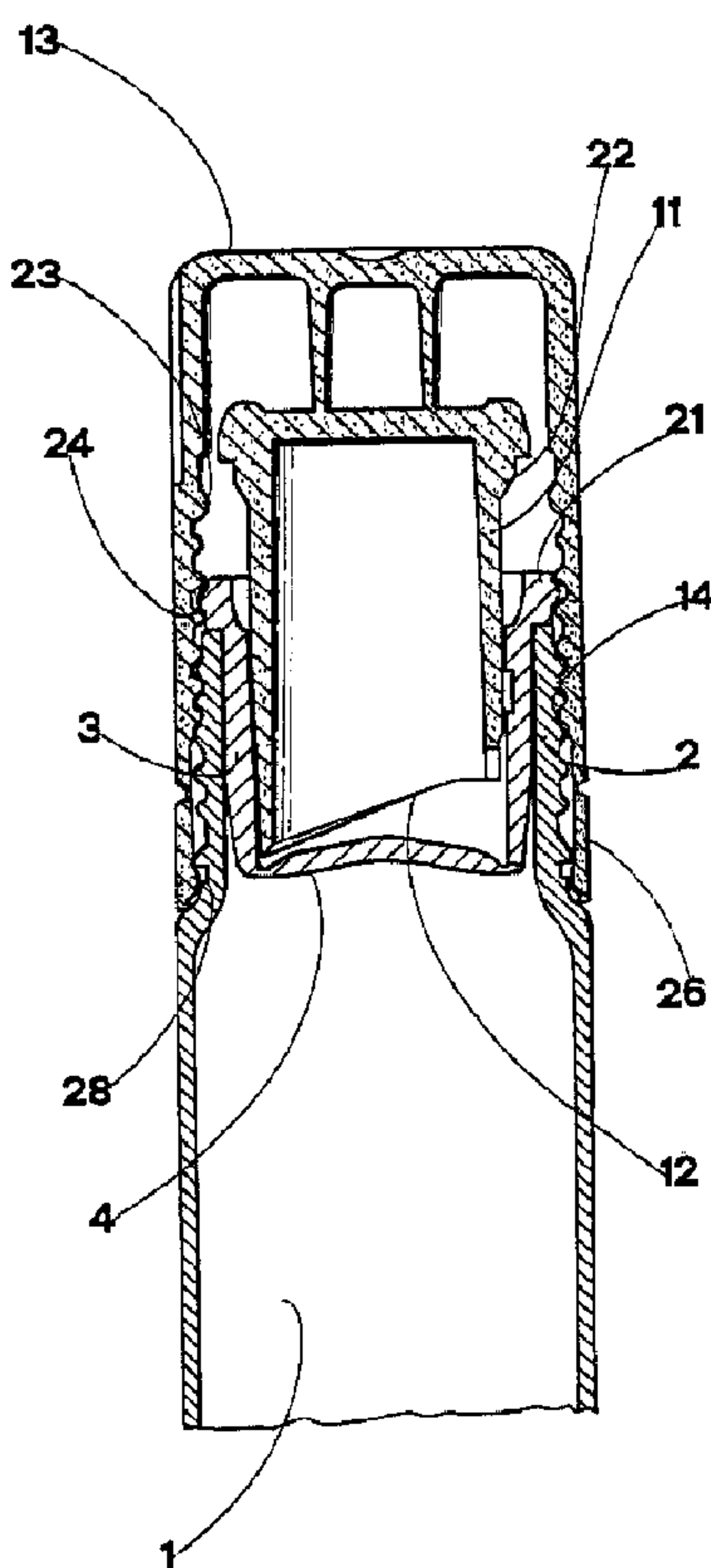




(86) Date de dépôt PCT/PCT Filing Date: 1997/09/10
 (87) Date publication PCT/PCT Publication Date: 1998/09/03
 (45) Date de délivrance/Issue Date: 2006/08/08
 (85) Entrée phase nationale/National Entry: 1999/07/29
 (86) N° demande PCT/PCT Application No.: IT 1997/000222
 (87) N° publication PCT/PCT Publication No.: 1998/038104
 (30) Priorité/Priority: 1997/02/28 (ITMO97A000029)

(51) Cl.Int./Int.Cl. *B65D 51/28* (2006.01)
 (72) Inventeur/Inventor:
MORINI, EMILIO, IT
 (73) Propriétaire/Owner:
BORMIOLI ROCCO & FIGLIO S.P.A., IT
 (74) Agent: SHAPIRO COHEN

(54) Titre : EMBALLAGE PERMETTANT DE MAINTENIR SEPARÉS LES PRODUITS AVANT UTILISATION
 (54) Title: A PACKAGE FOR KEEPING PRODUCTS SEPARATE BEFORE USE



(57) Abrégé/Abstract:

A package for keeping products separate until use comprises a container (1) provided with an upper mouth (2) inside which a capsule (3) is inserted; the capsule having a bottom (4) which is destined at the moment of use of the package to be broken by a cutting element (11). A cap (13) covers the capsule (3) and the cutting element (11), and is screwed on a sleeve (6) solidly constrained to the capsule (3). When a security strip (16) is removed the cap (13) can be screwed, placing a pressure on the cutting element (11) which causes the capsule (3) to be ruptured and a product contained therein to mix with a product contained in the container.



PCT

WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

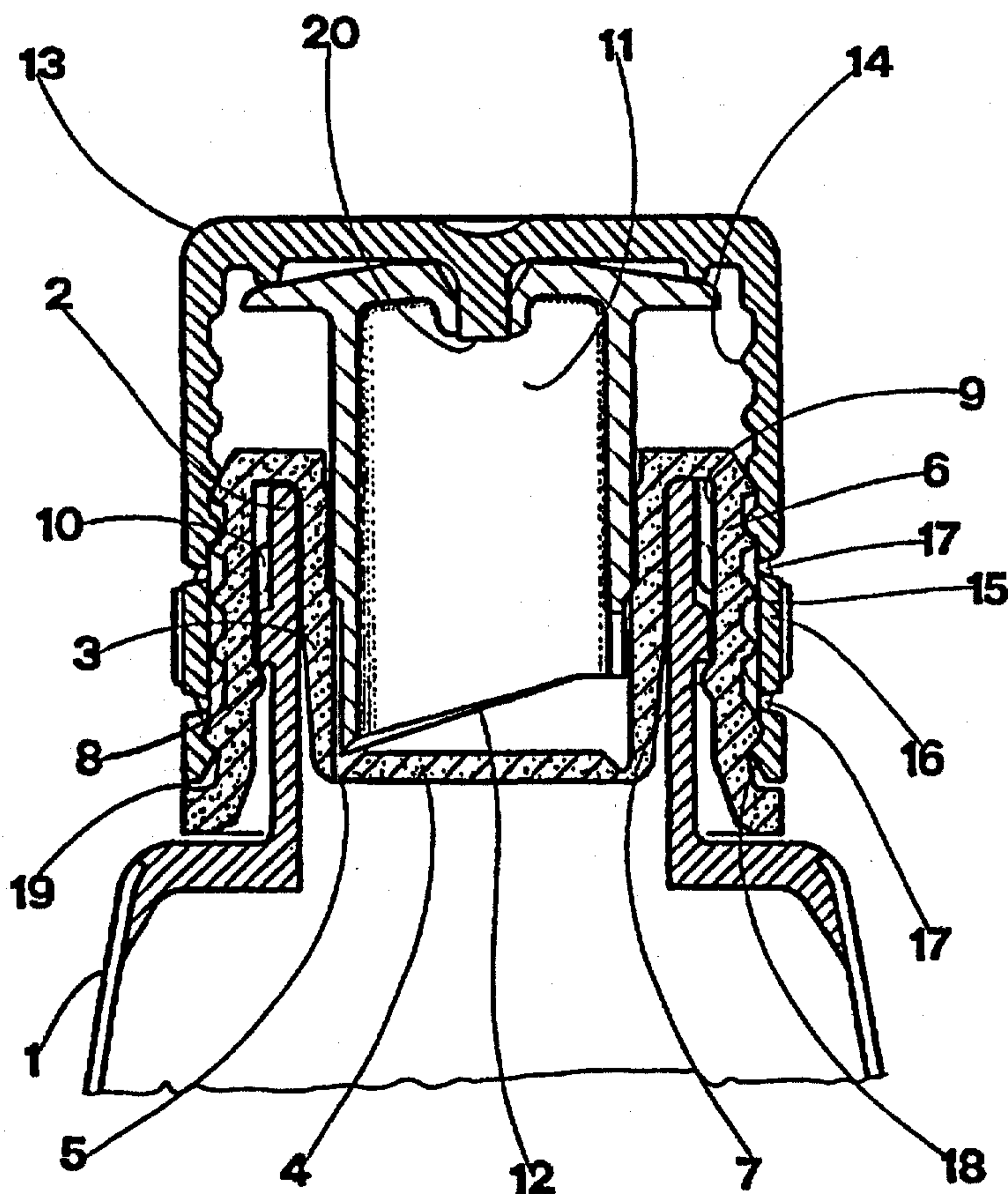
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : B65D 51/28	A1	(11) International Publication Number: WO 98/38104 (43) International Publication Date: 3 September 1998 (03.09.98)
<p>(21) International Application Number: PCT/IT97/00222</p> <p>(22) International Filing Date: 10 September 1997 (10.09.97)</p> <p>(30) Priority Data: MO97A000029 28 February 1997 (28.02.97) IT</p> <p>(71) Applicant (for all designated States except US): BORMIOLI ROCCO & FIGLIO S.P.A. [IT/IT]; Via San Leonardo, 41, I-43100 Parma (IT).</p> <p>(72) Inventor; and (75) Inventor/Applicant (for US only): MORINI, Emilio [IT/IT]; Via A. Moro, 35, I-43052 Colomo (IT).</p> <p>(74) Agent: NERI, Luciano; Bugnion S.p.A., Via Emilia Est, 25, I-41100 Modena (IT).</p>	<p>(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).</p> <p>Published With international search report.</p>	

(54) Title: A PACKAGE FOR KEEPING PRODUCTS SEPARATE BEFORE USE

(57) Abstract

A package for keeping products separate until use comprises a container (1) provided with an upper mouth (2) inside which a capsule (3) is inserted; the capsule having a bottom (4) which is destined at the moment of use of the package to be broken by a cutting element (11). A cap (13) covers the capsule (3) and the cutting element (11), and is screwed on a sleeve (6) solidly constrained to the capsule (3). When a security strip (16) is removed the cap (13) can be screwed, placing a pressure on the cutting element (11) which causes the capsule (3) to be ruptured and a product contained therein to mix with a product contained in the container.



179P231CA

A PACKAGE FOR KEEPING PRODUCTS SEPARATE BEFORE USETechnical Field

The invention relates to a package for keeping products separate before use. For some
5 time now the market has offered medicines packaged in two separate phases: the first of
the medicines is a powder, while the second is a liquid, and they have to be kept
separate until the moment of use. Packages for such medicinal mixtures comprise a
container for the liquid and a capsule for the powders, which are set in communication
just before use so that they can mix.

10

Background Art

One of the packages of the above-described type on the market is provided with a
cutting element which by means of a pressure applied thereto inserts into the liquid
15 container, which is closed off by a thin membrane; the cutting element ruptures the
membrane so that the powders can penetrate into the container. A package of this type
is described, for example, in Italian patent for industrial invention no. 1,066,140,
wherein the cutting element is in fact a hollow cylinder with an oblique-section end,
made in a single piece with walls which close the mouth of the container. This package
20 exhibits a lateral strip, removable by tugging along two easy-break parallel lines
exhibiting a tab-pull; the user can grip this strip, the removal of which enables the
cutting element to make an axial movement. When it is desired to mix the powder with
the liquid solvent, the strip must first be removed and then the cutting element pressed
25 using a finger so that the bottom of the little powder container is ruptured and the
powders can mix with the liquid.

Another prior-art package comprises a protection hood, which covers the cutting
element and the powder container and which is destined to be removed by tearing at the
moment of use in order that the cutting element can be pressed.

30

179P231CA

The prior art comprises US 4,982,875 which discloses a package comprising a capsule inserted internally of the upper mouth of the container. The capsule is superiorly open and is separated from the inside of the container. The capsule has a breakable bottom. A rupturing of the bottom setting the capsule in communication with the inside of the container. A cutting element is inserted internally of the capsule. The cutting element has a bottom end destined in use to break the bottom of the capsule. A cap is arranged on the container in such a way as to cover the capsule and the cutting element. The cap exhibits a thread with which a screw-coupling is achieved, by means of which coupling the cap can move axially downwards with respect to the container. The axial downward movement causes the cap to interact with the cutting element in order to rupture the bottom of the capsule.

The prior-art packages contain some drawbacks.

15 Firstly, in order to avoid a deterioration of the powder quality, the coupling between the external surface of the cutting element and the internal surface of the powder container must be sealed to guarantee a hermetic seal on the container. However, the correct realisation of such coupling is especially difficult to achieve, inasmuch as if the coupling is too tight, a strong pressure will have to be applied to the cutting element, which is not only hard to do but can cause the user to perform the operation wrongly, i.e. not by pressing with a finger on the cap-capsule but by tipping up the package and pressing the cap against a solid surface. This can mean that the mixture is not obtained in the correct manner, as the powder does not fall directly into the liquid but vice-versa, leading to the formation of lumps which are difficult to remove from the cap-capsule. Thus a wrong mixture of the medicine is obtained.

In series production of plastic objects at industrial levels it is quite difficult to obtain size tolerances which would guarantee a constantly correct and desired connection between the cutting element and the cap-capsule.

30

179P231CA

A further problem in prior-art packages is as follows: at the moment of use, after the mixing phase of the substances (powders and liquid), the container is opened to allow the mixture to be removed. The powder container, which stays in the mouth of the container even after the cap has been extracted, represents an obstacle which can disturb
5 the pouring-out of the mixture, making it irregular and discontinuous.

Disclosure of Invention

An aim of the present invention is to eliminate the above-described drawbacks by
10 providing a package, simple in construction and economical, which guarantees the seal and security of the package before use and which enables the package to be opened simply and practically.

The invention allows the powder container to be set in communication with the liquid
15 container by means of a simple screwing operation of the former on to the latter, requiring only a small effort on the part of the consumer, who, among other things, will not upturn the package in order to break the bottom of the cap-capsule and so will avoid the problem of lump-formation and the like.

20 In one aspect, the present invention provides a package for keeping products separate before use, comprising: a container provided with an upper mouth; a capsule inserted internally of the mouth of the container, superiorly open, an inside of the capsule being separated from an inside of the container, the capsule being provided with a breakable
25 bottom, a rupturing of said breakable bottom setting said capsule in communication with the inside of the container; a cutting element inserted internally of said capsule, provided with a bottom end destined in use to break the bottom of the capsule; a cap arranged on the container in such a way as to cover the capsule and the cutting element; wherein the cap exhibits a thread with which a screw coupling is achieved, by means of
30 that said axial downward movement causes the cap to interact with the cutting element

179P231CA

in order to rupture the bottom of the capsule; characterized in that the cap internally exhibits a projection destined, by effect of said downward axial movement of the cap, to engage in an upper part of the capsule which is elastically deformable in an internalwise direction, such as to constrain the cap to the capsule in upward axial movements for
5 extraction from the container.

Also, at the moment of use and after the mixture has been united, the powder-container can be removed from the mouth of the container together with the cap and the cutting element, so leaving the container mouth free of obstruction.

10

An advantage of the invention is that it provides a package which is easily realisable and which is safe from liquid-permeation and which guarantees that the cap cannot be removed from the container until after the mixture of the two products has been obtained.

15

The above aims and others besides are all attained with the package of the invention, as it is characterised in the claims that follow.

Further characteristics and advantages of the present invention will better emerge from
20 the detailed description that follows of a preferred but non-exclusive embodiment of the invention, illustrated purely by way of non-limiting example in the accompanying figures of the drawings, in which:

figure 1 is a vertical elevation of an embodiment of the package;

figure 2 is a section made according to line II-II of figure 1;

25 figure 3 is the section of figure 2 with the package in a different configuration in which the products, separated previously, are now in communication;

figure 4 is the package of figure 3 with the cap detached from the container. The package of the invention comprises a container 1, provided with an upper mouth 2, internally of which a superiorly-open capsule 3 is inserted slightly tight. The side
30 surfaces of both the capsule 3 and the mouth 2, set in contact at the moment of

179P231CA

packaging, guarantee a perfect seal against any possible leaking of the liquid from the container 1. The capsule 3 comprises a bottom 4 which is easily breakable along a peripheral easy-break line. The bottom 4 of the capsule 3 separates the liquid present in the container 1 from the capsule 3 itself. When the bottom 4 is ruptured the capsule 3 is
5 set in communication with the inside of the container 1.

A cutting element 11, having the shape of a hollow cylindrical body, is predisposed internally of the capsule 3. The external surface of the cutting element 11 is coupled by slight sealing friction with the internal surface of the capsule 3. The lower end 12 of the
10 cutting element 11 is sharpened inasmuch as it exhibits an oblique section, which pointed lower end 12 is destined in use to break through the capsule 3 by means of an applied pressure. Figure 3 shows the package with the capsule 3 broken through by the cutting element 11 and set in communication with the inside of the container 1.

15 The package further comprises a cap 13 arranged on the container 1 in such a way as to cover the capsule 3 and the cutting element 11.

The various elements composing the package are made of plastic for medicinal use, of known type and in common use.

20

Figures 1 and 2 show the package before use, with the liquid (the solvent) in the container separated from the powder (the solute) in the capsule 3.

The cap 13 is screw-coupled directly on a thread 25 predisposed on the neck of the
25 container 1.

The capsule 3 exhibits an upper part 21 situated above the upper margin of the mouth of the container 1. The internal diameter of the upper part 21 of the capsule 3 is greater than the external diameter of the cutting element 11 inserted sealedly in the capsule 3.
30 In the assembled configuration of figure 2 (before use) the upper part 21 of the capsule

179P231CA

3 can thus be elastically deformed inwardly. The cutting element 11 exhibits a tract
22 which in use (when the package is to be used) is destined to contact the internal
surface of the upper part 21 of the capsule, so as to prevent said upper part 21 from
being deformed inwardly. An annular projection 23 internal of the cap 13 exhibits an
5 internal diameter which is smaller than the internal diameter of the thread 14. During
the downwards axial movement of the capsule 13, this annular projection 23 is destined
to engage in an annular recess afforded on the upper part 21 of the capsule 3 so as to
constrain the cap 13 and the capsule 3 one to the other in axial upward movement, with
which the cap 3 is extracted from the container 1.

10

Figures 1 and 2 illustrate the package before use.

The package exhibits a breakable ring 26 coaxially circling the container 1 and situated
below the cap 13. The cap 13 and the ring 26 are united by means of easy-break
15 perimeter ribs 27. The ring 26, which has the task of guaranteeing the security of the
package, comprises an annular relief 28 coupled with the container 1 in such a way as to
prevent or limit axial raising movements of the cap 13. The easy-break ring 26 resists
attempts to unscrew and therefore raise the cap 13 (that is, to distance it from the ring
26), while it breaks easily when the cap 13 is lowered. The ring 26 further exhibits an
20 easy-break axial line 29 along which the ring 26 can be opened. In figures 1 and 2 the
ring 26 is still unbroken. Figure 3 illustrates the ring 26 open along the axial line 29
and detached from the cap 13.

At the moment of use the ring 26 detaches from the cap 13 and opens by screwing the
25 cap 13 (figure 3). During the screwing-up operation, the cap 13 interacts contactingly
with the cutting element 11 so that the latter is pressed downwards, breaking the bottom
of the capsule. During this phase the upper annular part 21 of the capsule is deformed
inwardly, bringing the internal projection 23 of the cap 13 to engage elastically in the
recess 24 on the upper part 21 of the capsule. This is made possible by the fact that
30 between the elastically-deformable upper annular part 21 of the capsule 3 and the

179P231CA

external surface of the cutting element 11 there is a free space. At the end of the cap 13 screwing operation this free space no longer exists, since the above-mentioned tract 22 of cutting element 11 is in contact with the upper part 21 of the capsule. In the subsequent unscrewing phase of the cap 13 the capsule 3, made solid to the cap thanks to the coupling between the projection 23 and recess 24, is raised together with the cutting element 11. During the unscrewing phase the upper tract 22 of the capsule 3 can no longer deform inwardly - as in the screwing phase - since it is forced into contact between the tract 22 of cutting element 11 and the cap 13. The tract 22 of cutting element 11 having the greater diameter has thus the task of keeping the capsule 3 and the cap 13 solidly together during the extraction phase from the container 1.

On packaging, the liquid is poured into the container 1; the powder is placed in the capsule 3 which is then closed by the cutting element 11 with a hermetic and waterproof seal. The assembly is then inserted into the mouth 2 of the container 1. Subsequently the cap 13 is inserted; this is done in such a way that the annular relief 28 is constrained in the annular cavity afforded on the perimeter of the container 1. In this first conformation of the package, illustrated in figures 1 and 2, the conformation in which the package is sold, the cap 13 is solidly anchored to the container 1 and is partially screwed on the container itself. The cap 13 thus has a first function of preventing fraudulent access to the package and handling of the contents of the capsule 3 and the container 1. As has been described, at the moment of use the ring 26 is broken, so that the cap 13 is constrained to the container 1 only by the thread coupling.

The capsule 3 is placed in communication with the container 1 by simply rotating the cap 13, upon which the powders exit and mix with the liquid contents of the container 1. As in other known-type packages, a striker is provided to prevent the cutting element 11 from falling into the container 1. On completion of the cap 13 screwing operation the annular projection 23 is inserted into the annular recess 24 afforded on the upper part 21 of the capsule 3.

30

179P231CA

The second function of the cap 13 is to ensure that the above-described operation requires only a minimum effort on the part of the user, who will have no difficulty in performing the mixing operation, as he or she will only have to screw the cap 13. In the second configuration of the package, illustrated in figure 3, the cap 13 is still solidly anchored, thanks to the projection 23 and the recess 24, to the capsule 3 and is free of the container 1, apart, obviously, from the screw coupling.

It is now possible and indeed extremely easy to open the container 1; it is sufficient to unscrew the cap 13, which, translating axially upwards, draws the capsule 3 and the cutting element 11 both constrained thereto. This situation, in which the container 1 is accessible and contains the medicinal substance already mixed, is illustrated in figure 4.

The package has been described with reference to the pharmaceutical field, but can be used in other fields besides, for example cosmetics, chemistry, food and others, wherever it is necessary to commercialize substances, not necessarily powders and liquids as described herein, but any substances which have to be kept apart until the moment of use.

179P231CA

What is claimed is:

1. A package for keeping products separate before use, comprising:
 - 5 a container provided with an upper mouth;
a capsule inserted internally of the mouth of the container, superiorly open, an inside of the capsule being separated from an inside of the container, the capsule being provided with a breakable bottom, a rupturing of said breakable bottom setting said capsule in communication with the inside of the container;
 - 10 a cutting element inserted internally of said capsule, provided with a bottom end destined in use to break the bottom of the capsule;
a cap arranged on the container in such a way as to cover the capsule and the cutting element;
wherein the cap exhibits a thread with which a screw coupling is achieved, by
15 means of which coupling the cap can move axially downwards with respect to the container, so that said axial downward movement causes the cap to interact with the cutting element in order to rupture the bottom of the capsule;
characterized in that the cap internally exhibits a projection destined, by effect of said downward axial movement of the cap, to engage in an upper part of the capsule which
20 is elastically deformable in an internalwise direction, such as to constrain the cap to the capsule in upward axial movements for extraction from the container.
2. The package of claim 1, comprising means for blocking in position the upper
25 part of the capsule, which means for blocking intervene after the projection has engaged in said upper part.
3. The package of claim 2, wherein said means for blocking said upper part
comprise a tract of the cutting element conformed and arranged so as to meet with the
internal surface of the upper part of the capsule.

30

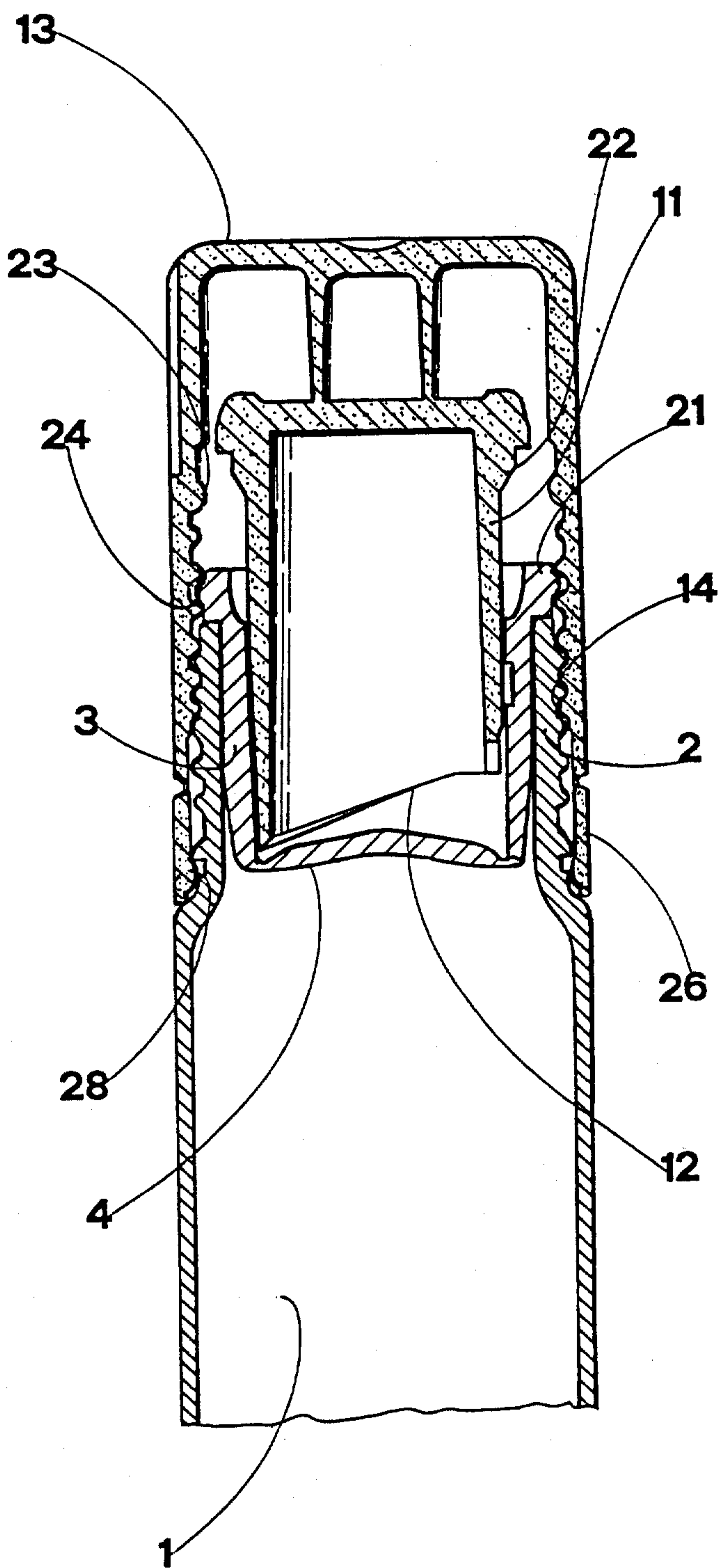
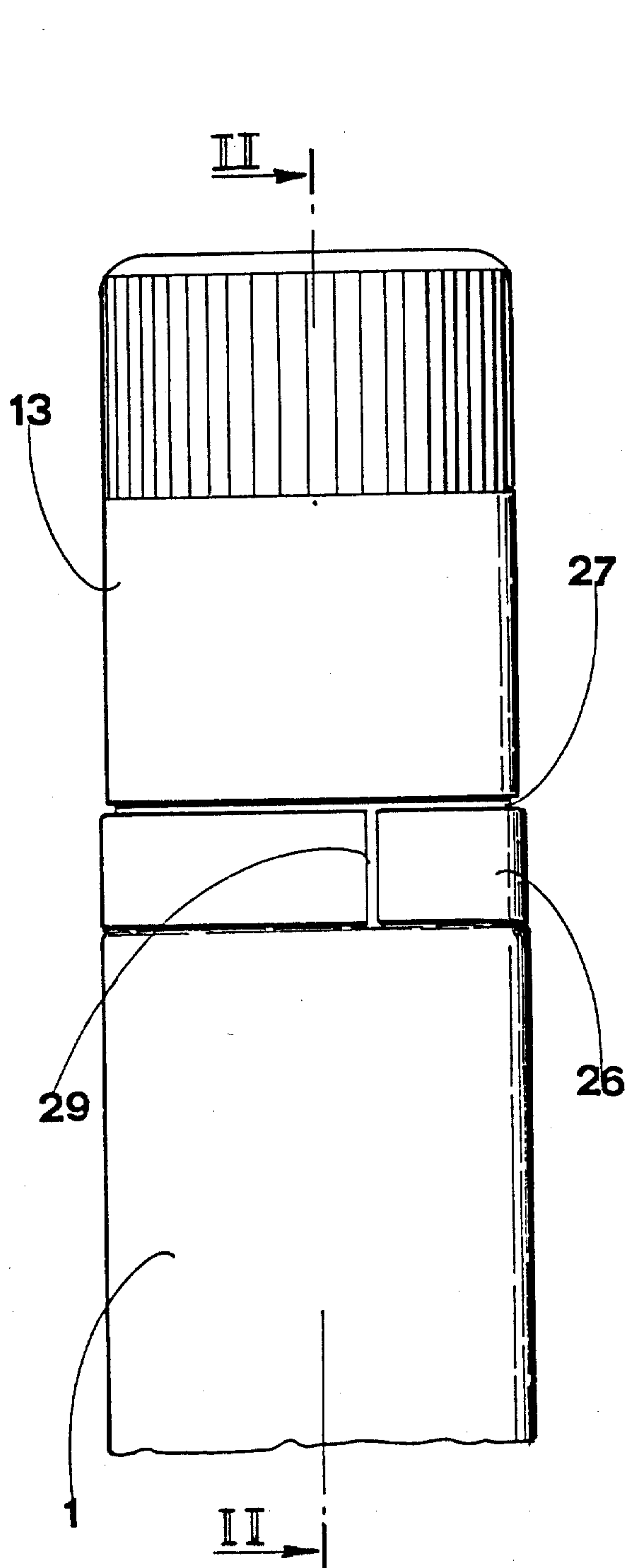
179P231CA

4. The package of any one of claims 1, 2, or 3, wherein said projection and said upper part of the capsule are annular shaped.
5. The package of any one of claims 1, 2, 3, or 4, wherein the cap is screw-coupled directly on to the neck of the container.
6. The package of any one of claims 1, 2, 3, 4, or 5, comprising a breakable ring, predisposed below the cap, destined to break by effect of said downward axial movement of the cap.
- 10 7. The package of claim 6, wherein said ring can be opened along an easy-break axial line.
8. The package of claim 6 or 7, wherein said ring is joined to the cap along an
15 easy-break perimeter line.
9. The package of any one of the claims from 6 to 8, wherein the breakable ring exhibits an annular relief coupled with the container in such a way as to prevent or limit upward axial movements of the cap.

1/2

Fig.1

Fig.2



2/2

Fig. 3

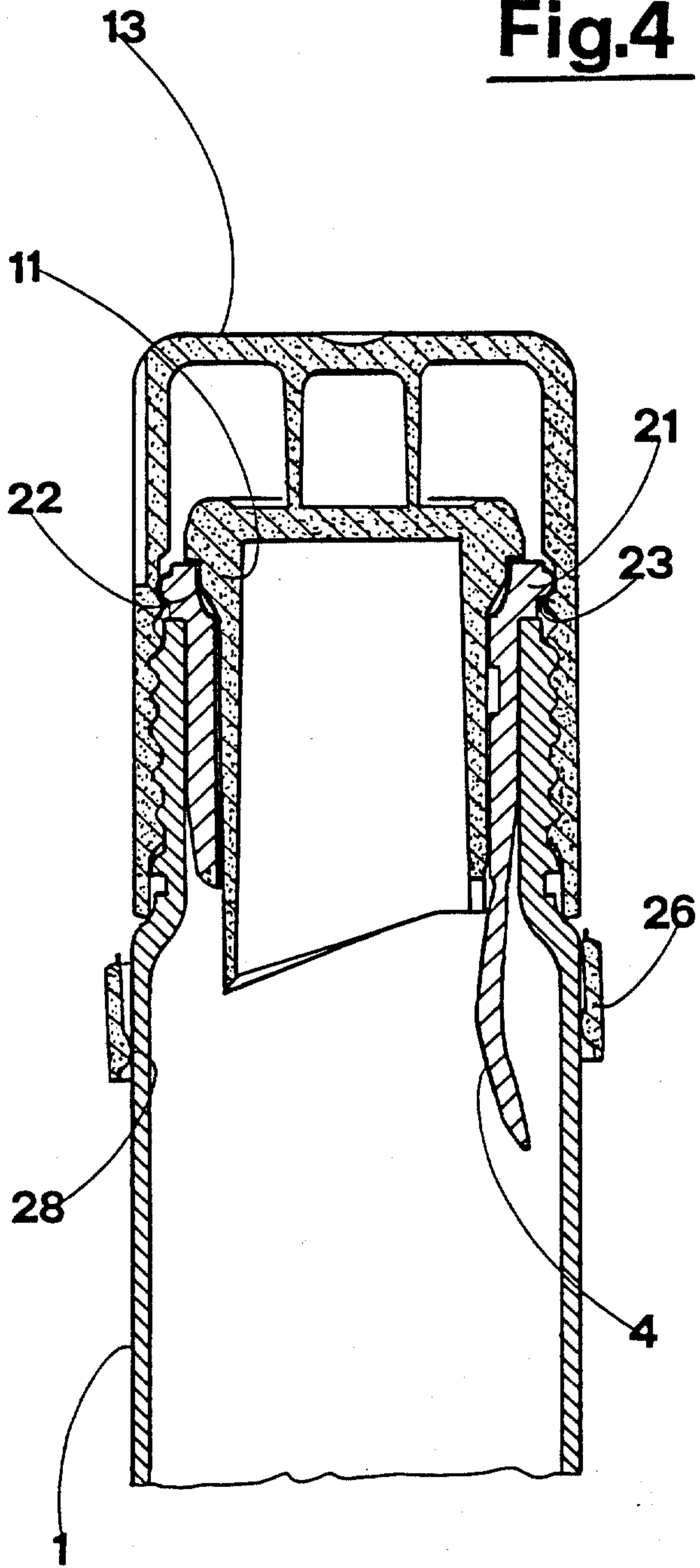


Fig. 4

