



(11)

EP 1 659 073 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
24.05.2006 Bulletin 2006/21

(51) Int Cl.:
B65D 49/04 (2006.01) B65D 41/62 (2006.01)

(21) Application number: **05397003.4**

(22) Date of filing: **21.01.2005**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IS IT LI LT LU MC NL PL PT RO SE SI SK TR**
Designated Extension States:
AL BA HR LV MK YU

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(30) Priority: **17.11.2004 LV 040136**

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(54) Tamper-proof closure for bottles

(57) The present invention relates to devices made of polymeric materials and used for bottle capping and the first uncapping indication. The object of the present invention is to simplify the design of the device and to prevent unauthorized adulterating of beverages after the first uncapping of a bottle. The present invention is characterized in that the base 1 of the cap rigidly connected with the neck of the bottle and being a pouring part of the

closure, and the cap 2 having the tear-off element 19 and provided with the beveled shoulder 20 are mutually connected by threaded joints 8 and 21; the base 1 is provided with the lateral partition 12, in the axial hole of which there is the stopper 3, and the cylindrical tappet 7 interacting with the tear-off element 19 of the cap 2. The present invention may be illustrated with reference to drawing in fig. 1.

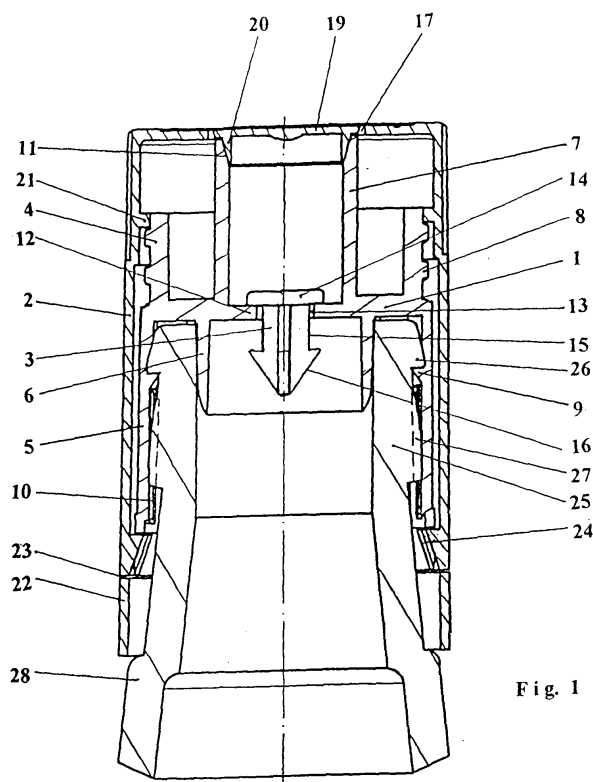


Fig. 1

Description

[0001] The proposed device relates to means made of polymeric material and used for bottle capping and the first uncapping indication.

[0002] It is known the closure for bottles of the Italian company Guala S.p.A. (patent No. 2 129 512 of Russian Federation), providing indication of bottle uncapping and comprising a pouring part provided with a flange, and a tubular part provided with an annular inner shoulder. A threaded cap is connected to the tubular part by means of perforated strip. An end face sleeve is placed between the shoulder on the tubular part and the flange on the pouring part and is designed for providing angular rigidity of pouring and tubular parts. The closure provides the closing of a bottle and the first uncapping indication of a bottle by means of breaking of perforated strip. Among disadvantages of this closure are its complicated design (it consists of six interacting elements, for manufacturing of which complicated press molds are required), and the need for auxiliary devices for assembling of elements of the closure and its connection to a bottle, that results in complication of a capping apparatus installed on a bottle filling lines.

[0003] Simplification of design of closure is provided in a device disclosed in the patent No. 12913 of the Republic of Latvia taken as a prototype. This device consists of three elements: a cap and a pouring part, which, in turn, constitutes a base and a sleeve connected by a thread. The base on the inner part is provided by several radial ridges interacting with a shoulder on a bottle neck, and also provided with longitudinal ledges interacting with longitudinal ledges on a bottle neck, that provides, correspondingly, axial and angular fixing of a closure base on a bottle neck. The base is provided also with a tubular sealing element, which goes into a bottle neck. Rotation of a cap results in rotation of a sleeve (those are provided with engagement in the form of longitudinal ridges on a cap and a sleeve) and sleeve screwing off the base, i.e. its axial movement - up to breaking of integrity of a bottom of a cap, provided with a tear-off part.

[0004] Among disadvantages of this closure are its relative complicated design and a lack of protection against unauthorized dilution of a beverage after the first uncapping of a bottle that may take place in case of sale a beverage by pouring thereof.

[0005] The object of the present invention is to simplify the design of the tamper-proof closure for bottles and to prevent an unauthorized adulterating of beverages after uncapping of a bottle.

[0006] This object is achieved by bottle closure, which comprises a base having angular and longitudinal fixing elements on a bottle neck, screw thread on the outer surface and tubular sealing element equipped with a cylindrical tappet, at the upper part of which on the inside there is a beveled facet; at the inner surface of a cap there are elements of screw threading, while a tear-off element placed at the bottom of a cap has a beveled

sealing shoulder. Moreover, the base of the closure has a lateral partition, in the axial hole of which a stopper is placed.

[0007] Fixing elements of the base of the closure on the bottle neck may be made both as longitudinal ledges on the inner surface of the base and as the screw thread, depending upon the type of the bottle: correspondingly, either with longitudinal ledges on the external surface of the bottle neck (the so called "guala-type" bottles, named after Guala S.p.A company) or with screw thread.

[0008] For better visual control of the integrity of a tamper-proof closure, lower part of its cap is provided by a sectionalized cylindrical collar connected with a cap by means of breakable bridges.

[0009] The essence of the present invention is explained with reference to the drawings, in which:

Fig. 1 illustrates the proposed tamper-proof closure fitted onto bottle neck (cross section view);

Fig.2 is a plan view of a tamper-proof closure;

Fig.3 illustrates the elements of the tamper-proof closure disassembled in the axial direction.

[0010] The proposed tamper-proof closure comprises a base 1, a cap 2 and a stopper 3.

[0011] The outer part of the base 1 has an upper cylindrical part 4 and a lower cylindrical part 5. The inner part of the base 1 has a tubular sealing element 6 and a cylindrical tappet 7. On the outer surface of the upper part 4 there is a thread 8, while on the inner surface of the lower cylindrical part 5 there are radial ridges 9 and longitudinal ledges 10 (in the variant of the embodiment - screw thread). On the inside of the upper part of the cylindrical tappet 7 there is a beveled facet 11. A lateral partition 12 has an axial hole 13 with the stopper 3, which is a shutoff element of a pouring port, and this stopper has a head 14 on its upper part, the diameter of which is larger than the diameter of the hole 13. A central part 15 and a lower part 16 of the stopper 3 have cross-shaped section. Each ledge of the lower part 16 has a triangular section with horizontal dimension a little bit larger than the diameter of the hole 3.

[0012] At the cap 2 bottom there are arched grooves 17 with bridges 18 between them, which in the aggregate constitute in the plane of the cap 2 bottom a tear-off element 19, which has a beveled sealing shoulder 20. On the inner surface of the cap 2 there is an element 21 of threaded joint, for example, in the form of radial ridges arranged along the screw line. The lower part of the cap 2 has a cylindrical sectionalized collar 22 separated from the main part of the cap 2 by arched grooves 23 with bridges between them (not shown on the drawings). The collar 22 consists of several, for example, four, sections connected with each other by breakable bridges.

[0013] On the inside of the cap 2 above the sectionalized collar 22 there are radially projecting catches 24.

[0014] Tamper-proof closure may be fitted onto a neck 25 of the bottle, having on its outer surface a bead 26

and fixing elements 27 (longitudinal ridges or thread). The neck of the bottle has also a widening part 28.

[0015] The tamper-proof closure operates as follows.

[0016] Upon axial fitting of the base 1 onto the neck 25 of the bottle radial ridges 9 and longitudinal ledges 10 of the base 1 engage with the shoulder 26 and with the fixing element 27, consequently, for example, with longitudinal ledges on the neck 25 of the bottle. (In case of screw joint of the base 1 with the neck 25 of the bottle the base 1 is screwed in the thread of the fixing element 27 on the neck 25 of the bottle until the radial ridges 9 of the base 1 are engaged with the shoulder 26 on the neck 25 of the bottle). At the same time the tubular sealing element 6 goes into the mouth of the bottle. Its tight fit prevents the ingress of liquid into the inner cavity of the cap 2. Therefore, the mouth of the bottle is extended by the base 1, which serves as the pouring part of the tamper-proof closure.

[0017] The stopper 3 is pushed into the hole 13 overcoming elastic deformation of the lateral partition 12. Sticking of the stopper 3 in the hole 13 is provided by the head 14 on the lateral partition 12. After that the cap 2 is fitted onto the base 1 against the stop axially, then, by rotating the cap 2 the threaded joint of the elements 21 is provided on the inner surface of the cap 2 with the thread 8 on the outer surface of the cylindrical part 4 of the base 1. This screwing on should be made until the cylindrical tappet 7 is butted up against the bottom of the cap 2. At the same time catches 24 are snap-engaged beyond the lower end face of the base 1. Right there the connection of the tamper-proof closure with the bottle is completed. Hermetic sealing of the pouring port is provided by the tubular sealing element 6 and by the sealing between the beveled shoulder 20 on the tear-off element 19 and the beveled facet 11 on the cylindrical tappet 7.

[0018] Pre-assembling of the elements of the tamper-proof closure (of the base 1, the stopper 3 and the cap 2) with its further axial fitting as assembled unit onto the neck 25 of the bottle until the radial ridges 9 are engaged beyond the bead 26. This engagement along with the engagement of catches 24 beyond the body of the base 1 prevents the unsealing of the bottle without breaking the integrity of the cap 2 and the sectionalized collar 22.

[0019] Upon the first unsealing of a bottle by rotating the cap 2 counterclockwise the cap 2 moves down along the thread 8, which has the left-handed thread with the result that under the pressure of the tappet 7 the bridges 18 at the bottom of the cap 2 are broken, and the tear-off element 19 separates from the bottom of the cap 2, while the cylindrical tappet 7 moves into the formed hole. The sectionalized collar 22 is broken, too, under the action of a widening part 28 of the neck 25 of the bottle. When the tear-off element 19 separates from the bottom of the cap 2 the pouring port is opened: interior of the bottle - the axial opening 13 - the cavity of the cylindrical tappet 7. Upon the tilting of the bottle, the stopper 3 moves under the pressure of the liquid into the cavity of the cylindrical tappet 7 thus providing the flowing of the liquid

between the walls of the hole 13 and the cross-shaped section of the central part 15 of the stopper 3, which offers a minimum resistance to the flow of liquid.

[0020] Upon returning the bottle into an upright position the head 14 of the stopper 3 shuts off the hole 13 preventing an unauthorized refilling the bottle. This object is achieved with minimum number of elements of the tamper-proof closure.

10 SPECIFICATION

[0021]

1. base
2. cap
3. stopper
4. upper part of base 1
5. lower part of base 1
6. tubular sealing element
7. cylindrical tappet
8. thread
9. radial ridges
10. longitudinal ledges
11. beveled facet
12. lateral partition
13. axial hole
14. head of stopper 3
15. central part of stopper 3
16. lower part of stopper 3
17. arched grooves at the bottom of cap
18. bridges
19. tear-off element
20. beveled sealing shoulder
21. element of threaded joint
22. sectionalized collar
23. arch-shaped grooves
24. catches
25. neck of bottle
26. bead
27. fixing element
28. widening part of neck 26

Claims

1. A tamper-proof closure for bottles with angular and longitudinal fixing elements on the neck, which comprises a base with mating elements of fixation on the neck of the bottle and sealing elements of a mouth of the bottle, and a cap provided with a tear-off element, **characterized in that** there is a thread on the outside of the base, the cap is provided with thread elements interacting with the thread of the base, while the base has a lateral partition with a shut-off

element in the form of a stopper placed in its axial hole and a cylindrical tappet with a beveled facet, and a beveled shoulder interacting with beveled facet of the tappet is made on the tear-off element of the cap.

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2. The tamper-proof closure according to claim 1, **characterized in that** at the lower part of the cap there is a sectionalized collar formed by arched grooves and breakable bridges between them.

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3. The tamper-proof closure according to claim 1, **characterized in that** fixing elements of the base of the cap on the neck of the bottle are made in the form of thread and radial ridges on the inside of the base of the tamper-proof closure.

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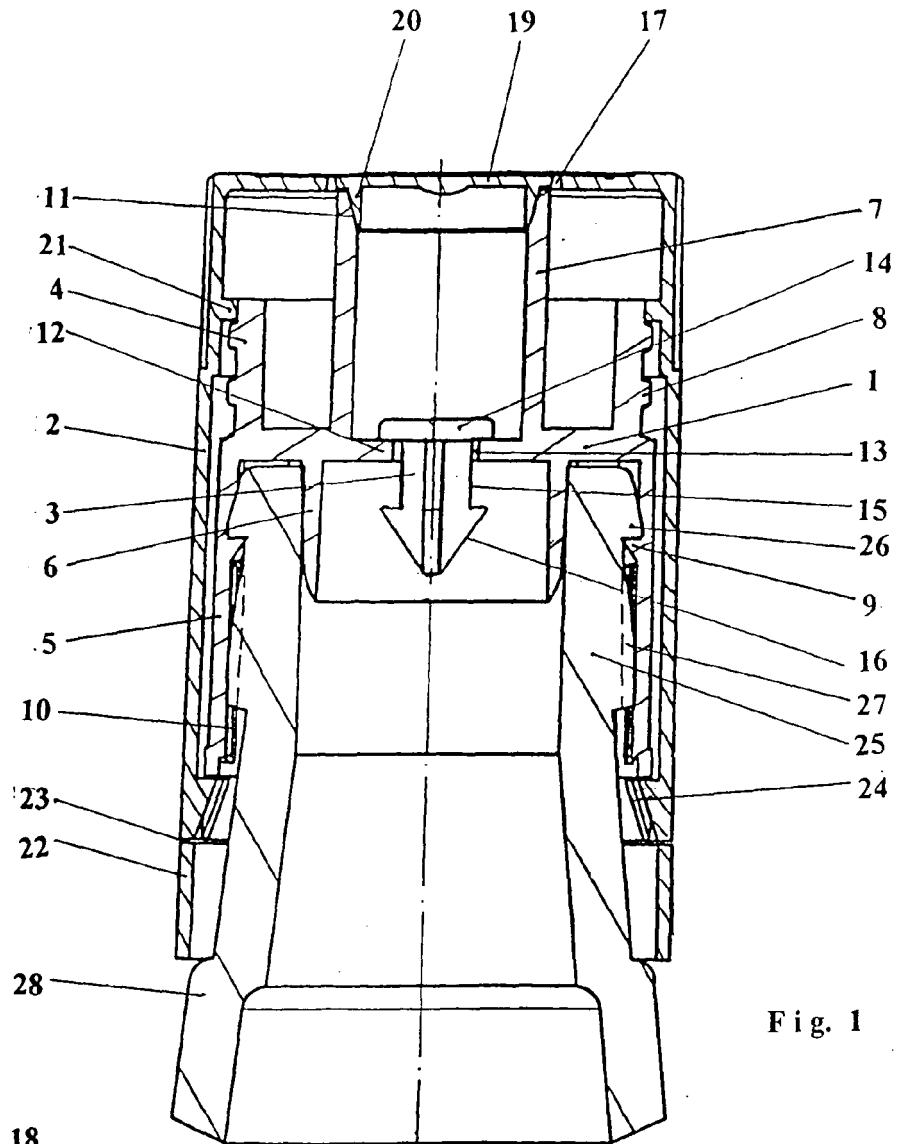


Fig. 1

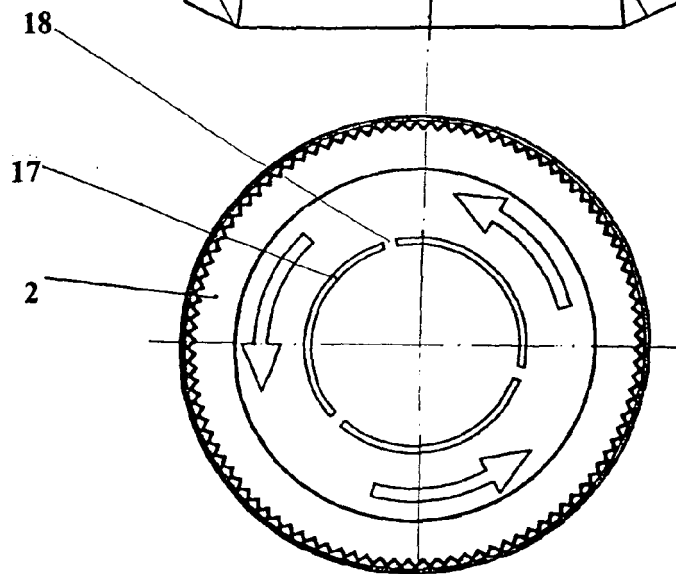


Fig. 2

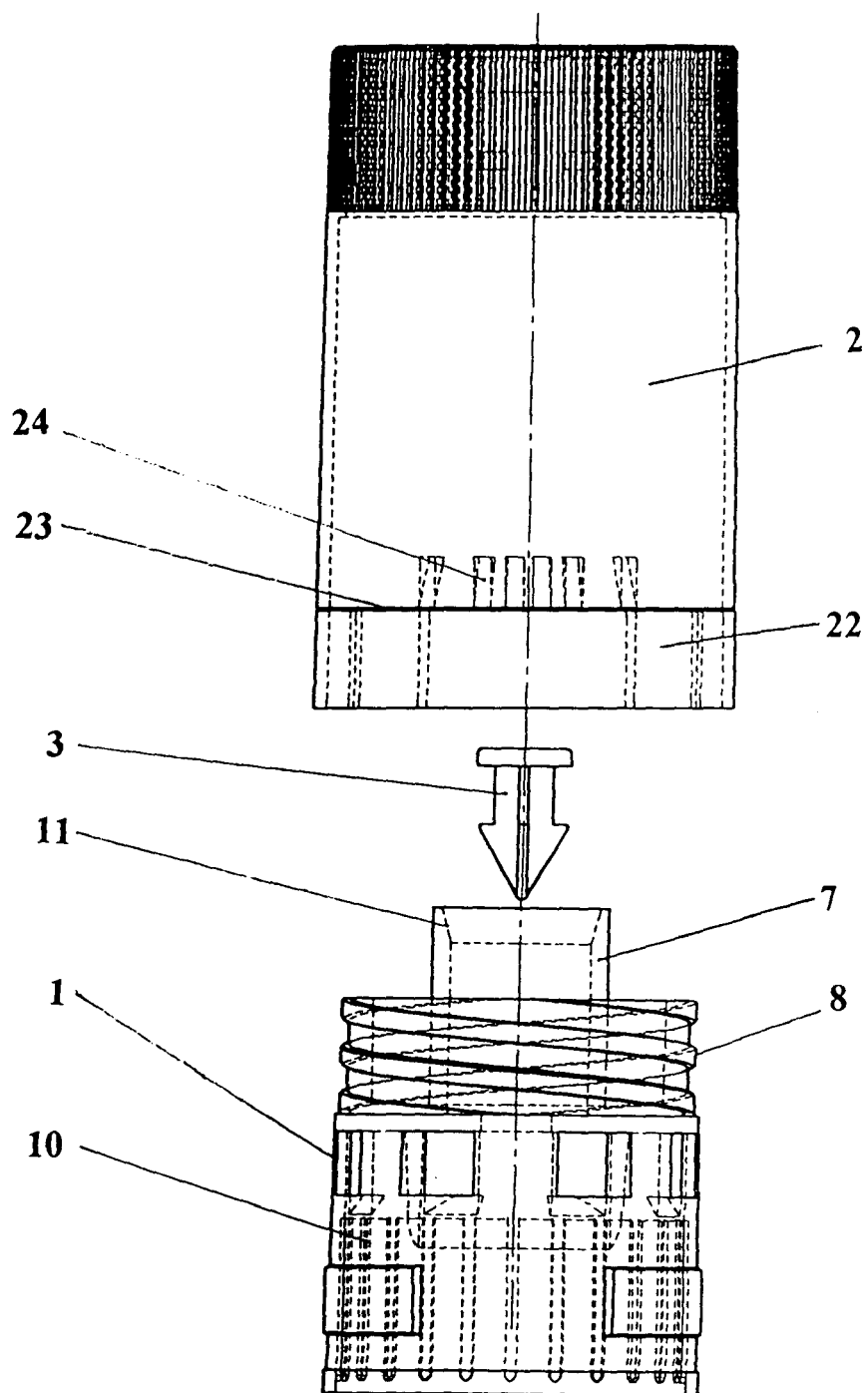


Fig. 3



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 05 39 7003

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			TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 14 March 2006	Examiner SERRANO GALARRAGA, J
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03 82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 05 39 7003

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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