



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
13.02.2008 Bulletin 2008/07

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

(21) Application number: **06125284.7**

(22) Date of filing: **01.12.2006**

(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 LV MC NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK YU

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(30) Priority: **10.08.2006 EA 200601306**

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(54) **Closure cap for a standard bottleneck ring**

(57) The invention relates to the screw closure caps intended for closing glass receptacles or bottles with a thread on the bottleneck. These bottles are typically used to contain aperitifs, liqueurs, vodka and strong alcohol beverages that are commonly consumed occasionally so that said bottles need to be possibly closed and opened many times.

The closure cap for a standard neck ring comprises a decorative casing on which the areas of weakened strength are made, particularly by perforation, and having an inner threaded cylindrical sleeve of a polymeric material to be engaged with the external thread of the bottleneck, said sleeve being fixed on the decorative casing by an adhesive and having concentric annular projections on its external end surface that are separated by the radial beams thereby forming open cavities, the external side surface of said sleeve being made with blind slots bevelled at the end thus forming at least 0.5 mm wide strips on the bottom of the sleeve, said sleeve having inside a rigidly fixed discharge element with a plug and a shut-off valve, wherein said plug of the discharge element is fixed over the interior surface of the sleeve by involving the ending of the thread collar found at the same level with at least two radially arranged projections.

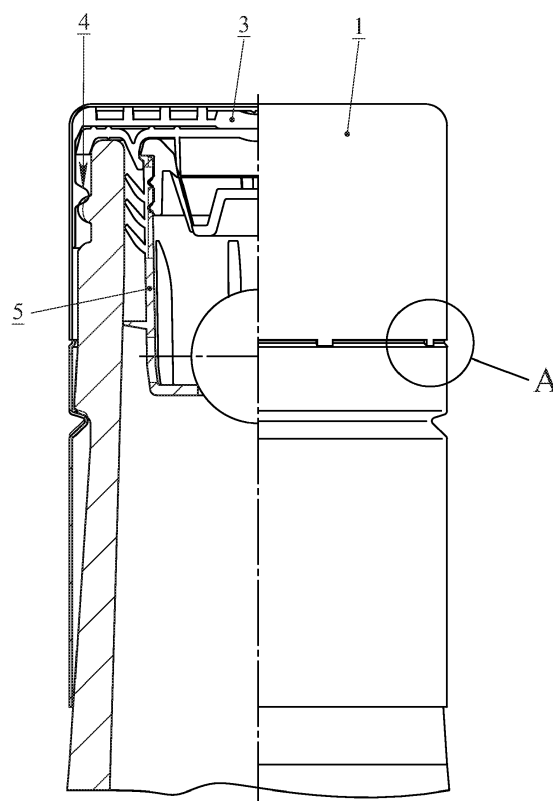


Fig. 1

Description

[0001] The invention relates to screw closure caps intended for closing glass containers or bottles with a threaded neck ring. These bottles are typically used to contain aperitifs, liqueurs, vodka and strong alcohol beverages that are commonly consumed occasionally so that said bottles need to be possibly closed and opened many times.

[0002] Known in the art are closing screw caps made of plastics that are typically intended to close plastic water bottles (USSR Patent No 448632, Int. Cl. B 65 D 41/34, published 10.07.75). The drawbacks of named caps are the imperfect closure sealing and impossibility of using a standard bottle with a standard neck ring.

[0003] A closure is known to close bottles (US Patent No 3930588, Int. Cl. B 65 D 41/34, published 06.01.76) in the form of an aluminium cap comprising an identifying and/or tamper indicating means with a threaded element for fixing on the bottleneck, and perforation to ease opening and removal of said cap. Upon rolling of the closure on the bottleneck said thread relief becomes visible from the outside. The drawbacks of the described technical solution are insufficiently reliable leak proofing of the bottle, inadequate features for making identification marks and inconvenient unsealing due to elevated friction in the threaded joint between the glass and rolled-in aluminium.

[0004] Known in the art closing screw caps used to close bottles with aperitifs and alcohol drinks commonly contain a threaded plastic insert fixed inside of a typically metallic case of the cap so that there is no thread visible on the outside. Such caps are provided additionally with a pad to make the closure tighter (RU Patent No 2223209, Int. Cl. B 65D 41/62, published 10.02.2004; RU Patent No 2262474, Int. Cl. B 65D 49/04, published 20.03.2004).

[0005] The drawbacks of above-mentioned closing caps are insufficient reliability of closing because of inadequate structural stiffness of the design elements and insecure connection of said insert with the cap case, particularly in providing screwing and unscrewing on the bottleneck. If the insert is formed with rather thin walls, said thread often becomes visible on the casing during fastening on the bottle.

[0006] The closest in its technical essence is a closure cap comprising a metallic casing on which weakened sections are formed, particularly by perforation, with tamper-evident means. The casing is additionally furnished with an inner cylindrical sleeve made of a polymeric material and having an internal threading to be engaged with the external threading on the bottleneck, said sleeve being fixed to the casing via a tight mechanical fit or using an adhesive (RU Patent for a Useful Model No 50206, Int. Cl. B 65 D 41/00, published 27.12.2005 - a prototype).

[0007] The prototype bears some imperfections similar to those of mentioned previously analogues.

[0008] The purpose of the invention is to broaden technical potentialities of the closure cap by imparting certain

features perfecting tightness of the closure, tamper-indicating means, and by providing its convenient handling.

[0009] The stated goal is achieved in that the closure cap for a standard neck ring comprises a decorative casing on which weakened sections are made, particularly by perforation, incorporating a threaded inner cylindrical sleeve of a polymeric material to be engaged with the external thread of the bottleneck, said sleeve being fixed on the decorative casing by an adhesive and having concentric annular projections on its external end surface that are separated by the radial beams to form open cavities, the external side surface of said sleeve being made with blind slots bevelled at the end thus forming strips on the bottom of the sleeve at least 0.5 mm wide, said sleeve having inside a rigidly fixed discharge element with a plug and a shut-off valve, wherein said plug of the discharge element is fixed over the interior surface of the sleeve making use of the ending of the thread collar found at the same level with at least two radially arranged projections.

[0010] A particular embodiment of the invention is realised by forming at least three annular sealing collars over the interior end surface of the plug of the discharge element. The exterior end surface of the discharge element plug is made with annular projections arranged conformably opposite the annular sealing collars of the discharge element to concentrate the strain on the collars and reduce friction at closure and screwing.

[0011] Another embodiment of the invention is realised by making sealing rings on the exterior surface of the discharge element casing spaced in axial direction with weakened cross-section to alleviate load on the thread collar of the inner sleeve and to prevent the emergence of the threading relief on the decorative casing. An additional guiding and centring annular projection is formed on the exterior side surface of the case of said discharge element. The cap is furnished with a flexible sealing grip fixed on the external annular projection of the discharge element so as to provide jointly with the interior sealing collar of the plug of the discharge element a double sealing of the closure.

[0012] The sealing collar of the discharge sleeve plug does not protrude in its extreme position beyond the seat of the discharge sleeve taper, eliminating thereby any acute edges or juts on the contact surface of the sealing collar and taper, which, in turn, averts the appearance of any dust or shaving during simultaneous axial movement and screwing of the cap.

[0013] Another embodiment of the invention envisages a centring and relieving annular projection on the plug of the discharge sleeve, the interior and exterior surfaces of said projection being tapered to prevent the discharge element from the radial shift and fixing it immovably in the bottle.

[0014] A single-start thread is formed on the interior surface of the sleeve.

[0015] The threaded section of the cylindrical sleeve is shorter than the threaded area on the bottleneck.

[0016] The cross-section profile of the thread collar of the cylindrical sleeve is tapered at a slope angle 55° to tighten the junction of the sealing collars of the discharge element plug by creating an interference fit between the threaded collar of the inner sleeve and the bottleneck not to allow the thread to become visible on the decorative casing.

[0017] The cylindrical sleeve is formed so as to provide its handling from position of complete separation to the position of total engagement on the bottleneck ring via a smooth turning.

[0018] The body of the decorative casing is made of the material chosen from a group comprising a polymer, a metal and their combination.

[0019] The interior part of the bottom of the cylindrical sleeve may contain a sealing pad of a foamed polyethylene fastened with the help of a thread collar and radially spaced inside the sleeve projections, said pad diameter being suffice to overlap the bottle ring.

Fig. 1 presents general view of the closure cap.

Fig. 2. View A in Fig. 1.

Fig. 3. Upper view of the cylindrical sleeve.

Fig. 4 View B in Fig. 3.

Fig. 5. Bottom view of the sleeve.

Fig. 6. View of the discharge element.

Fig. 7. View C in Fig. 6.

[0020] The closure cap comprises a decorative casing 1 with perforation 2 on the side wall of the casing, an inner cylindrical sleeve 3 having interior threading 4, and a discharge element 5. The exterior end surface of the inner cylindrical sleeve 3 is made with concentric annular projections 6 separated by radially directed beams 7 thereby forming open cavities 8, the exterior side surface of said sleeve having blind slots 9 with a bevel 10 at the end to merge into strips 11 in the bottom portion of the sleeve, which makes mounting in the decorative casing easier and allows for the air outlet during assembly of the parts. Bevel 10 is made to strengthen the item structurally and improve the moulding quality of the cylindrical sleeve 3.

[0021] To fix the discharge element over the interior surface of sleeve 3 the ending of thread collar 12 located at the same level with two radially arranged projections 13 is used. Inside the cylindrical sleeve 3 there is a discharge element 5 with a plug 14 and a shutoff valve 15, a splitter 16 and a case 17. Annular sealing collars 18, 19 and 20 are made over the interior end surface of plug 14 of discharge sleeve 15.

[0022] There are annular projections 21, 22, 23 and 24 on the exterior end surface of plug 12 of discharge element 11. Projections 22, 23, 24 are located conformably opposite annular sealing collars 18, 19 and 20 of plug 14 of discharge element 5 to concentrate the load on the collars and alleviate friction between face surfaces of the inner sleeve 3 and plug 14 during closure and screwing.

[0023] Plug 14 of discharge element 5 is formed with a flexible sealing grip 25 fixed on the external annular projection 26 of case 17 of said discharge element in order to double tightness of the closure together with the sealing interior collar 20. Plug 14 of discharge element 5 has an annular centring and relieving projection 27 whose interior and exterior surfaces are tapered. Sealing collar 20 of plug 14 of discharge element 5 does not protrude beyond the seating taper 28 of the discharge element.

[0024] On the exterior surface of case 17 of discharge element 5 there are sealing rings 29 with a weakened cross-section that are spaced in axial direction, and an additional guiding and centring annular projection 30 on the lower part of said exterior surface of case 17 of discharge element 5.

[0025] A single-start thread 4 is made on the interior surface of sleeve 3 wherein the cross-section profile of the thread collar is tapered to a slope angle 55° , said sleeve 3 having the threaded area shorter than the threaded portion on the bottleneck. This solution makes it possible to shift the cap by a smooth turning from position of the total separation to that of complete engagement on the bottle. In addition thereto, tapering of the thread collar to the slope angle of 55° prevents thread from emerging o the cap wall during screwing and unscrewing so that the exterior wall of casing 1 is kept non-deformed.

[0026] Annular projections 6 separated by beams 7 ensure structural stiffness and thereby tightness of the closure. Open cavities 8 assist in spreading evenly the glue over the surface of the sleeve when fastening inside the decorative casing. Perforation 2 makes the first opening and removal of the cap easier. Slots 9 are not through and are having bevel 10 that forms strips 11 at the end of sleeve's bottom of at least 0.5 mm width, thus imparting structural rigidity to the annular wall and providing for a smooth air outlet during assembly, said structure being made so that there is no thread visible on the outside of the casing upon closing.

[0027] Casing 1 of the cap is typically made of aluminium by stamping (stretch pressing) or a polymeric material by injection moulding or vacuum shaping. Inner cylindrical sleeve 3 is fabricated by injection moulding from polymeric materials such as low-density polyethylene; discharge element 5 and plug 14 are made of low-density polyethylene; the splitter is made of polystyrene and shutoff valve 15 of polystyrene or glass.

[0028] There is a sealing pad of a foamed polyethylene inside the cylindrical sleeve bottom fastened by a thread collar and radial projections found inside the sleeve, the diameter of said pad being suffice to overlap the neck ring. The pad is fabricated by extruding a foamed polyethylene followed by cutting blanks of necessary diameter on a crank press.

[0029] Discharge element 5 is inserted inside cylindrical sleeve 3, after which perforation 2 is formed on decorative casing 1 using a rolling machine. The inner cylin-

drical sleeve 3 is then fixed on decorative casing 1 by a suitable adhesive to obtain a ready article.

[0030] Closing of bottles is performed by a top-down pressing simultaneously with screwing on the bottleneck followed by rolling the casing into a corresponding groove on the bottle with the help of a closing machine.

[0031] During unscrewing of the cap, perforation 2 ruptures thereby separating the upper part of casing 1 together with the threaded inner cylindrical sleeve 3 and plug 14 of discharge element 5 thus opening through channels for liquid escape. The bottom part of the metallic casing 1 remains on the bottleneck to indicate its unsealing.

[0032] The proposed technical solution opens wide vistas for realising a great variety of the forms of closure caps, improves tamper-indicating means and tightness of closing while keeping high engineering level of closures in conditions of a large-scale factorial production.

Claims

1. A closure cap for a standard bottleneck ring comprising a decorative casing (1) with the areas of weakened strength by, particularly, perforation holes (2) incorporating an inner threaded cylindrical sleeve (3) of a polymeric material to be engaged with the external thread on the bottleneck, said sleeve being adhesively bonded to the decorative casing, **characterised in that** the exterior end surface of the sleeve is made with concentric annular projections (6) separated by radial beams (7) and forming open on top cavities (8), wherein the exterior side surface of said sleeve is made with blind slots (9) bevelled (10) at the end and forming thereby at least 0.5 mm wide strips (11) in the bottom part of the sleeve, said sleeve containing a discharge element (5) rigidly fastened inside and having a plug (14) and a shutoff valve (15), said plug of the discharge element being fixed over the interior surface of the cylindrical sleeve by involving the screw collar ending (12) located at the same level of at least two radial projections (13).
2. Closure cap as claimed in Claim 1 **characterised in that** the interior end surface of the plug (14) of the discharge element (5) is made with at least three annular sealing collars (18, 19, 20).
3. Closure cap as claimed in Claim 1 **characterised in that** the exterior end surface of the plug (14) of the discharge element (5) is made with annular projections (21, 22, 23, 24) located conformably opposite the annular sealing collars (18, 19, 20) of the discharge element plug in order to concentrate the strain on the collars and alleviate friction during closure and screwing.
4. Closure cap as claimed in Claim 1 in which the exterior surface of the case (17) of the discharge element (5) is fabricated with arranged in axial direction sealing rings (29) weakened in cross-section to lessen strain on the thread collar of the inner sleeve and prevent the emergence of the thread relief on the decorative casing.
5. Closure cap as claimed in Claim 1 **characterised in that** an additional guiding and centering annular projection (30) is made in the lower portion of the exterior surface of the case (17) of the discharge element (5).
6. Closure cap as claimed in Claim 1 in which the plug (14) is made with a flexible sealing grip (25) fastened over the exterior annular projection (26) of the discharge element case (17) to double sealing of the closure together with the interior sealing collar (20) of the discharge element plug.
7. Closure cap as claimed in Claim 6 in which the sealing collar (20) of the discharge element plug does not protrude in its extreme position beyond the seating taper (28) of the discharge element thereby eliminating sharp edges and juts on the contact surface of both sealing collar and taper thus preventing the appearance of dust and chips in the course of simultaneous axial motion and screwing of the cap.
8. Closure cap as claimed in Claim 1 **characterised in that** the plug (14) of the discharge element (5) has an annular centring and relieving projection (27), the interior and exterior surface of said projection being tapered in order to prevent radial shift of the discharge element (5) and to fix it immovably in the bottle.
9. Closure cap as claimed in Claim 1 **characterised in that** a single-start thread (4) is made on the interior surface of the sleeve (3).
10. Closure cap as claimed in Claim 1 in which the threaded portion of the cylindrical sleeve is shorter than the threaded portion on the bottleneck.
11. Closure cap as claimed in Claim 1 in which the cross-section profile of the thread collar (4) of the cylindrical sleeve (3) is tapered at a slope angle of 55°.
12. Closure cap as claimed in Claim 1 **characterised in that** the cylindrical sleeve (3) is made so as to provide its handling from position of complete separation to full engagement on the bottleneck ring by a smooth turning.
13. Closure cap as claimed in Claim 1 **characterised in that** the case of the decorative casing (1) is fabricated from a material chosen from a group contain-

ing a polymer, a metal and their combination.

- 14.** Closure cap as claimed in Claim 1 in which inside the cylindrical sleeve bottom there is a sealing pad of a foamed polyethylene fastened by a thread collar and radial projections found inside the sleeve, the diameter of said pad being suffice to overlap the neck ring.

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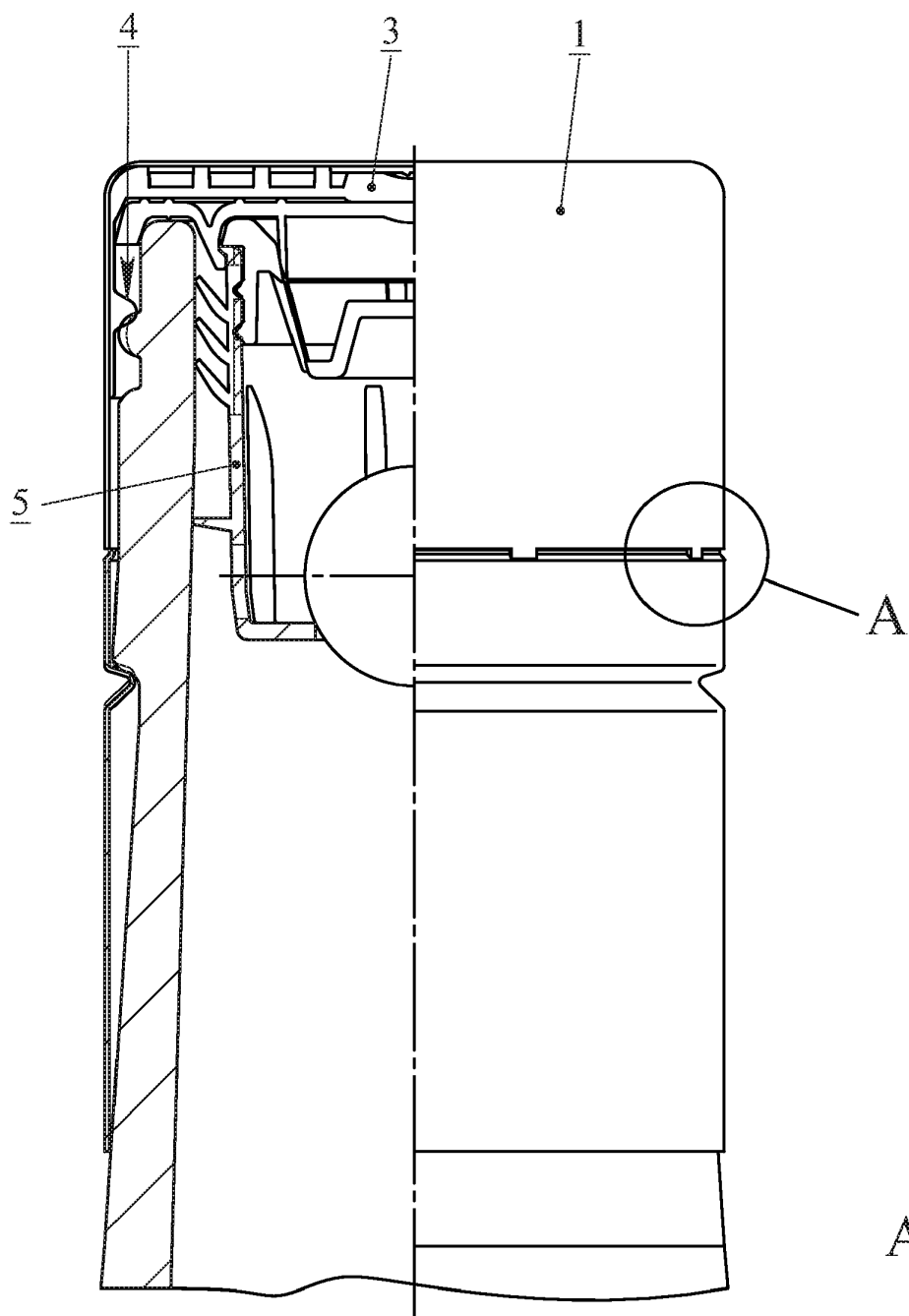


Fig. 1

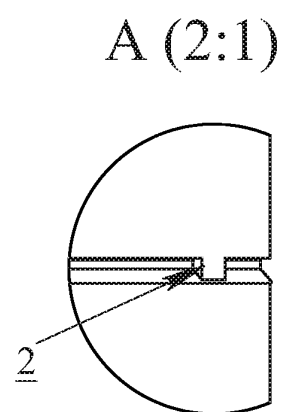


Fig. 2

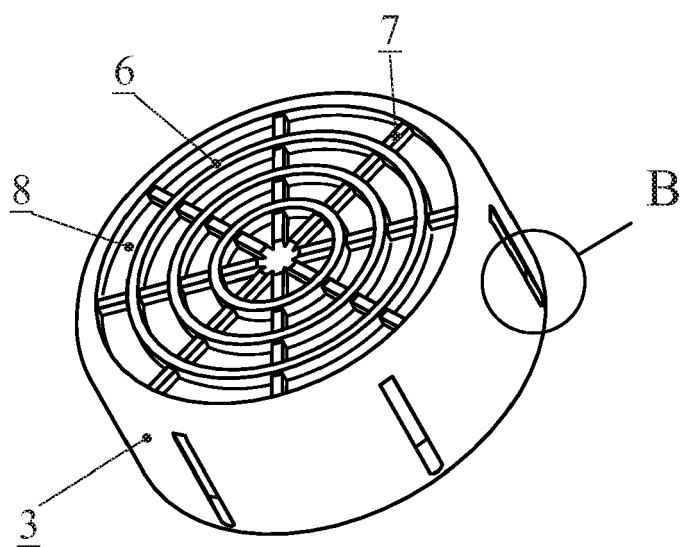


Fig. 3

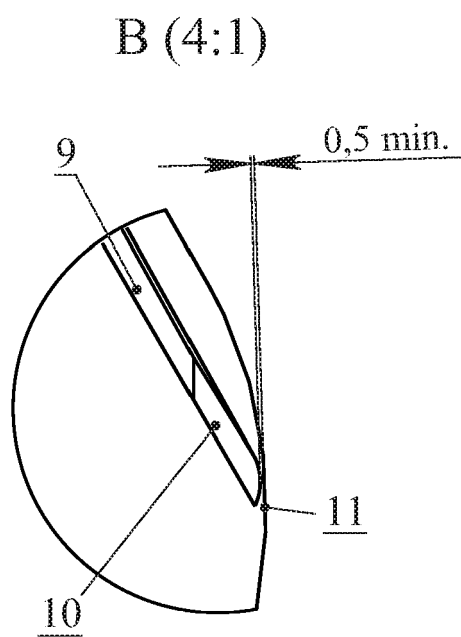


Fig.4

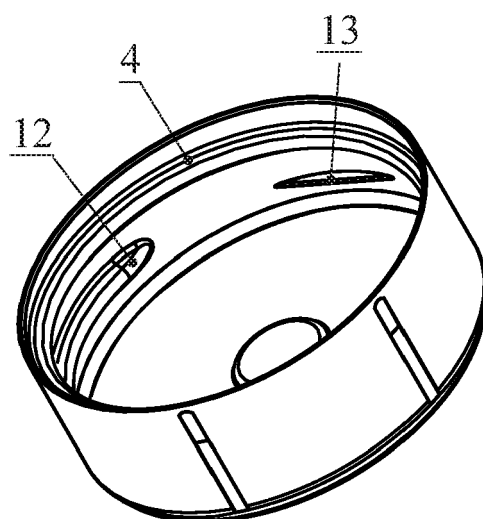


Fig. 5

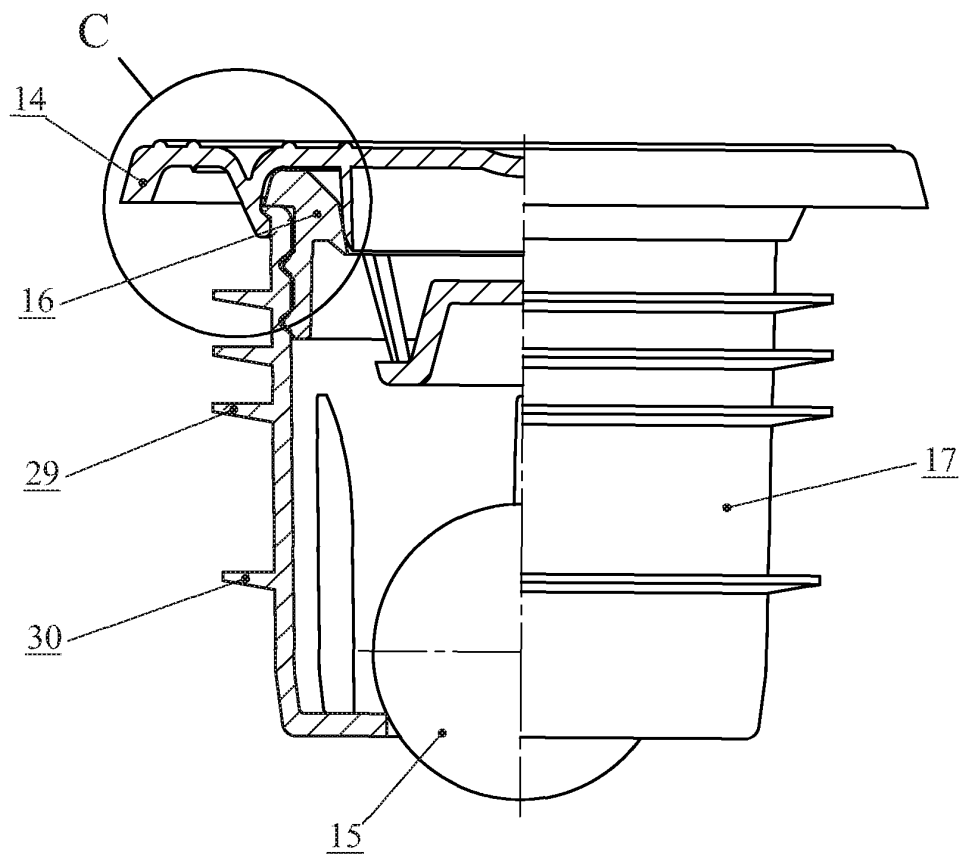


Fig. 6

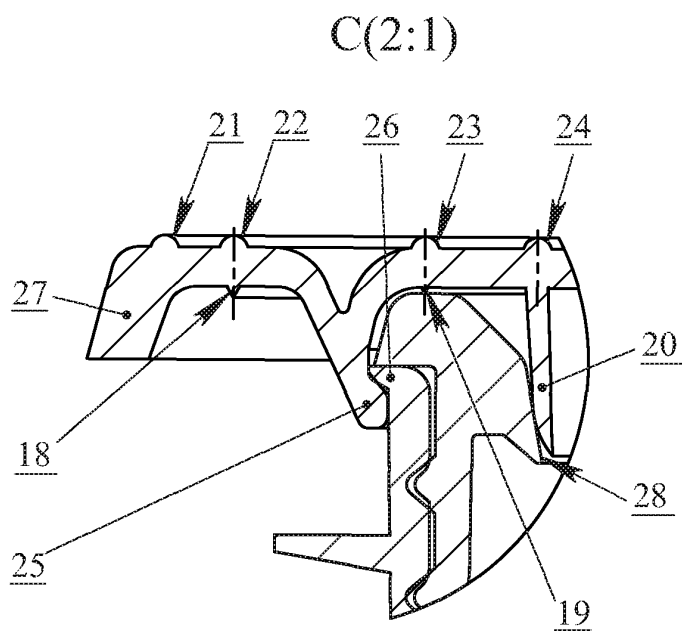


Fig. 7



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EUROPEAN SEARCH REPORT

Application Number
EP 06 12 5284

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	FR 2 856 982 A (PECHINEY CAPSULES [FR]) 7 January 2005 (2005-01-07) * figure 4a * -----	1	INV. B65D49/04 B65D41/04
			TECHNICAL FIELDS SEARCHED (IPC)
			B65D
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 16 November 2007	Examiner Bridault, Alain
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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 06 12 5284

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16-11-2007

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
FR 2856982 A	07-01-2005	AU 2004261424 A1	10-02-2005
		BR PI0412108 A	15-08-2006
		CA 2524781 A1	10-02-2005
		EP 1644257 A2	12-04-2006
		WO 2005012126 A2	10-02-2005
		MX PA05013280 A	09-03-2006
		US 2007138125 A1	21-06-2007

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- SU 448632 [0002]
- US 3930588 A [0003]
- RU 2223209 [0004]
- RU 2262474 [0004]
- RU 50206 [0006]