(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 2 298 663 A1**

(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
23.03.2011 Bulletin 2011/12

(21) Application number: **09831485.9**

(22) Date of filing: **02.09.2009**

(51) Int Cl.:
B65D 47/36 *(2006.01)*

(86) International application number:
PCT/EA2009/000005

(87) International publication number:
WO 2010/066259 (17.06.2010 Gazette 2010/24)

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK SM TR
Designated Extension States:
AL BA RS

(30) Priority: **12.12.2008 EA 200802321**

(71) Applicants:
- **Pachomov, Dmitriy Ivanovitch**
  Gomel 246032 (BY)
- **Birucov, Nicolai Petrovitch**
  Gomel 246050 (BY)

(72) Inventors:
- **Pachomov, Dmitriy Ivanovitch**
  Gomel 246032 (BY)
- **Birucov, Nicolai Petrovitch**
  Gomel 246050 (BY)

(74) Representative: **Benatov, Emil Gabriel**
Dr. Emil Benatov & Partners
Bl. 36B, Liuliakova Gradina Str.
1113 Sofia (BG)

(54) **CLOSURE DEVICE WITH AN EXTENSIBLE TAMPER INDICATOR**

(57) The closure with extensible tamper-evident means comprises an external sleeve made with fastening means to be fixed on the bottle, a base for a tight fitting in the bottleneck hole, and lifting bevel surfaces, whereas the exterior cylindrical surface of the discharge sleeve is furnished with guiding projections for axial advance along said bevel surfaces in direction of opening so as to enable it come outside the shutoff sleeve relative to the decorative casing, indicating thereby first opening of the bottle.

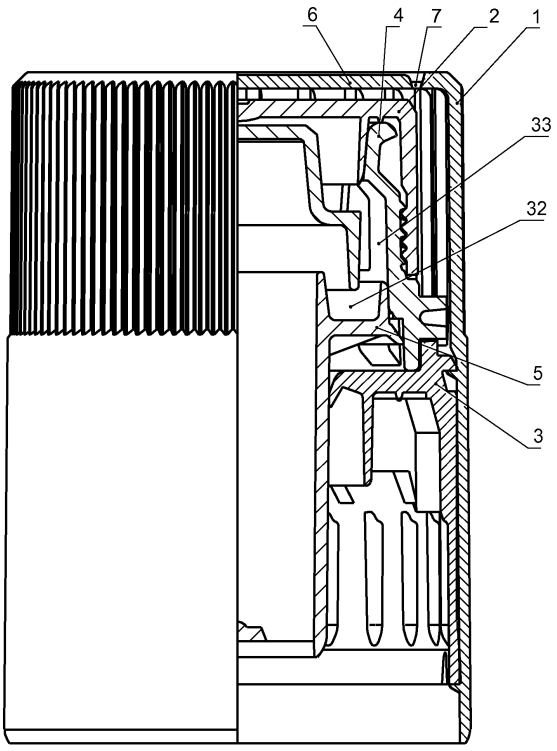

fig.1

EP 2 298 663 A1

Description

[0001] The invention can be used in food industry, is related to bottle closures for storage and bottling strong beverages, and is intended to indicate first opening and prevent refilling of the bottle with off-grade alcohol products.

[0002] Different closures with extensible tubes for liquid discharge are known in the art: RU utility model patent no. 30726, Int. Cl. B65D 47/36, published 10.07.2007; RU utility model patent no. 22937, Int. Cl. B65D 41/34; 41/38, published 10.05.2002; or having discharge tubes mounted on the casing so as to allow its in-plane travel: RU utility model patent no. 65483, Int. Cl. B65D 41/34, published 10.08.2007; RU utility model patent no. 23290, Int. Cl., B65D 39/00, published 10.06.2002.

[0003] The closures of this type usually comprise a decorative metal or plastic casing with an element indicating first opening of the bottle, a polyethylene cap with a discharge device able to extend upwards thus opening by turning the decorative casing of the bottle. Rotation of the casing in reverse direction makes the cap operate like a gate that closes tightly the unsealed bottle and preventing thereby its contents from evaporation.

[0004] A drawback of this type of devices is complexity of the design and insufficiently high level of protection against unauthorized opening. Besides, there is a probability of a foreign object falling into the open nozzle and discharge tube upon first opening of the bottle.

[0005] Known in the art also is a closure (RU utility model patent no 67550, Int. Cl. B65D 41/34, published 27.10.2007), comprised of fixedly attached to each other external and retaining casings, a single-pass gate with a shutoff ball and sealing rings to provide a tight fit on the bottleneck, a shaped extensible dispenser with a cap and discharge element made as a whole with a support case in the lower part and having arresters on the exterior cylindrical surface, said external casing being made with vertical ribs and projections over its upper and lower parts of the interior cylindrical surface, correspondingly, while on its upper face surface there is a spot-glued circular check hatch. The retaining case incorporates a discharge tube with a circular collar and projections made over its interior surface, which external and retaining cases being attached to each other via the projections of the external case and the lower face of the retaining case.

[0006] The described device does not, however, ensure reliable tightness and convenience during operation, while the presence of a gate in the form of a ball governs the shape of the vertical guides for fitting on the seat, wherefore, its mobility is restricted, as a result of which the shutoff element may be jammed and refuse to pour out the liquid.

[0007] The closest engineering solution is a closure for bottles with a slide nozzle containing a decorative casing, shutoff sleeve with splines made over the interior surface, and a tear element on the face surface, a discharge sleeve threadedly on engaged with a cap having a nozzle for liquid discharge, and splines on the interior side surface. Named decorative casing is made with a tear-off or weakened by vertical slots upper piece (EA patent no. 6731, Int. Cl. B65D 49/02, publ. 28.04.2006). The device contains also a tamper-evident means preventing bottle refilling with low-quality alcohol products, and made in the form of a hydraulic gate.

[0008] Known in the art device provides for a dual indication of opening and reveals the fact of unauthorized unsealing by removal of the upper piece of the casing and a breakable piece of the shutoff sleeve at extension of the nozzle. The embodiment of the breakable upper piece of the decorative casing with strips on the face and side surfaces, and vertical slots complicates the design, requires more material consumption on manufacture and is inconvenient at handling. In addition, there is a possibility of some other liquid or pollutant penetration into the container through the open nozzle upon removal of the tear part of the casing.

[0009] The proposed engineering solution is aimed at creation of convenient for operation closure with a raised level of protection against unauthorized opening, and having reliable sealing characteristics of the discharge sleeve in any position, along with refined hygienic facilities that protect the discharge sleeve from penetration of any other liquid or foreign objects into the discharge system of the device.

[0010] This technical result is achieved in that the closure with extensible tamper-evident means comprises a decorative casing with a tear element, which is likely to be removed from the casing, a shutoff sleeve engaged by a threaded with the discharge sleeve having a pouring hole that is connected via ribs with the internal sleeve so as to form through-pass channels, a resilient element with a through opening, tightly fitted in the discharge sleeve, being possibly installed in the bottleneck, said closure being additionally fit with a lifting element having fastening facilities for fixing on the container and a base for tight fitting in the bottleneck hole, a reverse lock , and at least one lifting bevel surface, while on the exterior cylindrical surface of the discharge sleeve there is at least one guiding projection interacting with the decorative casing to allow for axial advance over the bevel surfaces of the lifting element towards the opening, and possibly emerge outside the shutoff sleeve relative to the decorative casing, warning thereby about first opening.

[0011] A particular case of the invention comprises a bevel surface of the lifting element made at a constant or variable slope angle transferring into a horizontal one, which is restricted by a vertical arrester in such a way that the discharge sleeve installed on the horizontal surface hinders the reverse motion of the shutoff sleeve relative to the decorative casing.

[0012] Preferably, the resilient element is made as an elongated nozzle tightly fit in the discharge sleeve in axial direction so that can move together with said sleeve keeping tightness of the closure over the discharge sleeve path towards opening.

[0013] Preferably, the guiding ribs are made on the interior surface of the decorative casing to serve simultaneously as the elements of the locking engagement that provide for a transfer motion along the bevel surfaces of the lifting element via the guiding projections of the discharge sleeve.

[0014] Preferably, the reverse lock is made as a resilient element extending in cantilever and protruding beyond the exterior surface of the lifting element so that is able to lock the reverse motion of the decorative casing in radial direction.

[0015] The embodiment of the present invention characterized by above combination of features and realization of its purpose is supported by description of the closure design made according to the present invention. Description of the design is illustrated graphically:

Fig. 1 shows a general view of the closure in partial cross-section.
Fig. 2. General view of the closure in partial cross-section in the open state.
Fig. 3. Decorative casing.
Fig. 4. Lifting element.
Fig. 5. Discharge sleeve.
Fig. 6. Shutoff sleeve.
Fig. 7. Resilient element.

[0016] The bottle closure comprises a decorative casing 1, shutoff sleeve 2, lifting element 3, discharge sleeve 4 and a resilient element 5.

[0017] The face surface of decorative casing 1 is made with a breakable piece 6 by means of a weakened line 7, while the interior surface of casing 1 is made with guiding ribs 8, being simultaneously the elements of the locking engagement intended to transfer motion at lifting to discharge sleeve 4 with shutoff sleeve 2, and at least two fixing arresters 9 in order to hold lifting element 3 after assembly.

[0018] Shutoff sleeve 2 is made with internal thread 10 and annular sealing projection 11, wherein shutoff sleeve 2 may be of a color contrasted to that of decorative casing 1.

[0019] Lifting element 3 is made with fastening means 12 to be fixed on the bottle, base 13 for tight fitting in the bottleneck hole, and has at least one lifting bevel surface 14 with either constant or variable slope angle extending into a horizontal surface 15, which is restricted by a vertical thrust plane 16 limiting thereby axial displacement of discharge sleeve 14 and rotation of casing 1 at unscrewing. The side surface of the lifting element is made with locks of reverse movement 17 that provide together with guiding ribs 8 rotation of casing 1 in direction of opening only, thus preventing displacement of discharge sleeve 4 together with shutoff sleeve 2 backwards. Preferably, reverse locks 17 are made in the form of an elastic element extending in cantilever beyond the external surface of the lifting element so that is able to stop the reverse motion of the decorative casing in radial direction.

[0020] Base 13 is provided with a sealing element 18 for tube 26 with through opening 19 and a seal for installation in the bottleneck.

[0021] Discharge sleeve 4 is made with an external thread 20 engaged with an internal thread 10 of shutoff sleeve 2, and is connected via ribs 21 with internal sleeve 22 so that forms through channels 23, while the lower part of sleeve 4 is fit with at least two arresters 24 to form a fixed coupling mutually with resilient element 5.

[0022] Discharge sleeve 4 has on its exterior cylindrical surface guiding projections 25 to advance axially along bevel surfaces 14 in direction of opening so as to emerge outside shutoff sleeve 2 relative to decorative casing 1, warning thereby about first opening.

[0023] Resilient element 5 is realized with elongated nozzle 26, through channel for liquid 27 that makes possible to preserve tightness of the closure in any position of the pouring block. Resilient element 5 contains in its upper part an inner 28 and outer 29 projections forming on top annular cavity 30. Said resilient element 5 is made with annular collar 31 round its diameter to be tightly installed via arresters 24 in discharge sleeve 4 in axial direction so as to allow their joint motion. Tube 26 is mounted on the base 13 of lifting element 3 in order to preserve tightness of the closure along the whole path of discharge sleeve 4 and shutoff sleeve 2 to the side of opening. The face surface of base 13 is fit with compensators of the closing force.

[0024] The lower part of internal sleeve 22 is accommodated in annular cavity 30 of resilient element 5, forming thereby a means preventing refilling of the bottle in the form of a hydraulic gate 32, and through channels 33 (Fig. 1) for liquid escape.

[0025] The given closure is assembled with all parts as a single unit and can be transported separately.

[0026] The device operates as follows:

[0027] When casing 1 is rotated in direction of unscrewing during first opening, guiding ribs 8 of decorative casing 1 transfer this motion via guiding projections 25 of discharge sleeve 4 over bevel surfaces 14 of lifting element 3, starting simultaneously a lifting movement of shutoff sleeve 2, discharge sleeve 4 and resilient element 5. Shutoff sleeve 2 presses by its lifting movement against breakable element 6 of decorative casing 1 thus tearing it off via rupture of weakened line 7 and extends outside, signaling thereby about first opening. There is, nevertheless, a possibility of repeated unscrewing and screwing back shutoff sleeve 2, which prevents the pouring hole of discharge sleeve 4 from penetrating foreign objects or other liquids into the pouring system of the device. Tightness of the closure is preserved in any moment from the beginning till the end of motion.

[0028] Guiding projections 25 of discharge sleeve 4 are moving over bevel surfaces 14 displacing simultaneously in axial direction along guiding ribs 8 of decorative casing 1, and extend onto horizontal surface 15 that is restricted by a vertical arresting plane 16. The shutoff sleeve can not be returned into its initial position due to

the presence of the locking joint formed between decorative casing 1 and the elements of locking coupling 17 on the external wall of lifting element 3.

[0029] At tilting the bottle (not shown) the liquid passes through hole 27 of resilient element 5 into the channel of nozzle 26 via through channels 33 (Fig. 1) of discharge sleeve 4 and escapes from the bottle.

[0030] On returning bottle into the upright position, the liquid found in through channels 33 leaks into the annular cavity 30 of hydraulic gate 32, which hampers its further supply. The pressure created inside the vessel prevents from filling the bottle with unauthorized liquids.

[0031] All parts of the closure are made of ecologically friendly polymeric materials, such as polyethylene and polystyrene, using highly efficient thermoplastic automatic machines by injection molding in molds with a system of hot channels, and dies. The bottle is closed by top-down pressing in a capping machine.

[0032] Some modifications of the closure are admitted within the frames of the present invention. For instance, the screw closure can be provided with tamper-evident means, namely, be made with breakable elements (a ring, ribbon or else) as additional warning about unsealing, and may have such indication means as words, letters or symbols, besides, the cap face can be made rough or smooth.

[0033] The proposed invention raises hygienic characteristics of the device, improves convenience in operation, ensures reliable tightness, and warns visually about first opening of the bottle thus protecting against refilling thereof.

Claims

1. A closure with extensible tamper-evident means comprises a decorative casing with a tear element, which is likely to be removed from the casing, a shutoff sleeve engaged by a thread with the discharge sleeve having a pouring hole that is connected via ribs with the internal sleeve so as to form through-pass channels, a resilient element with a through opening, tightly fitted in the discharge sleeve, being possibly installed in the bottleneck, **characterized** that said closure being additionally fit with a lifting element having fastening facilities for fixing on the container and a base for tight fitting in the bottleneck hole, a reverse lock, and at least one lifting bevel surface, while on the exterior cylindrical surface of the discharge sleeve there is at least one guiding projection interacting with the decorative casing to allow for axial advance over the bevel surfaces of the lifting element towards the opening, and possibly emerge outside the shutoff sleeve relative to the decorative casing, warning thereby about first opening.

2. Closure for bottle as claimed in claim 1, wherein the bevel surface of the lifting element made at a constant or variable slope angle transferring into a horizontal one, which is restricted by a vertical arrester in such a way that the discharge sleeve installed on the horizontal surface hinders the reverse motion of the shutoff sleeve relative to the decorative casing.

3. Closure for bottle as claimed in claim 1, wherein the resilient element is made as an elongated nozzle tightly fit in the discharge sleeve in axial direction so that can move together with said sleeve keeping tightness of the closure over the discharge sleeve path towards opening.

4. Closure for bottle as claimed in claim 1, wherein the guiding ribs 8 are made on the interior surface of the decorative casing to serve simultaneously as the elements of the locking engagement that provide for a transfer motion along the bevel surfaces of the lifting element via the guiding projections of the discharge sleeve.

5. Closure for bottle as claimed in claim 1, wherein the reverse lock is made as a resilient element extending in cantilever and protruding beyond the exterior surface of the lifting element so that is able to lock the reverse motion of the decorative casing in radial direction.

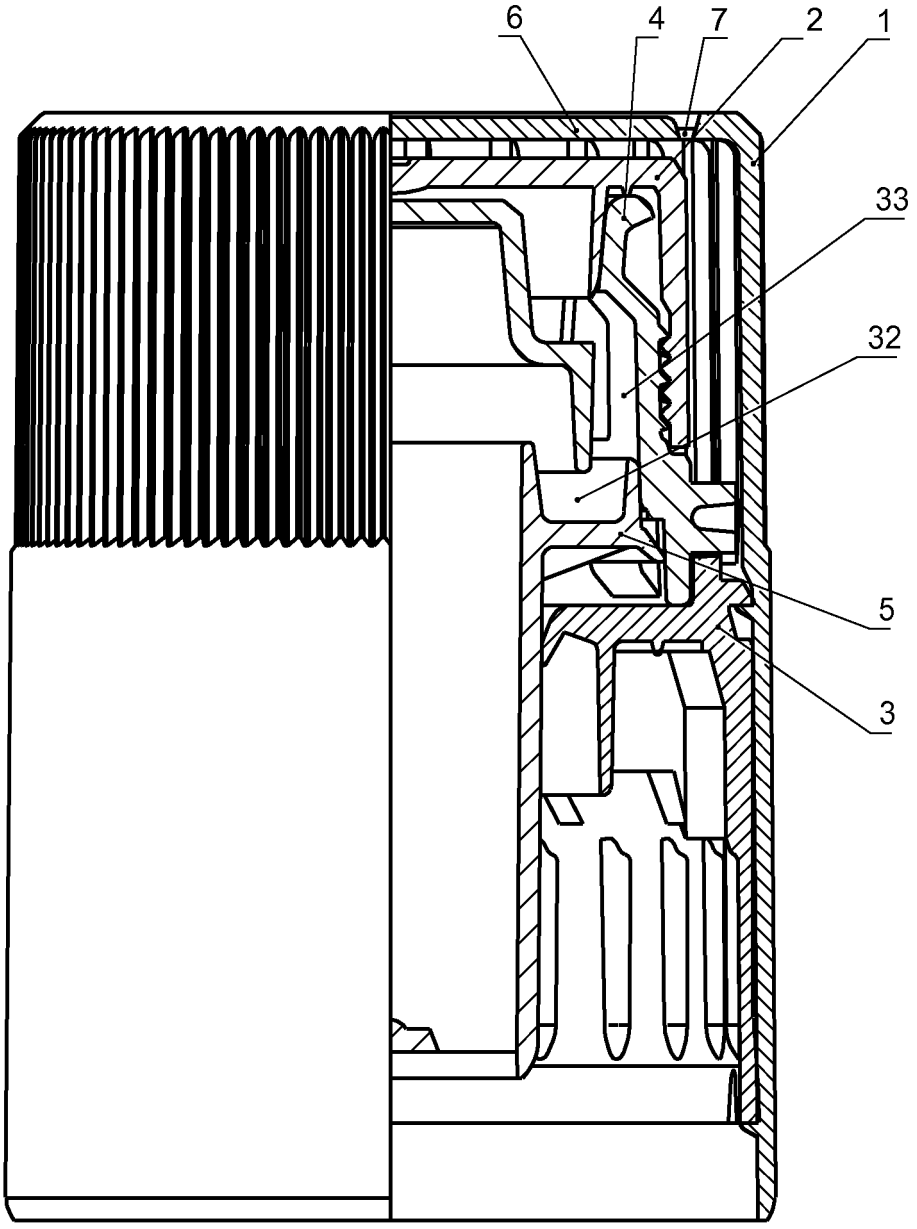

fig.1

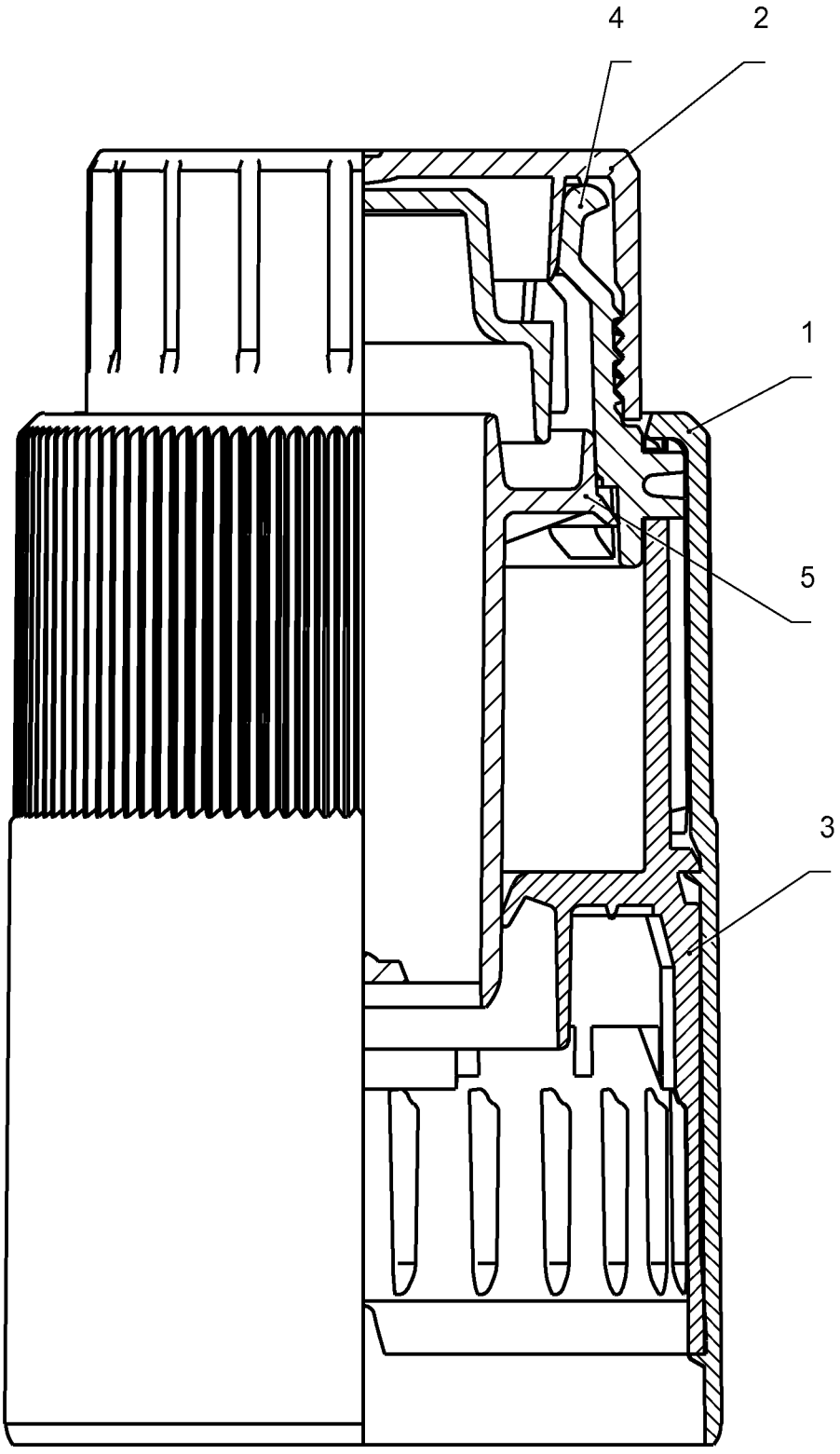

fig.2

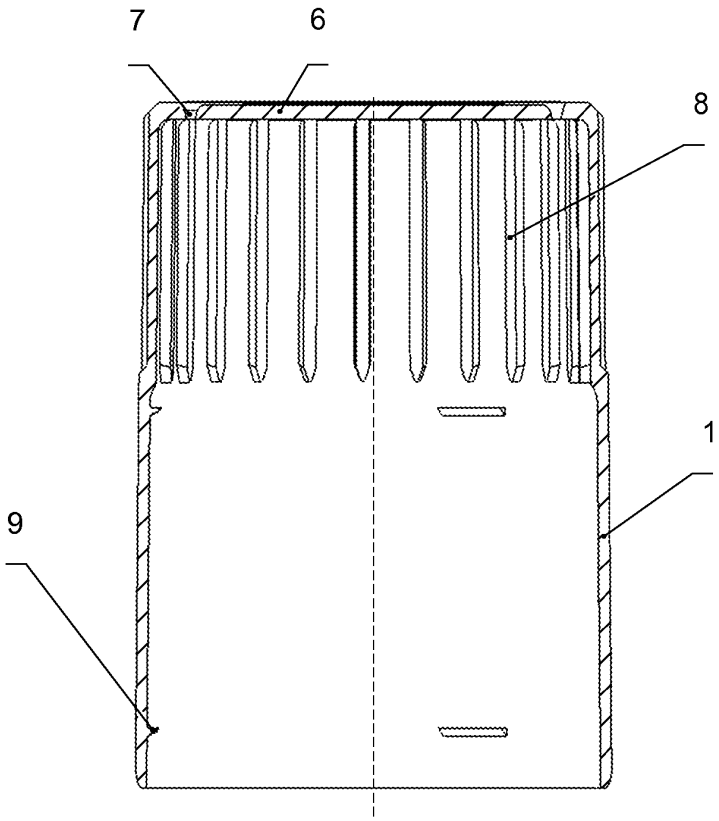

fig.3

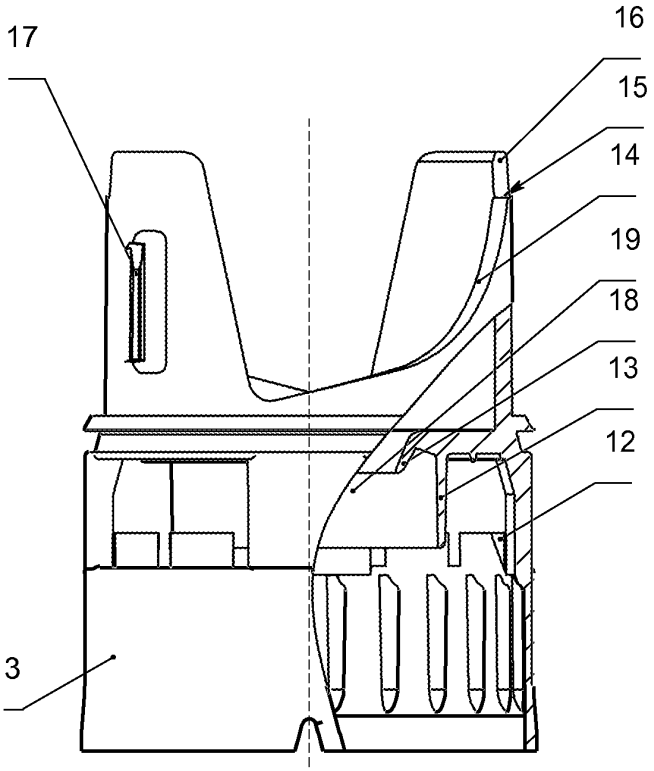

fig.4

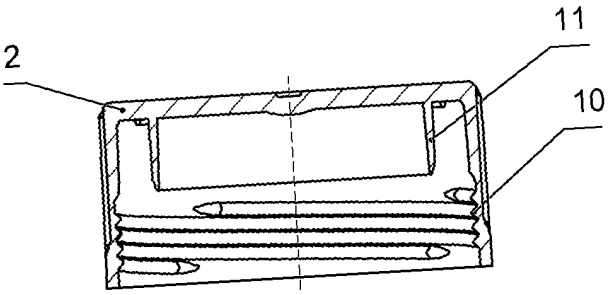

fig.5

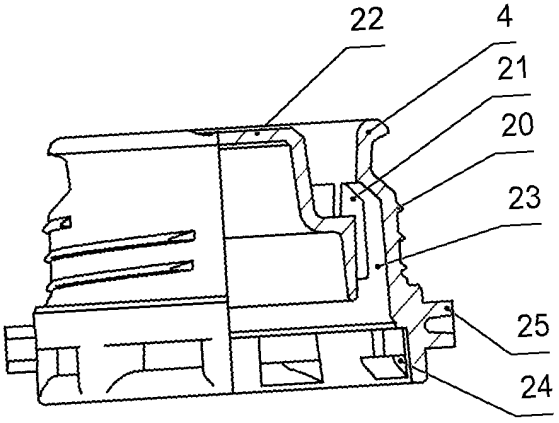

fig.6

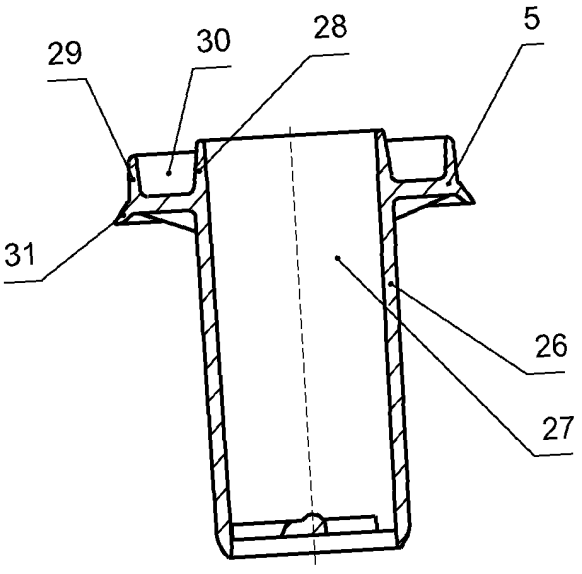

fig.7

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EA2009/000005

A. CLASSIFICATION OF SUBJECT MATTER
B65D 47/36 (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B65D 47/24, 47/36, 51/18

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Esp@cenet, RUPAT, RUABRU, RUPAT OLD, RUABU1, USPTO DB, DPWI

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EA 006731 B1 (INOSTRANNOE UNITARNOE PROIZVODSTVENNOE PREDPRIYATIE KOMPANII "BELKAPS BETAILINGUS GMBKH" BELKEPS), 28.04.2006	1-5
A	UA 35550 U (INOSTRANNOE CHASTNOE PROIZVODSTVENNOE UNITARNOE PREDPRIYATIE "ALKOPAK") 25.09.2008	1-5
A	FR 2631318 A1 (SIMONE MOREL) 17.11.1989	1-5
A	RU 67550 U1 (SHALMIEV MIKHAIL YAKUBOVICH) 27.10.2007	1-5

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
18 December 2009	24 December 2009
Name and mailing address of the ISA/ RU Facsimile No.	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (April 2005)