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

(11) EP 2 674 371 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
18.12.2013 Bulletin 2013/51

(51) Int Cl.:
B65D 51/18 *(2006.01)* ***B65D 51/28*** *(2006.01)*

(21) Application number: **13171588.0**

(22) Date of filing: **12.06.2013**

(84) Designated Contracting States:
AL 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 RS SE SI SK SM TR
Designated Extension States:
BA ME

(30) Priority: **12.06.2012 IT TO20120506**

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(54) Bottle cap for the conservation of substances to be kept separate until their use

(57) A cap for the conservation of substances to be kept separate until their application, said cap is adapted to be applied onto the mouth of a bottle (2).

Said cap comprises a hollow separation device (3), which is provided with constraint means that constrain it to said bottle, a tank (4), which contains a first substance, which has to be kept separate from a second substance, which is contained in said bottle (2), until their use, and breaking means for breaking the base of said tank, which are activated by applying pressure on the top of said device. Said cap comprises, furthermore, a protection capsule (5), which is fitted on said device.

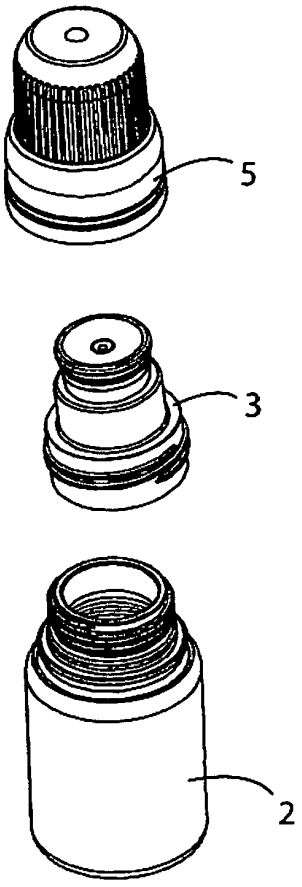

Fig. 2

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Description

[0001] The present invention is relative to a cap for dispensing substances, for example liquid or powered substances, to be kept separate until their application.

[0002] Currently, containers are available on the market, which allow the substances contained therein to be kept separate until their use, when they are mixed. This occurs, for example, in case of conservation of pharmaceutical products, which, if they were sold already mixed and ready to be used, would loose their therapeutic power over a limited amount of time. These containers are usually provided with a bottle closing cap consisting of a capsule, inside which a cylindrical tank is provided, in which a first substance, for example a powdered substance, is contained, which has to be mixed with a second substance, which is contained in the container, for example a liquid substance. This capsule, furthermore, is associated with a breaking element, whose top can be pressed, so that a stem of said element penetrates into the tank and so that the lower end of the stem breaks the lower base of the cylindrical tank along at least part of its circular perimeter. In this way, the first substance is released in the container, thus forming the desired mixture with the second substance contained therein. The perimeter of the base of the tank has a membrane, which is advantageously provided with weakening or pre-breaking elements, which make it easier for it to be broken.

[0003] The capsule is usually connected to the bottle by means of a threaded coupling, so that the bottle can be opened in order to use the product contained therein after the mixture has been formed. Sometimes the capsule, the tank and the breaking means are manufactured as one single piece.

[0004] Furthermore, the base of the tank is a separation membrane, which is welded to the tank and is made of a material that is adapted to prevent water vapor from flowing from the outside to the inside of the tank and vice versa.

[0005] The bottle closing cap according to the present invention can be fitted on bottles having any kind of shape and made of any kind of material; the cap, furthermore, can be used to mix both liquid and powered products. Preferably, the product contained in the bottle is a liquid product, whereas the product contained in the cap is a powered product. One aspect of the present invention is relative to a protection cap having the features set forth in appended claim 1.

[0006] The features and the advantages of the closing cap according to the present invention for a bottle of substances to be kept separate until their delivery will be best understood upon perusal of the following detailed description, which is explanatory and nonlimiting, with reference to the accompanying drawings, which specifically illustrate what follows:

- figure 1 shows a prospective view of a bottle associated with a closing cap according to the present invention;
- figure 2 shows an exploded view of the assembly made up of the bottle, the separation device and the protection capsule according to the present invention;
- figure 3a shows a cross section of the separation device according to the present invention;
- figure 3b shows a front view of the separation device according to the present invention;
- figure 4a shows a cross section of the protection cap according to the present invention;
- figure 4b shows a cross section of the protection cap according to the present invention.

[0007] With reference to the figures mentioned above, an embodiment is shown, which comprises a closing cap 1 associated with a bottle 2 having a cylindrical shape. The present invention can be equally applied to bottles having different shapes.

[0008] Furthermore, in this specific case, the separation device is threaded on the inside and, as a consequence, is screwed onto the container. In a further embodiment, the closing device can be fitted onto the container by applying pressure or in similar manners that can guarantee a tight closing.

[0009] In detail, separation device 3 preferably has an internally hollow cylindrical shape and is provided with an upper portion 31, which forms, on the inside, a tank 4 for a first substance to be mixed with a second substance contained in bottle 2.

[0010] Said first and second substances can be made up, for example, of a powder, a liquid, a granulate, or other substances to be mixed with a liquid.

[0011] The device comprises, furthermore, breaking means to break the base of tank, which can be manually activated by applying pressure on the top of said device.

[0012] Separation device 3 comprises, furthermore, a lower portion 32, which has a diameter that is larger than the diameter of the upper portion and is provided with constraint means to constrain it to the container, such as for example an inner thread or, alternatively, pressure constraint means to fit it onto container 2.

[0013] Said lower portion comprises, if necessary, an annular closing seal of the type normally applied on the caps of beverages contained in plastic bottles. The base of tank 4 can have a membrane, which is welded to an edge 41, which is arranged close to the connection of the upper portion to the lower portion. Said membrane, for example, is thermowelded or induction-welded or glued onto said edge, and it is made of a plastic material coupled to an aluminum film.

[0014] Said membrane, when the separation device is closed on bottle 2, separates the first substance contained in tank 4 from the second substance contained in container 2.

[0015] In case one of the substances is a liquid containing water, the membrane hinders a possible passage of water vapor through it and, therefore, avoids an unde-

sired pre-mixing of the two substances, which would cause the product to be ineffective when used.

[0016] Said tank breaking means comprise a cylindrical piston 33, which is able to slide inside the hollow cylindrical body of the separation device and is provided, on its lower portion, of at least one breaking tip 331.

[0017] Advantageously, lower portion 32 comprises a plurality of ribs and/or recesses, which are substantially vertically arranged adapted to help the device be handled during the opening and closing operations of the container.

[0018] The cap according to the present invention comprise a protection capsule 5, which is arranged on said device 3. Said capsule preferably has a shape that is similar to the shape of the device on which it is fitted. Said capsule comprises an upper dome-like portion 51, which is advantageously provided with corrugations that help users grip it. Furthermore, said capsule comprises a lower annular portion 52, which has, on the inside, a thread 53, which can be coupled to a similar thread 321 available on the outside of lower portion 32 of device 3.

[0019] The thread allows the capsule to be coupled to the separation device.

[0020] The device according to the present invention works as described below.

[0021] When the two substances have to be mixed, it is sufficient to remove capsule 5 and apply a pressure on the piston of the separation device. The latter, therefore, moves downwards until the breaking tip penetrates the membrane, thus causing the membrane to almost completely break and the first substance contained in tank 4 to fall by gravity into bottle 2, hence coming into contact with the second substance. Then, the capsule can be screwed again on the separation device, so as to cause the two elements to be integral to one another, remove everything from the mouth of the bottle and allow users to use the content of the bottle.

[0022] In a further embodiment not shown in the accompanying drawings, when the two substances have to be mixed, it is advantageously possible to use the presence of the capsule, which, in this condition, acts not only as a protection for the device against possible external agents.

[0023] As a matter of fact, both the protection capsule and the separation device can be shaped in such a way that inner thread 53, when it is rotated in the given rotation direction, is screwed on device 3, thus pressing on the piston with its dome-like portion. The latter, therefore, moves downwards until the breaking tip penetrates the membrane, thus causing the membrane to almost completely break and the first substance contained in tank 4 to fall by gravity into bottle 2, hence coming into contact with the second substance.

[0024] Capsule 5 is provided with holding means to hold device 3 therein after the tank inside the device has been opened and the two components have been mixed. Then, the cap is removed, thus removing both the capsule and the device locked therein.

Claims

1. Cap for the conservation of substances to be kept separate until their use, said cap being adapted to be applied onto the mouth of a bottle (2) said cap comprising

   - a hollow separation device (3), which is provided with constraint means that constrain it to the bottle
   - a tank (4), which contains a first substance, which has to be kept separate from a second substance, which is contained in said bottle (2), until their use,
   - breaking means for breaking the base of said tank, which are activated by applying pressure on the top of said device,

   characterized in that it comprises a protection capsule (5), which is fitted on said device and is provided with an inner thread (53), which is coupled to a similar thread (321) available on the outer side of the device (3), so as to cause the two parts to become integral; and **in that** said capsule comprises holding means for holding the device (3) therein, once the tank inside the device has been opened and the two components have been mixed.

2. Cap according to claim 1, wherein said device comprises an upper portion (31), in which said tank (4) is built-in, and a lower portion (32), which has a larger diameter than the diameter of the upper portion provided with constraint means that constrain it to the bottle.

3. Cap according to claim 1, wherein said capsule comprises an upper dome-like portion (51) and a lower annular portion (52), which presents, on its inner side, said thread (53).

4. Cap according to claim 2, wherein said outer thread (321) is arranged on the lower portion (32) of the device (3).

5. Cap according to claim 3, wherein said capsule is provided with corrugations that help users to grip it.

6. Cap according to claim 2, wherein said base of the tank comprises a membrane, which is associated in an integral manner to an edge (41), which is arranged close to the connection of the upper portion to the lower portion of the device (3).

7. Cap according to claim 1, wherein said tank breaking means comprise a cylindrical piston (33), which is able to slide inside the hollow cylindrical body of the separation device (3) provided, on its lower portion, of at least one breaking tip (331).

8. Cap according to claim 6, wherein said membrane is thermo-welded or induction-fixed or glued to said edge (41).

9. Device according to claim 1, wherein said first substance is a powdered substance and said second substance is a liquid substance.

10. Device according to claim 1, wherein said capsule and said device are shaped in such a way that, by screwing the capsule itself, the tank breaking means are pressed by said capsule, thus causing the first substance contained in the tank (4) to fall by gravity into the bottle (2).

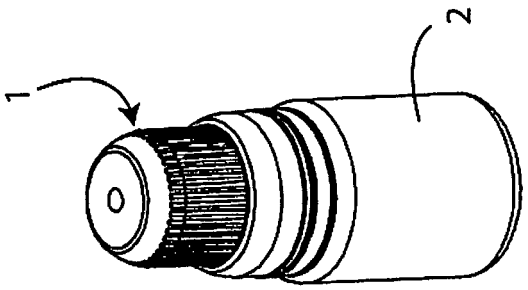

Fig. 1

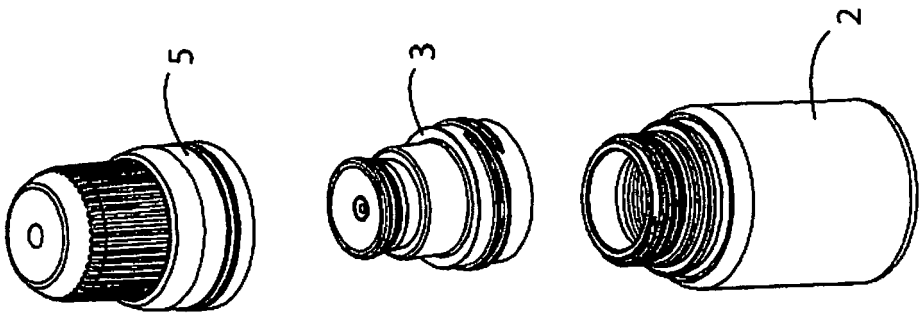

Fig. 2

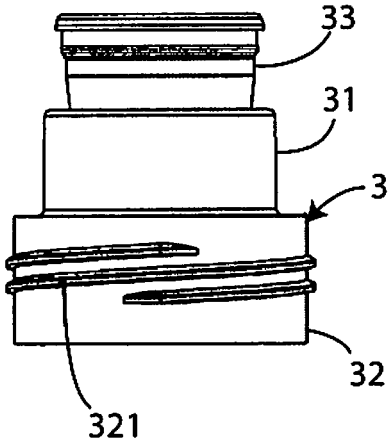

Fig. 3a

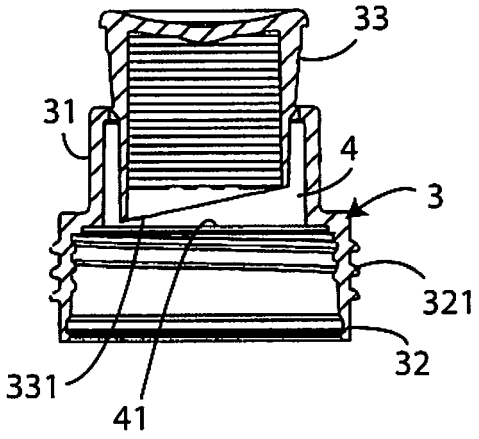

Fig. 3b

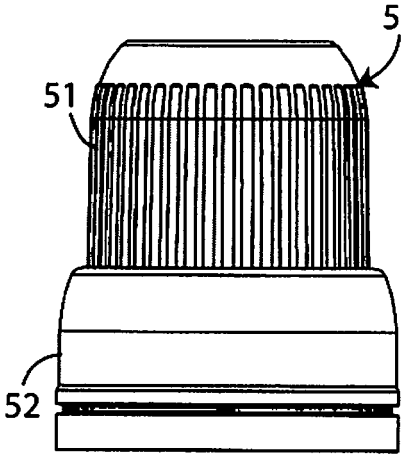

Fig. 4a

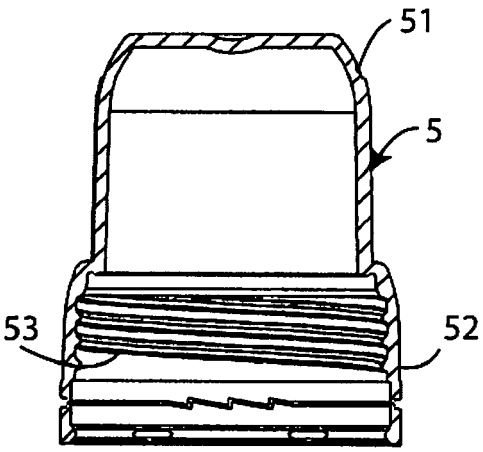

Fig. 4b

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EUROPEAN SEARCH REPORT

Application Number
EP 13 17 1588

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X Y	US 2005/161348 A1 (MORINI EMILIO [IT]) 28 July 2005 (2005-07-28) * paragraph [0013] - paragraph [0029]; figures 1-3 *	1-3,5,7, 9,10 6,8	INV. B65D51/18 B65D51/28
X	WO 2009/031864 A2 (CHO YOUNG-KOOK [US]; PARK JEONG-OOG [KR]) 12 March 2009 (2009-03-12) * page 6, line 13 - page 10, line 18; figures 1-11 *	1,3,5,9	
Y	EP 1 623 932 A1 (INGE SPA [IT]) 8 February 2006 (2006-02-08) * paragraph [0020]; figures 1-3 *	6,8	

TECHNICAL FIELDS SEARCHED (IPC)

B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	12 September 2013	Fitterer, Johann

CATEGORY OF CITED DOCUMENTS

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 13 17 1588

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12-09-2013

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2005161348 A1	28-07-2005	AU 2002304300 A1	17-11-2003
		BR 0215725 A	22-02-2005
		CA 2482390 A1	13-11-2003
		DE 60215977 T2	05-07-2007
		EP 1499535 A1	26-01-2005
		ES 2275874 T3	16-06-2007
		HK 1073636 A1	27-04-2007
		MX PA04010773 A	07-03-2005
		US 2005161348 A1	28-07-2005
		WO 03093128 A1	13-11-2003
WO 2009031864 A2	12-03-2009	KR 20090025416 A	11-03-2009
		WO 2009031864 A2	12-03-2009
EP 1623932 A1	08-02-2006	AT 365688 T	15-07-2007
		DE 602005001476 T2	28-02-2008
		EP 1623932 A1	08-02-2006
		ES 2290855 T3	16-02-2008

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