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(54) **DEVICE FOR THE FLUID-TIGHT CONSERVATION OF A SUBSTANCE TO BE MIXED TO ANOTHER SUBSTANCE CONTAINED IN A CONTAINER**

VORRICHTUNG ZUM FLÜSSIGKEITSDICHTEN KONSERVIERUNG EINER SUBSTANZ ZUR MISCHUNG MIT EINER ANDEREN IN EINEM BEHÄLTER VORHANDENEN SUBSTANZ

DISPOSITIF DE CONSERVATION ÉTANCHE AUX FLUIDES D'UNE SUBSTANCE À MÉLANGER À UNE AUTRE SUBSTANCE CONTENUE DANS UN RÉCIPIENT

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Description

[0001] The present invention relates to a device for the fluid-tight conservation of a substance to be mixed to another one contained in a container and the simultaneous opening of said container, which allows the two substances to be mixed upon use.

[0002] In the prior-art, devices of the type described above are known, which have a first concave element, which is provided with an edge that is adapted to be associated, in a fluid-tight manner, with a container, thus sealing it, and a second element, which, together with the first element, defines a chamber, which is adapted to contain the substance to be mixed with the one available in the container. The chamber has a removable closing wall to close the chamber itself when the second element slides relative to the first element.

[0003] The prior patent, namely the Italian patent no. IT1252265, in the name of the Applicant, discloses a device of this type, in which the second element comprises said closing wall and holding means, which are suited to hold said wall when it is in the removed position, so as to prevent the second element from falling into the container, are provided between said first element and said second element. This technical solution is very easy to be used by the user. The user, indeed, simply needs to exert a pressure on the top of the device in order to cause the second element to move downwards, thus removing the above-mentioned chamber closing wall. This is possible due to the fact that the second element has a stem, which connects the top of the device to the bottom wall of the chamber; hence, by pressing on the stem, said wall is disengaged.

[0004] In these types of devices, one of the most important requirements is the fluid-tight sealing of the chamber, which usually holds powder. Therefore, to this purpose, plastic materials are used, which are able to prevent humidity and other degrading agents from penetrating into the chamber. In the above-mentioned patent, a possible spot for the penetration of these agents is the area that connects the removable wall and the fixed wall of the chamber. This area is sufficiently sealed to prevent the substance contained in the chamber from coming out of it, but, in some particular unfavorable conditions, it could not be able to completely prevent said agents from penetrating into the chamber from the outside.

[0005] WO 2010/084176 A1 relates to a capsule for dispensing solid, free-flowing, or liquid active ingredients, wherein in said capsule, a penetrating plunger is attached to a curved membrane, and a chamber is formed by a capsule wall, said chamber being sealed by a destructible film at the end of the chamber opposite the membrane. In order to really destroy said film completely so that the active ingredient can also actually escape, the penetrating plunger is provided with elastic arms, which are angled from top to bottom and from the center to the periphery, or preferably curved. The penetrating plunger comprises a stem, which is open in the direction away from the membrane and is sealed at the bottom by an end wall. The elastic arms, the cross-section of which is gable shaped, and also a rod-shaped spike having a tip are formed on said end wall, wherein the rod-shaped spike first penetrates the destructible film upon actuation before the elastic arms take effect with their perforation teeth and cutting edges.

[0006] TW M 431147 U discloses a mixing cap including a cap body including a bottle connection part for connection to a bottleneck of a bottle, a blender container mounted in the bottle connection part corresponding to the bottleneck, a pressing shell pressable to deform elastically, and a seal member joined to the blender container and defining a storage chamber in the blender container to hold a blender. The pressing shell is elastically deformably pressable by an external force to impart a pressure to the seal member, making an opening in the seal member for allowing the blender to enter the bottle.

[0007] WO 2009/100544 A1 discloses a device according to the preamble of claim 1 having a fillable closure with a triggering pushbutton comprising a filler neck that is to be screwed onto or joined to a container neck as well as a closure cap which is associated to said filler neck and can be joined, pivoted and snapped-on the filler neck by means of a hinge connection. A separately fillable container can be inserted into the filler neck, said container being closed at the bottom with a sealing foil that can be pierced or cut open. The closure cap comprises a cap cover as a pusher disc, which can be pressed downward in the axial direction while deforming. By pressing said cap cover downward on the container inserted in the filler neck or on a rigid opening element accommodated therein, said opening element can be pressed downward so that the sealing foil of the container can be pierced and cut open.

[0008] US 2009/020495 A1 discloses a container cap that includes a housing having an inner thread for engaging with an outer thread of a mouth of a receptacle, and a casing extended inwardly from an upper wall and spaced from the housing for forming an inner peripheral space between the casing and the housing, and a compartment formed in the casing for receiving a liquid-dissolvable additive, a membrane attached to the casing for retaining the liquid-dissolvable additive within the compartment of the casing, and a piercing device may be used for selectively piercing the membrane to allowing the liquid-dissolvable additive to be released from the compartment of the casing and introduced into the receptacle.

[0009] US 2008/116221 A1 discloses a dispenser for a bottle adapted to contain a consumable beverage, the dispenser being adapted for a person to drink from and being adapted to engage the bottle, the dispenser comprising: a dispenser body adapted to hold a flavoring component, the dispenser body having a first dispenser end, adapted for drinking therefrom, and having a second dispenser end, adapted to be engaged with the bottle; a plunger slidably disposed at least partially within the dis-

penser body for movement from a first plunger position to a second plunger position, in which the plunger creates a passageway through the dispenser body, the passageway being adapted to allow the flavoring component from the dispenser body to mix with the consumable beverage in the bottle; and a cap slidably positioned on the first dispenser end of the dispenser body and defining a cap opening adapted to allow the person to drink the consumable beverage therefrom, the cap being moveable between a first cap position, in which the cap opening is proximate to the first dispenser end of the dispenser body, and a second cap position, in which the cap opening is spaced further from the first dispenser end than when the cap is in the first cap position, wherein when the plunger is in the second plunger position and the cap is in the first cap position, the plunger end cooperates with the cap to seal the cap opening so that the dispenser is adapted to prevent the consumable beverage from leaving the bottle.

[0010] The object of the present invention is to solve the drawbacks mentioned above by suggesting a device, in which the fluid-tight sealing is guaranteed for sure. An aspect of the present invention is relative to a device for the fluid-tight conservation of a substance to be mixed with another one contained in a container having the features set forth in appended claim 1.

[0011] The features and the advantages of the device according to the present invention will be best understood upon perusal of the following detailed description, which is explanatory and non-limiting, with reference to the accompanying drawings, which specifically illustrate what follows:

- figure 1 shows a prospective view of a container, which is associated with a closing device according to the present invention;
- figure 2 shows a cross section of the separation device according to the present invention;
- figure 3 shows a front view of the breaking element according to the present invention.

[0012] With reference to the figures mentioned above, the device for the fluid-tight conservation of a first substance to be mixed with a second substance contained in a container 1 and the simultaneous opening of said container comprises an outer cap 2 and a breaking element 3.

[0013] Cap 2 is concave, substantially cylindrical and comprises an edge portion 21, which is adapted to seal the mouth of the container, preferably a bottle, for example by means of an inner thread, on which the device can be mounted. In this way, mouth 11 of container 1 is protected against possible bacterial contaminations. Edge portion 21 also extends on the sides of the mouth of the container and, furthermore, is provided with means to seal the device relative to the mouth.

[0014] The cap has, on the upper side, a deformable portion 22 and, on the lower side, a conical portion 23, which can be inserted, by applying pressure, into the mouth of the container.

[0015] Both portions define the concavity that is adapted to house breaking element 3.

[0016] Conical portion 23 has a thickness that is substantially identical to the one of the edge portion and to the one of deformable portion 22, which, therefore, is properly pliable, despite having a local thickening 24, which is arranged where the greatest deformation occurs. Conical portion 23 is provided, on the inside, with a projecting element 25.

[0017] The conical portion is closed, on the lower side, by a thermowelded film 26, which is welded to the lower edge of the conical portion. In this way, a chamber C is defined, which holds said first substance. The first substance preferably is a powder, which can be both the solute and the solvent of the substance contained in the container, with which the device can be associated. The chamber is obviously filled before being closed by welding the film.

[0018] Breaking element 3 is inserted into the cap and comprises a stem 31, which is substantially arranged at its lower end, and has film breaking means, which comprise a plurality of spokes 32, which diagonally extend towards the outside, so as to end in a ring 33. The ring is provided, on the lower side, of a plurality of teeth 34, which are adapted to break the film 6. The upper end of the stem substantially strikes against the inside of the deformable portion of the cap.

[0019] The breaking element comprises, above the breaking means, preferably in an intermediate portion of the stem, a circle 35, which is connected to the stem by arms 36.

[0020] During the assembly phase, after the chamber has been filled with the first substance and the film has been welded, the device is mounted on the mouth of the container. In this way the substance contained in the chamber inside the cap is protected both against any type of tampering and against the contamination from external agents, such as humidity.

[0021] Upon use, the user presses on the top of the cap, which is properly flexible. In order to make this operation easier, indicator means I are provided, such as for example arrows that indicate the spot where the greatest pressure needs to be applied. Local thickening portion 24 is arranged in correspondence to the lower end of stem 31, with which it comes into contact, thus pushing it downwards. In this way, the entire breaking element moves towards the chamber closing film. breaking teeth 34, as a consequence, come into contact with the film, thus breaking it and causing the first substance to fall into the container, hence creating the mixture of the two substances.

[0022] The shape of the breaking element prevents it from completely coming out from the inside of the cap, possibly falling into the container. Suitable means to hold this element are made up of circle 35, which strikes against projecting element 25, thus preventing the ele-

ment from moving further downwards. The shape of the breaking element, furthermore, makes it easier for the first substance to come out of the chamber, since spokes 32 and ring 33 are not solid structures, but they simply create a sort of frame, inside which large free spaces are provided, through which the substances, both liquids and powders, can easily move.

[0023] Now the user can break the sealing means and open the container by removing the device, thus using the mixture.

Claims

1. Device for the fluid-tight conservation of a first substance to be mixed to a second substance, which is contained in a container (1) comprising

   • an outer concave cap (2) comprising an edge portion (21), for sealing the mouth (11) of the container, and presenting, on the upper side, a deformable portion (22) and, on the lower side, a portion (23), which can be inserted, by applying pressure, into said mouth of the container, inside which a chamber (C) for containing said first substance is defined,
   • a breaking element (3) comprising a stem (31), which, at its upper end, strikes from the inside the deformable portion of the cap and is able to move downwards after a pressure has been applied onto said deformable portion of the cap,
   • holding means for holding said element inside the cap after said pressure has been applied onto the cap itself, said means being adapted to prevent the element itself from keeping moving downwards outside the cap;

   wherein said chamber (C) is closed on the lower side by a film (26), and said stem presents, at its lower end, breaking means for breaking said film, wherein said breaking means comprise a plurality of teeth (34), for breaking the film (26);
   wherein said breaking means further comprise: a ring (33), on whose lower surface said teeth are arranged, and a plurality of spokes (32), which diagonally extend from the end of the stem towards the outside, so as to support said ring (33);
   characterized in that said portion (23) on the lower side of said outer cap (2) is conical and said film (26) is welded to the lower edge of said conical portion (23);
   said holding means for holding said element inside the cap comprise a circle (35), which is associated to said stem and, during its movement, strikes a projecting element (25), which is arranged inside the conical portion along its circumference, thus preventing the element from moving further downwards.

2. Device according to claim 1, wherein said circle (35) is connected to the stem by means of arms (36).

3. Device according to claim 1, wherein said deformable portion presents a local thickening (24), which is arranged where the greatest deformation occurs.

4. Device according to claim 1, wherein said deformable portion presents indicating elements (6), which indicate the point where the greatest pressure has to be applied.

5. Device according to claim 1, wherein said edge portion (21) is provided with sealing means for sealing the device with respect to the mouth.

Patentansprüche

1. Vorrichtung für die fluiddichte Konservierung einer ersten Substanz, die mit einer zweiten Substanz, welche in einem Behälter (1) enthalten ist, gemischt werden soll, umfassend:

   eine äußere konkave Kappe (2), die einen Randabschnitt (21) umfasst, um eine Mündung (11) des Behälters abzudichten, und an der oberen Seite einen verformbaren Abschnitt (22) aufweist, und an der unteren Seite einen Abschnitt (23) aufweist, der durch Ausüben eines Drucks in die Mündung des Behälters eingesetzt werden kann, und in dem eine Kammer (C) zur Aufnahme der ersten Substanz definiert ist,
   ein Brechelement (3), das einen Schaft (31) umfasst, der an seinem oberen Ende von der Innenseite her auf den verformbaren Abschnitt der Kappe trifft und in der Lage ist, sich abwärts zu bewegen, nachdem ein Druck auf den verformbaren Abschnitt der Kappe ausgeübt wurde,
   Haltemittel, um das Element im Inneren der Kappe zu halten, nachdem der Druck auf die Kappe selbst ausgeübt wurde, wobei die Mittel dazu ausgelegt sind, das Element selbst daran zu hindern, sich außerhalb der Kappe weiter nach unten zu bewegen;
   wobei die Kammer (C) an der unteren Seite durch einen Film (26) verschlossen ist, und der Schaft an seinem unteren Ende Brechmittel zum Aufbrechen des Films aufweist, wobei die Brechmittel mehrere Zähne (34) umfassen, um den Film (26) aufzubrechen;
   wobei die Brechmittel ferner einen Ring (33), an dessen unterer Fläche die Zähne angeordnet sind, und mehrere Speichen (32), die sich diagonal von dem Ende des Schafts nach außen erstrecken, um den Ring (33) zu tragen, umfassen;
   dadurch gekennzeichnet, dass der Abschnitt

(23) an der unteren Seite der äußeren Kappe (2) konisch ist und der Film (26) an den unteren Rand des konischen Abschnitts (23) geschweißt ist;
die Haltemittel zum Halten des Elements im Inneren der Kappe einen Kranz (35) umfassen, der dem Schaft angeschlossen ist und während seiner Bewegung auf ein vorspringendes Element (25) trifft, das entlang des Umfangs im Inneren des konischen Abschnitts angeordnet ist, wodurch verhindert wird, dass sich das Element weiter nach unten bewegt.

2. Vorrichtung nach Anspruch 1, wobei der Kranz (35) durch Arme (36) mit dem Schaft verbunden ist.

3. Vorrichtung nach Anspruch 1, wobei der verformbare Abschnitt eine lokale Verdickung (24) aufweist, die dort angeordnet ist, wo die größte Verformung auftritt.

4. Vorrichtung nach Anspruch 1, wobei der verformbare Abschnitt Anzeigeelemente (6) aufweist, die den Punkt angeben, an dem der größte Druck ausgeübt werden muss.

5. Vorrichtung nach Anspruch 1, wobei der Randabschnitt (21) mit Dichtungsmitteln versehen ist, um die Vorrichtung in Bezug auf die Mündung abzudichten.

Revendications

1. Dispositif pour la conservation étanche aux fluides d'une première substance à mélanger à une seconde substance, qui est contenue dans un contenant (1) comprenant

• un bouchon concave externe (2) comprenant une portion de bord (21), permettant de sceller le goulot(11) du contenant, et présentant, sur le côté supérieur, une portion déformable (22) et, sur le côté inférieur, une portion (23), qui peut être insérée, par l'application d'une pression, dans ledit goulot du contenant, à l'intérieur duquel est définie une chambre (C) permettant de contenir ladite première substance,
• un élément de rupture (3) comprenant une tige (31), qui, au niveau de son extrémité supérieure, dépasse de l'intérieur de la portion déformable du bouchon et peut se déplacer vers le bas après l'application d'une pression sur ladite portion déformable du bouchon,
• des moyens de retenue permettant de retenir ledit élément à l'intérieur du bouchon après l'application de ladite pression sur le bouchon lui-même, lesdits moyens étant adaptés pour empêcher l'élément lui-même de continuer à se déplacer vers le bas à l'extérieur du bouchon ;

dans lequel ladite chambre (C) est fermée sur un côté inférieur par un film (26), et ladite tige présente, au niveau de son extrémité inférieure, des moyens de rupture permettant de rompre ledit film, dans lequel lesdits moyens de rupture comprennent une pluralité de dents(34), permettant de rompre le film (26) ;
dans lequel lesdits moyens de rupture comprennent en outre : un anneau (33), sur la surface inférieure duquel lesdites dents sont agencées, et une pluralité d'ailettes (32), qui s'étendent en diagonale à partir de l'extrémité de la tige vers l'extérieur, de façon à supporter ledit anneau (33) ;
caractérisé en ce que ladite portion (23) sur le côté inférieur dudit bouchon externe (2) est conique et ledit film (26) est soudé au bord inférieur de ladite portion conique (23) ;
lesdits moyens de retenue permettant de retenir ledit élément à l'intérieur du bouchon comprennent un disque(35), qui est associé à ladite tige et, pendant son déplacement, fait dépasser un élément de saillie(25), qui est agencé à l'intérieur de la portion conique le long de sa circonférence, empêchant ainsi l'élément de se déplacer davantage vers le bas.

2. Dispositif selon la revendication 1, dans lequel ledit disque (35) est raccordé à la tige au moyen de bras (36).

3. Dispositif selon la revendication 1, dans lequel ladite portion déformable présente un épaississement local(24), qui est agencé là où la déformation la plus importante a lieu.

4. Dispositif selon la revendication 1, dans lequel ladite portion déformable présente des éléments d'indication(6), qui indiquent le point où la pression la plus importante doit être appliquée.

5. Dispositif selon la revendication 1, dans lequel ladite portion de bord (21) est dotée de moyens de scellement permettant de sceller le dispositif par rapport au goulot.

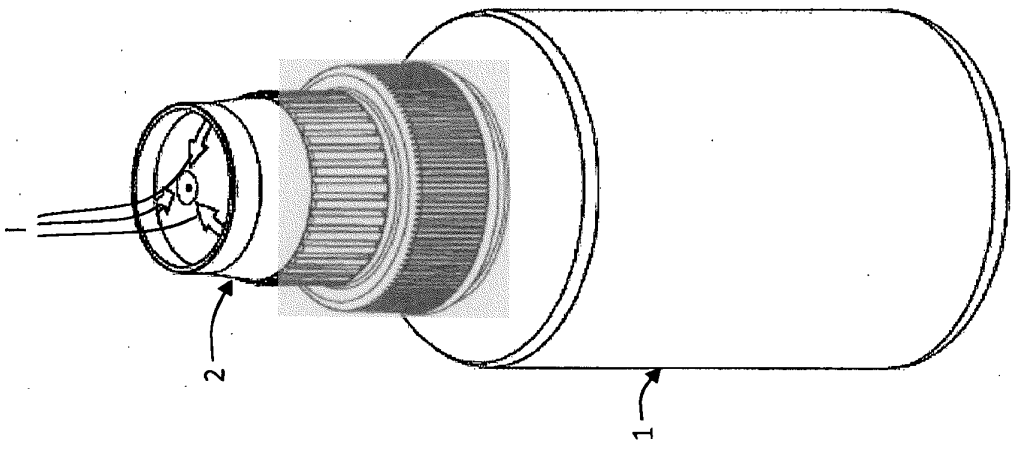


Fig. 1

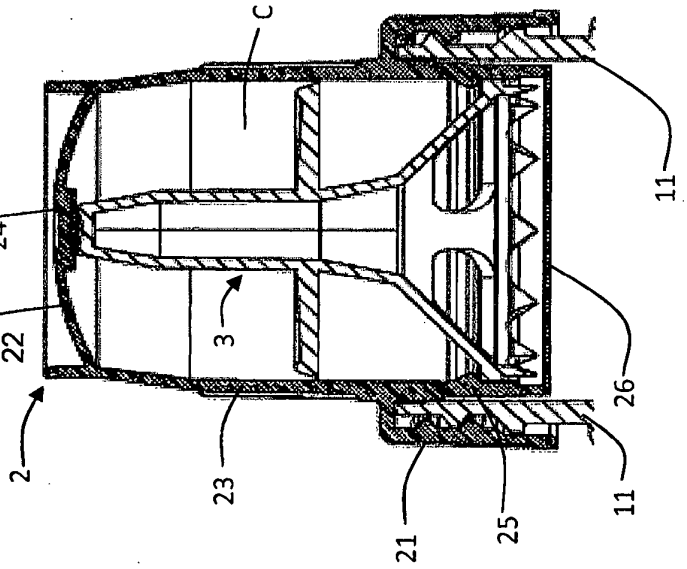


Fig. 2

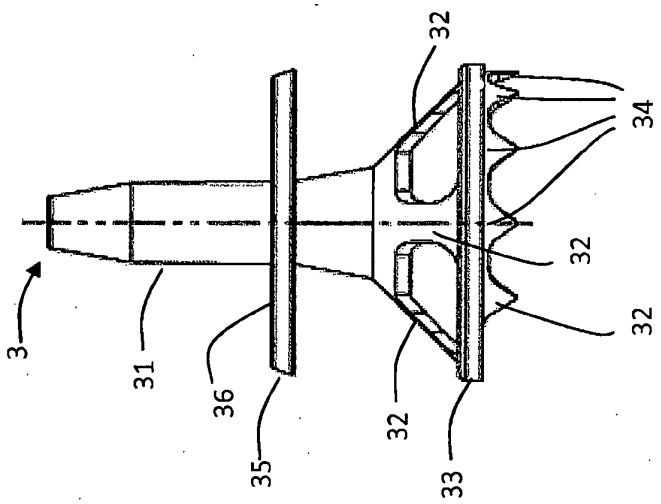


Fig. 3

REFERENCES CITED IN THE DESCRIPTION

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