Dispensing cap with automatic valve for containers for transporting and dispensing liquid or creamy substances

Spenderkappe mit automatischem Ventil für Behälter zum Transportieren und Abgeben von flüssigen oder cremigen Substanzen

Bouchon de distribution avec une soupape automatique pour récipients de transport et de distribution de substances liquides ou crémeuses

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References cited:
EP-A1- 0 405 472
JP-U- 54 039 244
US-A- 3 685 701

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Description

[0001] The present invention relates to a dispensing cap with automatic valve for containers for transporting and dispensing liquid or creamy substances.

[0002] It relates in particular to a cap associated with a flexible container.

[0003] Caps are currently known presenting a silicone insert located in proximity to a dispensing port of the cap.

[0004] This silicone or thermoplastic rubber insert is produced by moulding. It comprises a top part of predetermined thickness in which a cross-shaped cut is made after moulding.

[0005] The cross-shaped cut creates four flaps which when frontally resting one against another hermetically close the container, whereas when a pressure exceeding a certain threshold value is present in the container they flex outwards to hence free a dispensing port.

[0006] The drawback of this known art is that if the product to be dispensed contains sticky components, the front edges of the flaps can stick together and become difficult to open, necessarily requiring more pressure.

[0007] A further drawback of the known art is that when the flaps move into their closure position they frontally press against each other to form a hermetic seal which does not allow air to enter the container.

[0008] EP 0405472 describes a dispensing cap with a flexible dispensing closure according to the preamble of claim 1.

[0009] An object of the present invention is therefore to provide a cap which represents an improvement over the known art.

[0010] A further object of the present invention is to provide a cap in which the pressure required to open the valve is substantially constant and is not influenced by any product residues which remain on the valve.

[0011] These and other objects are attained by a cap in accordance with the technical teachings of the accompanying claims.

[0012] Further characteristics and advantages of the invention will be apparent from the description of a preferred but non-exclusive embodiment of the invention, illustrated by way of no-limiting example in the accompanying drawings, in which:

- Figure 1 is a top plan view of a valve of the cap according to the present invention;
- Figure 2 is a section through the valve of Figure 1 when in its rest position;
- Figure 2A is a section on the line 2-2 of the valve of Figure 1 shown in a closed position;
- Figure 2B is a section through the valve of Figure 1 shown in an open position;
- Figure 3 is a section on the line 3-3 of Figure 1;
- Figure 4 is a section through a different embodiment of the valve of the present invention;
- Figure 5 is an enlargement of the region shown within the circle in Figure 4;
- Figures 6 and 7 show two perspective views of the valve of Figure 1; and
- Figure 8 is a section through the cap of the present invention.

[0013] With reference to said figures, these show a dispensing cap 1 with automatic valve 2 for containers (not shown) able to transport and dispense liquid or creamy substances such as creams, shampoos, liquid soaps, balsams and the like.

[0014] The cap 1 (see Figure 8) comprises a profiled body 3 and a cover 4 hinged together and formed in a single moulded piece. The profiled body 3 presents a threaded part representing a means for its fixing to the neck of a container for containing the substance to be dispensed. In proximity to the threaded part a projecting element 6 is present, which on insertion into the container neck forms a seal between the cap and container. The seal can also be provided in other ways, for example directly between the container and the valve to be described hereinafter.

[0015] The profiled body 3 comprises a seat 7 presenting undercut and snap-fixing means 8 which lock the valve 2 in a position corresponding with the dispensing port 9, this opening towards the outside of the cap.

[0016] The valve 2 presents a body formed of soft plastic material and is provided, for its fixing to the cap, with means substantially comprising a flange 2A which extends into the lower portion of the valve and connects to the snap-fixing means 8.

[0017] The material with which the valve is formed can be thermoplastic rubber, SEBS, LLDPE, silicone or any other material suitable for the purpose.

[0018] Extending from the valve body 2B there are two first flaps 20A, B and second flaps 21A, B. These flaps can be of any number, with a minimum of two, and can also be of odd number. The characteristic of the present invention is that the first and second flaps are positioned in different planes, as can be seen in Figure 2, in which the valve is shown in a rest condition.

[0019] In the embodiment described here the flaps are four in number, namely two first flaps and two second flaps. Proceeding in a clockwise direction and starting from the first flap 20A, there is a second flap 21A, a further first flap 20B, and a further second flap 21 B. The first and second flaps are of circular sector shape with an angle of 90° at the centre. They are mutually offset by 90° such as to completely close the dispensing aperture.

[0020] In alternative embodiments, they can have different shapes. Hence in the embodiment of Figure 4 each flap presents a surface area slightly greater than that of a circular sector with an angle of 90° at its centre. In this manner, in proximity to the passage from one flap to the adjacent flap, these are slightly superposed. The superposed region Z (see Figure 5) is between 0.05 and 1.5 mm, advantageously 0.2 mm.

[0021] If a different number of flaps are provided, the angle at the centre could evidently be greater or lesser.
Given the flexibility of the system, the body 2B could have any sectional shape, including square, rectangular, triangular etc., there being also no limit on diameter.

0022 Advantageously the flaps present a thickness S between 0.2 and 3 mm, preferably 0.4 mm.

0023 During the various stages in the use of the valve, the flaps can present various positions by virtue of their flexibility and the flexibility of the material with which they are formed.

0024 In particular they can assume a rest position, represented in Figure 2, which occurs when the pressure in the container is equal to the external pressure. Under these conditions, at least one slit is present between them, enabling air to pass.

0025 The configuration with flaps provided in two different planes is very advantageous. In fact, using this configuration, the valve and flaps can be formed directly by injection moulding, with flap pre-cutting achieved by vertical mould adjustment. In this manner, in contrast to traditional valves, a further cutting operation subsequent to moulding is not required, and the valve leaves the mould ready for location in the cap and already perfectly functional.

0026 Advantageously when in the rest position (which substantially coincides with the valve having just left the mould) the lower surface of the first flap is spaced from the upper surface of the second flap by a distance d between 0.05 and 1.5 mm, preferably 0.15 mm.

0027 When the pressure inside the container or acting on the valve (or rather on the flaps) is slightly greater than the external pressure, the flaps move into the configuration of Figure 2A. This situation occurs for example when the container has been turned upside down, and hence the pressure of the liquid (given its weight) acts on the valve and closes it by flexing the lower flap. In this configuration the valve makes the necessary seal to prevent the liquid or creamy substance from emerging through the dispensing port. Only a further pressure exerted on the container, to consequently cause an increase in the pressure acting on the valve, results in valve opening determined by the flexure of the flaps.

0028 Essentially, when the valve is subjected to a pressure below a determined value, the flaps, by lying on or resting against each other, form a "seal" which prevents the substance inside the container from emerging. The seal made by the flaps is not an airtight seal, which as shown is not present, but instead a seal against the (dense) substance contained in the container.

0029 The "determined value" of this pressure is a variable which can be set during valve design, by acting on the flap thicknesses S, on the amount of superposing Z between one and another, and on the type and rigidity of the material used to form the valve.

0030 When the pressure inside the container, which acts on the valve, exceeds said "predetermined value", the flaps flex (see Figure 2B) to enable the fluid to be dispensed.

0031 In conclusion it should be noted that the valve flange 2A has dimensions greater than the seat 7 such that even if the valve becomes released from the under-cut, it cannot escape from the container.

0032 It should again be noted that the cap comprises the cover 4, which when in the lowered position (Figure 8) cooperates with the valve flaps by pressing on at least one of them, such as to prevent valve opening, independently of the pressure present in the container.

0033 Advantageously there is also a further seal provided between the cover 4 and the dispensing port, which even further ensures the impossibility of substance leakage when the cover is lowered.

0034 It must be emphasized that the valve in question is particularly advantageous compared with those traditional valves which are cut after moulding.

0035 This is because such valves present flaps which close the dispensing port by abutting against each other. These consequently form a perfect seal and indeed prevent fluid exit, but also prevent air entering in any situation. This generates a constant vacuum in the container, making it uncomfortable to use. In fact it must be almost totally "squeezed" to enable the entire product to be used.

0036 A further drawback which is overcome by the present valve is linked to the possible presence of deposits or substance residues therein. In traditional valves the "sticky" effect of a dry product remained trapped between two abutting flaps is considerable. In fact it is often necessary to exert a much higher pressure than the "design" pressure to enable the substance to be dispensed. This is due to the need to overcome the gluing force between two abutting surfaces pressed together by the elasticity and shape of the valve material. In the current solution the flaps are not urged to rest abuttingly against each other, but instead the seal is given by the flexural rigidity imposed by the flaps. Hence even if the substance should dryer between one flap and another, a slight pressure would be sufficient to remove this block, the flaps being able to mutually move transversely (rising or lowering).

0037 A preferred embodiment of the invention has been described, however others can be conceived by utilizing the same inventive concept.

Claims

1. A dispensing cap (1) with automatic valve (2) for containers for transporting and dispensing liquid or creamy substances, comprising means for its sealed fixing to a container neck, and a dispensing port (9) opening towards the outside of the cap (1) and associated with said automatic valve, the valve (2) comprising a body formed of soft plastic material and provided with means for its fixing to the cap, and at least one first flexible flap (20A, 20B) and at least one second flexible flap (21A, 21B) which are able to assume a closed position in which, when the valve is subjected to a pressure inside the container less than
a determined value, the flaps, by resting on each other, form a seal to hence prevent the substance in the container from escaping, and an open position in which said flaps, when the pressure inside the container acting on said valve exceeds said predetermined value, flex to enable fluid dispensing, characterized in that said at least one first flap (20A, 20B) and said at least one second flap (21A, 21B) are formed in two different planes, wherein said at least one first flap (20A, 20B) is formed in an upper plane relative to said at least one second flap (21A, 21B) formed in a lower plane, such that when the pressure inside the container equals the external pressure they assume a rest position in which between the lower surface of the first flap (20A, 20B) and the upper surface of the second flap (21A, 21B) at least one slit is present, enabling air to pass.

2. A cap as claimed in the preceding claim wherein, when in the rest position, the lower surface of the first flap (20A, 20B) is spaced from the upper surface of the second flap (21A, 21B) by a distance between 0.05 and 1.5 mm, preferably 0.15 mm.

3. A cap as claimed in one or more of the preceding claims, wherein said flaps (20A, 20B, 21A, 21B) have a thickness between 0.2 mm and 3 mm, preferably 0.4 mm.

4. A cap as claimed in one or more of the preceding claims, wherein two first (20A, 20B) and two second flaps (21A, 21B) are present.

5. A cap as claimed in the preceding claim, wherein, preceding in the clockwise direction, the valve is formed from a first flap (20A), a second flap (21A), a further first flap (20B), and a further second flap (21B), the first and second flaps being mutually offset by 90°.

6. A cap as claimed in claim 4, wherein the flaps assume the shape of a circular sector.

7. A cap as claimed in one or more of the preceding claims, wherein each of said flaps is dimensioned such as to be seen to be slightly superposed on the adjacent flap when viewed in plan.

8. A cap as claimed in one or more of the preceding claims, wherein the means for fixing the valve to the cap comprise an undercut connection (8).

9. A cap as claimed in one or more of the preceding claims, wherein said valve is housed in a seat (7) provided in the cap, and presents a flange of greater dimensions than the seat such that even if the valve becomes released from the undercut, it cannot escape from the container.

10. A cap as claimed in one or more of the preceding claims, wherein said valve is formed from thermoplastic rubber, SEBS, LLDPE or silicone.

11. A cap as claimed in one or more of the preceding claims, comprising a cover movable between a first position in which it does not interfere with said valve, and a second position in which said cover presses on at least one of said flaps such as to prevent it from opening and hence ensure a seal.

Patentansprüche

1. Abgabekappe (1) mit Automatikventil (2) für Behälter zum Transport und zur Abgabe von flüssigen oder cremigen Substanzen, umfassend Mittel für ihre abgedichtete Befestigung an einem Behälterhals und eine Abgabeöffnung (9), die sich zur Außenseite der Kappe (1) hin öffnet und dem Automatikventil (2) zugeordnet ist, wobei das Ventil (2) einen aus weichem Kunststoffmaterial gebildeten und mit Mitteln zu seiner Befestigung an der Kappe versehenen Körper um 90° von einem vorbestimmten Wert abweicht und dadurch gekennzeichnet, dass die mindestens eine erste flexible Klappe (20A, 20B) und mindestens eine zweite flexible Klappe (21A, 21B) umfasst, die in der Lage sind, eine geschlossene Position einzunehmen, in der die Kappen eine Dichtung bilden, wenn auf das Ventil ein Druck im Behälter unterhalb eines vorbestimmten Wertes ausgeübt wird, indem sie aufeinanderliegen, um so zu verhindern, dass die Substanz in dem Behälter entweicht, und eine offene Position einzunehmen, in der die Kappen sich biegen, wenn auf das Ventil ein Druck im Behälter oberhalb des vorbestimmten Wertes ausgeübt wird, um so eine Abgabe eines Fluids zu ermöglichen, dadurch gekennzeichnet, dass die mindestens eine erste Klappe (20A, 20B) und die mindestens eine zweite Klappe (21A, 21B) in zwei verschiedenen Ebenen ausgebildet sind, wobei die mindestens eine erste Klappe (20A, 20B) in einer oberen Ebene relativ zu der mindestens einen zweiten Klappe (21A, 21B) ausgebildet ist, die in einer unteren Ebene ausgebildet ist, sodass sie eine Ruheposition einnehmen, wenn der Druck im Behälter gleich dem Außendruck ist, in der zwischen der unteren Fläche der ersten Klappe (20A, 20B) und der oberen Fläche der zweiten Klappe (21A, 21B) zumindest ein Schlitz vorhanden ist, sodass Luft passieren kann.

2. Kappe nach dem vorhergehenden Anspruch, wobei die untere Fläche der ersten Klappe (20A, 20B) in der Ruhestellung von der oberen Oberfläche der zweiten Klappe (21A, 21B) zwischen 0,05 und 1,5 mm, vorzugsweise 0,15 mm, beabstandet ist.

3. Kappe nach einem oder mehreren der vorhergehenden Ansprüche, wobei die Klappen (20A, 20B, 21A,
1. Bouchon de distribution (1) avec une soupape automatique (2) pour des récipients permettant le transport et la distribution de substances liquides ou crémeuses, comprenant des moyens pour sa fixation étanche sur un goulot d’un récipient, et un orifice de distribution (9) s’ouvrant vers l’extérieur du bouchon (1) et associé à ladite soupape automatique, la sou-

2. Bouchon selon la revendication précédente, dans lequel, lorsqu’il est dans la position de repos, la surface inférieure du premier volet (20A, 20B) est espacée de la surface supérieure du second volet (21A, 21B) d’une distance comprise entre 0,05 et 1,5 mm, de préférence 0,15 mm.

3. Bouchon selon l’une ou plusieurs des revendications précédentes, dans lequel lesdits volets (20A, 20B, 21A, 21B) présentent une épaisseur comprise entre 0,2 mm et 3 mm, de préférence de 0,4 mm.


5. Bouchon selon la revendication précédente, dans lequel, en allant dans le sens des aiguilles d’une montre, la soupape est formée à partir d’un premier volet (20A), d’un second volet (21A), d’un premier volet (20B) supplémentaire, et d’un second volet (21B) supplémentaire, les premier et second volets étant mutuellement décalés de 90°.

6. Bouchon selon la revendication 4, dans lequel les volets prennent la forme d’un secteur circulaire.

7. Bouchon selon l’une ou plusieurs des revendications précédentes, dans lequel chacun desdits volets est...
dimensionné de manière à être vu pour être légèrement superposé sur le volet adjacent lorsqu’il est vu en plan.

8. Bouchon selon l’une ou plusieurs des revendications précédentes, dans lequel les moyens de fixation de la soupape sur le bouchon comprennent une connexion en contre-dépouille (8).

9. Bouchon selon l’une ou plusieurs des revendications précédentes, dans lequel ladite soupape est logée dans un siège (7) prévu dans le bouchon, et présente un rebord de plus grandes dimensions que le siège de telle sorte que même si la soupape est libérée de la contre-dépouille, elle ne peut pas s’échapper du récipient.

10. Bouchon selon l’une ou plusieurs des revendications précédentes, dans lequel ladite soupape est formée à partir de caoutchouc thermoplastique, de SEBS, de PEBDL ou de silicone.

11. Bouchon selon l’une ou plusieurs des revendications précédentes, comprenant un couvercle mobile entre une première position dans laquelle il n’interfère pas avec ladite soupape, et une seconde position dans laquelle ledit couvercle appuie sur au moins l’un des-dits volets, de manière à l’empêcher de s’ouvrir et à assurer par conséquent une étanchéité.
REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

• EP 0405472 A [0008]