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(54) **A DISPENSING SYSTEM OF COMESTIBLE CREAM**

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(56) References cited:
DE-A1-102007 007 402
DE-U1- 29 717 034
JP-A- H06 298 269
US-A- 5 842 605

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to the technical sector concerning the dispensing of comestible cream, such as for example sweet creams for pastry products. In particular, the present invention relates to a dispensing system of comestible cream.

DESCRIPTION OF THE PRIOR ART

[0002] To date, in bakeries, known dispensing systems of comestible cream involve injecting comestible cream into the pastries, cornets or other sweet pastry products.

[0003] Likewise, these known dispensing systems of comestible cream are used to inject comestible cream into savoury pastries.

[0004] A dispensing system of comestible cream (110) of known type, illustrated in figures 1, 2, comprises: a container of comestible cream (111) which, in turn, comprises: a first chamber (112) in which a comestible cream is contained; a first opening (118) which is in communication with the first chamber (112); a second chamber (112a) which is in communication with the first chamber (112) through the first opening (118); a dispensing conduit (121) which is in fluid communication with the outside and which is in communication with the second chamber (112) (via the first chamber (112) and in determined functioning conditions, such as the one illustrated in figure 2), for dispensing the comestible cream towards the outside. Further, the first chamber (112) comprises a second opening (120) and a third opening (117), while the second chamber (112a) comprises a fourth opening (115) and a fifth opening (116). The dispensing conduit (121), at a relative end, is provided with a dispensing nozzle (114) and at the other end is connected to the second opening (120) of the first chamber (112). The dispensing system (110) of comestible cream further comprises: a movable wall (113) which is movable through the third opening (117) of the first chamber (112) between a first position (fig.1) and a second position (fig.2), reducing or increasing the available volume of the first chamber (112) so as to respectively exert a pressure or a depression in the comestible cream contained in the first chamber (112); a ball valve (119) (in the drawing, for the sake of simplicity, only the relative ball has been illustrated) which engages in the first opening (118) of the first chamber (112), which ball valve (119) enables or prevents inlet of comestible cream into the first chamber (112) via the first opening (118) respectively when a depression (figure 2) or an overpressure (figure 1) is created in the first chamber (112). The dispensing system (110) of a comestible cream of known type further comprises: a grip (122); a rod (123) which is connected at an end thereof to the movable wall (113) and at the other end thereof to the grip (122); an abutment (124) which is fixed to the rod (123); elastic means (125) interposed between the upper wall of the container of comestible cream (111) and the abutment (124) in order to maintain the movable wall (113) in the second position (fig.2).

[0005] The operating of the above-mentioned known dispensing system of comestible cream (110), including the passage of the comestible cream from the second chamber (112a) to the first chamber (112) only by effect of the depression exerted by the movable wall (113) in the first chamber (112), might result in some residues of comestible cream remaining on the internal and external walls of the first chamber (112) and on the internal walls of the second chamber (112a), which would not be dispensed through the dispensing conduit (114). This might lead to a waste of comestible cream, which, therefore, would not be used in the bakery's sweet pastries. This waste of comestible cream, is usually dealt with as scrap product deriving from the comestible cream used in the above-described dispensing system of comestible cream (110).

[0006] In a like manner to the foregoing, since the functioning of the dispensing system of comestible cream (110) of known type includes the movable wall (113) being partially immersed in the comestible cream contained in the first chamber (112), in order to create a pressure thereon, there might be residues of comestible cream left on the movable wall (113) itself.

[0007] A further drawback of the known dispensing system of comestible cream (110) is linked to the cleaning operations.

[0008] Once the comestible cream to be dispensed, contained in the second chamber (112a) of the dispensing system of comestible cream (110), has been used up, the dispensing system will have to be thoroughly cleaned and thus freed of the residues of comestible cream present inside it, in order then to be newly filled with more comestible cream, which might be different to the cream previously used.

[0009] For this reason the internal and external walls of the first chamber (112) will need to be cleaned, as well as the internal walls of the second chamber (112a) and the movable wall (113), which requires a certain amount of time as the operation is carried out manually.

[0010] Further, again with reference to when the comestible cream to be dispensed has been used up, the container of comestible cream (111) will need to be refilled and the second chamber (112a) will have to be opened to be filled. During the filling of the second chamber (112a), the comestible cream that is being inserted into the second chamber (112a) is in direct contact with the outside, for the whole time of filling. This might lead to contamination, with external substances, of the comestible cream as soon as it is inserted in the second chamber (112a) and the perishing thereof: in fact, the comestible cream, during the filling operation, might dry as it is exposed to contact with the outside environment. Further exemplary dispensers are described in DE29717034U1, DE102007007402 A1, JPH06298269A and US5842605A.

SUMMARY OF THE INVENTION

[0011] In the light of the above, the aim of the present invention consists in obviating the above-mentioned drawbacks.

[0012] The above aim is attained by a dispensing system of comestible creams according to claim 1.

[0013] During the use of the dispensing system of comestible cream, the first piston advantageously also draws with it the possible residues of comestible cream which might adhere to the internal walls of the first chamber.

[0014] In other words, the sliding of the first piston along the internal walls of the first chamber, by reducing the volume of the first chamber, reduces the depositing of residues of comestible cream in the first chamber to a value close to zero: in fact, the first piston, as it slides, draws the comestible cream contained in the first chamber with it.

[0015] Further, with the dispensing system of comestible cream, object of the present invention, the cleaning operations of the dispensing system of comestible cream are facilitated or even eliminated, thus reducing working times.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] Specific embodiments of the invention will be described in the following part of the present description, according to what is set down in the claims and with the aid of the accompanying tables of drawings, in which:

- figure 1 is a section view, along a vertical plane, of a dispensing system of comestible cream of known type, during an operating step;
- figure 2 is a view alike to that of figure 1, during a further operating step;
- figure 3 is a section view, along a vertical plane, of a dispensing system of comestible cream, object of the present invention, during an operating step;
- figure 4 is a section view, along a vertical plane, of the dispensing system of comestible cream, object of the present invention, during a further operating step;
- figures 5 and 6 are views alike to those of figurers 3 and 4, during a further two operating steps;
- figures 7 and 8 are section views, along a vertical plane, of a second embodiment of the dispensing system of comestible cream of the present invention;
- figure 9 is a section view of the container of comestible cream;
- figure 10 is a view of detail K of figure 9.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0017] With reference to the appended tables of drawings, reference numeral (1) denotes in its entirety a dispensing system of comestible cream, comprising: a container of comestible cream (2) which in turn comprises: a first chamber (3) in which a comestible cream is contained, a first opening (4) which is in communication with the first chamber (3); a second chamber (5) which is in communication with the first chamber (3) through the first opening (4); a dispensing conduit (6) which is in fluid communication with the outside and which communicates with the second chamber (5) for dispensing the comestible cream towards the outside. Further, the container of comestible cream (2) comprises a first piston (7) which is slidable along the internal walls of the first chamber (3) in order to reduce the volume of the first chamber (3). Further, the dispensing system of comestible cream (1) comprises a second piston (8) which is slidable along the internal walls of the second chamber (5).

[0018] The dispensing system of comestible cream (1) is configured so that during an operating cycle: the activating of the second piston (8) from a first position (A) to a second position (B) determines a depression in the second chamber (5) which causes conveying of a first part of comestible cream, contained in the first chamber (3), into the second chamber (5) and the sliding of the first piston (7) along the internal walls of the first chamber (3) in order to reduce the volume of the first chamber (3); the activating of the second piston (8) from the second position (B) towards the first position (A) determines an overpressure in the second chamber (5) which causes dispensing towards the outside of a second part of comestible cream, contained in the second chamber (5), through the dispensing conduit (6).

[0019] By activation of the second piston (8) from the first position (A) to the second position (B) is meant the sliding of the second piston (8) from the first position (A) to the second position (B) along the internal walls of the second chamber (5).

[0020] Likewise, by activation of the second piston (8) from the second position (B) to the first position (A) is meant the sliding of the second piston (8) from the first position (A) to the second position (B) along the internal walls of the second chamber (5).

[0021] Further, it is specified that the first piston (7) is meant a movable wall that slides adheringly to the internal walls of the first chamber (3).

[0022] Likewise, it is specified that by second piston (8) is meant a movable wall that slides adheringly to the internal walls of the second chamber (5).

[0023] The first chamber (3) can have a circular or quadrilateral section.

[0024] The first piston (7) can have a complementary shape to the shape of the first chamber (3).

[0025] With reference to figures 3-6, the first chamber (3) forms a first cylindrical body (3a) and the first piston (7) has a complementary shape to the shape of the first cylindrical body (3a).

[0026] The first piston (7) can be arranged opposite the first opening (4).

[0027] With reference to figures 3-6, the first piston (7) ensures a sealed closure of the container of comestible cream (2).

[0028] The second chamber (5) can be in fluid communication with the first chamber (3) through the first opening (4).

[0029] The second chamber (5) can have a circular or quadrilateral section.

[0030] The second piston (8) can have a complementary shape to the shape of the second chamber (5).

[0031] With reference to figures 3-6, the second chamber (5) forms a second cylindrical body (5a) and the second piston (8) has a complementary shape to the shape of the second cylindrical body (5a).

[0032] The second piston (8) can be activated to increase the volume of the second chamber (5), when activated from the first position (A) towards the second position (B).

[0033] The second piston (8) can be activated to reduce the volume of the second chamber (5), when activated from the second position (B) towards the first position (A).

[0034] The second chamber (5) can be arranged externally with respect to the first chamber (3).

[0035] The conveying of the first part of comestible cream into the second chamber (5) can take place through the first opening (4).

[0036] The second part of comestible cream can be smaller than or equal to the first part of comestible cream.

[0037] The activation of the second piston (8) includes the sliding of the second piston (8) in a vertical direction, along the development axis (S1) of the second chamber (5) (see figure 3).

[0038] In the same way, the sliding of the first piston (7) so as to reduce the volume of the first chamber (3) can be in a vertical direction, along the extension axis (S2) of the first chamber (3) (see figure 3).

[0039] The extension axis (S1) of the second chamber (5) and the extension axis (S2) of the first chamber (5) can coincide (see figure 3).

[0040] The dispensing system of comestible cream (1) preferably comprises a rod (9) which is connected to the second piston (8) and which is manually activatable in order in turn to activate the second piston (8) from the second position (B) towards the first position (A).

[0041] The manual activating of the rod (9) advantageously makes the activating of the second piston (8) from the second position (B) towards the first position (A) simple and practical.

[0042] With reference to figures 3-6, the rod (9) is connected to the second piston (8) at a relative first end (9a) of the rod (9) and comprises a portion of grip (10). The portion of grip (10) can be arranged at a relative second end (9b) of the rod (9) in order to activate the second piston (8) from the second position (B) towards the first position (A).

[0043] Further, the rod (9) is manually activatable to activate, in turn, the second piston (8) from the first position (A) towards the second position (B).

[0044] With reference to figures 3-6, the second chamber (5) comprises a through-hole (11), which through-hole (11) is crossed by the rod (9) so that the rod (9) enters, with the relative first end (9a) to which the second piston (8) is connected, into the second chamber (5).

[0045] The second piston (8) preferably comprises a first through-hole (12) and the dispensing system of comestible cream (1) comprises a first valve (13) arranged at the first through-hole (12) so as to assume an open position (see figures 3, 5 and 7) and a closed position (see figures 4, 6 and 8); the rod (9) is tubular and forms at least a part of the dispensing conduit (6); the rod (9) communicates with the first through-hole (12) of the second piston (8) so as to establish fluid communication between the second chamber (5) and the outside, when the first valve (13) assumes the open position, (see figures 3, 5 and 7), and so as to prevent fluid communication between the second chamber (5) and the outside, when the first valve (13) assumes the closed position (see figures 4, 6 and 8).

[0046] The first valve (13), when assuming the closed position, advantageously prevents inlet of air into the second chamber (5) during the activation of the second piston (8) from the first position (A) to the second position (B).

[0047] Further, preventing the inlet of air into the second chamber (5) ensures optimal functioning of the dispensing system of comestible cream (1) and ensures that the comestible cream contained in the dispensing system of comestible cream (1) maintains its characteristics unchanged.

[0048] The first valve (13) can assume the closed position, by effect of the depression determined in the second chamber (5) by the activating of the second piston (8) from the first position (A) towards the second position (B).

[0049] When the first valve (13) assumes the closed position, fluid communication is prevented between the second chamber (5) and the outside.

[0050] The first valve (13) can assume the open position, by effect of the overpressure determined in the second chamber (5) by means of the activating of the second piston (8) from the second position (B) towards the first position (A).

[0051] When the first valve (13) assumes the open position, fluid communication is enabled between the second chamber (5) and the outside.

[0052] The dispensing conduit (6) can be directly in communication with the second chamber (5).

[0053] The dispensing system of comestible cream (1) preferably comprises elastic means (14) which are arranged in the second chamber (5) and which are inter-

posed between a base wall of the second chamber (5) and the second piston (8) in order to activate the second piston (8) from the first position (A) towards the second position (B).

[0054] The elastic means (14) advantageously make the activation of the second piston (8) from the first position (A) to the second position (B) simple and practical.

[0055] The elastic means (14) preferably comprise a spring (15). The maximum extension reached by the spring (15), without external stresses, defines a first endrun position (see figures 4, 6 and 8) of the second piston (8); while the maximum shortening that the spring (15) can achieve, during use of the dispensing system of comestible cream (1), defines a second endrun position (see figures 3, 5 and 7) of the second piston (8). The first position (A) and the second position (B) are interposed between the first endrun position and the second endrun position.

[0056] As the spring (15), when taking on the first endrun position and the second endrun position, advantageously impedes the second piston (8) from contacting the opposite two base walls of the second chamber (5), being the base walls that connect the lateral walls of the second chamber (5), limiting wear.

[0057] The dispensing system of comestible cream (1) preferably comprises abutting means (18) which enable the first piston (7) to slide along the internal walls of the first chamber (3) in a single advancement direction (Z), which is the direction for conveying the first part of comestible cream into the second chamber (5) through the first opening (4).

[0058] The first abutting means (18) can be arranged at the first piston (7) so as to block the sliding thereof in an opposite direction to the advancement direction (Z).

[0059] Alternatively, and preferably, the second chamber (5) comprises a second through-hole (16); the abutting means (18) comprise a second valve (17) arranged at the second through-hole (16) so as to assume a first configuration in which it enables passage of the first part of comestible cream, contained in the first chamber (3), into the second chamber (5) when the second piston (8) is activated from the first position (A) to the second position (B), and so as to assume a second configuration in which it prevents return of comestible cream from the second chamber (5) to the first chamber (3) when the second piston (8) is activated from the second position (B) towards the first position (A).

[0060] The second valve (17) can be arranged so as to assume an open position, i.e. the first configuration (see figures 4, 6 and 8) and a closed position, i.e. the second configuration (see figures 3, 5 and 7).

[0061] The second valve (17) advantageously ensures the translation of the first piston (7) in a single advancement direction, i.e. towards the first opening (4) so as to convey the first part of comestible cream into the second chamber (5).

[0062] During the activating of the second piston (8) from the second position (B) towards the first position (A), the second valve (17) assumes the second configuration, i.e. the closed position and, therefore, prevents the overpressure determined in the second chamber (5) from spreading to the first chamber (3). The spreading of the overpressure, determined in the second chamber (5), into the first chamber (3) might cause the first piston (7) to slide in an opposite direction to the relative advancement direction (Z). The second valve (17) prevents a possible sliding of the first piston (7) in an opposite direction to the relative advancement direction (Z).

[0063] The second valve (17) can assume the first configuration by effect of the depression determined in the second chamber (5) by means of the activation of the second piston (8) from the first position (A) to the second position (B).

[0064] When the second valve (17) assumes the first configuration, fluid communication is enabled between the second chamber (5) and the first chamber (3).

[0065] The second valve (17) can assume the second configuration, by effect of the overpressure determined in the second chamber (5) by means of the activating of the second piston (8) from the second position (B) towards the first position (A).

[0066] When the second valve (17) assumes the second configuration, fluid communication between the second chamber (5) and the first chamber (3) is impeded.

[0067] The first valve (13) and the second valve (17) can be diaphragm valves.

[0068] Alternatively, as illustrated in figures 7-8, the first valve (13) and the second valve (17) can be ball valves (in the drawings of figures 7-8, the relative ball has been illustrated for the sake of simplicity).

[0069] The container of comestible cream (2) is preferably of a single-use type.

[0070] The fact that the container of comestible cream (2) is of a single-use type advantageously eliminates any cleaning operation: in fact, when the comestible cream inside the container of comestible cream (2) has run out, it is sufficient to replace the container of comestible cream (2), by now empty, with another full container of comestible cream (2).

[0071] Further, the fact that the container of comestible cream (2) is of a single-use type makes the dispensing system of comestible cream (1) simple to use: in fact, it is possible simply and rapidly to replace the container of comestible cream (2) by now empty with a new container of comestible cream and return to using the dispensing system of comestible cream (1) for filling cornets, or other sweet or savoury pastry products.

[0072] The container of comestible cream (2) is removably connectable to the second chamber (5) by means of the connection of the first chamber (3) and of the second chamber (5) to one another via the first opening (4).

[0073] The dispensing system of comestible cream (1) can comprise a cladding frame (not illustrated) which clads the container of comestible cream (2) and the second chamber (5) so as to ensure protection from outside.

[0074] The first chamber (3) and the second chamber

(5) are, according to the invention, separate from one another and are removably connectable via the first opening (4). When the comestible cream inside the container of comestible cream (2) has run out, it is advantageously sufficient to replace the container of comestible cream (2) by now empty with another full container of comestible cream (2), without any need to eliminate the residues of comestible cream which might remain adhering on the external walls of the second chamber (5), should the latter have been inserted in the first chamber (3) and, therefore, not separated from one another.

[0075] The first chamber (3) can be arranged downstream of the second chamber (5) with respect to the activation direction of the second piston (8) from the second position (B) towards the first position (A).

[0076] The dispensing system of comestible cream (1) comprises: a first outlet conduit (30) projecting towards outside starting from the first chamber (3); a second outlet conduit (50) projecting towards outside starting from the second chamber (5); the first opening (4) being arranged at the first outlet conduit (30); it comprises a fitting element (40) for connecting the first outlet conduit (30) and the second outlet conduit (50) to one another (see figure 7, in which the fitting element is illustrated with a broken line).

[0077] The fitting element (40) advantageously ensures the stable connection during the operation of the dispensing system of comestible cream (1), between the first outlet conduit (30) and the second outlet conduit (50).

[0078] The first outlet conduit (30) and the second outlet conduit (50) advantageously make the single-use operations of the container of comestible cream (2) rapid and simple, as, on termination of the comestible cream inside the comestible cream (2) container, it is sufficient to disconnect the first outlet conduit (30) and the second outlet conduit (50) from one another and arrange a new container of comestible cream (2), containing comestible cream internally thereof, so as to insert the second outlet conduit (50) in the first opening (4), without having to intervene with cleaning operations of the second chamber (5).

[0079] The fitting element (40) can be a bushing internally having a nylon ring in order to guarantee the seal.

[0080] The first outlet conduit (30) preferably has a smaller capacity than the first chamber (3) and with respect to the capacity of the dispensing conduit (6); the dispensing conduit (6) is directly connected to the second chamber (5) (see figures 3 and 4).

[0081] The above-described configuration advantageously guarantees the passage of the comestible cream from the first chamber (3) to the second chamber (5) with a constant quantity at each activation cycle of the second piston (8) and, consequently, the dispensing of the same quantity of comestible cream at each activation cycle of the second piston (8).

[0082] Further, this configuration ensures the complete exit of the comestible cream present in the second chamber (5).

[0083] By way of example, the first outlet conduit (30) can comprise a pair of grooves (30a) that are parallel to one another with respect to the extension axis of the container of comestible cream (2) (see figures 9 and 10).

[0084] The first outlet conduit (30) can comprise a further pair of grooves (30b) that are parallel to one another with respect to the extension axis of the container of comestible cream (2) (see figures 9 and 10).

[0085] The pair of grooves (30a) and the further pair of grooves (30b) are arranged at the external surface of the first outlet conduit (30) (see figures 9 and 10).

[0086] The first outlet conduit (30) can comprise a closing wall (30c) that closes the first outlet conduit (30).

[0087] Before using the container of comestible cream (2), it is advisable to remove the closing wall (30c) in order to open the outlet conduit (30), by cutting the first outlet conduit (30) at the pair of grooves (30a) or the further pair of grooves (30b), according to the viscosity of the comestible cream: in fact, if the comestible cream is a high-viscosity comestible cream, the pair of grooves (30a) closer to the first opening (4) is chosen, while if the comestible cream is a low-viscosity comestible cream, the further pair of grooves (30b) away from the first opening (4) is chosen.

[0088] Further, the container of comestible cream (2) can comprise a pair of stop elements (60) which project internally of the container of comestible cream (2) with respect to the internal walls of the first chamber (3).

[0089] During the operation of the dispensing system of comestible cream (1) of the present invention, there might arise situations in which the adherence of the first piston (7) to the internal walls of the first chamber (3) is compromised.

[0090] In these situations, there might occur a translation of the first piston (7) in an opposite translation direction towards the first opening (4).

[0091] The pair of stop elements (60) guarantees the halting of the translation of the first piston (7) and thus prevents a possible undesirable opening of the first chamber (3) during the operation of the dispensing system of comestible cream (1).

[0092] Therefore, the pair of stop elements (60) prevent an accidental opening of the first chamber (3) at the portion of container of comestible cream (2) which is opposite the portion of container of comestible cream (2) affected by the first opening (4).

[0093] Further, the pair of stop elements (60) prevents third parties from contaminating and compromising the hygienic safety of what is present inside the first chamber (3), as they make the extraction of the first piston (7) from outside of the container of comestible cream (2) difficult to achieve.

[0094] The following is a description of the operating cycle of the dispensing system of comestible cream (1), with reference to figures 3-6.

[0095] The subsequent operating cycles are a repetition of the operating cycle described in the following. During the operation of the dispensing system of comestible

cream (1), the operating cycle is repeated several times up until the comestible cream to be dispensed and contained in the first chamber (3) has run out.

[0096] With particular reference to figure 3, the second piston (8) is manually activated, pressing the portion of grip (10) downwards, so that the second piston (8) slides towards the first position (A). In this way, there is a compression of the spring (15) interposed between the second piston (8) and the base wall of the second chamber (5). At this point, by freeing the portion of grip (10), by effect of the lengthening of the spring (15), the second piston (8) is activated from the first position (A) to the second position (B) (see figure 4). During the sliding of the second piston (8) from the first position (A) to the second position (B), a depression is created in the second chamber (5) which depression causes the following effects: the first valve (13) assumes the closed position, the second valve (17) assumes the open position, the first part of comestible cream, contained in the first chamber (3), is conveyed, via the first opening (4) and the second opening, into the second chamber (5) and the first piston (7) slides along the advancement direction (Z), drawing the comestible cream contained in the first chamber (3) (fig.4). Subsequently, the second piston (8) is manually activated, newly pressing the portion of grip (10) downwards, so that the second piston (8) slides towards the first position (A) (figure 5). In this way, an overpressure is created in the second chamber (5) which overpressure causes the following effects: the first valve (13) assumes the open position, the second valve (17) assumes the closed position and the second part of comestible cream, contained in the second chamber (5), crosses the dispensing conduit (6) in order to be dispensed to the outside.

[0097] Lastly, again by effect of the lengthening of the spring (15), the second piston (8) is activated from the first position (A) to the second position (B). During the sliding of the second piston (8) from the first position (A) to the second position (B), in a like manner to what is described in the foregoing, a further part of comestible cream, contained in the first chamber (3), is conveyed, via the first opening (4), into the second chamber (5) and the first piston (7) recommences sliding along the advancement direction (Z), drawing the comestible cream contained in the first chamber (3) (fig.6).

[0098] Figures 7-8 are alike figures 5-6 illustrating the embodiment of the dispensing system of comestible cream (1) which includes the ball valve.

[0099] It is understood that the above has been described by way of non-limiting example and that any constructional variants are considered to fall within the protective scope of the appended claims.

Claims

1. A dispensing system of comestible cream (1), comprising:

a container of comestible cream (2) which in turn comprises a first chamber (3) in which a comestible cream is contained; a first opening (4) which is in communication with the first chamber (3);
a second chamber (5) which is in communication with the first chamber (3) through the first opening (4);
a dispensing conduit (6) which is in fluid communication with the outside and which communicates with the second chamber (5) for dispensing the comestible cream towards the outside;
wherein:

the container of comestible cream (2) comprises a first piston (7) which is slidable along the internal walls of the first chamber (3) in order to reduce the volume of the first chamber (3);
comprises a second piston (8) which is slidable along the internal walls of the second chamber (5);
the dispensing system of comestible cream (1) is configured so that during an operating cycle:

the activating of the second piston (8) from a first position (A) to a second position (B) determines a depression in the second chamber (5) which causes conveying of a first part of comestible cream, contained in the first chamber (3), into the second chamber (5) and the sliding of the first piston (7) along the internal walls of the first chamber (3) in order to reduce the volume of the first chamber (3);
the activating of the second piston (8) from the second position (B) towards the first position (A) determines an overpressure in the second chamber (5) which causes dispensing towards the outside of a second part of comestible cream, contained in the second chamber (5), through the dispensing conduit (6);
wherein
the container of comestible cream (2) is of a single-use type;
the first chamber (3) and the second chamber (5) are separate from one another and are removably connectable via the first opening (4);
the dispensing system of comestible cream (1) further comprises a first outlet conduit (30) projecting towards outside starting from the first chamber (3);
a second outlet conduit (50) projecting towards outside starting from the sec-

ond chamber (5);
the first opening (4) is arranged at the first outlet conduit (30);
the dispensing system of comestible cream (1) is
characterised in that it further comprises a fitting element (40) for connecting the first outlet conduit (30) and the second outlet conduit (50) to one another.

2. The dispensing system of comestible cream (1) of the preceding claim, comprising a rod (9) which is connected to the second piston (8) and which is manually activatable in order in turn to activate the second piston (8) from the second position (B) towards the first position (A).

3. The dispensing system of comestible cream (1) of the preceding claim, wherein:

the second piston (8) comprises a first through-hole (12);
it comprises a first valve (13) arranged at the first through-hole (12) so as to assume an open position and a closed position;
the rod (9) is tubular and forms at least a part of the dispensing conduit (6);
the rod (9) communicates with the first through-hole (12) of the second piston (8) so as to establish fluid communication between the second chamber (5) and the outside, when the first valve (13) assumes the open position, and so as to prevent fluid communication between the second chamber (5) and the outside, when the first valve (13) assumes the closed position.

4. The dispensing system of comestible cream (1) of any one of the preceding claims, comprising elastic means (14) which are arranged in the second chamber (5) and which are interposed between a base wall of the second chamber (5) and the second piston (8) in order to activate the second piston (8) from the first position (A) towards the second position (B).

5. The dispensing system of comestible cream (1) of the preceding claim, wherein the elastic means (14) comprise a spring (15); and wherein:

the maximum extension that the spring (15) can achieve, without external stresses, defines a first endrun position of the second piston (8);
the maximum shortening that the spring (15) can achieve, during use of the dispensing system of comestible cream (1), defines a second endrun position of the second piston (8);
the first position (A) and the second position (B) are interposed between the first endrun position and the second endrun position.

6. The dispensing system of comestible cream (1) of any one of the preceding claims, comprising abutting means (18) which enable the first piston (7) to slide along the internal walls of the first chamber (3) in a single advancement direction (Z), which is the direction for conveying the first part of comestible cream into the second chamber (5) through the first opening (4).

7. The dispensing system of comestible cream (1) of the preceding claim, wherein: the second chamber (5) comprises a second through-hole (16); the abutting means (18) comprise a second valve (17) arranged at the second through-hole (16) so as to assume a first configuration in which it enables passage of the first part of comestible cream, contained in the first chamber (3), into the second chamber (5) when the second piston (8) is activated from the first position (A) to the second position (B), and so as to assume a second configuration in which it prevents return of comestible cream from the second chamber (5) to the first chamber (3) when the second piston (8) is activated from the second position (B) towards the first position (A).

8. The dispensing system of comestible cream (1) of any one of the preceding claims, wherein: the first outlet conduit (30) has a smaller capacity than the first chamber (3) and with respect to the capacity of the dispensing conduit (6); the dispensing conduit (6) is directly connected to the second chamber (5).

Patentansprüche

1. Ein Dosiersystem für essbare Creme (1), bestehend aus: einem Behälter für essbare Creme (2), der seinerseits eine erste Kammer (3) enthält, in der eine essbare Creme enthalten ist; eine erste Öffnung (4), die mit der ersten Kammer (3) in Verbindung steht; einer zweiten Kammer (5), die mit der ersten Kammer (3) durch die erste Öffnung (4) in Verbindung steht; einem Dosierrohr (6), das mit der Außenseite in Fluidkommunikation steht und mit der zweiten Kammer (5) in Verbindung steht, um die essbare Creme nach außen zu dosieren; wobei: der Behälter für essbare Creme (2) einen ersten Kolben (7) enthält, der entlang der inneren Wände der ersten Kammer (3) verschiebbar ist, um das Volumen der ersten Kammer (3) zu reduzieren; einen zweiten Kolben (8) enthält, der entlang der inneren Wände der zweiten Kammer (5) verschiebbar ist; das Dosiersystem für essbare Creme (1) so konfiguriert ist, dass während eines Betriebszyklus: das Aktivieren des zweiten Kolbens (8) von einer ersten Position (A) zu einer zweiten Position (B) eine Depression in der zweiten

Kammer (5) erzeugt, die den Transport eines ersten Teils der essbaren Creme, die in der ersten Kammer (3) enthalten ist, in die zweite Kammer (5) bewirkt und das Verschieben des ersten Kolbens (7) entlang der inneren Wände der ersten Kammer (3) zur Reduzierung des Volumens der ersten Kammer (3) verursacht; das Aktivieren des zweiten Kolbens (8) von der zweiten Position (B) zur ersten Position (A) einen Überdruck in der zweiten Kammer (5) erzeugt, der die Dosierung eines zweiten Teils der essbaren Creme, die in der zweiten Kammer (5) enthalten ist, nach außen durch das Dosierrohr (6) bewirkt; wobei: der Behälter für essbare Creme (2) vom Einwegtyp ist; die erste Kammer (3) und die zweite Kammer (5) voneinander getrennt sind und über die erste Öffnung (4) abnehmbar miteinander verbunden werden können; das Dosiersystem für essbare Creme (1) weiterhin umfasst: einen ersten Auslasskanal (30), der von der ersten Kammer (3) nach außen ragt; einen zweiten Auslasskanal (50), der von der zweiten Kammer (5) nach außen ragt; die erste Öffnung (4) ist am ersten Auslasskanal (30) angeordnet; das Dosiersystem für essbare Creme (1) ist **gekennzeichnet dadurch, dass** es ein Verbindungselement (40) für die Verbindung des ersten Auslasskanals (30) und des zweiten Auslasskanals (50) miteinander weiterhin umfasst.

2. Das Dosiersystem für essbare Creme (1) nach vorheriger Anspruch, umfassend eine Stange (9), die mit dem zweiten Kolben (8) verbunden ist und manuell aktivierbar ist, um den zweiten Kolben (8) von der zweiten Position (B) zur ersten Position (A) zu aktivieren.

3. Das Dosiersystem für essbare Creme (1) nach vorheriger Anspruch, wobei: der zweite Kolben (8) ein erstes Durchgangsloch (12) aufweist; es ein erstes Ventil (13) am ersten Durchgangsloch (12) gibt, das eine offene Position und eine geschlossene Position einnimmt; die Stange (9) rohrförmig ist und zumindest einen Teil des Dosierrohrs (6) bildet; die Stange (9) mit dem ersten Durchgangsloch (12) des zweiten Kolbens (8) kommuniziert, um eine Fluidkommunikation zwischen der zweiten Kammer (5) und der Außenseite herzustellen, wenn das erste Ventil (13) die offene Position einnimmt, und um eine Fluidkommunikation zwischen der zweiten Kammer (5) und der Außenseite zu verhindern, wenn das erste Ventil (13) die geschlossene Position einnimmt.

4. Das Dosiersystem für essbare Creme (1) nach einer der vorherigen Ansprüche, umfassend elastische Mittel (14), die in der zweiten Kammer (5) angeordnet sind und zwischen einer Grundwand der zweiten Kammer (5) und dem zweiten Kolben (8) angeordnet sind, um den zweiten Kolben (8) von der ersten Position (A) zur zweiten Position (B) zu aktivieren.

5. Das Dosiersystem für essbare Creme (1) nach vorheriger Anspruch, wobei die elastischen Mittel (14) eine Feder (15) umfassen; und wobei:
die maximale Ausdehnung, die die Feder (15) ohne äußere Belastungen erreichen kann, eine erste Endposition des zweiten Kolbens (8) definiert; die maximale Verkürzung, die die Feder (15) während der Verwendung des Dosiersystems für essbare Creme (1) erreichen kann, eine zweite Endposition des zweiten Kolbens (8) definiert; die erste Position (A) und die zweite Position (B) zwischen der ersten Endposition und der zweiten Endposition angeordnet sind.

6. Das Dosiersystem für essbare Creme (1) nach einer der vorherigen Ansprüche, umfassend Anschlagmittel (18), die es dem ersten Kolben (7) ermöglichen, entlang der inneren Wände der ersten Kammer (3) in einer einzigen Vorschubrichtung (Z) zu gleiten, die die Richtung für die Förderung des ersten Teils der essbaren Creme in die zweite Kammer (5) durch die erste Öffnung (4) ist.

7. Das Dosiersystem für essbare Creme (1) nach vorheriger Anspruch, wobei die zweite Kammer (5) ein zweites Durchgangsloch (16) aufweist; die Anschlagmittel (18) ein zweites Ventil (17) umfassen, das am zweiten Durchgangsloch (16) angeordnet ist, um eine erste Konfiguration einzunehmen, in der es den Durchgang des ersten Teils der essbaren Creme, die in der ersten Kammer (3) enthalten ist, in die zweite Kammer (5) ermöglicht, wenn der zweite Kolben (8) von der ersten Position (A) zur zweiten Position (B) aktiviert wird, und um eine zweite Konfiguration einzunehmen, in der es das Zurückfließen der essbaren Creme von der zweiten Kammer (5) zur ersten Kammer (3) verhindert, wenn der zweite Kolben (8) von der zweiten Position (B) zur ersten Position (A) aktiviert wird.

8. Das Dosiersystem für essbare Creme (1) nach einer der vorherigen Ansprüche, wobei: der erste Auslasskanal (30) eine kleinere Kapazität als die erste Kammer (3) und im Vergleich zur Kapazität des Dosierrohrs (6) hat; das Dosierrohr (6) direkt mit der zweiten Kammer (5) verbunden ist.

Revendications

1. Un système de distribution de crème comestible (1), comprenant : un récipient de crème comestible (2) qui comprend à son tour une première chambre (3) dans laquelle est contenue une crème comestible ; une première ouverture (4) qui est en communication avec la première chambre (3); une deuxième chambre (5) qui est en communication avec la première chambre (3) par l'intermédiaire de la première ouver-

ture (4); un conduit de distribution (6) qui est en communication fluidique avec l'extérieur et qui communique avec la deuxième chambre (5) pour distribuer la crème comestible vers l'extérieur; où : le récipient de crème comestible (2) comprend un premier piston (7) qui est coulissant le long des parois internes de la première chambre (3) afin de réduire le volume de la première chambre (3) ; comprend un deuxième piston (8) qui est coulissant le long des parois internes de la deuxième chambre (5) ; le système de distribution de crème comestible (1) est configuré de telle sorte que, lors d'un cycle de fonctionnement : l'activation du deuxième piston (8) depuis une première position (A) vers une deuxième position (B) provoque une dépression dans la deuxième chambre (5) qui entraîne le transport d'une première partie de crème comestible, contenue dans la première chambre (3), dans la deuxième chambre (5) et le glissement du premier piston (7) le long des parois internes de la première chambre (3) afin de réduire le volume de la première chambre (3) ; l'activation du deuxième piston (8) depuis la deuxième position (B) vers la première position (A) provoque une surpression dans la deuxième chambre (5) qui entraîne la distribution vers l'extérieur d'une deuxième partie de crème comestible, contenue dans la deuxième chambre (5), par l'intermédiaire du conduit de distribution (6) ; où : le récipient de crème comestible (2) est de type à usage unique ; la première chambre (3) et la deuxième chambre (5) sont séparées l'une de l'autre et sont amoviblement raccordées par l'intermédiaire de la première ouverture (4) ; le système de distribution de crème comestible (1) comprend en outre : un premier conduit de sortie (30) s'étendant vers l'extérieur à partir de la première chambre (3) ; un deuxième conduit de sortie (50) s'étendant vers l'extérieur à partir de la deuxième chambre (5) ; la première ouverture (4) est disposée au niveau du premier conduit de sortie (30) ; le système de distribution de crème comestible (1) est **caractérisé en ce qu'**il comprend également un élément de raccordement (40) pour relier le premier conduit de sortie (30) et le deuxième conduit de sortie (50) l'un à l'autre.

2. Le système de distribution de crème comestible (1) de la revendication précédente, comprenant une tige (9) qui est reliée au deuxième piston (8) et qui peut être actionnée manuellement pour activer à son tour le deuxième piston (8) de la deuxième position (B) vers la première position (A).

3. Le système de distribution de crème comestible (1) de la revendication précédente, où : le deuxième piston (8) comprend un premier trou traversant (12) ; il comprend une première valve (13) disposée au niveau du premier trou traversant (12) de manière à prendre une position ouverte et une position fermée ; la tige (9) est tubulaire et forme au moins une partie du conduit de distribution (6) ; la tige (9) communique avec le premier trou traversant (12) du deuxième piston (8) de manière à établir une communication fluidique entre la deuxième chambre (5) et l'extérieur, lorsque la première valve (13) prend la position ouverte, et de manière à empêcher la communication fluidique entre la deuxième chambre (5) et l'extérieur, lorsque la première valve (13) prend la position fermée.

4. Le système de distribution de crème comestible (1) de l'une quelconque des revendications précédentes, comprenant des moyens élastiques (14) qui sont disposés dans la deuxième chambre (5) et qui sont interposés entre une paroi de base de la deuxième chambre (5) et le deuxième piston (8) afin d'activer le deuxième piston (8) de la première position (A) vers la deuxième position (B).

5. Le système de distribution de crème comestible (1) de la revendication précédente, où les moyens élastiques (14) comprennent un ressort (15) ; et où : l'extension maximale que le ressort (15) peut atteindre, sans contraintes extérieures, définit une première position d'extrémité du deuxième piston (8) ; le raccourcissement maximal que le ressort (15) peut atteindre, lors de l'utilisation du système de distribution de crème comestible (1), définit une deuxième position d'extrémité du deuxième piston (8) ; la première position (A) et la deuxième position (B) sont interposées entre la première position d'extrémité et la deuxième position d'extrémité.

6. Le système de distribution de crème comestible (1) de l'une quelconque des revendications précédentes, comprenant des moyens de butée (18) qui permettent au premier piston (7) de coulisser le long des parois internes de la première chambre (3) dans une seule direction d'avancement (Z), qui est la direction pour transporter la première partie de crème comestible dans la deuxième chambre (5) par l'intermédiaire de la première ouverture (4).

7. Le système de distribution de crème comestible (1) de la revendication précédente, dans lequel : la deuxième chambre (5) comprend un deuxième trou traversant (16) ; les moyens de butée (18) comprennent une deuxième soupape (17) disposée au niveau du deuxième trou traversant (16) de manière à adopter une première configuration dans laquelle elle permet le passage de la première partie de la crème comestible, contenue dans la première chambre (3), dans la deuxième chambre (5) lorsque le deuxième piston (8) est activé de la première position (A) à la deuxième position (B), et de manière à adopter une deuxième configuration dans laquelle elle empêche le retour de la crème comestible de la

deuxième chambre (5) à la première chambre (3) lorsque le deuxième piston (8) est activé de la deuxième position (B) vers la première position (A).

8. Le système de distribution de crème comestible (1) de l'une quelconque des revendications précédentes, dans lequel : le premier conduit de sortie (30) a une capacité plus petite que celle de la première chambre (3) et par rapport à la capacité du conduit de distribution (6) ; le conduit de distribution (6) est directement connecté à la deuxième chambre (5).

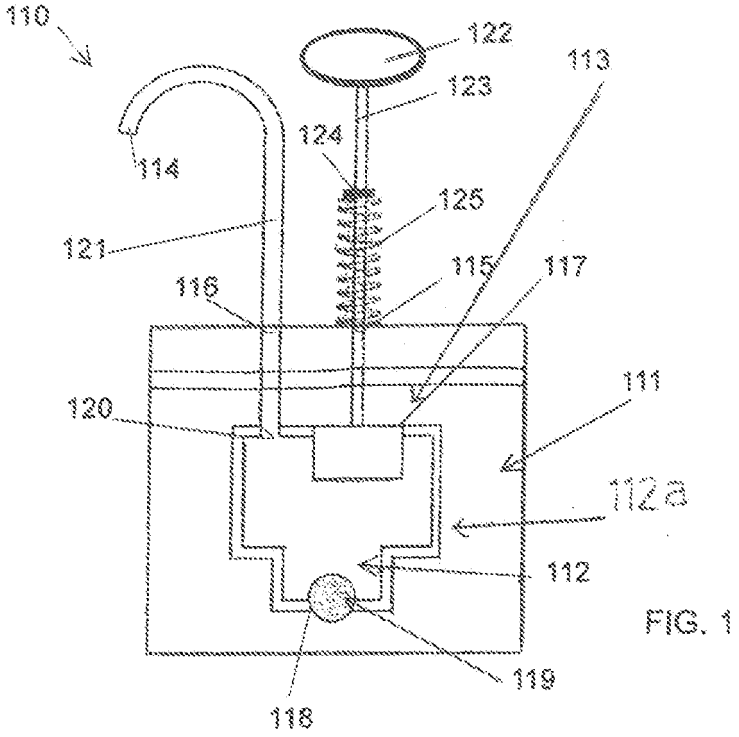
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FIG. 1

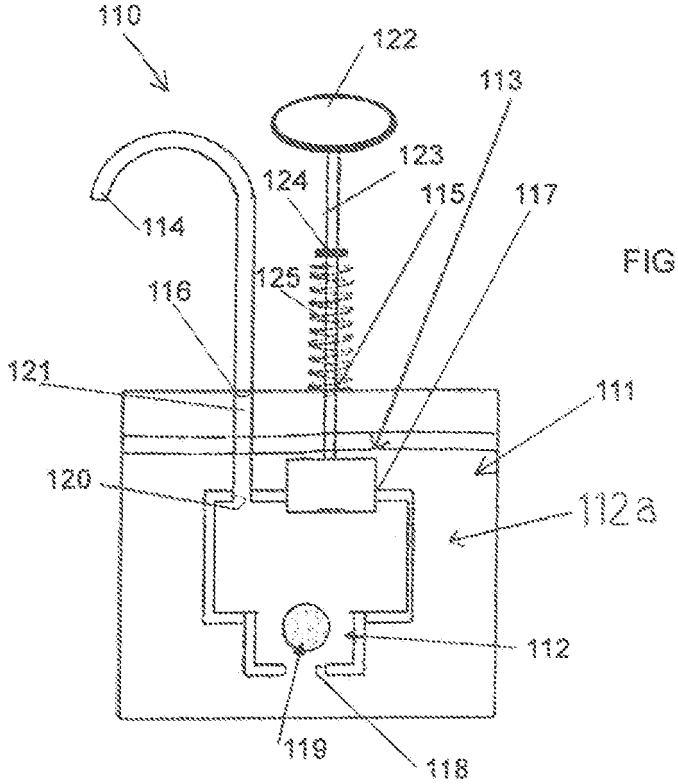
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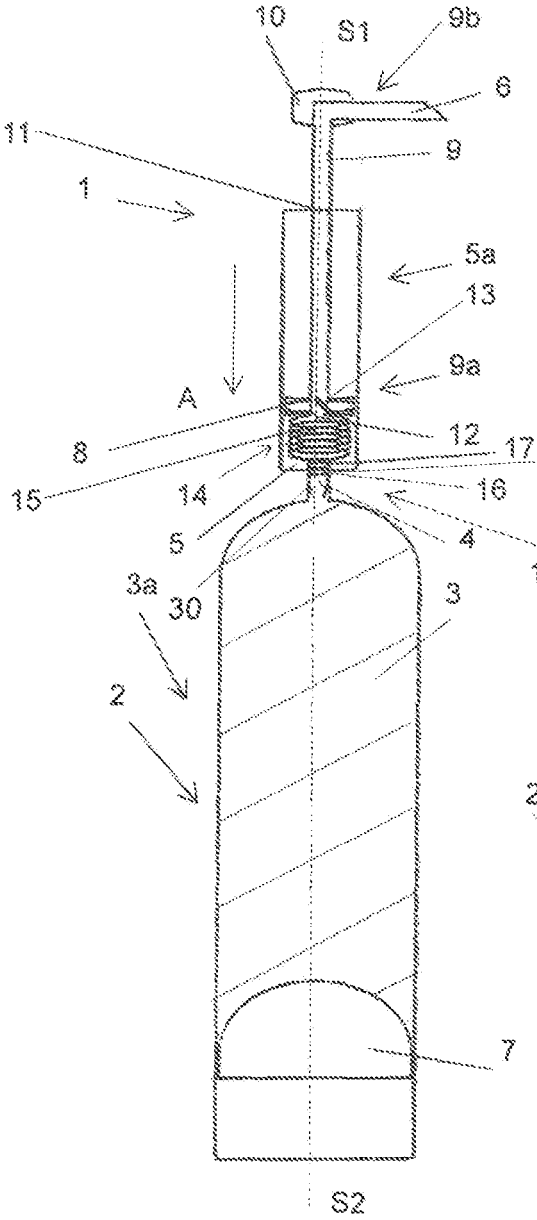
FIG. 2

FIG. 3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S2

FIG. 4

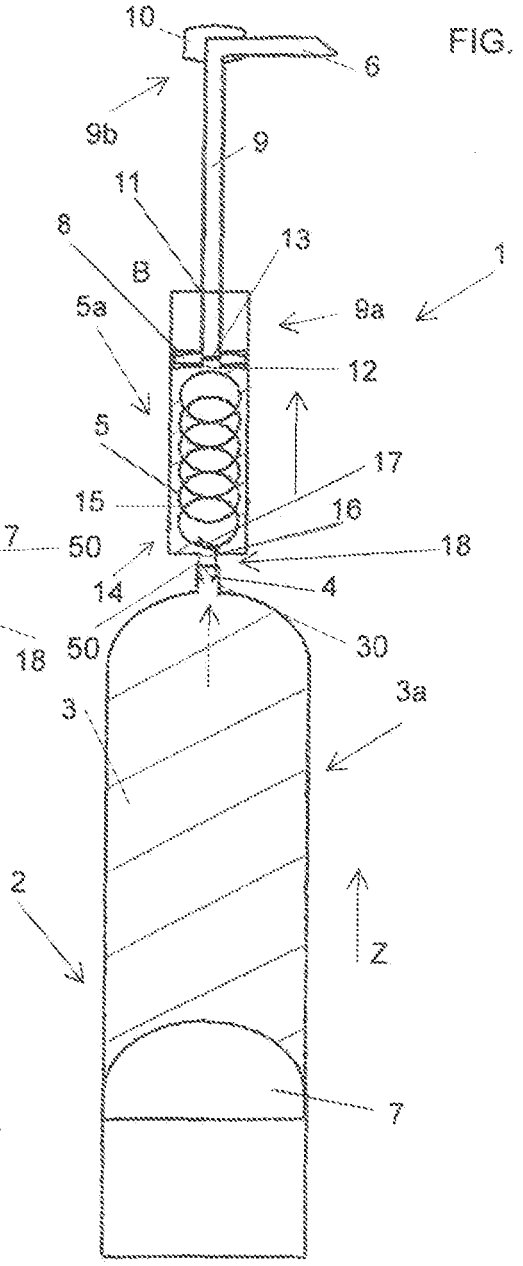
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FIG. 5

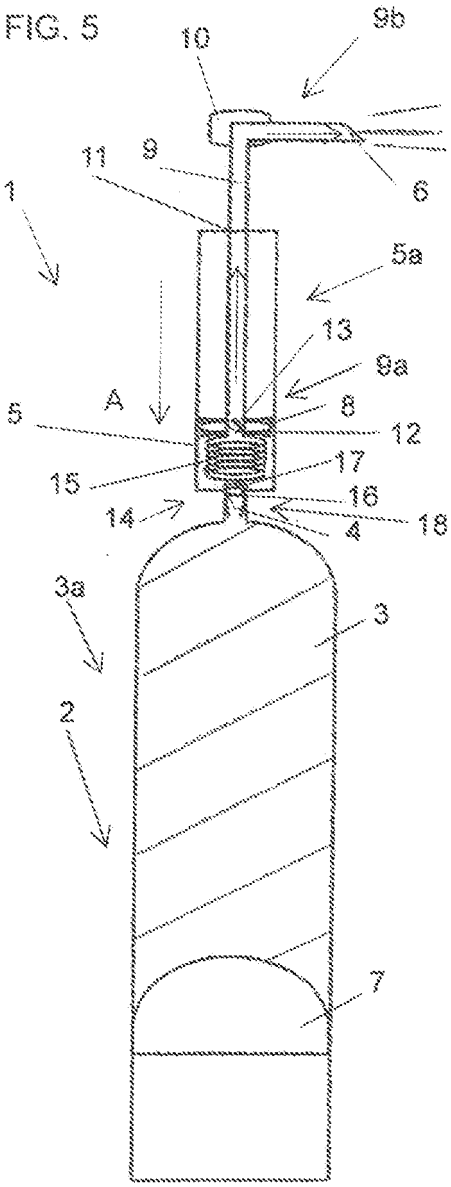
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FIG. 6

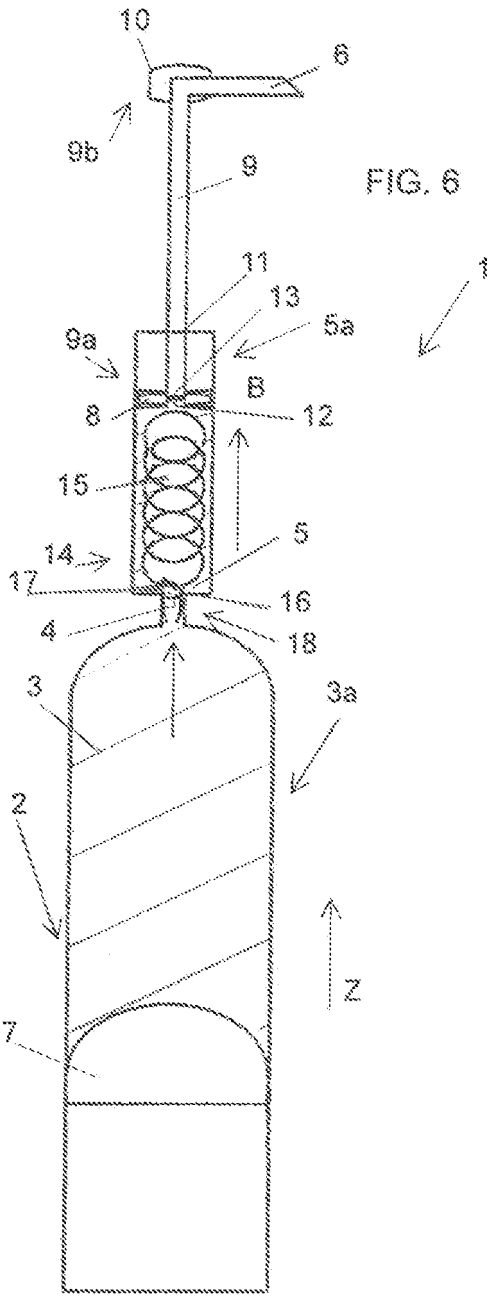
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FIG. 7

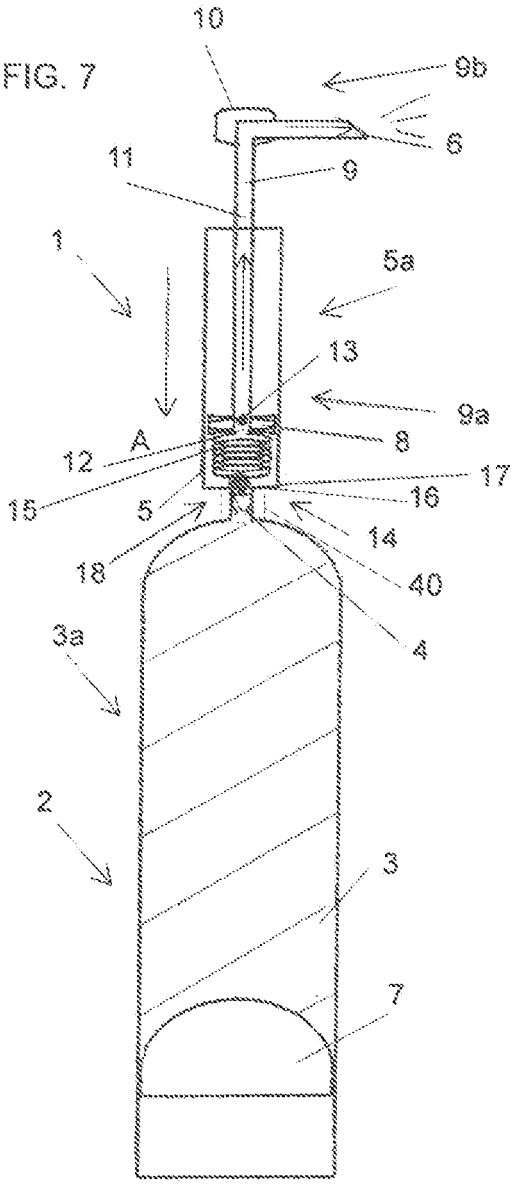
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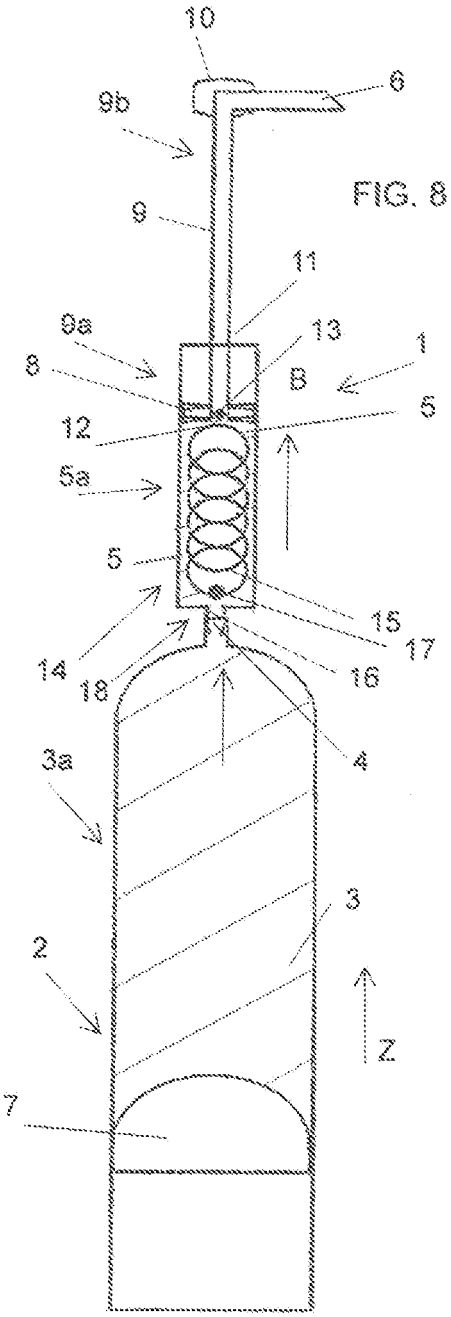
FIG. 8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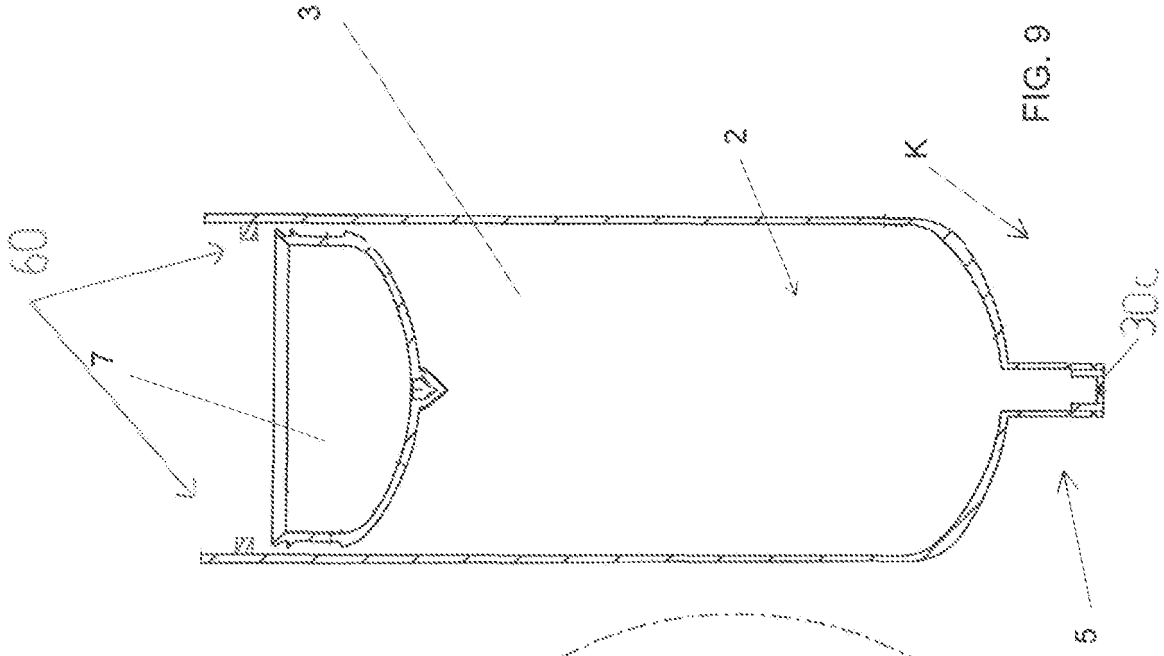

FIG. 9

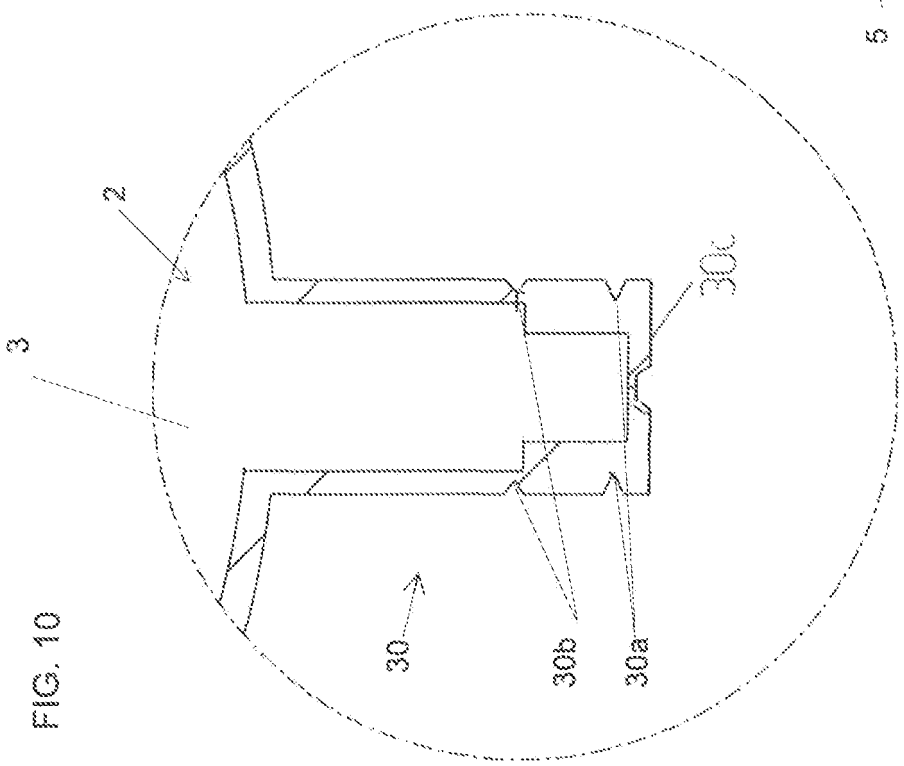

FIG. 10

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- DE 29717034 U1 **[0010]**
- DE 102007007402 A1 **[0010]**
- JP H06298269 A **[0010]**
- US 5842605 A **[0010]**