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(54) Beverage dispensing valve, in particular for a household refrigeration appliance

Ventil zur Abgabe eines Getränks, insbesondere für Kühlschrank

Vanne pour soutirage de boisson, en particulier pour réfrigérateur domestique

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Description

[0001] The present invention relates to a beverage dispensing valve, in particular for a household refrigeration appliance, according to the preamble of claim 1.

[0002] The present invention also relates to a respective household refrigerating appliance comprising said beverage dispensing valve.

[0003] Reference will be prevalently made in the following description to a refrigeration appliance for household use, even though the present invention is not strictly limited to such an appliance.

[0004] It is known in the art a refrigeration appliance, in particular for household use, of the type comprising a structure with at least one compartment formed therein for food preservation.

[0005] Refrigeration appliances known in the art typically comprise two compartments which are kept at different temperatures, thus providing at least two different food preservation states, in particular a refrigerator compartment suitable for preserving fresh food at a temperature between 0°C and 10°C and a freezer compartment suitable for preserving frozen food at a temperature between -15°C and -30°C; such refrigeration appliances are commonly referred to by those skilled in the art of household refrigeration as "double-door" or "combined" refrigerators, depending on the relative position of the two compartments. In a "double-door" refrigeration appliance, the freezer compartment is above the refrigerator compartment, whereas in a "combined" refrigeration appliance the freezer compartment is located at the bottom.

[0006] It is also known in the art that a refrigeration appliance, in particular for household use, may include a device for dispensing a beverage outside said refrigeration appliance, said device comprising a beverage dispensing valve. Usually said valve is associated, whether directly or indirectly, with a reservoir located inside a compartment of the refrigeration appliance, in particular said reservoir being typically positioned in a refrigerator compartment; said valve is operated by an actuator element associated therewith and positioned externally to the refrigeration appliance, said actuator element being operated by a user wanting the beverage to exit the valve.

[0007] Refrigeration appliances with such features have been very common for decades in the USA; actually, the refrigeration appliances widespread on the American market are equipped with dispensers capable of dispensing not only refrigerated water, but also ice and, in some cases, refrigerated soft drinks. These refrigeration appliances are usually fitted with two doors arranged side by side, and are therefore very bulky; the dispenser and the valve are associated with one door, the valve typically extending through the door, so that it protrudes both inside and outside the refrigeration appliance; furthermore, a recess is normally present on said door, outside the refrigeration appliance, where the valve or the associated ducts come out for dispensing the beverage; in said recess, the user can lay, for example, a glass or another container suitable for receiving the dispensed beverage. A beverage dispensing valve according to the preamble of claim 1 is known from AT-B-373 564.

[0008] In Europe, refrigeration appliances equipped with a dispenser have begun to catch on in quite recent times. It must be pointed out that the European market demands rather different products from those sold in the United States, i.e. products being much less bulky (60 or 70 cm wide) and usually dispensing refrigerated water only; moreover, such products must not be too expensive and therefore must use simple but effective technical solutions.

[0009] It has however been observed that the refrigeration appliances known in the art suffer from a number of drawbacks, which are substantially due to the particular realization of the beverage dispensing valve.

[0010] In fact, the valves known in the art are so realized as to cause beverage dripping even when the user has already removed the container suitable for receiving the dispensed beverage.

[0011] It is clear that such dripping, in addition to wasting beverage, will inevitably soil both the refrigeration appliance and the surrounding area.

[0012] As a consequence, said dripping of the valves known in the art inevitably leads to much discomfort for the user.

[0013] Moreover, the valves known in the art are usually so realized as to not ensure a homogeneous exit of the beverage; it is clear that also this drawback is particularly annoying, in that it may cause the beverage to be improperly dispensed, thus increasing the risk of spilling beverage on the refrigeration appliance and on the surrounding area.

[0014] Further drawbacks are caused by the insufficient versatility of prior-art valves, each of which is conceived for being associated with a specific refrigeration appliance with walls having specific dimensions, without the possibility of associating said valves with elements having different dimensions than the predetermined ones.

[0015] In this frame, it is the main object of the present invention to provide a beverage dispensing valve, in particular for a household refrigeration appliance, and a respective refrigeration appliance which are adapted to overcome the above-described drawbacks, thus proving to be particularly efficient and economical.

[0016] It is another object of the present invention to provide a beverage dispensing valve, in particular for a household refrigeration appliance, which is so realized as to prevent, or at least to limit, a possible dripping of beverage, in particular when the user has already removed the container suitable for receiving the dispensed beverage, so as to not waste beverage and soil the refrigeration appliance and/or the surrounding area.

[0017] It is a further object of the present invention to

provide a beverage dispensing valve, in particular for a household refrigeration appliance, which is so realized as to ensure a homogeneous exit of the beverage and a proper dispensation thereof.

[0018] It is yet another object of the present invention to provide a beverage dispensing valve, in particular for a household refrigeration appliance, which is so realized as to ensure particular versatility, said valve being so conceived that it can also be associated with elements having different dimensions than the predetermined ones.

[0019] Said objects are achieved by the present invention through a beverage dispensing valve, in particular for a household refrigeration appliance, and a respective refrigeration appliance which incorporate the features set out in the appended claims, which are an integral part of the present description. Further objects, features and advantages of the present invention will become apparent from the following detailed description and from the annexed drawings, which are supplied by way of non-limiting example, wherein:

- Fig. 1 is a sectional side view of a refrigeration appliance according to the present invention;
- Fig. 2 is an exploded view of a beverage dispensing valve according to the present invention;
- Figs. 3a and 3b are sectional views of the valve of Fig. 2, respectively in a first and a second operating conditions;
- Figs. 4a and 4b are perspective views of a first and a second components, respectively, of the valve according to the present invention;
- Figs. 5a and 5b respectively show the valve without (Fig. 5a) and with (Fig. 5b) the second component shown in Fig. 4b.

[0020] Said description and said drawings are to be considered as non-limiting examples.

[0021] Referring now to the annexed drawings, Fig. 1 shows a schematic sectional view of a refrigeration appliance, in particular for household use, in accordance with the present invention, designated as a whole by reference numeral 1.

[0022] Said refrigeration appliance 1 comprises a structure 2 within which at least one compartment 3, 4 is obtained for preserving foodstuffs, which is adapted to be closed by at least one door 3P, 4P.

[0023] Preferably, said at least one compartment 3, 4 comprises:

- a refrigerator compartment 3, in particular suitable for preserving fresh food at a temperature between 0°C and 10°C, and adapted to be closed by a first door 3P,
- a freezer compartment 4, in particular suitable for preserving frozen food at a temperature between -15°C and -30°C, and adapted to be closed by a second door 4P.

[0024] It should be noted that the refrigeration appliance 1 shown in Fig. 1 is a "combined" one, in that the freezer compartment 4 is located under the refrigerator compartment 3; it is however clear that the refrigeration appliance 1 according to the present invention may be of a different type as well.

[0025] Also, Fig. 1 shows rather thick walls of the structure 2, to indicate the presence of a layer of thermally insulating material; normally, the thickness of the insulating material depends on the type of cell (i.e. on the cell's operating temperatures) and, of course, on the type of insulating material in use; this is common and well known to those skilled in the art.

[0026] The refrigeration appliance 1 comprises a beverage dispensing device, designated as a whole by reference numeral 5, said dispensing device 5 being associated with the structure 2 of the refrigeration appliance 1, in particular with said at least one door 3P, 4P.

[0027] Said dispensing device 5 comprises a valve 10 for dispensing said beverage. In the example of embodiment shown in Fig. 1, the valve 10 is associated with the first door 3P; in this embodiment, the valve 10 of the present invention preferably also acts as a duct for dispensing the beverage outside the refrigeration appliance 1, in particular by conducting the beverage to a recess 3N formed on said first door 3P. It is however clear that said valve 10 and said recess 3N may be associated with other parts of the structure 2, and that the valve 10 may be associated with a suitable duct (not shown in the drawings) for conducting the beverage outside the refrigeration appliance 1 and into said recess 3N.

[0028] The valve 10 according to the present invention (and according to the example of embodiment shown in Fig. 1) is preferably associated with a reservoir 6 arranged inside the refrigeration appliance 1, in particular within the refrigerator compartment 3; it is however clear that the valve 10 may also be associated, whether directly or indirectly, with a drinking water distribution main.

[0029] Furthermore, the valve 10 is associated with an actuator element 7 positioned outside the refrigeration appliance 1, said actuator element 7 being preferably of the type that can be operated via a thrust exerted by a user wanting the beverage to exit the valve 10 (e.g. said thrust being exerted by means of a container, designated by reference C in Fig. 1).

[0030] The valve 10 is shown in more detail in Figures 2 to 3b, wherein Fig. 2 shows an exploded perspective view and Figs. 3a and 3b show sectional views of the valve 10 in a first and a second operating conditions, respectively.

[0031] Said valve 10 comprises a main body 20 comprising:

- a first portion 21 for the entrance of the beverage into said valve 10;
- an intermediate portion 20I for said beverage to flow through the valve 10, said intermediate portion 20I comprising at least one opening 20A that allows the

beverage to flow out of said intermediate portion 20I;
- a second portion 22 extending substantially parallel to an axis A (indicated by a dashed-dotted line in Figs. 3a and 3b) of the valve 10, a sealing member 23 being associated with said second portion 22 in the proximity of a terminal part 22A thereof.

[0032] In addition, the valve 10 comprises a lower body 30, which is associated with the main body 20 in such a way as to encircle (i.e. in encircling relation) said second portion 22 and said at least one opening 20A of the intermediate portion 20I, said lower body 30 being adapted to slide axially (i.e. substantially parallel to said axis A of the valve 10) over said intermediate portion 20I and second portion 22, so as to move:

- from a first operating condition (shown in Fig. 3a), in which an inner surface 31 of the lower body 30 cooperates with said sealing member 23 to prevent the beverage from coming out of said valve 10,
- to a second operating condition (shown in Fig. 3b), in which at least one gap L (also shown in Fig. 3b) is formed between said inner surface 31 and said sealing member 23 to allow the flow of the beverage, and vice versa (i.e. said lower body 30 is adapted to slide axially from the second operating condition to the first operating condition).

[0033] In accordance with the present invention, said valve 10 comprises a sleeve 40 having:

- a first end 41, which is adapted to be coupled to said main body 20;
- a second end 42, which is adapted to be coupled to said lower body 30;
- an intermediate part 43 made of an elastic material, which is adapted to move from a substantially stretched state, occurring when the lower body 30 is in said first operating condition, to a contracted state, occurring when the lower body 30 is in said second operating condition, the intermediate part 43 of the sleeve 40 allowing a depression to be formed in said stretched state to prevent dripping downstream of the sealing member 23.

[0034] In practice, when the intermediate part 43 of the sleeve 40 contracts, it reduces the inner volume of the sleeve 40; when, on the contrary, the intermediate part 43 of the sleeve 40 stretches, it increases the inner volume of the sleeve 40, thereby reducing the pressure within said sleeve 40 and creating a depression suitable for preventing dripping downstream of the sealing member 23. Substantially, said intermediate part 43 of the sleeve 40 is so positioned as to surround or encircle the intermediate portion 20I of the main body.

[0035] As a consequence, as clearly shown in Figs. 3a and 3b, the valve 10 according to an embodiment comprises:

- a first chamber 11 formed between the main body 20 and the sleeve 40, in particular between the intermediate portion 20I of the main body 20 and the intermediate part 43 of the sleeve 40,
- a second chamber 12 formed between the second portion 22 of the main body 20 and the inner surface 31 of the lower body 30,

said first chamber 11 and second chamber 12 communicating through a passage P present between the main body 20 and the lower body 30.

[0036] In particular, the intermediate portion 20I of the main body 20 has slightly smaller dimensions than the inner surface 31 of the lower body 30, said dimensions being such as to allow obtaining said passage P; as a consequence, the dimensions of the passage P are such that said first chamber 11 and said second chamber 12 are put in communication with each other, without however the beverage being allowed to flow from the second chamber 12 to the first chamber 11.

[0037] The special provision of the sleeve 40 thus allows a depression to be created in the first chamber 11, in the passage P and in the second chamber 12 that contains the beverage to be dispensed, said depression being adapted to prevent dripping downstream of the sealing member 23, in particular when the user wants to stop dispensing the beverage and causes the lower body 30 to move from the second operating condition (shown in Fig. 3b, i.e. a condition in which at least one gap L is formed between the inner surface 31 of the lower body 30 and said sealing member 23, and in which the intermediate part 43 of the sleeve 40 is in the contracted state) to the first operating condition (shown in Fig. 3a, i.e. a condition in which the inner surface 31 of the lower body 30 cooperates with the sealing member 23 to prevent the beverage from coming out of the valve 10, and in which the intermediate part 43 of the sleeve 40 is in the stretched state).

[0038] In particular, said elastic material that the intermediate part 43 of the sleeve 40 is made of is a silicone-based material; furthermore, said first end 41 and second end 42 are made of substantially the same material used for the intermediate part 43 of the sleeve 40.

[0039] Preferably, said intermediate part 43 is shaped substantially like a bellows (as shown in Figures 2, 3a and 3b, 5a and 5b), wherein the folds of said bellows are more extended or elongated when the lower body 30 is in said first operating condition than when it is in the second operating condition.

[0040] In an alternative embodiment (not shown in the drawings), said intermediate part 43 may have the shape of a substantially ellipsoidal or spherical balloon, in said second operating condition said balloon being more flattened and having a smaller inner volume than in said first operating condition.

[0041] It is clear that the special provisions of the present invention allow to provide a beverage dispensing valve 10, in particular for a household refrigeration ap-

pliance 1, which is so realized as to prevent, or at least to limit, a possible dripping of beverage, in particular when the user has already removed the container C suitable for receiving the dispensed beverage.

[0042] Therefore, the valve 10 allows to avoid wasting beverage and soiling the refrigeration appliance 1 and/or the surrounding area.

[0043] As a result, the valve 10 according to the teachings of the present invention turns out to be particularly efficient and economical.

[0044] Preferably, the inner surface 31 of the lower body 30 comprises a narrowing 32, which is adapted to cooperate, in particular in said first operating condition, with the sealing member 23 to prevent the beverage from coming out of the valve 10.

[0045] According to another embodiment, as can be seen in Fig. 4a, which is a perspective view of the main body 20, the second portion 22 of said main body 20 substantially has the shape of a rod and comprises at least one slit 22F extending longitudinally along said second portion 22, in particular said at least one slit 22F being formed in such a manner as to be associated with said at least one opening 20A of the intermediate portion 20I and to terminate at the sealing member 23.

[0046] Consequently, said at least one slit 22F allows the beverage coming out of said at least one opening 20A of the intermediate portion 20I to be collected and brought towards the sealing member 23.

[0047] In a preferred embodiment, the second portion 22 of the main body 20 comprises a plurality of slits 22F and said at least one opening 20A comprises a plurality of openings 20A, in particular the number of slits 22F corresponding to the number of openings 20A; preferably, the number of slits 22F and openings 20A is four.

[0048] The particular shape of the second portion 22 of the main body 20 allows to provide a valve 10 which is so realized as to ensure a homogeneous exit of the beverage and a proper dispensation thereof.

[0049] In fact, the presence of the slits 22F provides beverage flows that rejoin downstream of the sealing member 23 and of the terminal part 22A of the second portion 22; it is therefore apparent that such rejoining of the beverage flows running through the slits 22F ensures that the beverage will flow out and be dispensed homogeneously.

[0050] Preferably, the second portion 22 of the main body 20 comprises a groove 22S adapted to receive the sealing member 23, in particular said groove 22S extending substantially perpendicular to said at least one slit 22F; the provision of the groove 22S allows for a proper and safe positioning of the sealing member 23.

[0051] In accordance with a preferred embodiment when the lower body 30 is in said first operating condition (shown in Fig. 3a), the sealing member 23 is associated with the second portion 22 of the main body 20 at a first distance d1 from an outlet section 33 of the lower body 30, said first distance d1 being comprised between 10 mm and 30 mm. Furthermore, when the lower body is in said first operating condition (shown in Fig. 3a), the sealing member 23 is associated with the second portion 22 of the main body 20 at a second distance d2 from said at least one opening 20A of the intermediate portion 20I, said second distance d2 being comprised between 20 mm and 40 mm.

[0052] In said preferred embodiment, the inner surface 31 of the lower body 30 has a diameter d comprised between 16 mm and 20 mm, in particular of about 18 mm, in the section comprised between the terminal part 22A of the second portion 22 and said outlet section 33. In particular, said diameter d is substantially constant over the section of inner surface 31 downstream of the terminal part 22A of the second portion 22.

[0053] It should be noted that said diameter d, first distance d1 and second distance d2 are indicated in Fig. 3a by means of dashed lines.

[0054] Such particular dimensions of the components of the valve 10 according to the present invention cooperate to prevent, or anyway to minimize, a possible dripping of beverage, particularly when the user has already removed the container C suitable for receiving the dispensed beverage, so as to avoid wasting beverage and soiling the refrigeration appliance 1 and/or the surrounding area.

[0055] In fact, the optimal provision of the first distance d1 allows to reduce the beverage volume downstream of the sealing member 23, thus reducing the time interval between when the valve 10 closes and when dripping stops.

[0056] As a result, the valve 10 according to the teachings of the present invention turns out to be particularly efficient and economical.

[0057] In addition, the particular dimensions of the components of the valve 10 (i.e. the first distance d1, the second distance d2 and the diameter d) allow to provide a valve 10 which is so realized as to ensure a homogeneous exit of the beverage and a proper dispensation thereof, in that they allow to prevent the flow of beverage that must be dispensed from becoming turbulent in the section of the valve 10 downstream of the terminal part 22A of the second portion 22 and of the sealing member 23.

[0058] The valve 10 according to another embodiment further comprises a spacer member 50, which is adapted to be associated with the first portion 21 of the main body 20 to impart a universal character to the valve 10, i.e. to make it suitable for being associated with elements of different sizes and/or doors 3P, 4P of different thickness.

[0059] Said spacer member 50 has substantially the shape of a ring having a hole 50F (shown in Fig. 4b) for the passage of the beverage to be dispensed.

[0060] Moreover, said spacer member 50 comprises fastener means 51 for firmly coupling it within said first portion 21 of the main body 20; in particular, said fastener means 51 comprise a thread adapted to be coupled to a mating thread formed within said first portion 21.

[0061] The valve 10 according to the present invention

preferably comprises a first gasket G1 (shown in Fig. 2), which must be positioned within said first portion 21 prior to associating the spacer member 50 with the latter.

[0062] In addition, the valve 10 according to the present invention may comprise a second gasket G2 (also shown in Fig. 2) to be positioned between the first portion 21 of the main body 20 and a further element to be associated with the valve 10.

[0063] The provision of the spacer member 50 allows to provide a valve 10 which is so realized as to have particular versatility, in that said spacer member 50 allows the valve 10 to be associated also with elements having different dimensions than the predetermined ones; in fact, in order to associate the valve 10 with doors 3P, 4P of different thicknesses, it will be sufficient to use a spacer member 50 having a size suitable for a specific door 3P, 4P, without necessarily having to use a specific valve 10 for that specific door 3P, 4P.

[0064] Figures 5a and 5b show the valve 10 of the present invention associated with a reservoir 6 arranged inside a refrigeration appliance 1; in particular, said valve 10 is shown in:

- a first view, where it is associated with the reservoir 6, in particular with an outlet 6A of the reservoir 6, without interposition of the spacer member 50 in the first portion 21 of the main body 20 (see Fig. 5a);
- a second view, where it is associated with the reservoir 6, in particular with said outlet 6A of the reservoir 6, with interposition of the spacer member 50 in the first portion 21 of the main body 20 (see Fig. 5b).

[0065] By comparing Figures 5a and 5b, it can be observed that, a first length L1 of the valve 10 being fixed, the use of the spacer member 50 will allow to position an outlet section 33 of the valve 10 at a third length L3 from the reservoir 6, greater than a second distance L2, said second distance L2 being the distance between the outlet section 33 and the reservoir 6 when the spacer member 50 is not used; as a consequence, it is clear that the use of a suitably sized spacer member 50 will allow to adapt the valve 10 to doors 3P, 4P of different thicknesses, without necessarily having to use a specific valve 10 for each one of said doors 3P, 4P of different thicknesses.

[0066] Fig. 4b shows a perspective view of the spacer member 50 according to the present invention.

[0067] As can be seen in said figure, the spacer member 50 comprises operating means 52 to ensure a stable coupling of said spacer member 50 within said first portion 21 of the main body 20; in particular, said operating means comprise at least one straight portion 52 of said spacer member 50, in particular said straight portion 52 being located near the hole 50F of said spacer member 50; it is clear that said straight portion 52 allows using a tool (not shown in the drawings) for tightening the spacer member 50 within said first portion 21, said tightening being in particular obtained through the action of the fastener means 51.

[0068] Referring back to Figures 2 to 3b, there is shown that the valve 10 comprises at least one elastic member 60 associated with the lower body 30 and/or with the main body 20, said elastic member 60 exerting a thrust upon the lower body 30, such as to allow the latter to move from the second operating condition (Fig. 3b) to the first operating condition (Fig. 3a) and/or such as to hold it in said first operating condition, thus preventing the beverage, by closing said at least one gap L, from coming out of the valve 10.

[0069] In a preferred embodiment, said elastic member 60 is associated with the lower body 30 through a connection element 61, in particular said connection element 61 comprising a housing 62 adapted to receive the elastic member 60.

[0070] In addition, the connection element 61 is preferably secured to the outer surface of the lower body 30 through second fastener means 63 known in the art; for example, as shown in Figures 3a and 3b, said second fastener means 63 comprise threads on the lower body 30 and on the connection element 61, which cooperate together to fasten the connection element 61 to the lower body 30; it is however clear that the connection element 61 may be formed as one piece with the lower body 30.

[0071] The elastic member 60 is positioned in such a way as to abut against a wall 20P of the main body 20.

[0072] The valve 10 according to an embodiment further comprises an external body 70 adapted to be associated with the main body 20 and to house the elastic member 60 and, at least partially, said connection element 61, in particular said external body 70 comprising retaining means (not shown in the drawings) adapted to limit the movement of the assembly constituted by the elastic member 60, the connection element 61 and the lower body 30.

[0073] In the annexed drawings (particularly in Figs. 3a and 3b), said external body 70 is secured to the main body 20 through third fastener means 71, in particular a thread that allows fastening said components; it is however clear that said fastening may also be obtained through other fastener means known in the art. The valve 10 according to the present invention preferably also comprises a covering element 80 adapted to be fitted onto said external body 70, said covering element 80 comprising at least one centering element 81 made of elastic material and extending substantially radially with respect to the body of the covering element 80.

[0074] Preferably, said at least one centering element 81 is shaped substantially like a ring or a fin that extends radially from the covering element 80; as can be seen in Figs. 2 to 3b, said at least one centering element 81 comprises a plurality of centering elements 81 allowing the valve 10 to be optimally positioned into an opening (not shown in the drawings) of the refrigeration appliance 1.

[0075] In Figs. 3a and 3b one can also see that the valve 10 according to the present invention comprises a coupling element 90 positioned between an actuator el-

ement 7 and said valve 10.

[0076] In particular, said coupling element 90 is made of a soft and/or elastic material, such as open-cell or self-modelling foam.

[0077] Said coupling element 90 is preferably positioned (as can be seen in Figs. 3a and 3b) in such a way as to encircle at least partially the lower body 30 of the valve 10; moreover, said coupling element 90 is preferably in contact with the connection element 61.

[0078] The special provision of the coupling element 90 provides numerous advantages.

[0079] In fact, said coupling element 90 allows to constitute a support surface for the actuator element 7, so as to take up any tolerances and prevent said actuator element 7 from being loose or vibrating (which would be the case if the coupling element 90 were absent), since the actuator element 7 will meet the soft and/or elastic material of the coupling element 90.

[0080] Furthermore, the coupling element 90 allows to avoid any undesired activation of the valve 10, since the soft and/or elastic material it is made of makes it necessary to exert an adequate thrust upon the actuator element 7 in order to activate said valve 10.

[0081] The following will describe a method of assembly of a beverage dispensing valve 10, in particular for a household refrigeration appliance 1, said valve 10 having a main body 20 comprising:

- a first portion 21 for the entrance of the beverage into said valve 10;
- an intermediate portion 20I for said beverage to flow through the valve 10, comprising at least one opening 20A that allows the beverage to flow out of said intermediate portion 20I;
- a second portion 22 extending substantially parallel to an axis A of the valve 10.

[0082] Said method comprises the following steps:

a) inserting said second portion 22 and said at least one opening 20A of the intermediate portion 20I into a lower body 30;

b) associating a sealing member 23 with said second portion 22, in particular said sealing member 23 being positioned in the proximity of a terminal part 22A of said second portion 22,

so that said lower body 30 can slide axially along said intermediate portion 20I and second portion 22 to move from a first operating condition (shown in Fig. 3a), in which an inner surface 31 of the lower body 30 cooperates with said sealing member 23 to prevent the beverage from coming out of said valve 10, to a second operating condition (shown in Fig. 3b), in which at least one gap L is formed between said inner surface 31 and said sealing member 23 to allow the flow of the beverage, and vice versa.

In accordance with an embodiment of the present invention, the method of assembly of the valve 10 according to the present invention comprises the following step:

c) coupling a first end 41 of a sleeve 40 to said main body 20 and a second end 42 to said lower body 30, said sleeve 40 comprising an intermediate part 43 made of an elastic material, which is adapted to move from a substantially stretched state, occurring when the lower body 30 is in said first operating condition, to a contracted state, occurring when the lower body 30 is in said second operating condition, the intermediate part 43 of the sleeve 40 allowing a depression to be formed in said stretched state to prevent dripping downstream of the sealing member 23.

Preferably, said step c) is followed by a step c1) of moving the lower body 30 to a condition in which the inner surface 31 of the lower body 30 abuts on said sealing member 23; this allows to properly find the first operating condition of the lower body 30 and the substantially stretched state of said intermediate part 43 so as to optimally close the valve 10, in that the thrust of the elastic member 60 alone might be insufficient to ensure the proper stretching of the intermediate part 43 of the sleeve 40, thus causing beverage to leak from the valve 10.

Furthermore, the method of assembly of the valve 10 according to an embodiment of the present invention may comprise one or more of the following steps:

d) associating an external body 70 with the main body 20, in particular said external body 70 being secured to the main body 20;

e) fitting a covering element 80 onto said external body 60, said covering element 80 comprising at least one centering element 81 made of elastic material and extending substantially radially with respect to the body of the covering element;

f) inserting at least one elastic member 60 between said main body 20 and external body 70;

g) securing to the lower body 30 a connection element 61 that allows associating the elastic member 60 with said lower body 30, in particular said connection element 61 comprising a housing 62 adapted to receive the elastic member 60;

h) associating a spacer member 50 with the first portion 21 of the main body 20.

[0083] In particular, said step h) may be carried out prior to a step i) of coupling the valve 10 to a reservoir 6 of a dispensing device 5, in particular of a household refrigeration appliance 1, for dispensing a beverage, in that said step h) allows to impart a universal character to the valve 10 and allow it to be associated with doors 3P, 4P of different thicknesses; as an alternative, said step h) may preferably be carried out prior to step a) of inserting said second portion 22 and said at least one opening 20A of the intermediate portion 20I into a lower body 30.

[0084] It is however clear that said step h) may be car-

ried out at any moment while assembling the valve 10 according to the present invention.

[0085] Said step h) may be carried out through a step h1) of obtaining a stable coupling of the spacer member 50 within said first portion 21 through fastener means 51, in particular comprising a thread adapted to be coupled to a mating thread formed within said first portion 21.

[0086] In addition, said step h1) of obtaining a stable coupling of the spacer member 50 within said first portion 21 may be carried out by acting upon operating means 52 of the spacer member 50, in particular said operating means comprising at least one straight portion 52 of said spacer member 50.

[0087] The features and advantages of a beverage dispensing valve and of the associated refrigeration appliance according to the present invention are apparent from the above description.

[0088] In fact, the special provision of the sleeve 40 according to the present invention allows to provide a beverage dispensing valve 10, in particular for a household refrigeration appliance 1, which is so realized as to prevent, or at least to minimize, a possible dripping of beverage, in particular when the user has already removed the container C suitable for receiving the dispensed beverage. The valve 10 thus allows to avoid wasting beverage and soiling the refrigeration appliance 1 and/or the surrounding area; as a result, the valve 10 according to the teachings of the present invention turns out to be particularly efficient and economical.

[0089] Another advantage of the present invention is that the particular shape of the second portion 22 of the main body 20 allows to provide a valve 10 which is so realized as to ensure a homogeneous exit of the beverage and a proper dispensation thereof. In fact, the presence of said at least one slit 22F provides beverage flows that rejoin downstream of the sealing member 23 and of the terminal part 22A of the second portion 22; it is therefore apparent that such rejoining of the beverage flows running through the slits 22F ensures that the beverage will flow out and be dispensed homogeneously.

[0090] A further advantage of the present invention is that the optimal provision of the first distance d1 allows to reduce the volume of beverage downstream of the sealing member 23, thereby speeding up the closing of the valve 10 and reducing the time interval between when the valve 10 closes and when dripping stops.

[0091] In addition, the particular dimensions of the components of the valve 10 (i.e. the first distance d1, the second distance d2 and the diameter d) allow to provide a valve 10 which is so realized as to ensure a homogeneous exit of the beverage and a proper dispensation thereof, in that they allow to prevent the flow of beverage that must be dispensed from becoming turbulent in the section of the valve 10 downstream of the terminal part 22A of the second portion 22 and of the sealing member 23.

[0092] Another advantage of the present invention is that the special provision of the spacer member 50 allows to provide a valve 10 which is so realized as to have particular versatility, in that said spacer member 50 allows the valve 10 to be associated also with elements having different dimensions than the predetermined ones; in fact, in order to associate the valve 10 with doors 3P, 4P of different thicknesses, it will be sufficient to use a spacer member 50 having a size suitable for a specific door 3P, 4P, without necessarily having to use a specific valve 10 for that specific door 3P, 4P.

[0093] It is however clear that many changes may be made to the beverage dispensing valve and to the associated refrigeration appliance according to the present invention, and that in its practical implementation the various components may have different shapes and arrangements or be replaced with other technically equivalent elements without departing from the appended claims.

[0094] It can therefore be easily understood that the present invention is not limited to the above-described beverage dispensing valve and the associated refrigeration appliance, but may be subject to many modifications, improvements or replacements of equivalent parts and elements without departing from the inventive idea, as clearly specified in the following claims.

Claims

1. A beverage dispensing valve (10), in particular for a household refrigeration appliance (1), said valve (10) having a main body (20) comprising:

- a first portion (21) for the entrance of the beverage into said valve (10);
- an intermediate portion (20I) for said beverage to flow through the valve (10), said intermediate portion (20I) comprising at least one opening (20A) that allows the beverage to flow out of said intermediate portion (20I);
- a second portion (22) extending substantially parallel to an axis (A) of the valve (10), a sealing member (23) being associated with said second portion (22) in the proximity of a terminal part (22A) thereof,

said valve (10) having a lower body (30) associated with the main body (20) in encircling relation to said second portion (22) and said at least one opening (20A) of the intermediate portion (20I), said lower body (30) being adapted to slide axially over said intermediate portion (20I) and second portion (22) to move:

- from a first operating condition, in which an inner surface (31) of the lower body (30) cooperates with said sealing member (23) to prevent the beverage from coming out of said valve (10),
- to a second operating condition, in which at

least one gap (L) is formed between said inner surface (31) and said sealing member (23) to allow the flow of the beverage, and vice versa,

said valve (10) being **characterized in that** it comprises a sleeve (40) having:

- a first end (41), which is adapted to be coupled to said main body (20);
- a second end (42), which is adapted to be coupled to said lower body (30);
- an intermediate part (43) made of an elastic material, which is adapted to move from a substantially stretched state, occurring when the lower body (30) is in said first operating condition, to a contracted state, occurring when the lower body (30) is in said second operating condition, and vice versa, the intermediate part (43) of the sleeve (40) allowing a depression to be formed in said stretched state to prevent dripping downstream of the sealing member (23).

2. A valve (10) as claimed in claim 1, **characterized in that** said intermediate part (43) of the sleeve (40) is positioned in such a way as to surround the intermediate portion (20I) of the main body.

3. A valve (10) as claimed in one or more of the preceding claims, **characterized in that** it comprises:

- a first chamber (11) formed between the main body (20) and the sleeve (40), in particular between the intermediate portion (20I) of the main body (20) and the intermediate part (43) of the sleeve (40),
- a second chamber (12) formed between the second portion (22) of the main body (20) and the inner surface (31) of the lower body (30),

said first chamber (11) and second chamber (12) communicating through a passage (P) present between the main body (20) and the lower body (30).

4. A valve (10) as claimed in one or more of the preceding claims, **characterized in that** the inner surface (31) of the lower body (30) comprises a narrowing (32), which is adapted to cooperate, in particular in said first operating condition, with the sealing member (23) to prevent the beverage from coming out of the valve (10).

5. A valve (10) as claimed in one or more of the preceding claims, **characterized in that** the second portion (22) of the main body (20) substantially has the shape of a rod and comprises at least one slit (22F) extending longitudinally along said second portion (22).

6. A valve (10) as claimed in claim 5, **characterized in that** said at least one slit (22F) is formed in such a manner as to be associated with said at least one opening (20A) of the intermediate portion (20I) and to terminate at the sealing member (23).

7. A valve (10) as claimed in one or more of the preceding claims 5 and 6, **characterized in that** the second portion (22) of the main body (20) comprises a plurality of slits (22F) and said at least one opening (20A) comprises a plurality of openings (20A), in particular the number of slits (22F) corresponding to the number of openings (20A).

8. A valve (10) as claimed in one or more of the preceding claims 5 to 7, **characterized in that** it comprises a sleeve (40) having:

- a first end (41), which is adapted to be coupled to said main body (20);
- a second end (42), which is adapted to be coupled to said lower body (30);
- an intermediate part (43) made of an elastic material, which is adapted to move from a substantially stretched state, occurring when the lower body (30) is in said first operating condition, to a contracted state, occurring when the lower body (30) is in said second operating condition, and vice versa, the intermediate part (43) of the sleeve (40) allowing a depression to be formed in said stretched state to prevent dripping downstream of the sealing member (23).

9. A valve (10) as claimed in one or more of the preceding claims, **characterized in that**, when the lower body (30) is in said first operating condition, the sealing member (23) is associated with the second portion (22) of the main body (20) at a first distance (d1) from an outlet section (33) of the lower body (30), said first distance (d1) being comprised between 10 mm and 30 mm.

10. A valve (10) as claimed in claim 9, **characterized in that** the inner surface (31) of the lower body (30) has a diameter (d) comprised between 16 mm and 20 mm, in particular of about 18 mm, in the section between the terminal part (22A) of the second portion (22) and said outlet section (33), in particular said diameter (d) being substantially constant over the section of inner surface (31) downstream of the terminal part (22A) of the second portion (22).

11. A valve (10) as claimed in one or more of the preceding claims 9 and 10, **characterized in that**, when the lower body (30) is in said first operating condition, the sealing member (23) is associated with the second portion (22) of the main body (20) at a second distance (d2) from said at least one opening (20A)

of the intermediate portion (201), said second distance (d2) being comprised between 20 mm and 40 mm.

12. A valve (10) as claimed in one or more of the preceding claims 9 to 11, **characterized in that** it comprises a sleeve (40) having:

- a first end (41), which is adapted to be coupled to said main body (20);
- a second end (42), which is adapted to be coupled to said lower body (30);
- an intermediate part (43) made of an elastic material, which is adapted to move from a substantially stretched state, occurring when the lower body (30) is in said first operating condition, to a contracted state, occurring when the lower body (30) is in said second operating condition, and vice versa, the intermediate part (43) of the sleeve (40) allowing a depression to be formed in said stretched state to prevent dripping downstream of the sealing member (23).

13. A valve (10) as claimed in one or more of the preceding claims 9 to 12, **characterized in that** said intermediate part (43) has substantially the shape of a bellows, wherein the folds of said bellows are more extended or elongated when the lower body (30) is in said first operating condition than when it is in said second operating condition.

14. A valve (10) as claimed in one or more of the preceding claims 9 to 13, **characterized in that** said intermediate part (43) has the shape of a substantially ellipsoidal or spherical balloon, in said second operating condition said balloon being more flattened and having a smaller inner volume than in said first operating condition.

15. A valve (10) as claimed in one or more of the preceding claims, **characterized in that** it comprises a spacer member (50), which is adapted to be associated with the first portion (21) of the main body (20).

Patentansprüche

1. Getränkespenderventil (10), insbesondere für einen Haushaltskühlschrank (1), wobei das Ventil (10) einen Hauptkörper (20) aufweist, der umfasst:

- einen ersten Abschnitt (21) für den Eintritt des Getränks in das Ventil (10);
- einen Zwischenabschnitt (201) zum Fließen des Getränks durch das Ventil (10), wobei der Zwischenabschnitt (201) zumindest eine Öffnung (20A) umfasst, die es dem Getränk ermöglicht, aus dem Zwischenabschnitt (201) herauszufließen;
- einen zweiten Abschnitt (22), der sich im Wesentlichen parallel zu einer Achse (A) des Ventils (10) erstreckt, wobei ein Verschlusselement (23) mit dem zweiten Abschnitt (22) in der Nähe eines Abschlussteils (22A) desselben verbunden ist,

wobei das Ventil (10) einen unteren Körper (30) aufweist, der mit dem Hauptkörper (20) in einer den zweiten Abschnitt (22) und die zumindest eine Öffnung (20A) des Zwischenabschnitts (201) umkreisenden Beziehung verbunden ist, wobei der untere Körper (30) angepasst ist, axial über den Zwischenabschnitt (20I) und den zweiten Abschnitt (22) zu gleiten, um sich:

- von einem ersten Betriebszustand, in dem eine innere Fläche (31) des unteren Körpers (30) mit dem Verschlusselement (23) zusammenwirkt, um zu verhindern, dass das Getränk aus dem Ventil (10) austritt,
- zu einem zweiten Betriebszustand, in dem zumindest ein Spalt (L) zwischen der inneren Fläche (31) und dem Verschlusselement (23) gebildet ist, um den Fluss des Getränks zu ermöglichen, und umgekehrt, zu bewegen,

wobei das Ventil (10) **dadurch gekennzeichnet ist, dass** es eine Hülle (40) umfasst, die aufweist:

- ein erstes Ende (41), das angepasst ist, mit dem Hauptkörper (20) gekoppelt zu sein;
- ein zweites Ende (42), das angepasst ist, mit dem unteren Körper (30) gekoppelt zu sein;
- ein Zwischenteil (43), das aus einem elastischen Material gemacht ist, das angepasst ist, sich von einem im Wesentlichen ausgestreckten Zustand, der auftritt, wenn sich der untere Körper (30) in dem ersten Betriebszustand befindet, zu einem kontrahierten Zustand, der auftritt, wenn sich der untere Körper (30) in dem zweiten Betriebszustand befindet, zu bewegen, und umgekehrt, wobei das Zwischenteil (43) der Hülle (40) es ermöglicht, in dem ausgestreckten Zustand eine Vertiefung zu bilden, um ein Tropfen stromabwärts des Verschlusselements (23) zu verhindern.

2. Ventil (10) nach Anspruch 1, **dadurch gekennzeichnet, dass** das Zwischenteil (43) der Hülle (40) in einer solchen Weise angeordnet ist, dass es den Zwischenabschnitt (20I) des Hauptkörpers umgibt.

3. Ventil (10) nach einem oder mehreren der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** es umfasst:

- eine erste Kammer (11), die zwischen dem Hauptkörper (20) und der Hülle (40) gebildet ist, insbesondere zwischen dem Zwischenabschnitt (20I) des Hauptkörpers (20) und dem Zwischenteil (43) der Hülle (40),
- eine zweite Kammer (12), die zwischen dem zweiten Abschnitt (22) des Hauptkörpers (20) und der inneren Fläche (31) des unteren Körpers (30) gebildet ist,

wobei die erste Kammer (11) und die zweite Kammer (12) über einen Durchgang (P), der zwischen dem Hauptkörper (20) und dem unteren Körper (30) vorhanden ist, kommunizieren.

4. Ventil (10) nach einem oder mehreren der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** die innere Fläche (31) des unteren Körpers (30) eine Verengung (32) umfasst, die angepasst ist, insbesondere in dem ersten Betriebszustand, mit dem Verschlusselement (23) zusammenzuwirken, um zu verhindern, dass das Getränk aus dem Ventil (10) austritt.

5. Ventil (10) nach einem oder mehreren der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** der zweite Abschnitt (22) des Hauptkörpers (20) im Wesentlichen die Form eines Stabs aufweist und zumindest einen Schlitz (22F) umfasst, der sich in Längsrichtung entlang dem zweiten Abschnitt (22) erstreckt.

6. Ventil (10) nach Anspruch 5, **dadurch gekennzeichnet, dass** der zumindest eine Schlitz (22F) in einer solchen Weise gebildet ist, dass er mit der zumindest einen Öffnung (20A) des Zwischenabschnitts (20I) verbunden ist und an dem Verschlusselement (23) endet.

7. Ventil (10) nach einem oder mehreren der vorangegangenen Ansprüche 5 und 6, **dadurch gekennzeichnet, dass** der zweite Abschnitt (22) des Hauptkörpers (20) eine Mehrzahl von Schlitzen (22F) umfasst und die zumindest eine Öffnung (20A) eine Mehrzahl von Öffnungen (20A) umfasst, wobei insbesondere die Anzahl der Schlitze (22F) zu der Anzahl der Öffnungen (20A) korrespondiert.

8. Ventil (10) nach einem oder mehreren der vorangegangenen Ansprüche 5 bis 7, **dadurch gekennzeichnet, dass** es eine Hülle (40) umfasst, die aufweist:

- ein erstes Ende (41), das angepasst ist, mit dem Hauptkörper (20) gekoppelt zu sein;
- ein zweites Ende (42), das angepasst ist, mit dem unteren Körper (30) gekoppelt zu sein;
- ein Zwischenteil (43), das aus einem elastischen Material gemacht ist, das angepasst ist, sich von einem im Wesentlichen ausgestreckten Zustand, der auftritt, wenn sich der untere Körper (30) in dem ersten Betriebszustand befindet, zu einem kontrahierten Zustand, der auftritt, wenn sich der untere Körper (30) in dem zweiten Betriebszustand befindet, zu bewegen, und umgekehrt, wobei das Zwischenteil (43) der Hülle (40) es ermöglicht, in dem ausgestreckten Zustand eine Vertiefung zu bilden, um ein Tropfen stromabwärts des Verschlusselements (23) zu verhindern.

9. Ventil (10) nach einem oder mehreren der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass**, wenn sich der untere Körper (30) in dem ersten Betriebszustand befindet, das Verschlusselement (23) mit dem zweiten Abschnitt (22) des Hauptkörpers (20) in einem ersten Abstand (d1) von einem Auslassabschnitt (33) des unteren Körpers (30) verbunden ist, wobei der erste Abstand (d1) zwischen 10 mm und 30 mm gelegen ist.

10. Ventil (10) nach Anspruch 9, **dadurch gekennzeichnet, dass** die innere Fläche (31) des unteren Körpers (30) einen Durchmesser (d) aufweist, der zwischen 16 mm und 20 mm gelegen ist, insbesondere von ungefähr 18 mm, in dem Abschnitt zwischen dem Abschlussteil (22A) des zweiten Abschnitts (22) und dem Auslassabschnitt (33), wobei insbesondere der Durchmesser (d) im Wesentlichen konstant über den Abschnitt der inneren Fläche (31) stromabwärts des Abschlussteils (22A) des zweiten Abschnitts (22) ist.

11. Ventil (10) nach einem oder mehreren der vorangegangenen Ansprüche 9 und 10, **dadurch gekennzeichnet, dass**, wenn sich der untere Körper (30) in dem ersten Betriebszustand befindet, das Verschlusselement (23) mit dem zweiten Abschnitt (22) des Hauptkörpers (20) in einem zweiten Abstand (d2) von der zumindest einen Öffnung (20A) des Zwischenabschnitts (20I) verbunden ist, wobei der zweite Abstand (d2) zwischen 20 mm und 40 mm gelegen ist.

12. Ventil (10) nach einem oder mehreren der vorangegangenen Ansprüche 9 bis 11, **dadurch gekennzeichnet, dass** es eine Hülle (40) umfasst, die aufweist:

- ein erstes Ende (41), das angepasst ist, mit dem Hauptkörper (20) gekoppelt zu sein;
- ein zweites Ende (42), das angepasst ist, mit dem unteren Körper (30) gekoppelt zu sein;
- ein Zwischenteil (43), das aus einem elastischen Material gemacht ist, das angepasst ist, sich von einem im Wesentlichen ausgestreckten

Zustand, der auftritt, wenn sich der untere Körper (30) in dem ersten Betriebszustand befindet, zu einem kontrahierten Zustand, der auftritt, wenn sich der untere Körper (30) in dem zweiten Betriebszustand befindet, zu bewegen, und umgekehrt, wobei das Zwischenteil (43) der Hülle (40) es ermöglicht, in dem ausgestreckten Zustand eine Vertiefung zu bilden, um ein Tropfen stromabwärts des Verschlusselements (23) zu verhindern.

13. Ventil (10) nach einem oder mehreren der vorangegangenen Ansprüche 9 bis 12, **dadurch gekennzeichnet, dass** das Zwischenteil (43) im Wesentlichen die Form eines Balgs hat, wobei die Falten des Balgs mehr erstreckt oder elongiert sind, wenn sich der untere Körper (30) in dem ersten Betriebszustand befindet als wenn er sich in dem zweiten Betriebszustand befindet.

14. Ventil (10) nach einem oder mehreren der vorangegangenen Ansprüche 9 bis 13, **dadurch gekennzeichnet, dass** das Zwischenteil (43) die Form eines im Wesentlichen ellipsoiden oder sphärischen Ballons aufweist, wobei in dem zweiten Betriebszustand der Ballon platter ist und ein geringeres inneres Volumen aufweist als in dem ersten Betriebszustand.

15. Ventil (10) nach einem oder mehreren der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** es ein Beabstandungselement (50) umfasst, das angepasst ist, mit dem ersten Abschnitt (21) des Hauptkörpers (20) verbunden zu sein.

Revendications

1. Vanne de distribution de boisson (10), destinée en particulier à un appareil de réfrigération domestique (1), ladite vanne (10) comportant un corps principal (20) comprenant :

- une première portion (21) destinée à introduire la boisson dans ladite vanne (10) ;
- une portion intermédiaire (20I) permettant à ladite boisson de s'écouler à travers la vanne (10), ladite portion intermédiaire (20I) comprenant au moins un orifice (20A) qui permet à la boisson de s'écouler hors de ladite portion intermédiaire (20I) ;
- une seconde portion (22) s'étendant sensiblement parallèlement à un axe (A) de la vanne (10), un élément d'étanchéité (23) étant associé à ladite seconde portion (22) à proximité d'une partie terminale (22A) de celle-ci,

ladite vanne (10) comportant un corps inférieur (30) associé au corps principal (20) dans une relation d'encerclement par rapport à ladite seconde portion (22) et ledit au moins un orifice (20A) de la portion intermédiaire (20I), ledit corps inférieur (30) étant adapté pour coulisser axialement sur ladite portion intermédiaire (20I) et ladite seconde portion (22) afin de se déplacer :

- d'un premier état de fonctionnement, dans lequel une surface intérieure (31) du corps inférieur (30) coopère avec ledit élément d'étanchéité (23) afin d'empêcher la boisson de sortir de ladite vanne (10),
- un seconde état de fonctionnement, dans lequel au moins un espace (L) est ménagé entre ladite surface intérieure (31) et ledit élément d'étanchéité (23) pour permettre l'écoulement de la boisson, et vice versa, ladite vanne (10) étant **caractérisée en ce qu'**elle comprend un manchon (40) comportant :
- une première extrémité (41), qui est adaptée pour être accouplée audit corps principal (20) ;
- une seconde extrémité (42), qui est adaptée pour être accouplée audit corps inférieur (30) ;
- une partie intermédiaire (43) en matière élastique, qui est adaptée pour passer d'un état sensiblement étiré, qui apparaît lorsque le corps inférieur (30) est dans ledit premier état de fonctionnement, à un état contracté, qui apparaît lorsque le corps inférieur (30) est dans ledit second état de fonctionnement, et vice-versa, la partie intermédiaire (43) du manchon (40) permettant la formation d'une dépression dans ledit état étiré afin d'empêcher l'égouttage en aval de l'élément d'étanchéité (23).

2. Vanne (10) selon la revendication 1, **caractérisée en ce que** ladite partie intermédiaire (43) du manchon (40) est positionnée de manière à entourer la partie intermédiaire (20I) du corps principal.

3. Vanne (10) selon l'une ou plusieurs des revendications précédentes, **caractérisée en ce qu'**elle comprend :

- une première chambre (11) formée entre le corps principal (20) et le manchon (40), en particulier entre la portion intermédiaire (20I) du corps principal (20) et la partie intermédiaire (43) du manchon (40),
- une seconde chambre (12) formée entre la seconde portion (22) du corps principal (20) et la surface intérieure (31) du corps inférieur (30),

ladite première chambre (11) et la seconde chambre (12) communiquant par un passage (P) ménagé entre le corps principal (20) et le corps inférieur (30).

4. Vanne (10) selon l'une ou plusieurs des revendica-

tions précédentes, **caractérisée en ce que** la surface intérieure (31) du corps inférieur (30) comprend un rétrécissement (32) qui est adapté pour coopérer, en particulier dans ledit premier état de fonctionnement, avec l'élément d'étanchéité (23) afin d'empêcher la boisson de sortir de la vanne (10).

5. Vanne (10) selon l'une ou plusieurs des revendications précédentes, **caractérisée en ce que** la seconde portion (22) du corps principal (20) a sensiblement la forme d'une tige et comprend au moins une fente (22F) s'étendant longitudinalement le long de ladite seconde portion (22).

6. Vanne (10) selon la revendication 5, **caractérisée en ce que** ladite au moins une fente (22F) est ménagée de manière à être associée audit au moins un orifice (20A) de la portion intermédiaire (20I) et à se terminer au niveau de l'élément d'étanchéité (23).

7. Vanne (10) selon l'une ou plusieurs des revendications précédentes 5 et 6, **caractérisée en ce que** la seconde portion (22) du corps principal (20) comprend une pluralité de fentes (22F) et ledit au moins un orifice (20A) comprend une pluralité d'orifices (20A), en particulier le nombre de fentes (22F) correspondant au nombre d'orifices (20A).

8. Vanne (10) selon l'une ou plusieurs des revendications précédentes 5 à 7, **caractérisée en ce qu'**elle comprend un manchon (40) comportant :

- une première extrémité (41) qui est adaptée pour être accouplé audit corps principal (20) ;
- une seconde extrémité (42) qui est adaptée pour être accouplée audit corps inférieur (30) ;
- une partie intermédiaire (43) en matière élastique qui est adaptée pour passer d'un état sensiblement étiré, qui apparaît lorsque le corps inférieur (30) est dans ledit premier état de fonctionnement, à un état contracté, qui apparaît lorsque le corps inférieur (30) est dans ledit second état de fonctionnement, et vice-versa, la partie intermédiaire (43) du manchon (40) permettant la formation d'une dépression dans ledit état étiré afin d'empêcher l'égouttage en aval de l'élément d'étanchéité (23).

9. Vanne (10) selon l'une ou plusieurs des revendications précédentes, **caractérisée en ce que**, lorsque le corps inférieur (30) est dans ledit premier état de fonctionnement, l'élément d'étanchéité (23) est associé à la seconde portion (22) du corps principal (20) à une première distance (d1) d'une section de sortie (33) du corps inférieur (30), ladite première distance (d1) étant comprise entre 10 mm et 30 mm.

10. Vanne (10) selon la revendication 9, **caractérisée en ce que** la surface intérieure (31) du corps inférieur (30) a un diamètre (d) compris entre 16 mm et 20 mm, en particulier d'environ 18 mm, dans la section comprise entre la partie terminale (22A) de la seconde portion (22) et ladite section de sortie (33), en particulier ledit diamètre (d) étant sensiblement constant sur la section de surface intérieure (31) en aval de la partie terminale (22A) de la seconde portion (22).

11. Vanne (10) selon l'une ou plusieurs des revendications précédentes 9 et 10, **caractérisée en ce que**, lorsque le corps inférieur (30) est dans ledit premier état de fonctionnement, l'élément d'étanchéité (23) est associé à la seconde portion (22) du corps principal (20) à une seconde distance (d2) dudit au moins un orifice (20A) de la portion intermédiaire (20I), ladite seconde distance (d2) étant comprise entre 20 mm et 40 mm.

12. Vanne (10) selon l'une ou plusieurs des revendications précédentes 9 à 11, **caractérisée en ce qu'**elle comprend un manchon (40) comportant :

- une première extrémité (41) qui est adaptée pour être accouplée audit corps principal (20) ;
- une seconde extrémité (42) qui est adaptée pour être accouplée audit corps inférieur (30) ;
- une partie intermédiaire (43) en matière élastique qui est adaptée pour passer d'un état sensiblement étiré, qui apparaît lorsque le corps inférieur (30) est dans ledit premier état de fonctionnement, à un état contracté, qui apparaît lorsque le corps inférieur (30) est dans ledit second état de fonctionnement, et vice-versa, la partie intermédiaire (43) du manchon (40) permettant la formation d'une dépression dans ledit état étiré afin d'empêcher l'égouttage en aval de l'élément d'étanchéité (23).

13. Vanne (10) selon l'une ou plusieurs des revendications précédentes 9 à 12, **caractérisée en ce que** ladite partie intermédiaire (43) a sensiblement la forme d'un soufflet, les plis dudit soufflet étant plus étendus ou allongés lorsque le corps inférieur (30) est dans ledit premier état de fonctionnement que lorsqu'il est dans ledit second état de fonctionnement.

14. Vanne (10) selon l'une ou plusieurs des revendications précédentes 9 à 13, **caractérisée en ce que** ladite partie intermédiaire (43) a la forme d'un ballon sensiblement ellipsoïdale ou sphérique, ledit ballon étant plus aplati et ayant un volume interne plus faible dans ledit second état de fonctionnement que dans ledit premier état de fonctionnement.

15. Vanne (10) selon l'une ou plusieurs des revendications précédentes, **caractérisée en ce qu'**il com-

prend un élément d'écartement (50) qui est adapté pour être associé à la première portion (21) du corps principal (20).

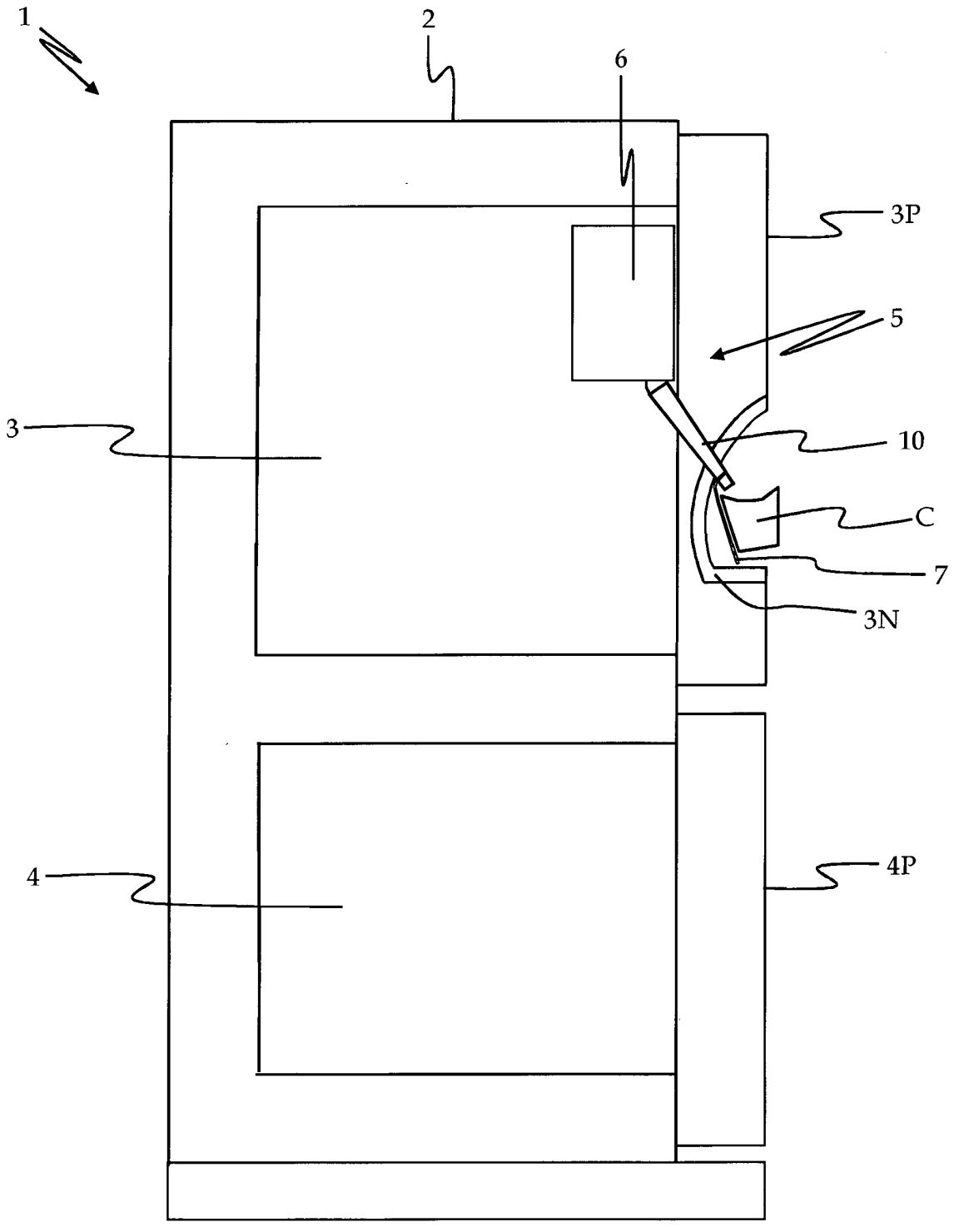


Fig. 1

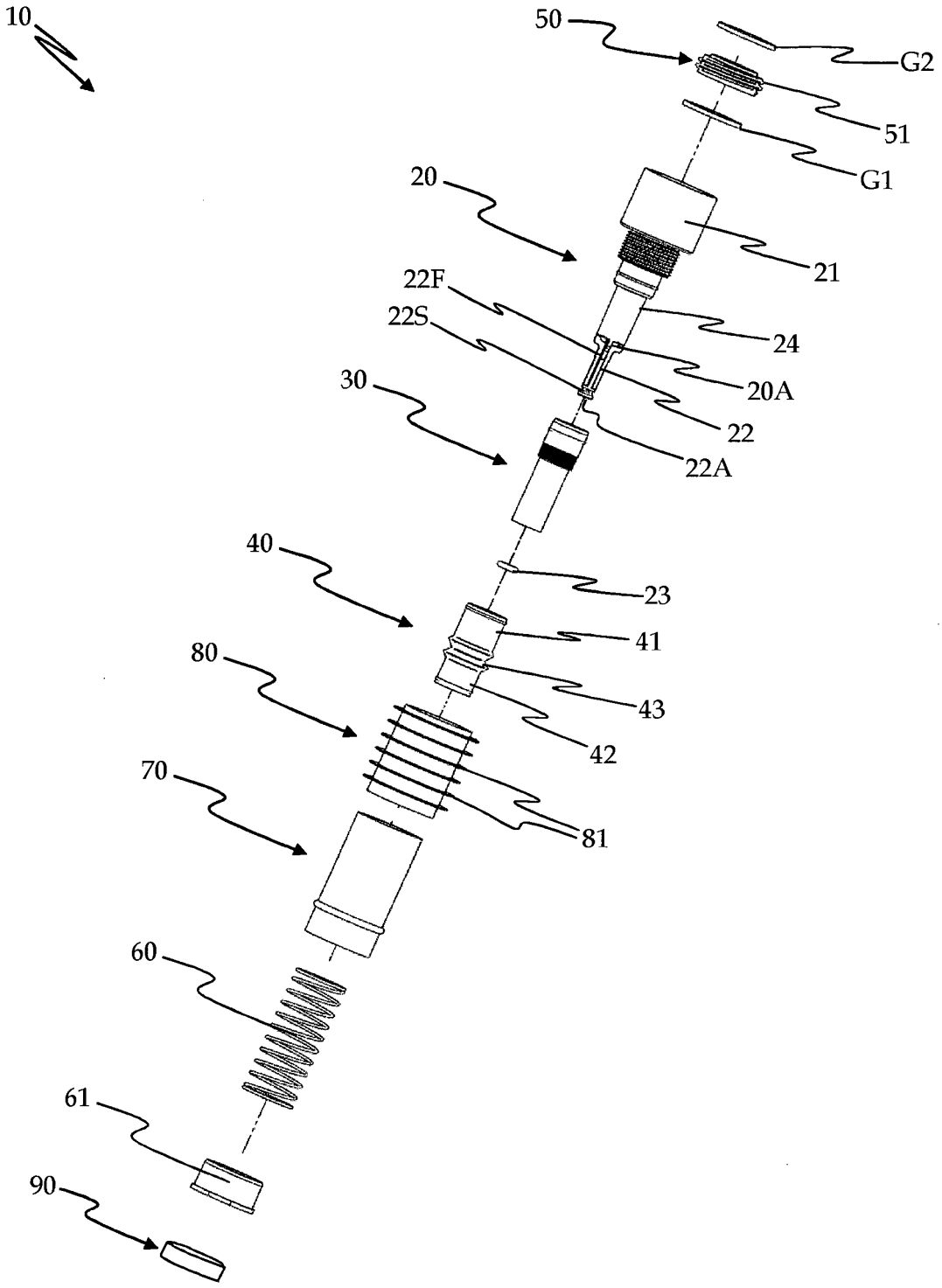

10
50
G2
51
G1
20
21
22F
22S
24
20A
30
22
22A
40
23
41
80
43
42
70
81
60
61
90

Fig. 2

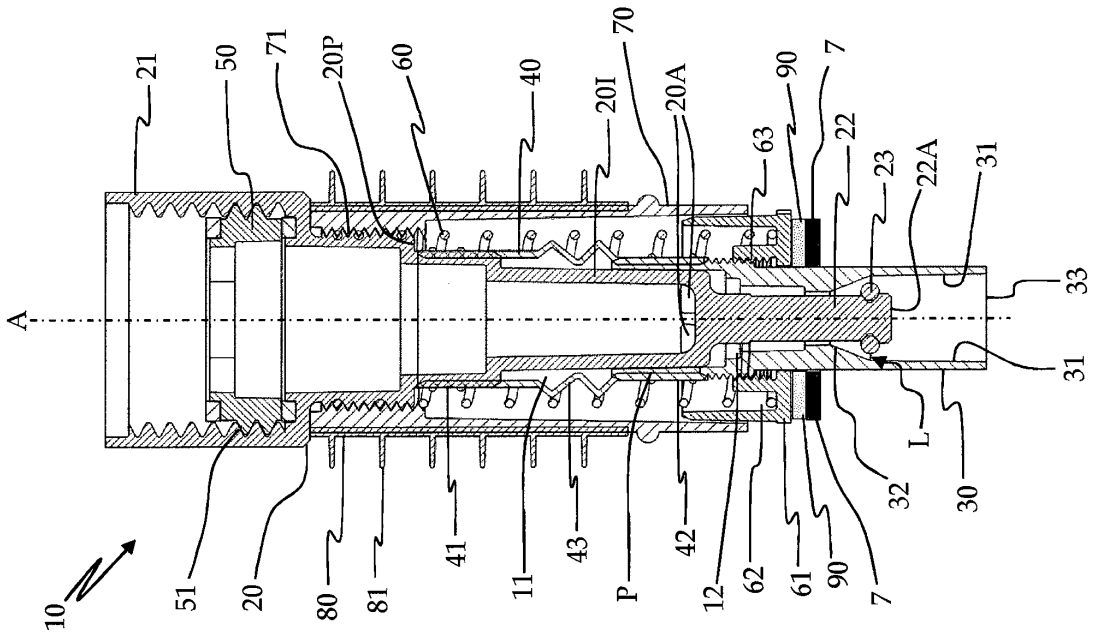

A
10
21
50
71
20P
60
40
20I
70
20A
63
90
7
22
23
22A
31
33
L
32
30
51
20
80
81
41
11
43
P
42
12
62
61

Fig. 3b

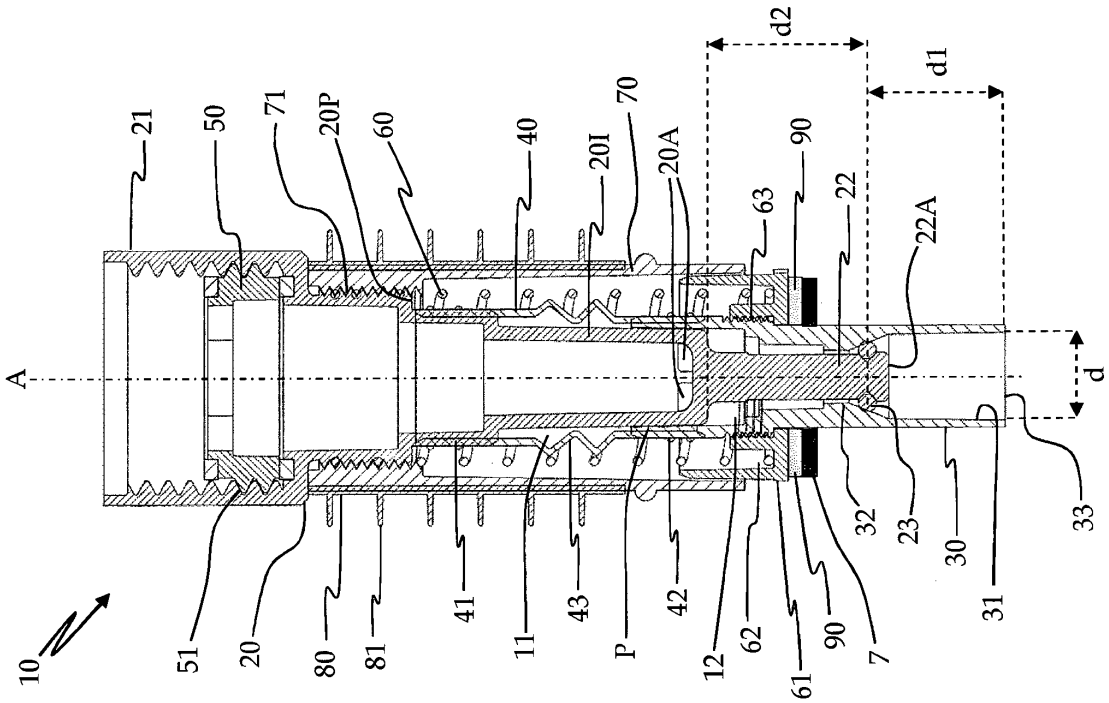

A
10
21
50
71
20P
60
40
20I
70
20A
63
90
22
22A
d2
d1
d
33
32
23
30
31
51
20
80
81
41
11
43
P
42
12
62
61
7

Fig. 3a

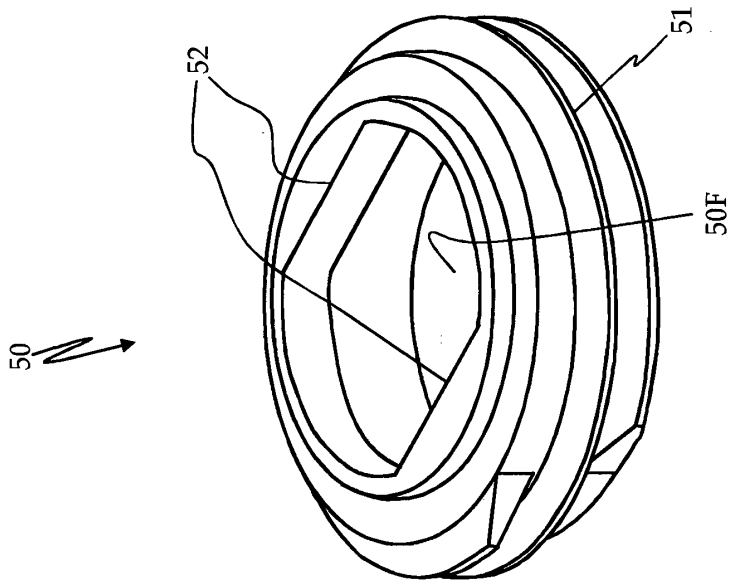


Fig. 4b

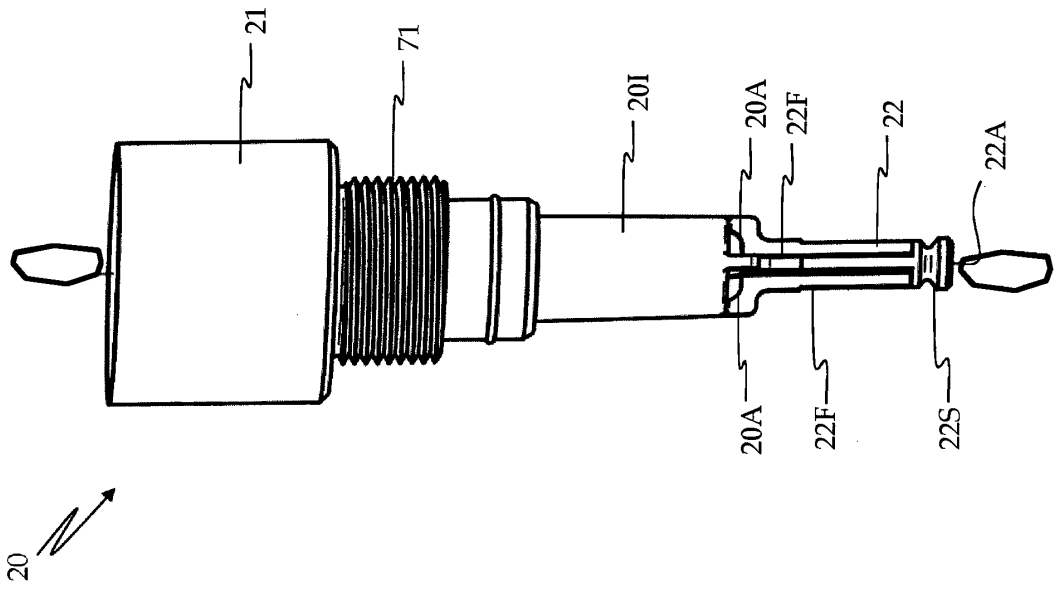


Fig. 4a

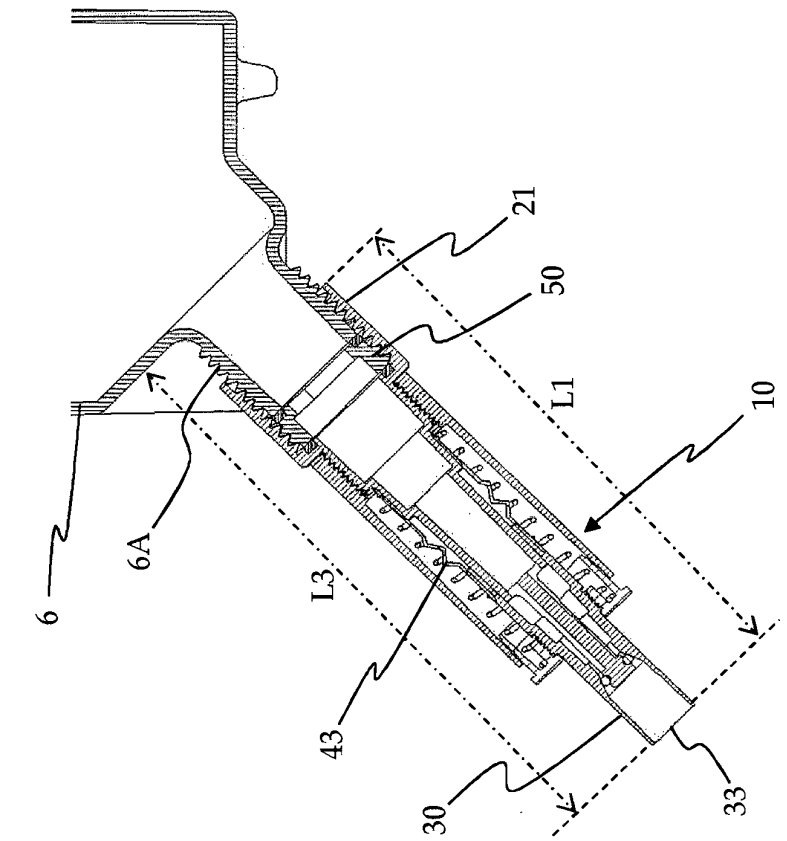


Fig. 5b

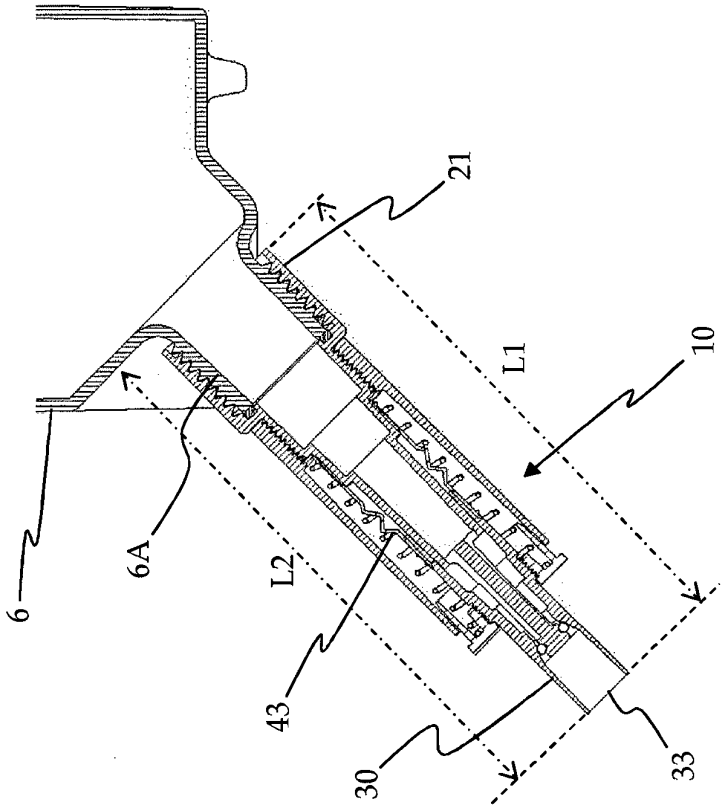


Fig. 5a

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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