

# PATENT SPECIFICATION

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## (54) IMPROVEMENTS IN PRESSURISED DISPENSERS

(71) We, RHENAG AG, a Swiss Company, of 264 Im Riet, 8260 Stein am Rhein, Switzerland, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to a dispenser for receiving and dispensing liquid and pasty compositions under pressure, which device has a pressure-resistant outer container and a flexible inner container.

Usually the commodity to be dispensed is introduced into the inner container of such a dispenser. The annular chamber between the inner container and the outer container is filled under pressure with a propellant gas. Desirable objects to be achieved in the construction of a dispenser of this type reside in avoiding the escape of the pressurized gas introduced into the outer container and the commodity introduced into the inner container. The intermixing of the propellant gas and the commodity must also be avoided.

Many forms of these dispensers, also called two-chamber canisters or two-chamber pressure containers, are known. The chief differences between them reside in the manner of securing and connecting the inner and outer containers to the container cover and to the base of a dispensing valve which is usually inserted into the top opening of the outer container.

In one form, the top rim of the inner container is rolled over between the outer container and the container cover. This ensures satisfactory securing and sealing. However, the collapse of the inner container during emptying and the consequential emptying of the inner container dependent upon the collapsing of the inner container are not satisfactory. In many cases the inner container is made from a plastics material. Thus, if the

commodity which is introduced into the inner container is of a kind which attacks metal, it does not have any detrimental effect on the inner container. However, the commodity also comes into contact with the container cover and if the latter is made of metal, the dispenser cannot be used for many commodities.

In another form of known dispenser, the rim of the inner container is rolled over into the bottom of the outer container. The propellant gas for extruding the commodity is then introduced into the inner container. The commodity itself is introduced into the annular chamber between the inner container and the outer container. Thus, the commodity is in contact with the entire metal casing forming the outer container. Thus, this form of dispenser is unsuitable for all materials which attack metal.

In a third known form of dispenser, the inner container is hooked into the top rolled over rim of the outer container. A dispensing valve is mounted thereon by means of its base. The rim of the said base is flanged and thus interconnects the inner and outer containers, thus resulting in a leak-proof and rigid connection. The commodity introduced into the inner container does not come into contact with the metal of the outer container. In this known embodiment, the top rim of the pressure container is rolled outwardly or is bent over. When inserting and pressing on the base of the dispensing valve, the inner container is thus pressed against the conically outwardly extending rim strip of the outer container. This pressure is effected directly below the rolled rim. The inner and the outer containers are in contact with one another along a strip zone, two surface areas being pressed together to form a seal. This usually is an unreliable form of sealing. There is a risk of cold flow within the locations where pressure has been exerted when plastics material is used

for the inner container. Thus, the valve can become loose and the gas can escape from the outer container. The cold-flowing of the plastics material can also cause expansion of the flange rim of the base of the valve when there is a high pressure in the outer container, and the valve becomes loose.

An aim of the present invention is to construct a device such that the space in the inner container is satisfactorily sealed relative to the chamber between the inner container and the outer container, and the valve is reliably prevented from becoming loose and dropping out.

According to the present invention there is provided a dispenser for receiving and dispensing liquid and pasty composition under pressure, comprising a pressure-resistant outer container; a flexible inner container whose upper rim at least partially overlies the upper rim of said outer container; a dispensing valve having a base which is received in the mouth of the said inner container, said valve base having a rim which overlies and is rolled over the rims of said inner and outer containers to attach the containers and the valve base to one another; a sealing edge being formed at least on the rim of the base or the rim of the outer container and sealingly engaging one side of said inner container with line contact; and a sealant confined between the rim of said inner container and at least one of the others of said rims.

In one embodiment of the present invention the top rim of the inner container extends only to the centre of the bent-over upper rim of the outer container so that the edge of the rim of the inner container rests thereon.

This edge of the inner container, resting on the centre of the bent-over upper rim of the outer container, is preferably located below the sealant. The sealant is in turn pressed downwardly by the mounted base of the dispensing valve. As a result of this pressure, the sealant is pressed and squeezed against the edge of the inner container and the top of the bent-over upper rim of the outer container. The sealing composition is compressed by 20% to 30% of its original volume by the bearing pressure, thus resulting in high sealing forces and a reliable leak-proof closure.

In another embodiment of the present invention the base has a rim which is rolled over the upper rims of said inner and outer containers and thus interconnects the inner and outer containers, and which also defines a sealing edge which is pressed radially inwardly against the rim of the inner container; a sealant being interposed between said rims.

In this embodiment, the sealing edge is displaced radially further outwardly. It

extends along the outer edge of the base of the dispensing valve which pressed the overlaid rim of the inner container along a line radially against the outside of the outer container.

In some embodiments, the top rim of the outer container is bent-over inwardly to form a strip portion having a sealing edge which abuts against the inner container. In these embodiments, the sealing edge is displaced radially inwardly. The sealing edge formed on the strip portion of the outer container rim presses the inner container radially inwardly against the flanged rim of the base of the dispensing valve.

In some embodiments, the top rim of the outer container is bent-over outwardly. These embodiments are suitable for cases in which the sealing edge is formed by portions of the base of the dispensing valve.

It has proved to be advantageous, particularly for the embodiment in which the top rim of the outer container is bent-over inwardly, to interpose a sealing composition between the walls of the outer container and the inner container below the inwardly bent-over rim strip portion of the outer container. This sealing composition is pressed on and against the sealing edge between the inner container and the rim strip portion by the pressure prevailing in the gas chamber formed between the two containers.

In all embodiments, it is advantageous to interpose a sealing composition between the bent-over top rim of the outer container and the top rim of the inner container resting thereon.

In accordance with a further advantageous embodiment, the base of the dispensing valve is curved radially outwardly adjacent its juncture with the rolled over portion and in the region of the edge of the outer container to form a bulge. Thus, the inner container is pressed radially outwardly from the inside against the edge of the outer container, thus producing large sealing pressures at this edge.

In a further embodiment, the base of the dispensing valve has a cylindrically formed upright rim portion and horizontally extending disc-portion so that a sealing edge is formed at the juncture of these two portions. Thus, the transition between the vertical rim of the base and the horizontal portion thereof is effected at right angles. The pressure prevailing in the gas chamber between the inner container and the outer container presses the inner container against the sealing edge located at this transition, so that, here also, large sealing pressures are produced.

The invention will be further described by way of example with reference to the accompanying drawings, in which:

Fig. 1 is a side elevation of one embodi-

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ment of dispenser with the outer container and the valve base shown in section.

Fig. 2 is a section taken on the line II-II of Fig. 1.

5 Fig. 3 is a sectional detail drawn to a larger scale of that part shown by the circle III in Fig. 1. and

10 Figs. 4 and 5 are sectional details, similar to Fig. 3, but illustrating two other embodiments.

Referring to Figs. 1 and 2 an inner container 14, made from plastics material, is located within a metal outer container 12. A charging valve 16 for a propellant gas is located in the bottom of the outer container 12. The inner container 14 is filled with a liquid or pasty commodity to be dispensed before a dispensing valve 32 is inserted by its base 26 into the upper open ends of the containers.

In the embodiment of seal illustrated in Fig. 3, the top rim 18 of the outer container is bent inwardly. The rim of the outer container is bent-over in the form of an internal chime to provide a strip 20 having a sealing edge 22. The dispensing valve 32 (Fig. 1) is pressed into its base 26. The base of the dispensing valve is bent upwardly along its rim 24 and is flanged downwardly and outwardly at 28. The base 26 is expanded outwardly in the lower region of the rim 24 by means of an expansion tool to form a bulge 34. A sealing ring 30 rests on the end edge 36 of the inner container 14 and on the inwardly bent rim 18 of the outer container 12. After assembly the propellant gas is introduced through the charging valve 16 into the annular chamber between the inner and outer containers 14 and 12 to place the commodity under pressure.

The bulge 34 presses the inner container 14 firmly against the strip 20 of the outer container 12. The sealing edge 22 of the outer container is pressed into the plastics material of the inner container 14. A bead of sealing composition 38 comprising, for example, latex, is located between the inner container 14 and the outer container 12 below the sealing edge 22. The sealing composition is pressed against the two edges of the strip 20 by the pressure in the gas chamber between the inner container 14 and the outer container 12. The gas chamber is thus additionally sealed. The inner container 14, containing the commodity, is sealed by the clamping of its top rim between the strip 20 of the outer container 12 and the flanged rim 24 of the valve base. Further sealing is effected along the end edge 36 of the inner container. The sealing ring 30 is pressed against the end edge by high pressures. As stated initially, the sealing ring 30 is compressed by up to 30% of its free state volume. This leads to high sealing forces along the end edge 36.

The embodiment illustrated in Fig. 4 differs from the embodiment of Fig. 3 in that the inner container 14 is drawn across the entire inwardly bent top rim 18 of the outer container 12. In this embodiment, a sealing edge 40 is formed along the downwardly facing rim 42 of the bent-over rim of the valve base 26. The rim 42 presses the inner container 14 radially inwardly against the outside of the outer container 12 along the sealing edge 40.

In the embodiment illustrated in Fig. 5, the rim 18 of the outer container 12 is bent outwardly to form an external chime. A further special feature of this embodiment is that the flanged rim 24 of the base of the dispensing valve is cylindrical. Thus, a sealing edge 44 is produced at the transition between the flanged rim 24 and the horizontally extending disc-portion of the base 26, this edge providing a sealing edge with the line contact with the inner container 14. The pressure prevailing in the gas chamber between the two containers presses the inner container 14 against the sealing edge 44. This produces high sealing pressure at this location. A sealing composition can also be provided in this embodiment at the location 38 of Fig. 3 for the purpose of further sealing.

In the embodiment of Fig. 5 the bent-over rim of the valve base 26 is turned right under the outwardly bent rim 18 of the outer container so that a sealing edge 22 found on the rim of the outer container and a sealing edge 40 found on the rim of the valve base both engage the turned-over portion of the inner container 14.

In the embodiments of Figs. 4 and 5 the confined sealing composition is disposed between the rims of said inner and outer containers.

All the embodiments have the common feature that the inner container 14 is pressed against a linear sealing edge. Referring to Figs. 3 and 4, this sealing edge extends along the rim of the inwardly bent-over strip 20 of the outer container and coincides with this rim. In Fig. 5 the sealing edge extends along the transition between the cylindrical rim and the horizontally extending portion of the base of the dispensing valve. An additional sealing edge is produced along the outer container. Thus, an additional sealing edge is produced along the end edge 36 of the inner container 14 in Fig. 3. In Figs. 4 and 5 an additional sealing edge is produced at 40 along the bottom rim 42 of the bent rim of the valve base. These different sealing edges can, within the scope of the invention as defined in the claims, be arranged in different ways from those illustrated in detail.

WHAT WE CLAIM IS:—

1. A dispenser for receiving and dis-

5 pensing liquid and pasty composition under pressure comprising a pressure-resistant outer container; a flexible inner container whose upper rim at least partially overlies the upper rim of said outer container; a dispensing valve having a base which is received in the mouth of the said inner container, said valve base having a rim which overlies and is rolled over the rims of said inner and outer containers to attach the containers and the valve base to one another; a sealing edge being formed at least on the rim of the base or the rim of the outer container and sealingly engaging one side of said inner container with line contact; and a sealant confined between the rim of said inner container and at least one of the others of said rims.

20 2. A dispenser as claimed in claim 1 in which the rim of said outer container is bent-over inwardly and said sealing edge is on the end of said inwardly bent-over rim of the outer container.

25 3. A dispenser as claimed in claim 2 in which a sealing composition is additionally provided in the form of a bead between said outer and inner containers and adjacent said sealing edge.

30 4. A dispenser as claimed in claim 2 or 3 in which the upper rim of said inner container extends only partially over the upper rim of the outer container and in which said confined sealing composition urges the end edge of said inner container against the upper rim of said outer container.

35 5. A dispenser as claimed in any of claims 1 to 4 in which said confined sealing composition is under a pressure such that its volume reduced by up to 30% as compared with its free state volume.

40 6. A dispenser as claimed in claim 2 or 3 in which the upper rim of said inner container extends right over the upper rim of said outer container and beyond the rim of said valve base and in which an additional sealing edge is formed on the end of the rolled-over rim of said valve base and sealingly engages the rim of said inner container with line contact.

50 7. A dispenser as claimed in claim 1 in which the rim of said outer container is bent-over outwardly.

55 8. A dispenser as claimed in claim 7 in which said sealing edge is formed at the juncture of a disc-portion and cylindrical

flange portion of said valve base, said flange portion forming part of the rim of the valve base.

9. A dispenser as claimed in claim 7 or 8 in which the rim of said valve base is turned under the outwardly bent-over rim of said outer container.

10. A dispenser as claimed in claim 9 in which the rim of said inner container extends beyond the bent-over rim of the outer container and an additional sealing edge is formed on said bent-over rim of the outer container and engages the rim of the inner container with line contact.

11. A dispenser as claimed in claim 9 or 10 in which the rim of said inner container extends beyond the turned-under rim of said valve base and an additional sealing edge is formed, on said turned-under rim of the valve base and engages the rim of said inner container with line contact.

12. A dispenser as claimed in any of claims 1 to 7 in any of claim 9 to 11 in which said valve base is curved radially outwardly adjacent its rim to form a bulge in the vicinity of said sealing edge.

13. A dispenser as claimed in any of claims 1 to 3 or in any of claims 6 to 12 in which said confined sealing composition is disposed between the rims of said inner and outer containers.

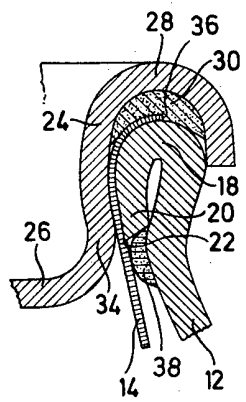
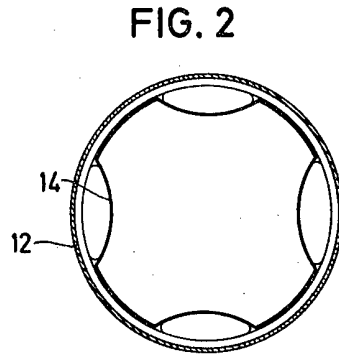
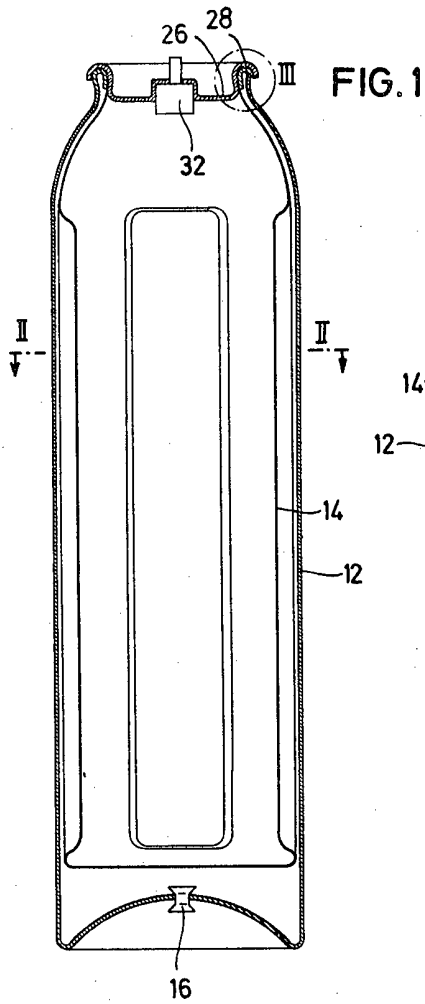
14. A dispenser as claimed in any preceding claim in which a closable filling opening is provided in the bottom of said outer container for introducing a pressurized fluid into the chamber between said inner and outer containers to place a commodity in said inner container under pressure.

15. A dispenser constructed substantially as herein described with reference to and as illustrated in Figs. 1, 2 and 3 of the accompanying drawings.

16. A dispenser constructed substantially as herein described with reference to and as illustrated in Figs. 1, 2 and 4 of the accompanying drawings.

17. A dispenser constructed substantially as herein described with reference to and as illustrated in Figs. 1, 2 and 5 of the accompanying drawings.

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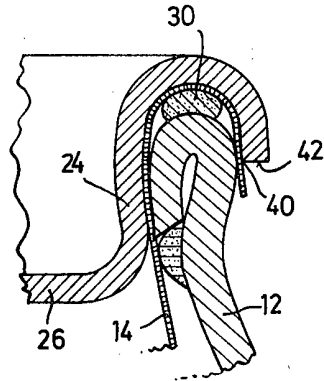


FIG. 4

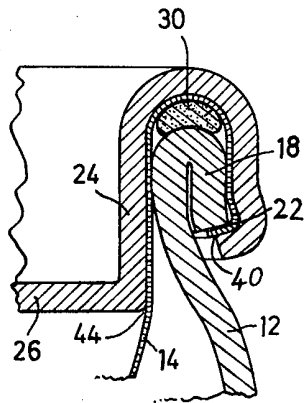


FIG. 5