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(54) **DISPENSER FOR DISCHARGE OF LIQUID TO PASTY MATERIALS**

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(57) **ABSTRACT**

The invention relates to a dispenser (**1**) for discharging liquid to pasty materials. The dispenser comprises a pump head (**2**) and a pump chamber (**8**) which is embodied therein and is provided with a pump chamber wall (**20**), an inlet valve (**26**) and a discharge valve (**11**). The dispenser (**1**) further comprises a reservoir (**3**) which contains a storage bag (**4**) whose volume can be reduced so as to empty the same. In order to obtain an advantageous design regarding vibrations or sudden pressure increases in the material, the pump chamber wall (**20**) of the pump head (**2**) is configured in a flexible manner.

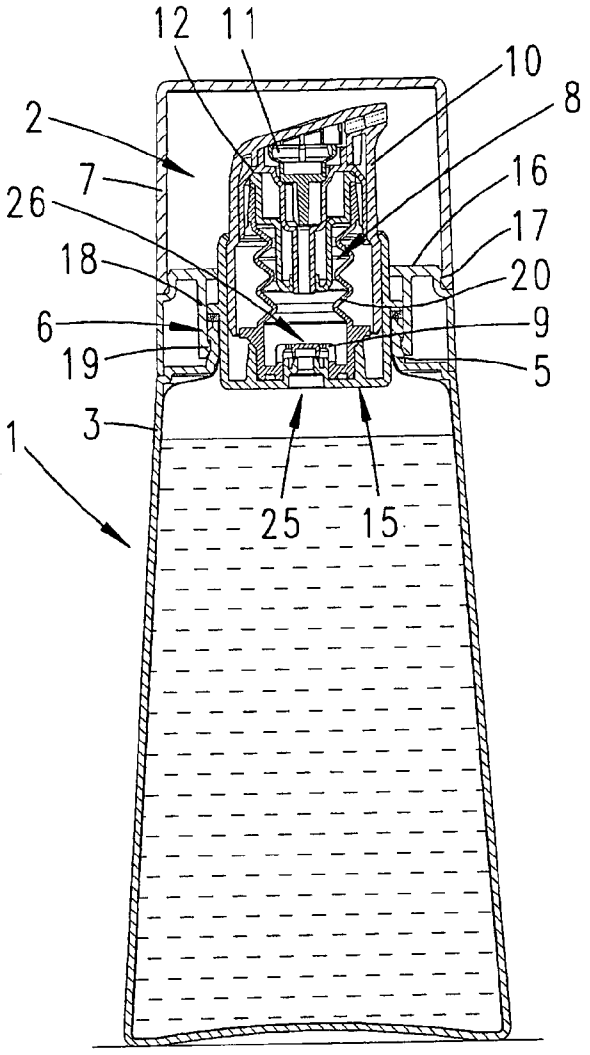


Fig: 1

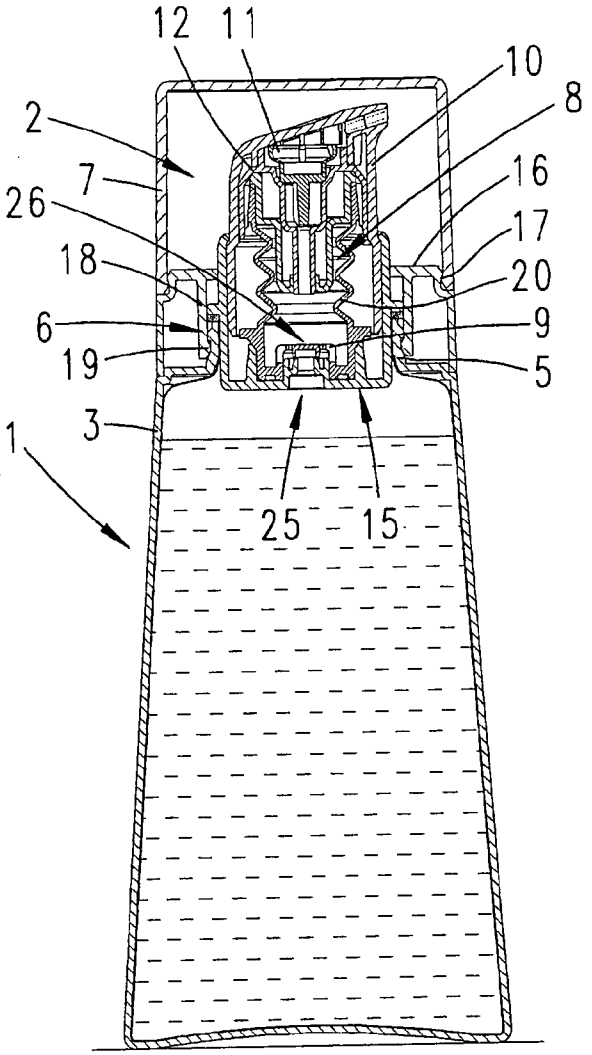


Fig: 2

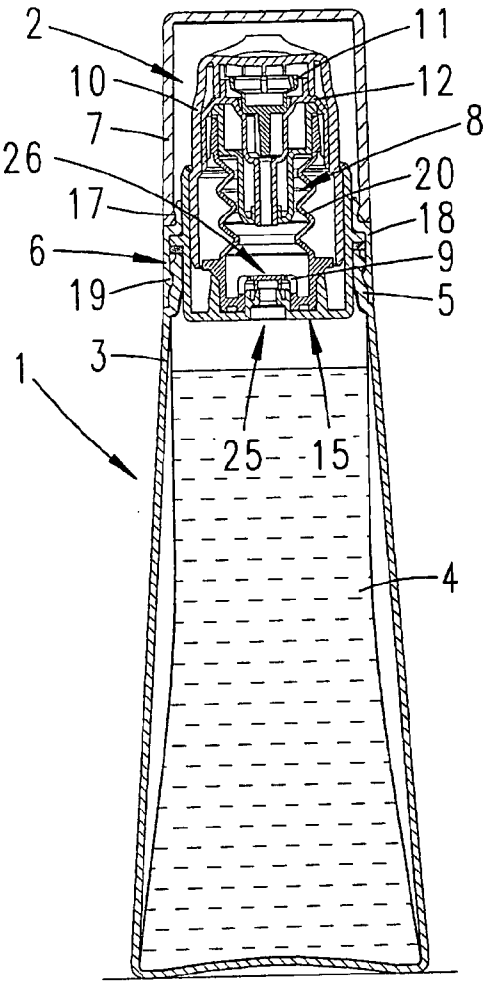
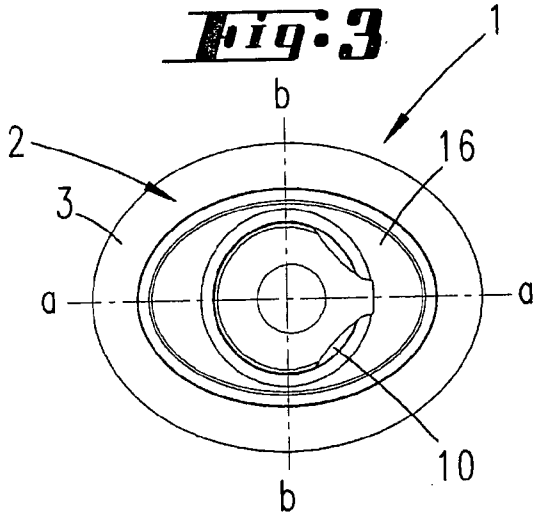


Fig: 3



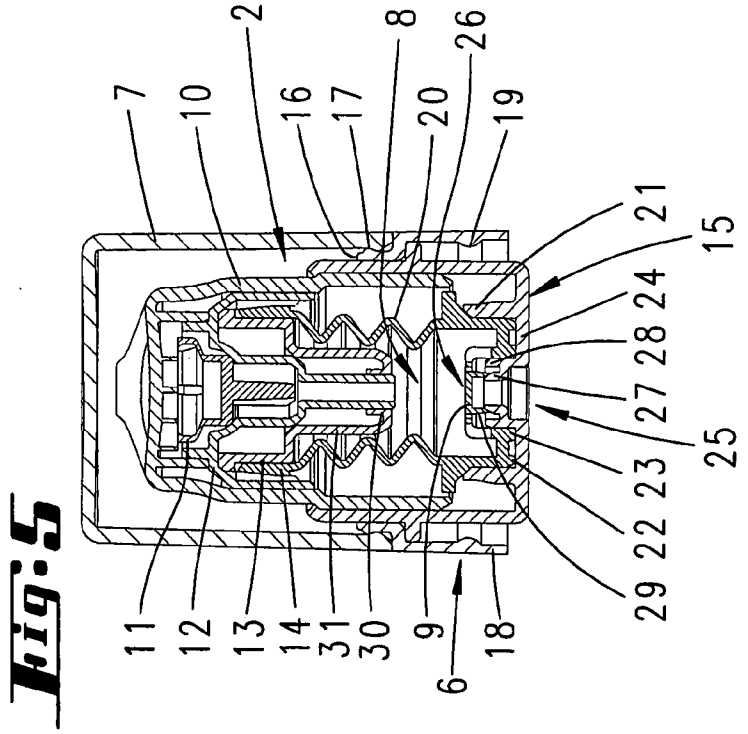


Fig.5

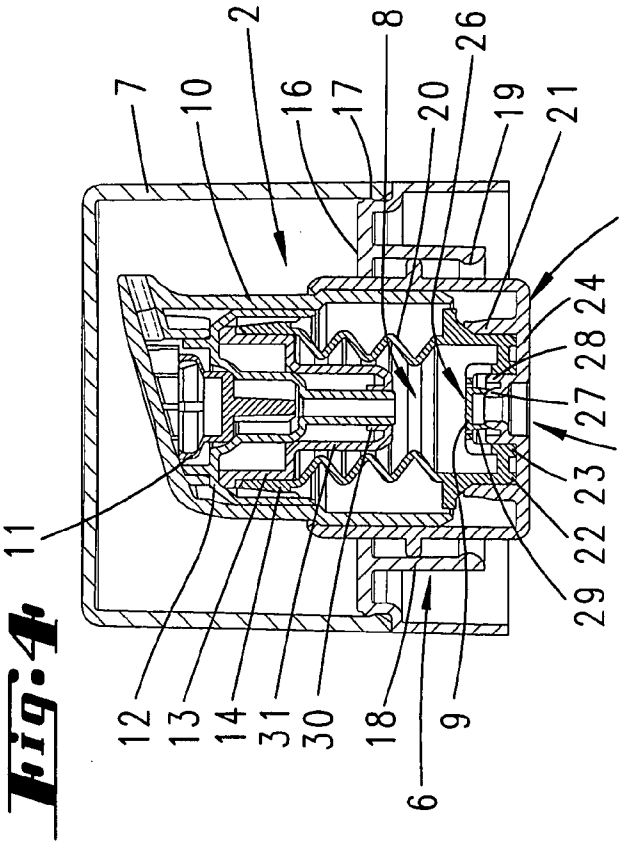


Fig.4

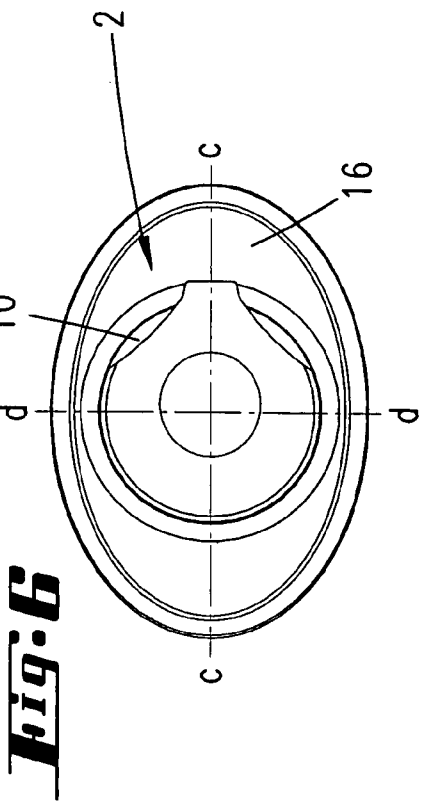


Fig.6

DISPENSER FOR DISCHARGE OF LIQUID TO PASTY MATERIALS

[0001] The invention relates to a dispenser for discharge of liquid to pasty materials comprising a pump head and a pump chamber formed in the pump head, the pump chamber having a pump chamber wall and an inlet valve and an outlet valve, and the dispenser comprising a storage container, a storage bag which can be reduced in volume for the purposes of discharge being contained in the storage container.

[0002] Dispensers of this kind are already known in a multiplicity of configurations. For example, reference is made to FR-A1-2 647 418 or DE-A1-34 42 092.

[0003] In dispensers of this kind, a certain disadvantage may however be experienced. During transport of such dispensers, vibration of the material or pressure shocks in the material may occur, which may have effects up to an undesired exit of product. This is in particular the case when there has already been a partial emptying, and a transport security means, optionally provided in principle, has not been activated.

[0004] It is therefore an object of the invention to provide a dispenser of the kind described at the beginning which is formed advantageously with regard to the aforementioned problem.

[0005] This objective is met first and foremost by the subject matter of Claim **1** where it is provided that the pump chamber wall is flexible. Because of such a flexible pump chamber wall, it is possible in the case of a dispenser of the kind previously described for pressure oscillation to be averted, at least to a certain degree. For example, a loading or pre-loading of the outlet valve can in addition be adjusted such that in comparison with the elasticity of the pump chamber wall, a pressure spike can be absorbed in the pump chamber wall practically completely or in any case to a very great extent. This configuration is in particular also advantageous in the case when the inlet and outlet valve in the inactive condition of the dispenser do not definitely shut off, this being usually the case. Because of cohering in the material in the unactuated condition, this may occur.

[0006] Moreover, a non-return valve, as is generally used as inlet valve for the pump chamber, is not always closed after use of the dispenser, in particular for highly viscous media. This is because after a dispensing stroke of a dispenser, there follows the suction phase, during which product is sucked out of the storage container into the pump chamber while the pump chamber inlet valve is open. The valve is opened accordingly. In particular also in connection with such high viscosity media, there results therefore a direct transfer from the storage container into the pump chamber, so that the pressure fluctuations mentioned may under certain circumstances act in a correspondingly negative manner. A certain improvement can optionally be achieved by an elastically formed inlet valve being provided, in particular also by an inlet valve being provided which is preloaded into its closed position, the valve being in this case only elastic by way of example.

[0007] It is also advantageous if such a pump chamber wall is used as likewise replaces, on account of its elastic return force, an otherwise necessary return spring. Since such a return spring is as a rule a metal spring, it is also further possible in the case of a dispenser as here described to provide a dispenser which does without metal components.

[0008] In further detail, the pump chamber may be formed by a pump bellows, as is for example described in principle with regard to the pump chamber wall in DE-U1-87 02 705 or DE-86 29 681. The disclosure content of these specifications is hereby incorporated as to its full content also in the disclosure of the present application, including for the purpose of incorporating features of the specifications taken into consideration into claims of the present application.

[0009] The subject matter of the further claims is explained below in connection with Claim **1**, but may also be in principle in each case of importance in independent formulation.

[0010] Thus it is also preferred for the pump chamber wall, on account of its elastic return force, to replace an otherwise necessary return spring.

[0011] The inlet valve which is preloaded into its closed position consists, preferably also as a whole, of an elastic plastics material. This is possible because of the special configuration of the inlet valve in the form of a part which is double cup-shaped, or inwardly hollow and widening in stepwise manner toward the top. The sealing is effected by way of an outer peripheral edge of the part insofar as it has a circular cross section, at a step transition. A centering column may extend also from the lower base of the inlet valve, which is directed toward the pump chamber.

[0012] The preloading of the inlet valve and/or of the outlet valve into the closed position means that it is not necessary for it to engage with preload against the closure wall. In particular for the inlet valve, this may also mean that closure may be only approximate, but a gap is optionally left free. This may also be advantageous with respect to a continuous connection between the material in the pump chamber and the storage container for, for example, longer periods of non-use. The inlet valve which is preferably formed in an integrated manner into the pump bellows has in detail a bridge portion, which consists preferably of a soft plastics, as for the remainder of the pump bellows as a whole. A sealing lip may extend once again circumferentially from this bridge portion, the sealing lip interacting with a counter sealing portion on the telescopic outer part.

[0013] The invention is described further below with reference to the accompanying drawings, which however represent only one exemplary embodiment. In the drawings:

[0014] FIG. **1** shows a cross section through a dispenser, cut along the longitudinal axis a-a in FIG. **2**, in FIG. **3**;

[0015] FIG. **2** shows a cross section through the dispenser, cut along the transverse axis b-b in FIG. **3**;

[0016] FIG. **3** shows a top view of the dispenser according to FIG. **1** and FIG. **2**;

[0017] FIG. **4** shows a cross section through the pump head, cut along the longitudinal axis c-c in FIG. **6**;

[0018] FIG. **5** shows a representation corresponding to FIG. **4**, cut along the transverse axis d-d in FIG. **6**;

[0019] FIG. **6** shows a top view of the dispenser head according to FIG. **4** and FIG. **5**, with the covering cap removed.

[0020] Illustrated and described in first instance with reference to FIGS. **1** and **2** is a dispenser **1** consisting of a pump head **2** and a storage container **3**. Within the storage container **3**, there is located a substantially loose internal bag **4** in which the substance to be dispensed is contained. The internal bag **4** can be connected to the base in the base region of the storage container **3**, either in a pointwise manner or along a line, so that turning inside out of the internal bag is prevented.

[0021] The internal bag **4** is furthermore secured to the storage container **3** in the neck region **5** of the container.

[0022] At the same time, securing can also be achieved here because of clamping by the pump head **2**. The pump head **2** is formed in modular manner and can be introduced from above into the storage container **3**. The connection between the storage container **3** and the pump head **2** is achieved by means of an adaptor part **6**, which because of the round implementation of the pump head **2**, respectively the telescopic outer part **15** and the telescopic inner part **10**, is shown differently in the cross sections according to FIGS. **1** and **2**. In the longitudinal axis a-a of the storage container **3**, which is configured to be oval, see the sectional representation according to FIG. **1**, the adaptor portion **6** forms a step region **16**, which in the transverse axis b-b, see FIG. **2**, is represented only as a single wall **17**. In corresponding manner, the latching or clamping connection between the adaptor part **6** and the storage container **3** is partially effected, in the region of the step surface **16**, by a separate latching wall **18**, which co-operates with the associated neck region **5** of the storage container, the neck region being formed for latching. In the region of the transverse axis b-b, the wall **17** however takes over this co-operation, the wall **17** forming to this extent also an individual latching bead **19**, see FIGS. **2** and **5**.

[0023] A covering cap **7** engages in addition over the pump head **2**. As can be seen in further detail from FIG. **4** to **6**, the pump head **2** has a pump chamber **8** which consists of a flexible pump bellows **20**. The pump bellows **20** is formed to extend in vertical cross section in a zigzag manner, but as against this, as can be seen from a horizontal cross section, is formed to be fundamentally circular. There is in question here preferably a plastics moulded part of a suitably yielding elastic plastics material. Formed integrally in the pump bellows at the foot is a part **9** of an inlet valve, the opposing co-operating part for which is integrated into the telescopic outer portion **15** of the pump head **2**. Furthermore, the pump head **2** has a telescopic inner part **10**, both parts telescoping with one another outside the pump chamber **8**.

[0024] In further detail, the telescopic outer part **15** forms an encircling supporting socket **21**, in which the foot region of the pump bellows **20** is seated at its lower end; this specifically in co-operation with an inner surface of the supporting socket **21**. In this region, the pump bellows **20** is no longer formed in bellows-like manner, but rather with a solid wall, which has a strengthened triangular cross section in the region in which it engages over the supporting socket **21**.

[0025] By means of separate supporting feet **22**, **23**, the pump bellows is seated at its lower end on the base **24** of the telescopic outer portion **15**, on the inside. The base **24** defines a central opening **25** as delivery channel to the inlet valve **26**, which is narrowed with respect to the base **24** toward the interior of the pump chamber **8**. At its mouth, the channel ends in two concentric rings **27**, **28**, of which the outer surface of the ring **27** is formed for sealing co-operation with a lip **29** of the bridge part **9** of the inlet valve **26**.

[0026] Above in the pump head, there is also an outlet valve **11** formed of a yieldingly elastic plastics material. This is seated in a seating part **12**, which holds the upper collar **14** of the bellows or the pump chamber wall, by clamping the collar in between the part **12** and a cooperating counter retaining part **13**.

[0027] The counter holding part **13** has a lower portion **29** which projects into the fold region of the pump chamber **8**, the lower portion being formed to be basically cylindrical, and at its lower end is also still in the form of an inner double wall, which has a guide portion **30** formed over a partial portion of the portion **29**, in which portion **30** the seating part **12** is guided. The seating part **12** ends at the bottom, for example with the lower end of the guide part **30**.

[0028] All features disclosed are (inherently) pertinent to the invention. The disclosure content of the associated/accompanying priority documents (copy of the previous application) is hereby included as to its full content in the disclosure of the application, including for the purpose of incorporating features of these documents in claims of the present application.

1-9. (canceled)

10. Dispenser (**1**) for discharge of liquid to pasty materials, comprising a pump head (**2**) and a pump chamber (**8**) formed in the pump head, the pump chamber having a pump chamber wall (**20**) and an inlet valve (**26**) and an outlet valve (**11**), and the dispenser comprising a storage container (**3**), a storage bag (**4**) which can be reduced in volume for emptying purposes being contained in the storage container (**3**), wherein the pump chamber wall (**20**) of the pump head (**2**) is formed to be flexible, wherein the internal bag is connected in the base region of the storage container (**3**) to the base, pointwise or along a line, so that turning inside-out of the internal bag (**4**) is prevented, and wherein the internal bag (**4**) is secured to the storage container (**3**) in the neck region of the container.

11. Dispenser according to claim **10**, wherein the pump chamber wall (**20**) is formed by a pump chamber bellows of plastics material.

12. Dispenser according to claim **10**, wherein the pump chamber wall (**20**) replaces, on account of its elastic restoring force, a return spring which would otherwise be required.

13. Dispenser according to claim **10**, wherein the inlet valve (**26**) is biased into its closed position.

14. Dispenser according to claim **10**, wherein the inlet valve (**26**) is formed from an elastic plastics material.

15. Dispenser according to claim **10**, wherein the outlet valve (**11**) is biased into its closed position.

16. Dispenser according to claim **10**, wherein the outlet valve (**11**) is formed of a plastics material having elastically restoring properties.

17. Dispenser according to claim **14**, wherein the inlet valve (**26**) has a bridge portion (**9**) of soft plastics material, the bridge portion being biased into its closed position.

18. Dispenser according to claim **17**, wherein the bridge portion (**9**) of soft plastics material is formed integrally with the material of the pump chamber wall (**20**).

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