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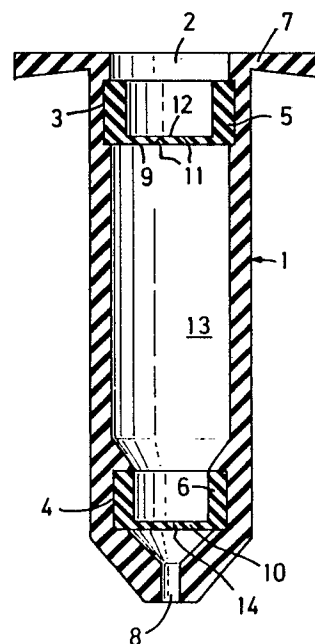
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Device for dispensing liquid or paste products from a container.

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The pump housing (1) designed for connection to the opening of the container consists of a one-piece sleeve-like member of an elastic material and comprises inlet and outlet valves (5 and 6, respectively). Radial compression of the walls of the pump housing opens the outlet valve (6) to dispense the product while the inlet valve is held closed. When the walls of the pump housing return to their normal shape, an underpressure arises inside the pump housing, thereby opening the inlet valve and an amount of the liquid or paste product is drawn into the interior of the pump housing.



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Device for dispensing liquid or paste products from
a container

5 The present invention relates to a device for dispensing liquid or paste products from a container, said device comprising a pump housing which is connected to the mouth of the container and is provided with inlet and outlet valves.

10 Up to now there have been problems in manufacturing dispensing devices of this type which function satisfactorily in all respects.

15 In one attempt at a solution, the valves are made of an elastic material and are conically tapered with an opening in the form of a slit across the lateral surface of the cone. Since the lower valve opens directly into the ambient air, there is an unavoidable oxidation of the liquid or paste product both at the opening and directly
20 inside the same. The result will be the formation of a plug in this valve which will make the functioning of the apparatus impossible.

25 Another solution is described in Swedish Patent Specification 325 680. The funnel-shaped valves described in this publication function well but are complicated to manufacture and difficult to mount in the flow channel of the pump housing. The funnel-shaped valve must be fixed at its point securely to a supporting body which is arranged
30 to center the valve funnel in the flow channel and at the same time allow the fluid to pass. A pressure bubble is required in the device, which is mounted to generate over or under pressure in the valve chamber between the two valves. The pressure bubble is relatively complicated
35 to mount and it is not uncommon that leakage occurs where the bubble is fastened. It is clearly evident from the above that such a pump device is complicated to manufacture and assemble and is therefore expensive.

The present invention achieves a pump device in which the above mentioned disadvantages have been completely eliminated. The pump device according to the invention is even so simple and inexpensive that it is suitable as a disposable product. The characterizing features of the invention are revealed in the attached claims.

The invention will be described in more detail below with reference to an example which is shown in the accompanying drawings. Fig. 1 shows a longitudinal section through the pump device itself. Figs. 2 and 3 show views from above of inlet and outlet valves respectively, in the device according to Fig. 1. Figs. 4 and 5 show two different side views of a screw cap. Figs. 6 and 7 show two different views of a button. Fig. 8 shows the button according to Figs. 6 and 7 mounted on the cap according to Fig. 5. Figs. 9 and 10 show perspective views of two different parts of a bracket. Finally, Fig. 11 shows a front view of a dispenser composed of the parts according to Figs. 9 and 10 and provided with a cap and pump device according to Figs. 1-8.

The pump housing 1 is cast in one piece of rubber with a through-channel 2, in which cavities 3 and 4 are arranged for inlet and outlet valves 5 and 6, respectively, which enclose between them a valve chamber 13. At the top, the pump housing is provided with a collar 7 and tapers conically down to an outlet opening 8, the size of which is suitably adapted to the pump medium so that the pump housing does not drip.

The inlet and outlet valves 5 and 6, respectively, are made of rubber and have a cylindrical form with a membrane 9 and 10 respectively, at one end. As can be seen from Fig. 2, the membrane 9 of the inlet valve 5 has a V-shaped through-slit 11, thus forming a flexible valve tongue 12. The slit 11 is bevelled in relation to the surface of the

membrane so that the tongue surface facing the interior of the valve chamber 13 is greater than the opposite surface of the valve tongue. The tongue 12 can thus only be opened in the direction towards the interior of the valve chamber from its normal sealing position. The outlet valve 6 is provided with a normally sealing slit 14 in the membrane 10. When an overpressure is generated in the interior of the valve chamber 13 by pressing the elastic walls of the pump housing radially inward, the valve tongue 12 is pressed into sealing contact while the slit 14 opens when a certain pressure in the interior of the valve chamber has been exceeded.

When the elastic walls of the pump housing return to their original shape after being compressed, an underpressure arises in the interior of the valve chamber 13, whereby the flexible tongue 12 in the inlet valve opens in the direction towards the interior of the valve chamber, so that an amount of liquid or paste product in a container (not shown) connected to the inlet of the pump housing is fed into the interior of the valve chamber 13. When the walls of the pump housing are again compressed, the above described process is repeated. With the aid of the pump shown in Fig. 1, a liquid or paste product can be dispensed in dosed amounts from a container. Figs. 4 and 5 show a cap 15 adapted to the pump according to Fig. 1. In addition to the screw top 16 it is also provided with an axial flange 17 made in one piece therewith, which has an elongated hole 18. There is a central hole (not shown) in the topside of the screw top, the diameter of which essentially agrees with the outer diameter of the cylindrical pump housing according to Fig. 1. Furthermore the inner dimensions of the screw top are adapted to the collar 7 on the pump housing so that the collar forms an effective seal between the cap and the surroundings when the cap is screwed tightly onto a container. Figs. 6 and 7 show a special button 19 which is designed to fit into

and be displaceable across the hole 18 in the cap flange 17. The button consists of a button portion 20 and a central extension 21 therefrom. Fig. 8 shows the cap 15 with the button 19 in place. The button 19 is provided with spring hooks 22,23, which are snapped into the elongated hole 18 when mounting the button in the cap flange. When the pump device according to Fig. 1 has been mounted in the cap according to Fig. 8, the button 19 with its extension 21 will be in front of the elastic walls of the valve chamber. Pressing the button 19 will thus press the extension 21 against the pump housing, and since a fixed member is mounted against the opposite side of the pump housing, the pump housing walls will be compressed so as to achieve the intended and previously described pump effect.

The cap according to Fig. 8 with a pump mounted therein according to Fig. 1, is, as was mentioned, designed to be screwed onto a container (not shown here) containing the product for dispensing. Figs. 9 and 10 show an example of a holder designed to carry such a container with associated capsule and pump housing. Fig. 10 shows the actual bracket 24, which is designed to be screwed to a wall, and Fig. 9 shows an associated cover 25. The bracket 24 is arranged with an upwardly open gutter 26. When the container with the cap 16 with the associated pump device are mounted, the flange 17 of the cap will be in front of the narrow portion 27 of the gutter, so that this portion and the flange 17 will completely, and with a suitably selected fitting, enclose the cylindrical pump device. The composite device described above is shown in Fig. 11.

The invention is not limited to the above described embodiment. Rather, a number of modifications are possible within the scope of the attached claims. For example, no special holder according to Figs. 9-11 or caps with

associated buttons according to Figs. 4-8 are required. Likewise, a cap similar to that in Fig. 4 but without a flange can be used to screw a pump device according to Fig. 1 onto a container, whereafter the pump housing can
5 be actuated directly using one's fingers.

It is also conceivable to securely join a pump device similar to that in Fig. 1 to a container by using the collar. A device of this type can be suitable at a
10 disposable product.

If the container consists of a compressible bag member, the user may be tempted to press the bag to dispense the contents. In previously known pump devices, the contents
15 would then flow out in an uncontrolled manner, but with the special pump construction according to the invention, and especially with the valves in the same, an uncontrolled dispensing is practically impossible.

20 The inlet valve of the pump device, if required because of dimensions and materials, can be reinforced with a detachable plastic body, which fits into the cylindrical hole in the same and in order to permit through-flow is provided with a central hole. This plastic body then
25 serves primarily as a support for the inlet valve and prevents it from being deformed when the walls of the pump housing are pressed in. Deformation of the valve could result in pressing the valve into the container.

CLAIM

Device designed for dispensing liquid or paste products from a container, comprising a pump housing (1) connected to an opening in the container and provided with inlet and outlet valves (5 and 6, respectively), characterized in that the pump housing (1) consists of a sleeve-like portion made in one piece of elastic material, preferably rubber, that the valves (5,6) are also made of an elastic material, preferably rubber, and have a sleeve-like shape with a membrane (9 and 10, respectively) at one end, that said valves are mounted in cavities (3,4) designed therefor next to either end of the sleeve-like pump housing, that the outlet valve (6) has a normally sealing slit (14) in the membrane (10), said slit opening upon overpressure in the pump housing, that at least one essentially V-shaped or semicircular through-slit (11) is arranged in the membrane (9) of the inlet valve to form a flexible tongue (12), said tongue slit being bevelled in relation to the plane of the membrane so that the tongue can only bend from its normal sealing position in the direction towards the interior (13) of the pump housing, whereby radial compression of the pump housing dispenses a dosed amount of the product through the outlet valve and the pump housing is refilled via the inlet valve as the pump housing recovers its normal shape.

FIG. 1

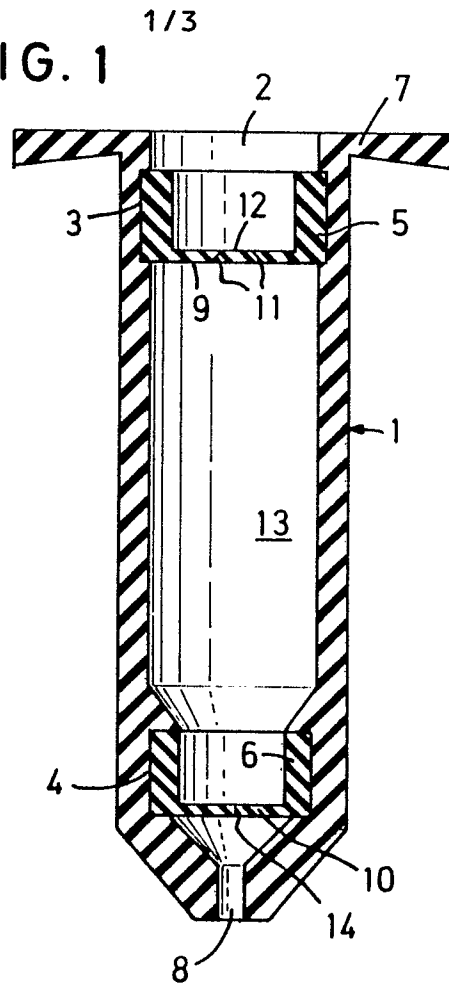


FIG. 2

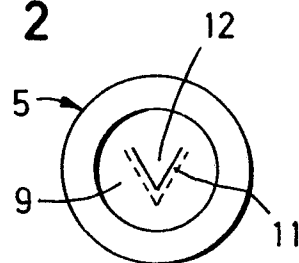


FIG. 3

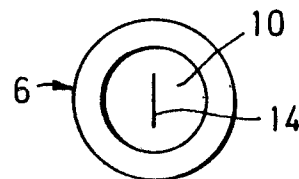


FIG. 4

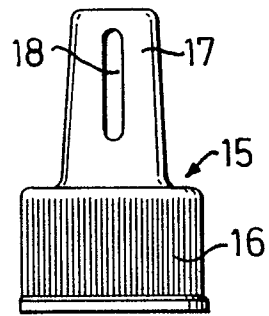


FIG. 5

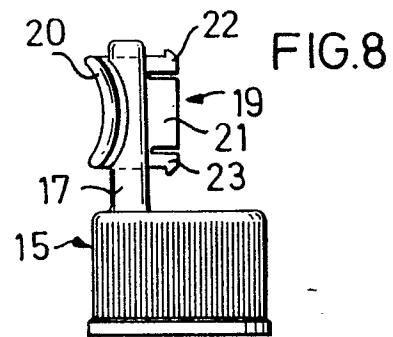
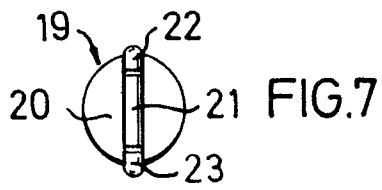
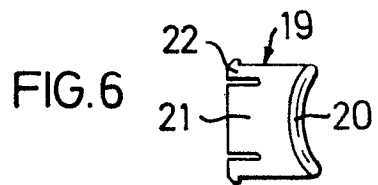
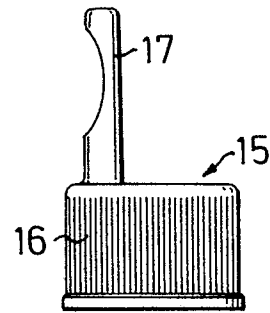


FIG.9

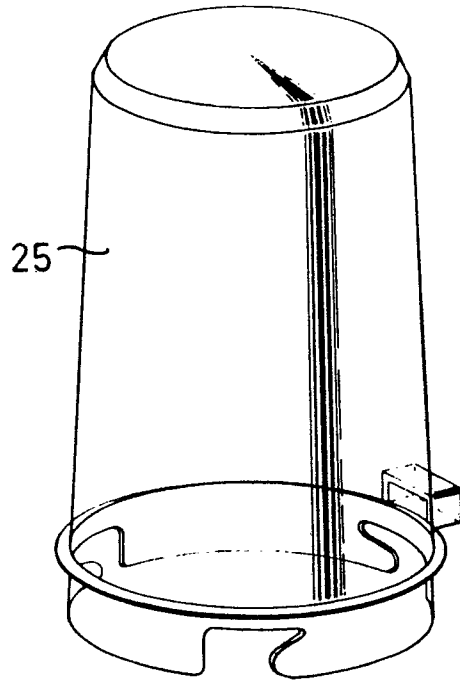


FIG.11

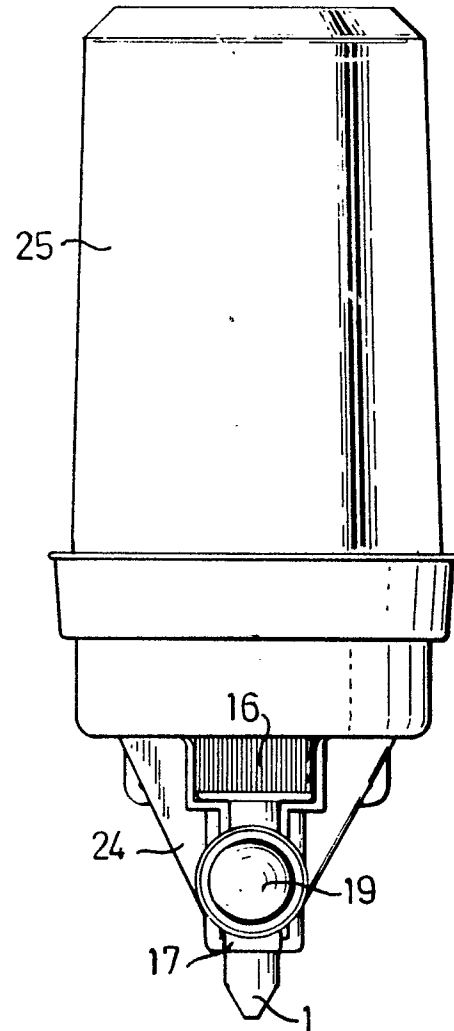
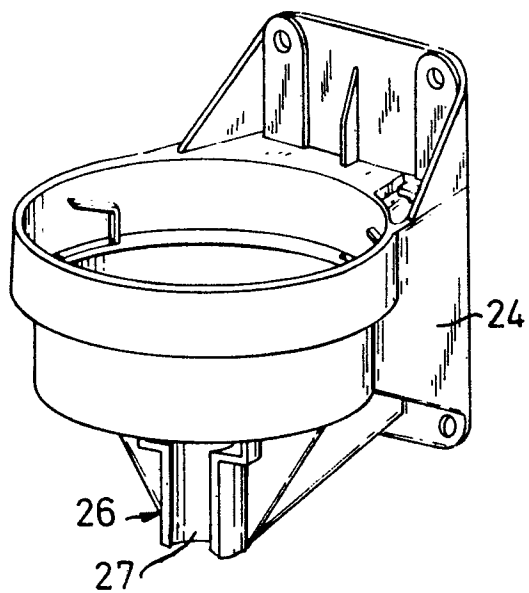


FIG.10





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EUROPEAN SEARCH REPORT

0065506

Application number

EP 82 85 0096

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 3)
A	US-A-2 772 817 (JAUCH) * Column 2, lines 31-72; column 3, lines 1-24; figures 1-3 *	Claim	A 47 K 5/12
A	BE-A- 567 442 (NEWTON) * Page 4, lines 15-31; page 5, lines 1-32; page 6, lines 1-32; page 7, lines 1-11; figures 1,2 *	Claim	
A	US-A-1 542 584 (ROSE) * Page 1, lines 95-110; page 2, lines 1-36; figures 1-5 *	Claim	
A	US-A-3 211 340 (ZANDER) * Column 3, lines 63-75; column 4, lines 1-9; figures 1-8 *	Claim	
A	GB-A- 711 630 (CHURCHILL) * Page 2, lines 72-130; page 3, lines 1-36; figures 1-6 *	Claim	TECHNICAL FIELDS SEARCHED (Int. Cl. 3)
A	FR-A-1 399 087 (ROMA) * Page 2, column 1, lines 6-58; column 2, lines 1-13, 24-38; figures 1-4 *	Claim	A 47 K
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 27-08-1982	Examiner SCHOLS W.L.H.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			