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APPARATUS FOR DISPENSING PULPY OR PASTY SUBSTANCES FROM A CONTAINER

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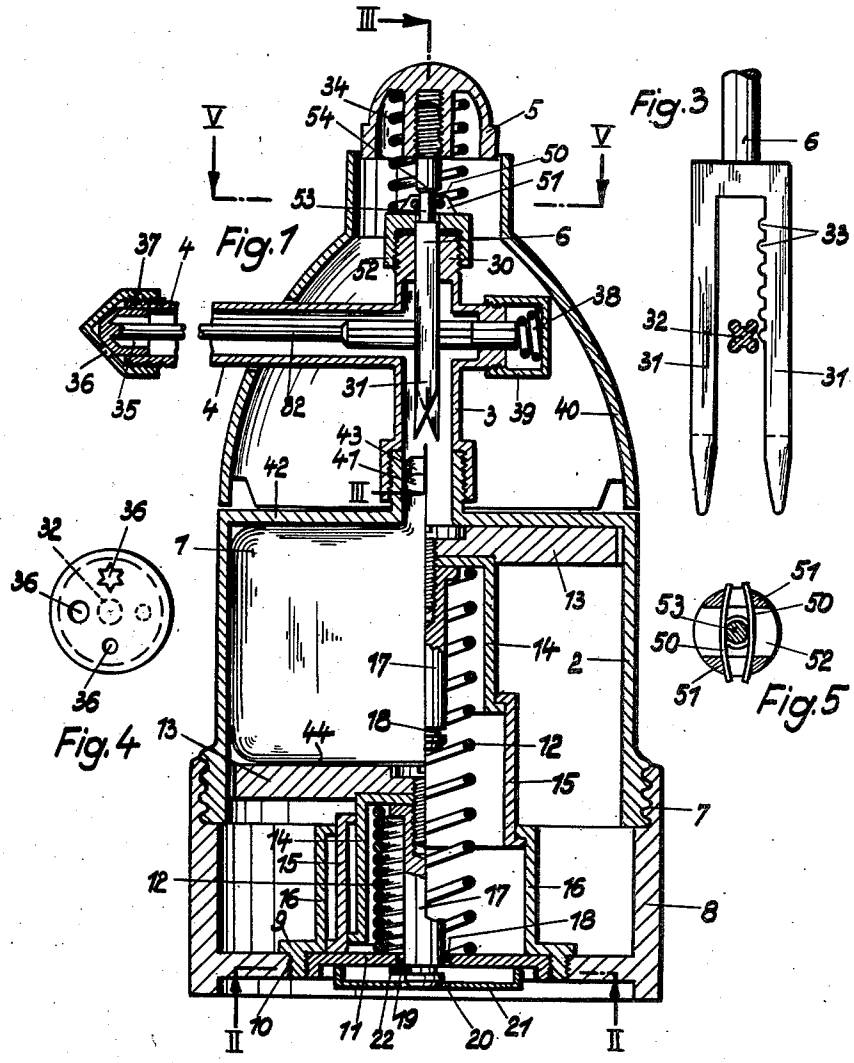


Fig. 1

Fig. 4

Fig. 3

Fig. 5

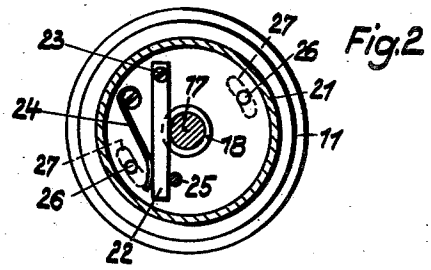


Fig. 2

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APPARATUS FOR DISPENSING PULPY OR PASTY SUBSTANCES FROM A CONTAINER

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6 Claims. (Cl. 222—82)

Many devices are known for dispensing pulpy or pasty substances, such as mustard, mayonnaise, marmalade, or materials which are not food stuffs, in which the substances are stored in a container made of deformable material and equipped with a dispensing nozzle. The contents can be discharged in small quantities by external pressure. In these devices the pressure is exerted by hand, generally by means of a piston, sometimes with the aid of an air cushion which can be put under pressure. Such devices have a number of disadvantages. Re-filling is difficult and the emptying requires the exertion of considerable force. In addition there is a possibility of these devices becoming blocked if they are filled with materials containing water, for example mustard, because of hardening of the contents caused by loss of water.

It having become customary to retail substances, in particular food stuffs and the like, in hygienic packages consisting of synthetic materials, there has been formed a corresponding demand for a device by means of which such packages can be emptied in small quantities. It is the object of the invention to produce such a device which fulfills the demand for simple operation in filling and emptying and which is of convenient construction.

It has been found that containers of the kind mentioned above, if they are filled with a pasty substance, and if they are located in a dispensing apparatus, require considerable force for their emptying, whereby the operation of such apparatus is rendered difficult. In order first of all to remove this difficulty, use is made in the present case of a known device, which contains the substance in a storage space into which a piston is urged by the action of a spring, the discharge of the material being controlled at will by the opening or closing of a discharge opening. Such a device permits the storage of an adequate reserve of force in the spring which is utilised for the discharge of the material. According to the invention the material is contained in an expendable bag which fits into the storage space and is made of a flexible material. There is provided at least one punch acting between the storage space and the discharge opening, which can penetrate the said bag and pierce it locally, as soon as the pressure of the piston acts upon the bag.

Hitherto the known discharge devices acting with a piston penetrating a storage space were intended to receive filled bags which themselves had an outer cylindrical container equipped with a movable bottom. It is not practicable to store food stuffs and the like over a prolonged period in containers of this description, because these containers cannot be made completely tight if, at the same time, they are also equipped with an easily movable piston. Only by means of the use of a cheap bag, of a plastic which can be thermoplastically welded after filling, is it possible to provide refill packages which on the one hand ensure storage of unlimited duration and on the other hand are cheap enough so that the purchaser is not burdened with expenses for packing which are out of proportion to the cheap goods to be packed. However, with the use of such cheap bags there arises the difficulty

that the bag cannot be provided with an opening before its introduction into the discharge device. If an opening is pierced into such a bag, it will instantly discharge a not inconsiderable quantity of its contents, which would produce an unbearable soiling. In contradistinction the present invention enables very simple and clean re-filling, combined with automatic opening of the re-fill packing, and, furthermore, the invention obviates tight-fitting pistons, because the bag itself effects the necessary tight closure downwards.

The apparatus is opened after the contents of the bag have been consumed, the empty bag is removed and a new bag is introduced. For the reception of this bag the device is equipped with a chamber joined to the discharge nozzle, which chamber the piston tends to enter, the discharge of the substance being controlled at will by opening or closing the discharge opening provided. The chamber and the piston are situated in two different parts of the device, which are accessible after dismantling of the device, and the piston is capable of being fixed in that position in which the spring is loaded. Further features of the invention will be explained with reference to the accompanying drawing.

In the diagrammatic drawing an embodiment of the invention is shown by way of example.

Fig. 1 is a longitudinal section and

Fig. 2 is a bottom plan view, in partial section along line II—II of Fig. 1;

Fig. 3 shows on a large scale a side view, in the direction III—III of Fig. 1, of the control member that controls the valve for opening and closing the bag;

Fig. 4 is a view of the discharge nozzle on a larger scale; and

Fig. 5 is a section on the line V—V of Fig. 1.

The device comprises a cylindrical or, if desired, a prismatic part 2, which receives the re-fill packing 1. The part 2 is connected with the discharge nozzle 4 by means of a tubular extension 3. At the outer end of nozzle 4 there is provided a closure member which can be opened by means of a rod 6 by depressing a push button 5. The part 2 can be screwed on to the lower part 8 at 7. Into the lower part 8 a bottom 9 is screwed at 10 or fastened permanently by other means, the bottom 9 carrying an additional ring 11. The latter forms an abutment for a spring 12 which urges a piston 13 upwards in the chamber formed inside the container 2. This piston 13 is shown in the left hand-half of Fig. 1 in its lowest position, and in the right-half in its highest position. In order to provide an adequate guide for this piston 13, it is equipped with a cylindrical extension 14 which can slide telescopically in further cylinders 15, 16, the part 16 forming a unit with the bottom 9. The piston also carries a rod 17 with a notch 18, which passses through a hole 19 in the bottom part 11 and a hole 20 in a further bottom part 21 which is rotatably connected to the ring 11. Between the ring 11 and the bottom part 21 there is arranged a detent 22, which is rotatable about a pivot 23 (Fig. 2) and which drops into the notch 18 of the rod 17 under the action of a spring 24 as soon as, after disassembling of the parts 2 and 8, the piston 13, which has now become accessible, is pressed against the action of the spring 12 from its highest into its lowest position. If the rotatable piece 21 in Fig. 2 is turned clockwise, then the detent 22 is disconnected from the rod 18 against the pressure of the spring 24, as a bolt 25 on part 21 displaces the detent 22. The piston 13 will be moved into its upper position under the action of the spring 12. The part 21 is fixed to the part 11 by means of screws 26, which penetrate elongated holes 27 therein in order to enable the part 11 to be rotated.

The rod 6 is guided in the tube 3 at 30 and is movable with a leak-proof fit. As shown in Fig. 3, the rod 6

terminates in a fork 31, which straddles a valve rod 32, and is coupled, by means of projections 33 on one leg of the fork, to the valve rod 32 which is provided with teeth in the region of the fork. If, therefore, the button 5 is pressed downwards, then, on the one hand, the rod 32 is turned against the action of a spring 34 and, on the other hand, the fork 31 is displaced downwards. The rotation of the rod 32 is utilised to turn a control member formed as a rotary valve 35, which is fixed to the end of the rod 32. The turning movement is sufficient to allow the opening (not shown) of the valve 35 to register with an opening 36 in a cap 37 fixed to the nozzle 4. The body of the rotary valve 35 is conical and is pressed into the corresponding internal cone of the cap 37 by means of a spring 38, which is arranged at the end of the nozzle 4 and rests against a cap 39. At 40 there is shown a casing which is fixed to the apparatus in a suitable manner.

The re-fill container 1 may have an extension 41, which fits into the tube 3 of the container 2.

The filling and operation of the apparatus are effected as follows:

The apparatus is opened at 7, and therefore the screw threads at 7 are suitably steep, but self-locking. Prior to this opening, the piston 13 may be situated in its highest position (right-hand side of Fig. 1), in which position it touches the transverse wall 42 of the container 2 with some force under the action of the spring 12. After removal of the upper part 2, 40 from the lower part 8, the piston 13 is pressed downwards, compressing the spring 12, into the position shown in Fig. 1 on the left-hand side. In this position the piston rod 17 is held by the detent 22, which drops into the notch 18 of the said rod.

The re-fill packing 1 is now inserted into the chamber surrounded by the hollow body 2. The said re-fill packing may for example consist of a bag of thermoplastic material, into which a measured quantity of some substance, for example mustard, has been filled. This bag may be thermoplastically sealed in known manner. The protruding sealing flaps are designated by 43 (at the top) and 44 (at the bottom). The bag may also be equipped with a conical extension 41, which can penetrate tightly into the tube 3. Now the parts 2 and 8 are screwed together, and the latch 22 is turned by turning the rotatable part 21, whereupon the spring 12 can expand and press the piston 13 with full force against the lower part of the re-fill bag. Upon depression of the button 5 the points of the fork 31 penetrate the bag or its extension 41 and rupture it. Under the pressure of the piston 13 the contents of the bag enter the tube 4 and reach the control valve 35. In a definite position of the button 5 the control valve, after a rotary movement, allows the discharge of the substance. When the button 5 is released the spring 34 is released and lifts the rod 6, so that the valve rod 32 is turned and the discharge opening 36 is closed.

The principle described so far permits of numerous constructional variants and improvements. For example it can be arranged that for the piercing of the re-fill bag by means of the fork 31 a longer stroke shall be required than for the mere opening of the outlet opening 36. It is of advantage to employ such different working strokes of the rod 6, because during discharge of the contents of the bag the points of the fork 31 should, if possible, not enter the holes which they have pierced into the bag 1 on their first downward movement as this would throttle the discharge of the contents. In order to make it unnecessary for the operator to be careful in the operation of the button 5, the rod 6 co-operates with a check, which can be felt at the end of the movement required for opening the valve 35, 36. In the example shown in the drawing this check consists of two resilient pieces of wire 50, Fig. 5, which are held in projections 51 in a part 52 and press against the rod 6. The rod 6 has a narrow part

53 and its end 54, which can be felt upon depression of the button 5, indicates that the correct position of the valve has been attained. The increased resistance, which is felt upon further depression of the button 5, has only to be overcome for the purpose of penetrating a new re-fill package.

An advantage of the embodiment shown is that the discharge opening 36 co-operates with a valve body 35, which cuts the rod of emerging material transversely, and furthermore, that the cross-sections of the tubes 3 and 4 have considerable dimensions, so that the pressure exerted upon the material by the piston 13 is effective as far as the valve 36. Thereby blockages of the valve are made impossible even after long intervals between successive operations, particularly as portions of the dispensed substance remaining at the discharge opening are so insignificant that incrustation or stickiness of the valve are substantially avoided. Furthermore, security against drying-out of the contents of the container is achieved. Exclusion of air as far as possible is important for food stuffs and the like containing water. It is to be noted that this exclusion has only been made possible by the fact that the contents are permanently kept under a pressure which is sufficiently high to allow immediate discharge of the contents as soon as the outlet openings 32, 33 are in register.

It is possible to provide the cap 37 with a number of outlet openings, which may be of different sizes. The required discharge opening is made effective by turning the cap 37 on the tube 4. In this way there is provided a device which allows delicate control of the discharged quantities according to their consistencies. As indicated in Fig. 4, the discharge openings 36 can also be profiled in known manner, in order to use the device for shaping, for example in dispensing mayonnaise.

The example shown operates with a single control button 5, the movement of which causes the opening of the refill bag 1 as well as the operation of the valve rod 32. This combination of two functions in one element is not necessary. It would be possible, for example, for the points 31 to be fixed in a suitable position, for example at the bottom of the container 2, and to effect the opening of the bag by pressing it with sufficient force against the points of the fixed opening device by the spring 12 after its release. The above-mentioned possibility of the discharge of the substance being checked by means of pins or the like remaining permanently in the opening has then to be excluded by suitably profiling the pins.

It is furthermore possible, to make the fork 6 or a similarly acting member movable independently of the devices for operating the rod 32. Also the rod 32 need not be present; it would be possible, for example, to arrange the part 37 rotatably on the tube 4 and to effect the turning of part 37 by means of a suitable additional member.

It is also a feature of the apparatus described that, provided that its components are suitably dimensioned, it allows complete discharge of the re-fill bags. It has been found that paste contained in the upper part of the device is not pressed downwards between the wall of the bag and the wall of the chamber and so discharged. On the contrary, the wall of the chamber remains quite clean.

What I claim is:

1. An apparatus for dispensing a pulpy or pasty substance, comprising a container, a flexible, frangible bag in said container filled with the substance to be dispensed, pressure means for maintaining said bag in a state of compression, said container being provided with an outlet for said substance, valve means at said outlet normally closing same, control means for said valve means operable to open said outlet, and an actuating member coupled with said control means for operating the latter, said actuating member being provided with punch means adapted to rupture said bag upon a first operation of said actuating member to open said outlet.

2. An apparatus according to claim 1, wherein said outlet means is provided with a fixed closure member, said valve means comprising a rotary closure member adjacent said fixed closure member, said closure members being provided with normally disaligned apertures.

3. An apparatus according to claim 2, wherein one of said closure members is provided with a plurality of apertures of different cross-sections selectively alignable with an aperture in the other closure member.

4. An apparatus according to claim 1, wherein said actuating member is a retractable plunger provided with indexing means for yieldably retaining said plunger in a position of partial displacement sufficient to open said outlet but insufficient to advance said punch means into contact with said bag.

5. An apparatus for dispensing a pulpy or pasty substance, comprising a container, a piston dividing said container into two compartments, a flexible, frangible bag in one of said compartments filled with the substance to be dispensed, outlet means in said one compartment, punch means for rupturing said bag at a location intermediate said piston and said outlet means, a tubular stem

extending from said piston in the other of said compartments, said stem being composed of a plurality of telescoped sections, spring means in said sections tending to expand said stem longitudinally, thereby placing said bag under pressure from said piston, and detent means for releasably locking said stem in a position of minimum longitudinal extent.

6. An apparatus according to claim 5, further comprising valve means for normally closing said outlet means and retractable plunger means coupled with said valve means and with said punch means for rupturing said bag and simultaneously inactivating said valve means.

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