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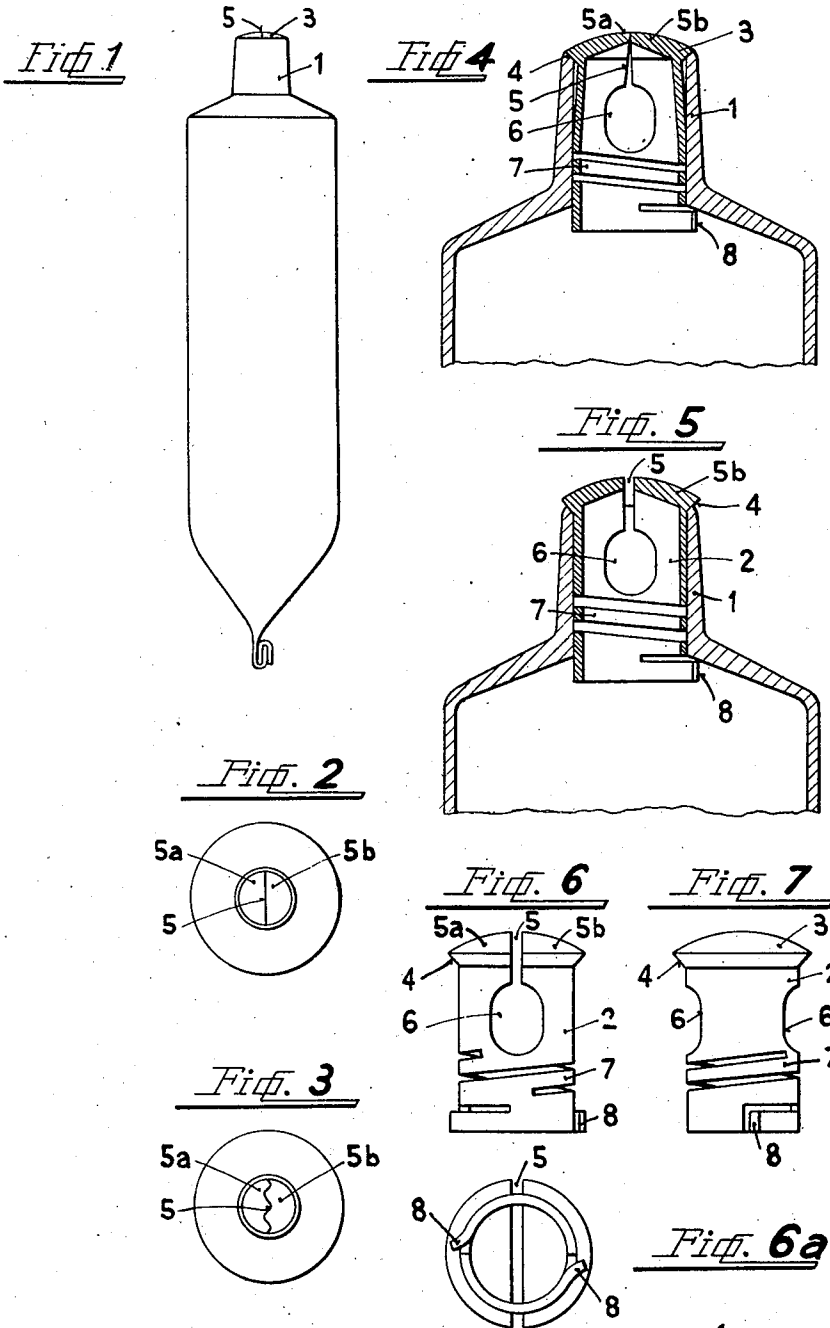
H. BÜHLER ET AL

2,378,061

NOZZLE FOR PRESSURE-OPERATED CONTAINERS

Filed Sept. 10, 1943

2 Sheets-Sheet 1



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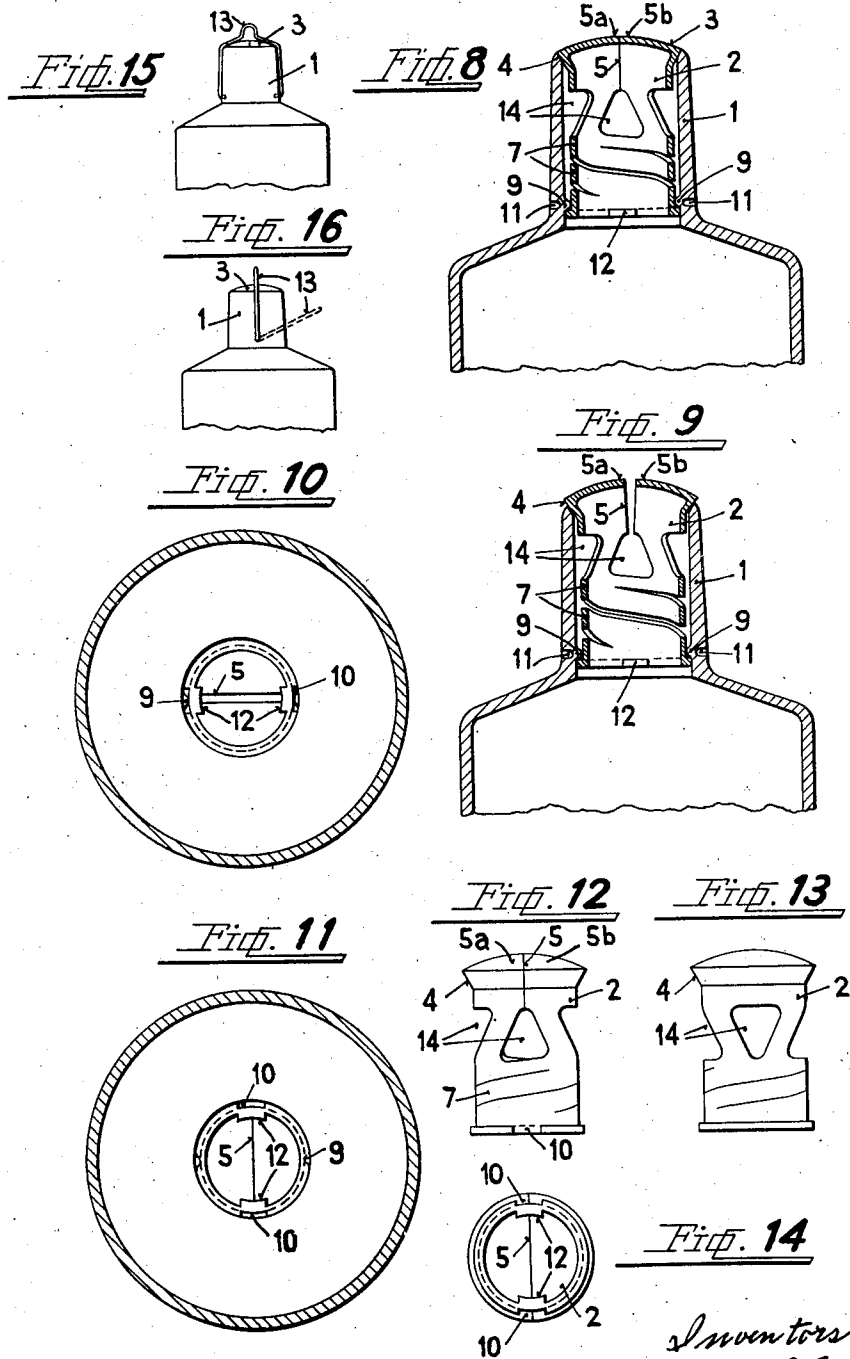
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UNITED STATES PATENT OFFICE

2,378,061

NOZZLE FOR PRESSURE-OPERATED
CONTAINERSHeinrich Bühler and Ernst Müller,
Zurich, SwitzerlandApplication September 10, 1943, Serial No. 501,864
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5 Claims. (Cl. 222-494)

My invention relates to improvements in the discharge nozzles of pressure operated tubular paste-dispensing containers; in particular collapsible tubes; and the objects of my improvement are, first, to provide a nozzle structurally independent of the container and easily and readily insertable therein, second, to afford a nozzle made of one piece and comprising all the spring elements necessary for its operation, and third, to eliminate the screw cap used heretofore.

I attain these and related objects by the nozzle structure shown, by way of two forms of invention, in the accompanying drawings, in which—

Fig. 1 is a lateral view of a tube equipped with a nozzle according to a first form of invention; Figs. 2 and 3 are top plan views of the latter showing two forms of discharge slots of the latter; Figs. 4 and 5 are sectional elevations of the mouth portions of Fig. 1, respectively in closed and open position; Figs. 6 and 7, two elevations taken at right angles to each other of the detached nozzle, respectively in closed and open position; Fig. 6a is a bottom plan view of the nozzle; Figs. 8 and 9 are sectional elevations of the mouth portions of a second form of invention, respectively in the closed and open position; Figs. 10 and 11, bottom plan views of Figs. 8 and 9 respectively; Figs. 12-14 are two elevations taken at right angles to each other and a bottom plan view of the nozzle; and Figs. 15 and 16 illustrate a securing swing hoop for both forms of invention.

In the first form of invention (Figs. 1-7) the nozzle 2-8, which is plugged from above into the tube throat 1, comprises a base portion 2 of sleeve form and of a length roughly equal to that of the tube throat, and a head portion 3 having a beveled guide rim or seat 4. The head 3 is slotted at 5 for approximately half the height of the shank 2, and forms the nozzle mouth with the lips 5a and 5b. The bottom of the slot 5 is widened into the apertures 6. The nozzle base is recessed to form the helical spring 7, and slotted to form the prongs or spring dogs 8 which lock the nozzle under the base of the tube throat (Fig. 6a). The top rim of the tube throat is beveled to provide a seat for the nozzle rim 4.

When in assembling the nozzle is plugged into the tube throat 1, its rim 4 contacts the top rim of the latter, and the lips 5a and 5b contact against the action of the spring embodied by the slot 5. The spring dogs 8 snap sideways under the tube throat, and the helical spring 7 of the shank 2 is subject to a certain tension. The nozzle also, of course, may be introduced into and propelled through the tube throat from the bottom of the

tube. Applying now pressure upon the tube or its contents, the head 3 is lifted from its seat 4 against the action of the spring 7, and the lips 5a and 5b part (Fig. 5) to open the discharge nozzle due to the spring action of the slot 5. When the said pressure is discontinued, the spring 7 withdraws the nozzle into the tube throat and onto its seat 4 against the spring action of the slot 5, and the lips 5a and 5b are closed to seal the tube.

In the second form of invention (Figs. 8-14) the nozzle is bayonet-fastened to the base of the tube throat 1. To this end the latter is provided with the two opposite snugs 9 formed by cupping the tube material at the points 11. Correspondingly, the nozzle base rim is cupped to form the two recesses 10 and the dogs 12. As shown in Figs. 8 and 9, the beaded nozzle base rim is securely locked in place by the snugs 9 of the tube throat 1, and, furthermore, the beveled seat 4 permits of only an upward displacement of the nozzle in the latter.

The slots 5 are widened to form the triangle apertures 14 in the shank wall. By providing four apertures 14, which alternately are turned 180 degrees, instead of only two of elliptical shape in the first form of invention, the resiliency and the strength of the shank wall are increased.

The nozzle according to the second form of invention is plugged from above into the tube throat, and adjusted therein to bring the recesses 10 into alignment with the tube snugs 9 (Fig. 10). By gripping the nozzle dogs 12 with a key tool inserted through the open tube end and turning them from underneath the snugs 9, the nozzle is locked in place (Fig. 11) against the action of the springs 7 and 5, 14. Upon applying pressure to the tube or its contents, the spring 7 is subject to an increased tension, the nozzle is lifted from its seat 4, the lips part under the action of the spring embodied by the apertures 14 and the slot 5, and the contents issue from the latter. When the said pressure is discontinued, the spring 7 pulls the nozzle back onto its seat against the action of the spring 5, 14, and the slot 5 is closed (Fig. 8).

The two grooves 11 on the outside of the tube throat may serve as bearing cups for a swing hoop 13 (Figs. 15 and 16), by means of which the slot 5 is locked against involuntary opening when the tube is subject to a random pressure.

The invention described and illustrated affords a self-acting and reliable closing device for tubular paste-dispensing containers, such as grease guns and collapsible tubes, and is extremely sim-

ple of manufacture and operation. An outstanding advantage is the fact that the said containers may be manufactured as heretofore, and that the nozzle is made of one piece and independent of the container. The nozzle, furthermore, may be quickly inserted and locked in place without the use of any special tools. The screw caps used heretofore are eliminated, and the tube throat does not need to be threaded.

What we claim and desire to secure by Letters Patent is:

1. A one-piece nozzle and throat liner for a pressure operated dispensing container, which comprises a tubular shank member having a head at one end thereof and terminating at its other end in a helically-slotted and resiliently extensible portion, said shank member being provided intermediate said head and said helically-slotted portion with a plurality of circumferentially spaced apertures, said head being provided with a normally-closed slot defining a dispensing outlet, and the ends of the said last-named slot terminating severally in said apertures, a beveled peripheral seat-forming rim on said head, and means on said shank member for anchoring the said nozzle and throat liner, when inserted into a container tube throat, to said throat, whereby pressure exerted from the interior of the container causes extension of said resiliently extensible portion and opening of said dispensing outlet.

2. A one-piece nozzle and throat liner for a pressure operated dispensing container, which comprises a tubular shank member having a head at one end thereof and terminating at its other end in a helically-slotted and resiliently extensible portion, said shank member being provided intermediate said head and said helically-slotted portion with a plurality of circumferentially spaced apertures, said head being provided with a normally-closed slot defining a dispensing outlet, and the ends of the said last-named slot terminating severally in said apertures, a beveled peripheral seat-forming rim on said head, and means on said shank member for anchoring the said nozzle and throat liner, when inserted into a container tube throat, to said throat, said anchoring means comprising dogs integral with said shank member and extending outwardly therefrom, whereby pressure exerted from the interior of the container causes extension of said resiliently extensible portion and opening of said dispensing outlet.

3. A pressure operated dispensing container having a tubular throat and a one-piece nozzle and throat liner in said throat, said nozzle and liner comprising a tubular shank member having a head at one end thereof and terminating at its other end in a helically-slotted and resiliently extensible portion, said shank member being provided intermediate said head and said helically-slotted portion with a plurality of circumferen-

tially spaced apertures, said head being provided with a normally-closed slot defining a dispensing outlet, and the ends of the said last-named slot terminating severally in said apertures, a beveled peripheral seat-forming rim on said head, and means on said shank member for anchoring the said nozzle and throat liner to said tubular throat, whereby pressure exerted from the interior of the container causes extension of said resiliently extensible portion and opening of said dispensing outlet.

4. A pressure operated dispensing container having a tubular throat and a one-piece nozzle and throat liner in said throat, said nozzle and liner comprising a tubular shank member having a head at one end thereof and terminating at its other end in a helically-slotted and resiliently extensible portion, said shank member being provided intermediate said head and said helically-slotted portion with a plurality of circumferentially spaced apertures, said head being provided with a normally-closed slot defining a dispensing outlet, and the ends of the said last-named slot terminating severally in said apertures, a beveled peripheral seat-forming rim on said head, and means on said shank member for anchoring the said nozzle and throat liner to said tubular throat, said anchoring means comprising dogs integral with said shank member and extending outwardly therefrom, whereby pressure exerted from the interior of the container causes extension of said resiliently extensible portion and opening of said dispensing outlet.

5. A pressure operated dispensing container having a tubular throat and a one-piece nozzle and throat liner in said throat, said nozzle and liner comprising a tubular shank member having a head at one end thereof and terminating at its other end in a helically-slotted and resiliently extensible portion, said shank member being provided intermediate said head and said helically-slotted portion with a plurality of circumferentially spaced apertures, said head being provided with a normally-closed slot defining a dispensing outlet, and the ends of the said last-named slot terminating severally in said apertures, a beveled peripheral seat-forming rim on said head, and means for operatively associating said nozzle and throat liner with said throat, said last-named means comprising a pair of spaced lugs projecting inwardly from said throat and a discontinuous peripheral flange extending outwardly from said helically slotted portion and engageable under said lugs, whereby pressure exerted from the interior of the container causes extension of said resiliently extensible portion and opening of said dispensing outlet.

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