Oct. 13, 1942. A. M. MAZZARELLI 2,298,957

VALVED CLOSURE FOR DISPENSING BOTTLES

Filed Oct. 13, 1941 2 Sheets-Sheet 1

Fig. 1

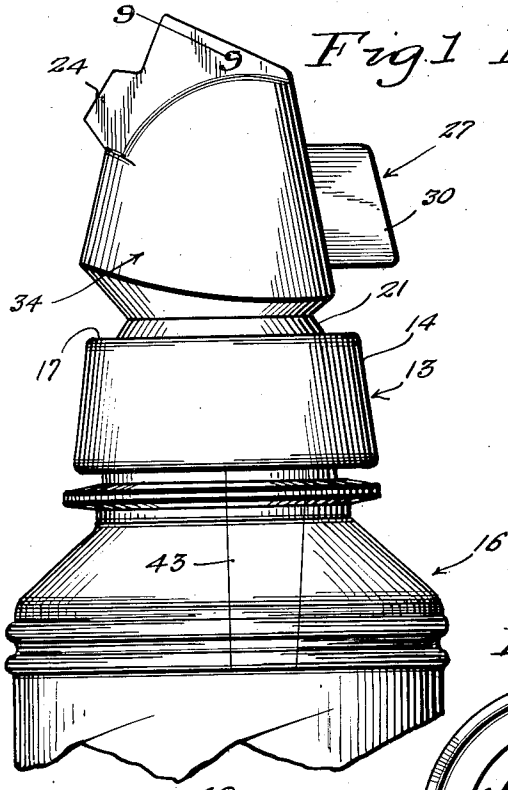


Fig. 2

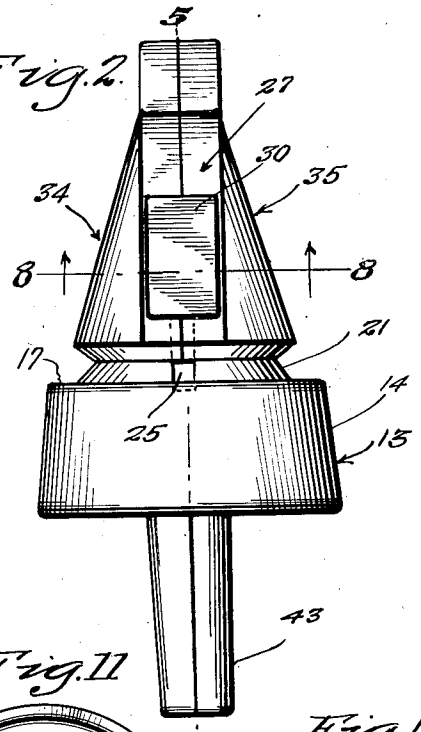


Fig. 11

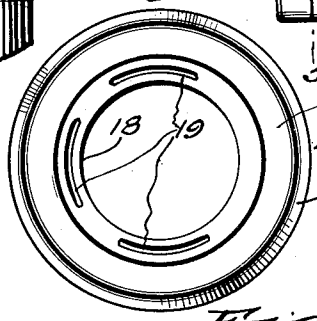


Fig. 12.

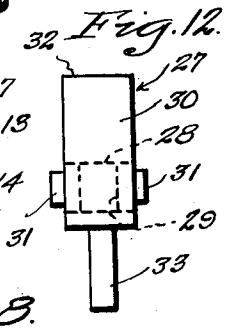


Fig. 7.

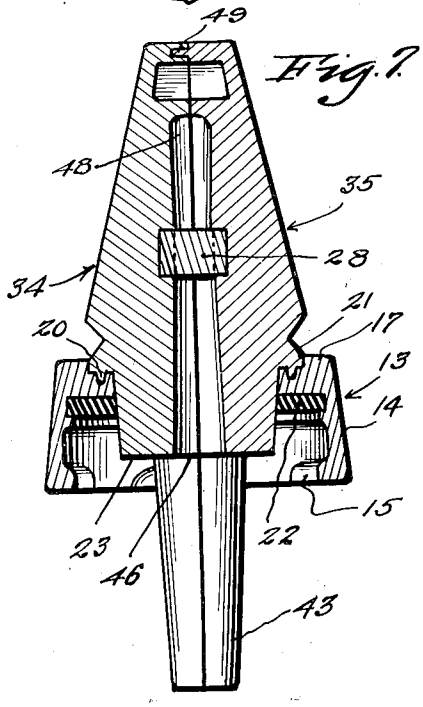
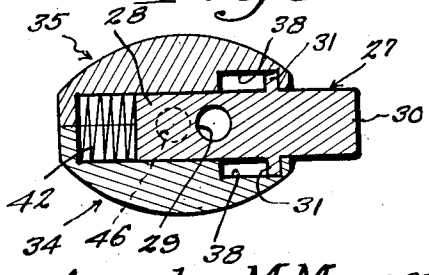


Fig. 8.



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VALVED CLOSURE FOR DISPENSING BOTTLES

Filed Oct. 13, 1941 2 Sheets-Sheet 2

Fig. 5.

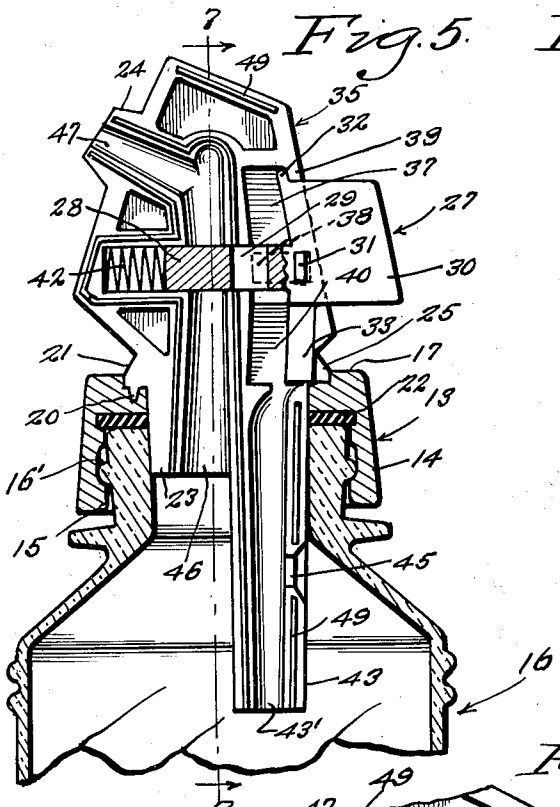


Fig. 6.

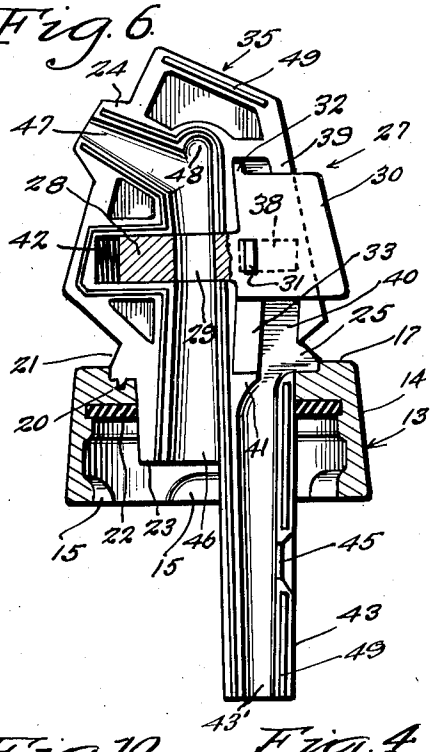


Fig. 9.

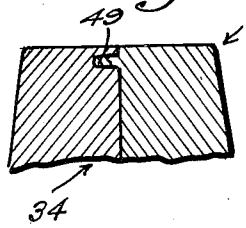


Fig. 10.

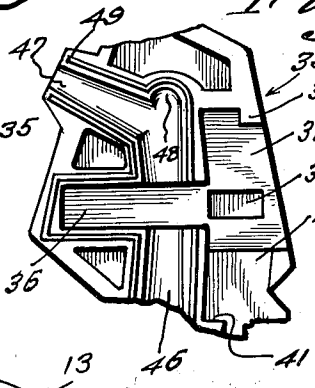


Fig. 4

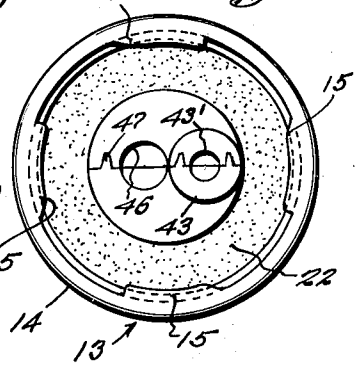
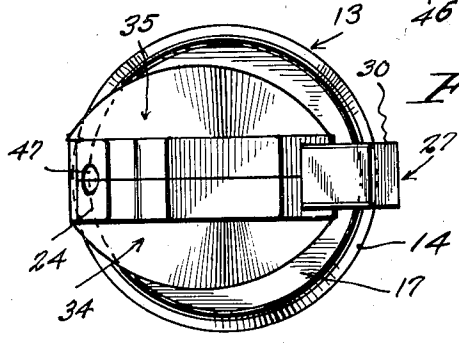


Fig. 3.



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UNITED STATES PATENT OFFICE

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VALVED CLOSURE FOR DISPENSING BOTTLES

Augustine M. Mazzarelli, New York, N. Y.

Application October 13, 1941, Serial No. 414,839

5 Claims. (Cl. 215—74)

This invention relates to valved closures for dispensing bottles and equivalent containers, having more specific relation to a novel and improved structure which is peculiarly yet aptly adapted for use on and in conjunction with so-called office and school room type ink bottles.

I am, as is implied by the preceding general statement, partially conversant with the state of the art to which the invention pertains. That is to say, I am well aware that structurally variable types of suitably valved and vented caps and analogous constructions have been devised in an effort to meet the demands, variable as they are, of the trade. By the same token, I have discovered the need for certain seemingly worthwhile revisions and refinements. Therefore, it is my primary aim to generally improve upon known forms and styles of ink bottle closures by providing one possessed of such structural adaptations and requirements as would seem to be sufficient to better satisfy manufacturers, retailers and users in general.

Looking toward achievement of resultful accomplishment, I have evolved and produced a structure susceptible of being produced from appropriate plastic materials, this in keeping with present-day priority requirements, and the preferred embodiment thereof being characterized by suitably coordinated and situated simultaneously valved pouring and venting bores or passages.

In reducing to practice the principles of the preferred concept, I have found it expedient and practicable to utilize a two-part body or stopper arrangement, this being effectively anchored on and carrying a well arranged fluid-tight cap for expedient application to the conventional bottle neck.

More specifically stated, I have devised a sectional stopper unit externally shaped for symmetrical appearance as well as usefulness in handling, this being internally constructed to guard against evaporation and otherwise devised to prevent undesirable gurgling and spurting due to the adoption of aptly regulated valving and flow control means.

Other features and advantages will become more readily apparent from the following description and the accompanying illustrative drawings.

In the drawings, wherein like numerals are employed to designate like elements or parts throughout the various views:

Figure 1 is what may be conveniently described as a side elevation of a valved ink bottle closure constructed in accordance with the principles of this invention, the same being shown attached to the neck of a regular or conventional ink bottle.

Figure 2 is an elevational view of the same construction illustrated in Figure 1, said view being at right angles to Figure 1 and observing said latter figure in a direction from right to left.

Figure 3 is a top plan view of the closure depicted in Figures 1 and 2.

Figure 4 is a bottom plan view of Figure 2.

Figure 5 is a central vertical sectional view taken approximately on the plane of the line 5—5 of Figure 2, parts being shown in section as well as elevation.

Figure 6 is a view similar to Figure 5 showing the plunger operated in a manner to push the valve element into its open position.

Figure 7 is a vertical central sectional view taken on the plane of the line 7—7 of Figure 5 and looking in the direction of the arrows,

Figure 8 is a horizontal section taken on the plane of the line 8—8 of Figure 2 looking upwardly.

Figure 9 is an exaggerated or enlarged fragmentary detail section occurring on the line 9—9 of Figure 1.

Figure 10 is an elevational view of a fragmentary type detailing the molded formation of the central part of one of the sections of the body or stopper, the plunger being removed for clearness of illustration.

Figure 11 is a top plan view of the cap forming collar serving as an adequate mounting for the stopper.

Figure 12 is an element or detail view of the plunger per se.

Referring now to the drawings and differentiating the elements or parts by distinguishing reference numerals, it will be observed that the so-called cap unit 13 comprises an annular rim 14 having circumferentially spaced radially and inwardly projecting detents 15 adapted to engage corresponding retention elements 16' on the neck of the bottle 16. The cap unit 13 also includes an annular flange portion 17 (see Fig. 11) providing a base for the stopper unit and having a central opening or aperture 18 through and beyond which the complemental portion of the stopper projects. It will be observed that the flange 17 has circumferentially spaced segmental grooves 19 forming suitable keyways for the correspondingly shaped and located keys or ribs 20 carried by the ring-like flange 21 of said stopper unit. The features 19 and 20 are suitably joined by adhesion to pro-

vide the desired fluid-tight joint between the cap and stopper. Then, too, and as shown in Figure 7, an appropriate gasket 22 is mounted on the interior of the cap for obvious purposes.

The body-like so-called stopper is also formed of plastic material of appropriate composition and is sectional in construction. That is to say, it is made up of a pair of duplicate or companion half-sections, these being disposed in opposed or face-to-face relation and adhesively secured together. The stopper may be said to embody a plug-like basal portion 23 and a tapered or conical protruding head portion. The external shape of the latter is effectively illustrated in Figures 1, 2 and 3 and makes for convenience of handling the closure and associated bottle. Generally observed, it will be noted that the apex portion is in the form of an inclining crown and below this and on the front pouring side is the projecting nozzle or spout 24. Diametrically opposite to this and located within the vicinity of the cap is the companion vent aperture 25. These features seem ideally situated for effective coordination in tilting the bottle as well as in righting it when the pouring operation is completed. The projecting finger-piece or trigger 30 of the plunger unit 27 is located outwardly of the vent 25 and diametrically opposite the pouring nozzle. Here, again, the location of parts is important where reliable handling is essential.

The construction of the plunger is better evident as we compare Figures 5, 6, 8 and 12. In general outline or delineation the plunger is somewhat T-shaped in form. The stem 28 is apertured, as at 29, and forms the valve element and the head, which is at right angles thereto, is fashioned into several parts, the major one of which is the thumb-piece 30. On the thumb-piece I provide the stabilizing and guide lugs 31, there being a check element 32 at the top and a pendant 33 at the bottom. The latter element serves in conjunction with the ported stem 28 as an auxiliary valving element. That is to say, it controls the air venting means.

As the opposed inner faces of the respective sections 34 and 35 of the head or stopper are identical, a description of one will suffice for both. In this connection, attention is first called to Figure 10 showing the somewhat T-shaped cavity including a guideway 36 for the stem 28, an accommodation recess 37 for the thumb piece, and a guide groove 38 for the adjacent lug 31. I call attention, too, to the stop shoulder or abutment 39 for the coacting check element 32, a slideway 40 for the vent valve 33 and a stabilizing ledge 41 for the lower end of said element 33 when it is in the vent opening position illustrated in Figure 6. The socket portion 36 also serves as an adapter for the coiled spring 42, the latter serving to normally hold the plunger or valve closed, as seen in Figure 5.

Next, I call attention to the depending tubular element 43 having a bore 43' leading to and communicating with the main vent 25. This vent tube is of appropriate length, depending on the requirements of the trade and preferably includes an auxiliary air orifice 45 to expedite the discharge of ink from the bottle, particularly when the supply is low. The associated bore or passage 46 is the ink discharge duct or channel and this is tapered, that is, gradually restricted in dimension in a direction outwardly. In fact, the outer end is oblique or at an appropriate angle to restrict and facilitate pouring, and at the juncture of this obtuse outlet 47 and the main bore 46 I provide a shallow cavity 48 which functions as a sort of a baffle and retards the outflow of ink and insures smooth operation and guards against gurgling and spurting. As is evident from the various figures, the two sections 34 and 35 are provided with tongues 49 and associated grooves which interlock, as shown, and facilitate assembling of said parts. It is perhaps unnecessary to repeat that these interfitting or interlocking elements are adhesively joined by appropriate means.

A closure as herein specifically shown and described provides an effective well sealed cap for ink bottles and corresponding liquid containing and dispensing receptacles. It embodies aptly regulated stream or flow control ranging from unrestricted discharge to intermittent drop-by-drop escape. The spring means assists in normally urging the dual valving means to closing positions. Then, too, it is properly tensioned so as to render the operation of the plunger sensitive to accurate finger control. That is to say, it resists inward motion or movement of the plunger so that it is possible to effectually control the pouring operation. From a standpoint of manufacturing expediency, the simple lug and the gasket equipped collar and stopper-like sectional body have become ideally suited for effective forming and assembling. In fact, and without attempting to relate commercial achievements, it is thought that the structure as a whole and its outstanding functional features are innovations in this line of endeavor.

A careful consideration of the foregoing description in conjunction with the invention as illustrated in the drawings will enable the reader to obtain a clear understanding and impression of the alleged features of merit and novelty sufficient to clarify the construction of the invention as hereinafter claimed.

Minor changes in shape, size, materials and rearrangement of parts may be resorted to in actual practice so long as no departure is made from the invention as claimed.

What I claim is:

1. In a combined stopper and cap closure for dispensing bottles, a cap forming collar, said collar including a neck embracing rim having retention detents, and an annular centrally apertured and recessed flange connected with the rim, the recessed portion of said flange being provided with circumferentially spaced lug accommodation grooves, a sectional body including head and stopper portions, the stopper portion projecting through and beyond the central aperture of the flange, and the head portion having an outstanding annular flange superimposed upon the first-named flange seated in said recess and provided with lugs anchored in said grooves, said body also having venting and pouring passages.

2. In a closure of the class described, a body composed of duplicate companion half-sections secured together in aligned and opposed relationship, the adjacent meeting faces of the sections being cored to provide air and liquid passages and a plunger accommodation chamber, the chamber being of general T-shaped form and including an air venting opening, a check shoulder, and valve element sockets, a spring in one of said sockets, a plunger in said chamber, said plunger having portions for coordination with the companionate portion of the chamber and further including an externally protruding thumb-piece.

3. As a component part of an assemblage of the class described, a sectional body forming a

pouring head and bottle neck stopper, said body having parallel passages, one for air and one for liquid, the air passage including a tube adapted to project into the body of the bottle, and the remaining passage being tapered and including a laterally disposed outer pouring branch and a pocket forming cavity at the juncture of the lateral branch and outer end portion of said tapered passage to momentarily trap and retard the outflow of ink and to thus minimize gushing and spurting.

4. As a new article of manufacture and component part of an assemblage of the class described, a double acting plunger of general T-shaped form including an apertured stem portion and a complemental head portion, the head portion including a finger-piece, outstanding side and guide lugs, an upstanding abutment engaging check element, and a depending element, the latter functioning as a vent controlling valve member.

5. A structure of the class described, a body including a combined pouring head and neck plugging stopper portion, said body having an internal substantially L-shaped liquid pouring discharge passage, the long branch thereof being tapered outwardly and the short branch being disclosed at an obtuse angle to the axis thereof, the short branch terminating in a discharge nozzle, that portion constituting the juncture between the two branches having a flow check cavity, the body at an intermediate point diametrically opposite to said nozzle having an air vent, a plunger type slidable and control valve including an apertured stem spanning the intermediate portion of said long branch, a finger piece, and a depending element forming a second valve to control the air vent.

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