

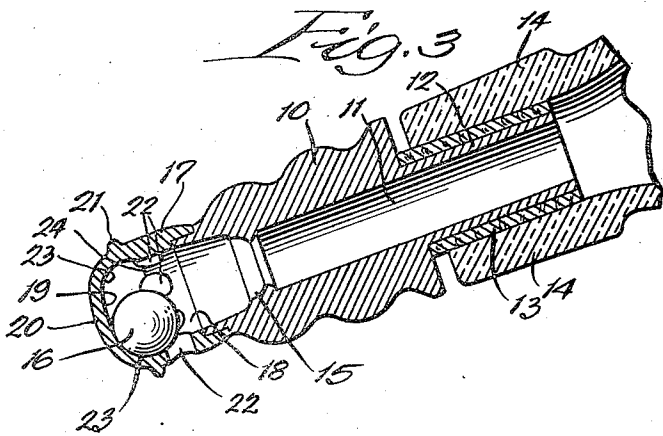
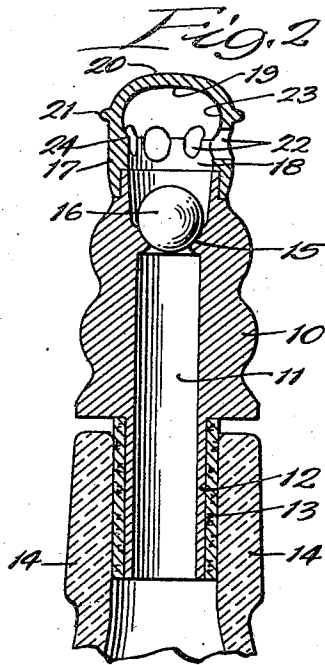
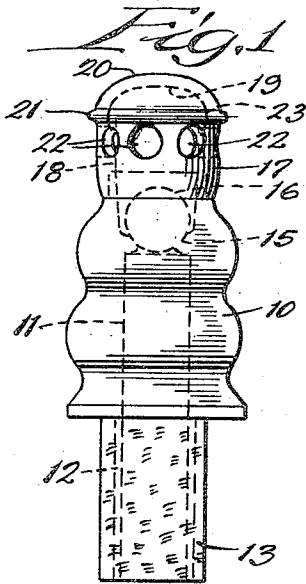
March 16, 1948.

L. M. MALLICK

2,437,882

BOTTLE CLOSURE

Filed Sept. 4, 1945



Inventor:  
Leo M. Mallick,

By Dawson, Brothers & Spangenberg,  
Attorneys.

# UNITED STATES PATENT OFFICE

2,437,882

## BOTTLE CLOSURE

Leo M. Mallick, Chicago, Ill.

Application September 4, 1945, Serial No. 614,097

3 Claims. (Cl. 215-75)

1

This invention relates to a bottle closure, and more particularly to a bottle closure which permits pouring of the contents of the bottle automatically upon the tilting of the bottle to pouring position.

Various types of closures are in use which are employed to replace the ordinary seal or closure of the bottle and which permit pouring of the contents as desired while at the same time providing a partial closure to prevent the escape of volatile material in the bottle. The chief difficulty with such closures is that they do not provide satisfactory air vents and the bottle has to be shaken repeatedly during the pouring operation, often causing a spilling of the liquid. Further, the temporary seals are not efficient in preventing the escape of volatile material, and their structure makes them serve as dust collectors and unsanitary structures.

An object of the present invention is to provide a closure which will at all times, when the bottle is in upright condition, provide a complete seal against the escape of volatile material, while at the same time, when the bottle is tilted to pouring position, will permit the steady and full flow of liquid without requiring the shaking of the bottle. A further object is to provide a closure having a full vent for the inflow of air when the bottle is turned to pouring position, and means for automatically sealing the drain passage against the escape of volatile material when the bottle is returned to upright position. Yet another object is to provide a closure in which a ball valve is employed, together with means for maintaining the ball effectively out of engagement with the valve seat during the pouring position and while moving the bottle at angles approximating a pouring position where the ball otherwise would flow back and interrupt the flow. Yet another object is to provide a structure in which a recess in the casing is provided for the ball valve while at the same time providing a dust eliminator dome and deflector means for protecting the dome from liquid. Other specific objects and advantages will appear as the specification proceeds.

The invention is illustrated in a preferred embodiment by the accompanying drawing, in which—

Figure 1 is a side view in elevation of a closure

2

embodying my invention; Fig. 2, a vertical sectional view of the structure shown in Fig. 1 and shown applied to the neck of a bottle, the bottle being in upright position; and Fig. 3, a view similar to Fig. 2 but showing the bottle tilted to pouring position.

In the illustration given, 10 designates a casing member formed of aluminum or any other suitable material and provided with a drain passage 11 extending therethrough. The lower portion of the casing 10 provides a tubular member 12 receiving a sealing sleeve 13 of cork or any other suitable material, the sleeve being effective in providing an airtight seal with the bottle neck 14. The upper part of the casing 10 provides a valve seat 15 adapted to receive a ball 16 of stainless steel or other suitable metal to provide an airtight seal therewith. A hollow crown member 17 provides with the upper enlargement of casing 10 a valve chamber 18 in which the ball 16 may move to sealing and unsealing position. The crown 17 has a flange which makes a sliding fit with a mating flange of casing 10. Any suitable means for securing the two members together may be employed. I have found that a press fit is very satisfactory, employing suitable pressure, say, for example, 600 pounds. It will be understood that any suitable means for securing the members together may be employed. The crown 17 is preferably recessed interiorly at 19 to provide a place for the ball 16 to rest while at the same time furnishing on the exterior of the structure a dome 20 which has pitched sides preventing the collection of dust thereon. In order to prevent the flow of liquid onto the dome and thus provide a means for contaminating it, I provide deflector 21 at the lower part of the dome which tends to divert liquid outwardly.

In order to provide at all times a full flow from the bottle with a sufficient vent for the inflow of air, while at the same time enabling the bottle to be turned at any position during the pouring operation, I provide the member 17 with pouring and vent apertures 22 which extend all the way around the structure. Thus, a vent 22 on the lower side of the structure, when tilted to pouring position, serves as a conduit for the outflow of liquid, while the vent diametrically opposed thereto is completely open to the atmosphere, and it together with the adjacent openings permit the

full inflow of air into the bottle along the upper side of the drain passage 11.

In addition to the recess 19 of the member 17, I prefer to form a groove 23 which forms a shoulder 24 between it and the valve seat 15 and thus, when the ball 16 is moved to the pouring position illustrated in Fig. 3, the ball is locked against fluctuating movements and is held firmly until there is a positive return of the bottle to upright position.

In the operation of the device, the closure is inserted within a bottle neck, as illustrated in Figs. 2 and 3, after the removal of the original cap of the bottle. As long as the bottle remains in upright position, the ball 16 provides a firm seal for the valve seat 15 and volatile material does not escape from the bottle. The seal is particularly effective when used with bottles containing liquor or alcohol and serves to prevent the escape of the alcohol.

When the bottle is tilted to pouring position, as illustrated in Fig. 3, the ball 16 moves into the recess 19 and rests within the groove 23 which securely holds it against any irregular movements during the pouring operation. Normally, in the pouring of liquids where a ball is employed, the ball tends to rock back and forth and to interrupt the flow of liquid. In the present structure, the groove 23 provides a positive control against such irregular movement and maintains the ball in fixed position until there is a complete tilting of the bottle well toward upright position. In the pouring operation, the deflector flange 21 breaks the flow away from the dome 20 and keeps the dome dry and therefore effective as an eliminator of dust or other material which would otherwise settle thereon.

In the pouring operation, it is not necessary to turn the bottle so as to bring a particular pouring spout into position above the glass because the openings 22 are spaced all the way around the crown member 17 and permit pouring from any angle. At the same time, the openings 22 are effective to serve either as vents or as pouring conduits, depending upon the position of the crown 17; the lowermost openings 22 serve as pouring passages, while the uppermost openings 22 serve as vents and allow at all times a full flow of air into the bottle. It is unnecessary therefore to shake the bottle in any pouring operation because the flow is full and even and there is no difficulty about the inflow of air.

When the bottle is again raised to upright position, the ball 16 leaves the groove 23 and resumes its position in seat 15 where escape of fumes or volatile matter is thereafter prevented.

In the structure shown, the openings 22 are each big enough to embrace a substantial portion of the ball 16 and to hold it firmly in position during the tilting operation. Thus, the openings 22 serve three functions: They provide an outlet aperture for the liquid, they provide inlet passages for the air, and they provide means for holding the ball against rocking movement and against movement back into the seat of the valve during angular tilting movements. If desired, the annular groove 23 may be entirely dispensed with, and the openings 22 relied upon to hold the ball 16 against rolling movement about the valve chamber during the pouring operation or tilting operations. With the structure shown, the annular groove 23 maintains the ball in the most advanced position during the pouring operation, while the openings 22 serve effectively to retain the ball when it is in a slightly tilted posi-

tion approaching the pouring position or approaching the upright position of the bottle.

Some of the subject matter which is disclosed in this application is claimed in applicant's co-pending application, Serial No. 638,031, filed December 29, 1945.

While in the foregoing specification I have set forth certain details of structure as illustrative of one embodiment of the invention, it will be understood that such details may be varied widely by those skilled in the art without departing from the spirit of my invention.

I claim:

1. A bottle closure comprising a casing having a longitudinal drain passage therethrough, said casing having an end portion adapted to be received within the neck of a bottle and the other end portion providing a valve seat in said passage and a chamber enclosing said seat, and a ball in said seat heavier than the liquid in the bottle and adapted to seal the passage when the bottle is in an upright position, said casing being provided above said valve seat with a continuous series of closely-spaced openings extending around the casing, said chamber extending beyond said openings and providing a recess adapted to receive said ball when the bottle is tipped to pouring position without closing any of said openings, said openings being located between said recess and said seat and being large enough to arrest return movement of said ball toward said seat when said bottle is tilted slightly past drain-back position by releasing said ball for return to its seat when a sharper angle of tilt in the drain-back position has been reached.

2. A bottle closure comprising a casing having a longitudinal drain passage therethrough, said casing having an end portion adapted to be received within the neck of a bottle and the other end portion providing a valve seat in said passage, said casing also providing a valve chamber enclosing said seat, and a ball in said seat heavier than the liquid in the bottle and adapted to seal said passage when the bottle is in an upright position, said casing being provided with a continuous series of closely spaced openings about said chamber and also with a groove about said openings, said openings being located between said groove and said seat and providing a means for arresting the return of said ball to said seat even after the bottle has been tilted to drain-back position and until a predetermined angle of tilt in the up-righting of the bottle is reached, said ball lying within the lowermost of said openings during said arresting movement to stop outward flow therefrom.

3. A bottle closure comprising a casing having an end portion adapted to be sealed within a bottle neck, a longitudinal body portion having a drain passage therethrough terminating in a valve seat and an enclosure providing a chamber about said seat, and a ball in said seat heavier than the liquid in the bottle and adapted to seal said passage when the bottle is in upright position, said casing being provided with a continuous series of closely spaced openings encircling said chamber and providing outlets therefrom, each of said openings being large enough to receive said ball and to hold the same firmly when the bottle is being tipped from pouring to drain-back position and to prevent the return of the ball to its seat until the bottle is tilted sharply toward upright position, said chamber being extended beyond said opening to provide a recess to receive said ball and to free said openings for pouring

5

when said bottle is tipped to pouring position, said openings lying between said recess and said seat and the lowermost of which is sealed during said arresting of the ball in its movement toward its seat.

LEO M. MALLICK.

## REFERENCES CITED

The following references are of record in the file of this patent:

## UNITED STATES PATENTS

Number	Name	Date
34,899	Newton -----	Apr. 8, 1862

Number
523,967
540,674
718,801
5 749,117
772,269
788,118
966,084
10 2,177,310

6

Name	Date
Bergman -----	Aug. 7, 1894
Librowicz -----	June 11, 1895
Strauss -----	Jan. 20, 1903
Wagner -----	Jan. 5, 1904
Bailey -----	Oct. 11, 1904
Perotti -----	Apr. 25, 1905
Colvin -----	Aug. 2, 1910
Stephany -----	Oct. 24, 1939

## FOREIGN PATENTS

Number	Country	Date
12,279	Great Britain -----	May 28, 1907