Sept. 30, 1941. R. E. DE KAY 2,257,370

CLOSABLE ORIFICE DEVICE

Filed Sept. 2, 1939

FIG. 1.

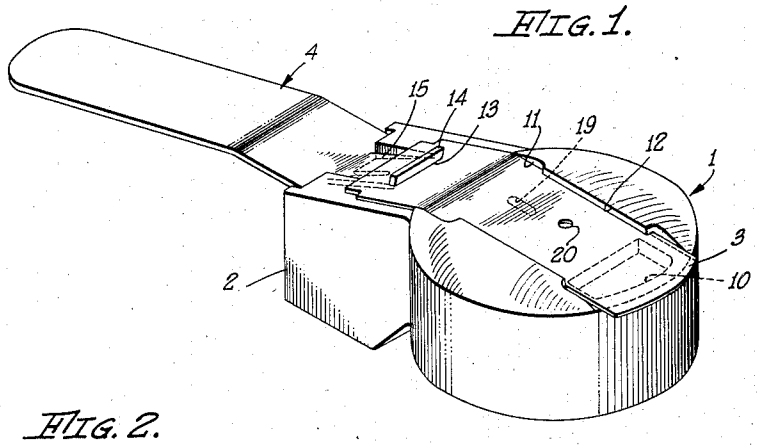



FIG. 2.

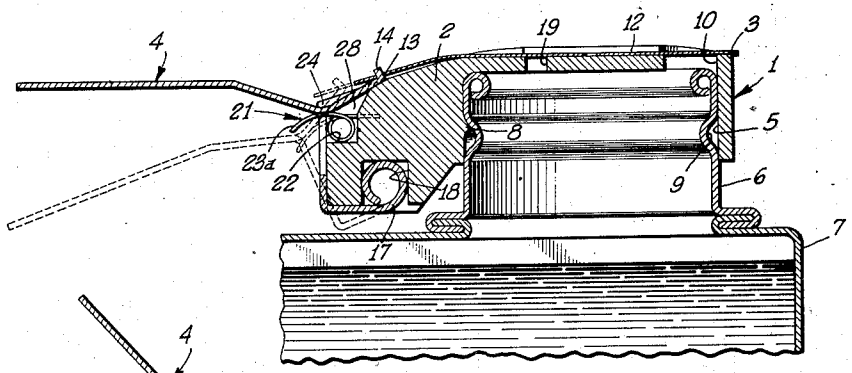



FIG. 3.

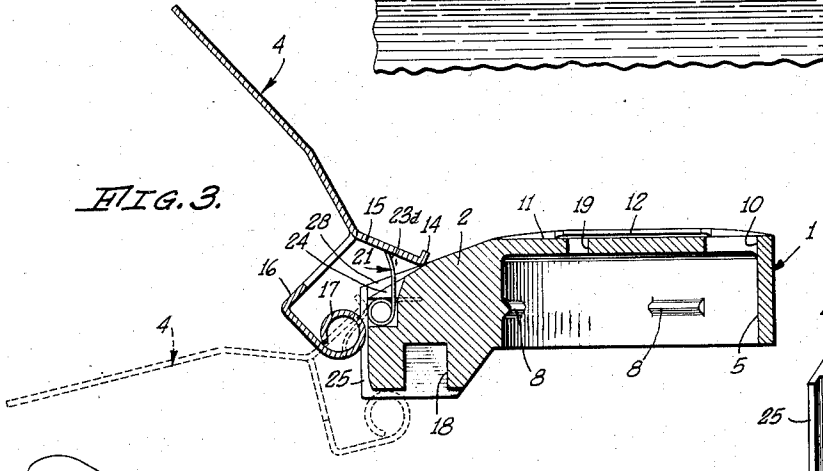



FIG. 4.

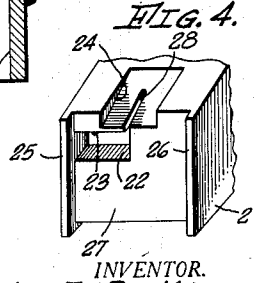
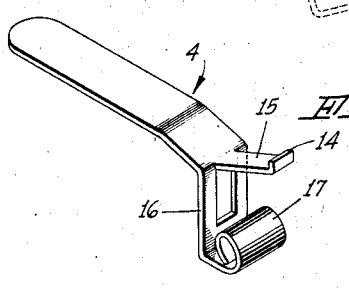



FIG. 5.




INVENTOR.
ROBERT E. DE KAY

BY Harold D. Mattingly

ATTORNEY.

Patented Sept. 30, 1941 2,257,370

# UNITED STATES PATENT OFFICE

2,257,370

## CLOSABLE ORIFICE DEVICE

Robert E. De Kay, Los Angeles, Calif., assignor to Na-Mac Products Corp., Los Angeles, Calif., a corporation of California

Application September 2, 1939, Serial No. 293,210

5 Claims. (Cl. 221—21)

My invention relates to a closure device and has particular reference to a closable orifice device of the class employed for closing the opening in containers in such manner as to permit the withdrawal of the container contents and which finds particular utility when used with containers packaging viscous liquids.

Considerable difficulty has in the past been experienced in pouring liquids from that class of containers having an opening in the top, particularly when the liquid was viscous as in the case of syrup, catsup, and the like. This difficulty arose primarily from the fact that it was virtually impossible to stop the pouring operation without dribbling the liquid down the side of the container, thus imparting a messy appearance thereto and making it impossible to handle the container a second time without getting previously spilled liquid on the hands. As a means for overcoming this difficulty a number of types of closable orifice devices have been proposed which employ a blade-like closure member for closing the orifice and cutting off the flow therethrough cleanly to eliminate drips, and this invention is directed to an improved device of this class which overcomes the disadvantages found in present constructions.

In the present constructions a great number of coacting parts is employed so that the device is expensive to construct and difficult to assemble and disassemble. The present devices are also deficient in that it is very difficult to keep them clean or to clean them after they have become dirty. Because of the relatively large number of parts employed and the attendant difficulty of assembling and disassembling, it has been found to be a considerable task to take one of these devices apart, clean it, and reassemble it.

It is accordingly an object of my invention to overcome the disadvantages found in prior constructions by providing a closable orifice device which employs a minimum number of parts.

It is a further object of my invention to provide a closable orifice device which may be readily assembled and disassembled for cleaning purposes.

It is also an object of my invention to provide in a closable orifice device of the class employing a cap body having a slidable blade mounted therein a means for guiding the sliding movement of the blade comprising a guide channel formed integrally with the cap body.

It is also an object of my invention to provide a device of the character set forth in the preceding paragraphs which includes a spring for holding the blade member in the closed position and in which the spring operates to maintain the parts in their assembled relationship.

It is a further object of my invention to provide a device of the character set forth in the preceding paragraphs which embodies features of construction permitting the blade and operator therefor to be inexpensively constructed by a die stamping operation and which permits the cap body to be inexpensively constructed by a molding operation.

It is a further object of my invention to provide in a device of the character set forth in the preceding paragraphs a means permitting attachment of the device to a great number of sizes and styles of containers.

Other objects and advantages of my invention will be apparent from a study of the following specifications, read in connection with the accompanying drawing, wherein:

Fig. 1 is a perspective view illustrating the appearance of the closable orifice device of my invention;

Fig. 2 is a longitudinal vertical section illustrating the details of construction of the device of my invention and its relationship to a common form of container for liquids when installed thereon;

Fig. 3 is a view similar to Fig. 2 illustrating the manner in which the device of my invention is assembled and disassembled;

Fig. 4 is a fragmentary elevational view of the cap body portion illustrating the construction of the guiding and spring holding recesses; and

Fig. 5 is a perspective view illustrating the appearance and details of construction of a handle member employed.

Referring to the drawing, I have illustrated in Fig. 1 the appearance of the preferred form of my invention. In this form a cap body 1 is provided with an extension portion 2 adapted to coact with the cap body 1 in guiding and supporting for slidable movement a blade member 3, slidable movement being imparted to the blade member 3 by means of an operator 4 which is pivotally supported upon the extension 2.

As illustrated in Figs. 2 and 3, the cap body 1 is provided with an upwardly extending cylindrical recess 5 adapted to fit over the spout portion 6 of a can 7 or the neck or similar part of a bottle or other liquid container. The cap 1 may be secured on the spout portion 6 by providing a number, preferably three, of inwardly

extending projections or bosses 8 adapted to coact with a groove 9 ordinarily formed about the upper portion of the spout 6. The cap may be installed upon the spout 6 by forcing it downwardly thereover, springing the metallic spout 6 inwardly until the bosses 8 seat within the groove 9. In case the spout 6 or the top of a bottle is provided with threads, the cap may be secured thereto by engaging the bosses 8 with the threads and rotating the cap to move it downwardly thereover. The top or ceiling of the recess 5 is provided with an aperture 10 through which the liquid contents of the container 7 may be poured. The orifice 10 may be closed by means of the blade-like closure member 3 which is slidably secured to the upper surface of the cap 1 for movement between a closed position overlying the orifice 10, as illustrated in Fig. 1, to an open position permitting discharge of the liquid contents through the orifice.

I have found that the blade member 3 may be conveniently mounted for slidable movement by providing a slot-like recess 11 transversely across the top of the cap 1, the recess 11 being provided with a width substantially equal to the width of the blade member 3. The blade member 3 may be held within the slot 11 by providing overhanging ledge portions 12 which are preferably formed integrally with the body of the cap 1. The blade member 3 is preferably constructed of very thin spring material having a slight curve along its length so that while the portion which is extended over the upper surface of the cap 1 is held in a substantially straight line by the overhanging flanges 12, the rearward portion thereof will curve downwardly so as to provide an engagement between a transversely extending slot 13 formed in that end of the blade member 3 and an upstanding ear 14 formed on the handle member 4.

The handle member is preferably constructed along the lines indicated in Figs. 2 and 5 and includes, in addition to the handle portion 4, a forwardly extending projection 15 which terminates at its outer end in the aforementioned upstanding ear 14. The handle member also includes a downwardly extending bracket portion 16 which is provided at its lower end with a forwardly extending portion terminating in a cylindrical bearing member 17. As illustrated in Fig. 2 the bearing member 17 is adapted to be received within a rectangular recess 18 formed in the under surface of the cap extension portion 2.

It will be observed that should the handle 4 be pushed downwardly it will pivot about the bearing member 17 so as to move from the position indicated in solid lines in Fig. 2 to a position such as that indicated by dotted lines in this figure. It will be observed that this movement of the handle 4 will cause a rearward movement of the ear 14 and through its engagement with the notch 13 in the blade member 3 cause sufficient retraction of the blade member to open the orifice 10 to permit discharge of the liquid contents of the container 7.

Pouring of the contents of the container may be facilitated by providing also through the ceiling portion of the recess 5 an air vent 19 which is disposed in a position to register with a corresponding air vent 20 provided in the blade member 3 when the blade member is retracted to an opened position.

I prefer to provide a spring 21 which coacts with the extension portion 2 of the cap and the handle 4 to return the handle to its uppermost position and move the blade member 3 to the closed position whenever pressure is removed from the handle so as to maintain the blade member 3 in the closed position and prevent accidental discharge of the container contents. The spring 21 is preferably of the coil-torsion variety and is received within a rectangular recess 22 formed in the rearward end of the extension portion 2. One end of the coil spring may be received in a bore 23 provided in the inner surface which defines the recess 22 and the other end 23a of the spring is preferably disposed in a position to engage the handle member 4 at substantially the junction between the horizontal portion 15 and the vertical portion 16 thereof.

The handle 4 may be held in an aligned position and against lateral movement by providing a sloping slot or recess 24 in the upper surface of the extension portion 2 which has a width and is so disposed as to receive the horizontal extension portion 15 of the handle member 4. I also prefer to provide a pair of rearwardly extending flange members 25 and 26 which operate to define a vertical recess 27 having a width substantially equal to the width of the vertical portion 16 of the handle member 4 so that the engagement between this portion and the recess 27 will also tend to prevent lateral movement of the handle 4 relative to the cap.

I have illustrated in Fig. 3 the manner in which the structure just described may be assembled. In performing the assembly operation the spring 21 is placed within its recess 22, the one end of said spring being inserted in the bore 23 provided therefor. In order that the spring may be inserted without overcoming the tension thereof, I provide a vertically extending slot 28 which is centrally disposed so as to receive the other end 23a of the spring when the spring 21 is placed within its recess 22. Then the handle member 4 may be installed by placing the end of the horizontal extension 15 in the forward portion of its recess 24. The handle member 4 and the spring 21 will then occupy the positions illustrated in Fig. 3. The handle may then be moved downwardly so as to tension the spring 21 and move the bearing member 17 downwardly along the recess 27 and then rearwardly along the under side of the extension portion 2 until it seats within its recess 18, at which time the spring 21 will have been moved into proper coacting position with the handle member 4 to immediately return the handle member 4 to its regular closed position as illustrated in Fig. 2. The blade member 3 may then be slid through the slot 11 and, by virtue of the resilience of the material employed, be lifted over the upstanding ear 14 until it has been moved into a position registering the slot 13 with this ear. The resilience of the blade member 3 will then operate to establish the proper engagement between the ear and this slot. It will be observed that the device may be disassembled as readily by reversing the above described operation.

It will be observed that the novel device just described employs only three parts in addition to the molded cap member 1, these parts being the blade member 3, the handle member 4, and the spring 21 therefor. Attention is called to the fact that the construction illustrated eliminates the use of hinges and securing means for holding the parts in their relative positions, the spring 21 serving the dual function of automatically returning the blade member 3 to its closed posi-

tion and holding the blade member, handle, and cap in their proper relative positions.

I have found that the handle member 4 and the blade member 3 may be readily and inexpensively constructed by a die stamping operation and that the employment of a molded plastic for the cap member 1 and its integral extension 2 permits the formation of the various slots, recesses, flanges, and ledges to be accomplished in an inexpensive and simple manner.

While I have shown and described the preferred embodiment of my invention, I do not desire to be limited to any of the details of construction shown or described herein, except as defined in the appended claims.

I claim:

1. In a closable orifice device including a cap member having means for attachment to the open end of a container and defining an orifice through which contents of said container may be discharged, a closure member on the upper surface of said cap member movable to open and close said orifice, and a handle for so moving said closure member, the combination of: means defining a socket in the under side of said cap member; and an extension on said handle member terminating in an integral cylindrical bearing portion, said bearing portion being removably received in said socket and engaged with the walls thereof as a bearing to permit pivotal movement of said handle thereabout.

2. In a closable orifice device including a cap member having means for attachment to the open end of a container and defining an orifice through which contents of said container may be discharged, a closure member on the upper surface of said cap member movable to open and close said orifice, and a handle for so moving said closure member, the combination of: means defining a socket in the under side of said cap member; and an extension on said handle member terminating in a cylindrical bearing portion received in said socket and engaging the walls thereof as a bearing permitting pivotal movement of said handle thereabout.

3. In a closable orifice device including a cap member having means for attachment to the open end of a container and defining an orifice through which contents of said container may be discharged, a closure member on the upper surface of said cap member horizontally slidable to open and close said orifice, and a handle for so sliding said closure member, the combination of: an upper extension formed integrally with said handle member and terminating in a lug portion; an opening in said closure member for receiving said lug; means defining a socket in the under side of said cap member; and a lower extension on said handle member terminating in a cylindrical bearing portion disposed below said lug and received in said socket for engaging the walls thereof as a bearing, whereby pivotal movement of said handle thereabout moves said lug horizontally to slide said closure member and open and close said orifice.

4. In a closable orifice device including a cap member having means for attachment to the open end of a container and defining an orifice through which contents of said container may be discharged, a closure member horizontally slidable to open and close said orifice, and a handle for so sliding said closure member, the combination of: an upper extension formed integrally with said handle member and engaged with said closure member; a lower extension also formed integrally with said handle member and terminating in a cylindrical bearing member disposed below said upper extension; a bearing socket formed in the under side of said cap member for receiving said bearing member; a recess in said cap member; and a spring disposed in said recess and engaged with said handle member for moving said handle member to a position corresponding to the closed position of said closure member and for normally urging said handle member upwardly to maintain said bearing member in continuous engagement with said bearing socket.

5. In a closable orifice device including a cap member having an orifice therein and carrying a closure member movable to open and close said orifice, the combination of: a handle for so moving said closure member; a bearing construction for pivotally supporting said handle on said cap member comprising a cylindrical bearing member on said handle and means defining a bearing receiving socket in said cap member for removably receiving said bearing member, said socket being of such shape that the walls thereof engage three sides of said bearing member, whereby said bearing member may be removed from said socket by sliding said bearing member outwardly towards the end of the socket, and a spring interposed between and engaging said cap member and said handle, said socket and said bearing member being so positioned with respect to the cap member and to one another as to permit the spring to urge said bearing member inwardly into said socket and to urge said handle in a direction to move said closure member to a closed position.

ROBERT E. DE KAY.