May 9, 1933. J. P. BURKE 1,908,113

CLOSURE

Filed Jan. 15, 1932

Fig. 1

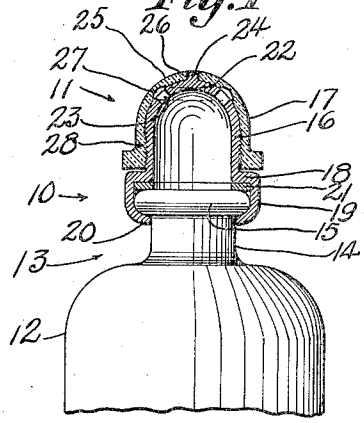


Fig. 2

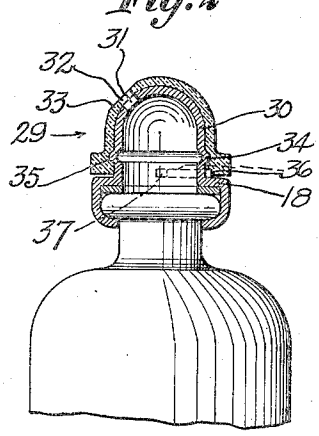


Fig. 3

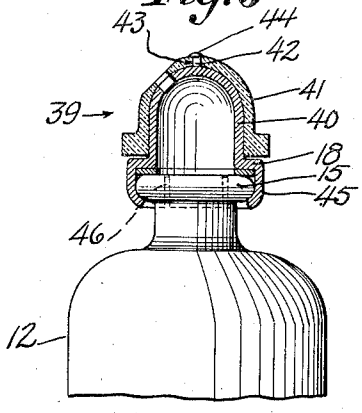


Fig. 4

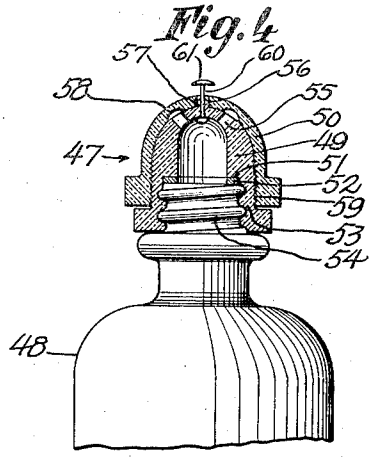


Fig. 5

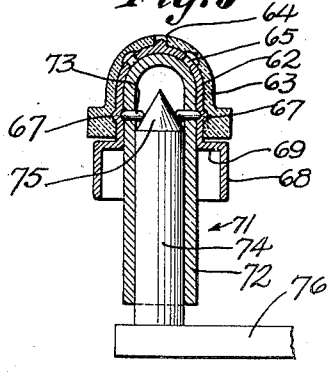


Fig. 6

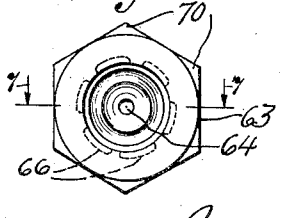
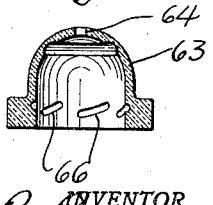


Fig. 7



James P. Burke INVENTOR

BY Mis Schumacher

ATTORNEY

Patented May 9, 1933 1,908,113

UNITED STATES PATENT OFFICE

JAMES P. BURKE, OF WAYNE, NEW JERSEY, ASSIGNOR TO KEPT-KAPT, INC., OF KNOXVILLE, TENNESSEE, A CORPORATION OF DELAWARE

CLOSURE

Application filed January 15, 1932. Serial No. 586,781.

This invention relates to closures.

One object of the invention is to provide a device of the character described having improved closure means particularly adapted for attachment in normally rigid relation to a container such as a glass bottle, or the like, and said closure means having inner and outer interrelatively movable parts for controlling a flow of material in the container.

Another object of the invention is the provision of closure means for a container, which closure means includes inner and outer cap members of which the latter is journaled upon the former for opening or closing action by a rotary movement therebetween, the closure means being arranged to function as a unit in permanent or detachable connection with a rigid container portion.

Another object of the invention is to furnish an improved closure means which has a plurality of interrelatively movable parts having threadlike engagement for combined rotary and axial movement, the engagement being such that the parts cannot be separated, and the engagement being arranged with respect to an outside fixing or indicator portion on the outer part of the closure means.

Another object is to provide an improved closure means and mounting therefor having few and simple parts, and which is inexpensive to manufacture, durable, reliable, and efficient in use.

Other objects and advantages of the invention will become apparent as the specification proceeds.

With the aforesaid objects in view, the invention consists in the novel combinations and arrangements of parts hereinafter described in their preferred embodiments, pointed out in the subjoined claims, and illustrated on the annexed drawing, wherein like parts are designated by the same reference characters throughout the several views.

In the drawing:

Figure 1 is a view in vertical section with a fragmentary part in elevation, showing a device embodying the invention.

Fig. 2 is a similar view showing a modified permanently connected closure means having an internal re-enforcing interlocking portion.

Fig. 3 is a similar view showing a modified closure means having the parts thereof interconnected as a unit.

Fig. 4 is a similar view showing a modified closure means having a demountable interconnected unit.

Fig. 5 is a vertical sectional view showing a method of making a modified interconnected closure means.

Fig. 6 is a bottom plan view of an outer cap member used in the method of Fig. 5.

Fig. 7 is a vertical sectional view taken on line 7—7 of Fig. 6.

With the aforesaid objects in view, the invention consists in the novel combinations and arrangements of parts hereinafter described in their preferred embodiments, pointed out in the subjoined claims, and illustrated on the annexed drawing, wherein like parts are designated by the same reference characters throughout the several views.

It will be obvious to those skilled in the art to which this invention appertains, that the same may be incorporated in several different constructions. The accompanying drawing, therefore, is submitted merely as showing the preferred exemplification of the invention.

Referring in detail to the drawing, 10 denotes a device embodying the invention. The same includes a closure means 11 arranged preferably for improved or permanent connection with a container 12, whereby the contents of the latter, which may be liquid or plastic may be slowly removed from the container, and at any adjusted rate of speed. Said container may have a rigid connecting portion 13 which may include a neck 14 and an annular outwardly projecting lip 15, while the body of the container may be pliable, and preferably rigid as by being made of glass, or the like. The closure means 11 may include inner and outer cap members 16, 17 arranged in cooperative relation, and one of the members such as the inner cap member having a circular laterally formed seating portion 18 coacting with the lip 15,

and a depending annular flange 19 which is preferably engaged around and under the lip as at 20 for engagement therewith. To afford a fluid-tight connection a yielding packing element 21, such as a cork ring may be disposed on the end surface of the lip 15 and the portion 18 seated thereon, said ring being compressed by tension of the flange 19 which may be spun or forced around said lip.

The closure means 11 can be embodied in various constructions, and in the specific form shown, the inner cap member may have a hemi-spherical end wall 22 provided with one or more outlets 23 and an axial valve projection 24. The outer cap member may have a corresponding hemi-spherical end 25 adapted to uniformly seat on the inner cap member, and a central opening 26 for receiving the valve element 24. Adapted to communicate with the openings 23 is an annular groove 27 formed in the seating surface of the inner cap member in proximity to said openings. In the closed position of the device shown in the drawing, the openings 23 are closed by reason of the snug seating engagement around the groove 27, and the opening 26 is shut tight by the valve 24, affording a double closure action. Said openings are opened by causing a simple interrelative axial movement of the cap members in a suitable manner, as by a coarse threaded engagement 28. The inner cap member may be made of metal, and the outer cap member of a moldable material such as a resin or other composition.

In Fig. 2 is shown a modification of the invention including a closure means 29 having a plurality of interrelatively movable cap members constituting a unit permanently mounted on a container such as 12, according to the general principle hereinbefore disclosed. The closure means may be of different construction and utility, having an inner cap member 30 having an opening 31 on the circular portion thereof spaced from the axis thereof, and the outer cap member having a corresponding opening 32 leading to an outer plane beveled surface 33 for a quick cut off. The openings are controlled by rotating the outer cap member on the inner cap member. Said cap members are preferably permanently interconnected as by outwardly pressing an annular rib 34 in the inner cap member into engagement with a corresponding groove 35 in the outer cap member. The rib 34 may be in relative proximity to the base of the outer cap member to constitute a reenforcement for the seating portion 18. In order to limit the rotary movement of the outer cap member the same may have an arcuate recess 36 for receiving a suitable projection 37 of the inner cap member to stop the communicating relation of the openings 31, 32.

In Fig. 3 is shown another modification of the invention including a closure means 39 having inner and outer interrelatively movable cap members which may constitute a suitably preferably permanently interconnected unit, detachably mounted on a container such as 12. The closure means may be similar to that shown in Fig. 2, except that the inner and outer cap members 40, 41 may be permanently axially interconnected, as by a pin-like projection 42 extending from the inner cap member through an opening 43 in the outer cap member and having a head 44 engaged around and over said opening. The element 42 may be integral with or separate of the inner cap member and the head 44 can be made in any suitable manner, as by being preformed, or by being pressed or spun. For mounting the closure unit 39 on the container 12, the inner cap member may have a depending circular flange means 45 extending from the seating portion 18, and which flange means may be vertically split as at 46 to provide resilient sections therebetween for snapping over and around the lip 15 into detachable interengagement with the container.

In Fig. 4 is shown a modification of the invention including a closure means 47 having a plurality of interrelatively movable cap members arranged as a unit detachably mounted on a container 48. The closure means may be generally similar to that shown in Fig. 1, and includes inner and outer cap members 49, 50 made of any suitable or composition material, the inner cap member having a seat at 51 for a packing 52 resting on the container, and a threaded portion 53 engageable with a threaded neck 54 of the container. The inner cap member may have one or more openings 55 spaced from its axis, and the outer cap member may have an axial opening 56 for coacting with a corresponding valve portion 57 of the inner cap member. An annular groove 58 may be provided to facilitate the closure of the device. The openings 55, 56 are controlled by axial movement of the outer cap member on the inner cap member, such as may be caused by a threaded engagement at 59. In order to limit the axial movement of the outer cap member, an element 60 may be connected detachably or otherwise to the inner cap member so as to extend through the opening 56, and having a narrow elongated head 61 adapted to act as a stop by engaging the outer cap member around said opening 56.

In Figs. 5 to 7 is shown another modification of the invention and a method of making the same. This may include an inner cap member 62 made of a pliable or ductile soft metal, and an outer cap member 63 of rigid molded or cast construction, said members having outlet openings 64, 65 controlled as above described. In order to cause an in-

terrelative axial movement between the cap members, a threadlike structure is employed which is preferably so arranged that the members cannot be separated from each other. Accordingly the outer cap member may have one or more preformed grooves 66 which are inclined and are closed ended and extend in a circular series. The inner cap member may have one or more projections or tits 67 engaged in certain of said recesses 66. Hence a slight turn of the outer cap member is sufficient to open the device. Thus the closure means constitutes a permanently interconnected unit that can be detachably or permanently connected to a container, as by a depending flange 68 extending from a seating portion 69 as hereinbefore described.

It will be particularly noted that the outer cap member has one or more irregular or indicator portions 70 with respect to which the grooves 66 are related in predetermined position. Preferably an even number of the grooves are provided in regularly angularly spaced relation, and there being two opposite projections 67 extended into any corresponding two of said grooves, whereby the process of making the closure device is facilitated.

The method of making the device shown in Figs. 5 to 7 will now be described. Taking the parts as shown in Fig. 5, a suitable tool such as 71 is inserted into the inner cap member. This tool may include an outside sleeve 72 whose end conforms to the inside of the inner cap member, and having a plurality of pins 73 slidingly mounted in the wall thereof for projection by a member 74 having a conical drive portion 75. The tool 71 may be actuated by a means 76 to cause an axial force on the element 74 for projecting the pins and forming the portions 67. By virtue of the irregularities 70, the recesses 66 being in predetermined relation thereto, and hence to the tool 71, the force of the pins 73 is always exerted in proper relation to the recesses. The method described can be used for interconnecting various types of elements sleeved upon one another for relative rotary and axial limited movement.

It will be appreciated that various changes and modifications may be made in the device as shown in the drawing, and that the same is submitted in an illustrative and not in a limiting sense, the scope of the invention being defined in the following claims.

I claim:

1. The combination with a container having a neck and an annular projection connected thereto, of a closure means for the container including an inner one piece cap member and an outer cap member journaled thereon, the cap members having openings adapted to communicate or to be cut off from communication with each other by a relative movement between the cap members, the inner cap member having a depending annular flange engaged around the annular projection of the container.

2. The combination with a container having a neck and an annular lip forming a seat at the end of the neck, of an inner cap member of thin sheet metal seated upon said lip and having a depending circular flange engaged around said lip for holding the cap member on the container, and an outer cap member connected to the inner cap member and movably seated thereon, said cap members being each dome shaped and having openings at the domes controlled by the relative movement between the cap members.

3. The combination with a container having a portion provided with an annular end lip, of an inner cap having a circular outwardly extending portion seated on the end of the lip, said circular portion having a depending annular flange rigidly engaged around and under the lip to hold the inner cap thereon, and an outer cap movably seated on the inner cap, said outer cap extending into proximity to said circular portion, the inner and outer caps having openings controlled by movement of the outer cap upon the inner cap, said inner and outer caps having otherwise closed ends.

4. The combination with a container having a portion provided with an annular end lip, of an inner cap having a circular outwardly extending portion seated on the end of the lip, said circular portion having a depending annular flange rigidly engaged around and under the lip to hold the inner cap thereon, and an outer cap movably seated on the inner cap, said outer cap extending into proximity to said circular portion, the inner and outer caps having openings controlled by movement of the outer cap upon the inner cap, and said inner cap having an annular ridge in the wall thereof and the outer cap having a groove for the same, said annular ridge holding the outer cap rotatably on the inner cap, said annular ridge being in reenforcing proximity to said circular outwardly extending portion.

5. The combination with a container having an annular outwardly extending lip, of an inner cap member rigidly secured to the container, and an outer cap member movably mounted on the inner cap member in spaced relation to the container, said inner cap member having a seating portion, a sealing material between the lip and the seating portion, said seating portion having an annular depending flange engaged around the lip for securing the inner cap member thereto and pressing the seating portion toward the lip, the cap members having interengaging means whereby the outer cap member is maintained for sliding movement along the wall of the inner cap member, said cap members being each of one piece construction and having

dome shaped end walls having openings controlled by moving the outer cap member.

6. The combination with a container having an annular lip, of closure means including inner and outer cap members, the inner cap member having an annular outward extending shoulder seated on said lip, and a depending flange engaged around and under said lip, the outer cap member being located above said shoulder and journaled on the inner cap member, and connecting means between said cap members including a groove in one of the cap members and a projection on the other cap member extending into said groove for rotatably holding the cap members in engagement with each other, and said cap members having eccentric openings movable into and out of registry with each other upon rotation of the outer cap member, and said openings being located above the connecting means.

In testimony whereof I affix my signature.

JAMES P. BURKE.