June 10, 1958 C. B. KINLEY 2,838,213

CONTAINER AND RESILIENTLY SUPPORTED CLOSURE MEMBER THEREFOR

Filed Aug. 12, 1954

FIG. 1.

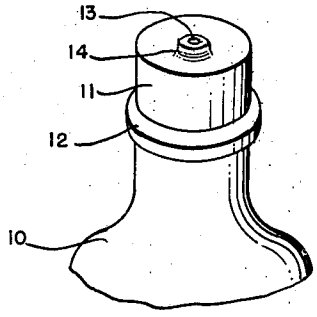


FIG. 2.

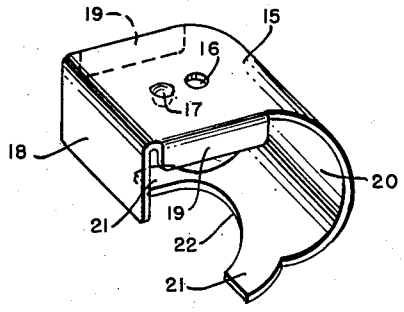


FIG. 3.

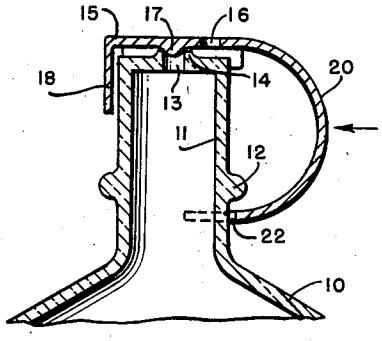
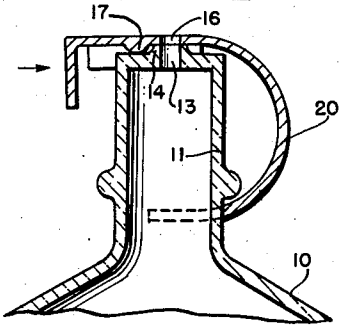


FIG. 4.



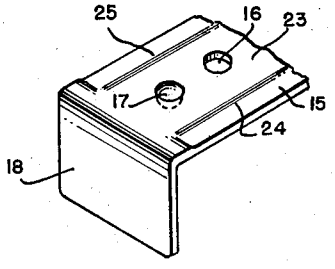


FIG. 5.

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United States Patent Office 2,838,213 Patented June 10, 1958

2,838,213

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Application August 12, 1954, Serial No. 449,475

2 Claims. (Cl. 222—498)

The present invention relates to dispensing devices and is more particularly concerned with a novel container and closure therefor whereby the said container may be readily and positively opened or closed for selective dispensing. In particular, the present invention comprises an improvement in the structure originally disclosed and claimed in my prior U. S. Patent No. 2,620,098, issued December 2, 1952, for Bottle Cap with Outlet Means and Having a Resiliently Supported Closure Member.

As was discussed in my said prior patent, it is known to provide containers having a cap defining a normally closed outlet port which may conveniently be opened by pressing a resilient element located adjacent thereto. For the most part, the closures of this general type have, of necessity, included a removable cap with which the resilient element has been operatively associated. Without such a cap, or without appropriate retaining means on the container itself, the closure member or resilient element would not, in fact, stay on the container. Further, closures of this general type have, in the past, ordinarily been capable of placement upon a container in a single predetermined position only, and deviation in position from the said single predetermined position has either seriously affected the operability of the closure device or has, in fact, rendered it completely inoperative. This often proves to be a pronounced disadvantage in dispensing applications wherein it is desired, or necessary, to have the closure device assume different positions with respect to a container. Thus, while prior art closures of the type disclosed in my prior U. S. Patent No. 2,620,098 have, for the most part, operated in a relatively efficient manner, the operation has in fact been limited in the foregoing respects because of the inherent design of the closure member. The improved container and closure of the present invention serves to overcome such limitations in permissible operation.

It is, therefore, an object of the present invention to provide an improved form of resilient closure member cooperating preferably with a container structure of novel design to permit selective dispensing from the said container structure.

Another object of the present invention resides in the provision of a novel container having improved closure means.

A further object of the present invention resides in the provision of a resilient closure member which may serve to open or close a container without being removed therefrom. In this respect, it is one purpose of the present invention to provide such a closure member which is so designed that it will not slip off a container during operation and which will, in fact, be maintained in position by the resilient forces exerted by the closure member itself.

Still another object of the present invention resides in the provision of a container defining an outlet port and having a readily removable resilient closure member of novel construction cooperating with the said port.

A still further object of the present invention resides in the provision of a novel container and/or closure member which may be manufactured inexpensively by known techniques.

It is still another object of the present invention to provide a novel container cooperating with a resilient closure member placed directly upon the said novel container. In this respect it should be noted that in accordance with the present invention the said closure member may be placed at a plurality of positions with respect to said container, and may in fact be rotated through a full 360 degrees about the longitudinal axis of the said container without affecting the opening or closing functions of the said closure member.

Other objects and advantages of the invention will appear as the description proceeds. In essence the improved container and closure of the present invention preferably comprises a container defining a restricted outlet port. In practice, the said port may be integrally formed as a portion of the container in a part thereof which is perhaps restricted in cross-dimension, such as the neck of a bottle or collapsible tube. The said outlet port further defines either a rim or groove adjacent thereto, or other appropriate abutment means, which serves to cooperate with the closure of the present invention thereby to hold the said closure in an open or closed position depending upon the direction of pressure selectively and temporarily applied to predetermined portions of the said closure member to cause operation thereof. The closure member itself preferably comprises a substantially flat portion defining an outlet aperture and an indent member adjacent thereto. A portion at least of the said closure is of resilient material whereby the said closure member may be located in plural predetermined and selective positions with respect to the outlet port of said container. The closure member is further so constructed that it is maintained in position upon the container device by resilient forces of the closure member itself and in this respect, the said improved closure member of the present invention preferably defines a pair of spaced side flanges or an elongated channel bearing upon opposed surfaces of a container whereby the said closure is prevented from slipping off the said container during normal operation thereof. The said closure member is further so constructed that it may be placed at a plurality of distinct positions with respect to the outlet port of said container without detracting from the operation of the said closure.

The foregoing objects, advantages and construction of my device will be more readily seen from the following description and accompanying drawings, in which:

Figure 1 represents a portion of a novel container in accordance with one form of the present invention;

Figure 2 is a perspective view of a resilient closure member in accordance with one form of the present invention;

Figure 3 is a cross-sectional view of a container and closure member of the types shown in Figures 1 and 2 wherein the said container is closed by said closure member;

Figure 4 is a cross-sectional view of a container and closure member of the type shown in Figures 1 and 2 in which said container is opened by said closure member; and

Figure 5 is a perspective view of a portion of a resilient closure member in accordance with a further embodiment of the present invention.

Referring now to the several figures, like numerals of which refer to like parts throughout, it will be seen that a container in accordance with the present invention comprises a main contents holding portion **10** which may take the form of a bottle, collapsible tube, etc., and one end of the said container portion **10** is preferably reduced in cross-section to define a neck **11**. The said neck **11** further defines an outstanding annular collar **12** at a position removed from the free end thereof, and the said free end of neck **11** is in turn closed except for a substantially

central aperture 13 which acts as an outlet port for the contents of container 10. Adjacent said outlet aperture 13, the neck 11 further defines an upstanding rim 14 and the said rim 14 extends around the external periphery of port or aperture 13, as shown.

The above described construction thus provides a container member which is preferably completely closed except for a single outlet port located substantially centrally at one end of the said container, and the said port is completely surrounded by an upstanding ridge-like portion. While the collar 12 and rim 14 may be formed integrally on the container 10, it should be noted that, in accordance with the present invention, the portions 12, 13 and 14 may be formed, for instance, as raised portions on the external surface of a removable cap whereby the present invention may be practiced in conjunction with other forms of containers such as conventional bottles or jars which normally require screw type closure caps of known internal configuration.

Referring now to Figure 2, it will be seen that the closure member of the present invention, serving to cooperate with a container or cap structure such as has been described above, preferably comprises a first substantially flat portion or member 15 defining an outlet aperture 16 therein. Adjacent the said aperture 16 and spaced therefrom on the lower surface of the member 15 is a downwardly projecting indent 17, preferably defining a substantially spheroidal or smoothly curved lower surface. The member 15 further defines a front portion or flange 18 extending downwardly and substantially at right angles to the said portion 15 and preferably integrally formed therewith. The sides of the member 15 further define downwardly extending side portions or flanges 19, again formed at substantially right angles to the portion 15 and at right angles to the front portion 18. The portions 19 act as flange members extending adjacent opposed surfaces or sides of the neck 11 of container 10 and serve to restrict the lateral movement of the closure member with respect to the said container device. Thus the portions 15, 18 and 19 define a semi-box-like structure capable of surrounding the neck 11 on three sides and containing an outlet aperture 16 and a downwardly projecting indent 17 within the confines thereof.

Opposite the front portion 18 and attached to the portion 15, preferably by integral construction, is an elongated resilient member 20 having a pair of spaced elongated portions 21 defining a smoothly curved surface 22 therebetween. While Figure 2 indicates that the portions 21 may extend outwardly so that their spacing is greater than the width of resilient member 20, the construction of this portion of my closure member may be varied in accordance with the dimensions of the container. Thus, portions 21 may be formed as linear extensions of member 20, and surface 22 will then be formed so as to define an arc having a chord less in dimension than the width of member 20.

In practice, the closure member shown in Figure 2 may be of one-piece construction and may be fabricated of materials such as spring brass, steel, or other resilient materials such as known plastics. It is contemplated, however, that the said closure member shown in Figure 2 may be formed of several independent portions joined together, and when this latter construction is in fact utilized only the portion 20 need be of resilient material.

As will appear subsequently, the curved surface 22 is adapted to conform to the external peripheral surface of the neck 11 of container 10 (or to the external surface of a cap member placed upon a container of conventional configuration) and the said surface 22 and spaced portions 21 are normally located below the collar 12. When so placed upon the container, the closure member is thus maintained in place by the resilient force exerted by the portion 20, and a stable configuration is achieved by the confining functions of portion 18 and flanges 19 adjacent the upper end of the neck 11, by the spaced members 21 and the curved portion 22 acting upon the neck 11 below the collar 12, and by the action of indent 17 in respect to rim or ridge 14.

Referring now to Figures 3 and 4, it will be seen that when the closure member is placed upon the container 10, the curved portion 22 fits thereon below the collar 12 and the front portion 18 is so located with respect to the upper end of the neck 11 that the downwardly extending indent 17 is seated within the rim 14 thereby to close off the outlet port 13. Because of the substantially spheroidal shape of the indent 17, the said indent is seated tightly within the rim 14 and this condition is maintained even though there may be some variation in the tension and alignment in the overall resilient closure member. To open the container 10, pressure may be exerted upon the portion 20 with the thumb or finger, in the direction of the arrow shown in Figure 3, whereby the said flat portion 15 and the indent 17 are urged away from the interior of rim 14 and port 13. The indent 17 is thus slid over the top of the upstanding rim 14 until it snaps into position adjacent the external periphery thereof, as is shown in Figure 4. When such a condition is attained, the outlet aperture 16 in the closure member is moved into alignment with the outlet port 13 in container 10, and this position is again positively maintained by the resilient forces of the portion 20 acting via curved portion 22 upon the neck 11 and via the indent 17 upon the external periphery of the upstanding rim 14. In the closure positions shown in both Figures 3 and 4, the side members or flanges 19 and the spaced elongated portions 21 may bear upon the complementary portions respectively of the neck 11 adjacent thereto to prevent the resilient closure member from snapping completely off of the said container. Thus, the closure member of the present invention is, by its very construction, retained upon the container 10. When the container 10 is opened by the closure member, as is shown in Figure 4, it may be reclosed by exerting a further pressure upon the downwardly extending front portion 18, as shown by the arrow in Figure 4, whereby the indent 17 is again caused to ride over the upstanding edge of rim 14 and to seat itself within the rim 14 and over the outlet port 13.

Thus, the container and closure structure of the present invention are of such construction that, by the pressure of thumb or finger, the said container may be quickly and positively opened or closed and the opened or closed state will be positively maintained until an opposing pressure is applied. Again, it should be noted that the closure member holds itself upon the container by the particular construction thereof and by the inherent tension therein. In practice, the spring tension of the overall closure member or of the resilient portion 20, should be such that the closure member can be slipped over the neck of the container or over the cap device utilized and under the collar 12 without exceeding the elastic limit of the material, but at the same time the said closure member should have sufficient inherent tension to hold it tightly over the outlet port 13 when it is in fact in a closed position.

Inasmuch as the outlet port 13 in the container 10 or in a cap device utilized in conjunction with a conventional container is located substantially centrally of the top of the said container and further, inasmuch as the portion 22 conforms to a substantially large curved surface and is maintained in place adjacent the container 10 by resilient force only, it should be noted that the closure member is not restricted to any predetermined position and may in fact be rotated through 360 degrees with respect to the neck 11 without affecting the opening and/or closing functions of the said closure member.

While I have described a preferred embodiment of my invention, it should be noted that many variations can be made in the container and/or closure structure without departing from the spirit of my invention. Thus, refer-

ring to Figure 5, it will be seen that rather than providing the side members or flanges **19** which are adapted to bear upon the external surfaces of neck **11**, as has been discussed in reference to Figure 2, the function of the said side members or flanges **19** may be provided by an elongated channel formed in the flat portion **15** of my closure member. As is illustrated in Figure 5, the said channel may be formed by pressing a raised elongated portion or channel **23** into the top of member **15**, the said portion **23** preferably defining elongated curved sides **24** and **25** as shown. The distance between the said sides **24** and **25** is preferably so chosen that the raised portion **23** may slide freely with respect to the rim **14** located adjacent the free end of the container shown in Figure 1. Thus, in this particular embodiment of my invention, lateral movement of my closure member is prevented by the pressure of sides **24** and **25** upon the external periphery of the rim **14** rather than by the pressure of side portions **19** upon the external surfaces of neck **11**. Thus, the closure member will again be retained by its inherent construction upon the container, as has been discussed previously.

It will be readily obvious to those skilled in the art that rather than pressing portion **23** into member **15** whereby curved sides **24** and **25** are formed, the portion **23** may in fact take the form of a true straight-sided channel raised above the major plane of portion **15**. Even further modifications will suggest themselves to those skilled in the art. Thus, rather than providing an outwardly projecting collar **12** on the neck **11**, as has been shown in Figure 1, the function of the said collar may be performed by an inwardly extending annular groove. Moreover, rather than providing an upstanding rim **14** adjacent the outlet port **13**, a depressed circular groove may be provided in the top of the neck **11** surrounding the outlet port **13**. Each of these modifications in structure will still permit a complete 360 degree rotation of the closure member with respect to the neck **11** or the cap closing a container **10**, and will at the same time retain the closure member in place with respect to the neck **11** in both an open and closed position. As has been mentioned previously, the closure member may be of one-piece construction or may in fact comprise several pieces interconnected with one another. While the resilient portion **20** of the closure member has been shown as a continuously downwardly extending portion, the resilient characteristics of the overall closure member may be altered as desired by changing the shape of the said member **20** and in this respect, for instance, a loop portion may be formed adjacent either the top or bottom of the portion **20** to give additional resiliency, as is shown in my prior Patent No. 2,620,098.

Again, while it is preferred to utilize the closure member of the present invention in conjunction with a substantially cylindrical container, the container may in fact take a plurality of other configurations and may indeed be of square cross-section without detracting from the inherent operation of the closure member. Still further modifications will suggest themselves to those skilled in the art, and it is to be understood that the foregoing description is meant to be illustrative only and not limitative of the true scope of my invention.

Having thus described my invention, I claim:

1. A dispensing device comprising a container having a neck defining an outlet port substantialy centrally located in a free end thereof, first abutment means integrally formed on said neck and surrounding said outlet port, second abutment means integrally formed on said neck and surrounding said neck at a location spaced from said free end, a closure comprising a substantially flat structural portion defining an outlet aperture therein and further defining indent means adjacent said aperture, said indent means adapted to seat selectively over said outlet port thereby to close said container and being further adapted to bear selectively upon a portion of said first abutment means whereby said outlet port and said outlet aperture are brought into alignment thereby to open said container, said flat structural portion having downwardly extending first and second parallel flanges slidably bearing simultaneously on first and second opposite surfaces of said neck adjacent said outlet port, said flat structural portion including a downwardly extending third flange selectively bearing on a third surface of said neck between said first and second flanges, said closure further including an elongated resilient member affixed at one of its ends to said flat structural portion and defining a pair of spaced elongated portions at the other of its ends, said spaced elongated portions being located adjacent opposing surfaces of said neck and defining an arcuate bearing surface therebetween which bears resiliently upon the external periphery of said neck between said first and second flanges below said second abutment means on a fourth surface of said neck opposite to said third surface.

2. A dispensing device comprising a container having a substantially cylindrical neck, said neck defining a substantially circular free end having an outlet port of restricted dimension substantially centrally located in said circular free end, first substantially circular abutment means completely surrounding said outlet port and located on the said free end of said neck entirely within the circular periphery thereof, second substantially circular abutment means completely surrounding said substantially cylindrical neck and located at a position removed from the free end thereof, a closure member comprising a substantially rectangular closure surface slidable substantially in a single plane and having flanges extending substantially orthogonal thereto on three sides thereof whereby two of said flanges are substantially parallel to one another, the third of said flanges being disposed at substantially right angles to each of said two parallel flanges and being adapted to abut a surface of said neck between said two parallel flanges, said flanges being adapted to restrict the slidable movement of said rectangular closure surface with respect to the said free end of said neck to substantially a single direction in said single plane, said rectangular closure surface defining an indent member and an outlet aperture colinear with one another on a line substantially equidistant from and parallel to said two substantially parallel flanges whereby said indent member may bear upon preselected portions of said first circular abutment means thereby to align selectively said outlet port and said outlet aperture, and an elongated resilient member attached at one of its ends to the fourth side of said substantially rectangular closure surface and defining at the other of its ends an arcuate bearing surface resiliently bearing upon the external periphery of said substantially cylindrical neck on a surface of said neck opposite the surface of abutment of said third flange and adjacent said second substantially circular abutment means, whereby said rectangular closure surface and elongated resilient member are restricted in axial movement but unrestricted in circumferential movement with respect to said neck by the combined actions of said first and second abutment means, said indent members, said flanges, and said arcuate bearing surface.

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