Sept. 29, 1953 A. E. SMITH 2,653,609

CONTAINER CLOSURE

Filed Aug. 26, 1950

Fig. 1.

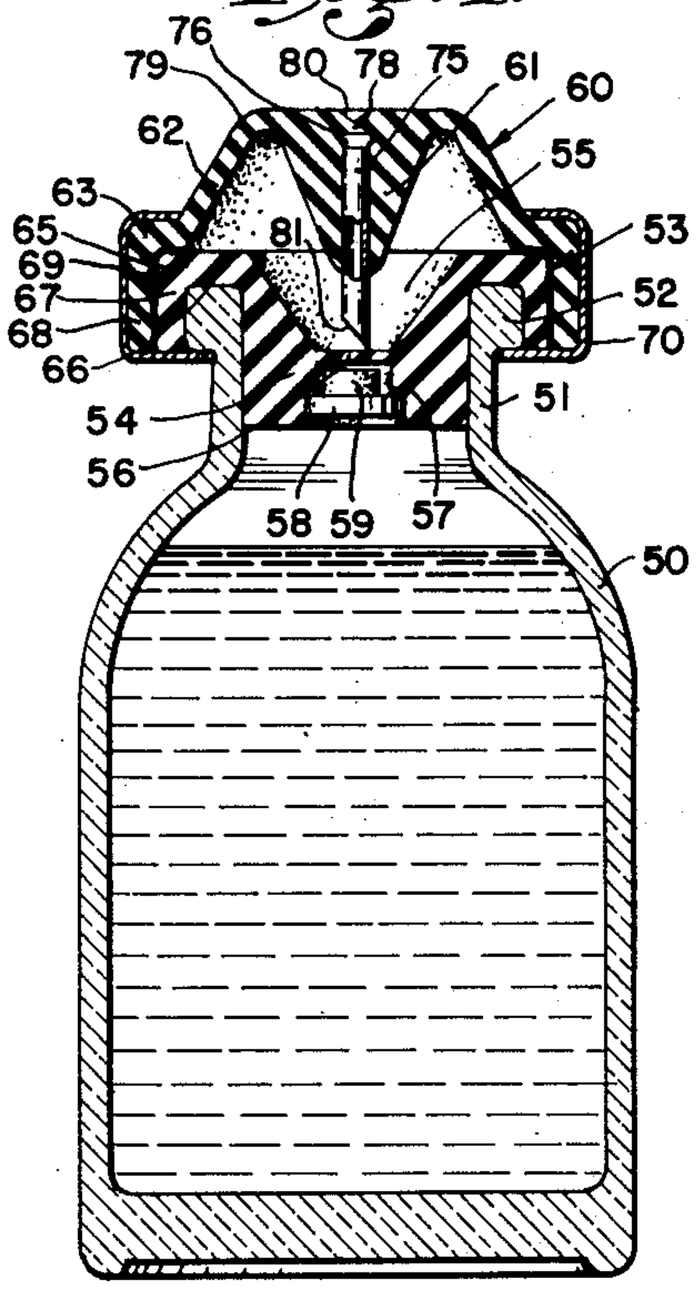


Fig. 2.

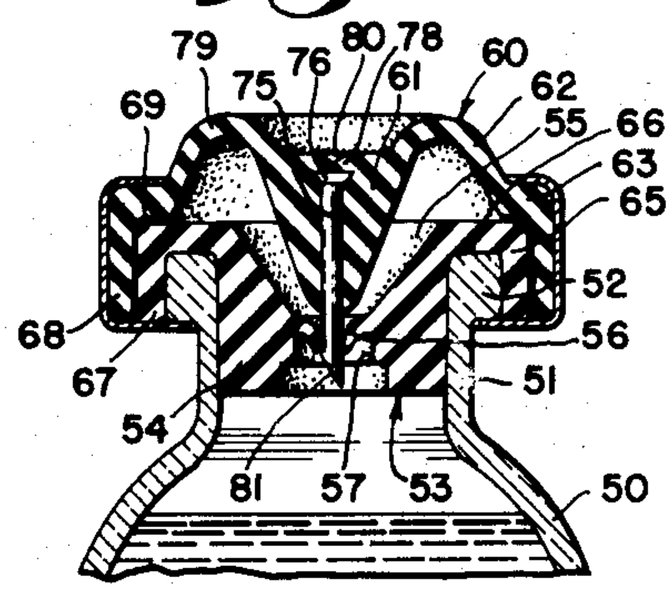


Fig. 5.

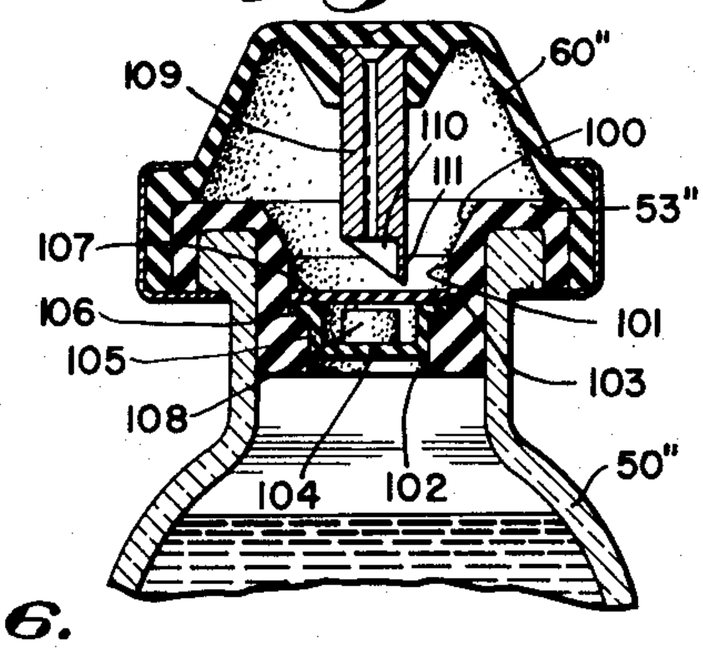


Fig. 6.

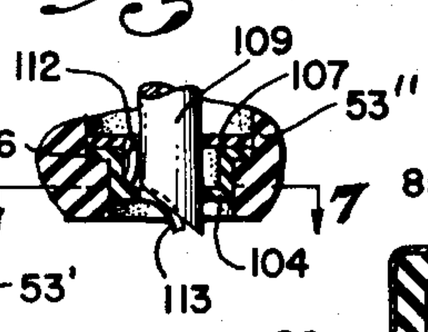


Fig. 3.

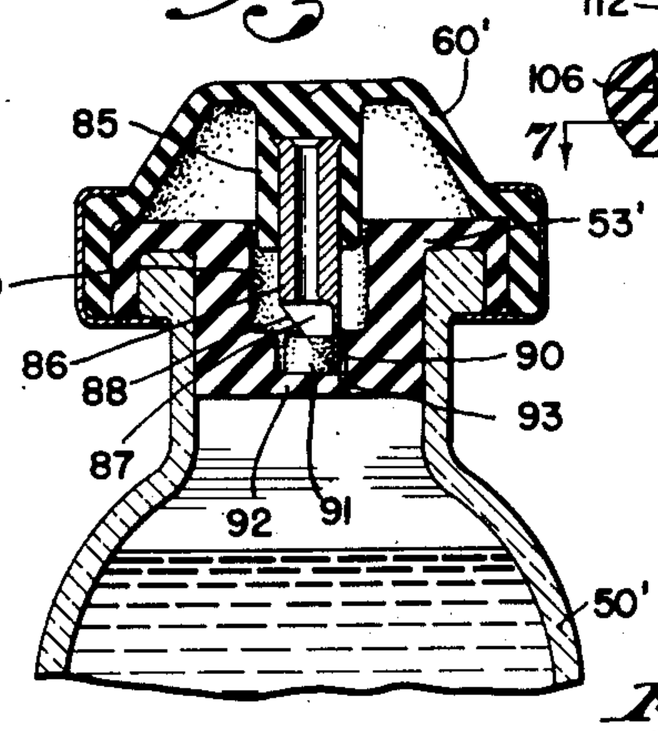


Fig. 4.

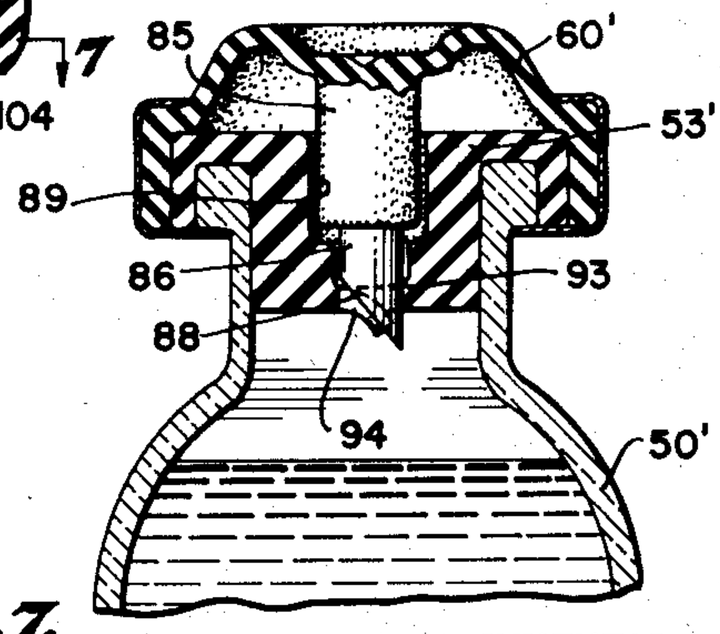
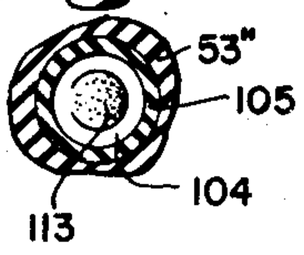


Fig. 7.



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CONTAINER CLOSURE

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1 Claim. (Cl. 128—272)

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This invention relates to a receptacle closure.

The general object of the invention is to provide an improved receptacle closure for use on receptacles such as bottles and jars and wherein the closure is of such a nature that it permits a fresh medicinal solution to be prepared by operation of parts of the closure.

A more specific object of the invention is to provide a receptacle closure including an inner and an outer member and wherein the inner member carries a distendable diaphragm which is adapted to be moved by pressure of the outer closure member to cause release of a tablet.

Another object of the invention is to provide a receptacle closure including a severable closure member and means to cut a trap door in the closure member.

Other objects and advantages of my invention will be apparent from the following description taken in connection with the accompanying drawings, wherein:

Fig. 1 is a central, sectional view showing a receptacle closure embodying the features of my invention;

Fig. 2 is a view similar to Fig. 1, showing the closure in another position;

Fig. 3 is a fragmentary sectional view showing a modification of my closure;

Fig. 4 is a view similar to Fig. 3, showing the closure after the trap door has been cut;

Fig. 5 is a view similar to Fig. 1, showing a further modification;

Fig. 6 is a fragmentary view similar to Fig. 4, showing the further modification, and

Fig. 7 is a fragmentary section taken on line 7—7, Fig. 6, with the piercing tube removed.

This application is a continuation in part of my prior application Serial No. 4193, filed January 24, 1948, now Patent No. 2,524,366, granted October 3, 1950.

Referring to the drawing by reference characters, I have shown my invention as applied to a receptacle 50 having a neck 51 with an external flange 52 thereon. Within the neck 51 I arrange an inner rubber closure member, indicated generally at 53. The closure includes a body 54, having a recess 55. The inner end of the recess is closed by a diaphragm 56 which may be planar and is arranged at the upper end of a recess 57 which is closed by a disc 58 to seal a medicinal preparation 59 in the recess 57.

An outer closure is indicated at 60 and includes a depending portion 61 of harder rubber material than the closure 60. From the top of the member 60 a skirt 62 tapers downwardly and

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merges with an outwardly directed collar portion 63. The collar portion 63 rests on a flange 65 on the body 54. The flange 65 in turn engages the end 66 of the receptacle.

The flange 65 includes a depending skirt 67 which engages the receptacle flange. The collar 63 has a depending skirt 68 which engages the skirt 67. The inner and outer closure members 53 and 60 may be united by cement 69, disposed between the engaging parts.

The tablet 59 and the disc 58 may be inserted in place and the loaded closure may then be sent to the filling department, whereupon the united closure members may be mounted in the position shown in Fig. 1, after which a sealing band 70, which may be made of metal or plastic, is arranged to seal the closure in place.

The tip 61 includes a tapered tubular piercing member 75 which has a flaring top, indicated at 76. The flared upper end is spaced by a diaphragm 78 from the outer surface 79 of the closure. An indentation 80 may indicate the position of the flaring end 76. The lower end of the member 75 is sharpened as at 81 and is normally closely adjacent to, but does not pierce, the diaphragm 56.

In using the invention as shown in Fig. 1, the operator presses upon the outer surface 79 of the closure 60, causing the portion 61 to move to the position shown in Fig. 2, whereupon the sharpened end 81 of the member 75 will pierce the diaphragm 56 and will dislodge the disc 58, thus allowing the pellet 59 to drop into the container. Thereafter the operator may release the closure 60 and may then place the sharpened end of a hypodermic needle in the indentation 80 and push it through the flaring top and through the diaphragm 56 into the receptacle, whereupon the desired amount of solution may be drawn into the hypodermic syringe. After the syringe is loaded the needle is removed from the top and the diaphragm 56 seals itself.

The disc 58 is inert in the solution and does not contaminate the solution.

In Figs. 3 and 4 I show a modification of my invention wherein parts similar to those described previously are designated by single primed reference numerals. In the modification the closure 60′ is provided with a cylindrical, depending stem portion 85 in which a piercing, metal or other, tube 86 is arranged. The tube is cut away at the lower end as at 87 and is sharpened as at 88. The stem 85 is arranged in a recess 89 in the closure 53′. The recess 89 is cylindrical and terminates in a reduced recess 90 in which I ar-

range a medicinal tablet 91. A diaphragm 92 on the closure 53' seals the liquid in the ampule from the tablet 91. The tip 93 of the tube is adjacent to, but does not pierce, the diaphragm 92. When the closure is depressed as shown in Fig. 4 the sharpened end of the tube 86 will pass through the diaphragm 92 and will cut out a U-shaped trap door 94. After the trap door has been cut and as the tube 86 is returned to the position shown in Fig. 3, the trap door will move towards closed position. The end of a hypodermic needle may then be pushed through the closure 60' and through the tube and by the trap door and into the container 50' so that the syringe may be loaded.

In Figs. 5 and 6 I show a further modification of my invention wherein parts similar to those previously described are designated by double primed reference numerals. In the further modification the closure 53'' is provided with a recess 100, the lower part of which is cylindrical at 101 and this in turn merges into a further reduced portion 102. This provides a shoulder 103.

Arranged within the closure 53'' I show a container indicated generally at 104. The container includes a cup member 105 having a flange 106 thereon. The flange 106 is engaged by a closure 107, which is sealed by the flange. Within the container I arrange a medicinal tablet 108. The closure 60'' carries a tube 109 which has a lower beveled portion 110 which is sharpened as at 111. The sharpened portion is disposed adjacent to, but does not pierce, the closure 106.

The portions 105 and 107 are of rubber or similar material and are readily pierceable and when the closure 60'' is depressed the piercing member will move to the position shown in Fig. 6 and will cut a trap door 112 in the closure 106 and will cut a second trap door 113 in the container. When the piercing member is removed the trap doors will move towards closed position. In use a hypodermic needle is inserted through the closure 60'' and through the tube

109 and a charge of material is withdrawn from the container 50''.

All of the parts of the closure except the piercing member may be made of rubber.

From the foregoing description it will be apparent that I have invented a novel receptacle closure which can be economically manufactured and which is highly efficient for its intended purpose.

Having thus described my invention, I claim:

A closure comprising a cylindrical main body portion and a separate flexible auxiliary closure portion, said main body portion having an annular flange adapted to engage the exterior surface of the neck of a bottle, said body portion having a downwardly opening recess, a sealing disc at the lower end of said recess and closing said recess, a medicinal tablet in said recess, a piercable diaphragm integral with the body portion and closing the upper end of the recess, said auxiliary closure including a flexible body having a skirt thereon, said skirt engaging the outer periphery of said body portion annular flange and being secured thereto. a band engaging said skirt and adapted to engage a bottle neck to secure the closure to a bottle, said auxiliary closure having a depending integral stem made of hard rubber, said stem having a downwardly directed hole therein, a diaphragm closing the upper end of said hole, a tubular piercing member in said hole, said piercing member having a sharpened lower end, said piercing member being adapted to pierce said diaphragm and release said sealing disc.

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