Sept. 3, 1935. D. J. BLOCK 2,012,950

CLOSURE FOR CONTAINERS

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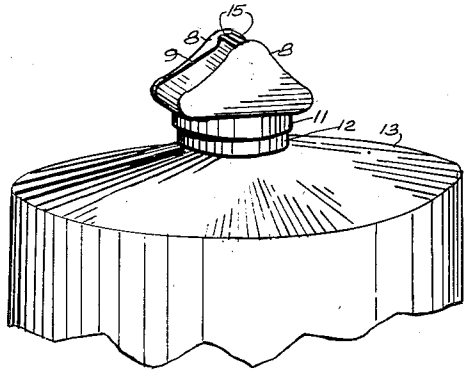


Fig. 1

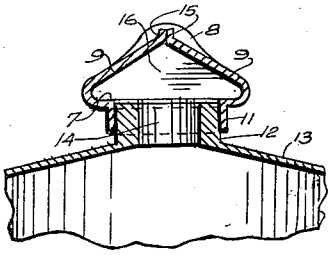


Fig. 2

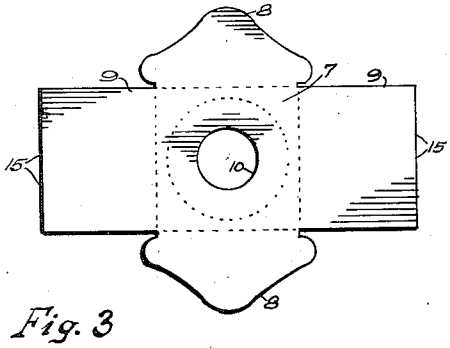


Fig. 3

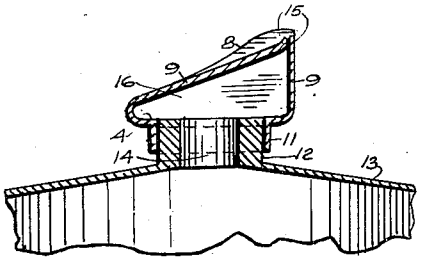


Fig. 4

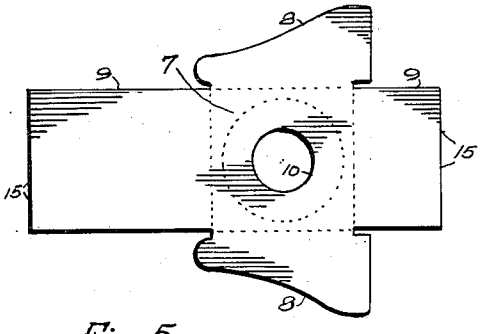


Fig. 5

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Fig. 6.

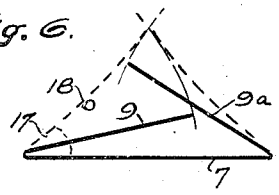


Fig. 7

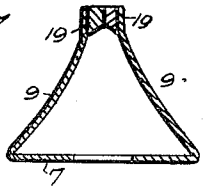


Fig. 8.

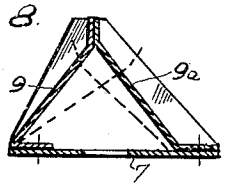


Fig. 9

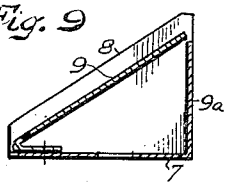


Fig. 10

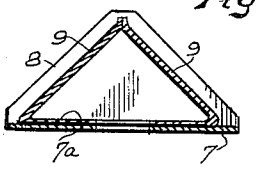


Fig. 11

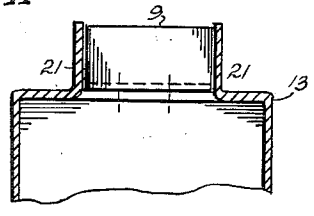
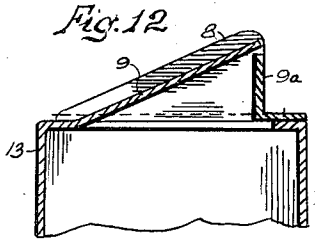


Fig. 12



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Patented Sept. 3, 1935 2,012,950

UNITED STATES PATENT OFFICE

2,012,950

CLOSURE FOR CONTAINERS

David Julian Block, Chicago, Ill.

Application November 12, 1931, Serial No. 574,535

5 Claims. (Cl. 221—60)

One object of the invention is to provide a self-opening and self-sealing closure for containers of the kind in which the contents are extruded by means of pressure upon the body of the container.

Another object is to provide a detachable closure which can be secured to the container selectively in an operable or non-operable position.

Reference is to be had to the accompanying drawings in which:

Figure 1 represents an external view of a simple embodiment of the invention.

Figure 2 is a section through the device shown in Figure 1.

Figure 3 shows the blank from which the closure shown in Figures 1 and 2 is formed.

Figure 4 shows a modified construction of the closure shown in Figure 2.

Figure 5 shows the blank from which the closure depicted in Figure 4 is formed.

Figure 6 pertains to a mode of manufacturing the resilient sealing means.

Figure 7 illustrates another means for obtaining resilient sealing of the closure.

Figures 8, 9 and 10 illustrate certain variations in the constructional details.

Figure 11 illustrates how the closure can be made partially integral with the container.

Figure 12 is a modification of Figure 11.

The invention relates to closures of the kind in which the contents of the receptacle issue through an aperture formed by the yielding of resilient lip-members.

In the device of my invention opening and closing is effected automatically, and the only manipulation required is that of applying pressure to the collapsible container, the inherently resilient lips being conformed and arranged in such manner that they bear resiliently one against the other during their non-operative period and can then be forced apart only by the impinging of the contents of the container upon their internal surfaces.

Figures 1 and 2 show a simple embodiment of my invention in which the closure device is depicted as directly secured to the collapsible container. In this embodiment the entire closure-device is shown as made of one single piece of resilient material, the blank before bending and forming being shaped substantially as shown in Figure 3. The blank has the central portion 7 from which extend the side members 8 and the lip-members 9. The blank may be provided with the perforation 10 to facilitate the forming of the outward pending flange or collar 11 which is adapted to receive the neck 12 of a collapsible container 13, the neck having the passage 14 which affords egress of the contents of the container.

The members 9 are bent up and inward at acute angles so that their terminal edges 15 are brought into resilient contact, in which position they form a seal that can only be opened by exerting pressure upon them from the inside outward.

The members 8 are bent up at substantially right angles and thus brought into frictional contact with the sides of the lip-members 9, the combined members 8 and 9 then forming the chamber 16 which communicates with the interior of the container by means of the passage 14.

External pressure applied to the collapsible container forces the contents through the neck passage 14 into the chamber 16; these contents subsequently impinge upon the inner surfaces of the lip-members whereby these members are forced to yield upward and outward, thus forming an aperture through which the contents are extruded. The extrusion continues until the external pressure on the container is released. The lip members 9 then, by virtue of their inherent resiliency, resume their initial position in resilient contact with one another, and thereby automatically effect the sealing of the aperture.

It is evident that several modifications of the above described device are possible. A simple modification is shown in Figure 4 in which one of the members 9 is placed in a substantially vertical position, the opposed lip-member 9 being bent over at an acute angle, the terminal edges of both lip-members being in resilient contact. In this embodiment the vertically depicted member 9 does not necessarily have to act as a spring, since it may be rigidly connected to the side-members 8. In this case, the vertical member 9 in conjunction with the members 8 form three rigid sides of the chamber 16, and the opening and closing of the seal is then effected by the resilient yielding of the lip-member 9 alone, the terminal edge of the vertical member 9 then acting as a sill for the lip-member. The blank for this arrangement is shown in Figure 5 and differs from that in Figure 3 mainly by the modified lengths of the two lip-members and the conformation of the side-members 8.

It is obvious that the sealing effect of the closure depends mainly on the firm resilient bearing of one lip-member against the other, in the case of two lip-members being employed, or of the one

lip-member against its sill if a construction similar to that of Figure 3 is resorted to.

The lip of member 9 is bent upward and inward at an acute angle, as shown in Figure 6; the opposed lip-member 9a is bent inward to a less extent so that the lip-member 9a overlaps the lip-member 9. The blank is then tempered and the lip-members are subsequently forcibly bent up until their terminal edges bear one against the other. The resilient action of the spring-like lip-members will thus cause them to remain constantly in firm sealing contact until they are forced apart by a pressure from within, sufficiently great to overcome their resilience.

The constructions thus far considered apply to a closure device formed of a single piece of material such as metal, fiber, pyroxylin, or any other substance possessing the quality of resilience and capable of bending without tearing or rupture. I do not limit myself to this construction, however, and the closure may consist of a number of parts secured together in any suitable manner. Figures 8, 9, and 10 show schematically some of the combinations of separate parts which can be resorted to. Figure 8 shows the lip-members 9 and 9a as being separate pieces secured to the base 7 in the manner shown. The original position of the lip-members is shown by the dotted lines; during the process of assembling both members are sprung outward and forced into the position shown in full lines. Figure 9 shows a modification of this arrangement. The member 9 being again separate whereas the member 9a forms an integral part of the plate from which the side members 8 and the base 7 are formed. In Figure 10 both lip-members are formed of one piece of material and joined by the base 7a, which is superimposed and secured to the central portion 7 which connects the side members 8. Since it is desirable to have sealing contact between the side members 8 and the lateral edges of the lip-members, these side members may be made separate, and secured to a common base 7 in such a manner that they lean slightly inward and resiliently bear against the lip-members. The same effect can be obtained, however, by blanking the base and the side members integral and subsequently bending the side members up and slightly inward. Figure 11 shows a closure device which is partly integral with the container itself. The top of the container 13 has been cut to provide the side members 21 bent up at substantially right angles, the lip-members 9 being made separately and secured in any suitable manner to the top of the container, the relative action of the side members and lip-members being the same as hereinbefore described. The material from which the top of the container is made should therefore possess a certain degree of resilience. Figure 12 shows a modification of the arrangement as presented in Figure 11. Only one lip-member is used in this case, cut from the top of the container and bent upward as shown, and as in the previous instance, the container top must possess a fair degree of resiliency. The lip-sill 9a and the side members 8 may be blanked integral with one another and formed to encompass and receive the lip-member; sill and side members being secured to the top of the container in any suitable manner.

Having thus described my invention, I claim:

1. A closure device formed from a single piece of metal adapted to automatically open for the egress of the contents of a collapsible container when under pressure and automatically close the said container against further egress when pressure on the container is released, said closure comprising spaced apart substantially parallel enclosing walls and a pair of pliant opposed walls included in the area between the retaining walls, the terminals of the pliant walls adapted to be in resilient closing contact when the pressure upon the container is released.

2. A closure for pressure-operated containers having a flexible wall of resilient material, normally closed by its own resiliency and having free edge and top portions, and side walls cooperating with the flexible wall to form a compartment, said flexible wall and side walls being formed from a single piece of metal.

3. A closure as set forth in claim 2, in which the closure has a pair of flexible walls of resilient material, normally closed against each other by their own resiliency.

4. A closure as described in claim 2, in which the edges of the flexible wall are in frictional engagement with the side walls.

5. An integral sheet metal closure of flexible resilient material, comprising a base adapted for attachment to a pressure-operated container, walls turned upwardly from the base, one of said walls having free edge and top portions and being normally held in closed position against another of said walls by its own resiliency, and a pair of walls forming a closed compartment with said first two walls.

DAVID JULIAN BLOCK.