

# United States Patent

[11] 3,587,897

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 [73] Assignee **The West Company**  
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[54] **CONTAINER CLOSURE**  
 6 Claims, 5 Drawing Figs.

[52] U.S. Cl. .... 215/38,  
 215/46  
 [51] Int. Cl. .... B65d 41/42  
 [50] Field of Search ..... 215/37, 38,  
 46.5

[56] **References Cited**  
**UNITED STATES PATENTS**  
 3,071,274 1/1963 Ravn ..... 215/37

**ABSTRACT:** A container closure comprising a cap of cuplike form adapted to hold a stopper in place in a container, said cap having a top including inner and outer portions, means defining a partial score in said top defining an area of reduced cross section separating said inner and outer portions, means on said outer portion for securing the cap to the container to hold the stopper or disc in place and a cover member connected to said inner portion being actuatable with respect to the outer portion to sever the top along the area of reduced cross section thereby to separate the inner portion from the outer portion.

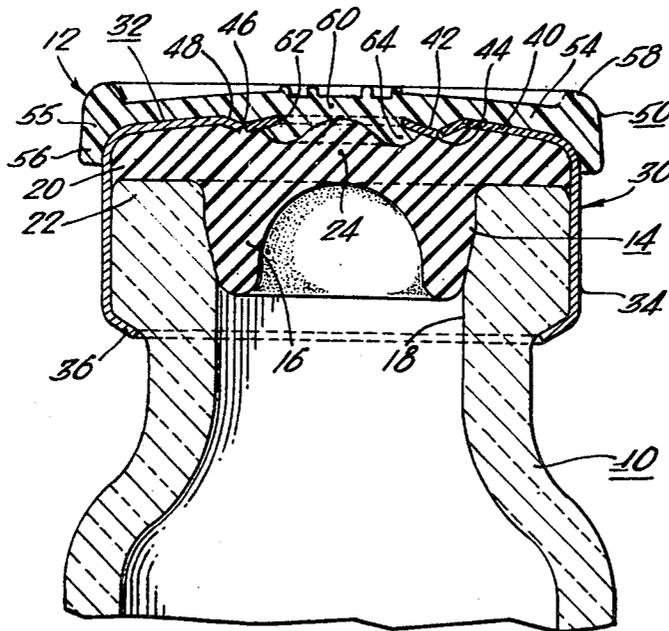


FIG. 1.

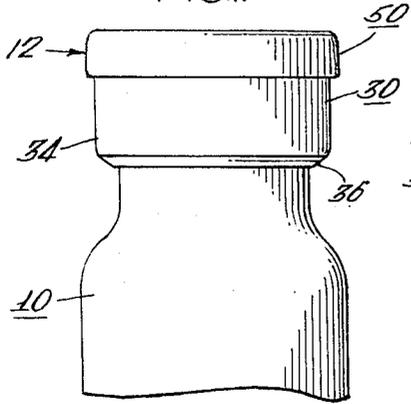


FIG. 3.

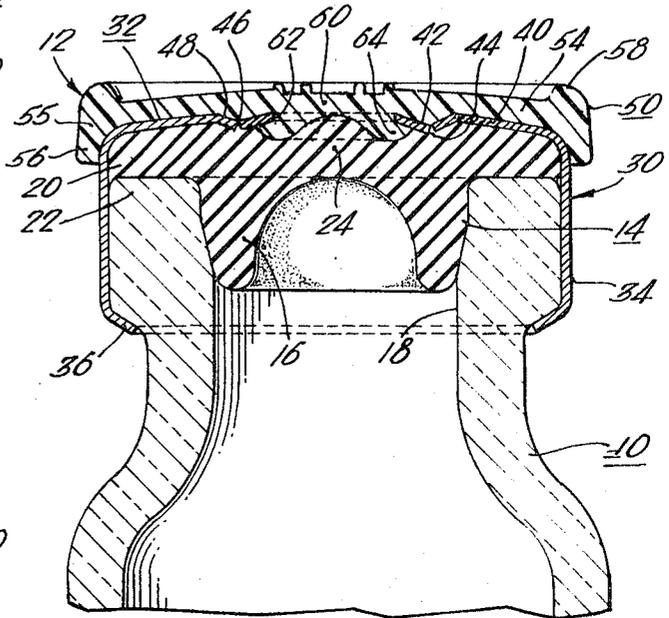


FIG. 2.

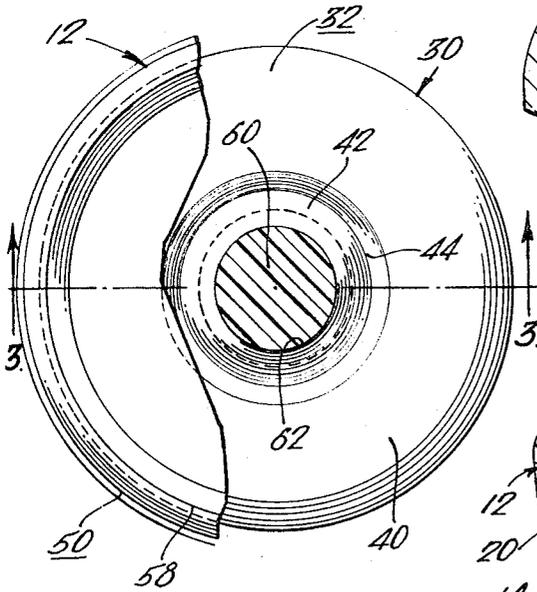


FIG. 4.

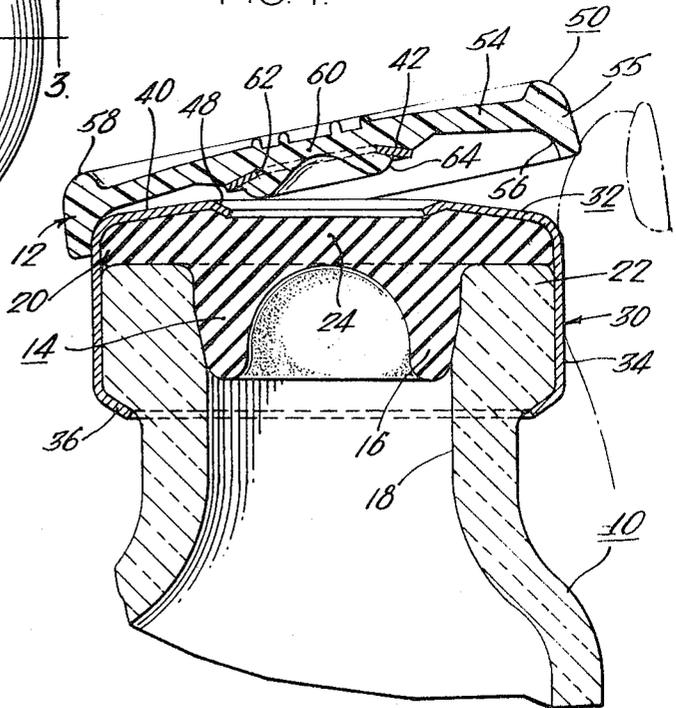
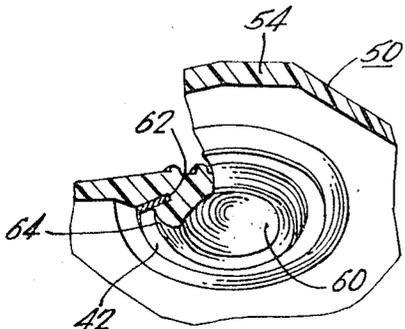


FIG. 5.



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## CONTAINER CLOSURE

This invention relates to an improvement in closures for pharmaceutical containers or bottles generally of the type shown in prior issued patents of the assignee of the present case, particularly U.S. Pat. No. 3,071,274 entitled "Cap Structure for Bottles" issued Jan. 1, 1963.

This prior closure which is used to hold a stopper in the opening of a bottle or the like comprises a cap member of sheet metal such as aluminum having an annular top with a control disc connected to the top by fracturable bridge members and a cover member secured to the central disc member which is actuatable relative to the cap to fracture the bridges and expose the stopper through the opening provided upon removal of the central disc.

In other cases, for example as shown in U.S. Pat. No. 3,193,128 entitled "Container Closure" issued July 6, 1965, the cap member has a top which terminates in an inner edge defining an opening and the cover member has a depending portion which engages under the edge whereby upon actuation of the cover member the depending portion is severed to expose the stopper through the inner circular edge of the top.

While these prior constructions are generally suitable for the purposes indicated, the present invention is an improvement over these closures in that it provides a more effective seal excluding any dirt and foreign matter from entering into the area of the stopper and thus into the container and is also more economical to manufacture and assemble.

More specifically, the closure of the present invention includes a cap member having a top and a depending skirt which is adapted to be crimped inwardly at its lower edge over the outer bead finish on the container to hold the stopper or disc in place. In the present instance the top of the cap has a partial score line defining in the illustrated embodiment a circular indentation in the top of a reduced thickness to define a dislike portion to which the cover member is secured. In the preferred form the partial scoring is formed on the inner wall of the top confronting the stopper and the cover member has a depending portion having a locking flange by which it is secured to the dislike portion of the top defined by the partial scoring.

By this construction it has been found that there is an effective seal in the assembled relation which precludes any dirt or foreign matter from entering into the area of the stopper. Additionally, since the depth of the scoring can be controlled very accurately, the amount of force required to fracture the scoring upon actuation of the cover member is uniform regardless of where the cover member is engaged about its periphery. This is not the case in connection with the previous closures where the disc member was connected to the annular portion of the top by, for example, three circumferentially spaced bridge members. It is also true of the embodiment where the depending portion of the cover member had three circumferentially spaced areas of increased cross section to effectively provide areas of increased resistance to removing the cover member or bridge members. Moreover, the present assembly is very easy and economical to manufacture. For example, the cap member which may be formed by stamping circular discs from a large sheet of aluminum are simply formed with an interior partial scoring to define the central disc in one operation. Thereafter, the skirt is formed by a conventional forming operation and the cover member applied in the normal manner. The completed cap is then ready to assemble over a stopper to a container such as a pharmaceutical bottle.

The foregoing and other objects of the invention and the various details of the construction thereof are hereinafter more fully described and set forth with reference to the accompanying drawing, in which:

FIG. 1 is a side elevation of a container closure in accordance with the present invention secured in position on a bottle;

FIG. 2 is an enlarged plan view of the cap with a portion of the cover broken away to more clearly illustrate the construction;

FIG. 3 is an enlarged sectional view taken on lines 3-3 of FIG. 2;

FIG. 4 is a sectional view similar to FIG. 3 showing the cover member and disc in a detached position; and

FIG. 5 is an enlarged fragmentary perspective view of the central disc and a portion of the cover member removed from the remainder of the cap.

Referring now to the drawing and particularly FIG. 1 thereof, there is shown a container or bottle of conventional form designated by the numeral 10, and a closure 12 in accordance with the present invention secured over the open end of the bottle. As seen in FIG. 3, the closure 12 holds a stopper 14 in the opening of the bottle. The stopper 14 which may be formed of rubber or like material, has a hollow plug portion 16 adapted to fit within the neck 18 of the bottle, a peripheral flange 20 which seats against the lip 22 of the bottle and a central thin wall portion 24 which may be pierced for example by the needle of a hypodermic syringe to gain access to the contents of the bottle. The stopper illustrated is of conventional form and the present invention is not concerned with the specific configuration thereof. For example, in lieu of the stopper 14, a dislike liner may be employed which engages over the opening in the container and is held in place by the closure 12.

The closure for holding the stopper in place comprises a cap 30 of generally cuplike form made out of sheet material such as aluminum, the cap 30 having a top 32 and a depending skirt 34 which is adapted to be crimped or spun at its lower terminal edge to provide an inwardly directed flange 36 which engages under a shoulder provided by the lip of the bottle thereby to secure the cap permanently to the bottle.

In the present instance the top 32 of the cap member 30 is divided into an outer annular portion 40 and an inner central disc portion 42. The disc portion 42 and outer annular portion 40 as illustrated are connected by fracturable bridge means in the present instance in the form of a partial score line 44 which is formed on the interior wall of the top confronting the stopper and provides a continuous circumferentially extending area 46 of reduced cross section or reduced thickness. As best illustrated in FIGS. 3 and 4, the outer annular portion 40 has a turned-in inner circumferentially extending terminal edge 48 adjacent the fracturable bridge means 44 and the disc 42 is slightly dished or outwardly flared. In other words, in the preferred form the disc 42 is slightly frustoconical in shape.

The tamperproof closure assembly further includes an outer cover member 50 connected to the central disc portion 42 of the cap member adapted for actuation relative to the cap to remove the central disc portion and expose the stopper so that it may be pierced by a hypodermic syringe or the like. The cover member 50 which may be made of a pliable material such as plastic is in generally dislike form and overlies the top portion and has an inner surface closely conforming to the configuration of the top portion of cap to snugly embrace the same in the assembled relation as shown in FIG. 3 and provide an effective seal. The cover member as illustrated has a comparatively thin central portion 54 terminating at its outer peripheral edge in an enlarged flange portion 55 including a downwardly depending lip 56 which embraces the top and a portion of the skirt as illustrated and a raised rib 58. Further, the cover member has a depending central portion 60 engaging through an opening 62 in the disc 42 which terminates in an out-turned locking flange 64 thereby securing the cover member to the cap.

The closure assembly described above is relatively simple and economical to manufacture. For example, the cap which may be of thin-gauge aluminum may be stamped from a large sheet in a dislike form wherein the partial score line 44 is formed simultaneously with stamping of a disc member from the sheet material. Also the central opening in the inner disc portion may be formed at that time. Thereafter conventional forming means may be employed to form the cap into the top configuration shown with the straight-sided skirt. Prior to assembly to the cap member the locking flange is a straight

downwardly depending extension which may be directed outwardly by conventional means and application of heat and pressure. The closure is now ready to be applied over a stopper and container by simply positioning it over the stopper and crimping the lower terminal edge of the skirt inwardly.

Now with reference to FIG. 4, when the user desires to withdraw the contents from the container, the user simply supports the container in the palm of the hand with the tip of the thumb engaging the flange 55 of the cover 50. Upon exerting an upward force on the cover member, it is actuated upwardly relative to the cap with the point of the cover diametrically opposed from the point engaged by the thumb acting as a fulcrum. Thus, the center disc is fractured along the continuous circumferential score line 44. This exposes the central portion of the stopper so that it may be pierced by the hypodermic syringe. As noted previously, the configuration of the cover conforming closely to the top of the cap insures a tight sealing relation therebetween. Additionally, since there is no perforation in the top of the cap as was the case with prior closures of this type discussed above, there is a complete seal between the outer cap member and stopper to preclude infiltration of dirt and foreign matter. Additionally, by reason of the partial score line configuration providing a cross section of reduced thickness of substantially the same cross section around the entire periphery of the juncture between the disc and outer top, the force required to remove the disc is uniform regardless of where it is engaged by the user. This was not the case in prior arrangements where the central disc was connected to the annular portion of the top by circumferentially spaced bridge connections. The turned-in circumferentially extending edge portion 48 strengthens the outer annular portion 40 of the cap and serves to prevent deformation of the cap upon removal of the central disc portion 42. Moreover, by

this construction the inner edge of the outer annular portion imbeds itself into the resilient material of the stopper so that there is less chance of catching cotton on the torn edge when cleaning the exposed center section of the rubber stopper.

I claim:

1. A container closure comprising a cap of cuplike form adapted to hold a stopper or liner in place in a container, said cap having a top including inner and outer portions, means defining a partial score in said top defining an area of reduced cross section separating said inner and outer portions, means on said outer portion for securing the cap to the container to hold the stopper in place and a cover member connected to said inner portion being actuatable with respect to the outer portion to sever the top along the area of reduced cross section thereby to separate the inner portion from the outer portion.

2. A container closure as claimed in claim 1 wherein said cover member is of generally disclike form and extends radially outwardly beyond the outer peripheral edge of said annular portion and has a depending flange whereby the cap is nested in said cover member to provide a seal.

3. A container closure as claimed in claim 1 wherein said partial score is continuous and of circular configuration to define a disclike inner top portion.

4. A container closure as claimed in claim 1 including means defining an opening in said inner portion and wherein said cover member has locking means engaging through said opening to secure said cover member to said inner portion.

5. A container closure as claimed in claim 4 wherein said locking means comprises an out turned flange.

6. A container closure as claimed in claim 1 wherein said partial score is on the inner face of said top.

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