

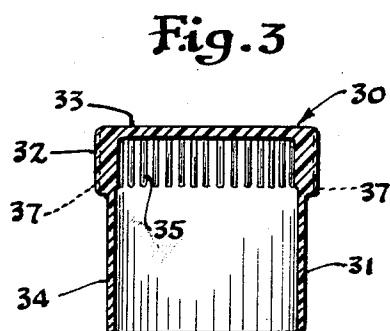
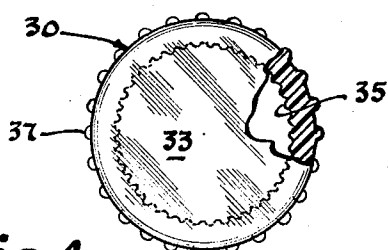
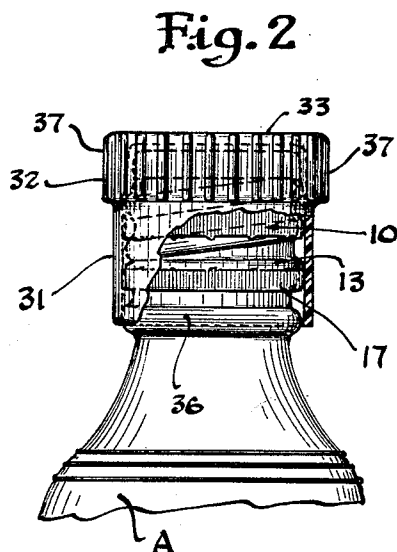
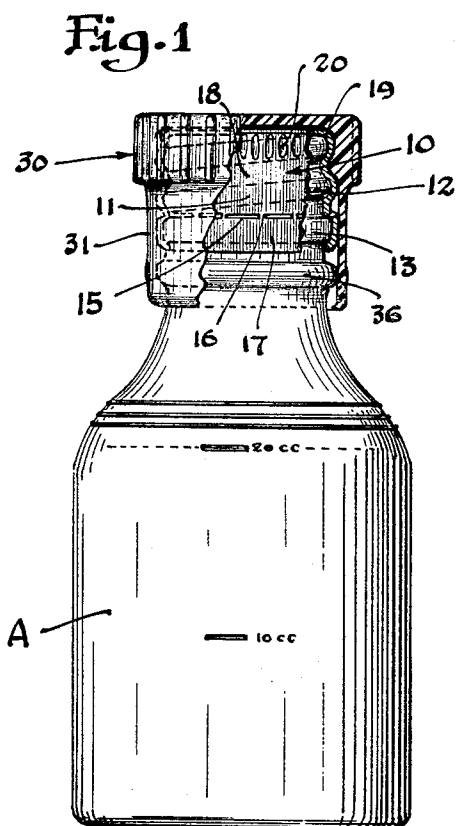
Dec. 1, 1959

G. R. RYAN

2,915,211

CONTAINER CLOSURE

Filed May 15, 1956



Inventor
George R. Ryan

By *William E. Dominick*
Attorney

1

2,915,211

CONTAINER CLOSURE

George R. Ryan, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill., a corporation of Illinois

Application May 15, 1956, Serial No. 585,090

1 Claim. (Cl. 215—42)

This invention relates generally to a container closure and more particularly to a protective hood and cap opening means for a container.

Many pharmaceutical products are distributed in a form which must be maintained in a sterile condition, such as serums, sterile powders, parenteral solutions, concentrates and the like. Certain of these pharmaceutical products must also be mixed with a suitable volume of distilled water or other parenterally acceptable vehicle prior to being administered to a patient. It has become common practice, therefore, to distribute these pharmaceuticals in small containers provided with "tamper-proof" or "pilfer-proof" closures. These closures maintain the sterility of the drug during storage and also make it clearly evident when the container has been once opened.

One type of "pilfer-proof" container closure frequently used when distributing pharmaceutical products of the above type is comprised of a cylindrical or cup-like body section of thin pliable metal, such as aluminum, which can be readily and permanently deformed and which can also be easily parted or severed when subjected to a twisting or pulling force. The outer end of the cylindrical body section, after being positioned on the pouring finish of a container, is crimped over a ridge or raised finish at the base of the threaded neck of the container so as to prevent the closure cap being accidentally removed. The outer or open end of the cylindrical body section also has spaced inwardly from the end thereof a plurality of slits or circumferential cuts which are separated by small sections of metal normally retaining the lower crimped section integrally with the upper threaded section of the cap. When it is desired to open the container, the usual practice is to hold the bottle in one hand and twist the upper section of the closure in a counter clockwise direction to unscrew the cap. The twisting force severs the sections of metal holding the upper and lower sections together, thereby permitting the upper threaded section being removed from the pouring finish and leaving the lower section crimped about the raised finish. In some instance, however, considerable force is required to sever the metal joining the upper and lower sections of the closure, particularly since the upper end of the metal cap is of a relatively small diameter and does not have a large gripping surface.

During the opening of a container having the above "pilfer-proof" type closure, the fingers are frequently placed in contact with the exposed surface of the pouring and raised finishes of the container. When this occurs, the pouring finish, for example, is exposed to bacterial and other contamination which can be accidentally transferred to a parenteral solution prepared therefrom while pouring the contents of the container into the larger container in which the parenteral solution is prepared.

It is therefore an object of the present invention to provide an improved means for opening a container closure.

2

It is another object of the present invention to provide an improved means for opening a "threaded pilfer-proof" container closure.

It is a still further object of this invention to provide improved means for maintaining the sterility of a pharmaceutical container.

Other objects of the invention will be apparent from the detailed description and claim to follow.

Reference to the accompanying drawing will make clear, when taken in conjunction with the detailed description, the manner in which the foregoing objects of this invention are achieved.

Figure 1 is a side elevation view partially in vertical section showing the novel protective hood and pilfer-proof cap opener in position on a pilfer-proof container closure.

Figure 2 is a fragmentary side elevation view partially in vertical section showing the protective hood and cap opener on the container shown in Figure 1 in a partially open position.

Figure 3 is a vertical sectional view of the protective hood and cap opener of Figure 1.

Figure 4 is a top plan view partially in horizontal section of the protective hood and cap opener of Figure 1.

Referring now to Figure 1 of the drawing, the pilfer-proof cap 10 of the container A is comprised of a generally cylindrical or cup-like body section 11 preferably of thin, pliable metal, such as aluminum, which can be permanently deformed so as to conform to the threaded finish 12 of the container, and which can also be severed or torn when subjected to a twisting or pulling force. The wall of the outer or open end of the said body section 11 is crimped about the ridge or raised finish 13 at the base of the threaded pouring finish 12 of the container. The outer or open end of the body section 11 also has spaced inwardly from the end thereof a plurality of spaced slits or circumferential cuts 15, the ends of which are separated by narrow sections 16 of uncut metal which normally hold the open end section 17 integrally with the closed end section 18 which has formed thereon threads conforming with the threaded finish 12. The inner or closed threaded end section 18 of the body section 11 is closed by a flat end wall 19. The outer lateral surface of the closed threaded end section 18 adjacent the end thereof is also provided with a plurality of shot vertical sections 20 extending about the entire circumference to provide the end with a knurled surface. The cap 11 may be considered to be divided into two parts; an end wall 19, and a skirt formed of sections 18, 16 and 17 extending sequentially down from the end wall 19.

Mounted on and completely enclosing the cap 10 which is fully seated and sealed on the pouring finish of the container is a protective hood and cap opener 30 comprised of a generally cylindrical body section 31 preferably of a flexible and resilient material, such as plasticized polyethylene plastic, having a closed end section 32 with a transverse end wall 33 and an upstanding cylindrical skirt section 34 extending outwardly substantially perpendicularly from the end wall 33. The inner lateral wall surface of the end section 32 has disposed about the entire circumference thereof a plurality of longitudinally extending ridges 35 which project radially inwardly from the surface. The ridges 35 are preferably spaced one from the other a distance such that each of the ridges 35 engages in one of the indentations 20 on the cap 10. The outer lateral surface of the end section 32 is also provided with a plurality of longitudinally extending ridges 37 to provide a gripping surface.

The cylindrical skirt section 34 extending from the end section 32 has an inner diameter substantially the same as the inner diameter of the end section 32 and is of

3

such length and diameter as to resiliently engage with the conventional transfer bead or ring 36 formed at the base of the pouring finish of the container A and is preferably of such a length as to extend a short distance below the said ring 36 when the protective hood and cap opener 30 is fully seated on the cap 10. The resilient sealing engagement between the skirt section 34 and the ring 36 provides a protective seal at the lower end of the pouring finish to prevent bacterial and other contamination of the cap and pouring finish of the container. The protective hood and cap opener 30 is also dimensioned so as to firmly and resiliently engage the knurled surface on the end section 18 of the cap 10.

In order to open the container for withdrawing a portion of the contents thereof or transferring the contents to a larger container where it can be mixed with a suitable diluent or other vehicle, it is only necessary to hold the gripping surface adjacent the closed end of the protective hood and cap opener 30 between the fingers of one hand while holding the body section of the container A with the other hand and turn the said cap opener 30 counter clockwise so as to unscrew the threaded section 18 of the cap 10. Since the ridges 35 on the inner surface of the end section 32 frictionally engage in the indentations 20 on the end of the cap 10, the turning or unscrewing motion applied to the cap opener 30 is directly transferred to the cap 10. This twisting motion of the upper section of the cap tears the metal sections holding the threaded end section 18 integrally with the lower crimped section 17 and permits the threaded end section 18 being completely removed from the pouring finish of the container. And, because the protective hood has at all times, until removed, completely covered the exposed lateral surface of the pouring surface, the container can be placed in an inverted position extending inside the neck of a larger container to which the contents of the container A are added and in which a solution thereof is prepared. Thus, the contents of the container A are removed easily and without danger of contaminating the solution thereof by contacting the pouring finish of the container A with the inner surface of the larger container.

The protective hood and cap opener 30 of the present invention is preferably molded of a flexible and resilient plastic material such as plasticized polyethylene or polyvinyl chloride. It should be understood, however, that other synthetic and natural plastics, both of the flexible

4

and relatively rigid type, can also be employed without departing from the broad invention disclosed herein.

Others may readily adapt the invention for use under various conditions of service, by employing one or more of the novel features disclosed or equivalents thereof. As at present advised with respect to the apparent scope of my invention, I desire to claim the following subject matter.

I claim:

10 A container closure assembly for a container having thread means on the neck adjacent the open end thereof, an annular ridge about the neck between said thread means and the body of said container and a transfer ring about the neck between said ridge and the body of said container, said closure assembly comprising: a primary cap receivable about said neck and extending from the open end of the neck toward the body, said cap having a skirt extending between said ridge and said ring with its lower end crimped over said ridge to secure the skirt of the cap to said ridge, said skirt also having threads engaging said thread means on the container, said cap having a top extending across the open end of the neck, said skirt having a circumferential weakened portion between said threads and said lower crimped end whereby 25 when said cap is put under a turning stress, said weakened portion will break to sever the portion of the cap adjacent said top from the lower crimped end, said cap having peripheral external knurled means on the portion thereof adjacent the top; and a protective relatively resilient hood about said cap, said hood having a top covering said top of said cap and a cylindrical body formed about an axis and extending down over the sides of said cap to and in peripheral contact with said transfer ring, said hood having internal ridges generally 30 parallel to said axis rotationally engaging said external knurled means on said cap whereby a rotational movement of said hood will result in a corresponding rotation of said cap.

References Cited in the file of this patent

UNITED STATES PATENTS

1,360,388	Gaynor	Nov. 30, 1920
2,054,033	Conner et al.	Sept. 8, 1936
2,140,732	Burke	Dec. 20, 1938
2,312,513	Wilson	Mar. 2, 1943
2,367,317	Thomas	Jan. 16, 1945