May 29, 1956 S. F. STAPLES 2,747,761

SLIP-ON CLOSURE CAP

Filed Dec. 16, 1954

Fig. 1.

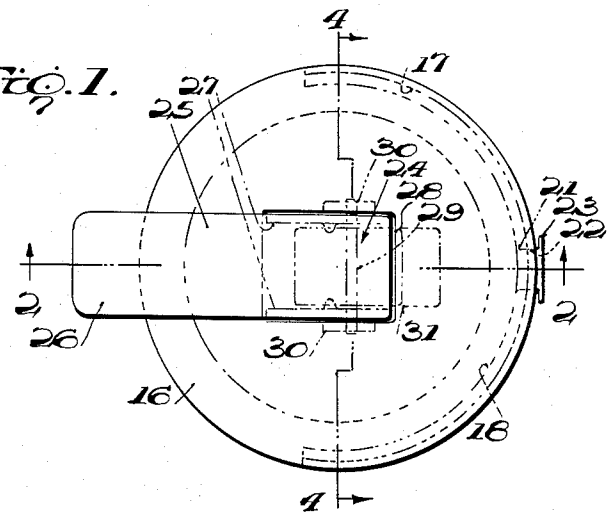



Fig. 2.

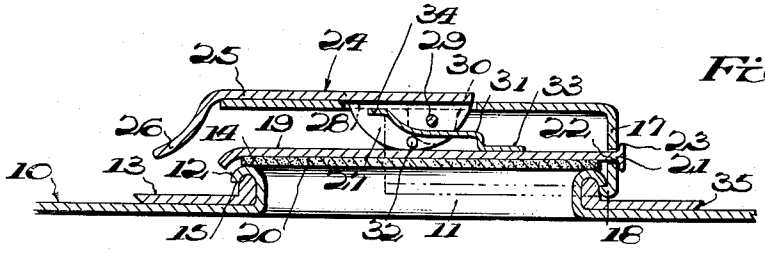



Fig. 3.

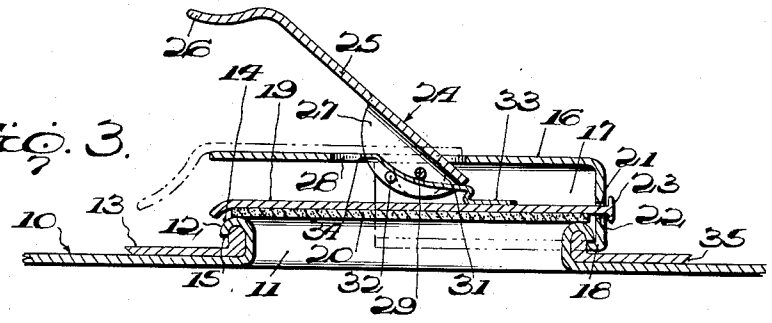
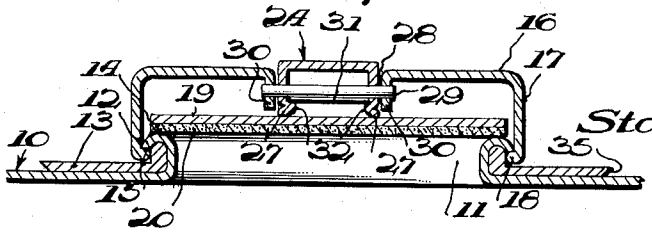



Fig. 4.




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# SLIP-ON CLOSURE CAP

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8 Claims. (Cl. 220—24)

The invention relates to container closures and more particularly to closure caps which are provided with a substantially semi-cylindrical skirt having means on the lower edges of the skirt for underlying a bead surrounding a container opening. Caps of this general structure are old and well known and a typical one is shown and described in the United States patent to Cady, No. 2,544,586, dated March 6, 1951. Caps of the type shown by the Cady patent aforesaid are secured in place by the actuation of a screw-threaded stud which moves a sealing a disc into and out of a sealing position by means of a fingergrip or a wrench. The comparatively slow operating speed of such screw threaded means is objectionable. Also, this type inherently increases the overall height of the container by the upward projection of the actuating stud.

With the foregoing in view, it is an object of the invention to provide a slip-on type of closure cap of the class described which includes a sealing disc which is operated by a single throw lever.

A further object is to provide such a lever which does not increase the height of the container when the parts are in the container sealing positions.

A further object is to provide in such a closure, spring means loading the lever to a container sealing position.

Other objects and advantages reside in the particular structure of the device, the structure of the several elements comprising the same, combinations and subcombinations of such elements, as will be readily apparent to those skilled in the art upon reference to the attached drawing and the following specification wherein the invention is shown, described and claimed.

In the drawing:

Fig. 1 is a top plan view of a closure embodying the invention;

Fig. 2 is a transverse vertical sectional view taken substantially on the plane of the line 2—2 of Fig. 1 and showing the parts in the container sealing position;

Fig. 3 is a sectional view like Fig. 2 but showing the parts in the unsealed position; and

Fig. 4 is a transverse vertical sectional view taken substantially on the plane of the line 4—4 of Fig. 1.

Referring specifically to the drawing, wherein like reference characters have been used throughout the several views to designate like parts, **10** designates generally a wall of any suitable container such as a metal drum. An opening **11** is formed in the wall **10** and is defined by an outwardly flanged embossment **12** which engages a reinforcing flange or sput **13** to provide at the top an annular bead **14** which comprises a gasket seat. The free edge of the embossment is downwardly directed to provide a shoulder **15** for a purpose to be apparent hereinafter.

The cap according to the invention comprises a disc-like plate **16** which is formed with a substantially semi-cylindrical depending side wall **17**. If desired, and as shown, the side wall **17** may be slightly more than semi-cylindrical. The lower edge of the side wall **17** is radially inwardly directed to provide a substantially semi-annular



flange **18**. The proportions of the flange **18** and side wall **17** are such that the disc **16** may be slid laterally across the embossment **12** with the flange **18** engaging below the shoulders **15** and ultimately seating thereunder as best seen in Figs. 2 and 3.

To seal the opening **11**, the plate **16** has secured thereto a sealing disc **19** which is sized to overlie the embossment **12** and the underside of which is provided with a yieldable and preferably resilient sealing gasket or disc **20**. An edge portion of the sealing disc **19** is provided with a radially outwardly directed tab or extension **21** which extends through an opening **22** formed in the flange **17** preferably centrally thereof. The free ends of the tab **21** are upset or otherwise deformed as at **23** to prevent withdrawal of the tab through the opening **22**. It should be understood at this time that the opening **22** is sufficiently larger than the thickness of the tab **21** as to permit vertical movement of the extension therein for a purpose to be apparent hereinafter.

To actuate the sealing disc **19** and its gasket **20** into sealing engagement with the bead **14** there has been provided a single throw lever **24** which comprises a flat handle portion **25** adapted to rest flatly atop the plate **16** and which preferably has a downwardly extending free end **26** which projects beyond the plate **16** to provide a fingergrip. The opposite end of the handle **25** is formed with a pair of flanges formed as arcuate cams **27** which are downwardly directed into parallel spaced relationship from opposite sides of the handle **25**. The cams **27** extend through an opening **28** formed in the plate **16** and normally rest atop the sealing disc **19**. The cams **27** are pivotally secured to the plate **16** by means of a pivot pin **29** which extends through said cams in eccentric relation to the axis thereof. Likewise, the opposite ends of the pin **29** extend through downwardly directed ears **30** integral with the plate **16** on opposite sides of the opening **28**. The cams **27** are likewise arranged to straddle any suitable spring means such as the leaf spring **31** which is disposed between the sealing disc **19** and the plate **16**. The spring **31** bears against any suitable crank means such as the inwardly directed bosses **32** formed in the cams **27** adjacent the free edge thereof and in downwardly and laterally offset relation to the pivot **29**, Figs. 2 and 3. One end of the spring **31** is secured to either the sealing disc **19** or the plate **16**. Preferably, however, one end **33** is secured as shown to the sealing disc **19** and the other end **34** is free but may project through opening **28** and slidably engage the undersurface of the lever arm **25**. By referring to Figs. 2 and 3, it is apparent that as the lever arm **25** is raised from the horizontal position illustrated in Figure 2 and in broken lines in Figure 3 to the elevated position illustrated in solid lines in Figure 3 the spring **31** is flexed by the bosses or cranks **32** whereby the lever arm **25** together with its cams **27** and the sealing disc **19** actuated by the latter are spring loaded to the sealing position of Fig. 2. Likewise, it is apparent that the cams **27** in the unsealed position of Fig. 3, impose no load upon the sealing disc **19** whereby the same may be readily slipped across the opening **11** to the Fig. 3 position. However, when the lever is moved downwardly to the Fig. 2 position, the free lower edges of the cams **27** force the sealing disc **19** and its gasket **20** into sealing engagement with the gasket seat **14**.

It is apparent from the foregoing that the closure is readily adaptable to any container opening which provides a bead for engagement by the flange **18** or by like structure, such as lugs. At the same time, the single throw lever **24** is readily moved to the unsealed position of Fig. 3 or returned to the sealing position of Fig. 2 without the use of special tools. Also, by providing a lever which is flat and which normally lies flatly atop the plate **16** there is virtually no structure which extends above the plate **16** to any appreciable extent. This is an important feature

when the device is applied to the opening of a metal drum and it is desired to apply a cap seal thereover for engagement with the periphery 35 of the flange or sput 13 in a manner readily understood.

While I have shown and described what is now thought to be a preferred embodiment of the invention, it is to be understood that the same is susceptible of other forms and expressions. Consequently, I do not limit myself to the precise structure shown and described hereinabove except as hereinafter claimed.

I claim:

1. In a closure cap for a container opening having a top bead or the like therearound, said cap being formed with depending means having radially inwardly directed means engaging under said bead as said cap is slid laterally across said opening, and a closure plate in said cap thereafter sealing said opening; the improvement comprising connecting means connecting said plate to said depending means and providing for limited, vertical axial movement of said plate relative to said depending means and cap, cam means carried by said cap in engagement with said plate, means for actuating said cam means so as to move said plate downwardly into sealing engagement with said bead, means on said cam providing a crank, spring means operatively connected to said crank, and said spring means loading said cam in a direction to force said plate into sealing engagement with the container.

2. In a closure cap for a container opening having a top bead or the like therearound, said cap being formed with depending means having radially inwardly directed means engaging under said bead as said cap is slid laterally across said opening, and a closure plate in said cap thereafter sealing said opening; the improvement comprising connecting means connecting said plate to said depending means and providing for limited, vertical axial movement of said plate relative to said depending means and cap, cam means carried by said cap in engagement with said plate, pivot means pivotally mounting said cam means on said cap, means for pivoting said cam means so as to force said plate downwardly into sealing engagement with said bead, said cam means comprising a pair of downwardly directed integrally connected arcuate flanges, said spring means comprising a leaf spring carried by said closure plate and extending substantially diagonally upwardly thereof between said cam-providing flanges, crank means on said flanges below and in operative engagement with said spring, and said crank means and cam being loaded by said spring in a direction to force said plate into sealing relation with said bead.

3. A closure cap according to claim 2, wherein said crank means comprises a pair of opposed inwardly directed bosses on said cam-providing flanges in eccentric relation to said pivot means.

4. A closure cap according to claim 3, wherein said bosses comprise hollow protuberances which are integral portions of said cam-providing flanges.

5. In a closure cap for a container opening having a top bead or the like around the opening, said cap having depending means including radially inwardly directed means which operatively engage said bead as said cap is slid laterally across said opening, and an axially movable closure plate in said cap thereafter sealing said opening; the improvement comprising cam means pivotally carried by said cap above said plate and in operative engagement therewith, means for pivoting said cam means in an actuating direction so as to move said plate downwardly to seal said opening, a spring in said cap above said closure plate, and crank means operatively connecting said spring to said cam means so as to load the same in said actuating direction.

6. In a closure cap for a container opening having a top bead or the like around the opening, said cap having depending means including radially inwardly directed means which operatively engage said bead as said cap is slid laterally across said opening, and an axially movable closure in said cap thereafter sealing said opening; the improvement comprising a pair of laterally spaced cams pivoted to said cap above said closure and in operative engagement with the latter, a single cam lever fixed to both cams for pivoting the same in a closure actuating direction to move said closure downwardly to seal said opening, a leaf spring in said cap above said closure, said spring extending between said cams, crank means on said cams, said crank means engaging and partially tensioning said spring so as to operatively connect the same to both cams and load said cams in said actuating direction.

7. A closure cap according to claim 6, wherein said crank means connecting said spring to said cams comprises a pair of laterally inwardly directed bosses, on said cams, and said spring having an end portion above said bosses and bearing downwardly on the same.

8. A closure cap according to claim 7, where said bosses comprise hollow integral extensions of said cams.

**References Cited** in the file of this patent

UNITED STATES PATENTS

| | | |
|---|---|---|
| 274,620 | Lyon et al. | Mar. 27, 1883 |
| 1,097,180 | Maynard | May 19, 1914 |
| 2,600,086 | Vastano | June 10, 1952 |
| 2,649,220 | Vastano et al. | Aug. 18, 1953 |
| 2,671,572 | Satz | Mar. 9, 1954 |