Sept. 14, 1937. H. SPENGLER 2,092,937

CLOSURE

Filed Jan. 25, 1937

Fig. 1.

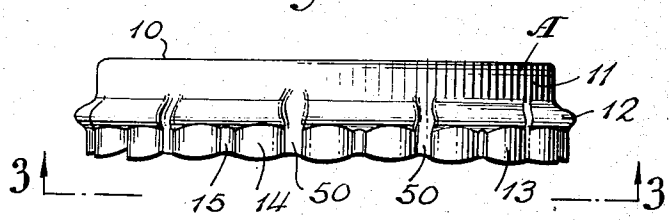


Fig. 5.

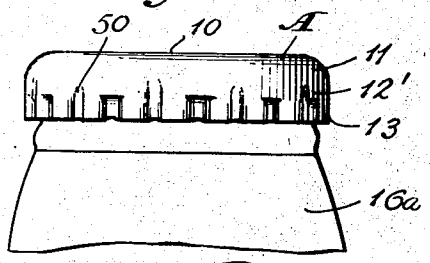


Fig. 2.

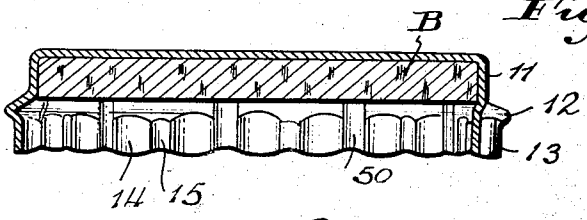


Fig. 4.

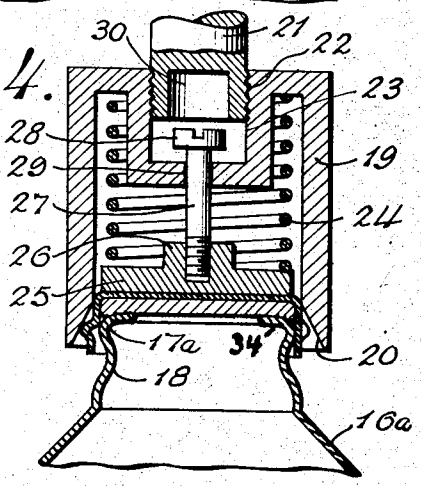


Fig. 3.

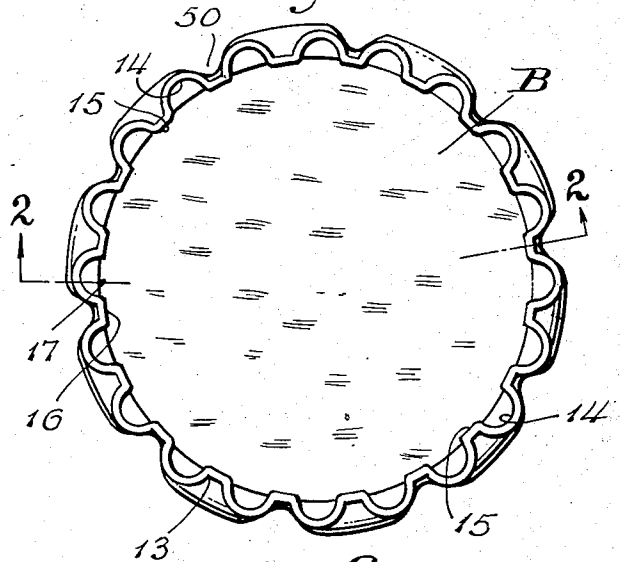


Fig. 7.

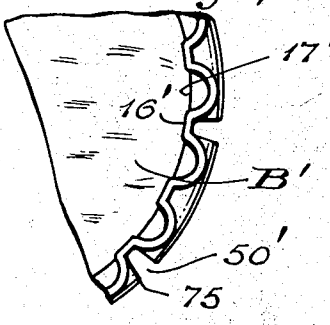


Fig. 6.

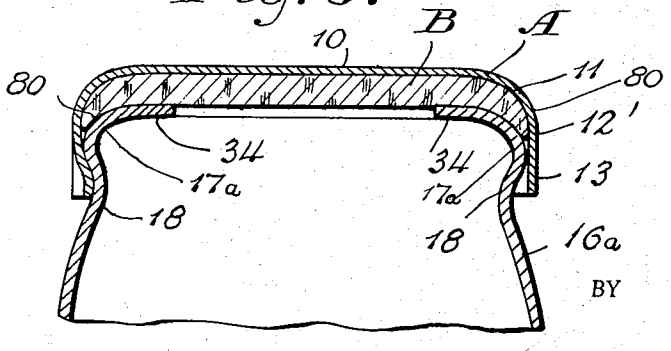
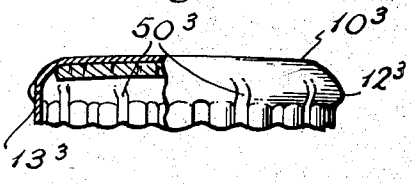


Fig. 8.



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Patented Sept. 14, 1937

2,092,937

UNITED STATES PATENT OFFICE

2,092,937

CLOSURE

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Application January 25, 1937, Serial No. 122,263

3 Claims. (Cl. 215—39)

The present invention relates to a closure and it particularly relates to a type of closure to be applied to the mouths of glass bottles, cans, jugs or other containers, the mouths of which are provided with peripheral beads or lips.

In my prior application, Serial No. 72,679 filed April 4, 1936, there is disclosed an improved cap construction, the skirt of which cap is provided with an intermediate bulge, the lower portion of said skirt below said fold being gathered or crimped.

This bulge is designed to be extended or flattened by a cylindrical capping tool, which, at the same time, presses the lower portion of the skirt below the bead of the container can or bottle, as the case may be.

By so constructing the caps and applying them to containers, it has been found that the caps more readily adjust themselves to varying heights and depths of beads and that breakage of bottles or deformation of containers in applying the caps is greatly lessened; that the cap when pressed down upon the bottle or can seals both the top and the side of the bead; and that a considerable amount of metal is saved.

It has now been found that for certain types of containers and particularly for cans with spout tops, such as are utilized for receiving beer and other beverages or liquids, it is desired to be able to apply the cap to the container to seal the same with certainty that the capping operation will not subject the can to undue stress or cause distortion.

It is, therefore, among the objects of the present invention to provide an improved cap of the character described in said prior application which cap may be readily applied without possibility of deformation or breaking of the container and without undue application of pressure.

Other objects will be obvious or will appear during the course of the following specification.

In accomplishing these objects, it has been found most suitable in one embodiment to weaken or indent the fold or bulge which supplies the extra metal for expansion to seal the top of the bottle.

Although the fold or ridge might be indented after the cap has been formed, it has been found most desirable to form such indentation simultaneously with the forming, stamping or punching of the cap structure.

By arranging or spacing the number of indentations it has been possible to control the amount of force which is necessary to deform the cap. The closer the spacing of the indentations, the less the force required to unfold or spread said intermediate fold in the cap.

The above and other objects will appear more clearly from the following detailed description when taken in connection with the accompanying drawing, will illustrate a preferred embodiment of the inventive idea.

Referring to the drawing:

Figure 1 is a side elevational view of one form of cap according to the present invention upon a substantially enlarged scale, as compared with the actual size of the cap in use.

Figure 2 is a transverse sectional view upon the line 2—2 of Figure 3.

Figure 3 is a bottom view of the cap upon the line 3—3 of Figure 1.

Figure 4 is a longitudinal sectional view of the cap of Figure 1 on the top of a container and about to be pressed into sealing position by a suitable capping die.

Figure 5 is a side elevational view of the cap after attachment on the bottle upon a somewhat smaller scale as compared to Figures 1 to 3.

Figure 6 is a longitudinal cross sectional view of the cap of Figure 5 after application and upon the same scale as Figures 1 and 2.

Figure 7 is a fragmentary view similar to Figure 3 of a portion of the cap illustrating an alternative indentation arrangement.

Figure 8 is an alternative embodiment similar to Figure 1 but with the fold or bulge extended over the entire upper portion of the cap.

Referring to Figures 1 to 3, the cap has a base 10, an upper skirt portion 11 and an intermediate ridge or fold 12 and a lower skirt portion 13.

The upper skirt portion receives the cork disk or insert B which cork disk or insert extends substantially up to the top of the ridge or fold 12.

The fold 12 extends outwardly between upper and lower skirt portions 11 and 13 to provide extra metal.

The lower skirt portion 13 which may be slitted, but which is preferably continuous, is provided with a series of indentations or corrugations having outwardly extending rounded portions 14 and indentations 15.

The cap may be made of steel or of alloys of iron, tin, brass, copper, aluminum and/or lead.

It will be noted by reference to Figure 3 that the inner portions of the indentations 16 extend inside of the periphery 17 of the cork disk B and thus hold said cork disk in a position that it cannot fall out.

This construction eliminates the necessity of

gluing the cork disk to the base 10 of the cap and enables a simpler and better assembly.

The cork disk may be faced with any suitably treated multi- or single layer paper or foil material.

In applying the cap of Figures 1 to 3 to the top of the can 16*a*, having the bead 17*a*, with a lower recess 18, a cylindrical die 19 with a bevelled lower edge 20 may be employed. As shown in Figure 6, the bead 17*a* has an inwardly projecting portion 34 upon which the cork disk B is compressed.

The die 19 contains an actuating member 21 screwed at 22 into the threaded recess 23. The cylindrical member 19 also receives the coil spring 24 which presses down the flat die member 25. The flat member 25 has an upstanding nipple 26, which is tapped and receives the bolt 27 having the head 28. The bolt passes through the opening 29 in the cup 23 and may reciprocate in said cup 23 and also in the recess 30 in the end of the rod 21.

In operation, the capping die 19 will come down and the bevel 20 will strike the extended fold 12, collapsing the metal of the lower portion 13 thereof from the position of Figures 1 to 3 to the position of Figures 5 and 6.

In the meanwhile, the flat element 25 will press down upon the base 10 and the cork 34 holding them in position upon the top of the bead 17*a*.

The extension of the ridge 12 will automatically press the metal of the lower skirt 13 into the recess 18 with the result, as shown in Figures 5 and 6, that the portions of metal indicated at 12' in Figures 5 and 6 corresponding to the flattened ridge 12 will be firmly clamped on the outside of the bead 17*a*, while the cork will be depressed on the upper portion of the bead 17*a*.

The attached cap, as shown in Figures 5 and 6, is devoid of the sharp outstanding edge, has a relatively neat appearance and may be most readily applied by a capping die, such as indicated in Figure 4, with substantial rapidity by automatic machinery.

The caps, as formed in Figures 1 to 3, may ordinarily have a maximum external diameter at the ridge 12 of $1\frac{3}{8}$ inches, and a maximum depth before placement upon the bottle top of $\frac{3}{8}$ inch.

Regardless of the depth of the bead 17*a*, and the location of the recess 18, the operation indicated in Figure 4, with straightening out of the ridge 12 will cause the lower skirt 13 to collapse around the lower portion of the bead with the indentations and elevations 14, 15, being received in the recess 18.

It will be noted that the outside of the cap, as shown in Figures 5 and 6, after attachment will be substantially cylindrical and a prying or bottle opening tool may be inserted there below to lift the cap from the top of the bottle.

The cap construction thus far described is fully disclosed and claimed in the prior application, Serial No. 72,679.

The present application is particularly directed to the indentations 50 of round contour as best shown in Figures 1 and 3, or of wedge shape contour, as shown at 50' in Figure 7, the similarly functioning parts of Figure 7 being indicated by the same numerals as in Figure 3 primed.

As shown, these indentations 50 or 50' break up the fold or ridge 12 into a series of sections or segments with the result that the metal of such fold or ridge 12 may be more readily unfolded or expanded to grip the top of the can and to form a close seal around the top and side of the bead.

Particularly where delicate containers of thin glass or metal are employed, it is desirable to weaken the fold 12 in the manner indicated in the indentations 50 or 50' so that the force required by the die in the operation as shown in Figure 4 will be a minimum and will not result in any deformation or undue stress or strain upon the container.

As shown, the indentations 50 and 50' are spaced apart by two of the indentations 14, but it is obvious that this spacing could be varied so that the indentations 50 might be spaced five, six or even one of said indentations 15 or bulges 14.

If desired, in forming the indentations 50 and 50', said indentations may be caused to constitute a continuation of the indentations 15.

In comparing the indentations 50 of Figure 3 with 50' of Figure 7, it has been found that sharper corners 75, as indicated in Figure 7, when deformed into the final shape, as shown in Figures 5 and 6 will result in hardening of the metal around the periphery of the skirt with the result that the hardened vertical streaks in the skirt of the final cap structure will assure a closure of maximum strength which will stand up over long periods of time.

Referring to Figure 6, it will be noted that the top of the cap has been drawn down and over the lip 17 so as to place the cork or flexible sealing material B in tension and to force it into the recess between the lip 17 and the skirt of the cap, said recess being indicated at 80 in Figure 6. This tensioned cap construction is more fully shown and described in my copending application, Serial No. 122,630 filed January 27, 1937.

In Figure 8 is illustrated an alternative construction in which the bulge 12^3 extends over the entire upper portion of the skirt, said upper portion of the skirt being provided with vertical grooves or recesses 50^3 to enable more ready deformation and spreading of the bulge.

In Figure 8 similar functioning parts to those in Figures 1 to 3 are indicated by the same numerals provided with a superior "3".

It is apparent that the specific illustrations shown above have been given by way of illustration and not by way of limitation and that the structures above described are subject to wide variation and modification without departing from the scope or intent of the invention, all of which variations and modifications are to be included within the scope of the present invention.

What is claimed is:

1. A cup shaped cap for application to cans and bottles provided with top beads and similar containers, said cap having a circular base, a skirt depending circularly from said base, a cylindrical pliable sealing disk inset against said base inside of said skirt, said skirt having a corrugated or indented lower portion, a smooth cylindrical upper portion and an intermediate bulged portion providing extra metal, said bulge being adapted to be contracted and spread to extend said skirt to grip the side of the bead and force the corrugated portion tightly below the bead, said bulge being provided with a plurality of indentations to enable more readily contraction and spreading thereof.

2. A cup shaped cap for application to cans and bottles provided with top beads and similar containers, said cap having a circular base, a skirt depending circularly from the periphery of said base, a cylindrical pliable sealing disk inset

against said base inside of said skirt, said skirt having a corrugated or indented lower portion, and a smooth intermediate portion providing extra metal, said intermediate portion taking the form of an outwardly projecting bulge, said bulge being adapted to be compressed and spread to extend said skirt to grip the side of the bead and force the corrugated portion tightly below the bead, said disk consisting of cork and substantially filling the interior of the cap between the bulge and the base, said bulge being provided with a plurality of spaced vertical indentations to enable more readily compressing and spreading thereof.

3. A cup shaped cap for application to cans and bottles provided with top beads and similar containers, said cap having a circular base, a skirt extending circularly from the periphery of said base, and a pliable sealing disk inset against said base inside of said skirt, said skirt being provided intermediate of its length with an outwardly projecting bulge adapted to be spread to extend the skirt in the direction of the axis of the cap and said skirt having corrugations or indentations between said bulge and the edge of said skirt which are adapted to collapse circumferentially during the spreading of said fold, to grip tightly below the bead, but which are retained generally in an axial direction, to facilitate engagement of an uncapping element therewith, by the union circumferentially of contiguous corrugations or indentations, said bulge being provided with a plurality of indentations to enable more readily contracting and spreading thereof.

HENRY SPENGLER.