Aug. 24, 1943. W. F. PUNTE 2,327,455

PADLESS CROWN CAP

Filed Sept. 19, 1940

Fig. 1.

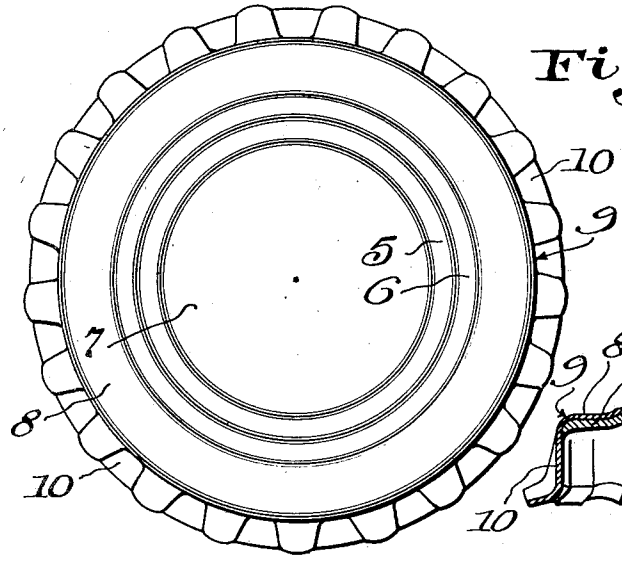


Fig. 2.

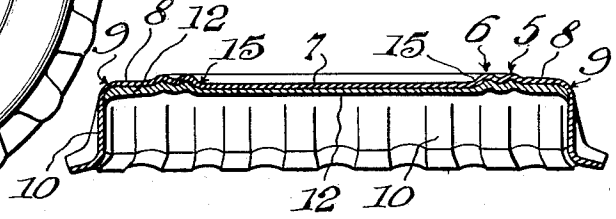


Fig. 3.

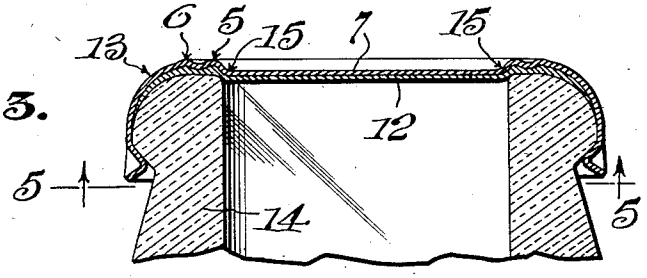
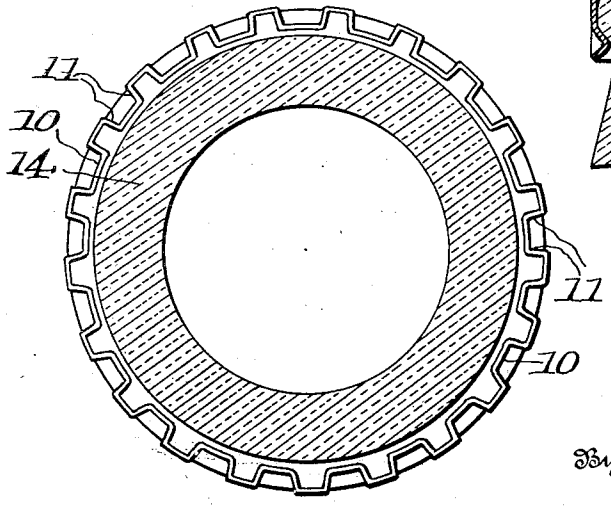


Fig. 5.



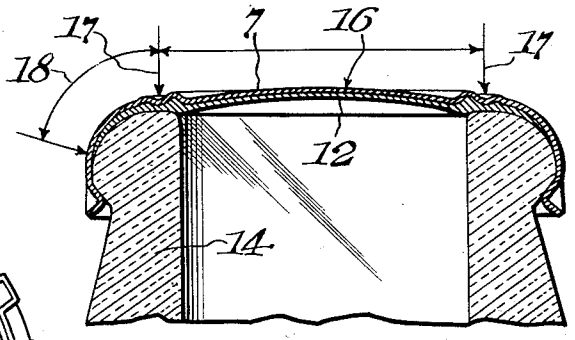


Fig. 4.

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PADLESS CROWN CAP

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2 Claims. (Cl. 215—39)

The invention relates generally to closure devices of the crown cap type and primarily seeks to provide a novel form of crown cap closure capable of effecting a satisfactory liquid and gas tight seal and also of protecting sealed contents of a container to which the novel closure cap is applied from direct contact with the metal of the cap without inclusion of the usual cork or similar yieldable sealing pads.

Crown caps having crown or body portions and depending, crimped skirt portions adapted to be bent into intimate contact with neck portions of bottles, cans or similar containers for effecting a sealing attachment are well known, but in the conventional forms of such caps it is necessary to include sealing pads of cork or similar yieldable material. In addition, it has been found desirable to cover the cork pads with center spots in order to avoid direct contact between beverages in the containers and the cork, or the metal of the caps through the small openings in the cork. Obviously, the inclusion of cork pads and center spots of aluminum foil or treated paper adds materially to the manufacturing cost of the caps, and the provision of a crown cap such as is herein disclosed and which is capable of effecting a proper liquid and gas tight seal without inclusion of sealing pads and center spots will not only materially decrease the cost of manufacturing the caps but will also materially decrease the amount of metal necessary to be used since the cap skirts can be made shorter. It has been noted also, in the use of some forms of crown caps, that outward bending of the caps occasioned by internal pressure within the sealed containers, tends to lift annular portions of the caps and sometimes permits objectionable leakages of the sealed products or gases therein.

Therefore, it is an object of the present invention not only to provide a padless crown cap that can be manufactured at low cost, but also a cap of the nature stated which will effect a more efficient and positive seal than has heretofore been provided.

In its more detailed nature, the invention resides in the provision of a crown cap comprising a central, slightly depressed and generally flat portion adapted to fit within the pouring mouth of the container to be sealed, two upstanding annular ribs surrounding said depressed portion and providing two downwardly directed sealing compound receiving grooves adapted to overlie the pouring neck annulus surrounding said pouring mouth, and an intervening upwardly directed hinge groove which facilitates upward bulging of said depressed portion under internal pressure without disturbing the seal, and a sealing annulus surrounding said ribs and merging into the crimped skirt and which is deformed during application of the cap to conform to the shape of the container neck and intimately press the sealing compound into efficient sealing contact with said neck.

Another object of the invention is to provide a novel crown cap of the character stated including a novel securing skirt crimped so that when it is affixed to the neck of a container the wall portions of the skirt crimping lie nearly radial to the axis of the cap thereby to provide a maximum of rigidity in said skirt and increased sealing efficiency.

With the above and other objects in view that will hereinafter appear, the nature of the invention will be more clearly understood by following the detailed description, the appended claims, and the several views illustrated in the accompanying drawing.

In the drawing—

Figure 1 is a plan view of the improved crown cap.

Figure 2 is a central vertical cross section of the cap shown in Figure 1.

Figure 3 is a central vertical cross section of the cap affixed to a bottle, a condition of the cap under normal sealed internal pressure being illustrated.

Figure 4 is a view similar to Figure 3 and showing the cap bulged upwardly by a greater than normal sealed internal pressure.

Figure 5 is a horizontal cross section taken on the line 5—5 on Figure 3.

The improved crown cap forming the basis of the present invention includes the usual generally flat top and depending skirt which is utilized in the usual manner to securely clamp the cap to the mouth of the bottle or other container. The top is provided with two annularly spaced upstanding ribs, the innermost of which is designated 5 and the outermost of which is designated 6. These ribs define an inner crown body portion 7 and the outer or surrounding neck engaging or sealing portion 8, the central body portion 7 being depressed slightly below the plane of the outer portion 8 in the manner clearly illustrated in Figure 2 of the drawing.

The outer or sealing portion 8 of the crown top turns rather sharply as at 9 into the securing skirt 10 which is crimped in a novel manner so that when the cap is affixed to the pouring neck

of a bottle or other container the side walls of the skirt crimps are disposed so as to closely approach a radial relation to the center of the crown cap, thereby to impart rigidity to the skirt and provide a greater security of attachment of the cap.

It is customary to provide sealing pads of cork or other suitable compressible material in crown caps of the usual type, but it is a purpose of the present invention to provide a crown cap which will effect an efficient seal without such sealing pad inserts. For this reason the improved cap herein disclosed has the whole of its internal crown top surface coated with an odorless and tasteless sealing compound 12. This compound fills the grooves formed at the underside of the annular ribs 5, 6 and merges into the securing skirt 10 in the manner best illustrated in Figure 2 of the drawing.

When the cap is applied to the neck of a bottle or other container in the manner illustrated in Figure 3 of the drawing, the sealing portion 8 of the crown top and the turn thereof at 9 into the skirt 10 are reshaped or deformed as at 13 to conform perfectly to the sealing surface presented by the neck 14 of the bottle or other container and to spread and reshape the engaged portion of the sealing compound so as to additionally assure the provision of a perfect seal.

It will be observed by reference to Figures 2 and 3 of the drawing that the central slightly depressed crown body portion 7 is of a diameter for fitting within the pouring throat in the container neck 14 so that the fillet 15 which adjoins this central portion with the innermost rib 5 is depressed slightly in the pouring throat in a manner for aiding the provision of an efficient seal. It should be obvious also that deformation of the metal of the cap at 13, or the drawing of this metal over the sealing surface of the container neck 14 tends to spread the ribs 5 and 6, slightly and by this means press the sealing compound contained in the grooves formed by the ribs tightly against the container neck so as to additionally facilitate the sealing function.

When a container sealed by one of the improved crown caps herein disclosed contains a normal amount of internal pressure, say a pressure of about sixty pounds per square inch, the central crown portion 7 will retain the flat condition illustrated in Figure 3. When abnormal internal pressures, such as one hundred thirty pounds per square inch are sealed by the improved crown caps, the central portions 7 thereof may bow upwardly under this abnormal internal pressure in the manner indicated at 16 in Figure 4 of the drawing. When this upward bowing of the central portion of the crown cap takes place, the annular groove formed between the upstanding ribs 5 and 6 acts as a hinge as indicated by the arrows 17 on Figure 4, and the seal effected by the crown cap throughout the areas indicated by the arrows 18 on Figure 4 are in no wise affected by this upward bowing of the crown cap, and a perfect seal is retained despite the abnormal internal pressure seeking to break said seal.

It is to be understood that the specific details of construction and the dimensions of the improved cap may be altered to suit conditions of different uses without departing from the scope of the invention as defined in the appended claims.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent is:

1. A metal closure cap for sealing the neck of a bottle, can or like container comprising a crown body portion and a depending container mouth gripping skirt portion, two upstanding integral annular ribs dividing the non-applied crown body portion into a generally flat central body portion of a diameter substantially coextensive with that of the pouring throat in the container mouth and a surrounding generally flat sealing portion deformable during application of the cap to conform to the shape of the container mouth and merging into said skirt portion, said ribs providing downwardly directed sealing compound receiving grooves disposed to lie above the sealing lip of a bottle when attached thereto and forming between them a hinge groove permitting upward bulging of said central body portion under abnormal sealed pressure conditions without disturbing sealing contact of said surrounding sealing portion, and a sealing compound permanently adhered in and filling said downwardly directed grooves and covering said surrounding sealing portion and merging into said skirt portion.

2. A metal closure cap for sealing the neck of a bottle, can or like container comprising a crown body portion and a depending container mouth gripping skirt portion, two upstanding integral annular ribs dividing the non-applied crown body portion into a generally flat central body portion of a diameter substantially coextensive with that of the pouring throat in the container mouth and a surrounding generally flat sealing portion deformable during application of the cap to conform to the shape of the container mouth and merging into said skirt portion, said ribs providing downwardly directed sealing compound receiving grooves disposed to lie above the sealing lip of a bottle when attached thereto and forming between them a hinge groove permitting upward bulging of said central body portion under abnormal sealed pressure conditions without disturbing sealing contact of said surrounding sealing portion, and a sealing compound permanently adhered in and filling said downwardly directed grooves and covering said surrounding sealing portion and said central body portion and merging into said skirt portion, said central body portion being depressed slightly below the level of said surrounding sealing portion so as to fit into the pouring throat of the container mouth, and said skirt portion having crimps therein and spaced equidistantly about the circumference thereof, each said crimp being composed of a circumferential outer wall disposed concentrically with respect to the center of the cap and side walls disposed in approximately right angular relation to said outer wall and approximately parallel each other when the cap is applied to a container mouth thereby to impart rigidity to said skirt and provide great security of attachment of said cap.

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