

PATENT SPECIFICATION

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(54) A CROWN CAP BOTTLE CLOSURE

(71) I, SHIH-CHEN HSU, residing at No. 34, Tien Swei Road, Taipei, Republic of China, of Chinese Nationality, do hereby declare the invention for which I pray
5 that a Patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 The present invention relates to an improved, easy-opening crown cap for closing the open end of a bottle or like container.

Priorly known crimped crown caps generally require a tool for their removal which
15 is inconvenient to the user, especially if a bottle opener is not readily available. In view of this, there have been proposals for crown caps which can be removed without a tool, such as those described in U.S. Patent Specifications Nos. 3,200,982, 3,382,997 and 2,778,520. Although all these known designs have score lines and tongue elements, yet, owing to their position on the cap against the direction of the applied
25 force, a considerable force must be exerted during opening. Particularly if the bottle contains carbon dioxide under pressure, it is difficult to provide both a perfect tight seal and an easily opened closure.

30 The primary object of this invention is to provide a crown cap which can easily be removed by the bare hands without the use of any auxiliary openers, but which provides a close and tight fit whether the contents of the bottle are pressurised or not.
35 A further object of this invention is to provide a crown cap which is inexpensive in construction, which may be used without changing present bottle-capping equipment, and which may be used in present bottle dispensing machines without modification thereof.

40 According to the present invention there is provided an easy-opening crown cap for
45 closing the open end of a bottle or like

container, the crown cap comprising a substantially flat top and a depending annular skirt of crimped configuration having alternate raised and depressed portions, a downwardly and outwardly inclined tongue on the cap projecting below a bottom edge
50 portion of the skirt, said tongue having a plurality of longitudinally extending reinforcing ribs of a length slightly greater than the crimps in the skirt, and a lower end edge portion of the tongue being warped to reinforce the tongue, said cap having a pair of circumferentially spaced apart notches extending upwardly from a lower edge of the skirt in registry with opposite edges
55 of the tongue, and a pair of score lines extending upwardly from the notches across the skirt and across the flat top of the cap a distance greater than the radius of the cap but less than the diameter thereof, the score lines never intersecting, the arrangement being such that the tongue may be grasped by hand and lifted to fracture the cap along the score lines and allow
60 removal of the cap from the container. 70

Preferred embodiments of the invention will now be described with reference to the accompanying drawings, in which:—

Figure 1 is a perspective view from above of a first embodiment of the invention, 75

Figure 2 is a perspective view from above of a second embodiment of the invention,

Figure 3 is a perspective view from above of a third embodiment of the invention, 80

Figure 4A is a perspective view from above of a fourth embodiment of the invention,

Figure 4B is a perspective view from below of the embodiment of Figure 4A, and 85

Figures 5 to 8 are perspective views showing various stages of the removal from the bottle of the cap shown in Figures 4A and 4B, the hand being omitted in Figure 90 6B.

In the first embodiment of the present invention as shown in Figure 1, a crown cap 10 is placed on the annular opening 31 of a bottle 30. The crimped skirt of the cap 10 has a plurality of raised portions 11 and depressed portions 12 to clamp onto the bottle. A tongue 15 having longitudinal-crimped reinforcing ribs 13 similar to but longer than the raised portions 11 of the skirt is inclined downwardly and outwardly and terminates below the skirt in a lower end edge 153 which is warped outwardly and upwardly at an angle of 30° to 45° with respect to the raised portions 11 of the skirt on opposite sides of the tongue. The two sides 151, 152 of the tongue are bounded by notches 181, 182 (shown in Figure 4B) provided between the tongue 15 and the adjacent raised portions 11 of the skirt. In continuity with these two notches 181, 182 two score lines 19, 20 are formed in the skirt in the direction in which force will be applied to pull the tongue 15 upward. Two score lines 21, 22 continue the score lines 19, 20 across the flat top 23 of the crown cap 10 and do not intersect with one another. The score lines 21, 22 are each longer than radii of cap 10 but shorter than its diameter, so that each score line 21 and 22 extends more than half way but not fully across the top 23 of the cap.

Although the crown cap according to the present invention is provided with a tongue 15 and notches 181, 182 on opposite sides of the tongue, yet the crimped skirt having raised portions 11 and depressed portions 12 has the same characteristics as the crimped skirts of conventional crown caps, and therefore it can closely and tightly seal the bottle. Moreover, the cap of this invention may be used without changing bottle-capping equipment, and may be used in present bottle dispensing machines without modification thereof.

Figures 2 to 4A illustrate other embodiments of the present invention. Except for the slightly different configuration of the score lines 21A, 21B, 21C and 22A, 22B, 22C, other features are the same. Figure 4B is a bottom view of the cap of Figure 4A showing its score lines 19, 21C, 20, 22C formed on the internal side of said cap.

The operation of the present invention is shown in Figures 5 to 8. In Figure 5 the bottle body is held by the left hand (not shown) while the thumb 41 of the right hand is pressed on the flat top 23 of the cap 10, and its forefinger 42 is placed underneath the tongue 15 to pull the tongue 15 upward. Then, owing to the notches 181, 182 and score lines 19, 20 at the two sides of the tongue, the tongue 15 can be lifted, and the seal can be partly disrupted as shown in Figures 6A and 6B. At this time, the cap 10 still weakly grips the neck of the

bottle by means of its disrupted skirt and therefore the tongue 15 is pulled further upward to break along the score lines 21, 22 as a solid piece 24. As said score lines 21, 22 do not intersect each other, there is still a connection 25 between the piece 24 and the remainder of the cap as shown in Figure 7. Now the grip of the skirt of cap 10 is completely disrupted and the tongue 15 is pulled off the bottle 30 along with the remainder of the cap 10 without the need of using any separate tool. As shown in Figure 8 a resilient fluid-tight gasket 32 may be provided as in a conventional crimped crown cap.

WHAT I CLAIM IS:—

1. An easy-opening crown cap for closing the open end of a bottle or like container, the crown cap comprising a substantially flat top and a depending annular skirt of crimped configuration having alternate raised and depressed portions, a downwardly and outwardly inclined tongue on the cap projecting below a bottom edge portion of the skirt, said tongue having a plurality of longitudinally extending reinforcing ribs of a length slightly greater than the crimps in the skirt, and a lower end edge portion of the tongue being warped to reinforce the tongue, said cap having a pair of circumferentially spaced apart notches extending upwardly from a lower edge of the skirt in registry with opposite edges of the tongue, and a pair of score lines extending upwardly from the notches across the skirt and across the flat top of the cap a distance greater than the radius of the cap but less than the diameter thereof, the score lines never intersecting, the arrangement being such that the tongue may be grasped by hand and lifted to fracture the cap along the score lines and allow removal of the cap from the container.

2. A cap as claimed in claim 1, wherein the score lines converge into close proximity with one another from the edge of the top of the cap and then extend parallel to one another over the major portion of the width of the cap.

3. A cap as claimed in claim 1, wherein the score lines converge toward one another in substantially straight lines along the top of the cap.

4. A cap as claimed in claim 1, wherein the score lines are parallel to one another substantially throughout their length.

5. A cap as claimed in claim 1, wherein the score lines along the top of the cap are arcuate and are convergent at their opposite ends and divergent at their mid-

In the first embodiment of the present invention as shown in Figure 1, a crown cap 10 is placed on the annular opening 31 of a bottle 30. The crimped skirt of the cap 10 has a plurality of raised portions 11 and depressed portions 12 to clamp onto the bottle. A tongue 15 having longitudinal-crimped reinforcing ribs 13 similar to but longer than the raised portions 11 of the skirt is inclined downwardly and outwardly and terminates below the skirt in a lower end edge 153 which is warped outwardly and upwardly at an angle of 30° to 45° with respect to the raised portions 11 of the skirt on opposite sides of the tongue. The two sides 151, 152 of the tongue are bounded by notches 181, 182 (shown in Figure 4B) provided between the tongue 15 and the adjacent raised portions 11 of the skirt. In continuity with these two notches 181, 182 two score lines 19, 20 are formed in the skirt in the direction in which force will be applied to pull the tongue 15 upward. Two score lines 21, 22 continue the score lines 19, 20 across the flat top 23 of the crown cap 10 and do not intersect with one another. The score lines 21, 22 are each longer than radii of cap 10 but shorter than its diameter, so that each score line 21 and 22 extends more than half way but not fully across the top 23 of the cap.

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Figures 2 to 4A illustrate other embodiments of the present invention. Except for the slightly different configuration of the score lines 21A, 21B, 21C and 22A, 22B, 22C, other features are the same. Figure 4B is a bottom view of the cap of Figure 4A showing its score lines 19, 21C, 20, 22C formed on the internal side of said cap.

The operation of the present invention is shown in Figures 5 to 8. In Figure 5 the bottle body is held by the left hand (not shown) while the thumb 41 of the right hand is pressed on the flat top 23 of the cap 10, and its forefinger 42 is placed underneath the tongue 15 to pull the tongue 15 upward. Then, owing to the notches 181, 182 and score lines 19, 20 at the two sides of the tongue, the tongue 15 can be lifted, and the seal can be partly disrupted as shown in Figures 6A and 6B. At this time, the cap 10 still weakly grips the neck of the

bottle by means of its disrupted skirt and therefore the tongue 15 is pulled further upward to break along the score lines 21, 22 as a solid piece 24. As said score lines 21, 22 do not intersect each other, there is still a connection 25 between the piece 24 and the remainder of the cap as shown in Figure 7. Now the grip of the skirt of cap 10 is completely disrupted and the tongue 15 is pulled off the bottle 30 along with the remainder of the cap 10 without the need of using any separate tool. As shown in Figure 8 a resilient fluid-tight gasket 32 may be provided as in a conventional crimped crown cap.

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2. A cap as claimed in claim 1, wherein the score lines converge into close proximity with one another from the edge of the top of the cap and then extend parallel to one another over the major portion of the width of the cap.

3. A cap as claimed in claim 1, wherein the score lines converge toward one another in substantially straight lines along the top of the cap.

4. A cap as claimed in claim 1, wherein the score lines are parallel to one another substantially throughout their length.

5. A cap as claimed in claim 1, wherein the score lines along the top of the cap are arcuate and are convergent at their opposite ends and divergent at their mid-



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portions.

6. An easy-opening crown cap for closing the open end of a bottle or like container constructed and arranged substantially as hereinbefore described and as illustrated in Figure 1, Figure 2, Figure 3 or Figures 4A, 4B and 5 to 8, of the accompanying drawings.

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