Sept. 15, 1942. J. D. GRANDY 2,295,946

BOTTLE CAP

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Fig. 1.

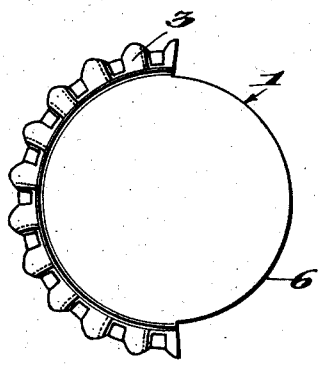


Fig. 2.

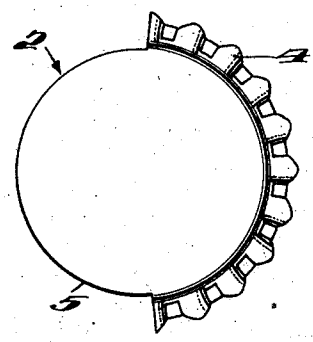


Fig. 3.

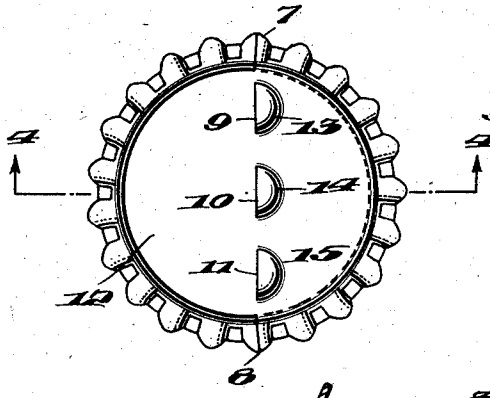


Fig. 4.

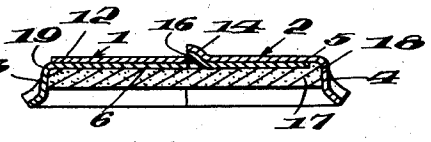


Fig. 5.

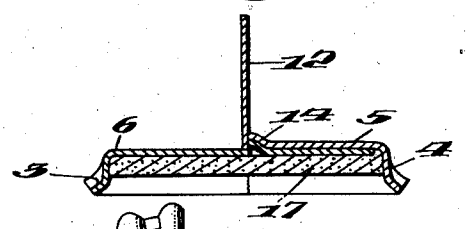


Fig. 6.

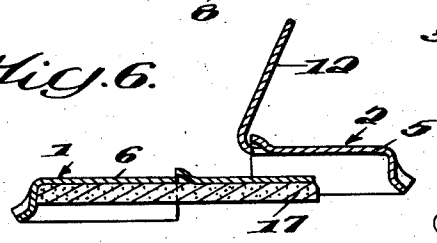


Fig. 22.

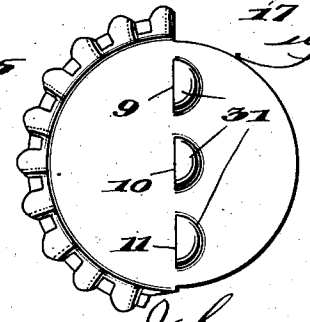
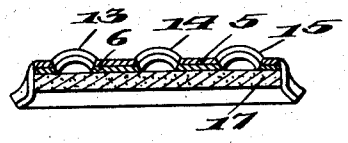


Fig. 7.



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Fig. 8.

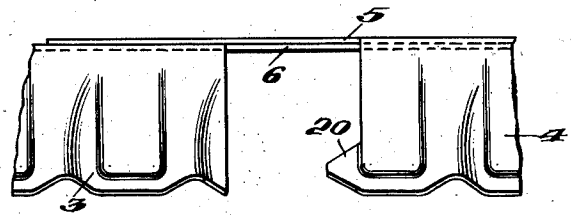


Fig. 9.

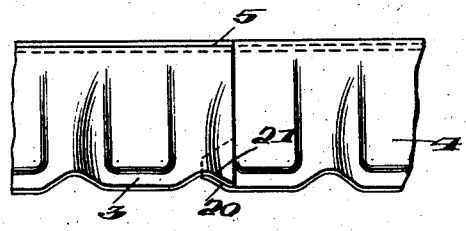


Fig. 11.

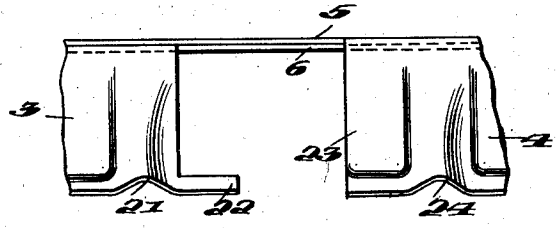


Fig. 12.

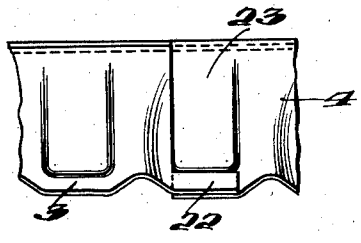


Fig. 10.

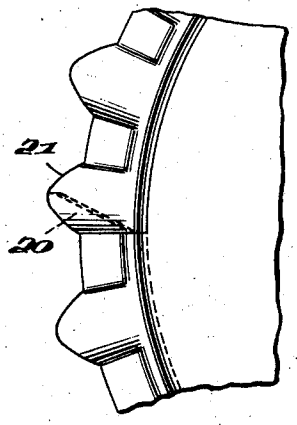


Fig. 13.

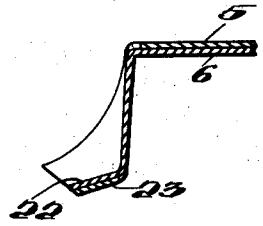
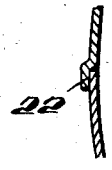


Fig. 14.



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BOTTLE CAP

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Fig. 15.

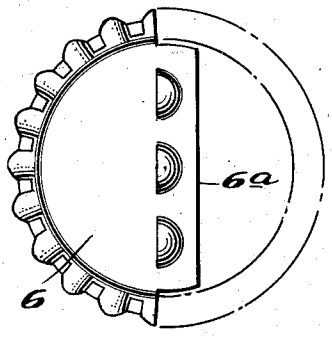


Fig. 20.

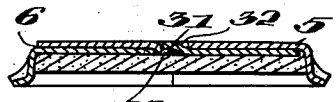


Fig. 21.

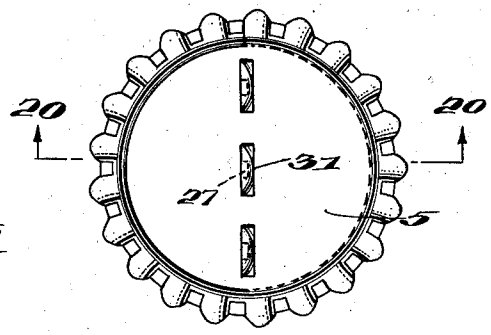


Fig. 16

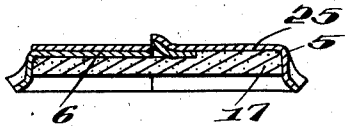


Fig. 17.

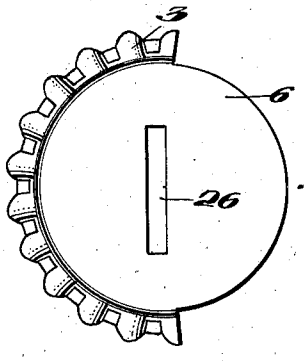


Fig. 18.

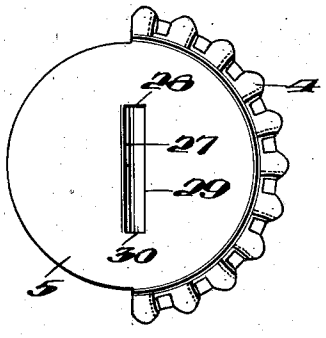
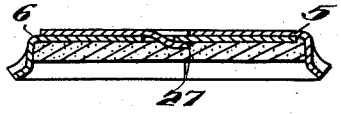


Fig. 19.



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UNITED STATES PATENT OFFICE

2,295,946

BOTTLE CAP

John D. Grandy, Loon Lake, Saskatchewan, Canada

Application November 22, 1940, Serial No. 366,770

10 Claims. (Cl. 215—46)

This invention relates to a bottle cap and is more particularly concerned with that type of cap which is known as a "Crown" cap, which consists of a circular disk having a depending skirt terminating in an outwardly flared flange, the skirt and flange being provided with crimps or corrugations, the flange being bent under the bead on the lip of the bottle for the purpose of holding the cap thereto.

In caps of the type mentioned it has universally been necessary to employ various types of opening devices in order that the crimped skirt may be released from the lip of the bottle, and the present invention has for one of its objects the provision of a cap of this general type which may be readily opened by the fingers, and thereby eliminates the necessity of providing the customary opening devices.

An additional object of the present invention is to provide a cap which may be used in conjunction with the hand or automatic capping machines which are now on the market without any change therein, and it is so designed that no sticking or binding in the capping machine will take place.

An additional object of the invention is to provide a sectional cap, one of the sections of which is provided with a member that acts as a handle or tab for the purpose of removing the first section, after which the second section may be easily removed by the fingers.

Another object of the invention is to provide a sectional cap in which various means are provided for locking the sections together so that they will firmly engage the neck of the bottle and will withstand any pressures generated within the bottle. Furthermore, the construction provides for means which prevent the sections of the cap from separating prior to application to the bottle.

Other objects and advantages of the present invention will appear as the description proceeds, it being understood that modifications may be resorted to without departing from the spirit of this invention so long as they fall within the scope of the appended claims.

Referring to the drawings forming a part hereof:

Figure 1 is a plan view of one section of the cap.

Fig. 2 is a plan view of the companion section.

Fig. 3 is a plan view of my cap in assembled relation.

Fig. 4 is a sectional view taken on the line 4—4 of Fig. 3.

Figs. 5 and 6 are views similar to Fig. 4 but showing the cap in its various stages of opening.

Fig. 7 is a sectional view of Fig. 3 taken at right angles to the line 4—4 and along the line of separation of the sections.

Fig. 8 is a fragmentary side elevation of a modified form of my cap in separated condition.

Fig. 9 is a view similar to Fig. 8 with the sections in assembled relation.

Fig. 10 is a fragmentary plan view of Fig. 9.

Fig. 11 illustrates a fragmentary side view of a modified form of Fig. 8 with the cap in separated condition.

Fig. 12 is a view similar to Fig. 11 with the cap in assembled relation.

Fig. 13 is a fragmentary vertical sectional view taken through the overlapped portions of Fig. 12.

Fig. 14 is a fragmentary horizontal sectional view taken through the overlap of Fig. 12.

Fig. 15 illustrates an additional modification of Fig. 1.

Fig. 16 is a sectional view of a complete cap embodying the form shown in Fig. 15 taken at right angles to the line of separation of the sections.

Figs. 17, 18 and 19 are views similar to Figs. 1, 2 and 3 but of a further modification of my invention.

Fig. 20 is a sectional view of a further modified form.

Fig. 21 is a plan view of Fig. 20.

Fig. 22 is a plan view of the lower section of the cap as shown in Fig. 20.

In Figs. 1 to 7 I have illustrated the preferred form of my invention. The cap consists of the sections 1 and 2 with each section provided with a depending skirt extending peripherally around the circumference of the circular disks.

In Fig. 1 the depending skirt is illustrated at 3 and in Fig. 2 the skirt is indicated at 4.

By examination of Fig. 3 it will be seen that the cap in its assembled relation provides twenty-one crimps in the depending skirt, but in order to render the cap easier to remove it will be noted that in Fig. 1 the depending skirt terminates at the apex of the crimps on opposite sides of the section 1, so that in Fig. 1 there are ten crimps and a half crimp at each end.

In Fig. 2 it will be noted that there are only nine crimps and two half crimps at the ends, so that the section 2 does not embrace as much of the circumference of the bottle lip as does the section 1, and consequently the section 2 can be more easily removed than the section 1.

In the form illustrated the section 2 overlaps the section 1, as clearly seen in Fig. 4, but it is to

be understood that the lower section 1 may contain the lesser number of crimps in order that this section may be more easily removed than the section 2.

The sections 1 and 2 are assembled by overlapping the circular disks 5 and 6, as shown in Fig. 4, and it will be noted that as the disks 5 and 6 are assembled in overlapped relation the ends of the depending skirts will abut as at 7 and 8 so that further movement of the disks towards each other is precluded.

In order to prevent separation of the two sections in a horizontal plane I provide a series of cuts 9, 10 and 11 which extend through both disks, and while I have illustrated in Fig. 3 that there are three of such cuts, it will be understood that any number may be used and that more than one row of the same may be employed.

The cuts 9, 10 and 11 are in alignment with the plane of separation of the two sections so as to facilitate bending of the tab portions 12 of the disk 5 in the removal of the cap.

In addition to the cuts heretofore mentioned it will be observed in Fig. 4 that the metal of both disks adjacent the cuts is elevated as at 13, 14 and 15, so that the elevated material of the lower disk 6 abuts the cut edge of the material of the upper disk 5 at the point indicated at 16. This abutting relation also prevents further collapse of the sections towards each other, and due to the elevations a tongue and socket lock is provided which prevents separation of the sections in a horizontal plane.

In order that the sections cannot be separated from each other in a vertical direction I find it sometimes necessary to utilize the cork 17 for this purpose, it being understood that the frictional contact between the cork and the depending skirts 3 and 4 may be sufficient to accomplish this, but if it is found that this is not sufficient the cork may be glued at its edges, as indicated at 18, to the section 5, and at 19 to the section 6, so that vertical separation is prevented.

From the description thus far it will be seen that the line of separation of the two sections is at approximately the apex of the opposed crimps. Consequently there is no tendency for the cap to spread because the capper exerts its pressure on the apex of each crimp, so that to all intents and purposes the crimped portion of the depending skirt is substantially continuous around the circumference of the disks.

It is to be further noted that in elevating the material of the two disks as at 13, 14 and 15, the metal is stretched or caused to flow and not simply bent, so that the diameter of the cap remains unchanged and retains its truly circular formation.

Referring to Figs. 5 and 6, the method of removing the cap is clearly illustrated. To effect this the tab portion 12 of the section 2 is engaged by the fingers and bent to the position as shown in Fig. 5, this bending occurring along the line of the cuts 9, 10 and 11 and the abutment lines of separation of the sections 7 and 8, and further bending into the position as shown in Fig. 6 causes release of the section 2 from the bottle. The section 1 can then be easily removed by the fingers due to the fact that its grip upon the bead of the bottle extends only slightly more than half the circumference of the bead. It is to be noted that due to the fact that the cuts 9, 10 and 11 are in the same plane as the line of separation of the two sections, the tab 12 will bend along this line and disengage the locking elevations.

With the form of invention thus far described it is obvious that the sections are overlapped to such an extent that substantially a flat surface is left on the interior of the cap in order that the cork may be readily applied and that no sharp edges are present which would tend to cut into the cork and thereby destroy the sealing action thereof.

As a further modification of the present invention and in order to insure against separation of the sections of the cap, I have shown an additional construction in Figs. 8, 9 and 10.

In connection with these figures it will be understood that in addition to the locking means employed in Figs. 1 to 7, I provide additional means to prevent vertical displacement of the sections and at the same time additionally provide against separation of the sections in a horizontal plane.

Referring to Fig. 8, the disk 5 has the depending skirt 4 terminating at one side of the crimp therein. At the lower edge of the skirt 4 there is provided a tapered tongue 20 projecting horizontally from the edge of the skirt, it being understood that there will be a corresponding tongue on the opposite edge of the skirt 4.

The disk 6, which is the lower disk, has a skirt 3 which likewise terminates to one side of the crimp so that as the sections are assembled into the position shown in Fig. 9, the tongue 20 will slip beneath the crimp 21 so that an overlapping relationship is provided, the tongue 20 extending into the apex of the crimp 21 and thereby insuring the cap against separation vertically, and at the same time reinforcing the cap against separation in the horizontal plane.

With reference to Figs. 8 and 9, it will be seen that the tongue 20 is carried by the disk 5, which is the uppermost disk, but after the caps are assembled the tongue 20 lies below the skirt 3 which is carried by the lower disk 6. In this manner the cap is held so that there is no tendency of separation in any direction.

With the foregoing arrangement it will be obvious that the sections of the cap are so interlocked that there is no necessity of depending upon adhesion between the cork and the sections in order to prevent separation, so that in this form the cork may be inserted in the usual manner and the frictional engagement between the cork and the walls thereof relied upon to retain the same within the cap.

Attention is called to the fact that the tongue 20 is located at the lower edge of the depending skirt 4, the purpose being that if a tongue were provided which extended the full height of the depending skirt the extra thickness of metal on the skirt adjacent the bead of the bottle will cause the cap to stick in the capper. However, by locating the tongue at the lower edge of the skirt it will be obvious that as the capper forces the skirt around the bead the double thickness of metal will lie beneath the bead and will be bent in under the bead so that it in no way affects the capper, and sticking of the cap therein is eliminated.

Referring now to Figs. 11 to 14, I have illustrated an additional modification, but which is substantially that of the invention shown in Figs. 8 to 10.

In the present modification the depending skirts 3 and 4 terminate in a direction circumferentially of the disks 5 and 6 in the valleys between the

crimps. In this case the skirt 3, which is secured to the lowermost disk, is provided with a horizontally projecting tongue 22 which overlaps the portion 23 which lies between the crimps 21 and 24.

Somewhat similarly to the construction shown in Fig. 8, it will be seen that the tongue 22 is carried by the lowermost disk but that when the sections are in assembled relation the tongue 22 overlaps the portion 23 exteriorly thereof, as shown in Fig. 12, and that by reason of such relationship the sections are locked against separation in a vertical direction, although the tongue 22 does not hold the sections from separation in a horizontal direction. It has been found that in view of the locking means disclosed in Fig. 3, it is unnecessary to provide additional means against separation of the sections in a horizontal direction, so that the construction of Figs. 11 to 13, supplemented by the locking tongue and socket arrangement of Fig. 3, has been found to securely retain the cap on the neck of the bottle and nevertheless permits its easy removal.

It will be understood with reference to the form of invention shown in both Figs. 9 and 12 that the ends of the skirt abut each other similar to the abutting relationship as shown at 7 and 8 in Fig. 3, except that the tongue 20 in Fig. 8 and the tongue 22 in Fig. 11 overlap a portion of the companion section.

In order to facilitate the action of sliding the tongue 20 or the tongue 22 over or under the skirt of its companion section, I may offset the metal of one or the other of the skirt members, as shown in Fig. 14, where the tongue 22 is indicated as having been offset a distance equal to the thickness of the metal, but it is to be understood, of course, that the metal of the portion 23 of the skirt 4 can be depressed and the tongue 22 extended laterally from the skirt in the plane thereof, and that the same results will be accomplished.

As a further modification of the form shown in Fig. 1 and in order to more securely retain the sections from separation in a vertical direction, a portion of the disk 6 may be cut away at 6a so as to expose more of the undersurface of the disk 5, as indicated at 25, and in this case the cork 17 is glued along its upper face to both the uppermost disk 5 and the lower disk 6.

In all other respects the cap, as shown in Figs. 15 and 16, is the same as that shown in Figs. 1 to 7 inclusive.

Referring to Figs. 17 to 19 inclusive, there is illustrated still an additional form of my invention. In this form the same principle is employed of providing the overlapping disks of metal, but instead of the locking arrangements described in previous figures, I provide an elongated slot 26 in the disk 6 which cooperates with a tongue 27 carried by the disk 5.

As shown in Fig. 19, the tongue 27 is depressed from the plane of the disk 5 so that it projects through the slot 26 and consequently the sections of the cap are held against separation either vertically or horizontally.

The tongue 27 is formed by cutting the metal of the disk 5 along the lines 28, 29 and 30 and depressing the edge adjacent the cut 29 downwardly out of the plane of the disk 5. In this form also it will be evident that it is not necessary to depend upon adhesion between the cork and the sections in order that the sections may be held in locked relationship.

In Figs. 20, 21 and 22 there is illustrated a slight modification of the form shown in Figs. 17 to 19. In this modification the disk 5 is provided with a plurality of spaced narrow tongues 27 and the disk 6 is provided with a plurality of raised sockets 31, said sockets corresponding to the elevated portions 13, 14 and 15 in Figs. 3 and 4. The tongues 27 should be just long enough to extend beneath the adjacent edges of the sockets in order that the sections will not separate vertically.

In the cap illustrated it is evident the two outside tongue and socket locks will rest directly over the rim of the bottle and would be impacted there as the cap is applied so that elevation of the tab of section 5 would not release the tongues 27. It is essential, therefore, that the tongues 27 be only of sufficient length and width to engage in the sockets 31 to prevent vertical separation, and do not project too far into the sockets.

Even with the short tongues 27 as shown, they will not unlock satisfactorily if the tongues 27 were depressed out of the plane of the disk 5 too greatly. It is for this reason that the material of the sockets 31 is elevated so that the tongues 27 may slide thereunder with little depression thereof.

In Fig. 20 it will be seen that elongated slots 32 are formed in the section 5 and that the tongues 27 project from one side thereof toward the other. The slots 32 are of such size that as the sections 5 and 6 are assembled as in Fig. 20, the raised sockets 31 exactly fit the slots 32 and close the same.

By such construction, the top of the cap is practically flat to receive conventional labels, or other printed matter.

While I have described a number of various modifications it is to be seen that the same underlying principle is involved in all forms of my invention. That is to say, I utilize a sectional cap with portions of each section overlapping each other so as to furnish the required rigidity, and have provided various means for interlocking the sections so that they are held against separation in any direction. Due to this relationship the upper section can be readily manipulated by the fingers, and consequently the expense and annoyance of using the customary bottle openers is dispensed with, and yet a cap is provided that has been found in actual practice to serve all the functions of the single piece construction that is commonly known today.

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

1. A bottle cap comprising two sections, each section comprising a disk and a depending crimped skirt, the disks being in overlapping relation and the skirts abutting each other to form a continuous skirt around the circumference of the disks, the upper disk being bendable having a cut therethrough substantially in line with the points where the skirts abut and means on the other disk engaging said cut to hold the sections together whereby the upper disk may be bent along said line for releasing said disk.

2. A bottle cap comprising two sections, each section comprising a disk having a depending crimped skirt, and means for securing the disks in overlapping relation, said means comprising a portion bent out of the plane of one disk to form a shoulder and a lug of the other disk engaging said shoulder, one of said disks being bendable to release the tongue from the socket.

3. A bottle cap comprising overlapping disks,

each disk having a depending skirt thereon provided with crimps, the skirts on the disks abutting to form a continuously extending skirt around the circumference of the disks, and means for preventing separation of the disks horizontally, said means comprising a cut extending through both disks and having the metal adjacent the cut pressed out of the plane of the respective disks.

4. A bottle cap comprising overlapping disks, each disk having a depending skirt thereon provided with crimps, the skirts on the disks abutting to form a continuously extending skirt around the circumference of the disks, and means for preventing separation of the disks horizontally, said means comprising a plurality of cuts extending through both disks and having the metal adjacent the cuts pressed out of the plane of the respective disks, so that the edge of the metal at the cut on one disk abuts the edge of the metal at the cut of the other disk.

5. A bottle cap comprising overlapping disks, each disk having a depending skirt thereon provided with crimps, the skirts on the disks abutting to form a continuously extending skirt around the circumference of the disks, and means for preventing separation of the disks horizontally, said means comprising a plurality of cuts extending through both disks and having the metal adjacent the cuts pressed out of the plane of the respective disks so that the edge of the metal at the cut on one disk abuts the edge of the metal at the cut on the other disk, said cuts lying in the plane of separation of the skirts.

6. A bottle cap comprising overlapping disks, each disk having a depending skirt thereon terminating in an outwardly directed flange, the flange on the lower disk carrying tongues at each end thereof, said tongues resting on the top of the ends of the flanges on the other disk to prevent the lower section from separating from the upper section in a vertical direction.

7. A bottle cap comprising overlapping disks, each disk having a depending skirt thereon terminating in an outwardly directed flange, the flange on the lower disk carrying tongues at each end thereof, said tongues resting on the top of the ends of the flanges on the other disk to prevent the lower section from separating from the upper section in a vertical direction, and means on said disks for securing the disks against separation in a horizontal direction.

8. A bottle cap comprising overlapping disks, each disk having a depending skirt thereon formed with crimps, the skirts on the disks forming a continuous crimped skirt around the circumference of the disks, means to prevent separation of the disks in a horizontal plane, and a cork lying within the crimped skirt and adhesively secured thereto to prevent separation of the disks in a vertical direction.

9. A bottle cap comprising two sections, each section comprising a disk provided with a depending crimped skirt extending partially around the circumference of the disk, said sections being assembled with the disks overlapping and with the ends of the skirts in abutting relation to form a continuous crimped skirt around the circumference of the disks, one of said skirts having tongues projecting horizontally from the ends thereof and interlocking with the opposed ends of the other skirt, said tongues engaging one face of the skirts and the disk of the tongue carrying section engaging the opposite face of its opposed disk.

10. A bottle cap comprising a pair of superposed disks, each disk having a depending skirt extending partially around the circumference of the disk, means for locking the disks together to prevent horizontal separation of the disks comprising a shoulder on one disk and an interengaging lug on the other disk, and means on the skirts for locking the same together to prevent separation of the disks in a vertical direction, said last named means comprising horizontal tongues extending from the ends of the skirt on one disk and engaging the adjacent ends of the skirt on the other disk.

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