

Description

This invention relates in general to new and useful improvements in closure caps, and more particularly to small diameter closure caps having a vacuum-tamper indicating button.

It has been known to provide closure caps with a button configuration which appears when the closure cap is initially formed, but essentially disappears when the closure cap is applied to a container in which a vacuum condition exists. Typical of such closure caps are those which are utilized on baby food jars to indicate the loss of a vacuum. When the vacuum is lost, although the closure cap remains securely on the container, the button disappears.

For example, in US—A—4 616 761, a vacuum indicating thermoplastic closure is disclosed for use with a wide mouth container or jar. AU—B 538 613 also relates to a vacuum indicating jar closure which includes the features defined in the pre-characterising portion of claim 1.

US—A—3 369 689 is simply concerned with an easy opening container closure.

In the past, buttons have been effectively incorporated in larger diameter closure caps, i.e., closure caps for containers having a neck finish with a diameter on the order of 55 mm and larger. However, when the same type of button configuration was attempted on a smaller scale, i.e. with respect to closure caps suitable for use with neck finishes having a diameter below 44 mm, satisfactory performance could not be obtained.

The present invention provides a closure cap for vacuum packed containers, said closure cap being in the form of a sheet metal shell configured to include a generally planar end wall and an axially depending outer skirt, said end wall having a radially outer part comprising a downwardly opening annular channel for receiving a sealant, and an axially recessed end panel extending radially inwardly of said channel, characterized in that said end panel is primarily in the form of a vacuum actuated tamper indicating button, said button including a radially outer annular flange sloping axially upwardly and radially inwardly to define a rise, an intermediate annular flange sloping radially inwardly and axially downwardly to define a dip and joined to said outer flange by an arcuate portion having a first radius, and central portion sloping axially upwardly and radially inwardly, and joined to said intermediate flange by an arcuate portion having a second radius, said central panel being movable axially downwardly under influence of a vacuum on said end panel to have a radially inwardly and axially downward slope.

In accordance with a preferred embodiment of this invention, there is proposed an end panel with a button configuration which is suitable for closure caps for use with neck finish diameters as low as 27 mm and up to 43 mm. Above 43 mm, the prior art button configuration will perform satisfactorily.

It is to be understood that the available space

for the tamper or vacuum indicating button is reduced not only by the small size of the closure cap, but also the need at the end of the closure cap for a channel for receiving therein the gasket material or sealant.

In accordance with a preferred embodiment of this invention, it has been found that with respect to very small diameter available end panels, for example with respect to a closure cap for a 30 mm neck finish, the available diameter will be on the order of (19.0 to 20.8 mm, whereas the cap diameter at the outside will be generally on the order of 33.5 to 33.6 mm). Thus, it will be seen that the available area is on the order of only 60% of the cap exterior diameter.

It has been found, in accordance with a preferred embodiment of this invention, that if the end panel within the channel for the gasket material has a slight rise and then a lesser dip, followed by a very lightly domed central portion, when the normal vacuum is pulled in a container the domed central portion which appears as the button will evert with a resultant decrease in the rise together with generally a decrease in the dip, and the everted central portion forming a general continuation of the dip so that the end panel has a generally flat appearance which is readily distinguishable from the protruding button appearance.

An embodiment of the present invention will now be described by way of example only with reference to the accompanying drawings in which:—

Figure 1 is an elevational view of a closure cap formed in accordance with this invention with parts broken away and shown attached to a container neck finish.

Figure 2 is an enlarged fragmentary sectional view of the encircled area Figure 2 of Figure 1, and shows specifically the cross section of the end wall of a closure cap embodying the invention.

Figure 3 is an enlarged fragmentary sectional view similar to Figure 2, but showing a preferred relationship of various portions of the end wall.

Figure 4 is an enlarged diagrammatic view showing the appearance of the button area as formed with the button up and as applied under vacuum conditions with the button down.

Referring now to the drawings in detail, reference is first made to Figure 1 wherein there is illustrated a closure cap which is the subject of this invention and is identified by the numeral 10. The closure cap 10 is illustrated as being applied to a neck finish, generally identified by the numeral 12, of a container 14. The shape of the container 14 below the neck finish 12 is immaterial as far as this invention is concerned.

It is to be understood that the closure cap 10 may either be of the screw-on type or the press-on type and the neck finish 12 will be of a shape in accordance with the closure cap. In the illustrated embodiment of the invention, the closure cap 10 is of the screw-on or twist-on type and the neck finish 12 will include a plurality of partial threads 16 of which a portion of one thread only is shown.

The neck finish 12 will also have a free end 18 which functions as a sealing end.

As is customary, the closure cap 10 is formed of sheet metal and includes a skirt 20 having an intumed lower portion 22 terminating generally in a reversed curl 24 which, in the case of a twist-on closure, will be further shaped to define a plurality of lugs which cooperate with the partial threads 16 as shown.

The skirt 20 terminates at its upper edge in a downwardly opening channel 26 in which there is positioned suitable gasket material or sealant 27 which is formable over the free end 18 of the neck finish 12 to form a seal with the neck finish. The radially inner part of the channel 26 is in the form of a downwardly and radially inwardly sloping portion 28.

It is to be understood that the channel 26 forms a radially outer part of an end wall, generally indicated by the numeral 30, of the closure cap 10. It is also to be understood that, for the purpose of describing the invention, that part of the end wall 30 radially within the channel 26 will be described as an end panel 32 and that this end panel 32 will be axially recessed with respect to the projecting channel 26.

In Figure 3, there is specifically illustrated a button configuration suitable for the limited area of the end panel 32 when the closure cap 10 is of a size to fit a 30 mm neck finish. The end panel 32 includes a radially outer annular flange 34 which slopes axially outwardly and radially inwardly and has a rise R. Radially inwardly of the flange 34 and connected to the flange 34 by an arcuate cross-sectional part 36 having a radius R1 is an intermediate annular flange 38. The flange 38 slopes radially inwardly and axially inwardly to have a dip D.

Within the flange 38 there is a central portion 40 which is slightly upwardly domed and is connected to the flange by an arcuate cross-sectional portion 42 having a radius R2.

In the embodiment of Figure 3, the outer flange 34 is connected to the portion 28 of the channel 26 by an arcuate cross-sectional portion 44 having a radius R3.

Referring now to Figure 2 in particular, it will be seen that there is illustrated a slightly different configuration of the end panel 32. The end panel 32 will have an outer annular flange 34A to which there is joined an intermediate flange 38A by way of an arcuate cross-sectional portion 36A. Further, there will be a slightly domed central portion 40A which is connected to the intermediate flange 38A by an arcuate cross-sectional portion 42A. The flange 34A will have a rise R_A while the intermediate flange 38A will have a dip D_A . Further, in lieu of the flange 34A being directly connected to the portion 28 of the channel 26, there may be an annular panel 46 which is joined to the portion 28 by an arcuate portion 48 and to the flange 34A by an arcuate portion 50. At this time it is pointed out that in the formation of a closure cap there will be a number of variants due to spring-back, etc. following the formation. Therefore, the end panel of the

closure cap 10 may vary from the preferred configuration of Figure 3 to a possible configuration as shown in Figure 2 basically utilizing the same tooling. Accordingly, hereinafter there will be given specific dimensions for a closure cap having a 30 mm neck finish which will be exemplary of dimensions which closure caps for container neck finishes ranging from 27 mm to 43 mm.

With particular reference to the diagrammatic showing of Figure 4, it will be seen that when the closure cap 10 is not effected by a vacuum environment, the outer flange 34 will have the rise R and the intermediate flange 38 will have the dip. Further, the central portion 40 will have its slightly domed appearance. At this time it is pointed out that the central portion 40 does not project above the top of the channel 26.

When the closure cap 10 is properly applied to a container under vacuum conditions, the central portion 40 will evert with the rise of the outer flange 34 slightly decreasing and with the intermediate flange 38 slightly dipping into the container, but not necessarily at the same degree of dip as originally provide. Further, the central portion 40 will have a radially outer part thereof forming a gentle continuation of the dip of the intermediate flange 38 and assuming a very slightly dished but substantially planar state.

The end panel 32, when the button is down, has the general appearance of being planar while, when the button is up, the button has a pronounced appearance and is easily visually ascertainable so that one inspecting a product to be purchased will be immediately informed that the vacuum condition no longer exists within the container.

At this time it is pointed out that buttons have been utilized in the past with respect to closure caps primarily to indicate the possibility of spoilage of the packaged product. However, such buttons may be utilized in conjunction with products which are not readily subject to spoilage for the purpose of indicating that someone may have sufficiently removed the closure cap to relieve the vacuum in the container and thus give rise to evidence of tampering. Therefore, the closure cap 10 may be alternatively utilized to indicate product spoilage or possible tampering, or both.

Closure caps of the sizes indicated above will normally be formed from double reduced steel sheet having a yield stress above 82,000 p.s.i. with the sheet metal having a base weight varying from 50 pounds to 65 pounds which is equivalent of thicknesses of .0055 to .0072".

In order more particularly to identify the relative sizes of the different portions of the end panel 32, with particular reference to Figure 3, it will be seen that the central portion will be of a diameter D1, the outer diameter of the intermediate flange 38 will be identified as a diameter D2, and the outer diameter of the outer flange 34 will be identified as a diameter D3.

When a preferred cap is formed for a 30 mm neck finish, the dimensions of the closure cap in inches will be as follows (1 inch=2.54 cm):

Cap outside diameter—1.321
 D3: .792; R3: .034
 D2: .642; R1: .057
 D1: .598; R2: .034
 Width of annular panel: 0.000
 Rise: .012; Dip: .003
 End Panel Thickness: .0061 (55# DR-9 Plate)

In regard to ranges of dimensions which could occur in the same cap (due to springback differences, different button heights and panel depths and concentricity differences) for the same closure cap the range of dimensions may be in inches:

Cap outside diameter: 1.319 to 1.325
 D3: .750 to .820; R3: .025 to .045
 D2: .611 to .651; R1: .020 to .075
 D1: .555 to .595; R2: .015 to .075
 Width of annular panel: 0.000 to 0.040
 Rise: 0.004 to 0.015; Dip: 0.000 to 0.005
 End panel thickness: .0055 to .0067

It is to be understood that as the diameter of the neck finish for which the closure cap is intended increases, the dimensions may be proportionally increased or the width of the annular panel 46 may be increased.

Although only a preferred embodiment of the closure cap has been specifically illustrated and described herein, it is to be understood that minor variations may be made in the closure cap dimensions without departing from the spirit and scope of the invention as defined by the appended claims.

Claims

1. A closure cap for vacuum packed containers, said closure cap (10) being in the form of a sheet metal shell configured to include a generally planar end wall (30) and an axially depending outer skirt (20), said end wall having a radially outer part comprising a downwardly opening annular channel (26) for receiving a sealant (27), and an axially recessed end panel (32) extending radially inwardly of said channel, characterized in that said end panel (32) is primarily in the form of a vacuum actuated tamper indicating button, said button including a radially outer annular flange (34) sloping axially upwardly and radially inwardly to define a rise (R), an intermediate annular flange (38) sloping radially inwardly and axially downwardly to define a dip (D) and joined to said outer flange by an arcuate portion (36) having a first radius (R1), and central portion (40) sloping axially upwardly and radially inwardly, and joined to said intermediate flange by an arcuate portion (42) having a second radius (R2), said central panel being movable axially downwardly under influence of a vacuum on said end panel to have a radially inward and axially downward slope.

2. A closure cap according to claim 1, characterized in that said central portion (40) when

downwardly sloping under the influence of a vacuum forms a general continuation of said intermediate flange (38).

3. A closure cap according to claim 1, characterized in that said central portion (40) when downwardly sloping under the influence of a vacuum forms a general continuation of said intermediate flange (38) with a resultant decrease in both said rise (R) and said dip (D).

4. A closure cap in accordance with claim 1, characterized in that said rise (R) exceeds said dip (D).

5. A closure cap in accordance with claim 1, characterized in that said rise (R) exceeds said dip (D) on the order of 3 to 4 times said dip.

6. A closure cap according to claim 1, characterized in that said outer flange (34) has an outer periphery directly connected to said channel by an arcuate portion (44) having a third radius (R3).

7. A closure cap according to claim 1, characterized in that said outer flange (34) has an outer periphery connected to said channel by an annular generally planar panel (46).

8. A closure cap according to claim 1, characterized in that said end panel (32) has a thickness on the order of 0.0217 to 0.0283 mm base thickness.

9. A closure cap according to claim 1, characterized in that said central portion (40) has a rise such that said central portion is axially recessed relative to said channel (26).

10. A closure cap according to claim 1, characterized in that said central portion (40) has a diameter on the order of 75% of the diameter of said end panel (32).

11. A closure cap according to claim 1, characterized in that said intermediate flange (38) has a width on the order of 3% of the diameter of said end panel (32).

12. A closure cap according to claim 1, characterized in that said outer flange (34) has a width on the order of 10% of the diameter of said end panel (32).

13. A closure cap according to claim 1, characterized in that said central portion (40) has a diameter on the order of 75% of the diameter of said end panel (32), said intermediate flange (38) has a width on the order of 3% of the diameter of said end panel (32), and said outer flange (34) has a width on the order of 10% of the diameter of said end panel (32).

14. A closure cap according to claim 1, characterized in that said central portion (40) primarily forms said button.

15. A closure cap according to claim 1, characterized in that said closure cap (10) is of a size ranging from 27 mm to 43 mm.

16. A closure cap according to claim 1, characterized in that said closure cap (10) is of a size on the order of 30 mm.

17. A closure cap according to claim 1, characterized in that said closure cap (10) is of a size as small as 27 mm.

Cap outside diameter—1.321
 D3: .792; R3: .034
 D2: .642; R1: .057
 D1: .598; R2: .034
 Width of annular panel: 0.000
 Rise: .012; Dip: .003
 End Panel Thickness: .0061 (55# DR-9 Plate)

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 D1: .555 to .595; R2: .015 to .075
 Width of annular panel: 0.000 to 0.040
 Rise: 0.004 to 0.015; Dip: 0.000 to 0.005
 End panel thickness: .0055 to .0067

It is to be understood that as the diameter of the neck finish for which the closure cap is intended increases, the dimensions may be proportionally increased or the width of the annular panel 46 may be increased.

Although only a preferred embodiment of the closure cap has been specifically illustrated and described herein, it is to be understood that minor variations may be made in the closure cap dimensions without departing from the spirit and scope of the invention as defined by the appended claims.

Claims

1. A closure cap for vacuum packed containers, said closure cap (10) being in the form of a sheet metal shell configured to include a generally planar end wall (30) and an axially depending outer skirt (20), said end wall having a radially outer part comprising a downwardly opening annular channel (26) for receiving a sealant (27), and an axially recessed end panel (32) extending radially inwardly of said channel, characterized in that said end panel (32) is primarily in the form of a vacuum actuated tamper indicating button, said button including a radially outer annular flange (34) sloping axially upwardly and radially inwardly to define a rise (R), an intermediate annular flange (38) sloping radially inwardly and axially downwardly to define a dip (D) and joined to said outer flange by an arcuate portion (36) having a first radius (R1), and central portion (40) sloping axially upwardly and radially inwardly, and joined to said intermediate flange by an arcuate portion (42) having a second radius (R2), said central panel being movable axially downwardly under influence of a vacuum on said end panel to have a radially inward and axially downward slope.

2. A closure cap according to claim 1, characterized in that said central portion (40) when

downwardly sloping under the influence of a vacuum forms a general continuation of said intermediate flange (38).

3. A closure cap according to claim 1, characterized in that said central portion (40) when downwardly sloping under the influence of a vacuum forms a general continuation of said intermediate flange (38) with a resultant decrease in both said rise (R) and said dip (D).

4. A closure cap in accordance with claim 1, characterized in that said rise (R) exceeds said dip (D).

5. A closure cap in accordance with claim 1, characterized in that said rise (R) exceeds said dip (D) on the order of 3 to 4 times said dip.

6. A closure cap according to claim 1, characterized in that said outer flange (34) has an outer periphery directly connected to said channel by an arcuate portion (44) having a third radius (R3).

7. A closure cap according to claim 1, characterized in that said outer flange (34) has an outer periphery connected to said channel by an annular generally planar panel (46).

8. A closure cap according to claim 1, characterized in that said end panel (32) has a thickness on the order of 0.0217 to 0.0283 mm base thickness.

9. A closure cap according to claim 1, characterized in that said central portion (40) has a rise such that said central portion is axially recessed relative to said channel (26).

10. A closure cap according to claim 1, characterized in that said central portion (40) has a diameter on the order of 75% of the diameter of said end panel (32).

11. A closure cap according to claim 1, characterized in that said intermediate flange (38) has a width on the order of 3% of the diameter of said end panel (32).

12. A closure cap according to claim 1, characterized in that said outer flange (34) has a width on the order of 10% of the diameter of said end panel (32).

13. A closure cap according to claim 1, characterized in that said central portion (40) has a diameter on the order of 75% of the diameter of said end panel (32), said intermediate flange (38) has a width on the order of 3% of the diameter of said end panel (32), and said outer flange (34) has a width on the order of 10% of the diameter of said end panel (32).

14. A closure cap according to claim 1, characterized in that said central portion (40) primarily forms said button.

15. A closure cap according to claim 1, characterized in that said closure cap (10) is of a size ranging from 27 mm to 43 mm.

16. A closure cap according to claim 1, characterized in that said closure cap (10) is of a size on the order of 30 mm.

17. A closure cap according to claim 1, characterized in that said closure cap (10) is of a size as small as 27 mm.



Patentansprüche

1. Verschlusskappe für vakuumverpackte Behälter, wobei die Verschlusskappe (10) in Form einer Blechhülse so ausgebildet ist, daß sie eine allgemein ebene Stirnwand (30) und einen axial abstehenden äußeren Rand (20) aufweist, wobei die Stirnwand einen radial äußeren Teil mit einem nach unten offenen Ringkanal (26) zur Aufnahme einer Dichtung (27) und eine axial eingezogene Stirnplatte (32) aufweist, die sich von dem Kanal radial nach innen erstreckt, dadurch gekennzeichnet, daß die Stirnplatte (32) hauptsächlich die Form eines vakuumbetätigten, einen Eingriff anzeigenden Knopfes besitzt, wobei der Knopf einen radial äußeren Ringflansch (34), der axial nach oben und radial nach innen geneigt ist und einen Anstieg (R) bildet, einen Zwischenflansch (38), der radial nach innen und axial nach unten geneigt ist, eine Senkung (D) bildet und mit dem äußeren Flansch durch einen bogenförmigen Bereich (36) verbunden ist, der einen ersten Radius (R1) besitzt, und einen Mittelteil (40) aufweist, der axial nach oben und radial nach innen geneigt und mit dem Zwischenflansch durch einen bogenförmigen Bereich (42) verbunden ist, der einen zweiten Radius (R2) besitzt, und wobei der Mittelteil unter dem Einfluß eines auf die Stirnplatte wirkenden Vakuums axial nach unten beweglich ist, so daß er eine Neigung radial nach innen und axial nach unten aufweist.

2. Verschlusskappe nach Anspruch 1, dadurch gekennzeichnet, daß der Mittelteil (40), wenn er sich unter dem Einfluß eines Vakuums nach unten neigt, eine allgemeine Fortsetzung des Zwischenflansches (38) bildet.

3. Verschlusskappe nach Anspruch 1, dadurch gekennzeichnet, daß der Mittelteil (40), wenn er sich unter dem Einfluß eines Vakuums nach unten neigt, eine allgemeine Fortsetzung des Zwischenflansches (38) mit einer daraus sich ergebenden Abnahme des Anstiegs (R) und der Senkung (D) bildet.

4. Verschlusskappe nach Anspruch 1, dadurch gekennzeichnet, daß der Anstieg (R) die Senkung (D) übersteigt.

5. Verschlusskappe nach Anspruch 1, dadurch gekennzeichnet, daß der Anstieg (R) die Senkung (D) in der Größenordnung des Drei- bis Vierfachen der Senkung übersteigt.

6. Verschlusskappe nach Anspruch 1, dadurch gekennzeichnet, daß der äußere Flansch (34) einen äußeren Umfang aufweist, der mit dem Kanal über einen bogenförmigen Abschnitt (44) direkt verbunden ist, der einen dritten Radius (R3) aufweist.

7. Verschlusskappe nach Anspruch 1, dadurch gekennzeichnet, daß der äußere Flansch (34) einen äußeren Umfang aufweist, der mit dem Kanal durch eine allgemein ebene Ringfläche (46) verbunden ist.

8. Verschlusskappe nach Anspruch 1, dadurch gekennzeichnet, daß die Stirnplatte (32) eine Dicke in der Größenordnung von 0,0217 bis 0,0283 mm Basisdicke besitzt.

9. Verschlusskappe nach Anspruch 1, dadurch gekennzeichnet, daß der Mittelteil (40) einen derartigen Anstieg aufweist, daß der Mittelteil bezüglich des Kanals (26) axial eingezogen ist.

10. Verschlusskappe nach Anspruch 1, dadurch gekennzeichnet, daß der Mittelteil (40) einen Durchmesser in der Größenordnung von 75% des Durchmessers der Stirnplatte (32) aufweist.

11. Verschlusskappe nach Anspruch 1, dadurch gekennzeichnet, daß der Zwischenflansch (38) eine Breite in der Größenordnung von 3% des Durchmessers der Stirnplatte (32) aufweist.

12. Verschlusskappe nach Anspruch 1, dadurch gekennzeichnet, daß der äußere Flansch (34) eine Breite in der Größenordnung von 10% des Durchmessers der Stirnplatte (32) aufweist.

13. Verschlusskappe nach Anspruch 1, dadurch gekennzeichnet, daß der Mittelteil (40) einen Durchmesser in der Größenordnung von 75% des Durchmessers der Stirnplatte (32) aufweist, wobei der Zwischenflansch (38) eine Breite in der Größenordnung von 3% des Durchmessers der Stirnplatte (32) und der äußere Flansch (34) eine Breite in der Größenordnung von 10% des Durchmessers der Stirnplatte (32) aufweist.

14. Verschlusskappe nach Anspruch 1, dadurch gekennzeichnet, daß der Mittelteil (40) hauptsächlich den Knopf bildet.

15. Verschlusskappe nach Anspruch 1, dadurch gekennzeichnet, daß die Verschlusskappe (10) eine Größe im Bereich von 27 mm bis 43 mm aufweist.

16. Verschlusskappe nach Anspruch 1, dadurch gekennzeichnet, daß die Verschlusskappe (10) eine Größe in der Größenordnung von 30 mm aufweist.

17. Verschlusskappe nach Anspruch 1, dadurch gekennzeichnet, daß die Verschlusskappe (10) eine Größe von nur 27 mm aufweist.

Revendications

1. Capuchon de fermeture de récipients emballés sous vide, ledit capuchon de fermeture (10) ayant la forme d'une coquille en tôle métallique profilée de façon à comporter une paroi extrême (30) plane dans l'ensemble et une jupe extérieure (20) dirigée axialement vers le bas, ladite paroi extrême comportant une partie radialement extérieure comprenant une rainure annulaire (26) ouverte vers le bas pour recevoir une matière d'étanchéité (27), et un panneau extrême (32) évidé axialement et s'étendant radialement vers l'intérieur de ladite rainure, caractérisé en ce que ledit panneau extrême (32) a dans l'essentiel la forme d'un bouton d'indication de violation actionné par vide, ledit bouton comportant une collerette annulaire (34) radialement extérieure, inclinée axialement vers le haut et radialement vers l'intérieur de façon à définir une saillie (R), une collerette annulaire intermédiaire (38) inclinée radialement vers l'intérieur et axialement vers le bas de façon à définir un creux (D) et jointe à ladite collerette extérieure par une partie incurvée (36) comportant un premier rayon (R1), ainsi



qu'une partie centrale (40) inclinée axialement vers le haut et radialement vers l'intérieur, et jointe à ladite collerette intermédiaire par une partie incurvée (42) comportant un second rayon (R2), ledit panneau central étant mobile axialement vers le bas sous l'influence d'un vide exercé sur ledit panneau extrême de façon à avoir une pente orientée radialement vers l'intérieur et axialement vers le bas.

2. Capuchon de fermeture selon la revendication 1, caractérisé en ce que ladite partie centrale (40) lorsqu'elle est inclinée vers le bas sous l'influence d'un vide, forme un prolongement général de ladite collerette intermédiaire (38).

3. Capuchon de fermeture selon la revendication 1, caractérisé en ce que ladite partie centrale (40), quand elle est inclinée vers le bas sous l'influence d'un vide, forme un prolongement général de ladite collerette intermédiaire (38), avec une réduction résultante à la fois de ladite saillie (R) et dudit creux (D).

4. Capuchon de fermeture selon la revendication 1, caractérisé en ce que ladite saillie (R) dépasse ledit creux (D).

5. Capuchon de fermeture selon la revendication 1, caractérisé en ce que ladite saillie (R) dépasse ledit creux (D) de l'ordre de 3 à 4 fois ledit creux.

6. Capuchon de fermeture selon la revendication 1, caractérisé en ce que ladite collerette extérieure (34) a une périphérie extérieure reliée directement à ladite rainure par une partie incurvée (44) comportant un troisième rayon (R3).

7. Capuchon de fermeture selon la revendication 1, caractérisé en ce que ladite collerette extérieure (34) à une périphérie extérieure reliée à ladite rainure par un panneau annulaire (46) plan dans l'ensemble.

8. Capuchon de fermeture selon la revendication 1, caractérisé en ce que ledit panneau extrême (32) a une épaisseur correspondant à

une épaisseur de base de l'ordre de 0,0217 à 0,0283 mm.

9. Capuchon de fermeture selon la revendication 1, caractérisé en ce que ladite partie centrale (40) comporte une saillie telle que cette partie centrale soit axialement évidée par rapport à ladite rainure (26).

10. Capuchon de fermeture selon la revendication 1, caractérisé en ce que ladite partie centrale (40) a un diamètre de l'ordre de 75% du diamètre dudit panneau extrême (32).

11. Capuchon de fermeture selon la revendication 1, caractérisé en ce que ladite collerette intermédiaire (38) a une largeur de l'ordre de 3% du diamètre dudit panneau extrême (32).

12. Capuchon de fermeture selon la revendication 1, caractérisé en ce que ladite collerette extérieure (34) a une largeur de l'ordre de 10% du diamètre dudit panneau extrême (32).

13. Capuchon de fermeture selon la revendication 1, caractérisé en ce que ladite partie centrale (40) a un diamètre de l'ordre de 75% du diamètre dudit panneau extrême (32), ladite collerette intermédiaire (38) a une largeur de l'ordre de 3% du diamètre dudit panneau extrême (32) et ladite collerette extérieure (34) a une largeur de l'ordre de 10% du diamètre du dit panneau extrême (32).

14. Capuchon de fermeture selon la revendication 1, caractérisé en ce que ladite partie centrale (40) forme dans l'essentiel ledit bouton.

15. Capuchon de fermeture selon la revendication 1, caractérisé en ce que ledit capuchon de fermeture (10) a une dimension comprise entre 27 mm et 43 mm.

16. Capuchon de fermeture selon la revendication 1, caractérisé en ce que ledit capuchon de fermeture (10) a une dimension de l'ordre de 30 mm.

17. Capuchon de fermeture selon la revendication 1, caractérisé en ce que ledit capuchon de fermeture (10) a une dimension aussi petite que 27 mm.

