(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 0 979 780 B1

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
12.11.2003 Bulletin 2003/46

(51) Int Cl.[7]: **B65D 41/48**, B65D 43/10

(21) Application number: **98630043.2**

(22) Date of filing: **11.08.1998**

(54) **A pilferproof cover and a container associated therewith**

Originalitätsverschluss und mit solchem Verschluss versehener Behälter.

Fermeture de garantie et récipient muni d'une telle fermeture.

(84) Designated Contracting States:
AT BE CH DE DK ES FI FR GB GR IT LI LU NL PT SE
Designated Extension States:
SI

(43) Date of publication of application:
16.02.2000 Bulletin 2000/07

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EP 0 979 780 B1

Printed by Jouve, 75001 PARIS (FR)

Description

[0001] The present invention relates to a pilferproof or tamper resistant cover or lid for a container, and also to a packaging assembly comprising the combination of the cover and container.

[0002] In the packaging art pilferproof caps have been developed for bottles or like containers. These caps as disclosed in CH-A-331168, provide an effective closure of the bottles and assure the consumer that the bottles have not been already opened. The known caps are generally made of a polymeric material and are characterized by a small dimension.

[0003] More recently, some attempts have been made as disclosed in US-A-4 535 904 to develop larger press-on covers or lids for cylindrical containers such as tins or the like.

[0004] However, these known covers with the safety rings are difficult to apply to the containers without damaging the safety ring or there is an unsatisfactory adaptation between the container and the safety ring detracting from the pilferproof or tamper resistant engagement between the cover and the container.

[0005] With the known covers, it is required to modify the machinery to apply the covers to the containers. This is due to the fact that the known covers cannot be applied or attached to the containers by a simple pressure applied to the covers on the top of the tins. Further, the known covers cannot be regularly stacked during the storage because of the presence of a safety ring maintaining tightly the cover in contact with the container device.

[0006] Furthermore, the covers, when stored, were damaged and distorted because of the pressure developed by the covers one another. This problem of distortion is due to the fact that the covers are larger than the caps used for bottles or the like and that the covers can slide relative to one another during storage thereof.

[0007] Another problem encountered with the use of the above-mentioned covers, resides in the fact that the safety ring comprises a tear-off tab which is grasped by the consumer to tear-off the safety ring when it is desired to open the container. This tear-off tab can interfere with the tabs of other safety rings due to the protruding position of the tear-off tab.

[0008] An object of the present invention is to provide a pilferproof or tamper resistant cover or lid which can be easily applied to a container while making it impossible to remove the lid or cover without tearing off the safety ring.

[0009] A further object of the present invention is to provide pilferproof or tamper resistant covers or lids that can be stacked on one another for packaging and present slip-off of the cover from one another and avoid damage or distortion of the covers.

[0010] A further object of the present invention is to provide a pilferproof or tamper resistant cover or lid having an improved safety ring to facilitate application of the cover to a container without modification of the existing assembly machinery.

[0011] Another object of the present invention is to provide a pilferproof or tamper resistant cover or lid in which the tear-off tab does not extend outwardly beyond the circumferential periphery of the cover.

[0012] Another object of the present invention is to provide a container consistent with the cover or lid of the present invention.

[0013] The present invention provides a pilferproof cover for a container, having an axial centerline, comprising:

a circular end wall having an upper end surface and an outer periphery having an outer diameter,

a cylindrical skirt extending downwardly from the outer periphery of the end wall having a lower end and a radially inner surface and an outer axial surface;

means for removably retaining the cover on a container, said means being provided on the radially inner surface of the skirt; and

an annular tear-off safety ring extending downwardly and radially inwardly from the lower end of the skirt, said safety ring having an upper end and a lower end, the upper end of the safety ring being connected by means of a circumferentially extending rupturable connection to the lower end of the skirt, the safety ring having a generally convex inwardly bulged inner surface and a generally flat outer surface tapering inwardly relative to the outer surface of the skirt, said flat outer surface forming a first acute angle with a line extending parallel to the axial centerline of the cover,

characterized in that said flat outer surface extends substantially from the upper end of the safety ring to the lower end thereof, and said inner surface has an upper generally flat surface section extending from the upper end of the safety ring and a lower curved surface section extending from the flat surface section to the lower end of the safety ring, said upper flat surface section forming, with said parallel line, a second acute angle which is larger than the first acute angle, and the curved inner lower surface section of the safety ring having a first intermediate curved surface portion having a first radius of curvature, a second curved surface portion between and tangent to the intermediate curved surface portion and the flat inner upper surface section and having a second radius of curvature, and a third curved surface portion between and tangent to the intermediate curved surface portion and the flat outer surface at the lower end of the safety ring and having a third radius of curvature, the second radius of curvature being smaller than the first radius of curvature and the third radius of

curvature being smaller than the second radius of curvature.

[0014] In a specific embodiment the safety ring has a maximum thickness closer to its lower end than to its upper end.

[0015] Preferably, the safety ring has a tear-off tab which does not extend radially outwardly beyond the outer axial surface of the skirt.

[0016] In another embodiment, the safety ring is generally half tear-shaped in cross section.

[0017] Preferably, an annular rib having an outer diameter is provided on the upper end surface of the end wall and spaced radially inwardly from the outer periphery thereof and the lower end of the safety ring has a diameter larger than the outer diameter of the annular rib and smaller than the diameter of the outer periphery of the circular end wall so that the cover can be stacked on another like cover with the annular safety ring of the first cover engaging said other cover on the end wall between the outer periphery thereof and the annular rib, so that the annular rib prevents slipping off of the covers from one another in transverse direction.

[0018] The curved inner lower surface section may have a compound to facilitate slipping on of the cover onto an end of the container.

[0019] The cover is preferably formed of a polymer material, such as plastic, although any resilient material could be used.

[0020] Another object of the invention is a packaging assembly comprising a container having a cylindrical outer wall and the pilferproof cover of the invention mounted on one end of said container characterized in that the container has at said one end a circumferential projection extending radially beyond its outer wall and a circumferential groove in said outer wall spaced below the circumferential projection and in that, with the cover mounted on the container, a lower end portion of the safety ring is snugly nested within the circumferential groove with the diameter of the lower end of the safety ring being substantially equal to the outer diameter of the container and the lower end of the safety ring being closely adjacent to or contacting the outer container wall substantially at a location where a lower edge of the circumferential groove merges with the cylindrical outer wall of the container.

[0021] Preferably the groove is V-shaped and has a rounded bottom and two inclined side walls smoothly merging with the outer cylindrical wall of the container.

[0022] The container can be a tin, such as a metallic tin, or the like.

[0023] Other objects, advantages and features will become more apparent with the teaching of the principles of the invention in connection with the disclosure of the preferred embodiments in the specification, claims and drawings.

Fig.1 is across-sectional view of the cover or the lid, applied to the top of a container;

Fig.2 is a bottom view of the cover or lid of Fig.1, showing the safety band or ring with its tear-off lip portion.

Fig.3 is a partial cross-sectional view in enlarged scale of the cover or lid in accordance with the invention, in stacked position on a second cover or lid of the invention;

Fig.3a is a partial cross-sectional view of the lower end of the cover or lid showing the safety band or ring;

Fig.4 is an enlarged view of the detail A in Fig.1;

Fig.5 is an fragmentary bottom view at an enlarged scale of the detail B of the tear-off lip portion of Fig. 2 of the safety band or ring; and

Fig.6 is a fragmentary perspective view of the cover or lid with the tear-off lip portion partially pivoted away from the safety band and ring to illustrate the construction of the safety band or ring in the area of the tear-off lip.

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0024] In Fig. 1 there is shown a pilferproof or tamper resistant cover 10 or lid of the invention mounted on top of a container, such as a metallic container (only the upper end portion thereof being shown). As best shown in Fig. 3, the cover 10 has a circular end wall 12. A cylindrical skirt 14 extends downwardly from the outer periphery of the end wall 12. An annular rib 16 extends upwardly from the upper surface 18 of the end wall 12. The annular rib 16 has a truncated cross-sectional shape and it is spaced radially inwardly from the outer cylindrical surface 14a of the cylindrical skirt 14 or from the outer peripheral edge of the end wall 12. The cylindrical skirt 14 has on its radially inner cylindrical surface 14b a radially inwardly projecting annular nose 20 disposed approximately centrally between the upper axial end and the lower axial end 15 of the cylindrical skirt 14. The nose 20 has a lower surface 22 and an upper surface 24 as well as rounded surface 26 interconnecting the lower surface 22 and the upper surface 24. The lower surface 22 is inclined downwardly toward the lower end 15 of the annular skirt 14 at an acute angle a' of approximately 5 degrees with respect to a radial line normal to the longitudinal axial centerline x-x (Fig. 1) of the cover. The upper surface 24 is inclined at a larger angle a" of approximately 45° with respect to a radial line normal to the longitudinal axis x-x of the cover. The upper surface is connected by a radiused surface portion 24a to the axial inner wall 14b of the cylindrical skirt 14.

[0025] An annular safety ring or guarantee strip 30 is connected at its upper end 30a by means of a thin tear-off connection 32 to the lower end 15 of the cylindrical

skirt 14. The safety ring 30, as shown in Fig. 3 is generally teardrop-shaped or half teardrop-shaped in cross-section and generally inclined radially inwardly from its upper end 30a at the tear-off connection 32 to its lower end 30b. The lower end 30b of the safety ring 30 has a diameter larger than the outer diameter of the rib 16 but smaller than the outer diameter of the skirt 14 or the outer diameter of end wall 12. The safety ring 30 has a generally flat outer surface 34 extending from the upper end 30a to the lower end 30b of the safety ring 30. The flat outer surface 34 is tapered inwardly at an acute angle α of approximately 19° with respect to the outer surface of the skirt 14 or an axial line extending parallel to the longitudinal centerline x-x of the cover 10. The safety ring 30 has furthermore a convex, inwardly bulged inner surface 36 consisting of a generally flat inner upper surface section 36a and a curved inner lower surface section 36b. The maximum thickness T of the safety ring 30 is closer to its lower end 30b than to its upper end 30a. The flat upper surface section 36a extends from the upper end 30a of the safety ring 30 to approximate a mid point of the axial length of the safety ring 30. The lower surface section 36b extends from the lower end of the flat upper surface section 36a and forms the lower end 30b of the safety ring 30. As shown in Fig. 3a, the curved inner lower surface section 36b of the safety ring 30 has a first intermediate curved surface portion 36b' having a first radius of curvature R1, a second curved surface portion 36b" between and tangent to the intermediate curved surface portion 36b' and the flat inner upper surface section 36a and having a second radius of curvature R2, and a third curved surface portion 36b"' between and tangent to the intermediate curved surface portion 36b' and the flat outer surface 34 at the lower end 30b of the safety ring 30 and having a third radius of curvature R3, wherein the second radius of curvature R2 is smaller than the first radius of curvature R1 and the third radius of curvature R3 is smaller than the second radius of curvature R2. In one embodiment, the first radius of curvature R1 is about 4 mm, the second radius R2 of curvature is about 2 mm and the third radius of curvature R3 is about 0.4 mm. The flat upper surface section 36a is inclined inwardly from the upper end 30a of the safety ring 30 at an angle β of approximately 48°. This facilitates conventional rolling on of the cover onto a container without the need for special tools for widening or enlarging the cover at the end of the safety ring.

[0026] A plurality of covers can be safety stacked on one another for packaging and shipment. In the stack the lower end 30b of the generally inwardly inclined safety ring 30 of each cover will engage the surface portion of the upper wall 18 of the end wall 12 of an adjacent underlying cover radially outwardly of the annular rib 16 between the rib 16 and the outer periphery of the end wall 12. The annular rib 16 resists undesired relative movement of the covers in the stack in a direction transverse to the longitudinal centerline of the covers to the extent that the covers cannot slip-off from one another in transverse direction whereby the covers can be safely stacked on one another to provide a stable stack facilitating packaging and shipment. In Fig. 1 an adjacent underlying cover is schematically indicated in phantom lines.

[0027] As can be seen from the bottom view of Fig. 2, the cover has a tab 40 which is connected by narrow rupturable connections 42a, 42b, 42c as shown in the enlarged detail of Fig. 4, the perspective view of Fig. 5 and also in Fig. 6, to the safety ring 30 and the skirt 14. The tab 40 is adapted to be grasped by the user's fingers for tearing off the safety ring 30 from the lower end of the cylindrical or circumferential skirt 14 along the connection 32. The tab 40 is generally parallel to the skirt 14 and is accordingly disposed at an angle with respect to the radially inwardly inclined safety ring 30. This facilitates grasping of the tab for tearing off the safety ring 30 from the skirt 14 of the cover 10. Preferably, the tab 40 does extend radially beyond the skirt 14 in order to prevent interference of the covers 10 with one another or with the cover manipulating machines during fabrication and stacking of the covers 10 and also during application of the covers 10 to the containers.

[0028] In Fig. 1 and as best shown in Fig. 4 a pilferproof or tamper resistant cover 10 is shown engaged on a container C, such as a metallic container. It can be seen that the container C has at its upper end a circumferential flange 50 projecting from the outer circumferential wall 52 of the container C. When the cover 10 is placed on the container C the flange 50 is received within the circumferential skirt 14 between the end wall 12 of the cover 10 and the radially inwardly projecting nose 26. The lower portion of the circumferential flange 50 has a decreasing diameter and is contoured to correspond substantially to the inwardly inclined shape of the upper surface 24 of the nose 20.

[0029] Spaced below the circumferential flange 50 the container C has in its outer wall 52 a circumferential radially outwardly opening groove 54 which is adapted to partly receive the safety ring 30 therein. The groove 54 has a rounded bottom portion 56 and two diverging side portions 58 interconnecting the rounded bottom portion 56 with the outer surface of the outer circumferential wall 52 of the container. The inclination of the diverging upper side wall portion 58 of the groove 56 corresponds generally to the inclination of the flat upper inner surface section 36a of the safety ring 30. The lower portion of the safety ring 30 extends into the groove 54 and the lowermost end of the safety ring 30 is at least closely adjacent or contacts the lower inclined side surface 58 of the groove 54. The diameter of the safety ring 30 at the lower end 30b thereof, namely the diameter of the safety ring 30 at the lower end of the flat outer surface 34 is generally identical to the diameter of the outer surface of the outer circumferential wall 52 of the container C. Accordingly, the lower end portion of the safety ring 30 is tightly nested within the groove 54 thereby providing a generally smooth transition between the lower end

of the inwardly inclined safety ring 30 and the outer surface of the container outer wall 52 making it impossible to remove the cover 10 from the container without previously tearing off the safety ring 30.

[0030] As an alternative to the described embodiment the radially inwardly projecting nose 20 at the inner wall of the skirt 14 may also be formed closely adjacent to the lower end 15 of the circumferential skirt 14.

[0031] The cover is preferably formed of plastic material.

[0032] As shown in Fig. 5, at the tear-off tab 40 the safety band 30 is weakened and does not extend upwardly the full height of the safety band up to the lower end 15 of the circumferential skirt 14. Radially inwardly of the tab 40 the safety band 30 has a cut-out portion 60 extending over a circumferential length generally corresponding to the circumferential length of the tear-off tab 40. The cut-out portion 60 is bounded at its lower end by a remaining web portion 62 of the safety ring 30 and is bounded at its upper end by the lower end 15 of the skirt 14. The tear-off tab 40 has on its outer surface the narrow rupturable connections 42a to connect the tab 40 to the skirt 14 and has on its inner surface narrow rupturable connections 42b connecting the tab 40 to the remaining web portion 62 of the safety ring 30. A radial triangular wall portion 64 connects the tab 40 at its rear end to the safety ring 30. In Fig. 5 the tear-off tab 40 is shown in an outwardly opened position with the narrow connections 42a between the tear-off tab 40 and the skirt 14 as well as the narrow connections 42b between lower remaining web portion 62 of the safety ring 30 ruptured prior to fully tearing off the safety ring 30 from the remaining portion of the cover 10. The remaining web portion 62 is connected by a rupturable tab 42c to the safety ring 30 as also shown in Fig. 5.

Claims

1. A pilferproof cover (10) having an axial centreline, for a container (c), comprising:

a circular end wall (12) having an upper end surface (18) and an outer periphery having a diameter;

a cylindrical skirt (14) extending downwardly from the outer periphery of the end wall (12) and having a lower end (15) and a radially inner surface (14b) and an outer axial surface (14a);

means for removably retaining the cover (10) on a container (c), said means being provided on the radially inner surface (14b) of the skirt (14); and

an annular tear-off safety ring (30) extending downwardly and radially inwardly from the lower end (15) of the skirt (14), said safety ring having an upper end (30a) and a lower end (30b), the upper end of the safety ring (30) being connected by means of a circumferentially extending rupturable connection (32) to the lower end (15) of the skirt (14), the safety ring (30) having a generally convex inwardly bulged inner surface (36) and a generally flat outer surface (34) tapering inwardly relative to the outer surface (14a) of the skirt (14), said flat outer surface forming a first acute angle (α) with a line extending parallel to the axial centreline (x-x) of the cover (10),

characterized in that said flat outer surface (34) extends substantially from the upper end (30a) of the safety ring (30) to the lower end (30b) thereof, and said inner surface (36) has an upper generally flat surface section (36a) extending from the upper end (30a) of the safety ring (30) and a lower curved surface section (36b) extending from the flat surface section (36a) to the lower end (30b) of the safety ring (30), said upper flat surface section (36a) forming, with said parallel line, a second acute angle (β) which is larger than the first acute angle (α), and the curved inner lower surface section (36b) of the safety ring (30) having a first intermediate curved surface portion having a first radius of curvature, a second curved surface portion between and tangent to the intermediate curved surface portion and the flat inner upper surface section (36a) and having a second radius of curvature, and a third curved surface portion between and tangent to the intermediate curved surface portion and the flat outer surface at the lower end (30b) of the safety ring (30) and having a third radius of curvature, the second radius of curvature being smaller than the first radius of curvature and the third radius of curvature being smaller than the second radius of curvature.

2. A cover according to claim 1, wherein the safety ring (30) has a maximum thickness (T) closer to its lower end (30b) than to its upper end (30a).

3. A cover according to claim 1 or 2, wherein the safety ring (30) is generally half tear-shaped in cross section.

4. A cover according to anyone of claims 1 to 4, wherein the safety ring has a tear-off tab (40) which does not extend radially outwardly beyond the outer axial surface (14a) of the skirt (14).

5. A cover according to anyone of claims 1 to 4, wherein an annular rib (16) having an outer diameter is provided on the upper end surface(18)of the end wall (12) and spaced radially inwardly from the outer periphery thereof and the lower end (30b) of the

safety ring (30) has a diameter larger than the outer diameter of the annular rib (16) and smaller than the diameter of the outer periphery of the circular end wall (12) so that the cover (10) can be stacked on another like cover with the annular safety ring (30) of the first cover engaging said other cover on the end wall (12) between the outer periphery thereof and the annular rib so that the annular rib (16) prevents slipping off of the covers from one another in transverse direction.

6. A packaging assembly comprising a container (c) having a cylindrical outer wall (52) and a pilferproof cover (10) according to any one of claims 1 to 5, mounted on one end of said container **characterized in that** the container has at said one end a circumferential projection (50) extending radially beyond its outer wall (52) and circumferential groove (54) in said outer wall spaced below the circumferential projection (50) and **in that**, with the cover mounted (10) on the container (c), a lower end portion of the safety ring (30) is snugly nested within the circumferential groove (54) with the diameter of the lower end (15) of the safety ring being substantially equal to the outer diameter of the container and the lower end of the safety ring being closely adjacent to or contacting the outer container wall substantially at a location where a lower edge of the circumferential groove (54) merges with the cylindrical outer wall (52) of the container.

7. The packaging assembly of claim 6, wherein the groove (54) is V-shaped and has a rounded bottom (56) and two inclined side walls (58) smoothly merging with the cylindrical outer wall (52) of the container.

Patentansprüche

1. Originalitätsverschluss (10) mit einer axialen Mittellinie für einen Behälter (c), wobei der Verschluss Folgendes umfasst:

eine kreisförmige Endwand (12) mit einer oberen Endfläche (18) und einem Außenumfang mit einem Durchmesser;
einen zylindrischen Schurz (14), der von dem Außenumfang der Endwand (12) nach unten verläuft und ein unteres Ende (15), eine radial innere Fläche (14b) und eine äußere axiale Fläche (14a) aufweist;
Mittel zum lösbaren Halten des Verschlusses (10) an einem Behälter (c), das an der radial inneren Fläche (14b) des Schurzes (14) vorgesehen ist; und
einen ringförmigen Abreißsicherheitsring (30), der vom unteren Ende (15) des Schurzes (14) nach unten und radial nach innen verläuft, ein oberes Ende (30a) und ein unteres Ende (30b) aufweist, wobei das obere Ende des Sicherheitsrings (30) über eine umfangsmäßig verlaufende, zerbrechbare Verbindung (32) mit dem unteren Ende (15) des Schurzes (14) verbunden ist, sowie eine allgemein konvexe, nach innen gewölbte innere Fläche (36) und eine allgemein flache äußere Fläche (34) aufweist, die sich bezüglich der äußeren Fläche (14a) des Schurzes (14) nach innen verjüngt und mit einer parallel zu der axialen Mittellinie (x-x) des Verschlusses (10) verlaufenden Linie einen ersten spitzen Winkel (α) bildet,

dadurch gekennzeichnet, dass die flache äußere Fläche (34) im Wesentlichen vom oberen Ende (30a) des Sicherheitsrings (30) zu seinem unteren Ende (30b) verläuft und die innere Fläche (36) einen oberen, allgemein flachen Flächenabschnitt (36a), der vom oberen Ende (30a) des Sicherheitsrings (30) verläuft, und einen unteren, gekrümmten Flächenabschnitt (36b), der vom flachen Flächenabschnitt (36a) zum unteren Ende (30b) des Sicherheitsrings (30) verläuft, aufweist, wobei der obere, flache Flächenabschnitt (36a) mit der parallelen Linie einen zweiten spitzen Winkel (β) bildet, der größer als der erste spitze Winkel (α) ist, und wobei der gekrümmte innere untere Flächenabschnitt (36b) des Sicherheitsrings (30) einen ersten gekrümmten Zwischenflächenabschnitt mit einem ersten Krümmungsradius, einen zweiten gekrümmten Flächenabschnitt, der zwischen dem gekrümmten Zwischenflächenabschnitt und dem flachen inneren oberen Flächenabschnitt (36a) liegt und diese berührt und einen zweiten Krümmungsradius hat, und einen dritten gekrümmten Flächenabschnitt, der zwischen dem gekrümmten Zwischenflächenabschnitt und der flachen äußeren Fläche am unteren Ende (30b) des Sicherheitsrings (30) liegt und diese berührt und einen dritten Krümmungsradius hat, aufweist, wobei der zweite Krümmungsradius kleiner als der erste Krümmungsradius und der dritte Krümmungsradius kleiner als der zweite Krümmungsradius ist.

2. Verschluss nach Anspruch 1, bei dem der Sicherheitsring (30) eine maximale Dicke (T) hat, die sich näher seinem unteren Ende (30b) als seinem oberen Ende (30a) befindet.

3. Verschluss nach Anspruch 1 oder 2, bei dem der Sicherheitsring (30) im Allgemeinen einen halbtropfenförmigen Querschnitt hat.

4. Verschluss nach einem der Ansprüche 1 bis 4, bei dem der Sicherheitsring einen Abreißstreifen (40) aufweist, der nicht radial nach außen über die äu-

ßere axiale Fläche (14a) des Schurzes (14) hinaus verläuft.

5. Verschluss nach einem der Ansprüche 1 bis 4, bei dem an der oberen Endfläche (18) der Endwand (12) und von ihrem Außenumfang radial nach innen beabstandet eine ringförmige Rippe (16) mit einem Außendurchmesser vorgesehen ist, wobei der Durchmesser des unteren Endes (30b) des Sicherheitsrings (30) größer als der Außendurchmesser der ringförmigen Rippe (16) und kleiner als der Durchmesser des Außenumfangs der kreisförmigen Endwand (12) ist, so dass der Verschluss (10) auf einen anderen, ähnlichen Verschluss gestapelt werden kann, wobei der ringförmige Sicherheitsring (30) des ersten Verschlusses den anderen Verschluss an der Endwand (12) zwischen ihrem Außenumfang und der ringförmigen Rippe so in Eingriff nimmt, dass die ringförmige Rippe (16) verhindert, dass die Verschlüsse in Querrichtung voneinander wegrutschen.

6. Verpackungsanordnung mit einem Behälter (c), der eine zylindrische Außenwand (52) und einen an einem Ende des Behälters angebrachten Originalitätsverschluss (10) nach einem der Ansprüche 1 bis 5 aufweist, **dadurch gekennzeichnet, dass** der Behälter an dem einen Ende einen radial über seine Außenwand (52) hinaus verlaufenden Umfangsvorsprung (50) und eine Umfangsnut (54) in der Außenwand in einem Abstand unter dem Umfangsvorsprung (50) aufweist und dass ein unterer Endabschnitt des Sicherheitsrings (30), wenn der Verschluss (10) auf dem Behälter (c) angebracht ist, passend in der Umfangsnut (54) ruht, wobei der Durchmesser des unteren Endes (15) des Sicherheitsrings im Wesentlichen gleich dem äußeren Durchmesser des Behälters ist und das untere Ende des Sicherheitsrings im Wesentlichen an einer Stelle, an der ein unterer Rand der Umfangsnut (54) in die zylindrische Außenwand (52) des Behälters übergeht, der Behälteraußenwand eng benachbart ist oder diese berührt.

7. Verpackungsanordnung nach Anspruch 6, bei dem die Nut (54) V-förmig ist und einen runden Boden (56) und zwei geneigte Seitenwände (58) aufweist, die glatt in die zylindrische Außenwand (52) des Behälters übergehen.

Revendications

1. Couvercle inviolable (10) à axe central, pour un récipient (c), comprenant :

une paroi d'extrémité circulaire (12) comportant une surface d'extrémité supérieure (18) et une périphérie extérieure présentant un certain diamètre ;
une collerette cylindrique (14) se prolongeant vers le bas depuis la périphérie extérieure de la paroi d'extrémité (12) et comportant une extrémité inférieure (15) et une surface radialement intérieure (14b) et une surface axiale extérieure (14a) ;
un moyen pour retenir, de façon amovible, le couvercle (10) sur un récipient (c), ledit moyen étant prévu sur la surface radialement intérieure (14b) de la collerette (14) ; et
une bague annulaire de sûreté arrachable (30) se prolongeant vers le bas et radialement vers l'intérieur depuis l'extrémité inférieure (15) de la collerette (14), ladite bague de sûreté comportant une extrémité supérieure (30a) et une extrémité inférieure (30b), l'extrémité supérieure de la bague de sûreté (30) étant raccordée, au moyen d'un raccord cassable se prolongeant circonférentiellement (32), à l'extrémité inférieure (15) de la collerette (14), la bague de sûreté (30) comportant une surface intérieure généralement convexe bombée vers l'intérieur (36) et une surface extérieure généralement plate (34) s'inclinant vers l'intérieur par rapport à la surface extérieure (14a) de la collerette (14), ladite surface extérieure plate formant un premier angle aigu (α) par rapport à une ligne se prolongeant parallèlement à l'axe central (x-x) du couvercle (10),

caractérisé en ce que ladite surface extérieure plate (34) se prolonge essentiellement depuis l'extrémité supérieure (30a) de la bague de sûreté (30) jusqu'à son extrémité inférieure (30b), et ladite surface intérieure (36) comporte une section de surface supérieure généralement plate (36a) se prolongeant depuis l'extrémité supérieure (30a) de la bague de sûreté (30) et une section de surface inférieure incurvée (36b) se prolongeant depuis la section de surface plate (36a) jusqu'à l'extrémité inférieure (30b) de la bague de sûreté (30), ladite section de surface supérieure plate (36a) formant, avec ladite ligne parallèle, un deuxième angle aigu (β) plus grand que le premier angle aigu (α), et la section de surface inférieure intérieure incurvée (36b) de la bague de sûreté (30) comportant une première portion de surface incurvée intermédiaire présentant un premier rayon de courbure, une deuxième portion de surface incurvée entre, et tangente à, la portion de surface incurvée intermédiaire et la section de surface supérieure intérieure plate (36a) et présentant un deuxième rayon de courbure, et une troisième portion de surface incurvée entre, et tangente à, la portion de surface incurvée intermédiaire et la surface extérieure plate à l'extrémité inférieure (30b) de la bague de sûreté (30) et présen-

tant un troisième rayon de courbure, le deuxième rayon de courbure étant plus petit que le premier rayon de courbure et le troisième rayon de courbure étant plus petit que le deuxième rayon de courbure.

2. Couvercle selon la revendication 1, dans lequel la bague de sûreté (30) présente une épaisseur maximale (T) plus près de son extrémité inférieure (30b) que de son extrémité supérieure (30a).

3. Couvercle selon la revendication 1 ou 2, dans lequel la bague de sûreté (30) présente une section transversale en forme générale de demi-goutte.

4. Couvercle selon l'une quelconque des revendications 1 à 4, dans lequel la bague de sûreté comporte une languette arrachable (40) qui ne se prolonge pas radialement vers l'extérieur au-delà de la surface axiale extérieure (14a) de la collerette (14).

5. Couvercle selon l'une quelconque des revendications 1 à 4, dans lequel une nervure annulaire (16) présentant un certain diamètre extérieur est prévue sur la surface d'extrémité supérieure (18) de la paroi d'extrémité (12) et espacée radialement vers l'intérieur depuis sa périphérie extérieure et l'extrémité inférieure (30b) de la bague de sûreté (30) présente un diamètre plus grand que le diamètre extérieur de la nervure annulaire (16) et plus petit que le diamètre de la périphérie extérieure de la paroi d'extrémité circulaire (12), de façon à pouvoir empiler le couvercle (10) sur un autre couvercle analogue, la bague de sûreté annulaire (30) du premier couvercle engageant ledit autre couvercle sur la paroi d'extrémité (12) entre sa périphérie extérieure et la nervure annulaire de manière à ce que la nervure annulaire (16) empêche les couvercles de glisser les uns par rapport aux autres dans une direction transversale.

6. Ensemble de conditionnement comprenant un récipient (c) comportant une paroi cylindrique extérieure (52) et un couvercle inviolable (10) selon l'une quelconque des revendications 1 à 5, monté sur une extrémité dudit récipient, **caractérisé en ce que** le récipient comporte, à ladite une extrémité, une saillie circonférentielle (50) se prolongeant radialement au-delà de sa paroi extérieure (52) et une gorge circonférentielle (54) dans ladite paroi extérieure, espacée sous la saillie circonférentielle (50), et **en ce que**, le couvercle (10) étant monté sur le récipient (c), une portion d'extrémité inférieure de la bague de sûreté (30) s'ajuste parfaitement dans la gorge circonférentielle (54), le diamètre de l'extrémité inférieure (15) de la bague de sûreté étant sensiblement égal au diamètre extérieur du récipient et l'extrémité inférieure de la bague de sûreté étant à proximité immédiate ou au contact de la paroi extérieure du récipient, sensiblement à l'endroit où un bord inférieur de la gorge circonférentielle (54) se joint à la paroi cylindrique extérieure (52) du récipient.

7. Ensemble de conditionnement selon la revendication 6, dans lequel la gorge (54) présente une forme en V et comporte un fond arrondi (56) et deux parois latérales inclinées (58) qui se joignent uniformément à la paroi cylindrique extérieure (52) du récipient.

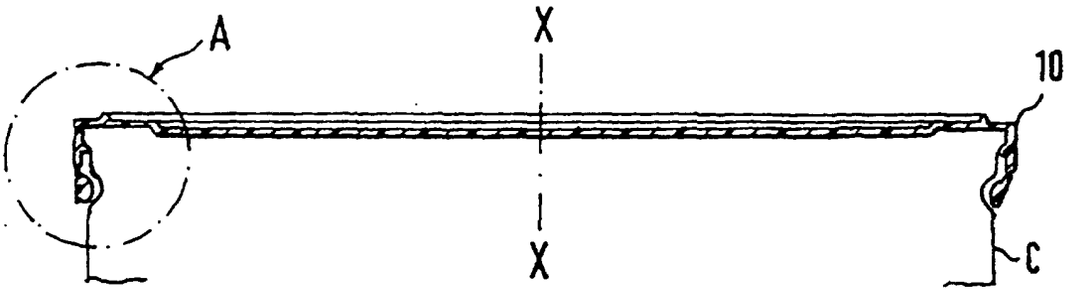


FIG.1

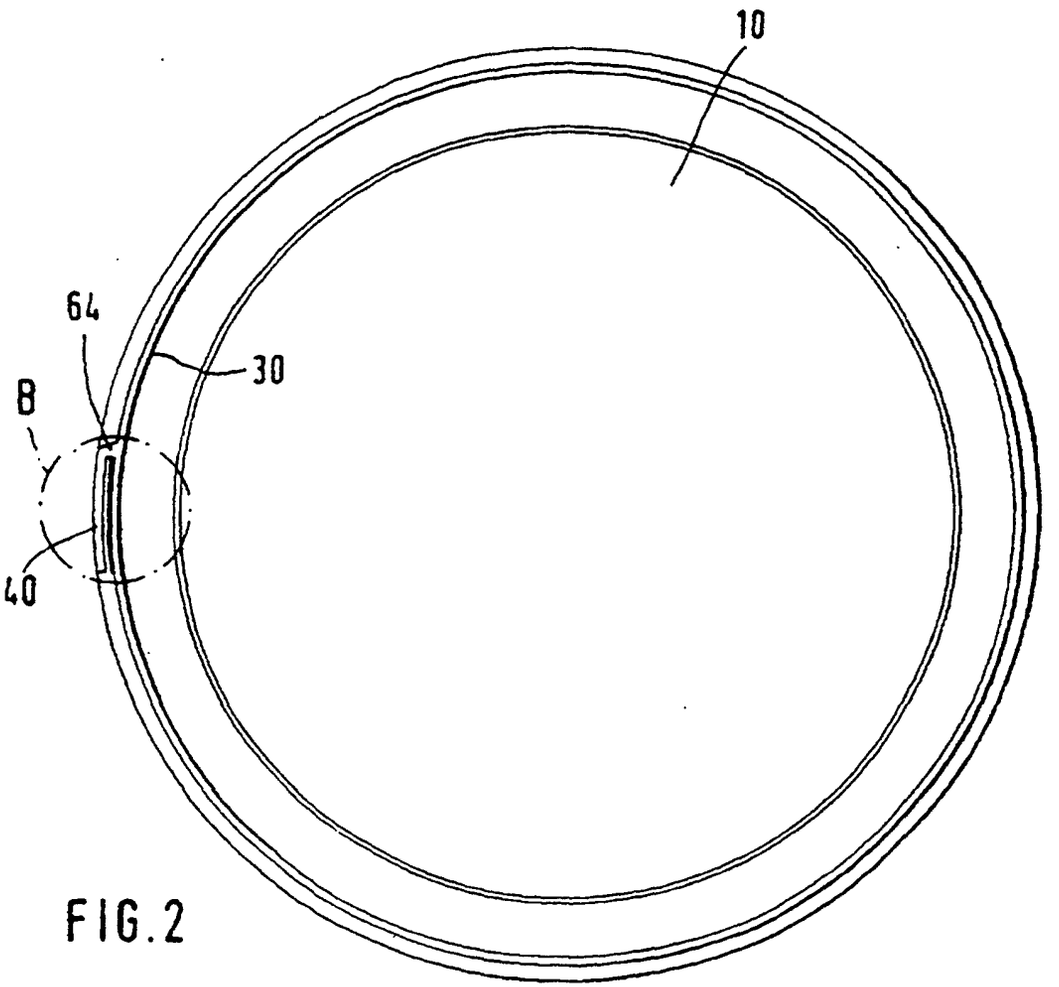


FIG.2

FIG. 3

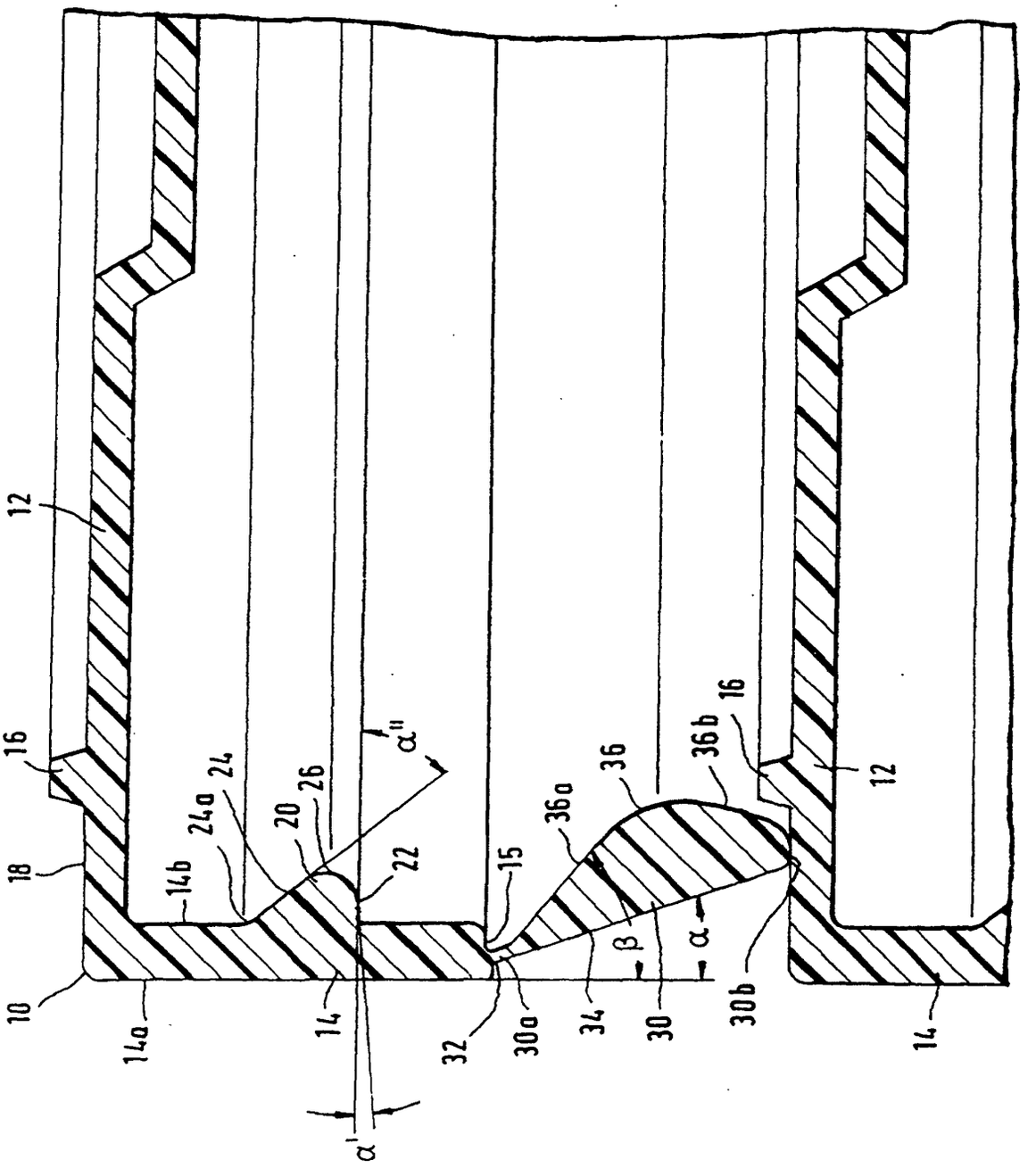
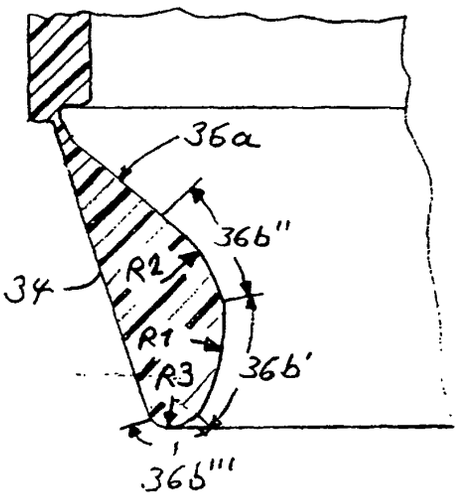

12
16
18
10
14a
14b
24
24a
20
26
22
α''
α'
14
15
32
30a
36a
36
36b
16
12
34
β
α
30
30b
14

FIG. 3a



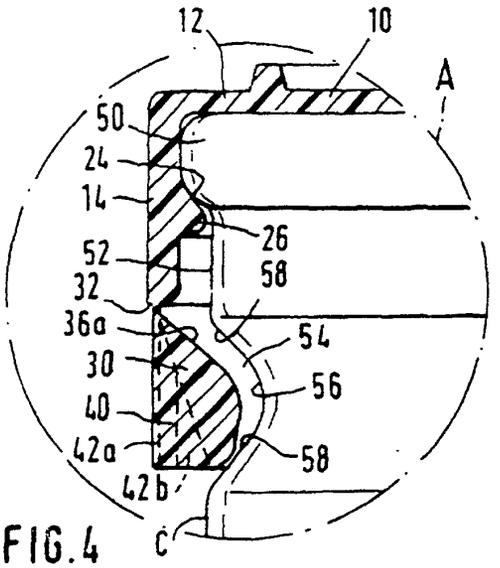


FIG. 4

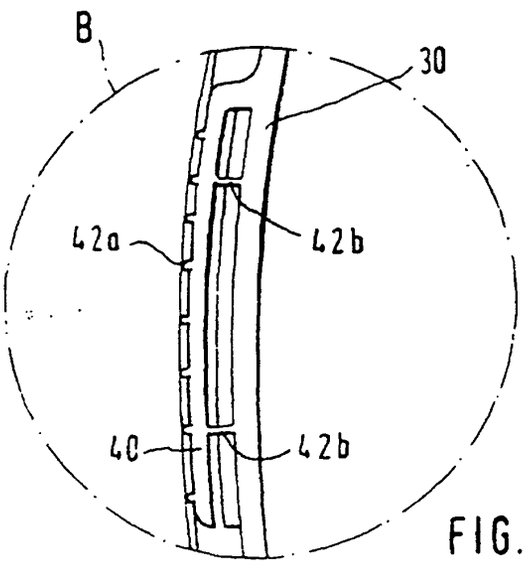


FIG. 6

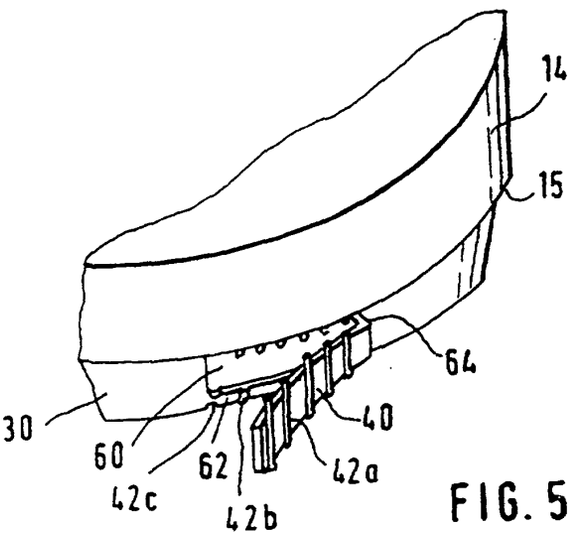


FIG. 5