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(54) **SAFETY SEAL FOR CAP**

(57) The present invention relates to a bottle cap safety seal, of among the different seals intended for bottle sealing purposes which is **characterised in** a special construction which incorporates rupture points in relation with the rim and others which facilitate the separation of the disc with respect to the skirt of the seal, leaving an under-ring on the neck or not. It is likewise **characterised in** a manner of securing which employs projecting teeth arranged with an equal distribution over the length of the inside of the lower cylindrical body of the seal with a design which optimises the easy entrance and the good securing of the seal.

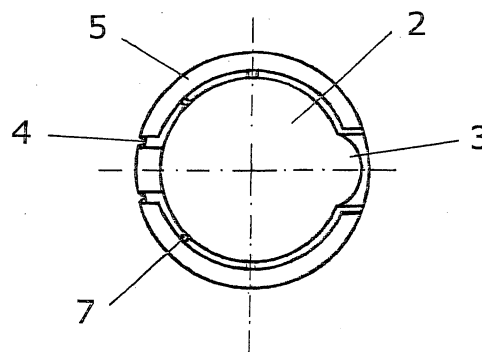
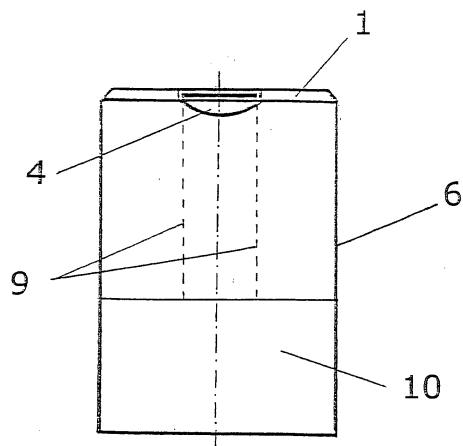


FIG. 1

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Description

OBJECT OF THE INVENTION

[0001] The present invention relates to a bottle cap safety seal of among the different seals intended for bottle sealing purposes.

[0002] This invention is characterised in a special construction of the seal, which incorporates rupture points in relation with the rim and others which facilitate the separation of the disc with respect to the skirt of the seal, leaving an under-ring on the neck or not.

[0003] It is characterised in a manner of securing which employs projecting teeth arranged with an equal distribution over the length of the inside of the lower cylindrical body of the seal. These teeth appear in plan view with the rim straight and below have an oblique planar surface for the tapering which permits an adequate insertion.

[0004] It is also characterised in a prolongation according to a plane of the tooth which provides an adequate resistance to pressure on the upper step when the seal has been inserted on the body of the cap.

BACKGROUND OF THE INVENTION

[0005] Bottle cap safety seals have also extended their field of application to bottles, it being sufficient to cite as example of the great number seals with these characteristics, those of the European patent with publication number EP0502379 and the Italian patent of invention n°22272/87, both of Guala, S.p.A. and, like practically the entirety of those known, with means for rupture of the lower part of the skirt which separate an internal ring from the rest of the seal.

[0006] Thus the seals are known which have a recess in the upper base, in form of an inverted "S" and with the ends and the central area thereof prolonged with individual slots which reach the peripheral rim of the seal.

[0007] It is only through these cuts in the upper base through which the brand name of the maker of the beverage is observed with supreme difficulty, a most undesirable feature.

[0008] The construction of the two tabs resulting from the aforementioned inverted "S" and the prolonged grooves thereof which, when released, take the form of a bracket in which one end rim flange runs from the rupture area thereof with respect to a lower ring of the skirt and the other flange starts in the base of the seal; and, its rim is rounded coinciding with the curvature of the inside of the "S".

[0009] Hence, an additional difficulty with this type of safety seal, indeed of greater significance, is that arising from the actual structure of the bracket which, when the user inserts a fingernail under the curved rim of the flange, it runs the risk of being broken when prising the flange up making use of the same as a lever.

[0010] The securing of the seal on the body of the cap

is usually implemented by means of a peripheral projection. It is sufficient to mention the Spanish patent of invention with publication number ES2153263 wherein is shown a pouring cap whose means of securing to the container consists of a continuous step of triangular section, arranged peripherally and internally, and which permits the entrance of the cap over the neck of the bottle but impedes escape through resting against an edge of the container on the straight part of the triangular step.

[0011] The problem with this type of fastening lies in that on insertion the truncated conical surface which facilitates the entrance of the edge of the internal body, it establishes a pressure over the whole perimeter. Each point of this step of triangular section has an opposing point, and the only possibility of admitting the entrance of the projection with its smaller diameter with respect to the edge of the internal body is by stretching in a tangential direction of the cylindrical body on which is located the projection of triangular section.

[0012] It is also to be pointed out that the greatest stress occurs on the rim which defines the vertex of the triangle of its section where less resistance is encountered.

[0013] A solution which permits sufficient deformation so that the external body, in this case the seal, enters by passing over the smaller diameter which defines the rim of the triangular step consists in reducing the dimensions of the step.

[0014] This solution permits an easier entrance of the seal; however, the reduction in the dimensions of this projection also implies reducing the supporting surface after insertion, facilitating its removal when this is a safety element which has to guarantee the inviolability of the seal.

[0015] The present invention discloses a special design of the seal based on simplicity and quality of finish wherein are also included some securing teeth which permit easy entrance as well as a support of sufficient strength to prevent the removal and improper manipulation of the covering cap.

DESCRIPTION OF THE INVENTION

[0016] The present invention relates to a cap safety seal, of among the different safety seals for caps of bottles, usually for liqueurs.

[0017] This invention is characterised in a special construction of the seal, which incorporates in its upper base a broad disc with a completely free surface, which permits the brand name of the drink manufacturer to be incorporated very easily will redound in an improved amortisation and better ret

[0018] This disc comes with a semicircular radial prolongation, in the form of and used as a tab which proves accessible through an opposing perforation which covers the peripheral rim of that area of the seal as well as part of the flange immediately below the same.

[0019] The tab includes rupture points, well removed

from area of the tab, in order to facilitate the lifting of the same without affecting the fingernail of the user and which join the latter with respect to the rim of the base.

[0020] It likewise has other unions, in the form of breakable straps, which define a weakened line, at least two being located on the rim, which facilitate the quick separation of the disc with respect to the rest of the skirt of the seal.

[0021] These breakable straps can be multiplied and prolong the weakened line until almost reaching the lower area of the skirt leaving an under-ring on the neck or else reach the rim of the same.

[0022] With respect to the means for securing the seal, in the section on background of the invention, the drawback of using peripheral continuous projections was explained since they oblige high pressures for the insertion of the seal over the cap giving rise in turn to high tangential stress and supports which are not always sufficient to guarantee inviolability.

[0023] This drawback is overcome by incorporating occasional equally distributed supports, the projection of which on the interior establishes an adequate support on the straight surface.

[0024] These occasional supports comprise by some teeth by way of internal projections on the lower cylindrical body of the safety seal.

[0025] Each of these teeth is configured according to a plan view with the rim projecting toward the interior in a straight section, as per a secant, thereby removing the presence of corners which establish possible support points potentially useable for removing the seal from the cap.

[0026] The depth of the tooth depends on the width thereof and on the radius of the seal since the projection in plan view is defined by a secant.

[0027] The tooth has a planar and oblique lower surface, which establishes the taper which facilitates the entrance of the seal when it is inserted.

[0028] Instead of terminating the planar and oblique surface directly on the step, the projection is prolonged according to a second planar and vertical surface increasing the height and eliminating the presence of sharp rims of less strength.

[0029] It is on this planar section where the straight step appears, whereon is established the support for the edge of the body of the cap where the seal is fastened.

[0030] Thus, each of the teeth is configured according to three planes, the lower one oblique in the form of a taper, the central one vertical which extends the tooth in height, and the upper one horizontal which defines the support.

[0031] Given that the supports are individual, one for each tooth, during insertion there is a certain deformation of the cylindrical body of the seal where they are located.

[0032] This deformation is in such a manner that the projections tend to push radially outwards, and the sections between projections tend to reduce their curvature

through the tension in order to yield and permit insertion of the seal.

[0033] In this way the deforming of the cylindrical body in some way approximates to a polygon wherein the teeth would be arranged in the vertices of said polygon.

[0034] During this same insertion, after the teeth pass over the edge on which they rest, said teeth enter the recess which houses them.

[0035] The configuration of the cylindrical body resumes its original condition, prior to deformation, so the teeth establish an adequate support on the edge of the cap preventing the escape thereof.

DESCRIPTION OF THE DRAWINGS

[0036] This descriptive specification is completed with a collection of drawings wherein by way of illustration and not restrictively, the preferred embodiment of the invention has been represented.

[0037] Figure 1 shows the upper base and the elevation of the safety seal of the preferred embodiment, viewed from the front of the tab.

[0038] Figure 2 shows a cross section of the seal when incorporated on the cap, the seal being highlighted by a thicker line.

[0039] Figure 3 shows the top and bottom plan and two profiles of an embodiment of the seal according to the invention showing the means of securing by teeth.

[0040] Figure 4 shows a detail of the teeth in plan view and profile, wherein the cylindrical section of the seal on which it is situated appears partially represented by way of reference.

PREFERRED EMBODIMENT OF THE INVENTION

[0041] In the light of the foregoing, the present invention relates to a bottle cap safety seal, of among the different cap safety seals, essentially characterised in that it incorporates on its upper base (1) a broad disc (2), with tab (3) opposite a perforation (4) which is prolonged according to a channelled section which covers the peripheral rim (5) of the upper base (1) and part of the skirt (6).

[0042] The tab (3) has some rupture points (7) removed from the tab (3) and with, at least, two external weakened lines (9), for separation of the disc (2) from the rest of the skirt (6) of the seal.

[0043] The surface of disc (2) is completely free, for the incorporation of makers' brand names.

[0044] The weakened lines (9) reach almost to the lower area of the skirt (6), leaving a lower ring (10) or else reach the rim thereof.

[0045] Figure 3 shows an embodiment of the seal, in a shorter configuration than that shown in the embodiment shown in the embodiment illustrated in figures 1 and 2, wherein are shown the teeth (8) or projections object of this improvement intended to establish support on an external peripheral recess of the cap.

[0046] Figure 4 likewise shows a detail of one of the teeth (8) in elevation and profile.

[0047] The tooth (8) is delimited by three planes:

- the oblique lower plane (8.1) which facilitates the entrance of the cap on insertion by establishing the sufficient degree of tapering for the projection;
- the central vertical plane (8.2) which extends the tooth (8) in height and strength;
- the horizontal upper plane (8.3) of support against the inside surface of the peripheral recess of the cap in order to prevent escape of the seal.

[0048] Given that the vertical plane constitutes a secant in the plan view, it is possible to relate the width (a) of the tooth (8) with the depth (e) of the latter, the relation being of the form

$$e = r\{1 - \sqrt{(1 - a^2 / 4r^2)}\}$$

where r is the inside radius of the cylindrical body where the tooth (8) is situated.

[0049] In this way, for a determined width, a greater depth is achieved of the step by increasing its width.

[0050] This greater width in turn reduces the distance between teeth (8) and therefore increases the stiffness which prevents the deformation of the lower part of the cylindrical body of the seal at the time of insertion.

[0051] In the particular case of this preferred embodiment of the invention use has been made of eight equally distributed teeth (8).

[0052] In the profile of tooth (8) shown in figure 4 the vertical prolongation (8.2) can be observed under the rim which is established with the upper surface (8.3) where the support is produced with the upper face of the peripheral recess of the cap (this recess is not shown in this figure and adopts a profile opposite to that of the profile shown, that is, the profile which corresponds to the middle section according to a vertical plane which runs through the axis of the seal.

[0053] It is this vertical prolongation (8.2) which permits a response to the upper support by means of a compressive force and not compressive plus flexing as occurs in the projections envisaged in the section on background of triangular section.

[0054] This support offers greater strength while avoiding support points appearing (even being individual elements and not peripheral projections) from the lower part which facilitate the withdrawal of the seal which permit the improper manipulation of the cap.

[0055] The essential nature of this invention is not altered through variation in the materials, form, size and arrangement of the component elements, described in a non-restrictive manner, which is sufficient for an expert to proceed to its reproduction.

Claims

1. Bottle cap safety seal, of among the different cap safety seals, **characterised in that** it incorporates on its upper base (1) a broad disc (2), with tab (3), opposite a perforation (4) which is prolonged according to a channelled section which covers the peripheral rim (5) of the upper base (1) and part of the skirt (6), while the tab (3) has some rupture points (7) removed from the tab (3) and, at least, two external weakened lines (9), for separation of the disc (2) from the rest of the skirt (6) of the seal; also having a system of securing between the cap and the seal by means of a plurality of teeth (8) distributed equally over the length of the inside surface of the lower cylindrical body of the seal intended to enter and rest on a continuous peripheral recess of the cap, wherein each of the teeth (8) is configured on a basis of three planes, an oblique lower plane (8.1) to establish the tapering which permits insertion, an intermediate vertical plane (8.2) which extends the tooth in height for greater strength thereof, and a third horizontal upper plane (8.3) for resting against the projection which is defined by the continuous peripheral recess of section opposite to the mean section of the tooth (8).
2. Bottle cap safety seal, according to the first claim, **characterised in that** the weakened lines (7) reach almost to the lower area of the skirt (6), leaving an under-ring (10).
3. Bottle cap safety seal, according to the first claim, **characterised in that** the weakened lines (7) reach the lower area of the skirt (6) and the rim thereof.

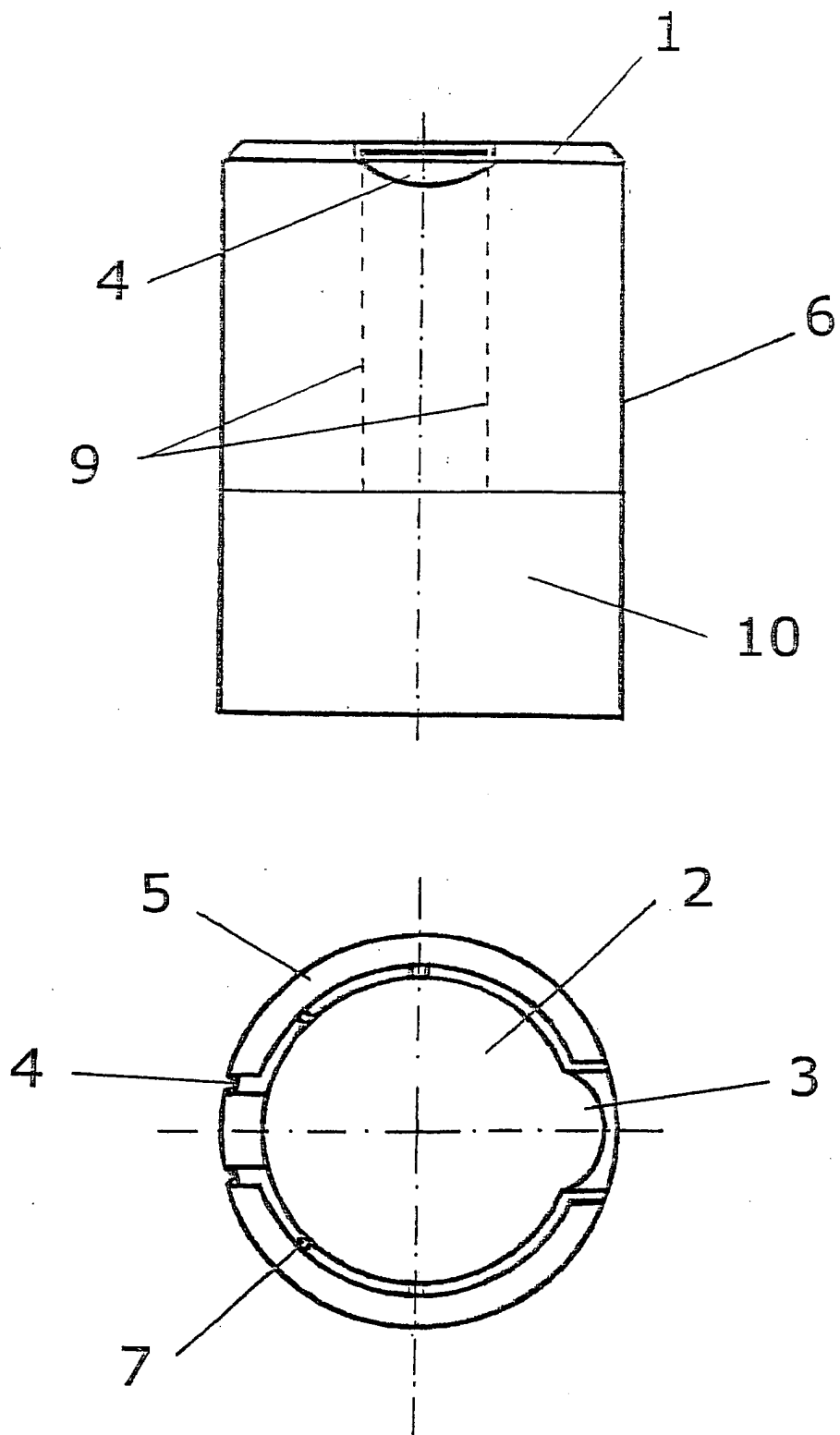


FIG. 1

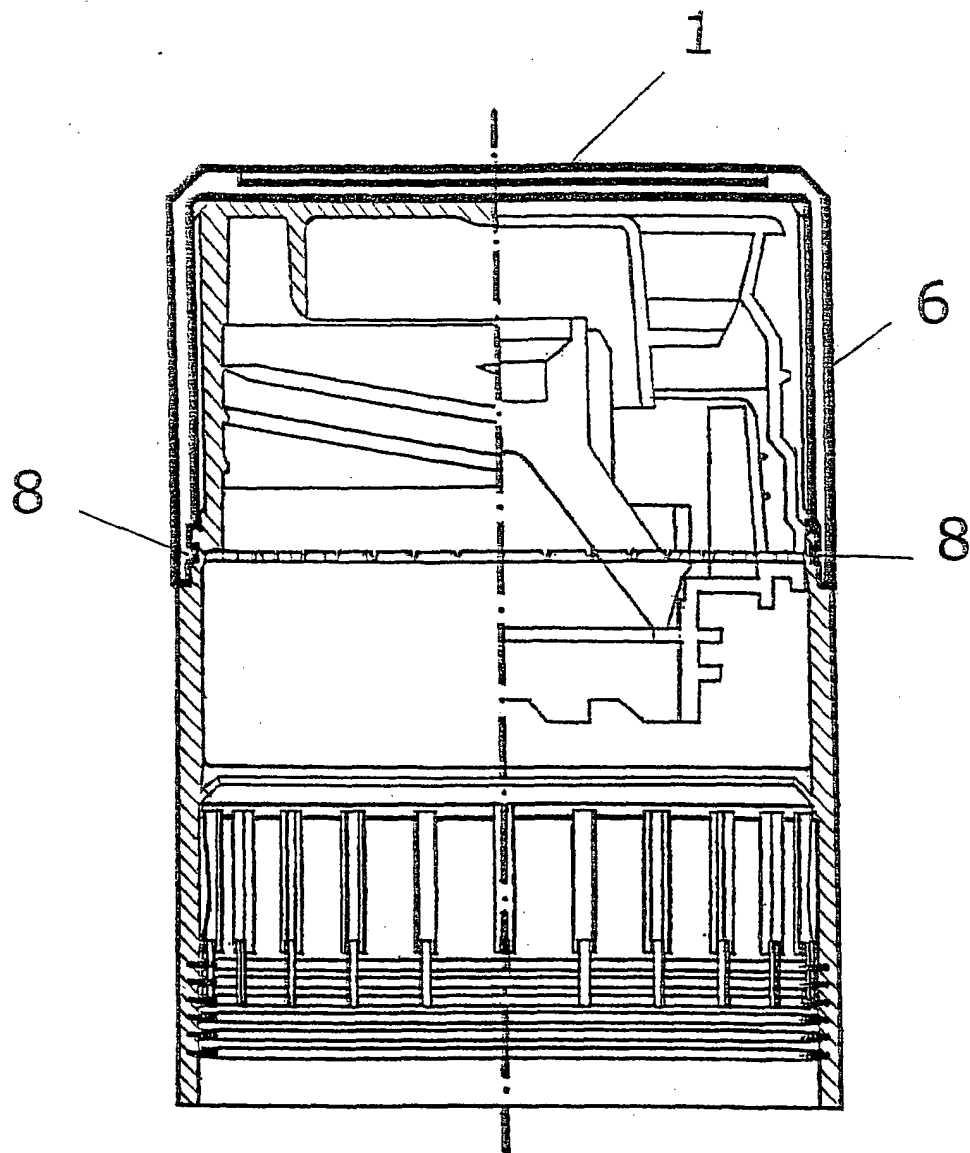


FIG. 2

FIG. 3

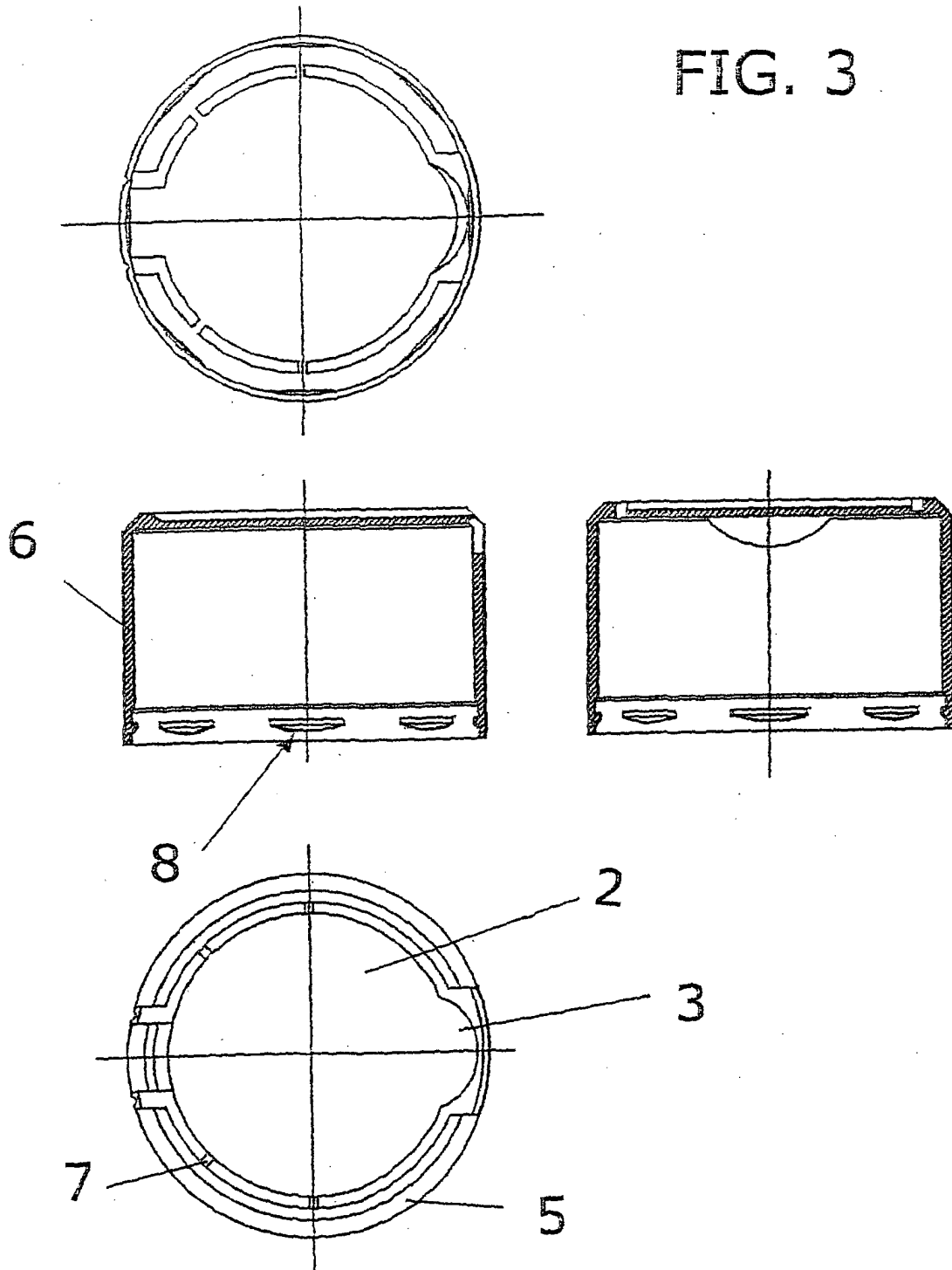
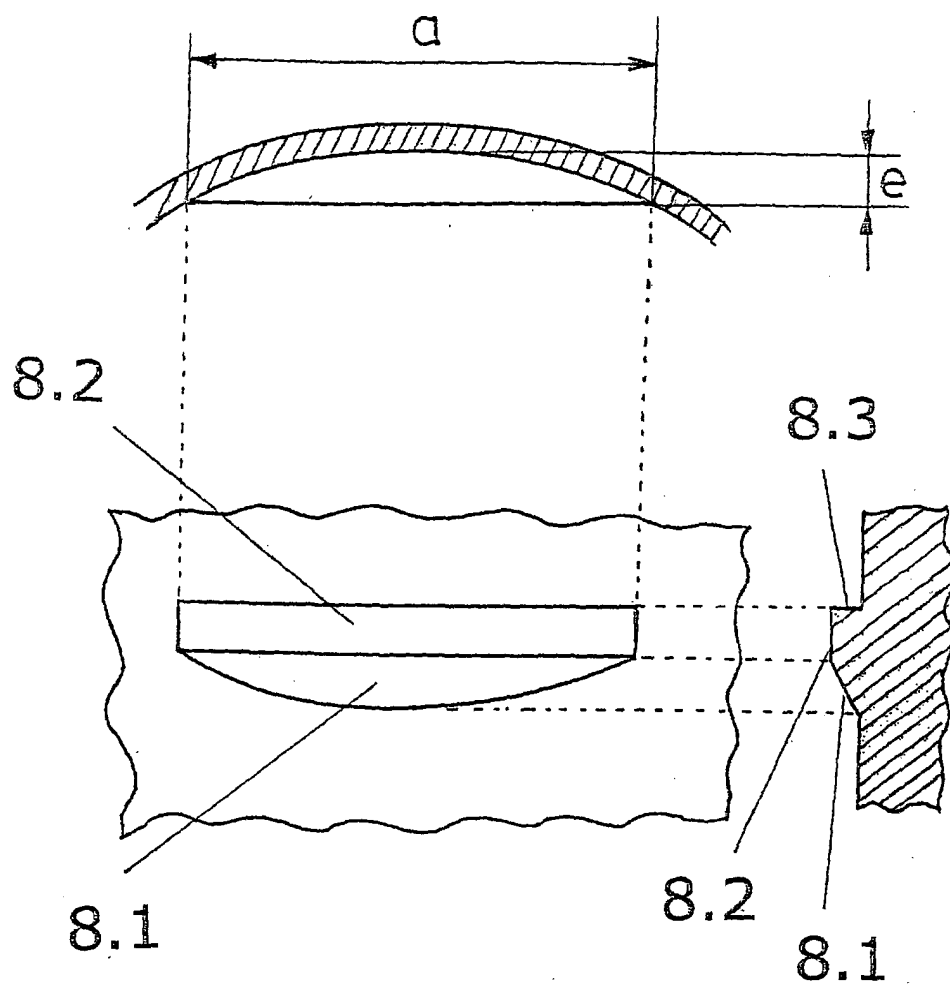


FIG. 4



INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES03/00437

A. CLASSIFICATION OF SUBJECT MATTER		
IPC 7 : 41/32		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols)		
IPC 7 : B65D 41/32		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
CIBEPAT, EPODOC, WPI, PAJ		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4561553 A (Crisci) 31.12.1985, column 2, line 1 - column 4, line 30; drawings	1-3
A	EP 0502379 A2 (GUALA S.p.A) 09.09.1992, column 2, line 6 - column 7, line 18, drawings	1-3
A	FR 1384284 A (Heierle) 23.11.1964, the whole document	1
A	US 3415404 A (W.H.Robinson) 10.12.1968, the whole document	1
A	CH 683335 A5 (Ewit AG) 06.02.1991, abstract ; drawings	1
A	US 3072277 (F. Hoffmann) 08.01.1963, the whole document	1
☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 12 November 2003 (12.11.03)		Date of mailing of the international search report 24 November 2003 (24.11.03)
Name and mailing address of the ISA/ S.P.T.O		Authorized officer
Facsimile No.		Telephone No.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/ES03/00437

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