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(11) **EP 1 332 976 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
06.08.2003 Bulletin 2003/32

(51) Int Cl.7: **B65D 45/30, B65D 25/28**

(21) Application number: **02425038.3**

(22) Date of filing: **30.01.2002**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE TR**
Designated Extension States:
AL LT LV MK RO SI

(72) Inventor: **Pacelli, Guiseppe**
20015 Parabiago (MI) (IT)

(74) Representative: **Garavelli, Paolo**
A.BRE.MAR. S.R.L.,
Via Servais 27
10146 Torino (IT)

(71) Applicant: **Metalscatola S.p.a**
24060 Telgate (BG) (IT)

(54) **Apparatus for stocking and handling an airtight container**

(57) An apparatus for handling and stocking an airtight container (1) is disclosed. By means of a component (101) made of monolithic plastics, it is ensured that a sealing gasket is kept squashed, a new handle system

(107) is introduced and makes the manual handling easier, a product integrity check system is inserted. The application is adapted for stocking and handling products belonging to the "general line" category.

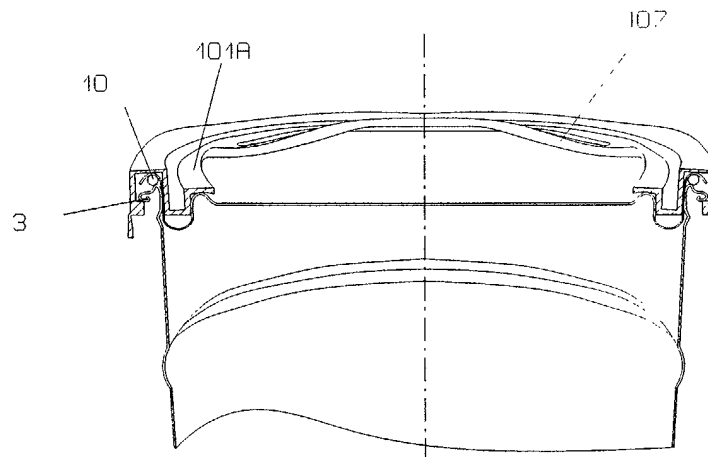


Fig. 5

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Description

[0001] The present invention refers to an airtight container apparatus for stocking foodstuff products, paints, resins, glues and all products falling within the so-called "general line" category. Such container is equipped with handles for transporting it and comprises an arrangement to verify its airtight degree.

[0002] The airtight container taken as reference in the present invention is a can, a cylinder drum, a cone-shaped bucket. The closing element is a cover, generally made of thin sheet or plastics with a medium-high stiffness. The container body can comprise one or more recesses arranged in opposite points next to the container body edge and equipped with projections, handle or band for transporting it, generally made of metal or plastics. The dealt- with container is moreover of the type that is adapted to have applied thereto closing elements that ensure keeping the seal of a gasket housed in the cover.

[0003] The container shape is such as to impart structural stiffness to the joining flange in which the gasket is housed. Moreover, the shape is such as to allow stacking containers with the same sizes, that is, orderly placing different containers one above the other. A gasket of a pressurised cover is distorted under the action of a squashing force when the cover is closed, keeping its state active due to the resiliency of cover edges and container body edge that are in contact. Among the apparatus that ensure keeping the squashing state for said gasket, those covers are taken into account that, in addition to resiliency of edges in contact, are equipped with wings or are equipped with lever or ring with band. A lever applied to the ends of said band or ring allows quickly opening the container and at the same time ensures the gasket squashing under stocking and handling conditions.

[0004] The airtightness maintenance when stocking is ensured through plastic elements that are applied along the container body and cover junction and that are torn when using enabling the cover to verify the integrity of the stored product.

[0005] The above-mentioned features are known for example from the following patents:

- patent US-A-4351449 deals with a container having an airtight closing plug that can be repetitively removed and is pressure-applied and equipped with quick-closing elements applied on the container body that crimp the cover in corresponding grip points keeping the gasket squashed;
- patent US-A-4482071 deals with a cover made of relatively stiff plastic material. A portion of the cover surface is joined to the external container outline. A band applied along the plug junction with the container body edge has a preferred breaking line and ends with a tongue that is torn by the operator upon using it;

- patent EP-A-0373013 deals with a tearable band applied along the junction between cover and container body.

[0006] Figures 1, 2 and 3 show an airtight container of a known type:

- Figure 1 shows the view of a container 1 comprising an airtight cover 2 of the lever type, a body 1A of the container being limited by ad edge 3 being shaped as a "lip" and, adjacent to "lip" 3, two recesses 4A and 4B arranged on two opposite points working as grips of an handle 5. The airtight container 2, in the example a lever cover made of thin sheet, is composed of a portion of plane surface 6 delimited by a form edge shaped as a recess formed by an intrados wall 7 and an extrados wall 8, respectively plane-shaped with an approximately vertical and concave slanting. Said wall are joined by means of a plane annular length 9 with suitable width that imparts stiffness to the cover in case of opening with the help of a lever, of the screwdriver type, or in case of manual handling by means of the handle 5.

Such recess houses a gasket 10 with its basic material made of silicone or polyurethane or any other plastic or rubber material, and is joined to the lip edge 3 by pressing the intrados wall 7 onto the internal wall of lip 3, the lip 3 apex squashing the gasket 10. In order to be able to keep the airtight seal, a concave metal band 11 equipped with lever 12 (not shown) for its quick release, crimps the external edge 8 belonging to the cover 2 guaranteeing the squashing state of the gasket during stocking and handling. A seal made of flexible material, adhesive and of plastics or paper, shaped as a small disk or strap, applied onto the package as guarantee of product integrity seals the closure till the operator opens the housing for its first use verifying its integrity.

- Figure 2 shows an housing adapted to store products of the "general line" type, whose airtight cover is composed of a pressure plug 22 with a central portion of a plane surface 26 delimited by a formed edge shaped as negative recess, this latter one being composed of an intrados wall 27 and of an extrados wall 28, both with a plane shape and substantially vertical slanting. Said walls are joined by an annular length of plane surface 29 with a suitable width that imparts stiffness to the cover. A second positive recess is composed of the same vertical wall 28 and of an external wall 34, both joined by an annular length of plane surface 35. Said positive recess houses a gasket 10 that is coupled with the edge belonging to the cover 1A of the container by pressing an intrados wall 36 obtained by successively bending some sheet sections composing the edges. Said edge further has a length of horizontal

place surface 37 in which a tool is inserted to open the cover by prying on an external wall or edge 38.

- Figure 3 shows another type of container whose winged airtight cover 42, in the example made of thin sheet, is composed of a portion of plane surface 46 delimited by a formed edge shaped as a recess comprising an intrados wall 47 and an extrados wall 48, respectively plane-shaped with an approximately vertical and concave slanting. Said walls are joined by a length of surface 49 with suitable width that imparts stiffness to the cover in case of opening with the help of a lever, of the screwdriver type, or in case of manual handling by means of handle 5. In particular the extrados wall 48 has some sections with overhanging surfaces 53 - the wings. Said recess houses a gasket 10 and is joined to the lip edge 3 by pressing the intrados wall 47, the lip 3 apex squashing the gasket 10. The wings 53 snap into the closing position, moving apart when sliding on the external edge of lip 3. In order to open the cover, the operator must apply a sufficient separation force to allow the wings to be moved apart due to the external lip edge.

[0007] The types of above-described containers are adapted to be improved when performing some functions dealing with seal and safety in keeping the product integrity that, above all in case of paints, glues and enamels, so far has scarcely been applied for the use of safety arrangements already known in the pharmaceutical field, as described in patent US-A-4482071 and patent EP-A-0373013A1. Moreover, though keeping the stiffness properties that are already known in the art in the field of containers for "general line" products, it is possible to improve the gripping system for handling.

[0008] Main object of the present invention is improving the airtight seal by means of a new and inventive apparatus operating both during stocking and during handling.

[0009] A further object of the invention is improving the gripping system with an handle that can be easily used.

[0010] A further object of the invention is introducing an innovative system for checking the product integrity by taking as reference what is already known in the field of stocking of sensitive materials, such as the pharmaceutical sector and sintering of fine powders.

[0011] A further object is finally providing an apparatus made of homogeneous material, with low industrial construction cost, composing a range with several sizes and, above all, that can be adapted to the different types of containers for "general line" stocking.

[0012] The above and other objects and advantages of the invention, as will appear from the following description, are obtained by an apparatus as claimed in Claim 1. Preferred embodiments and non-trivial variations of the present invention are claimed in the dependent Claims.

[0013] In particular, the present invention provides a plastic ring that engages the container body lip, equipped with a grip or support for the handle, capable of keeping in the airtight closing position the cover with gasket, adapted to guarantee the product integrity till its first use.

[0014] The present invention will be better described by some preferred embodiments thereof, given as a non-limiting example, with reference to the enclosed drawings, in which:

- Figures 1 to 3 have been described previously and show a prior art airtight container;
- Figure 4 is an exploded view of the container of the present invention; and
- Figure 5 is a side sectional view of the container in Fig. 4.

[0015] With reference to Figs 4 and 5, they show a plastic ring and a container with lever-type cover with or without band, equipped with plastic ring. The use of the invention can however be extended and adapted to the different types of containers that can be found nowadays in the field of "general line" stocking.

[0016] The plastic ring 101 is composed of an internal annular plane portion 101A delimited by two recesses arranged in series, respectively a negative recess and a positive recess. The walls composing the internal negative recess are: an intrados wall 102 connected by means of a ring 104 to an extrados wall 103. The walls composing the external positive recess are: the mentioned wall 103, herein defined as intrados wall, connected to an extrados wall 105 through a plane ring 106. Said negative recess has such a shape as to be able to be contained in the wall 7 of the lever cover in figure 1, or such as to be housed, with suitable tolerances, within the recess formed by walls 27 and 28 in figure 2, in case of a pressure-type cover. In a further embodiment, the plastic ring 101 is also housed in the recess composed of walls 28 and 34 of the pressure plug in figure 2 by abutting onto the ring 35 overlying the gasket 10, or in the recess with the walls 7 and 8 in case of the lever plug in figure 1, next to the gasket 10.

[0017] The external wall 105 belonging to the plastic ring 101 has a projection section 105A whose tooth shape creates an undercut recess of walls 105 and 103 and of ring 106.

[0018] The tooth 105A performs the function that in prior art was performed by the resilient wings 53 of the winged cover in figure 3. In fact the resilient ring 101 surrounds the cover perfectly adhering to the negative recess, and pushing the projecting wing 105A in addition to the container lip edge as described in figure 5. In such a way, the gasket 10 housed within the lever cover recess is kept squashed.

[0019] The internal ring 101A being part of the plastic ring 101 is connected in at least two points at the same distance to a plane and narrow element 107 with a cur-

vilinear shape located in the internal ring 101A plane. Said element 107, made of the same material composing the ring 101, is grasped by the operator and removed from the plane that contains it assuming the shape of an handle that is able to support the weight of the container full of the product to be handled. Figure 4 points out the optimum characteristic shape both due to an easy use and for a mechanical strength, above all next to the attachment edge 107A in which the load concentration is maximum.

[0020] The plastic ring 101 finally comprises a further projecting section 105B composing the end of wall 105 and connected to section 105A through a neck or ring 105C with reduced section arranged to trigger the breakage by tearing of a tongue or through the usual tear systems applied in the prior art according to the above-mentioned patents.

[0021] The airtight container equipped with a plastic ring placed onto the cover and hooked to the container body lip according to the above-mentioned embodiment performs the objects provided by the assignee of the present invention: the plastic ring 101 performs the function of an handle due to the removal from its resting plane of the curvilinear band 107 allowing to do without the conventional handle or grips. As regards this, it must be stated that the plastic ring 101 distributes the load balancing the container weight along the toothed edge 105 with the advantage of keeping the union flange undistorted even with a simple shape lacking any reinforcement of this latter one, resisting against the load transmitted by the grips, that are usually not more than two; the toothed projecting member 105A hooks the container body lip guaranteeing the cover adherence on which the plastic ring is placed keeping the gasket squashed both under handling and under stocking conditions; the detachable band 105B by breaking the necked section 105C performs the function of ensuring and checking the integrity of the product before its use.

[0022] From the industrial realisation point of view, the ring of the invention is adapted to be realised of a plastic material with not necessarily high mechanical characteristics, and of the type adapted to be injection molded.

[0023] The grips obtained in the container body, the closing band equipped with lever and the adhesive seals, described in the prior art, have been removed due to the use of the plastic ring that performs the functions pertaining to the removed components. The ratio between performed function and number of components composing the airtight container assembly is quite highly in favour of the plastic ring. Moreover the plastic ring, realised in the dimensional range that pertains to "general line" containers, is adapted to be applied to any type of container, in particular with pressure plug, with band, with lever plug with or without band.

Claims

1. Apparatus for stocking and handling an airtight container (1), comprising a container body (1A) with a lip-shaped edge (3) that is coupled with a cover (2), and a gasket (10) sandwiched between the container body (1A) and the cover (2), **characterised in that** a plastic ring (101) is perfectly placed around the cover (2), a projecting wall (105) of said plastic ring (101) keeping the cover (2) in adherence with the container body (1A), said projecting wall (105) being in turn adherent to said edge (3) till a tear-type opening occurs, a plane and narrow element (107) with a curvilinear shape connecting at least two points at a same distance from the ring (101) assuming a shape of an handle.
2. Apparatus for stocking and handling an airtight container (1) according to claim 1, **characterised in that** an intrados wall (102) is coupled to an extrados wall (27) of the cover (2), perfectly adhering thereto.
3. Apparatus for stocking and handling an airtight container (1) according to claim 1, **characterised in that** the extrados wall (103) is coupled with the intrados wall (7, 28, 47) of the cover (2).
4. Apparatus for stocking and handling an airtight container (1) according to claim 1, **characterised in that** the wall (103), connected to an extrados wall (105) through a plane ring (106), is housed within a recess made by the walls (7, 28, 38, 47; 8, 34, 48) abutting onto the ring (9, 35, 49) overlapping the gasket (10).
5. Apparatus for stocking and handling an airtight container (1) according to claim 1, **characterised in that** said wall (105) comprises a projecting section (105A) that encloses the lip edge (3) of the container body (1A) between the walls (105, 104) and the ring (106).
6. Apparatus for stocking and handling an airtight container (1) according to claim 2, **characterised in that** a projecting section (105B) is connected to the projecting section (105A) through a neck or ring (105C) with reduced section, said section (105B) being adapted to perform as breaking trigger by tearing a tongue.
7. Apparatus for stocking and handling an airtight container (1) according to claim 1, **characterised in that** the plastic ring (101) is connected in at least two points at the same distance to a plane and narrow element (107) with a curvilinear shape resting in the plane containing the internal ring (101A), said element (107) assuming the shape of an handle that is able to support the container weight upon with-

drawal from its resting plane.

8. Ring composing the apparatus for stocking and handling an airtight container (1) according to claim 1, **characterised in that** it comprises an internal plane annular portion (101A), an intrados wall (102) connected by means of a ring (104) to an extrados wall (103), said wall (103) being connected to an extrados wall (105) through a plane ring (106).
9. Ring for stocking and handling an airtight container (1) according to any one of claims 1 to 7, **characterised in that** it is made of monolithic plastics.

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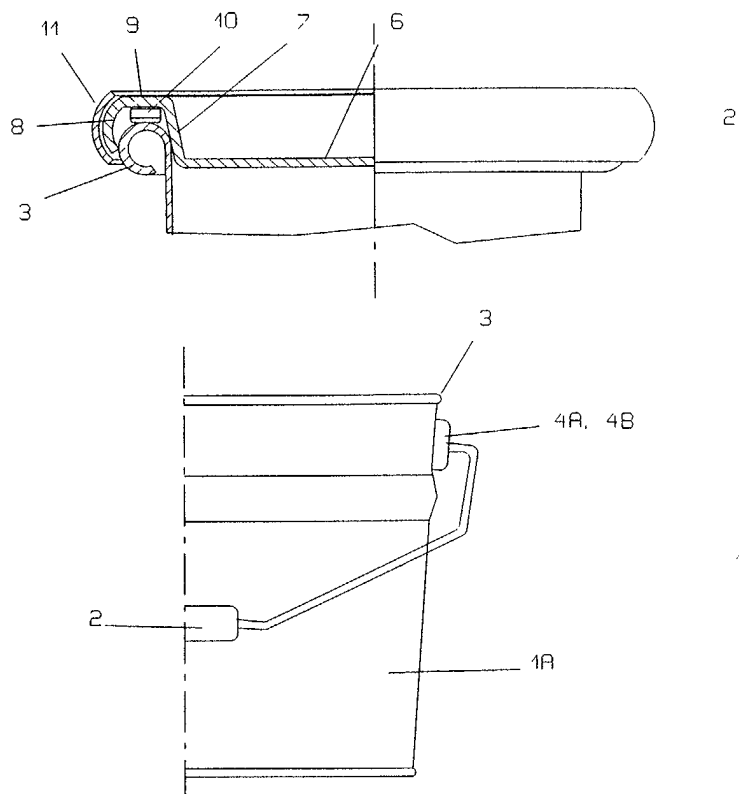


Fig. 1

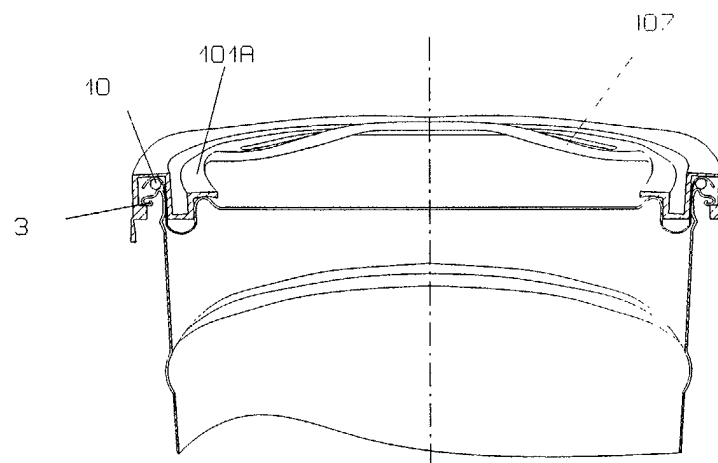


Fig. 5

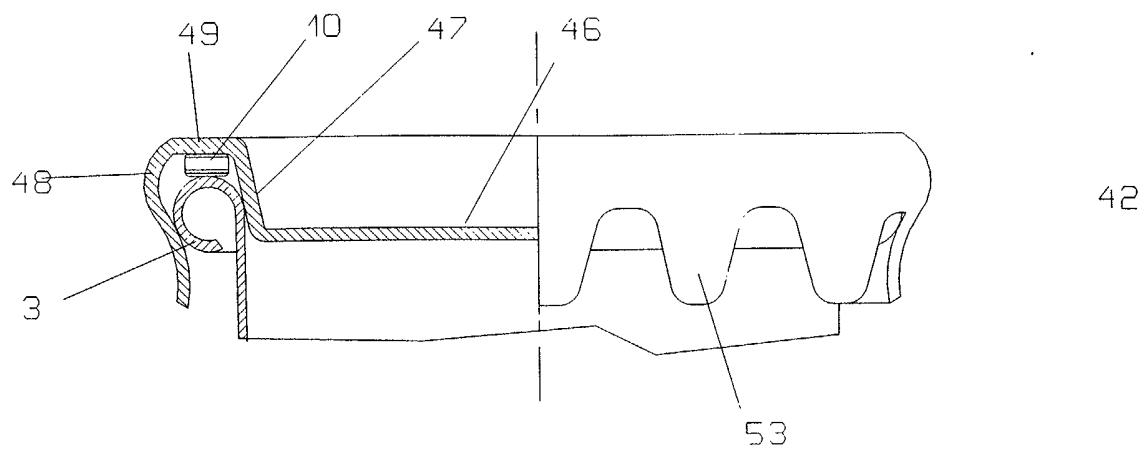


Fig. 3

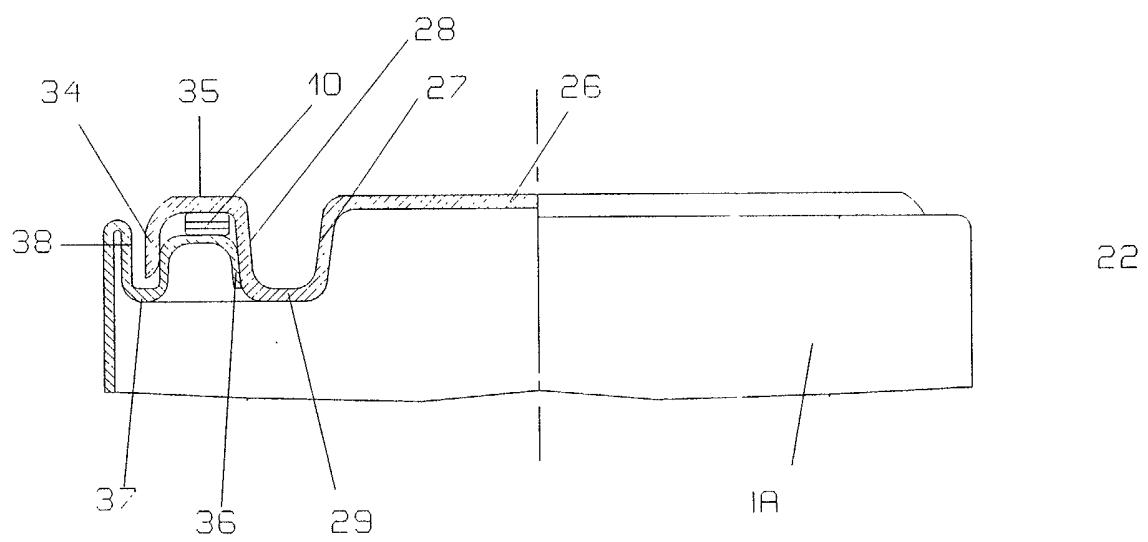


Fig. 2

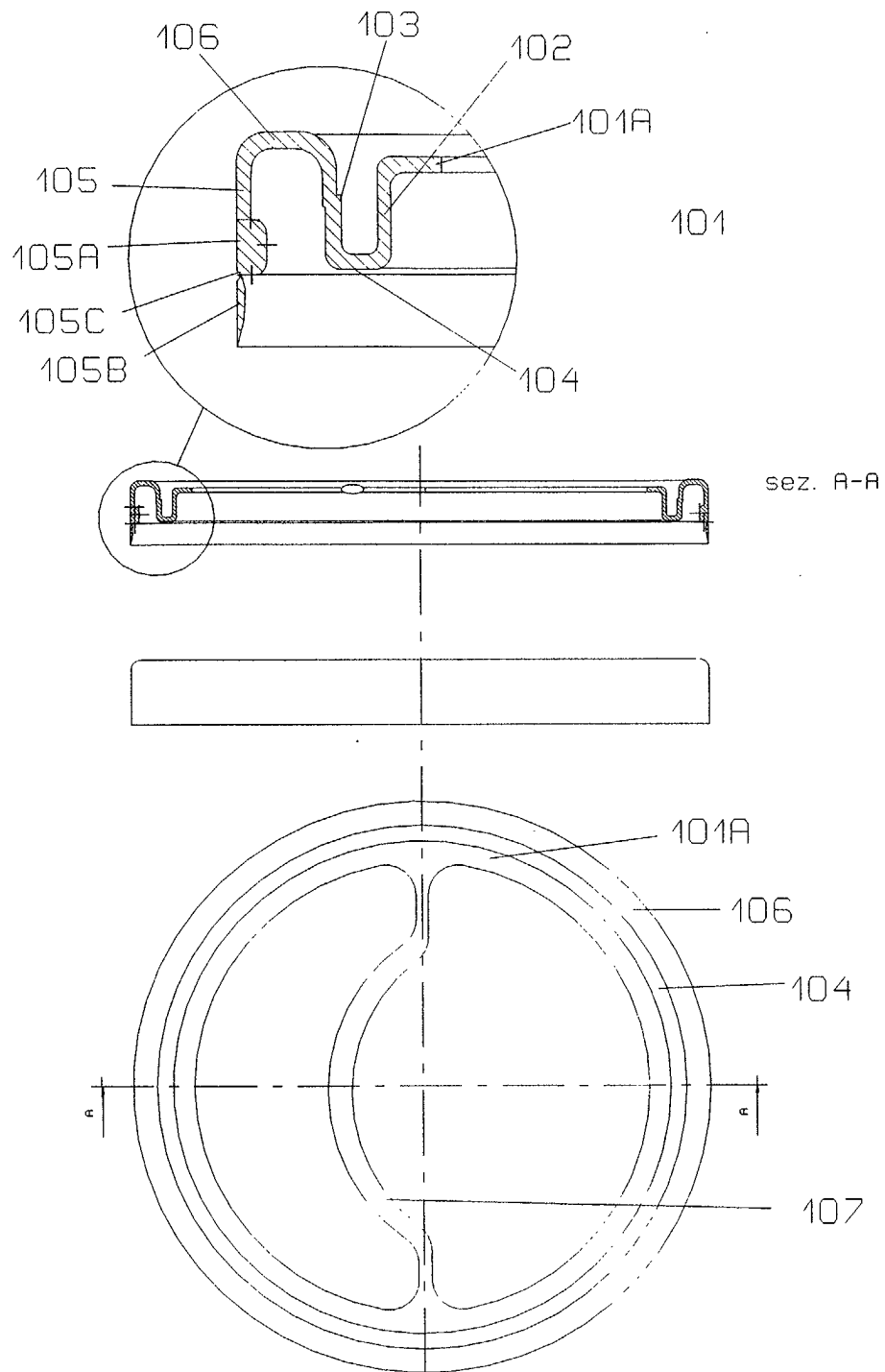


Fig. 4



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EUROPEAN SEARCH REPORT

Application Number
EP 02 42 5038

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 26 June 2002	Examiner Berrington, N
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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