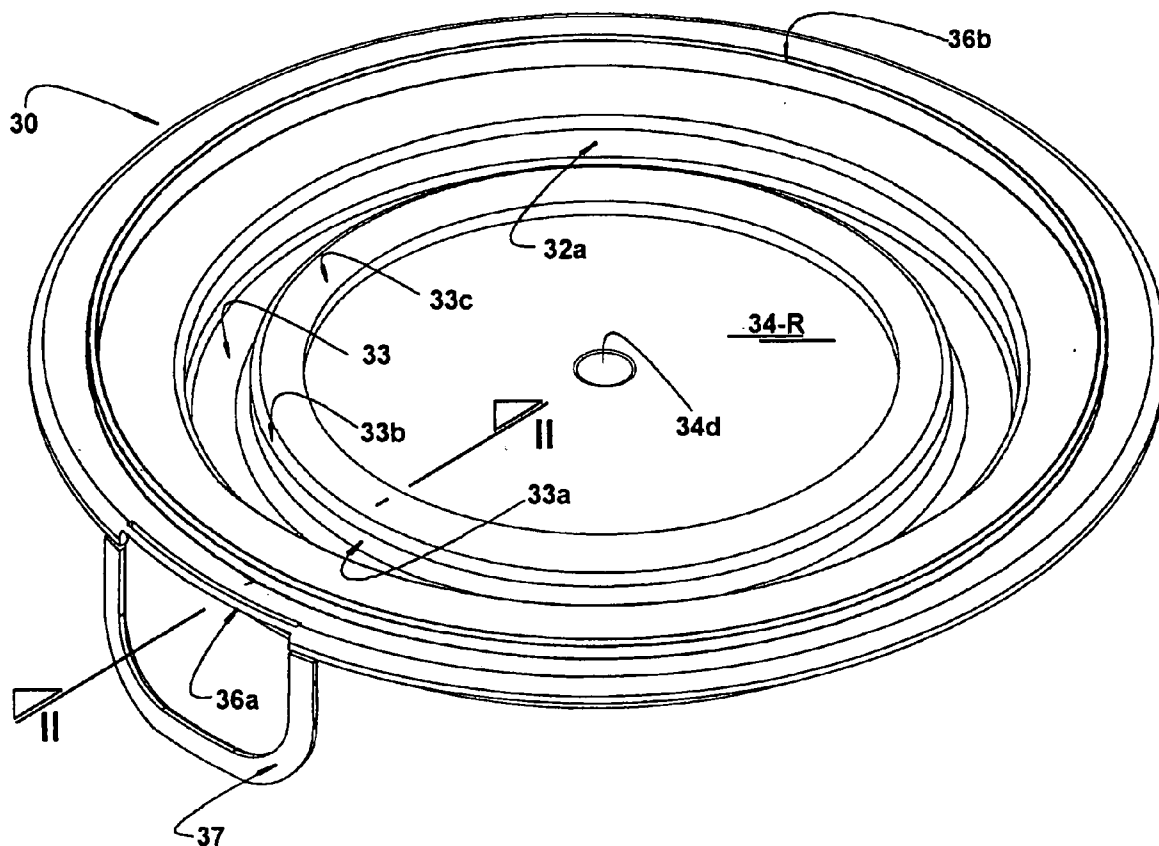


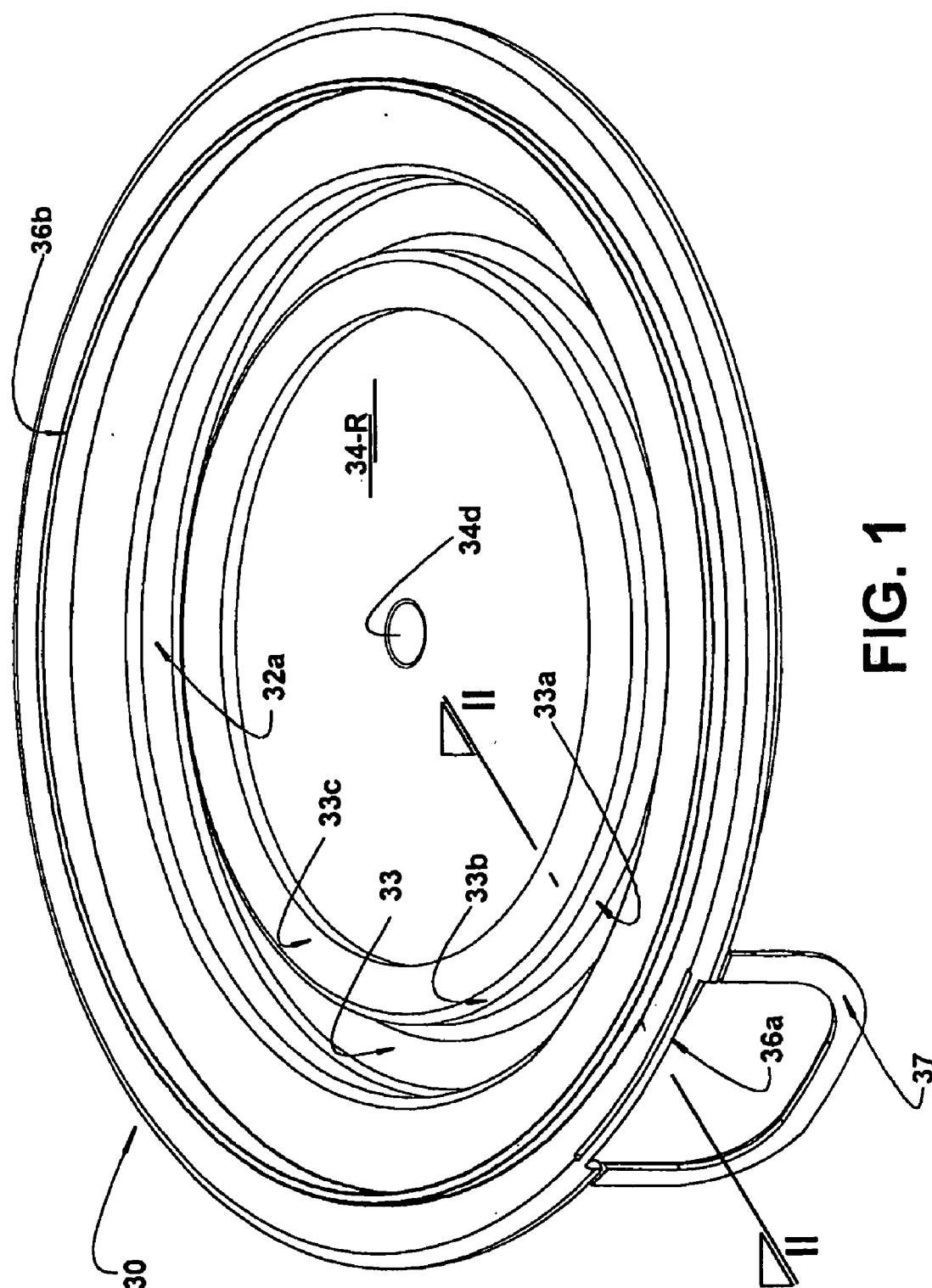


US 20110121009A1

(19) **United States**(12) **Patent Application Publication**
Alvares et al.(10) **Pub. No.: US 2011/0121009 A1**(43) **Pub. Date: May 26, 2011**(54) **COMPOSITE LID FOR CONTAINERS****Publication Classification**(75) Inventors: **Antonio Carlos Teixeira Alvares**,
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B65D 43/02 (2006.01)(52) **U.S. Cl.** **220/780**(73) Assignee: **BRASILATA S/A**
EMBALAGENS METALICAS,
Sao Paulo-SP (BR)(57) **ABSTRACT**(21) Appl. No.: **12/675,107**(22) PCT Filed: **Sep. 1, 2008**(86) PCT No.: **PCT/BR08/00267**§ 371 (c)(1),
(2), (4) Date: **May 25, 2010**

A composite lid for a container that includes a tubular body carrying an annular upper wall made of sheet metal, in which is defined an opening surrounded by a seat, which is configured to receive and retain the lid. The lid includes a base portion peripherally incorporating a retention portion to be seated and retained on the seat when the lid is closed. The base portion includes a peripheral annular element molded in a plastic material as a single piece with the retention portion, and a central element in the form of a sheet metal plate that has an outer peripheral edge attached to the peripheral annular element. The peripheral annular element includes, internally and in a single piece, a central panel disposed on the central element, which is incorporated to the lid during its injection or attached thereto afterwards.

(30) **Foreign Application Priority Data**Aug. 31, 2007 (BR) PI0703738-4
Jun. 20, 2008 (BR) PI0802246-1



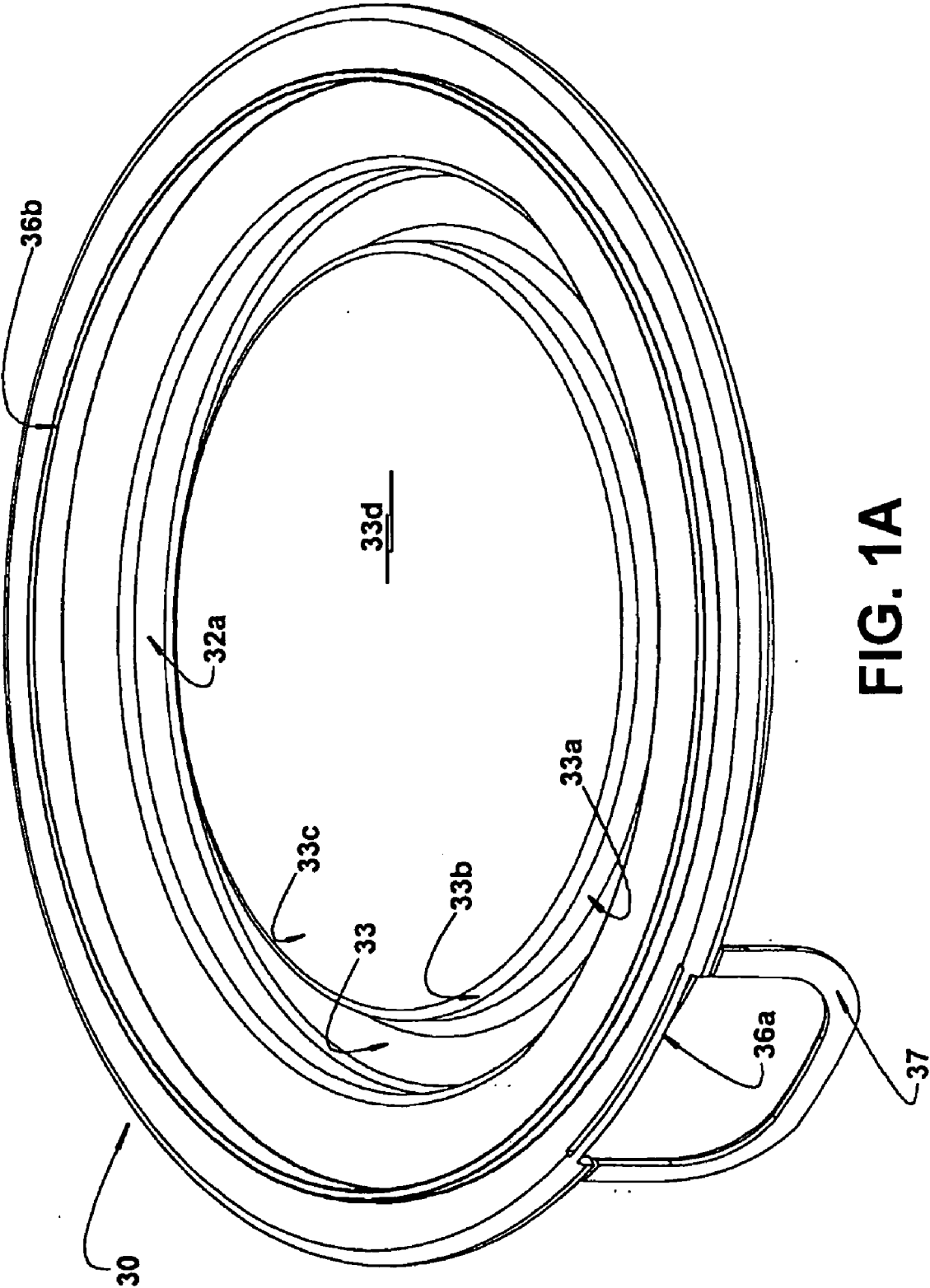


FIG. 1A

FIG. 2

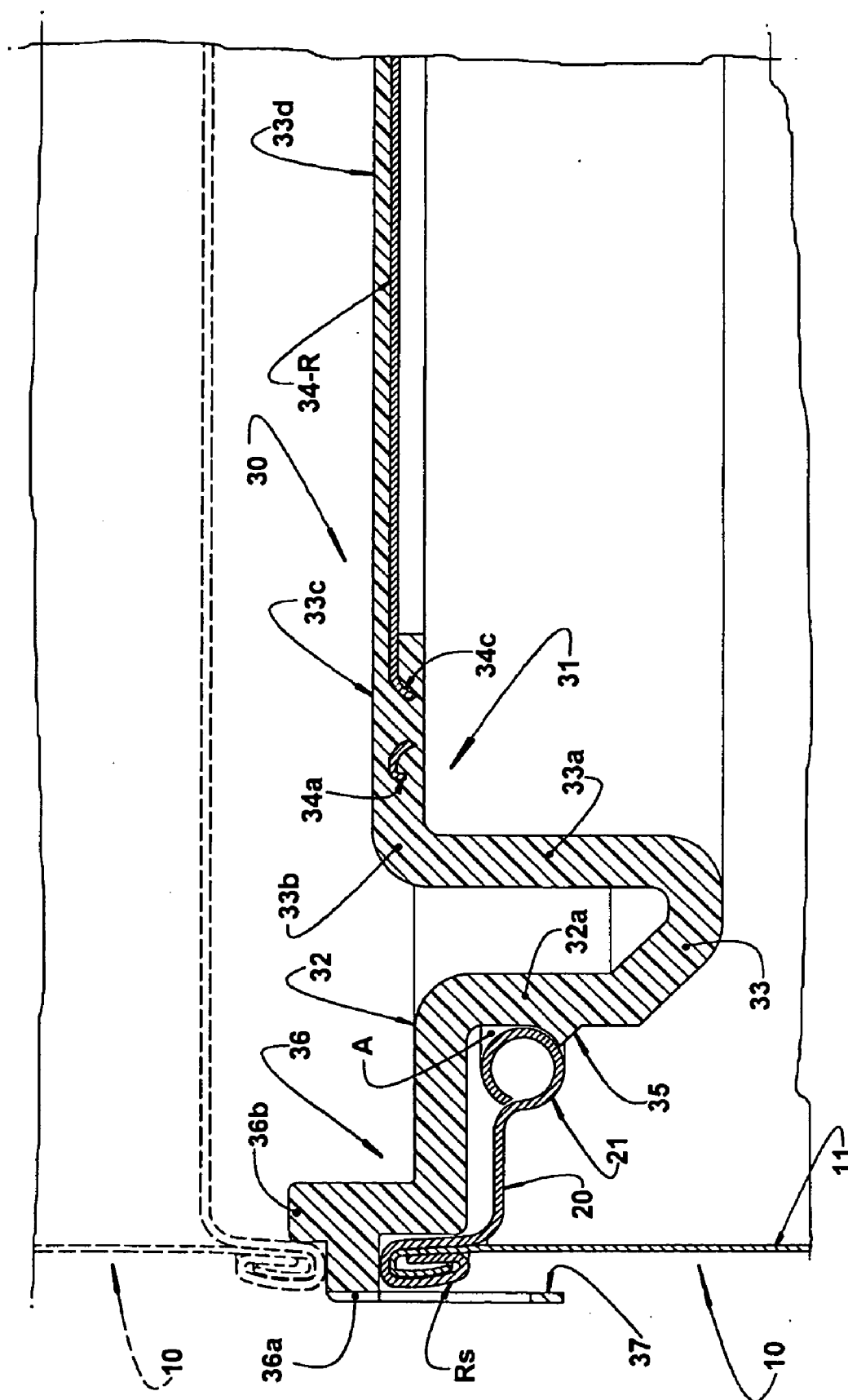


FIG. 2A

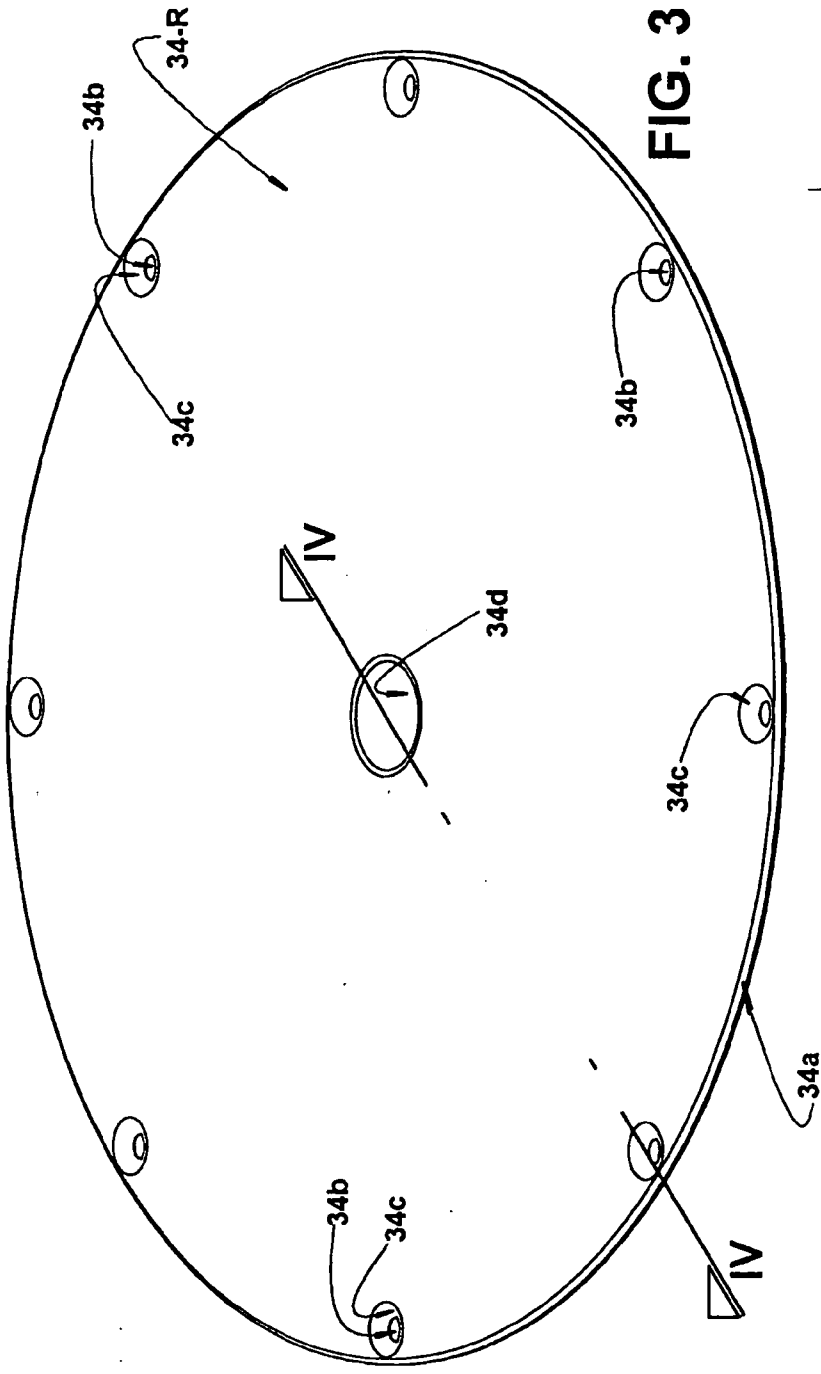


FIG. 3

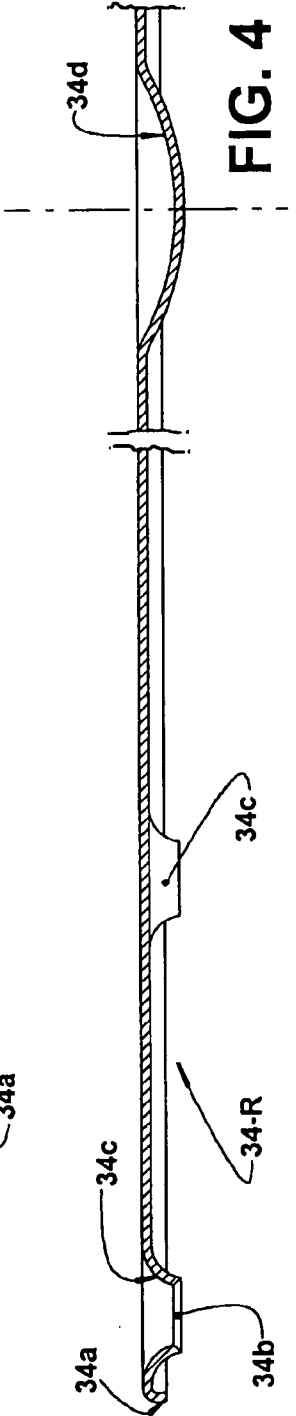


FIG. 4

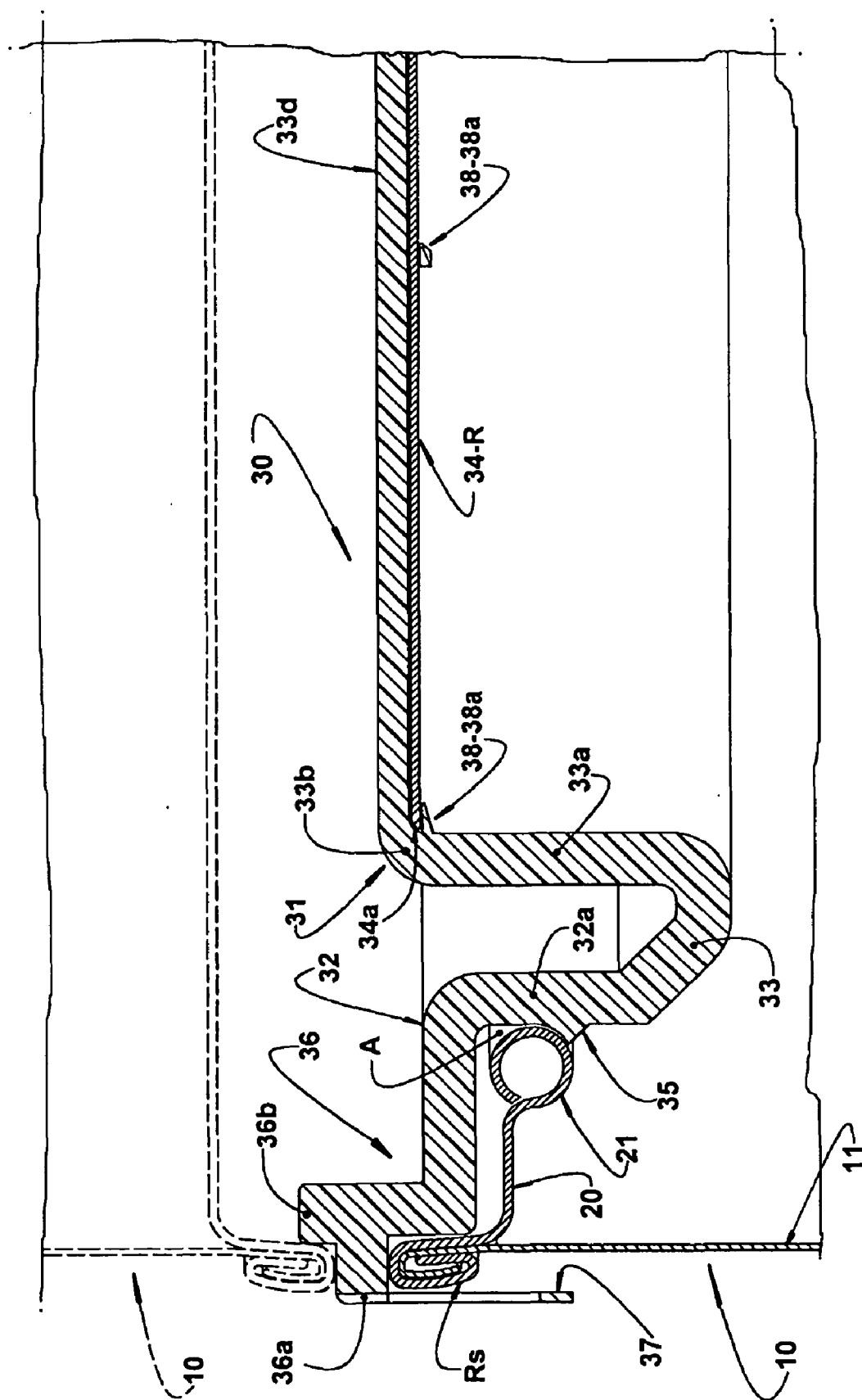


FIG. 5

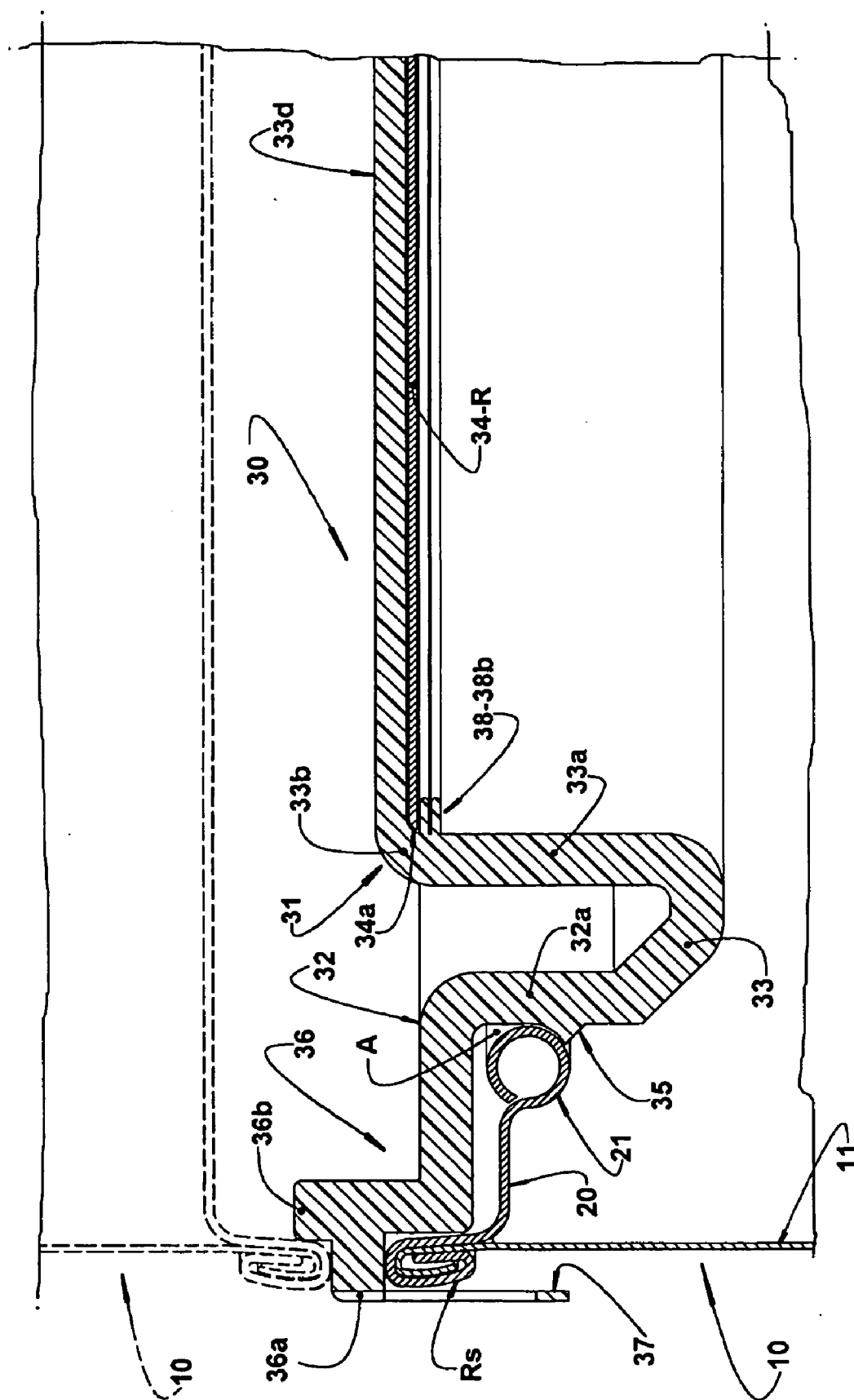


FIG. 6

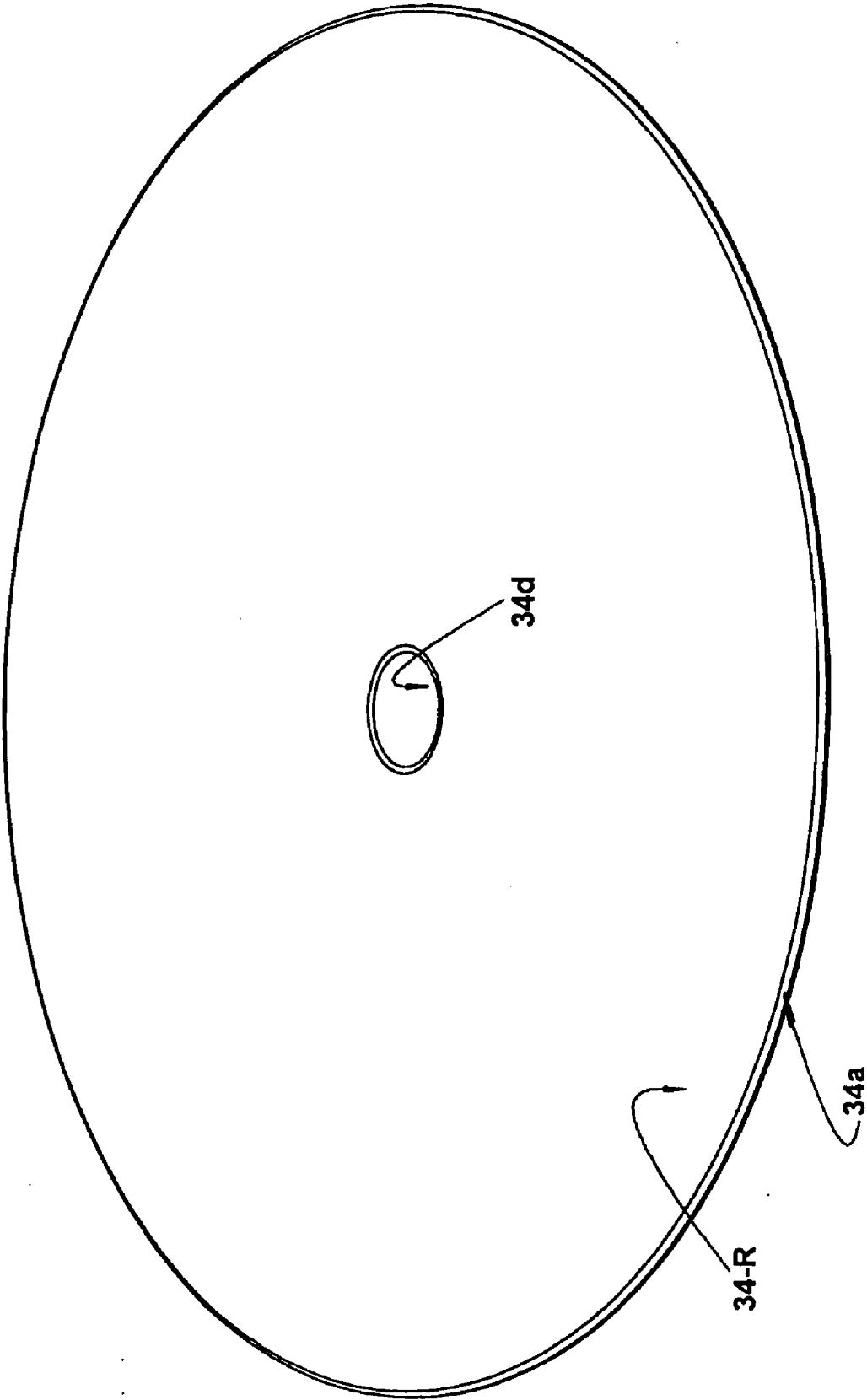


FIG. 7

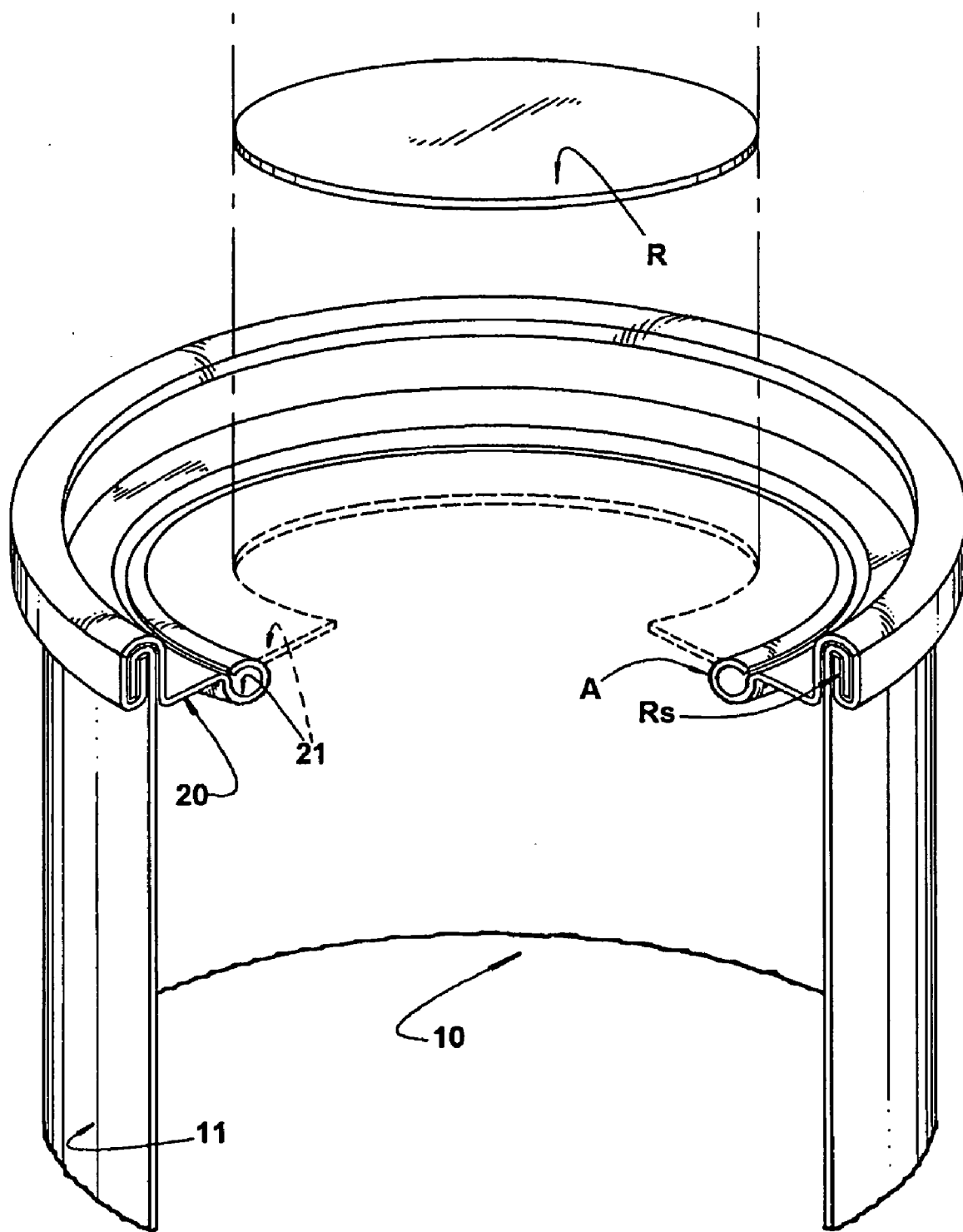


FIG. 8

COMPOSITE LID FOR CONTAINERS

FIELD OF THE INVENTION

[0001] The present invention refers to a lid formed of multiple materials, more particularly in sheet metal and in plastic material, to be applied to a container generally defined by a can with a circular or polygonal cross-section, obtained in sheet metal or in other materials, comprising a tubular body carrying an annular upper wall, which defines an access opening to the interior of the container and a seat on which the lid is removably fitted and retained, for closing the container.

PRIOR ART

[0002] There are well known from the prior art the lids of cans or other similar containers, said lids being constructed in a single piece in stamped sheet metal or molded plastic material and presenting a base portion, which covers the opening of the container and peripherally incorporates a retention portion to be seated and retained on the seat, when the lid is closed.

[0003] The lids formed in stamped sheet metal are generally deprived of a tamper evident seal portion, which is incorporated to the retention portion and radially projects outwards therefrom, to cooperate with an upper edge region of the container body. These lids in sheet metal have been used for many years and present constructive variations in the base portion and in the retention portion. However, although presenting substantial mechanical strength and defining adequate impermeability to oxygen and water vapor and also an adequate light barrier, these metallic lids lead to the provision of tamper evident seal elements defined in separate pieces applied to the container, externally or internally positioned in relation to the lid, in order to comply with determined applications.

[0004] On the other hand, the lids of the type considered herein and molded in plastic material, can be formed in a single piece, comprising base portion, retention portion and seal portion, guaranteeing the obtention of a closure element, with adequate characteristics of sealing, inviolability, strength and which is easily opened and closed by the user of a product of progressive consumption, which is stored in the container.

[0005] However, the plastic-molded lids can present some limitations, in certain applications, regarding the gas and vapor impermeability, particularly during long shelf periods, and also the formation of an effective light barrier.

[0006] Another aspect to be considered concerns the containers, whose annular upper wall is formed from a stamped sheet metal and peripherally double-seamed or otherwise hermetically attached to an end edge (upper edge) of the tubular body of the container. In these conditions, the median scrap of sheet metal, resulting from the stamping of the annular upper wall, is discarded as scrap, in spite of representing a sheet metal portion generated in the surface treatment required for application in the formation of containers. None of the solutions of metallic lid or plastic lid permit solving the problem of discarding the median scrap resulting from the stamping of the annular upper wall of the container.

[0007] A known composite lid construction, made of plastic and sheet metal, is described and claimed in the Certificate of Addition C1 0401239-9. This previous document suggests a lid construction comprising a base portion in sheet metal, with a peripheral portion conformed to be seated on an upper

edge of the tubular body of the container and coupled to a retention ring, made of plastic material, provided with seal means which guarantee the axial retention of the lid in the closed condition.

[0008] The previous construction cited above, and those defined in documents U.S. Pat. No. 5,881,907, U.S. Pat. No. 6,220,466, U.S. Pat. No. 7,147,118 and U.S. Pat. No. 7,175,039, use a composite lid comprising a base portion in sheet metal, integrally covering the open upper end of the tubular body of the container and having a peripheral portion necessarily conformed to be hermetically seated on the upper edge of the tubular body, the axial retention of the base portion being guaranteed by a peripheral annular element, in plastic material, presenting an annular or blind upper flange seated on the metallic base portion and a peripheral skirt to be coupled to the retention means, externally provided in the tubular body of the container and optionally incorporating a seal means detachable upon the first opening of the lid.

[0009] However, the composite lid solutions commented above are applied to containers without an annular upper wall for the formation of the seat of the lid, the axial locking of the lid being carried out by means, such as curl, rib or screw threads, provided externally to the tubular body of the container and to be engaged by the peripheral annular element in plastic material, without having any sealing function in relation to the seat for seating the base portion integrally in metal.

[0010] In these known composite lids, the oxygen and water vapor impermeability and the light barrier are produced by the base portion integrally in sheet metal, which is compulsorily conformed to interact with the seat defined by the upper edge of the tubular body of the container, either with or without help of an intermediate resinous sealing material. These solutions present a relatively complex and onerous construction, not being applicable to lids to be fitted and retained on a seat defined on an annular upper wall of the container.

SUMMARY OF THE INVENTION

[0011] As a function of the limitations and drawbacks of the prior art composite lids, when related to the containers of the type considered herein, it is an object of the present invention to provide a lid in sheet metal and in plastic material, presenting an improvement in the impermeability to oxygen (and other gases) and light barrier, in relation to the lids formed only in plastic material, through a simple construction which is less costly than that of the known composite lids incorporating or not a tamper evident seal.

[0012] It is yet a further object of the present invention to provide a lid as mentioned above and which presents its metallic portion formed by a stamping scrap.

[0013] It is also a further object of the invention to provide a lid as defined above and which allows safely stacking the containers closed by said lids.

[0014] In order to achieve the objects mentioned above, the lid in question comprises a base portion which peripherally incorporates a retention portion to be seated and retained on the seat of the annular upper wall of the container, when the lid is closed.

[0015] In accordance with the invention, the base portion of the lid comprises: a peripheral annular element molded in plastic material, in a single piece with the retention portion; and a central element in the form of a sheet metal plate and having an outer peripheral edge hermetically attached to the peripheral annular element.

[0016] By considering the formation of the annular upper wall in stamped sheet metal, the present invention allows the central element of the base portion of the lid to be defined by the own median scrap resulting from the stamping of the annular upper wall, whereby the metallic piece of the composite lid is then formed by an element usually treated as scrap.

[0017] The lid formed according to the present invention has practically its whole area, designed for closing the container opening, defined by an opaque sheet metal plate being gas impermeable and with an extremely less production cost, allowing the retention portion in plastic material to operate as a sealing element, in cooperation with the seat, and as an element for axially retaining the lid to the tubular body of the container.

[0018] In a constructive variant, the peripheral annular element can incorporate, internally and in a single piece, a closing central panel, also in plastic material, disposed on the central element. In this case, the plastic piece defined by the retention portion, by the peripheral annular element and by the central panel, establishes a hermetical closing barrier, which is inferiorly reinforced in the region under the central panel with the incorporation of the metallic central element which may have its peripheral edge incorporated to the plastic material of the peripheral annular element, during the injection of the plastic material of the lid, or fitted to said plastic material after its molding.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] The invention will be described below, with reference to the enclosed drawings, given by way of example of an embodiment of the invention and in which:

[0020] FIG. 1 represents a perspective view of a construction for the lid in question;

[0021] FIG. 1A represents a view similar to that of FIG. 1, but illustrating a constructive variant of the lid, in which the central element in sheet metal is totally covered with the plastic material constitutive of the peripheral annular element and of the retention portion;

[0022] FIG. 2 represents a partial diametral sectional view of the lid of FIG. 1, when fitted on the seat formed on annular upper wall of the tubular body of a can, said section taken according to line II-II in FIG. 1;

[0023] FIG. 2A represents a partial diametral sectional view of the lid, similar to that of FIG. 2, but considering the constructive variant of FIG. 1A;

[0024] FIG. 3 represents a top perspective view of the central element of the base portion of the composite lid;

[0025] FIG. 4 represents a partial diametral sectional view of the central element of the lid, said section taken according to line IV-IV in FIG. 3;

[0026] FIG. 5 represents a partial diametrical sectional view of the lid, similar to that of FIGS. 2 and 2A, but considering another constructive variant, according to which the central element is attached to the peripheral annular element, after the molding of the latter and by means of radial retaining projections incorporated to the peripheral annular element;

[0027] FIG. 6 represents a partial diametrical sectional view of the lid, similar to that of FIGS. 2, 2A and 5, but related to a further constructive variant, according to which the central element is attached to the peripheral annular element, after the molding of the latter and through the screw thread incorporated to the peripheral annular element;

[0028] FIG. 7 represents a top perspective view of the central element illustrated in the embodiment of FIGS. 5 and 6; and

[0029] FIG. 8 represents a partially sectioned top perspective view of a can provided with an annular upper wall, from which is medianly obtained, by stamping, the central element of the base portion of the lid, said central element being illustrated in an exploded mode.

DETAILED DESCRIPTION OF THE INVENTION

[0030] The composite lid of the present invention is applicable to containers of the type which comprises a tubular body 10 in sheet metal and having a usually cylindrical side wall 11, carrying an annular upper wall 20, also in sheet metal, presenting an opening A surrounded by a seat 21 against which is seated and retained a lid 30.

[0031] The annular upper wall 20 can be constructed in different ways as, for example, being formed by a deformed portion of the side wall 11 of the tubular body 10, as described in Brazilian Patent Application PI 0504528-2 (PCT/BR2005/000232) of the same applicant, or obtained in a separate sheet metal, being duly stamped and peripherally attached to an upper edge of the side wall 11 of the tubular body 10, as illustrated in FIGS. 2 and 8, by an upper double-seaming Rs.

[0032] Independently of the construction applied to the annular upper wall 20 (either a single piece or a piece double-seamed to the side wall 11 of the tubular body 10), it is constructed to define, in its inner peripheral edge and around the opening A, a seat 21 which, in the illustrated construction, takes the form of a circular or substantially circular tubular cross-sectional rib, obtained by bending the inner peripheral edge of the annular upper wall 20 downward, upward and outward, until completing the tubular form. However, it should be understood that the seat 21 may present different constructions associable with the type of composite lid proposed herein, guaranteeing not only the axial retention of the latter on the seat 21, but also the tightness of the container. For example, the seat 21 may have its cross-section defined by a circle arc with an extension sufficient to guarantee the tight seating and the retention of a confronting circumferential portion of the lid.

[0033] As illustrated in FIG. 8, when the annular upper wall 20 is formed in stamped sheet metal and double-seamed to the side wall 11 of the tubular body 10, the annular form of the upper wall is obtained by stamping a median scrap R in the form of a flat circular disk that would usually be discarded as scrap.

[0034] According to the invention, the lid 30 comprises a base portion 31 which peripherally incorporates a retention portion 32, molded in plastic material, to be seated and retained against the seat 21.

[0035] The base portion 31 of the lid 30 comprises a peripheral annular element 33, molded in plastic material, in a single piece with the retention portion 32, and a central element 34 in the form of a sheet metal plate and having an outer peripheral edge 34a to be attached, hermetically or not, to the peripheral annular element 33. More specifically, the outer peripheral edge 34a of the central element 34 is inserted and retained in the interior of the plastic material constitutive of the peripheral annular element 33, in the embodiment illustrated in FIGS. 1, 1A, 2 and 2A. In the embodiment of FIGS. 1 and 2, the outer peripheral edge 34a of the central element 34 must be hermetically retained in the interior of the plastic material constitutive of the peripheral annular element 33,

since said central element **34** operates as part of the lid closure, i.e., as a sealing element. In the embodiment of FIGS. 1A and 2A, the peripheral annular element **33** incorporates, internally and in a single piece, a closing central panel **33d** disposed on the central element **34**. In this case, despite being more appropriate, the retention of the outer peripheral edge **34a** of the central element **34** in the plastic material of the peripheral annular element **33** is not required to be necessarily hermetic.

[0036] When the annular upper wall **20** is attached to the container by the upper double-seaming **Rs**, the central element **34** of the base portion **31** of the lid is defined by the own median scrap **R** resulting from the stamping of the annular upper wall **20**, as illustrated in FIG. 8. As is known, the median scrap **R** is produced upon stamping the annular upper wall **20**, before its double-seaming to the side wall **11** of the tubular body **10**.

[0037] In the illustrated construction, the peripheral annular element **33**, in plastic material, of the base portion **31**, superiorly incorporates, in a single piece, an inner peripheral wall portion **33a**, projecting upwards, in a substantially cylindrical or frusto-conical arrangement and having an upper edge **33b** whose plastic material surrounds and retains the outer peripheral edge **34a** of the central element **34** in sheet metal, in the embodiments illustrated in FIGS. 1, 1A, 2 and 2A. The peripheral annular element **33** is also externally incorporated, in a single piece, to a lower region of the retention portion **32** which, in the illustrated construction, takes the form of a substantially cylindrical wall **32a**, radially spaced from the inner peripheral wall portion **33a** of the peripheral annular element **33** of the base portion **31** and circumferentially incorporating an outer cradle **35** to be seated against the seat **21**, in order to axially retain the lid **30** in the closed condition. It should be understood that the peripheral annular element **33** can be deprived of the inner peripheral wall portion **33a**, to receive and retain, in the interior of its constitutive plastic material, the outer peripheral edge **34a** of the central element **34**. In this case, the peripheral annular element **33** and the central element **34** are generally coplanarly arranged. However, this coplanar construction does not present the advantages of an adequate structural strength, gain of inner volume of the container and a better stacking of the lids in the magazines of the automatic closing machines.

[0038] Also according to the illustrated construction, the retention portion **32** of the lid **30**, more particularly its substantially cylindrical wall **32a**, superiorly incorporates, in a single piece, an annular wall **36** which projects radially outwards, to be positioned over the annular upper wall **20** of the tubular body **10**, when the lid **30** is closed.

[0039] The annular wall **36** presents an outer edge **36a**, which extends over the upper double seaming **Rs**, or over the upper edge of the side wall **11** of the tubular body **10** in case the upper double seaming is not provided, said outer edge **36a** incorporating a gripping handle **37** projecting downwards, to remain close to the side wall **11** of the tubular body **10** upon seating the lid **30** on the seat **21**.

[0040] In order to avoid lateral displacements between two vertically stacked containers **10**, the annular wall **36** can incorporate at least one circumferential rib extension **36b**, i.e., continuously formed or defined in segments, projecting upwards from the annular wall **36**, radially spaced back or not in relation to the outer edge **36a** of said annular wall **36**, so as to be loosely and telescopically fitted, inwardly or outwardly from the lower end double seaming of another container **10**,

which is seated onto the former in a stack, as illustrated in FIGS. 5 and 6, acting as a stacking guide.

[0041] In order to guarantee a fixed and hermetical attachment of the central element **34**, in sheet metal, to the peripheral annular element **33**, in plastic material, in the embodiments of FIGS. 1, 1A, 2 and 2A, the sheet metal plate of the former is provided, along and slightly spaced from its outer peripheral edge **34a**, with a plurality of spaced apart through holes **34b**, which can be formed in deformed through holes **34c** of the sheet metal plate, projecting outwards from the plane of the latter, said through holes **34b** being filled with the plastic material of the peripheral annular element **33**, upon incorporation of the central element **34** to the peripheral annular element **33**. This incorporation may be carried out, for example, by injection molding the peripheral annular element **33** and the retention portion **32**, in a single piece of plastic material, in a mold in whose interior is previously positioned the central element **34**. The outer peripheral edge **34a** of the central element **34** may also be in the form of a downwardly curved curl, for example, so as to increase even more the mechanical retention between the sheet metal and the plastic material. Aiming at easing the handling and also structurally stiffening the central element **34**, it may also be provided with a central recess **34d** in the form of a downwardly projecting spherical cap.

[0042] In the illustrated constructions, the upper edge **33b** of the inner peripheral wall portion **33a** of the peripheral annular element **33** incorporates an inner annular flange **33c**, in whose interior is retained the outer peripheral edge **34a** of the central element **34**. However, different constructive arrangements are possible for obtaining a secure and, if necessary, hermetical attachment of the sheet metal of the central element **34** to the plastic material of the single piece defined by the retention portion and by the peripheral annular element **33**.

[0043] A constructive variant of the lid **30** is illustrated in FIGS. 1A and 2A. In this construction, the peripheral annular element **33** is constructed so that the upper edge **33b** of the inner peripheral wall portion **33a**, or its radially inner region, is extended, in a single piece, over the whole extension of the central element **34**, forming a central panel **33d** over the latter, in order to facilitate printing the messages related to the identification of the product to be packaged. In this embodiment, the degree of tightness in the fixation region between the metallic central element **34** and the peripheral annular element **33** is not required to be so high as that required for the embodiment of FIGS. 1 and 2.

[0044] In the constructive variant illustrated in FIGS. 5, 6 and 7, the peripheral annular element **33** incorporates, internally and in a single piece, a closing central panel **33d**, also in plastic material, considering that, in this construction, the central element **34** has its outer peripheral edge **34a** fitted and locked in a retention means **38** provided in the peripheral annular element **33**, so as to axially retain the central element **34** seated under said central panel **33d** which, in these embodiments, presents a substantially constant thickness along the whole area defined internally to the inner peripheral wall portion **33a**.

[0045] In a particular way, when the peripheral annular element **33** superiorly incorporates, in a single piece, an inner peripheral wall portion **33a** provided with an upper edge **33b**, as already described for the previous embodiments, said upper edge **33b** internally incorporates, in a single piece, the central panel **33d**, the retention means **38** being provided

internally to the inner peripheral wall portion 33a of the peripheral annular element 33.

[0046] The retention means 38 can be defined, as illustrated in FIG. 5, by a plurality of radial projections 38a or by a single circumferential radial projection 38a incorporated, in a single piece, to the inner peripheral wall portion 33a, and on which is fitted the outer peripheral edge 34a of the central element 34, when this is mounted under the central panel 33d.

[0047] The retention means 38 can be also defined, as illustrated in FIG. 6, by at least one screw thread 38b incorporated, in a single piece, to the inner peripheral wall portion 33a, and in which is fitted the outer peripheral edge 34a of the central element 34, in order to permit the latter to be axially retained to the lid, seated against the central panel 33d.

[0048] In the embodiments of FIGS. 5 and 6, the upper edge 33b of an inner peripheral wall portion 33a directly incorporates the central panel 33d, without the provision of the inner annular flange 33c of the embodiments illustrated in FIGS. 1, 1A, 2 and 2A. In the constructions of FIGS. 5 and 6, the circumferential radial projection 38a, in one piece or in a plurality of radially projecting elements angularly spaced apart, is slightly spaced from the central panel 33d, in order to define therewith a gap in which is tightly fitted a corresponding circumferential extension of the outer peripheral edge 34a of the central element 34, allowing the latter to be safely and easily attached and seated under the central panel 33d of the lid 30, after the injection of the plastic material of the latter, permitting simplifying the molding tools.

[0049] While only some embodiments of the invention have been illustrated herein, it should be understood that alterations can be made in the form and physical arrangement of the different components of the lid, without departing from the constructive concept defined in the claims accompanying the present specification.

1. A composite lid for a container that comprises a tubular body carrying an annular upper wall made of sheet metal, in which is defined an opening surrounded by a seat, and which is configured to receive and retain a lid, the composite lid comprising:

- a base portion peripherally incorporating a retention portion to be seated and retained in the seat, when the lid is closed, the base portion including:
- a peripheral annular element molded in plastic material in a single piece with the retention portion; and
- a central element in the form of a sheet metal plate and having an outer peripheral edge attached to the peripheral annular element.

2. The lid, as set forth in claim 1, in which the annular upper wall of the container is formed in stamped sheet metal, to produce a median scrap, wherein the central element of the base portion is defined by said median scrap.

3. The lid, as set forth in claim 1 wherein the outer peripheral edge of the central element is inserted and retained in the interior of the plastic material of the peripheral annular element.

4. The lid, as set forth in claim 3, wherein the peripheral annular element includes, superiorly and in a single piece, an inner peripheral wall portion projecting upwardly, in a substantially cylindrical or frusto-conical arrangement, the inner peripheral wall portion presenting an upper edge, that surrounds and retains the outer peripheral edge of the central element.

5. The lid, as set forth in claim 4, wherein the upper edge of the inner peripheral wall portion of the peripheral annular

element incorporates an inner annular flange that retains the outer peripheral edge of the central element within an interior portion of the inner annular flange.

6. The lid, as set forth in claim 3, wherein the sheet metal plate of the central element is provided, along and slightly spaced from its outer peripheral edge, with a plurality of spaced apart through holes, configured to be filled with the plastic material of the peripheral annular element, for retention of the central element by the peripheral annular element.

7. The lid, as set forth in claim 6, wherein the through holes are formed coaxially with deformed through holes of the sheet metal plate of the central element projecting outwards from the plane of the latter.

8. The lid, as set forth in claim 3, wherein the outer peripheral edge of the central element is in the form of a curved curl.

9. The lid, as set forth in claim 3, wherein the retention of the outer peripheral edge of the central element in the interior portion of the inner annular flange of the peripheral annular element is hermetically provided.

10. The lid, as set forth in claim 3, wherein the peripheral annular element incorporates, internally and in a single piece, a closing central panel disposed on the central element.

11. The lid, as set forth in claim 1, wherein the peripheral annular element incorporates, internally and in a single piece, a closing central panel, the central element having its outer peripheral edge fitted and locked in a retainer provided in the peripheral annular element, in order to axially retain the central element seated under said central panel.

12. The lid, as set forth in claim 11, wherein the peripheral annular element includes, superiorly and in a single piece, an inner peripheral wall portion that projects upwardly, in a substantially cylindrical or frusto-conical arrangement, the inner peripheral wall portion presenting an upper edge incorporating, internally and in a single piece, the central panel, the retainer being provided internally to the inner peripheral wall portion of the peripheral annular element.

13. The lid, as set forth in claim 12, wherein the retainer includes at least one radial projection incorporated, in a single piece, in the inner peripheral wall portion and on which is fitted the outer peripheral edge of the central element, when it is mounted under the central panel.

14. The lid, as set forth in claim 12, wherein the retainer includes at least one screw thread incorporated, in a single piece, to the inner peripheral wall portion, and on which is fitted the outer peripheral edge of the central element when it is mounted under the central panel.

15. The lid, as set forth in claim 3, wherein the peripheral annular element is incorporated, externally and in a single piece, at a lower region of the retention portion, the retention portion including a substantially cylindrical wall, circumferentially incorporating an outer cradle to be seated against the seat, upon closing the lid.

16. The lid, as set forth in claim 15, wherein the retention portion of the lid incorporates, superiorly and in a single piece, an annular wall projecting radially outwards, and configured to be positioned over the annular upper wall of the tubular body, when the lid is closed.

17. The lid, as set forth in claim 16, wherein the annular wall includes an outer edge incorporating a gripping handle projecting downwardly, said gripping handle being configured to remain in proximity to the side wall of the body, upon the seating of the lid on the seat.

18. The lid, as set forth in claim **16**, wherein the annular wall includes at least one circumferential rib extension projecting upwardly at least one circumferential rib being configured as a stacking guide.

19. The lid, as set forth in claim **2**, wherein the outer peripheral edge of the central element is inserted and retained in the interior of the plastic material of the peripheral annular element.

20. The lid, as set forth in claim **2**, wherein the peripheral annular element incorporates, internally and in a single piece, a closing central panel, the central element having its outer peripheral edge fitted and locked in a retainer provided in the peripheral annular element, in order to axially retain the central element seated under said central panel.

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