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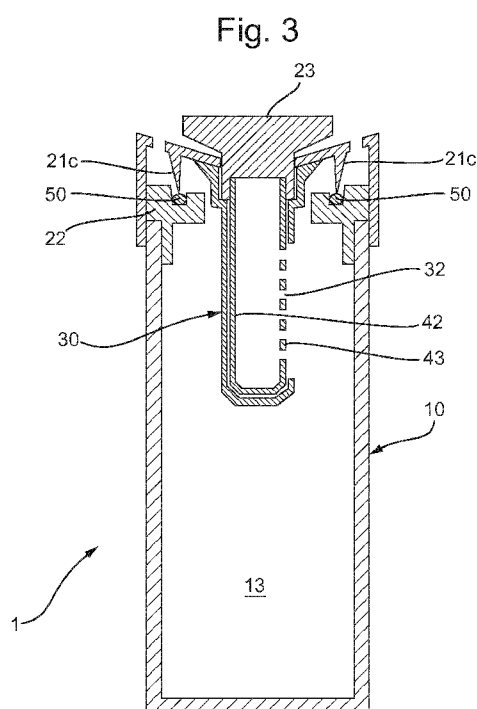
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(54) Title: DRINKING VESSEL WITH INFUSION CHAMBER



(57) Abstract: Disclosed is a drinking vessel (1) comprising a container (10) and a lid (20). The container extends from an open end (11) to a base (12) and comprises a cavity (13) for holding a liquid. The lid (20) closes the open end (11) of the container and comprises: an inner part (22) comprising an inner central orifice (22a), and an outer part (21) comprising a lip (21a) and an infusion chamber (30, 40). The infusion chamber (30, 40) comprises an entrance (35) and the lip (21a) surrounds the entrance. The infusion chamber (30, 40) extends from the entrance (35) away from the outer part (21) and the lip (21a) comprises one or more drinking outlets (21b). The outer part (21) of the lid (20) comprises a body portion comprising the infusion chamber entrance (35) and a plug portion (23) and wherein the infusion chamber entrance (35) forms a socket for engaging the plug portion (23). The outer part (21) of the lid (20) is mounted on the inner part (22) with the infusion chamber (30, 40) extending through the inner central orifice (22a) into the cavity (13) of the container. One or both of the outer part (21) and inner part (22) is moveable relative to each other between: a drinking configuration wherein a fluid path (70) extends from the cavity (13) of the container (10) through the inner central orifice (22a) and out of the drinking outlets (21b); and a sealed configuration wherein the outer part (21) and the inner part (22) contact to form an annular seal (50) in and/or around the inner orifice (22a) and sealing the fluid path (70).

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DRINKING VESSEL WITH INFUSION CHAMBER

Field of the Invention

The present invention relates to vessels such as drinking bottles, cups and the like. More particularly the present invention relates to such vessels which are suitable for brewing
5 particulate infusible material such as leaf tea contained in an infusion chamber.

Background of the Invention

Beverages such as tea and coffee are usually prepared in the home using ground coffee,
10 tea bags or loose-leaf tea. However, the long brewing time and mess after brewing are inconvenient.

Devices for automatically brewing beverages are known. In particular, automatic capsule-based brewing devices have been developed. Typically such devices require electricity to
15 operate and also a supply of water to flow through a capsule which also serves as the brewing chamber. Thus such devices are not portable and not suitable for brewing and consuming beverages on-the-go.

Therefore insulated containers have been developed that allow consumers to enjoy pre-
20 brewed beverages whilst travelling. For hot or iced beverages the container is typically insulated by means of double-walled construction.

Vessels have also been proposed that have specially adapted lids that allow for selective brewing of beverages such as tea and coffee, thus appealing to increasing consumer need
25 for brewing beverages to their own desired taste. For example, US 2011/0162532 A (Pacific Market International) discloses an integrated beverage infuser and lid that are adapted for use with an insulated drinking vessel for brewing a consumable product, such as tea, in an insulated travel mug, tumbler, or the like. The lid includes a main body adapted for movable receipt on a drinking vessel that forms a downwardly directed, open-ended cavity. A fluid-
30 permeable brewing basket defines an enclosable receptacle for removable receipt of the brewing consumable product. The basket is movable between a stowed position, substantially within the cavity above the liquid level of the hot water in the tumbler, and a deployed position, below and substantially outside of the cavity for submersion in the hot water contained in the drinking vessel. A lever arm forms a part of the transfer mechanism
35 and has a portion that penetrates the main body to the outside thereof so that the transfer

mechanism can be operated by an individual without removing the lid from the insulated drinking vessel, tumbler, or the like.

5 A drawback with vessels such as those disclosed in US 2011/0162532 A is the rather complex mechanism required for moving the infuser between positions wherein brewing is achieved and stopped. Furthermore, extra height on the container is needed to allow stowing of the basket in the lid. Further still, integration of the basket with the lid does not allow removal of the basket without removing the whole lid and also means that the basket needs cleaning between infusions rather than being replaceable with a clean disposable
10 infusion chamber for each infusion. The stowing mechanism also restricts the possibilities for design of the features employed to open/close the drinking outlet, especially where drinking from any side of the container is desired.

Thus the present inventors have recognised a need for providing mugs, bottles and the like
15 that employ lids that allow for more convenient brewing and/or drinking of beverages.

Summary of the Invention

In a first aspect, the present invention is directed to a drinking vessel comprising:

- a container extending from an open end to a base and comprising a cavity for
20 holding a liquid;
- a lid closing the open end of the container and comprising:
 - i. an inner part comprising an inner central orifice, and
 - ii. an outer part comprising a lip and an infusion chamber, wherein the
infusion chamber comprises an entrance and the lip surrounds the entrance, the
25 infusion chamber extending from the entrance away from the outer part and the lip
comprising one or more drinking outlets;

wherein the outer part of the lid comprises a body portion comprising the infusion chamber entrance and a plug portion and wherein the infusion chamber entrance forms a socket for engaging the plug portion;

30 wherein the outer part of the lid is mounted on the inner part with the infusion chamber extending through the inner central orifice into the cavity of the container; and wherein the outer part and inner part are moveable relative to each other between:

- a drinking configuration wherein a fluid path extends from the cavity of the container through the inner central orifice and out of the drinking outlets; and

- a sealed configuration wherein the outer part and the inner part contact to form an annular seal in and/or around the inner orifice and sealing the fluid path.

5 The positioning of the annular seal in or around the central orifice is especially advantageous where flow out of, and therefore drinking from, any side of the lid is desirable. Where drinking from any side is desired it is also advantageous that the lip comprises a plurality of drinking outlets arranged in an annular configuration, especially wherein the drinking outlets are arranged concentrically with the inner central orifice.

10 The seal may be achieved in any convenient manner but it is preferred that in the sealed configuration, the annular seal comprises a gasket, especially a gasket formed from silicone rubber or other resilient material.

15 Preferably in the sealed configuration the outer part and the inner part of the lid contact to form an annular seal in the inner orifice. More preferably a gasket is mounted on the outer surface of the infusion chamber and in the sealed configuration the gasket contacts a wall of the inner part of the lid facing the central orifice.

20 Where the annular seal is formed around the central orifice, a preferred arrangement is where the lip of the outer part comprises an annular projection from a lower surface thereof and wherein the inner part comprises a gasket concentric to the central orifice. In the sealed configuration the annular projection rests on the gasket and in the drinking configuration the annular projection is spaced away from the gasket.

25 Preferably the movement of the outer part, the inner part or both between the drinking and sealed configurations comprises rotation of the parts relative to each other about an axis passing through the central orifice. More preferably the rotation is on a screw thread whereby the outer part is lifted away from the inner part in the drinking configuration.

30 The outer part of the lid comprises a body portion comprising the infusion chamber entrance and a plug portion and wherein the infusion chamber entrance forms a socket for engaging the plug portion. Such an arrangement allows for access to the infusion chamber and/or cavity without having to remove the whole lid.

Preferably the infusion chamber comprises a vial engageable in or on the plug portion. By employing the vial attachable to the plug section of the lid, the vial can be easily inserted into the container by attaching the plug section and can be retracted by removing the plug section from the socket. This allows for single use (e.g. disposable and/or recyclable) vials and also means that the vial can be changed and the container refilled with liquid without removing the whole of the lid.

In a preferred embodiment the vial comprises a tubular body having at least one solid section and at least one filter section, and the infusion chamber additionally comprises a sheath extending from the socket into the cavity of the container and receiving the tubular body of the vial therein. The sheath comprises at least one aperture. The plug portion is rotatable in the socket to move between:

- a closed position wherein the solid section of the vial covers the aperture in the sheath; and
- an open position wherein the filter section of the vial is aligned with the aperture in the sheath.

The ability to move the plug section between the open and closed positions allows for the user to use the movement to stop brewing when a desired infusion strength has been achieved. To allow for more complete cessation of infusion in the closed position it is preferred that each aperture of the sheath comprises a rim and wherein a gasket at least partially surrounds the rim. The gasket can then assist in sealing the rim of the sheath to the vial body to prevent any flow of liquid from the cavity to the filter section when in the closed position.

Preferably the vessel is suitable for containing hot liquids, especially hot or even freshly boiled water. More preferably the container is an insulating container. Most preferably the container is a double-walled container.

The vessel is especially suitable for brewing of infusible material, especially particulate infusible material wherein insoluble material of the particles can be retained within the vial whilst soluble material is extracted by water or other infusion liquid moving through the filter section of the vial. Thus preferably the vial contains particulate infusible material. Most preferably the vial contains tea.

The term 'brewing' refers to the addition of a liquid, particularly hot water, to an infusible material thereby to form a beverage. Brewing may be carried out at any temperature, but preferably in the range of 80 to 95 degrees centigrade.

- 5 The term "particulate infusible material" refers to tea plant material, herb plant material, fruit pieces and / or flower material (e.g. petals), which when steeped or soaked in an aqueous liquid release certain soluble substances into the liquid, e.g. flavour and/or aroma molecules. The term 'tea' refers to leaf and / or stem material from *Camellia sinensis* var. *sinensis* or *Camellia sinensis* var. *assamica*. It also includes rooibos obtained from
- 10 *Aspalathus linearis*. 'Tea' is also intended to include the product of blending two or more of any of these teas. The tea material may be substantially fermented i.e. black tea, semi-fermented i.e. oolong tea, or substantially unfermented i.e. green tea. The term "herb plant material" refers to material which is commonly used as a precursor for herbal infusions. Preferably the herb plant material is selected from chamomile, cinnamon, elderflower,
- 15 ginger, hibiscus, jasmine, lavender, lemongrass, mint, rosehip, vanilla and verbena. The tea material may additionally comprise fruit pieces (e.g. apple, blackcurrant, mango, peach, pineapple, raspberry, strawberry etc). The tea material can be flavoured and/or spiced, e.g. with bergamot, citrus peel and the like. The particulate infusible material is preferably material other than coffee material. Preferably the particulate infusible material is dried and
- 20 has a moisture content of less than 30 wt percent, more preferably less than 20 wt percent and most preferably from 0.1 to 10 wt percent.

Preferably the particles of infusible material have a size of from 2 to 10 mm, more preferably 3 to 7 mm. In particular it is preferred that at least 75%, more preferably at least 90% by

25 weight of the particles have a size of from 2 to 10 mm, even more preferably 3 to 7 mm. The term "particle size" refers to the longest length of a particle measurable in any dimension.

In a second aspect the present invention provides a method of brewing a beverage with

30 the vessel according to any embodiment of the first aspect, the method comprising the steps of:

- (i) dosing liquid into the cavity of the container;
 - (ii) closing the open end of the container with the lid;
 - (iii) with the outer and inner parts of the lid arranged in the sealed configuration,
- 35 allowing the liquid to contact the particulate infusible material for a brewing time; and

(iv) after the brewing time, moving the outer and inner parts into the drinking configuration.

As used herein the term "beverage" refers to a substantially aqueous drinkable composition suitable for human consumption. Preferably the beverage comprises at least 85 percent water by weight of the beverage, more preferably at least 90 percent and most preferably from 95 to 99.9 percent. The beverage preferably comprises at least 0.01 percent by weight tea solids. More preferably the beverage comprises from 0.04 to 3 percent, even more preferably from 0.06 to 2 percent, most preferably from 0.1 to 1 percent by weight tea solids.

Detailed Description

The present invention will now be described with reference to the figures, wherein:

Figure 1 shows a schematic sectional view of part of a vessel according to an embodiment of the invention.

Figure 2 shows a schematic sectional view of a plug section and vial for use in the vessel of Figure 1.

Figure 3 shows a schematic sectional view of the complete vessel assembled from the features shown in Figures 1 and 2 and with the vial and sheath aligned in the open position.

Figure 4 shows a schematic sectional view of the vessel of Figure 3 after rotating the plug section to the closed position.

Figure 5 shows a schematic sectional view of the vessel of Figure 4 after rotating the outer lid into the drinking configuration.

Figure 6 shows a schematic sectional view of a vessel according to a second embodiment of the invention in the closed position.

Figure 7 shows a schematic sectional view of the vessel of Figure 6 after rotating the outer lid into the drinking configuration.

Figure 8a shows a perspective view of an embodiment of a vial for use in a vessel of the invention.

Figure 8b shows a sectional view of the vial of Figure 8a taken through a plane containing line A-A.

Figure 9a shows a perspective view of an assembled vessel according to another embodiment of the invention.

Figure 9b shows an exploded view of the vessel of Figure 9a.

Figure 10a shows a side projection of a vial for use in the vessel of Figure 9.

Figure 10b shows a sectional view of the vial of Figure 10a taken through a plane containing line A-A.

Figure 11 shows the plug section of the lid of the vessel of Figure 9 and the top end of the vial of Figure 10 oriented to be engaged in the plug section.

5 Figure 12 shows the plug section and vial of Figure 11 after engagement with each other. Figure 13 shows the plug and vial assembly of Figure 12 being inserted into the socket of the body part of the lid of the vessel of Figure 9.

Figure 14 shows a perspective view into the socket of the body part of the lid of the vessel of Figure 9.

10

Figures 1 and 2 show a parts of a vessel (1) comprising a cylindrical container (10) closed by a lid (20). The container (10) extends from a base (12) to an open end (11) and may be formed from plastic, metal, glass, ceramic or other material commonly used for bottles, mugs and the like. Preferably the container (10) is formed from transparent plastic material
15 as this allows for the liquid level in the cavity (13) of the container (10) to be easily assessed by a user even without removing the lid (20).

The lid (20) of the vessel (1) shown in Figures 1 and 2 comprises an inner part (22) and an outer part (21). The inner part (22) forms a liquid-tight closure around the rim of the open
20 end (11) of the container (10) through a screw-fit or other attachment mechanism. The inner part (22) of the lid does not close the open end (11) of the container (10) entirely owing to an inner central orifice (22a) therethrough. An annular gasket (50) formed from silicone rubber or another resilient material surrounds the inner central orifice (22a) in a recess on the upper surface of the inner part (22) of the lid.

25

The outer part (21) of the lid (20) comprises a plug section (23) that can be separated from the remaining body portion. The body portion comprises an annular lip (21a) surrounding a central socket (35). The socket (35) forms the entrance to a sheath (30) of an infusion chamber. The sheath (30) comprises a hollow body (31) extending downwards from the
30 socket (35). The hollow body (31) of the sheath (30) has a rectangular aperture (32) extending along part of its length on one side.

The main body of the outer part (21) of the lid is shown in Figure 1 mounted onto the inner part (22) by means of a screw fit or other secure mechanism with the socket (35) aligned
35 with the central orifice (22a) and the hollow body (31) of the sheath (30) extending from the

socket (35), through the central orifice (22a) of the inner lid (22) and into the cavity (13) of the container (10). Preferably the hollow body (31) extends into the cavity for only a portion of the height of the container (10), wherein height of the container means the distance between the base (12) and the open end (11). If the sheath were to extend too far into the container it would require large vials that would be difficult to remove. More preferably the hollow body extends for less than 80% of the height of the container, most preferably less than 70%. The hollow body (31) does need to extend some way into the cavity (13), however to ensure that the vial (when installed) can contact the liquid in the cavity (13). Therefore it is preferred that the hollow body extends for at least 25% of the height of the container, more preferably at least 40%.

The annular lip (21a) of the main body portion of the outer part (21) of the lid comprises a series of drinking outlets (21b) therethrough in an annular configuration spaced away from the socket (35). Slightly inward of the drinking outlets (21b) a solid annular projection (21c) extends down from the underside of the lip (21a) and is aligned over the annular gasket (50) of the inner part (22) of the lid.

Shown in Figure 2 is a vial (40) attached to the plug section (23) of the outer part (21) of the lid. The plug section (23) has a grippable portion on its top end and an open portion for engaging the vial (40) on its bottom end. The vial (40) is engaged in the plug section (23) via a push-fit mechanism which will be described in more detail below.

The vial (40) comprises a tubular vial body (41) extending in a longitudinal direction from a top end (45) to a bottom end (48). The tubular body (41) comprising a rectangular filter section (43) in one side thereof. The filter section (43) may be formed from woven or non-woven fabric, wire mesh or the like but is preferably formed from a woven mesh of plastic material, more preferably the same plastic material from which the remainder of the tubular body (41) is formed. Most preferably the whole tubular body (41) is formed from biodegradable and/or compostable plastic material such as poly-lactic acid. The remainder of the tubular body (41) is a solid section (42) impermeable to water. The bottom end (48) of the vial is similarly solid and so impermeable to water. The top end (45) comprises an orifice but the orifice is sealed by a membrane (47) such as a film of heat-sealed plastic, a plastic-foil laminate film or similar. Within the tubular vial body (41) a dose of particulate infusible material (not shown) is enclosed.

In use an infusion liquid (such as freshly boiled water) is poured into the cavity (13) of the container (10) either through the open socket (35) or directly through the central orifice (22a) if the outer part (21) of the lid is completely removed. The infusion liquid is preferably filled to a level of at least 50% of the height of the container (10), most preferably to height of between 60 and 95%.

With the vial (40) attached as shown in Figure 2, the plug section (23) is then pushed into the socket (35) and sealed therein via a push-fit mechanism that will be described below. To brew the beverage, the vial (40) is aligned such that the filter section (43) of the vial body is aligned with the aperture (32) in the hollow body (31) of the sheath (30). In this “open position” (see Figure 3), infusion liquid can flow into the vial (40) via the filter section (43) and thus contact and extract soluble material from the vial to form brewed beverage which is then carried out through the filter section (43) into the cavity (13).

The user can allow the brewing to continue until the desired brew strength is reached and then stop the brewing process by rotating the plug section (23) of the lid in the socket (35) such that the aperture (32) in the hollow body (31) of the sheath is covered by the solid section (42) of the tubular vial body (41). In this “closed position”, the infusion liquid has no path to enter the vial as the solid section (42) of the vial blocks access to the infusible material within the tubular vial body (41). To aid sealing in the closed position the aperture (32) of the sheath is surrounded by a rim and preferably the rim is covered by a gasket (not shown) of silicone rubber or other resilient material which can deform to form a seal with the solid section (42) of the tubular vial body (41).

As best seen in Figure 8b, in the part of the tubular vial body (41) wherein both the filter section (43) and solid section (42) extend in parallel (the “overlap region”), the solid section (42) extends around the circumference of the tubular body for a much greater distance than does the filter section (43). This further ensures that in the closed position the aperture (32) is effectively covered by the solid section (43) even if not completely correctly aligned.

30

In the configuration (“sealed configuration”) shown in Figure 4, brewed beverage is completely sealed in the cavity as the annular protrusion (21c) of the outer part (21) of the lid bears down on the annular gasket (50) of the inner part (22) of the lid such that the beverage cannot pass the gasket (50) even if the vessel (1) is inverted.

35

The outer part (21) of the lid is rotatably mounted on the inner part (22) such that by rotating the outer part (21) it moves upward on a screw thread (not shown) and the annular protrusion (21c) is lifted out of contact with the annular gasket (50) as shown in Figure 5. In this “drinking configuration” there are clear flow paths (70) for brewed beverage to flow from the cavity (13), through the central orifice (22a) of the inner part (22) of the lid, past the annular gasket (50) and out through the drinking outlets (21b) when the vessel (1) is inverted. Furthermore, as the flow paths are present around the annular gasket (50) and the drinking outlets (21b) are arranged in an annular configuration around the lip (21b), the user can drink from any side of the lip (21b) and so does not need to worry about the rotational orientation of the vessel when drinking therefrom.

In the embodiment shown in Figures 4 and 5 actuation of the infusion chamber (sheath (30) and vial (40)) between the open and closed positions and of the inner (22) and outer (23) parts of the lid between the drinking and sealed configurations are both effected by rotation about a common axis (60) passing centrally through the socket (35) and inner central orifice (22a). In the case of the opening and closing actuation, the rotation is of the plug section (23) within the socket (35) whilst in the case of the sealing and drinking actuation the rotation is of the outer part (21) of the lid on the inner part (22).

The vial (40) may be removed from the vessel (1) directly after brewing or when the brewed beverage has been drunk. The user simply pulls the plug section (23) of the lid from the socket (35) and in the same motion withdraws the vial (40) from the sheath (30). The vial (40) can then be pulled out of engagement with the plug portion (23). The membrane (47) can then be removed from the vial and spent infusible material tipped into a waste stream (such as a compost stream). The vial can then be recycled or disposed of in a waste stream (such as a plastic waste stream or the compost waste stream).

Another embodiment of a vessel (101) is shown in Figures 6 and 7. Features of this embodiment which correspond to those of the embodiment shown in Figures 1 to 5 are given the same reference numeral except with the addition of 100, such that for example, the plug section of the lid is now labelled as “123” instead of “23” etc. The embodiment shown in Figures 6 and 7 differs from that shown in Figures 1 to 5 in the way in which the inner (122) and outer (121) parts of the lid are sealed in the sealed configuration.

As seen in Figure 6, the annular gasket (150) in this embodiment is mounted on the outer surface of the part of the sheath (150) that locates within the central orifice (122a) of the inner part (122) of the lid in the sealed configuration. The annular gasket (150) is thus deformed against the wall of the inner part (122) that faces the central orifice (122a) such that no liquid can flow from the cavity (113) out of the central orifice (122a) even if the vessel (101) is inverted.

The outer part (121) of the lid is rotatably mounted on the inner part (122) such that by rotating the outer part (121) it moves upward on a screw thread (not shown) and the annular gasket (150) is lifted out of the central orifice (122a) as shown in Figure 7 into the drinking configuration. In this drinking configuration there are clear flow paths (170) for brewed beverage to flow from the cavity (113), through the central orifice (122a) of the inner part (122) of the lid, past the annular gasket (150) and out through the drinking outlets (121b) when the vessel (101) is inverted.

A further embodiment of a vessel is shown in Figures 9 to 14. Again features of this embodiment which correspond to those of the embodiment shown in Figures 1 to 5 are given the same reference numeral except this time with the addition of 200, such that for example, the plug section of the lid is now labelled as "223" instead of "23" etc.

The vessel (201) shown in Figures 9 to 14 operates in substantially the same manner as that shown in Figures 6 and 7. In the embodiment shown in Figures 9 to 14, however, the sheath (230) comprises two apertures (232) and the vial (240) correspondingly has two filter sections (243) on apposing sides of the vial body (241). This allows for greater surface area of filter section (243) to be exposed to infusion liquid during brewing. As can be seen in Figure 10b, however, the solid sections (242) of the vial body still extend around the circumference of the tubular body (241) for a greater distance than the filter sections (243) in the overlap region.

A further difference between the embodiment shown in Figures 9 to 14 and that shown in earlier embodiments is the presence of a second wall (210a) that provides the container (210) with an insulated doubled-walled construction.

The push-fit mechanism of the vial (240) and plug section (223) is shown in detail in Figures 10 to 12.

Located towards the top end (245) of the vial (240) is an annular collar (245a) that projects from the outer wall of the tubular vial body (241). Two rectangular lugs (245b) are also located towards the top end (245) of the vial (240) on opposing sides of the tubular body (241).

As best seen in Figure 11, opposite the grippable portion (223a) of the plug section (223) is a hollow portion that comprises an annular flange (223c) projecting inwards from the bottom rim thereof and a pair of rectangular recesses (223b) extending upwards from the bottom rim and into the hollow portion of the plug section (223).

The top end (245) of the vial (240) is attached to the plug section (223) by locating the top of each rectangular lug (245b) in the bottom of one of the rectangular recesses (223b) and then forcing the vial up into the hollow section of the plug section (223) until the collar (245a) is forced over the flange (223c). The vial is then held in place by the friction of the base of the collar (245a) on the flange (223c) and the location of the lugs (245b) in the rectangular recesses (223b) ensure that when the plug section (223) is inserted into the socket (235), the vial (240) is oriented in the open position in the sheath (230). As the vial completely encloses the particulate infusible material it can be seen that the push-fit mechanism need not comprise any seals or the like.

The push-fit mechanism of the socket (235) and plug section (223) is shown in detail in Figures 12 to 14.

As best seen in Figure 14, located inside the socket (235) are two pips (221e) which protrude from opposite sides of the inside wall surface of the sheath (230).

As best seen in Figure 12, the plug (223) and vial (240) assembly comprises a pair of guiding channels (223f) on opposite sides of the hollow part of the plug section (223) and which each narrow and curve slightly from the bottom of the plug section (223) to a recess (223d) located part way up the outer surface of the hollow part of the plug section (223). An additional section (223e) of each guiding channel extends away from the respective recess (223d) part way around the circumference of the plug section (223).

The plug section (223) is engaged in the socket (235) by first feeding the vial (240) into the socket (235) as shown in Figure 13. The vial (240) is pushed into the sheath (230) until each pip (221e) begins to enter a guiding channel (223f). On pushing the vial (240) further into the sheath (230) the pips (221e) are guided by the channels (223f) to the recesses
5 (223d) until each pip (221e) is forced into its respective recess (223d). The location of the pips (221e) in the recesses (223d) ensures that when the plug section (223) is located in the socket (235), the vial (240) is oriented in the open position in the sheath (230).

When brewing is complete and the plug section (223) is rotated in a clockwise direction,
10 the pips (221e) move out of the recesses (223d) and along the additional sections (223e) of the guiding channels to hold the plug section (223) in the socket (235) until the pips (221e) abut the end of the channels (223e) to stop the vial (240) in the closed position.

Although the invention has been described with reference to specific embodiments, various
15 modifications of the described modes for carrying out the invention which are apparent to those skilled in the relevant fields are intended to be within the scope of the following claims.

For the avoidance of doubt, the word “comprising” is intended to mean “including” but not necessarily “consisting of” or “composed of”. In other words, the listed steps or options
20 need not be exhaustive.

All numbers in this description indicating amounts of material, time periods, length scales, conditions of reaction, physical properties of materials and/or use may optionally be understood as modified by the word “about”.
25

It should be noted that in specifying any range of values, any particular upper value can be associated with any particular lower value.

The disclosure of the invention as found herein is to be considered to cover all
30 embodiments as found in the claims as being multiply dependent upon each other irrespective of the fact that claims may be found without multiple dependency or redundancy.

Where a feature is disclosed with respect to a particular aspect of the invention (for example a vessel of the invention), such disclosure is also to be considered to apply to any other aspect of the invention (for example a method of the invention) *mutatis mutandis*.

Claims

1. A drinking vessel comprising:

- a container extending from an open end to a base and comprising a cavity for holding a liquid;
- a lid closing the open end of the container and comprising:
 - i. an inner part comprising an inner central orifice, and
 - ii. an outer part comprising a lip and an infusion chamber, wherein the infusion chamber comprises an entrance and the lip surrounds the entrance, the infusion chamber extending from the entrance away from the outer part and the lip comprising one or more drinking outlets;

wherein the outer part of the lid is mounted on the inner part with the infusion chamber extending through the inner central orifice into the cavity of the container;

wherein the outer part of the lid comprises a body portion comprising the infusion chamber entrance and a plug portion and wherein the infusion chamber entrance forms a socket for engaging the plug portion; and

wherein the outer part and inner part are moveable relative to each other between:

- a drinking configuration wherein a fluid path extends from the cavity of the container through the inner central orifice and out of the drinking outlets; and
- a sealed configuration wherein the outer part and the inner part contact to form an annular seal in and/or around the inner orifice and sealing the fluid path.

2. The drinking vessel as claimed in claim 1 wherein the lip comprises plurality of drinking outlets arranged in an annular configuration.

3. The drinking vessel as claimed in claim 2 wherein the drinking outlets are concentric with the inner central orifice.

4. The drinking vessel as claimed in any one of the preceding claims wherein in the sealed configuration the outer part and the inner part of the lid contact to form an annular seal in the inner orifice.

5. The drinking vessel as claimed in any one of the preceding claims wherein in the sealed configuration, the annular seal comprises a gasket.

6. The drinking vessel as claimed in claim 5 wherein the lip of the outer part comprises an annular projection from a lower surface thereof and wherein in the sealed configuration the annular projection rests on the gasket and in the drinking configuration the annular projection is spaced away from the gasket.
7. The drinking vessel as claimed in any one of the preceding claims wherein the movement of the outer part, the inner part or both between the drinking and sealed configurations comprises rotation of the parts relative to each other about an axis passing through the central orifice.
8. The drinking vessel as claimed in any one of the preceding claims wherein the infusion chamber comprises a vial engageable in or on the plug portion.
9. The drinking vessel as claimed in claim 8 wherein:
 - the vial comprises a tubular body having at least one solid section and at least one filter section, and
 - the infusion chamber comprises a sheath extending from the socket into the cavity of the container and receiving the tubular body of the vial therein and the sheath comprising at least one aperture;wherein the plug portion is rotatable in the socket to move between:
 - a closed position wherein the solid section of the vial covers the aperture in the sheath; and
 - an open position wherein the filter section of the vial is aligned with the aperture in the sheath.
10. The drinking vessel as claimed in any one of the preceding claims wherein the infusion chamber contains particulate infusible material.
11. The drinking vessel as claimed in claim 10 wherein the infusion chamber contains tea.
12. A method of brewing a beverage with the drinking vessel as claimed in claim 11, comprising the steps of:
 - (i) dosing liquid into the cavity of the container;
 - (ii) closing the open end of the container with the lid;
 - (iii) with the outer and inner parts of the lid arranged in the sealed configuration, allowing the liquid to contact the particulate infusible material for a brewing time; and

- (iv) after the brewing time, moving the outer and inner parts into the drinking configuration.

Fig. 1

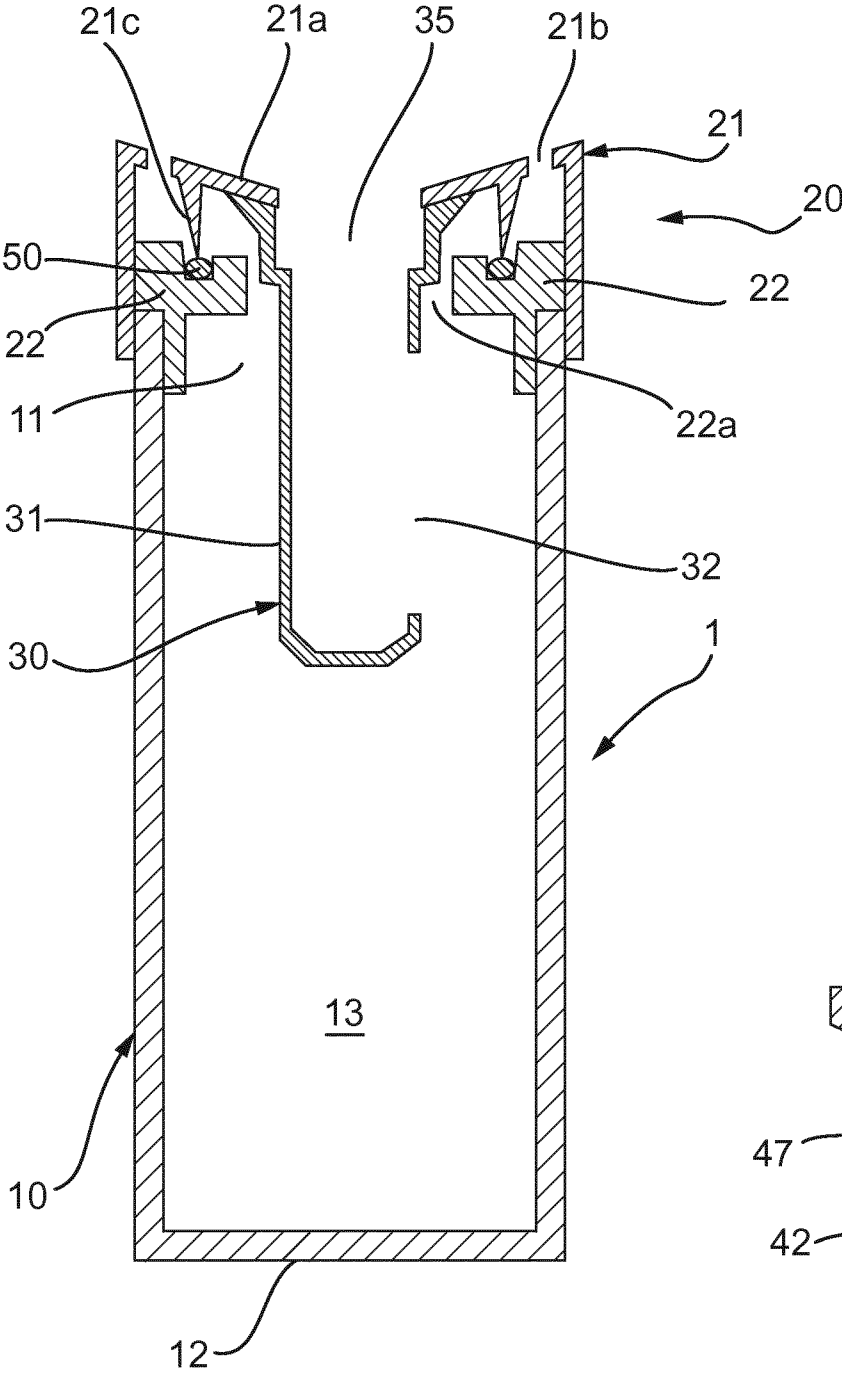


Fig. 2

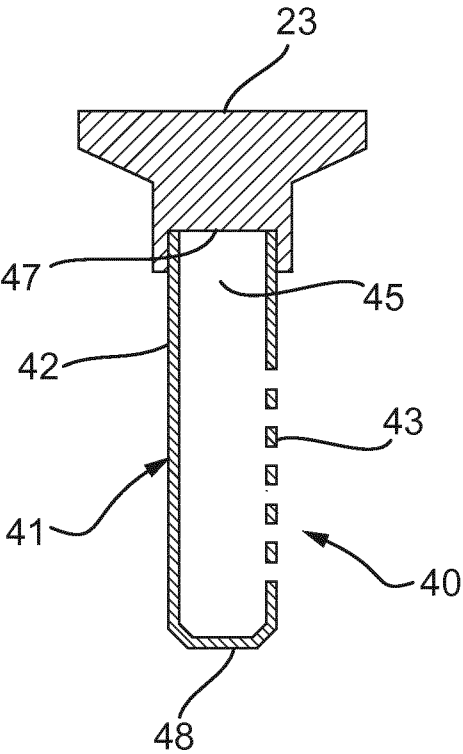


Fig. 3

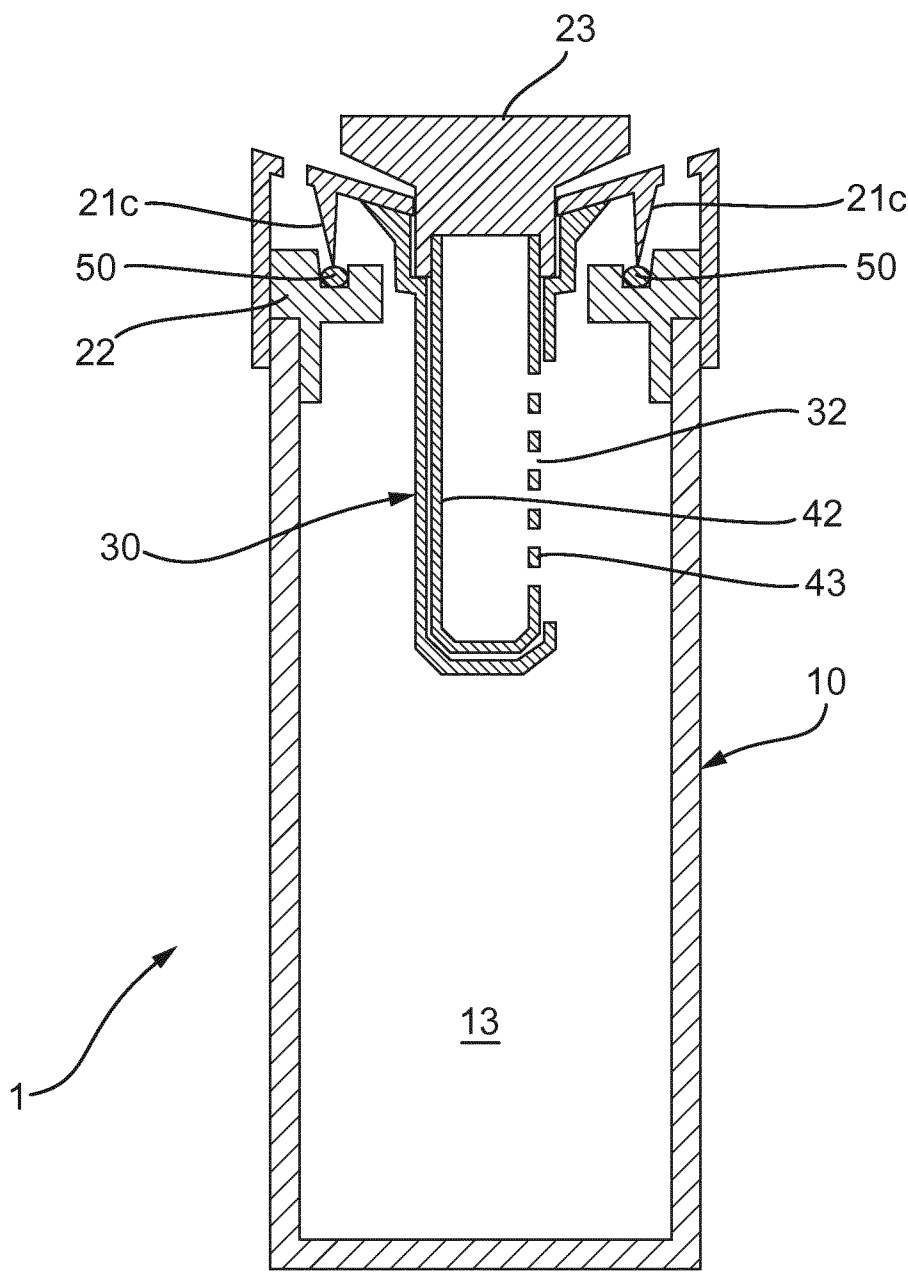


Fig. 4

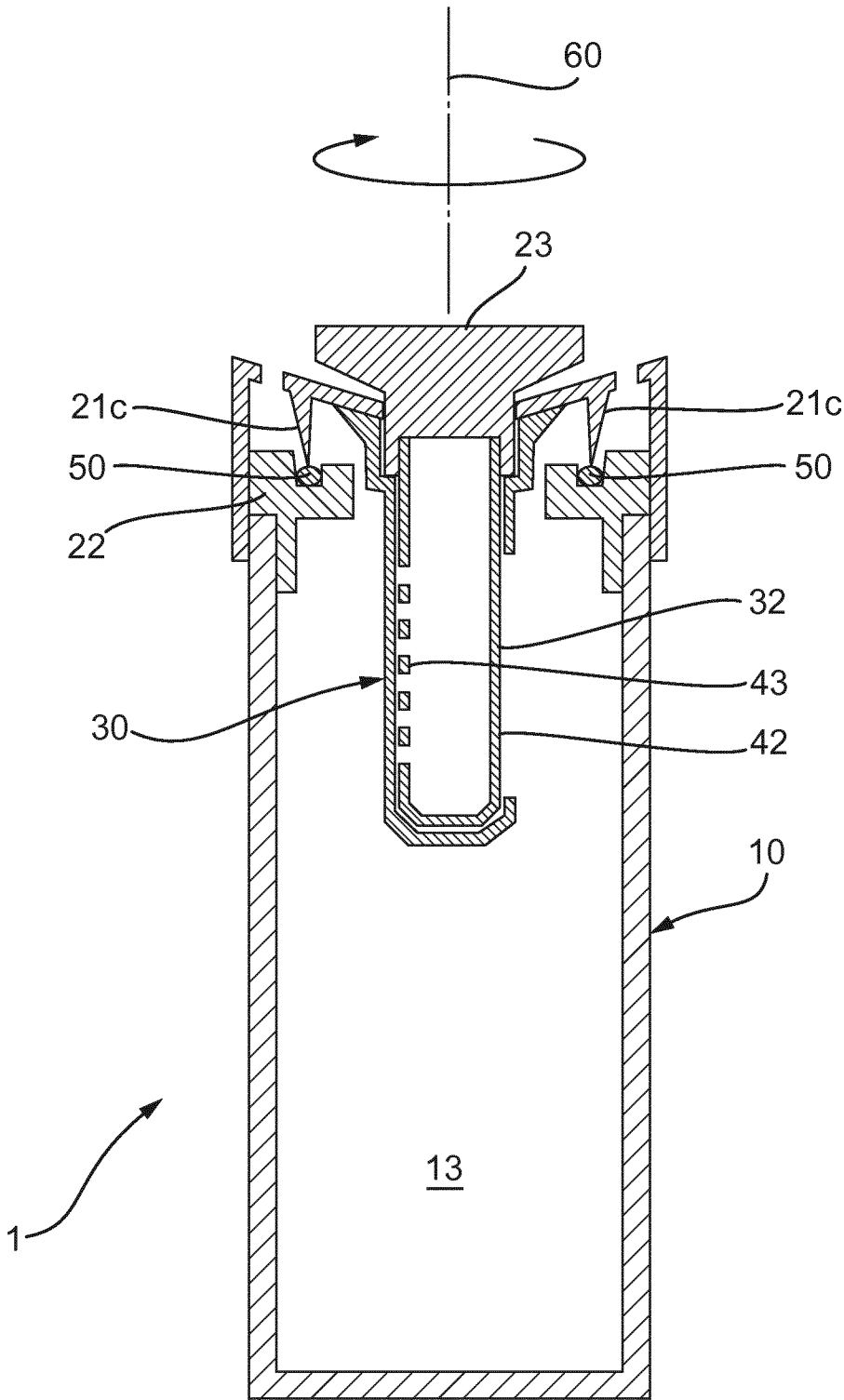


Fig. 5

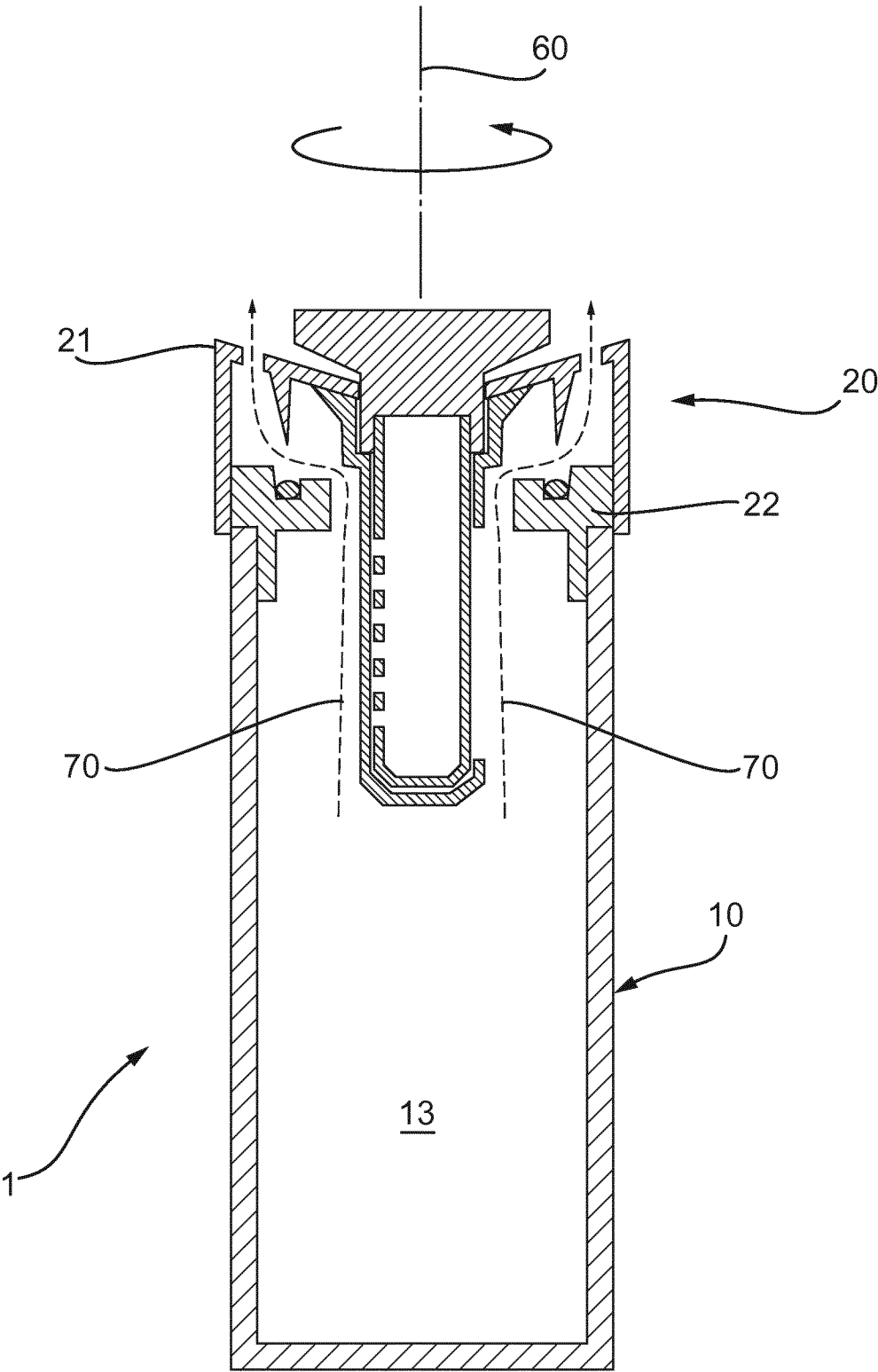


Fig. 6

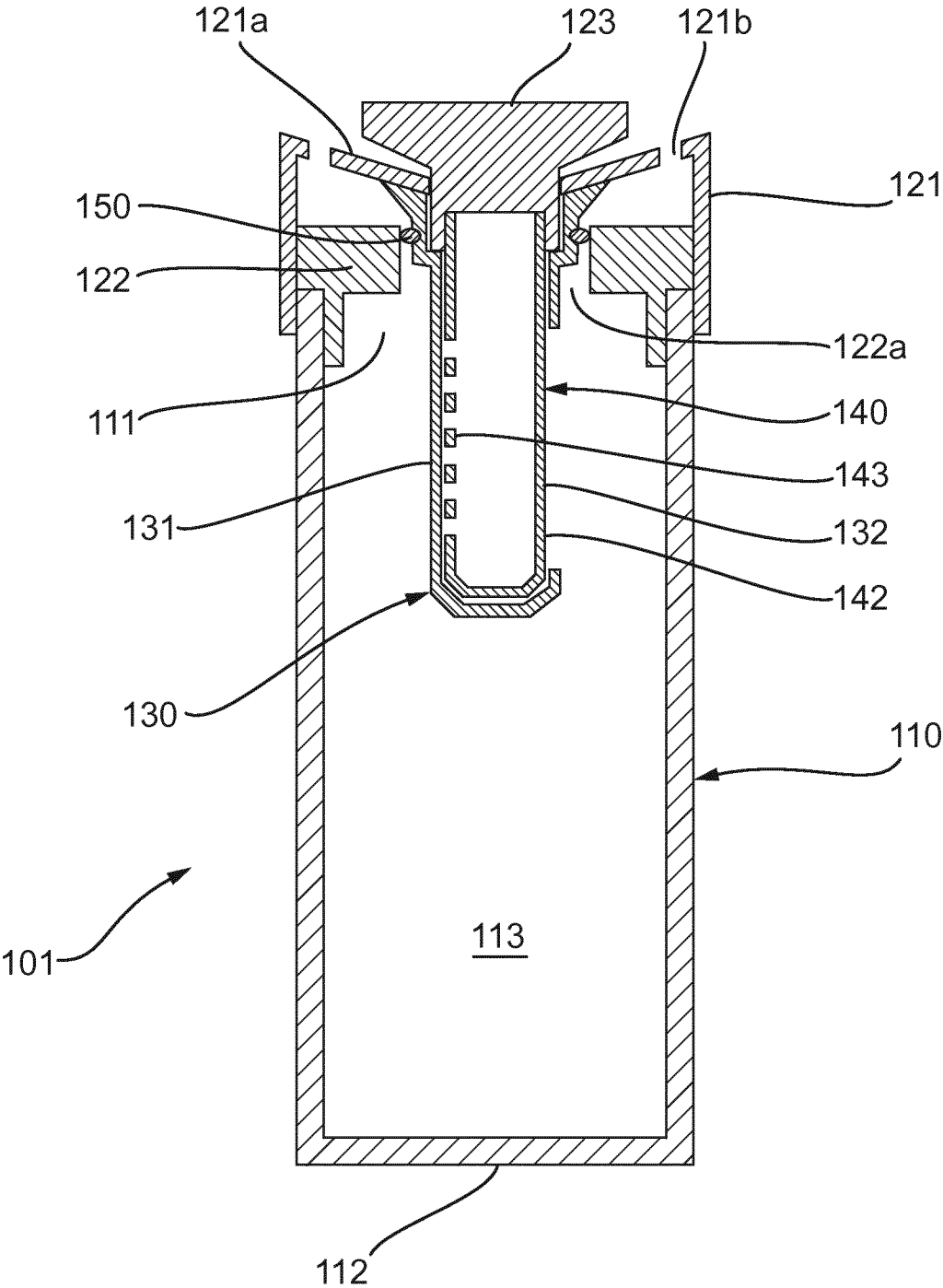


Fig. 7

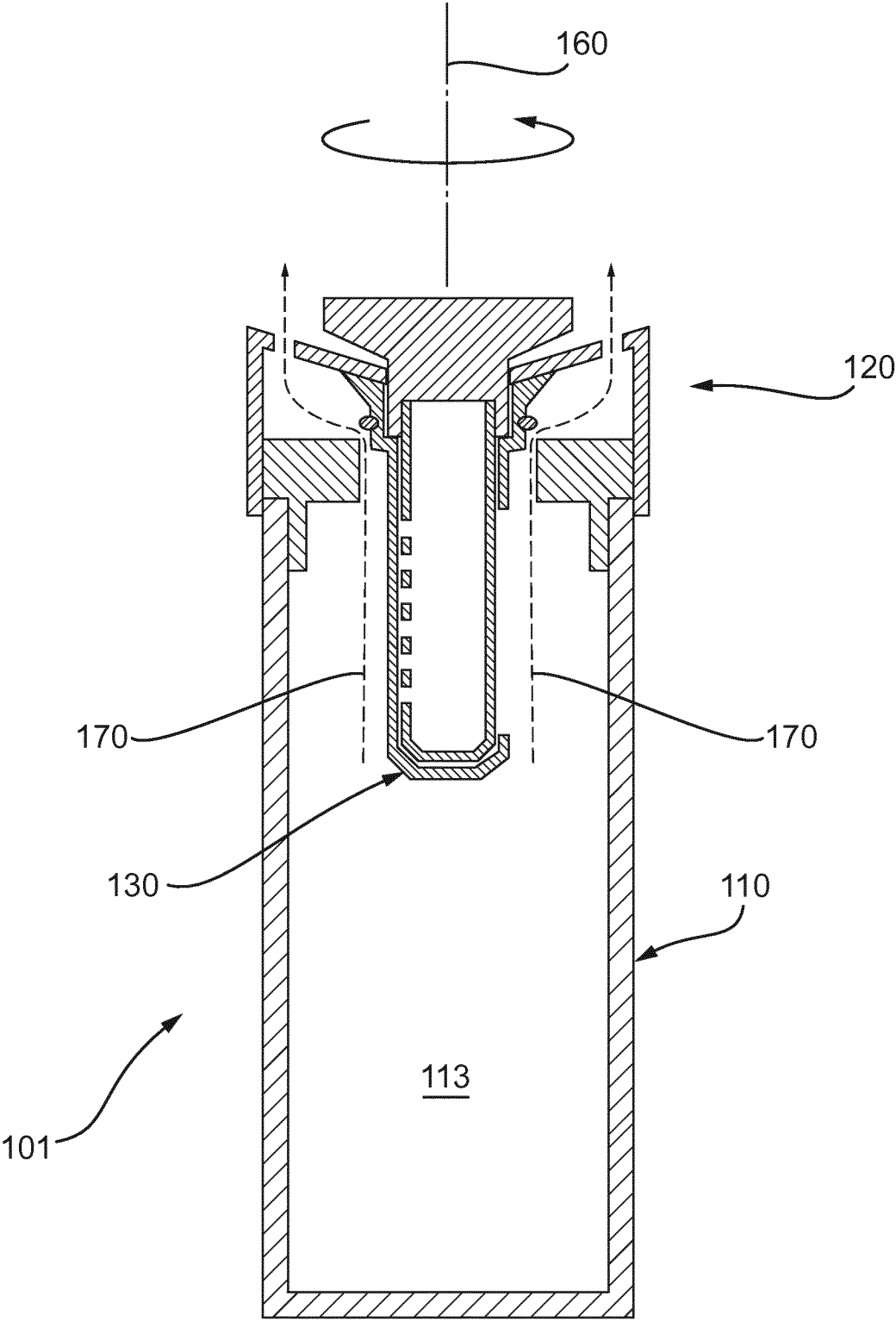


Fig. 8a

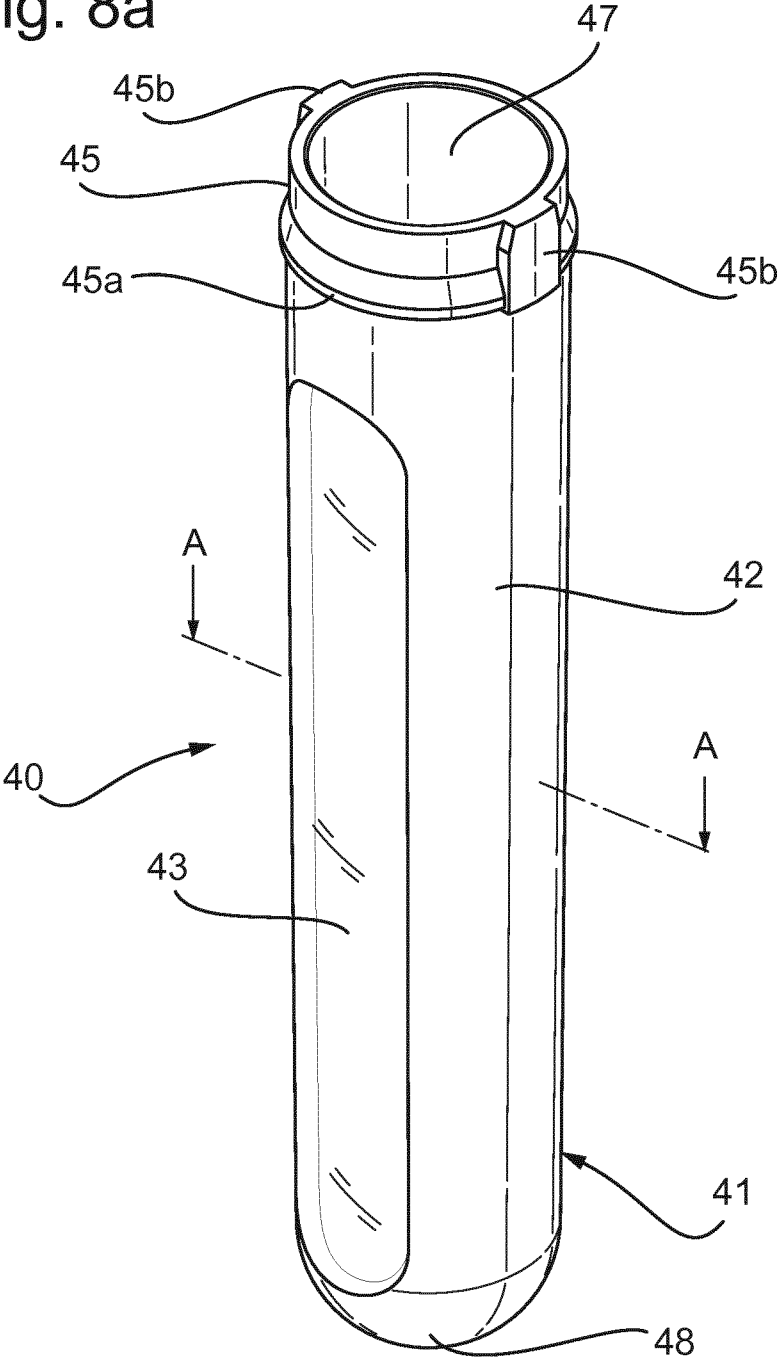
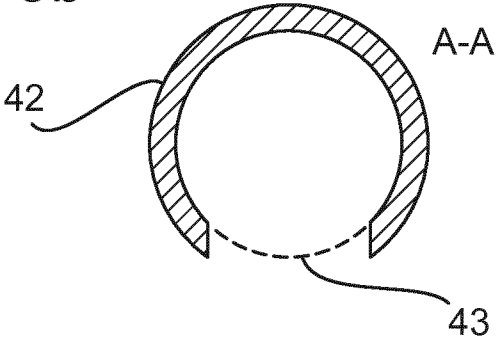


Fig. 8b



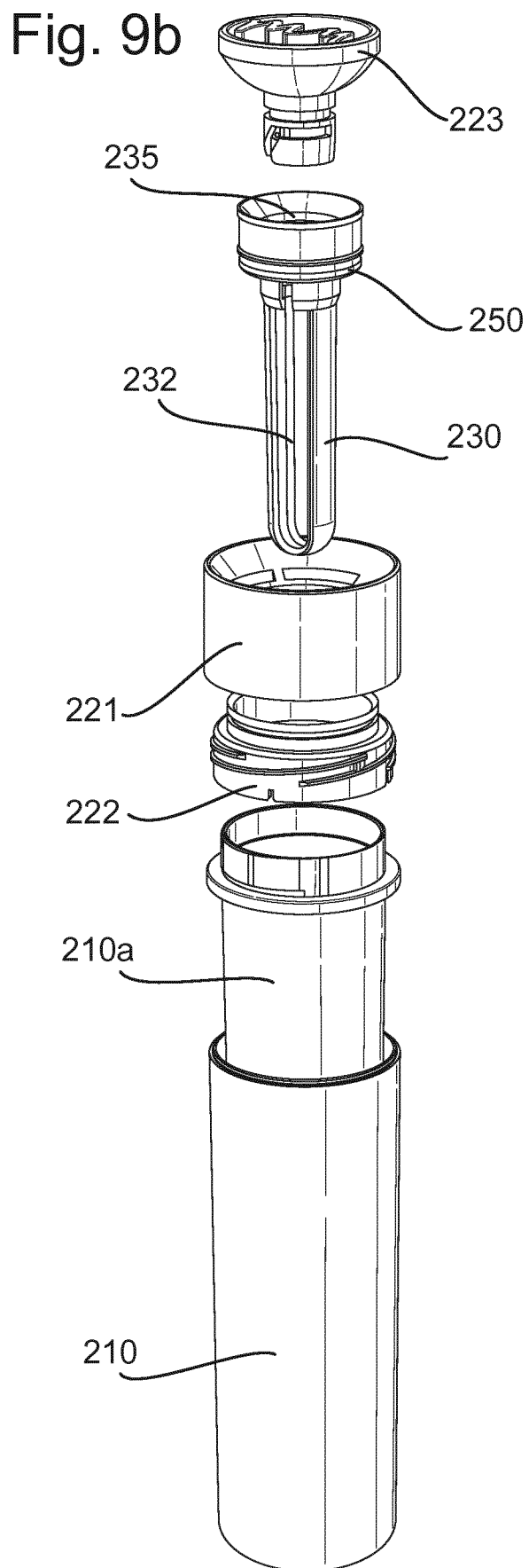
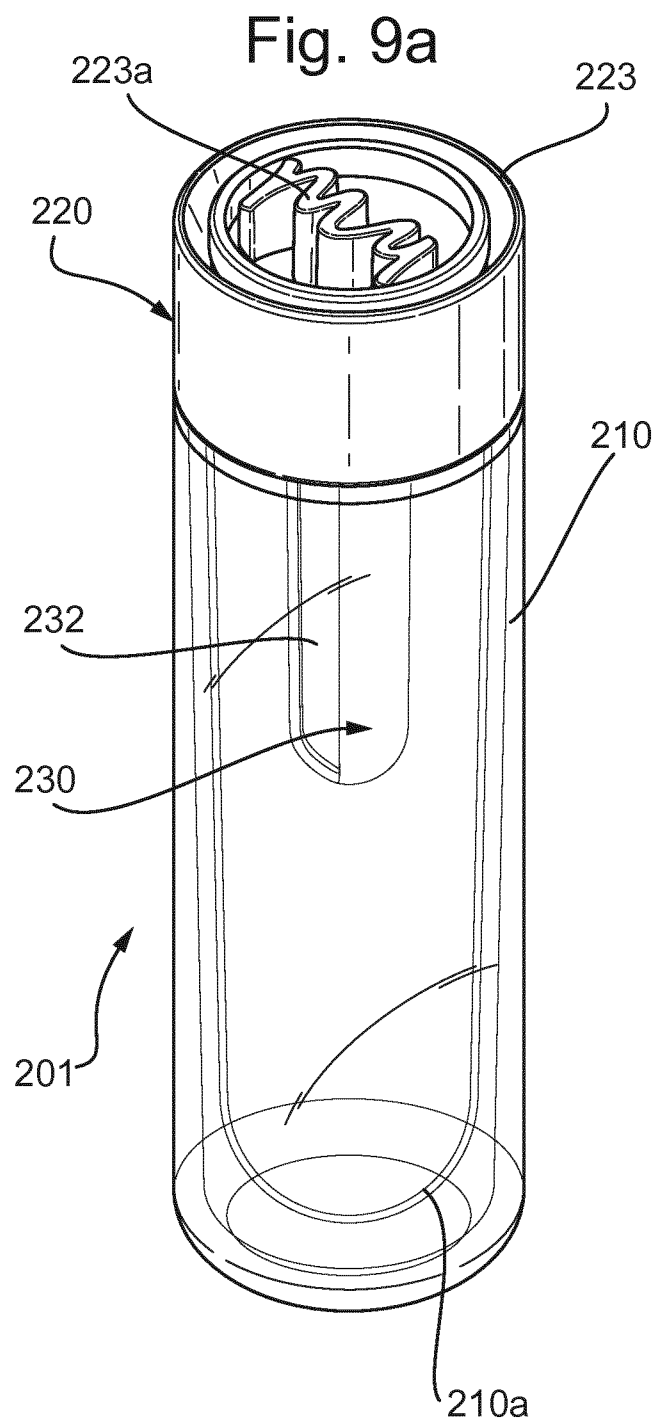


Fig. 10a

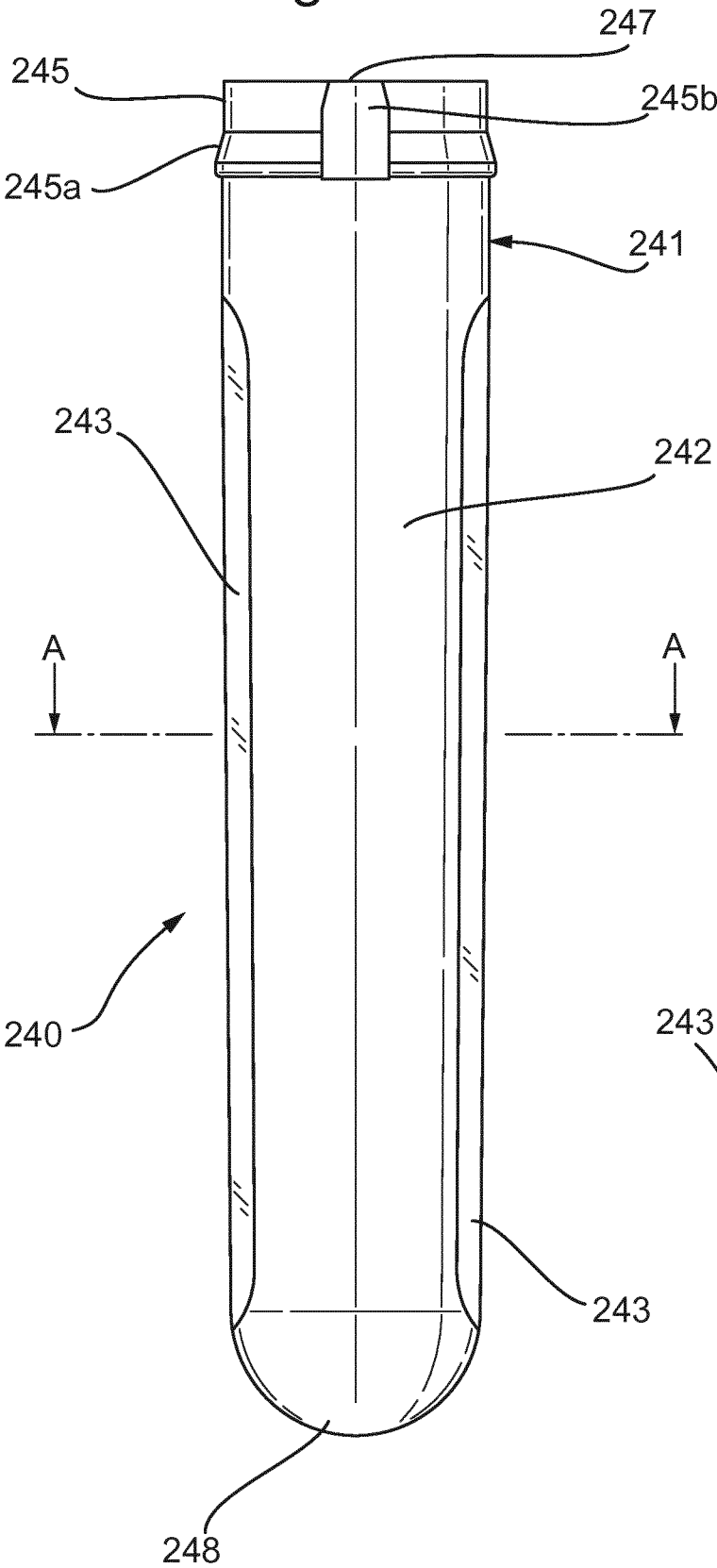


Fig. 10b

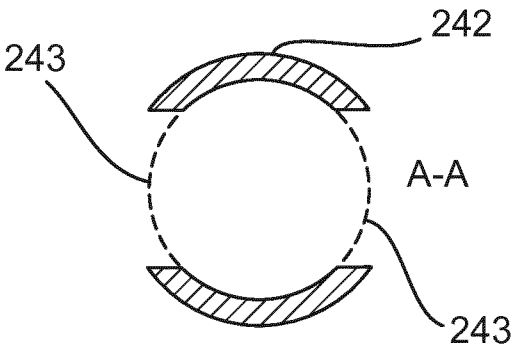


Fig. 11

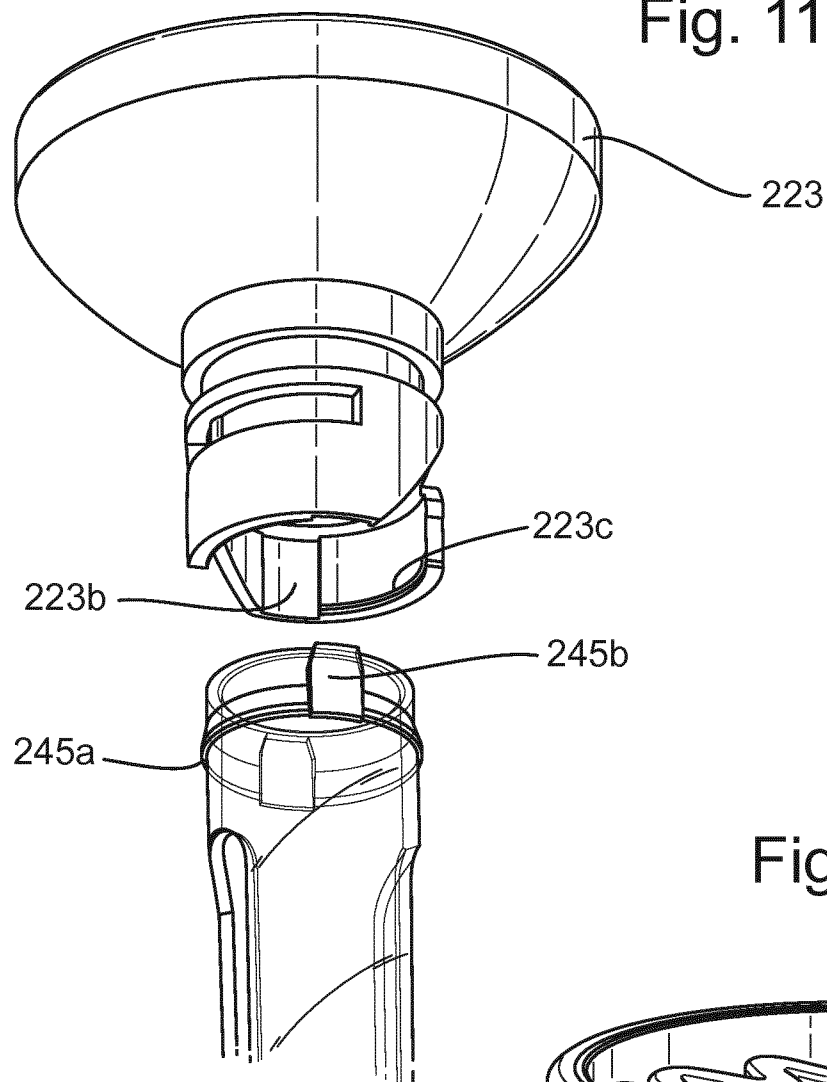


Fig. 12

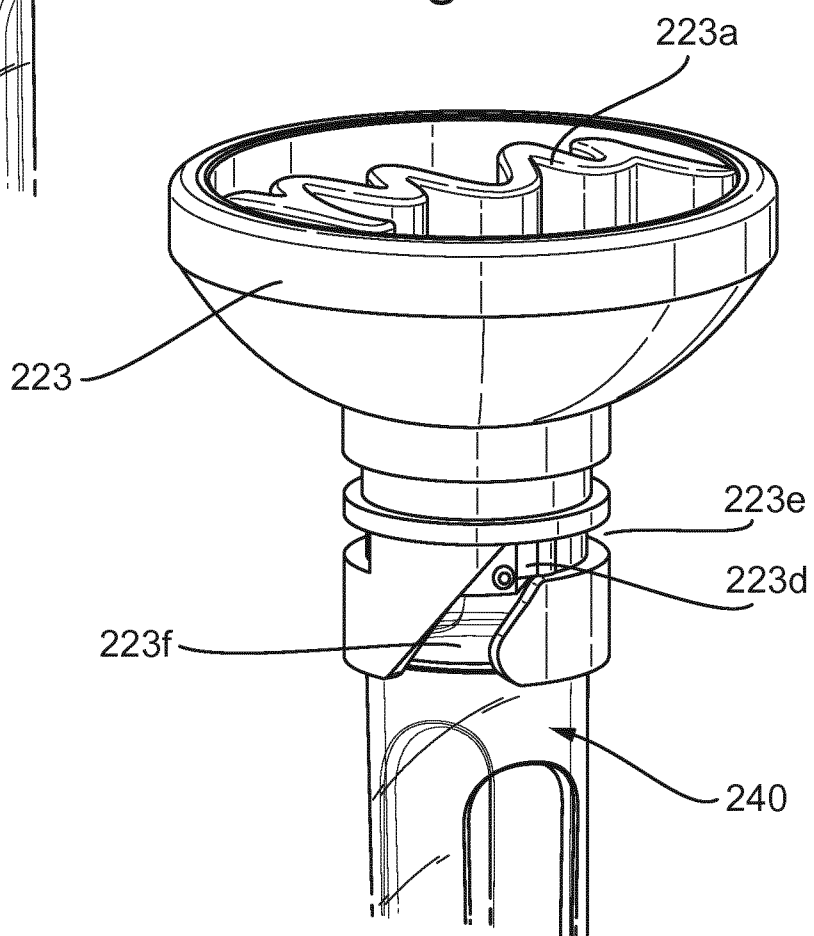


Fig. 13

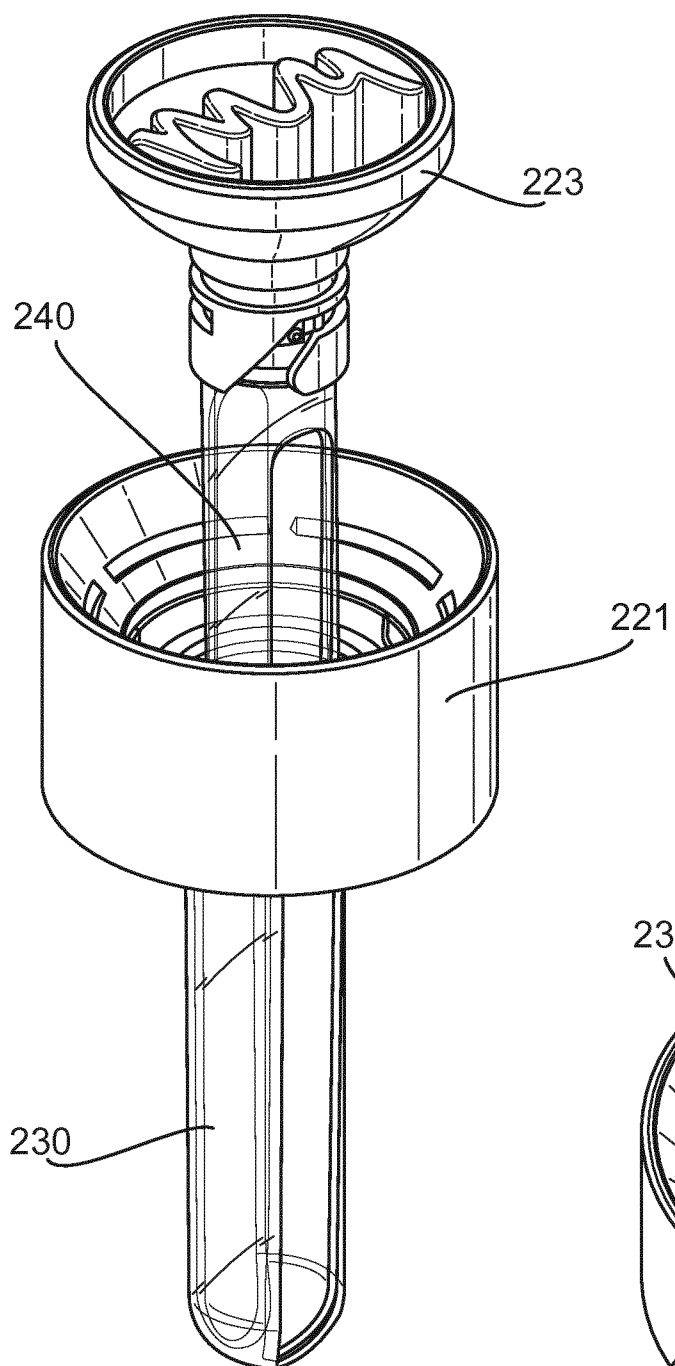
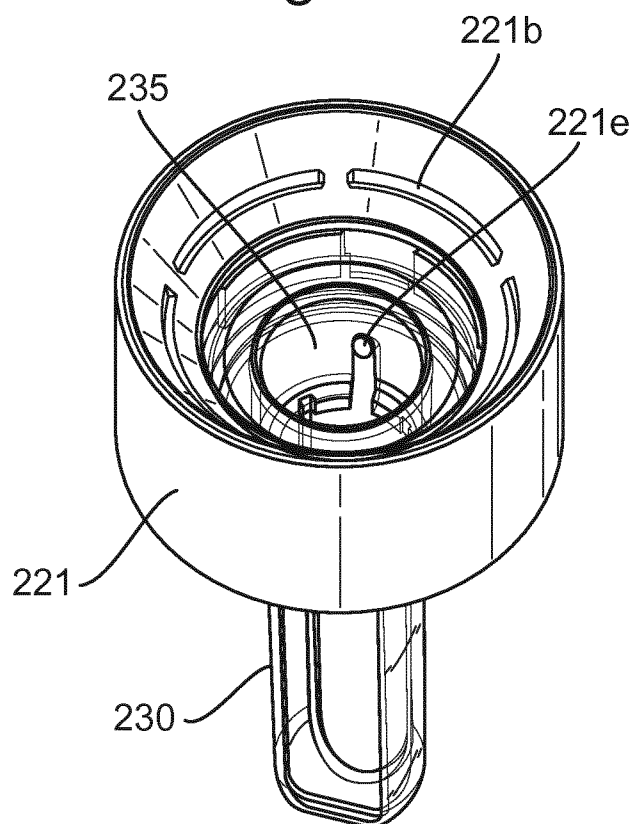


Fig. 14



INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2018/083129

A. CLASSIFICATION OF SUBJECT MATTER

INV. A47J31/06 A47J31/20 A47J41/00
ADD.

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)
A47J

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)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2016/122090 A1 (COTE SR ANDREW L [US] ET AL) 5 May 2016 (2016-05-05) paragraph [0015] paragraph [0018] - paragraph [0020] paragraph [0024] paragraph [0034] paragraph [0053] figures 1-6	1-12
A	US 9 801 492 B1 (LIN SHIN-SHUOH [US]) 31 October 2017 (2017-10-31) column 3, line 66 - column 4, line 55 figures 7-9	1-12
A	US 2016/120355 A1 (SHEN TZU YUAN [TW]) 5 May 2016 (2016-05-05) paragraph [0031] - paragraph [0032] figures 1-3	1-12
	----- -/-	



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

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"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

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"&" document member of the same patent family

Date of the actual completion of the international search

18 January 2019

Date of mailing of the international search report

30/01/2019

Name and mailing address of the ISA/

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Leblanc, Romain

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2018/083129

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 9 089 239 B2 (PLANETARY DESIGN [US]) 28 July 2015 (2015-07-28) figure 7 -----	1-12
A	US 2014/116259 A1 (LANDFORD JOSEPH DAVID [US]) 1 May 2014 (2014-05-01) paragraph [0045] paragraph [0049] paragraph [0080] figures 3,14A -----	1-12

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2018/083129

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2016122090	A1	05-05-2016	AU 2015343151 A1 01-06-2017 CA 2966633 A1 12-05-2016 EP 3215438 A1 13-09-2017 US 2016122090 A1 05-05-2016 US 2018065784 A1 08-03-2018 WO 2016073632 A1 12-05-2016
US 9801492	B1	31-10-2017	NONE
US 2016120355	A1	05-05-2016	TW M495808 U 21-02-2015 US 2016120355 A1 05-05-2016
US 9089239	B2	28-07-2015	NONE
US 2014116259	A1	01-05-2014	NONE