# Exhibit B

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**McLean et al.**

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(45) **Date of Patent: Aug. 9, 2016**

(54) **APPARATUS AND METHOD FOR EXTRACTING AN INFUSION**

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(73) Assignee: **ESPRO, INC.**, Vancouver (CA)

( * ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **14/318,371**

(22) Filed: **Jun. 27, 2014**

(65) **Prior Publication Data**

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**Related U.S. Application Data**

(62) Division of application No. 12/991,425, filed as application No. PCT/CA2009/000604 on May 12, 2009, now Pat. No. 8,770,097.

(60) Provisional application No. 61/127,430, filed on May 12, 2008.

(51) **Int. Cl.**
*A47J 31/38* (2006.01)
*A47J 31/20* (2006.01)
*B01D 11/02* (2006.01)

(52) **U.S. Cl.**
CPC *A47J 31/38* (2013.01); *A47J 31/20* (2013.01); *B01D 11/0253* (2013.01)

(58) **Field of Classification Search**
CPC ....... A47J 31/20; A47J 31/38; B01D 11/0253
USPC ............ D7/400, 510; 99/279, 287, 297, 322, 99/323; 426/80, 433, 435
See application file for complete search history.

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(57) **ABSTRACT**

An infusion extractor is provided including a plunger to be inserted into an infusing container containing the infusion mixture that has vertical inner walls oriented parallel to a vertical axis of the container. The plunger includes a first surface with a seal situated at an edge of the surface. The seal is adapted for sealing against the inner walls of the infusing container as the plunger moves within the container, to define a first chamber containing the mixture of infusible material and extract. The plunger also includes a second surface extending from the first surface and defining a second chamber; the second surface includes extract flow openings which permit flow of extract from the first chamber into the second chamber. At least a portion of the extract flow openings are situated at a depth either above or below the first surface along the vertical axis.

**23 Claims, 11 Drawing Sheets**

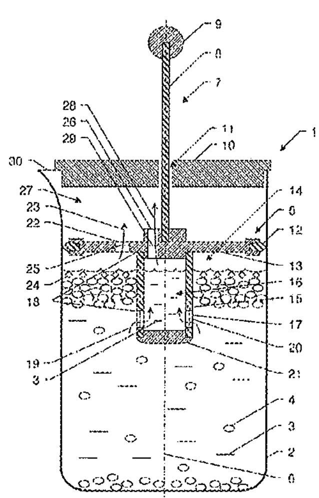

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FIG. 1

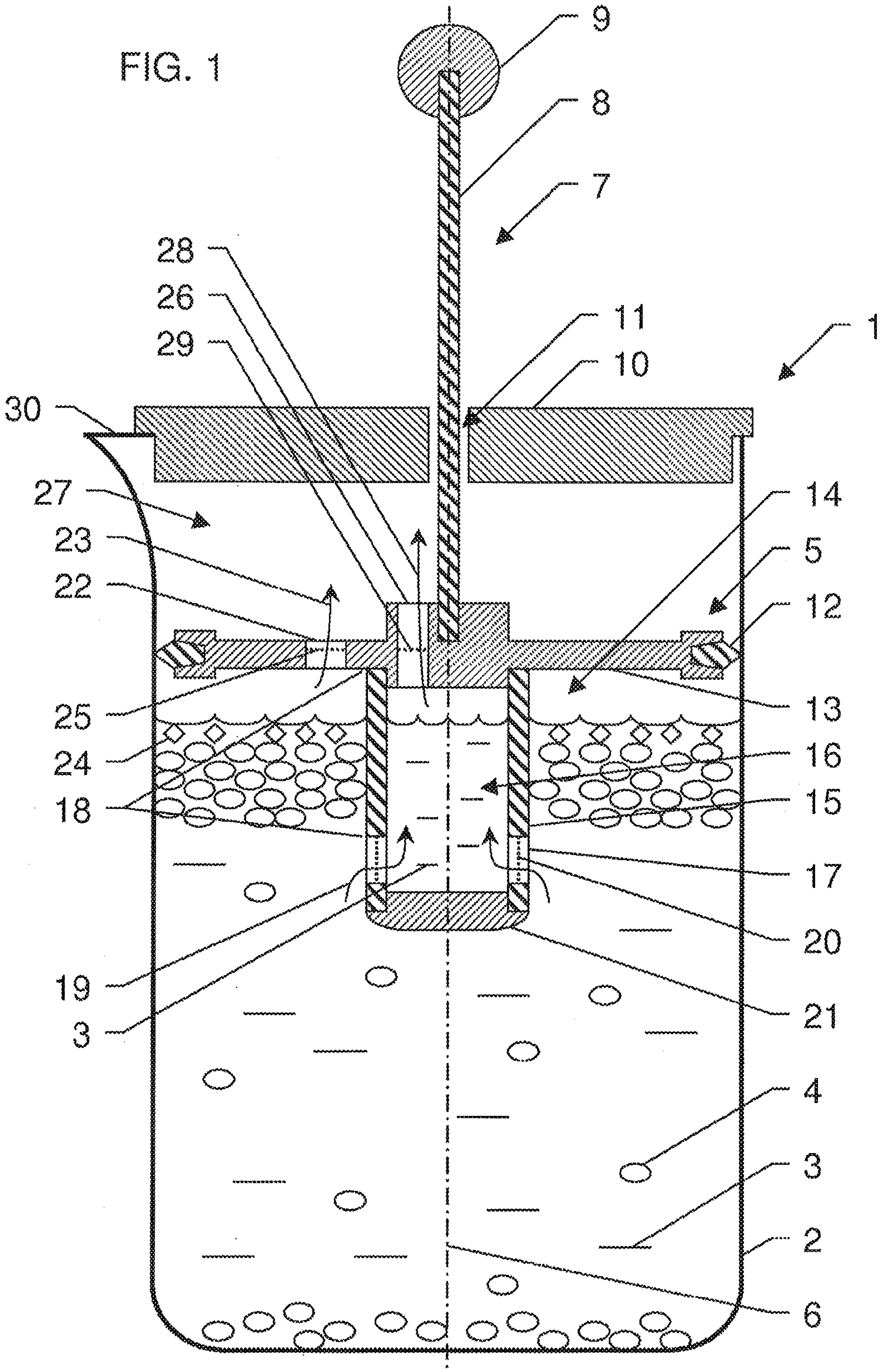
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FIG. 2

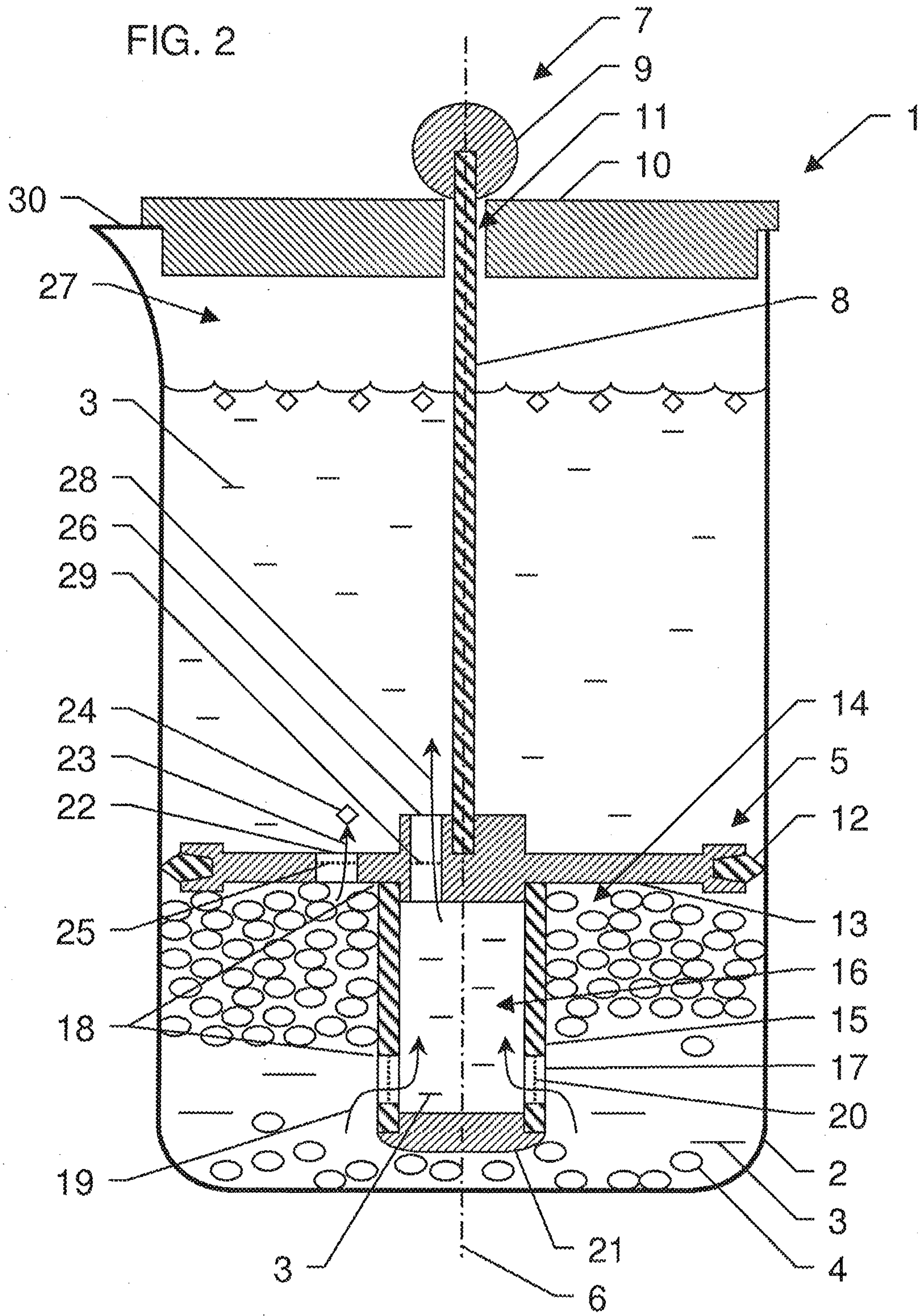
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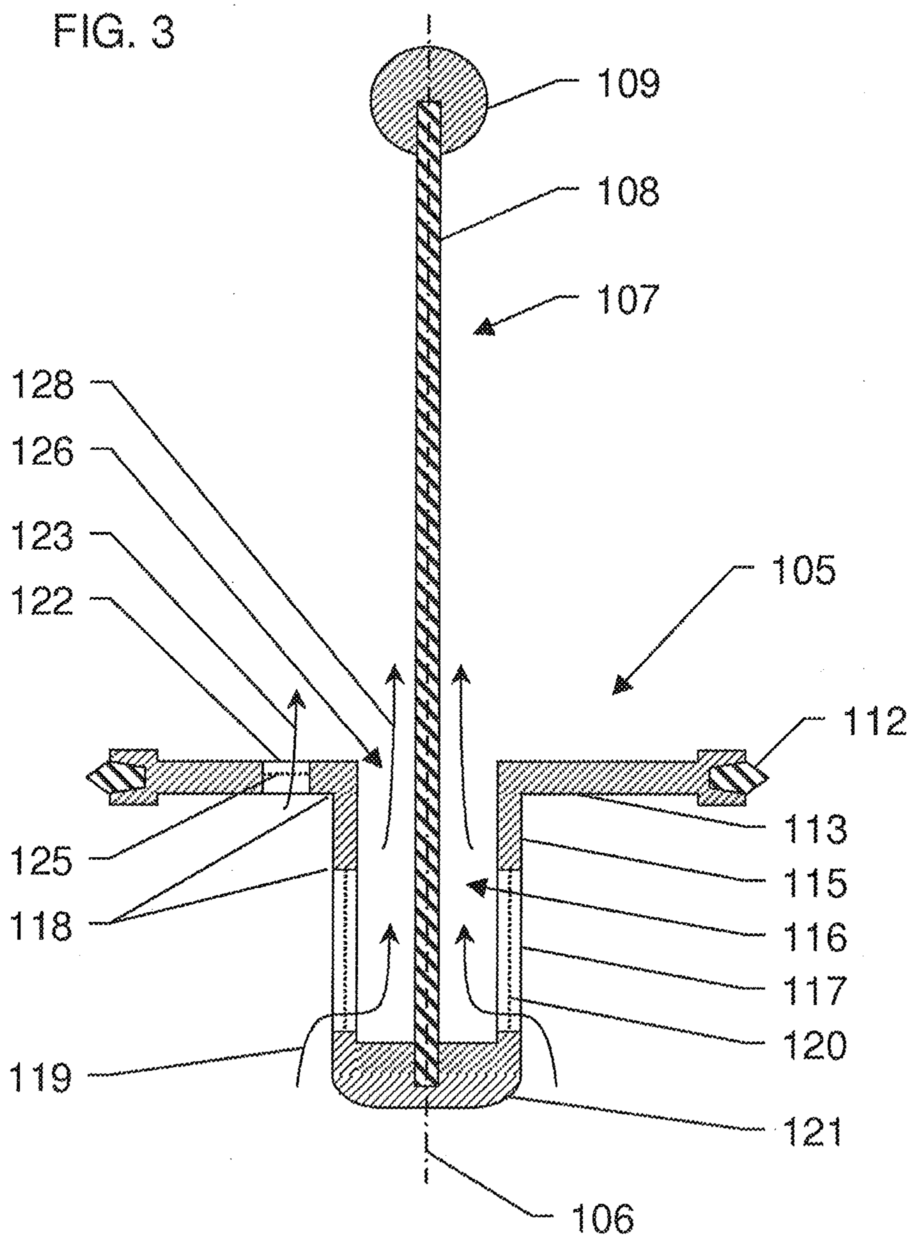
FIG. 3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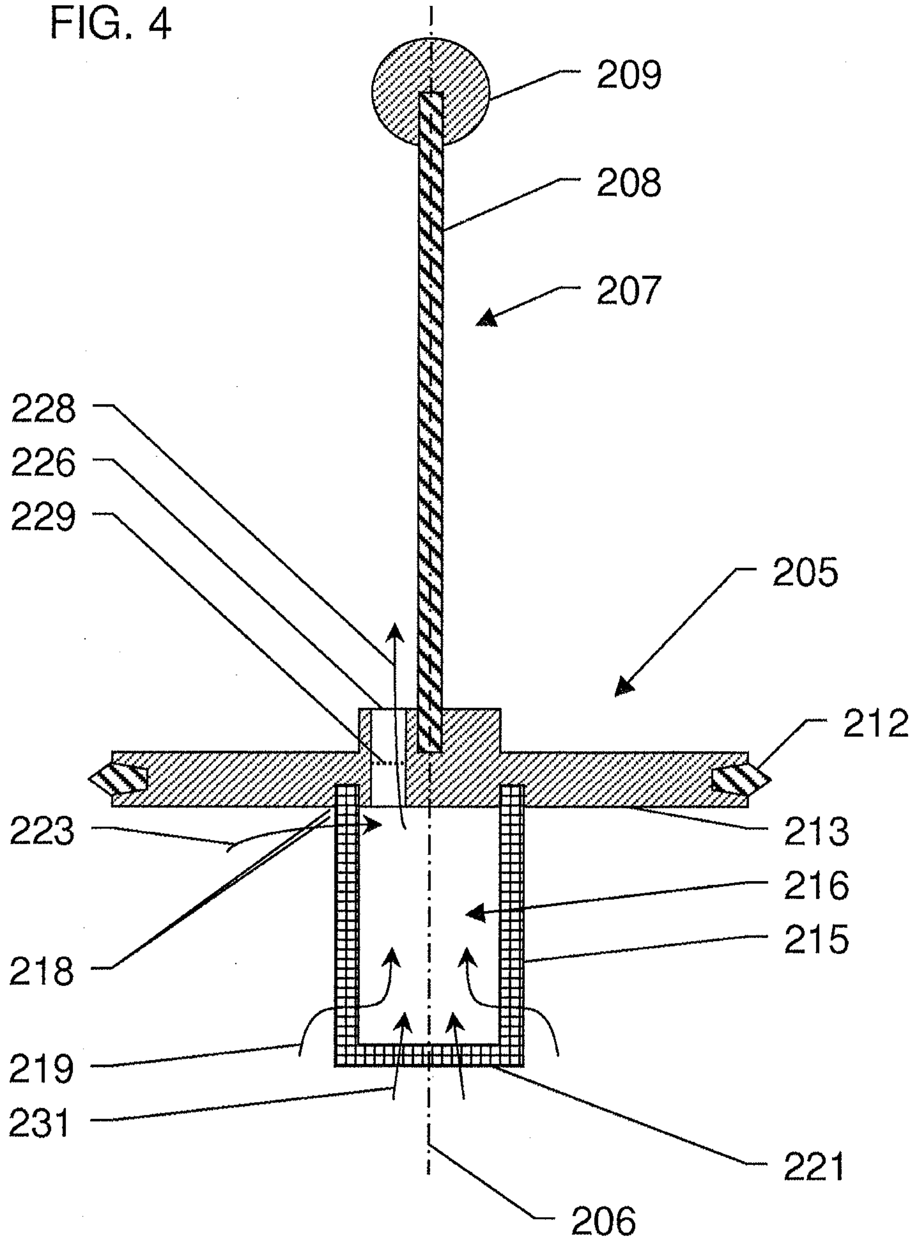

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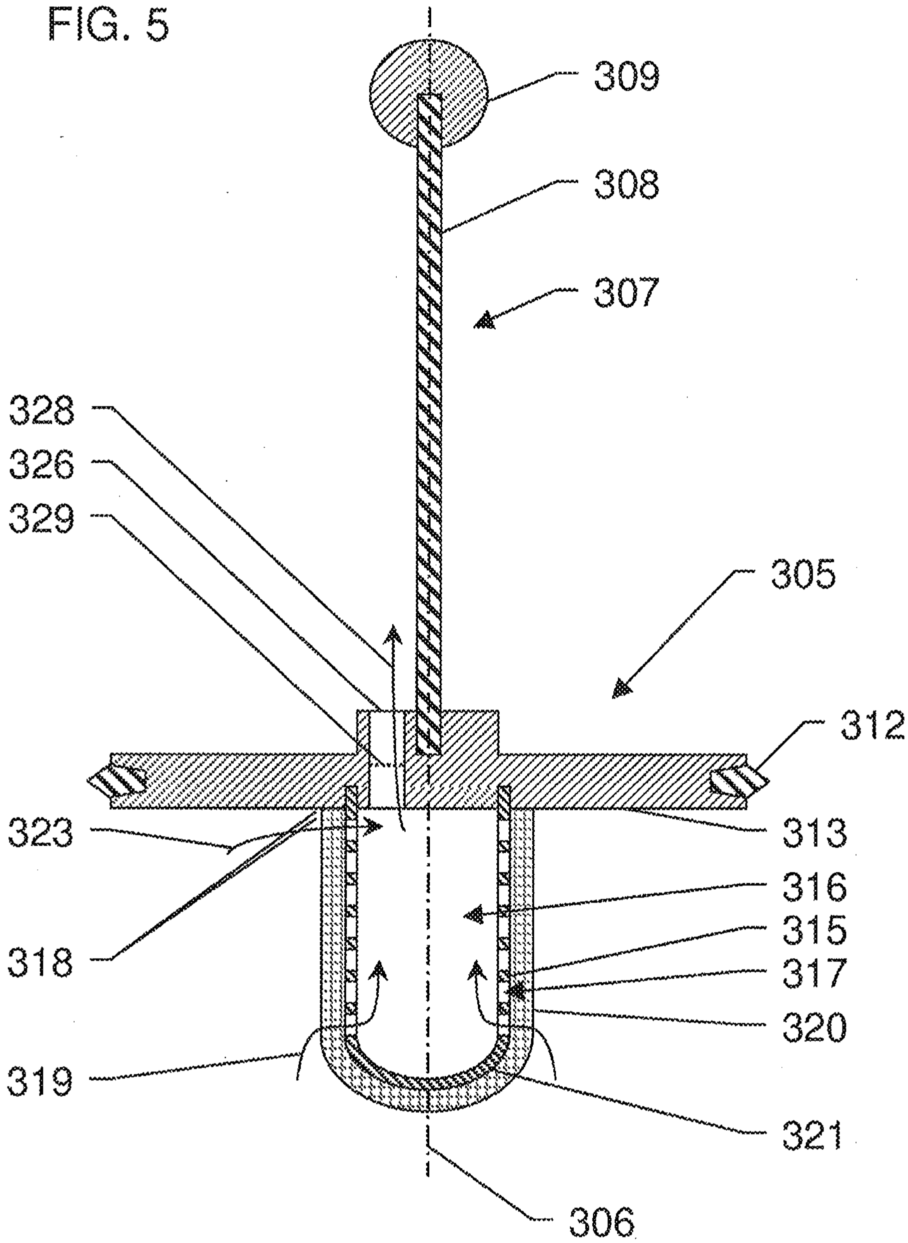
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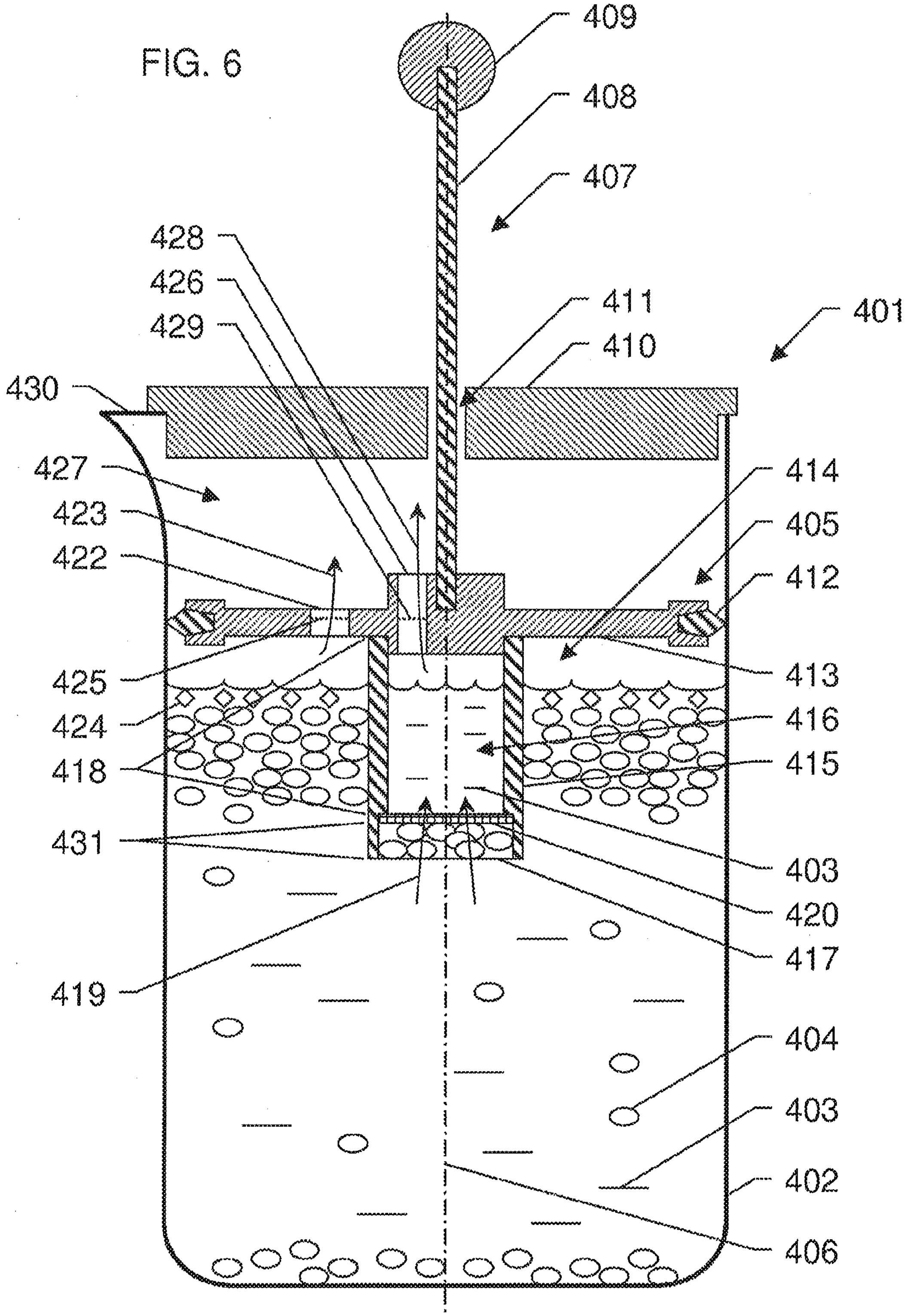

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FIG. 7

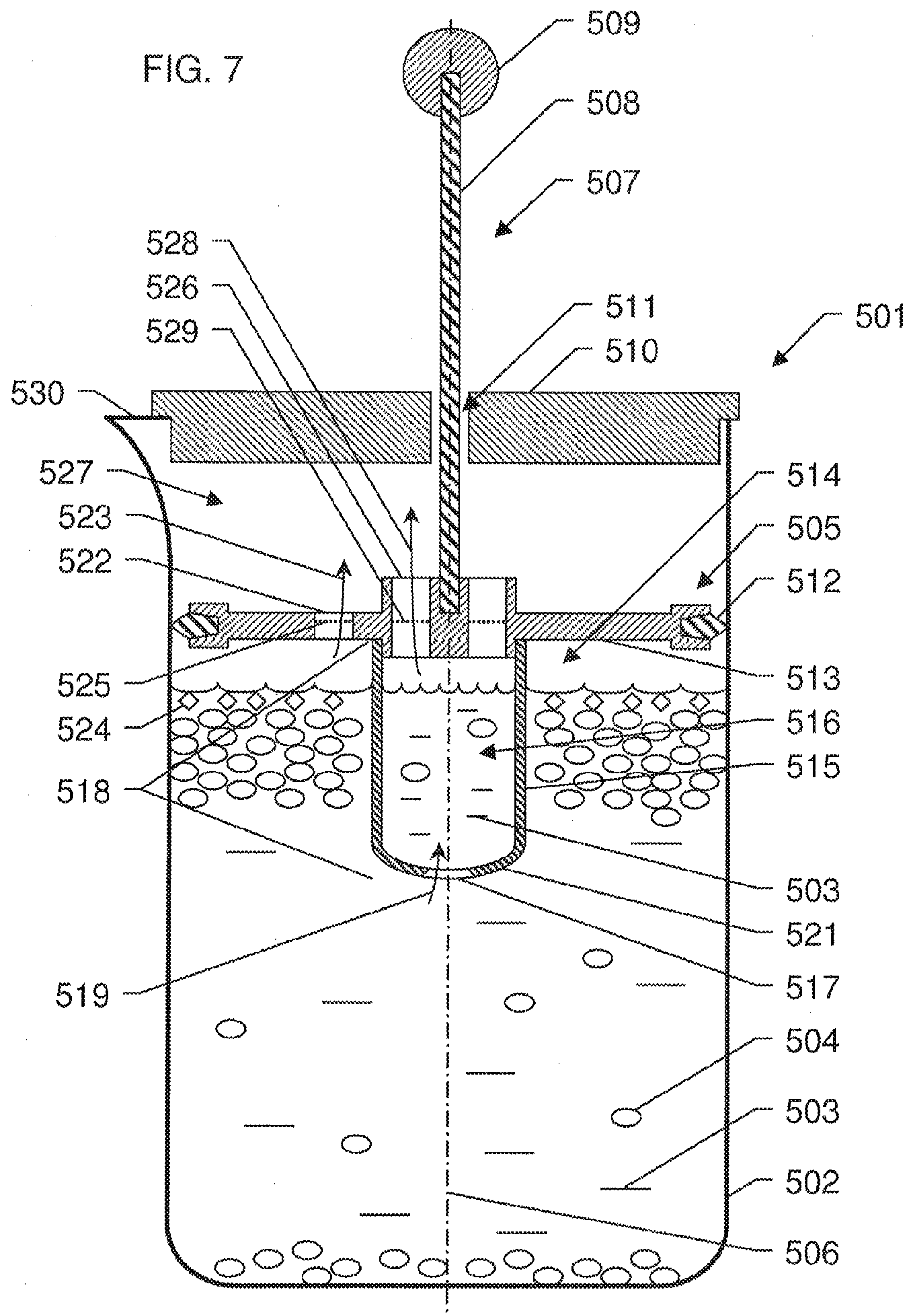
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FIG. 8

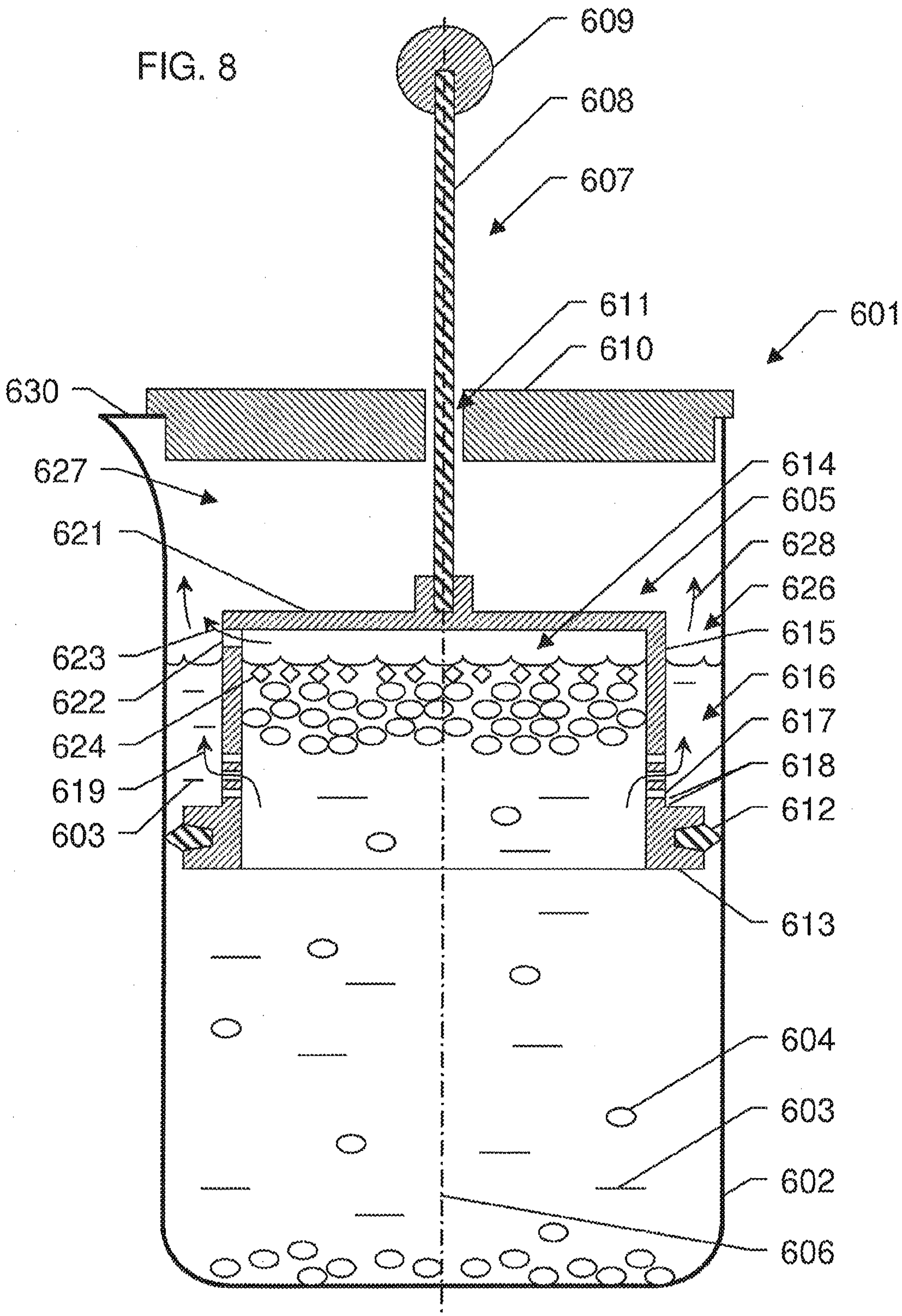
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FIG. 9

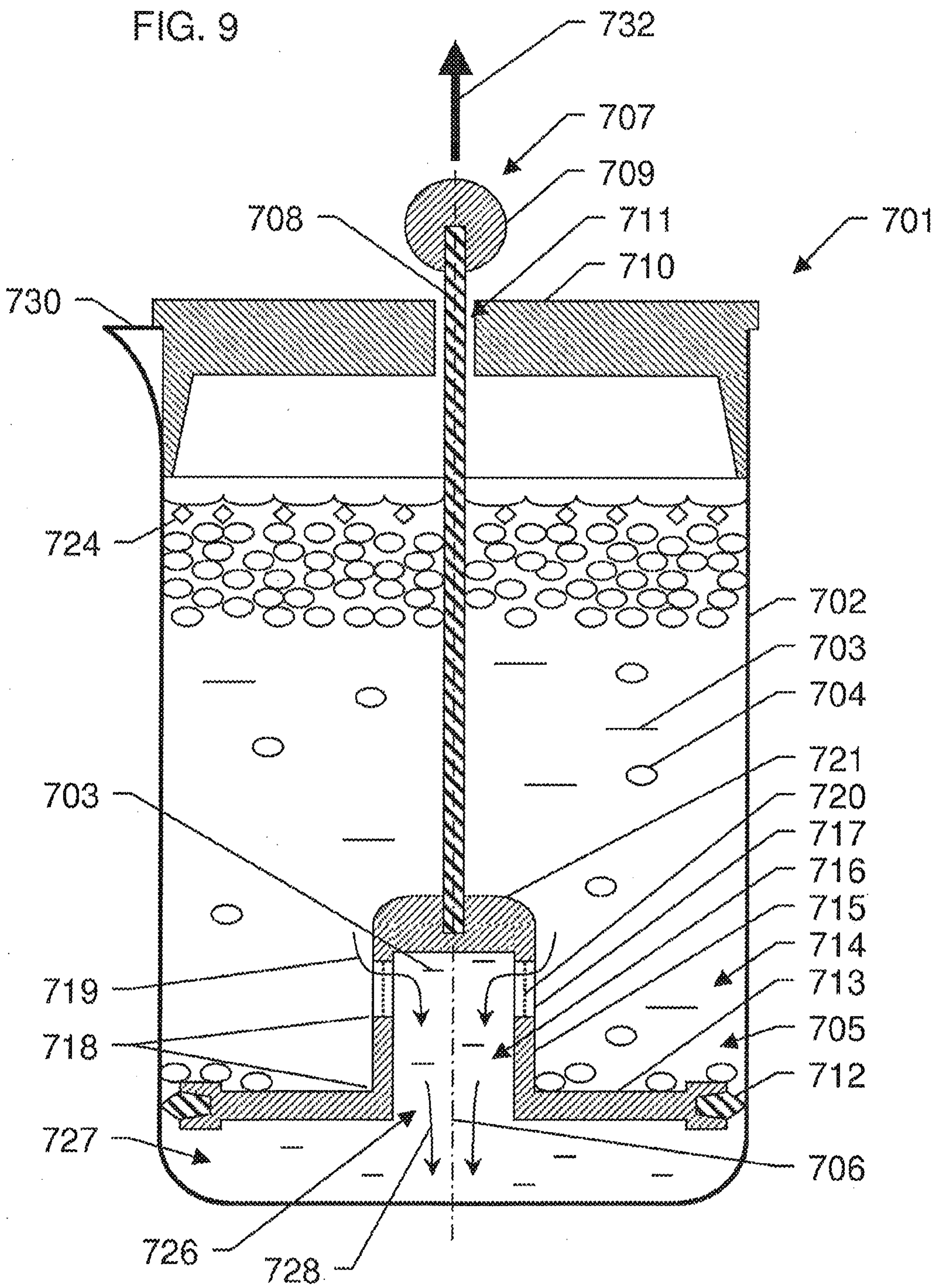
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FIG. 10

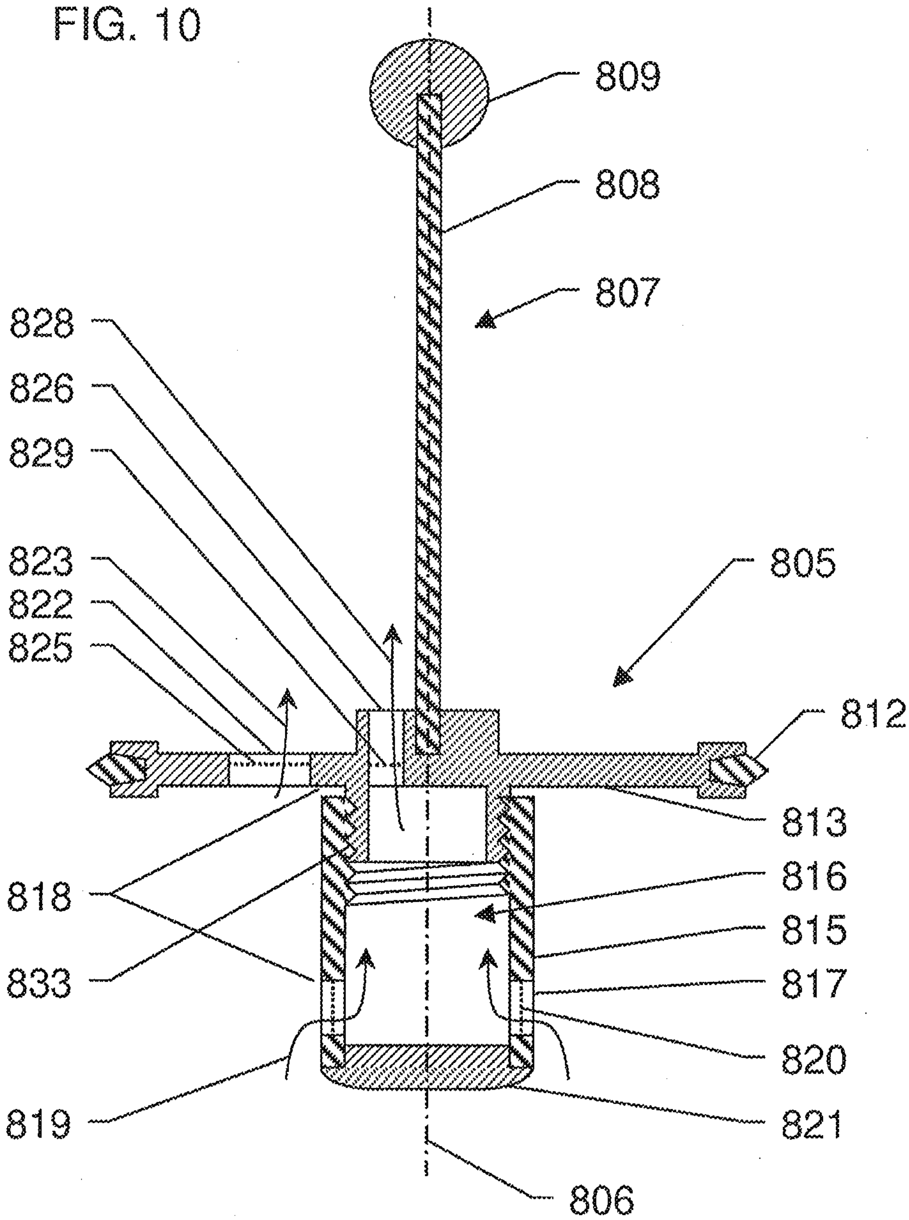
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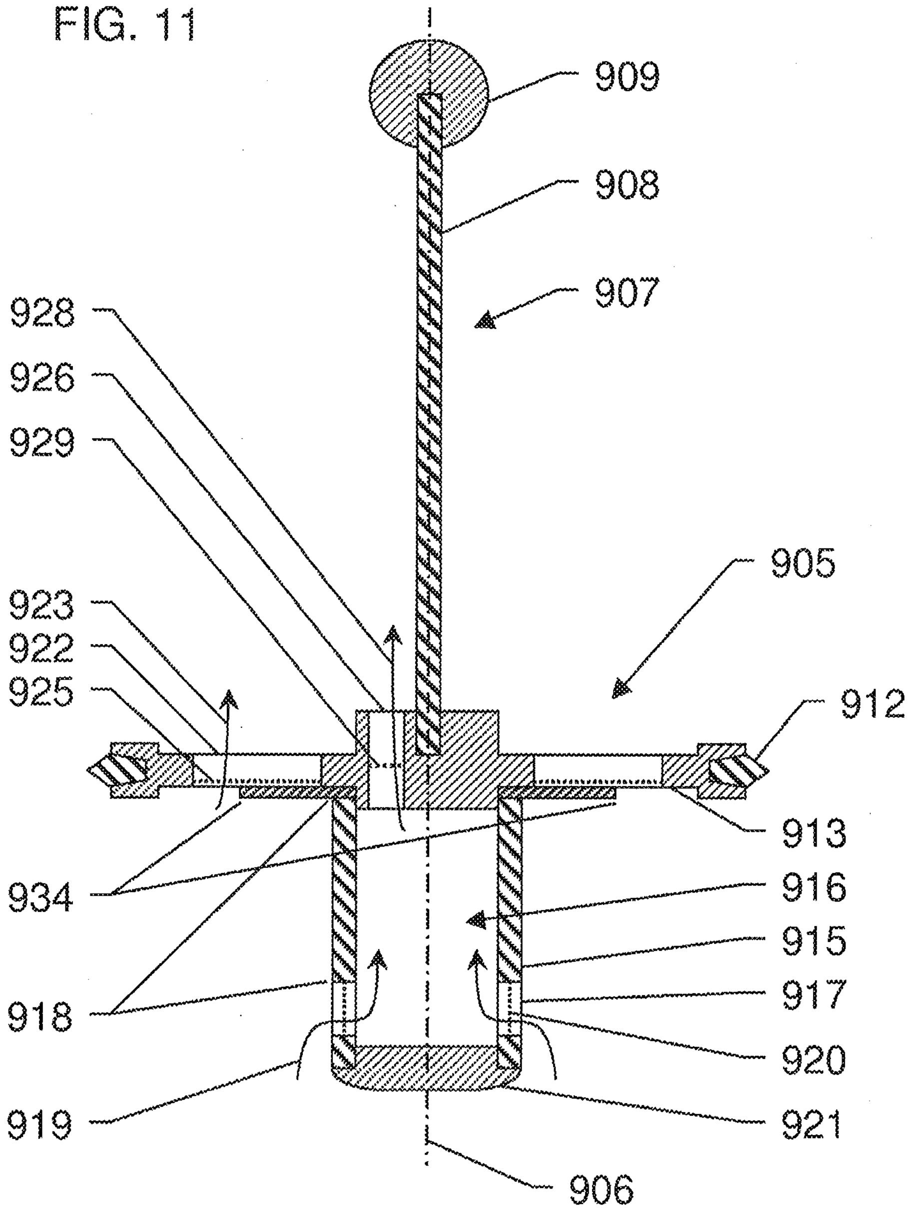
FIG. 11



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# APPARATUS AND METHOD FOR EXTRACTING AN INFUSION

## CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims the benefit of priority of and is a division of U.S. patent application Ser. No. 12/991,425, filed Nov. 5, 2010, which in turn is a U.S. National Stage of International Application Number PCT/CA2009/000604, filed May 12, 2009, and published on Nov. 19, 2009 as WO 2009/137915, which claims the benefit of priority to U.S. Provisional Patent Application No. 61/127,430, filed May 12, 2008.

## FIELD OF THE INVENTION

The present invention relates generally to apparati capable of carrying out an extraction of an infusible material, and methods of use thereof, and more particularly to an apparatus for separating an extract of an infusible material from a mixture of the extract and the infusible material, after extraction of the infusible material has taken place.

## BACKGROUND TO THE INVENTION

Solvent extraction of an infusible material typically involves the removal of one or more of the extractable constituents of an infusible material, by contact with a solvent, to form an extract. In many common extractions, a suitable solvent material may be mixed with an infusible material, resulting in a mixture of an extract and the infusible material after extraction has taken place. An exemplary common type of extraction is the extraction of constituents from infusible plant-based materials using water, and particularly hot water, as a solvent, to form a mixture of a substantially aqueous extract and the infusible plant-based material after extraction has taken place.

A number of input parameters affecting the process of extraction may be associated with the characteristics of the infusible material itself, independent from the solvent extraction apparatus. Three exemplary known infusible material characteristics in particular include:

- the mass of infusible material;
- the time between crushing or grinding (if required) of the infusible material and the extraction process;
- the particle size and particle size distribution of the infusible material.

A further number of input parameters known to affect the process of extraction may typically be controlled by the solvent extraction apparatus and method of performing the extraction. Such exemplary extraction parameters related to the extraction apparatus and method of use include:

- the volume of solvent relative to the volume or mass of infusible material;
- the extraction time (contact time of the solvent with the infusible material);
- the temperature of the mixture of infusible material and extract (note that the initial solvent temperature may be set externally from the solvent extraction apparatus, such as in the example of externally heated water). The temperature of the mixture may also vary over time, due to cooling for example.
- the effective aperture size of the filtering means used to separate the extract from the infusible material, after the extraction is complete.



The final properties of the extract produced by a solvent extraction process are typically affected and controlled by the above-described infusible material and extraction apparatus and method characteristics. Exemplary such final properties of the extract resulting from the solvent extraction process include:

- the final temperature of the extract;
- the soluble constituents of the infusible material contained in the extract;
- the insoluble constituents of the infusible material contained in the extract (e.g. fine particles of the infusible material and/or insoluble oils extracted from the infusible material that pass through the filtering means);
- the volume of extract produced.

For many common solvent extractions, particularly exemplary solvent extractions of plant materials using hot water to produce a beverage such as coffee or tea, for example, the preferred characteristics for the extraction process may be similar. For example, in some common exemplary extractions, smaller particles of the infusible material may be preferred over larger particles, since with larger particles, the outer surface of the particles may be undesirably over-extracted by the solvent during the extraction, while the inner core of the larger particles remains undesirably under-extracted. In such a case, the use of smaller infusible material particles may desirably contribute to more consistent extraction of the infusible material particles. Further, the extraction process may also proceed more quickly using smaller particles of infusible material, and therefore desirably take less time to complete. Such desirable faster extraction may also facilitate a more consistent temperature throughout the extraction, particularly in cases where a non-heated solvent extraction apparatus is used, wherein hot solvent, such as hot water for example, is placed in the extraction apparatus at an initial temperature, and the temperature of the extract and infusible material mixture decreases as the extraction process proceeds. Accordingly, there may typically exist a preferred extraction time period for a given infusible material particle size, wherein the preferred extraction time is shorter for relatively smaller particle sizes.

An additional desirable benefit of using smaller particles of infusible material for an extraction process may be realized in extractions where the infusible material and the extract separate due to density (i.e. wherein the infusible material generally floats or sinks in the extract). In such cases of unequal infusible material and extract densities such as in the exemplary case of extractions to produce coffee where the infusible material typically floats in the extract, if larger infusible material particles are used, the resulting slower extraction process may undesirably over-extract the bottom layers of the infusible material in contact with the extract, and undesirably under-extract the top layers of the infusible material which may be floating substantially above the extract. In such cases, the use of smaller infusible material particles which may complete extraction more quickly may desirably reduce the occurrence of such under and over-extraction.

In some common exemplary extractions, the above-described relatively faster extraction resulting from using smaller infusible material particles may also desirably reduce the extraction of some undesirable constituents of infusible material. For example, in the case of coffee extractions, faster extraction may desirably reduce the amount of caffeine extracted from the infusible material. Relatively high levels of caffeine may be undesirable due to its bitter flavour and stimulant properties. Additionally, relatively faster extraction may reduce variation in temperature of the extract and infusible material mixture during extraction using some types of extraction apparatus, as described above. Such reduced temperature variation may reduce extraction of sour constituents of coffee by lower than ideal temperature extraction, or reduce extraction of bitter constituents of coffee by higher than ideal temperature extraction, for example.

For reasons such as those detailed above, the use of relatively fine infusible material particles may be desirable for conducting extractions to produce a desirable extract product. However, some exemplary commonly known extraction apparati, such as a traditional french press coffee and/or tea making apparatus, for example, may be limited in the lower bounds of infusible material particle size that are practical for use in the apparatus. In some common extraction apparati like an exemplary french coffee press, and variations thereon, a piston or filter component is used to separate infusible material from the extract upon completion of extraction. Such separation may be achieved by physically filtering the extract to flow through a layer of retained infusible material accumulated on the surface of the piston or filter component and then through a filtering means in the piston or filter component as the piston or filter is pushed through the mixture of extract and infusible material from one end of the extraction apparatus to the other. In other similar known extraction apparati, a piston or filter component may be powered mechanically or pneumatically, for example to physically move the component and filter the extract.

Although smaller infusible material particle size may be desirable as explained above, commonly known extraction apparati such as a french coffee press as described above typically cannot function acceptably with infusible particle sizes below a certain size, as such smaller particles may typically unacceptably clog the filtering means, or pass through or around the filtering means and into the extract. Common unacceptable outcomes of filter medium clogging in known extraction apparati may include:

- making it difficult or impossible to push the extract through the clogged filter and accumulated infusible material, which may result in the application of excessive pressure to a piston or filter component which in an extreme case could lead to breakage of the apparatus or potential frustration and/or harm to a user;
- passage of unacceptable amounts of small infusible material particles around the piston or filter component or seals associated therewith, which then become undesirably entrained in the extract, which may result in an unwanted muddy or gritty texture to the extract; and
- passage of unacceptable concentrations of small infusible material particles (fines) through the filter and into the extract. The solvent in the extract may then continue the extraction process on such passed infusible material and extract undesirable constituents of the infusible material degrading the quality of the extract or even render the extract unpalatable in the case of a beverage extract.

Due to the undesirable results of using smaller infusible material particles in some common extraction apparati as described above, many such common extraction apparati according to the prior art (such as french coffee and/or tea press apparati for example) have effectively required the use of larger particle sizes for infusible materials in order to allow separation of the resulting extract and infusible material by use of a piston and filter component. Such required larger infusible material particles typically result in a slower progress of the extraction process, and therefore typically necessitates a relatively longer extraction time. Longer extraction times associated with use of some common extraction apparati may undesirably reduce the quality of the resultant extract by such exemplary factors as:



- over-extraction of the outer surfaces of the infusible material particles, while leaving the inner core of such particles under-extracted;
- time waste and delay due to longer extraction times required;
- potential increase in extraction of certain extraction duration-sensitive undesirable constituents, such as caffeine, or increase in undesirable characteristics of the extract due to either over or under-extraction of the infusible material; and
- potential increase in variation of the temperature of the extraction due to cooling of the extract/infusible material mixture in unheated extraction apparati, which may undesirably change the amount of certain temperature-sensitive extractable constituents which may be extracted from the infusible material.

## SUMMARY OF THE INVENTION

It is an object of the present invention to provide an improved extract separation apparatus to address some of the shortcomings of extraction apparati known in the art.

In a first embodiment of the present invention, an extract separation apparatus for separating an infused extract from a mixture of an infusible material and the extract is described. The apparatus in such first embodiment comprises a plunger element adapted to be inserted into an infusing container containing the mixture and having one or more substantially vertical inner walls oriented substantially parallel to a vertical axis of the container, wherein the plunger element is adapted to be moved within the container along the vertical axis thereof. The plunger element according to the first embodiment comprises a plunging means adapted to move the plunger element within the infusing container along the vertical axis thereof, and a first surface substantially transverse to the vertical axis and comprising sealing means situated at one or more edges of said first surface, wherein said sealing means are adapted for sealing engagement with the one or more inner walls of the infusing container as the plunger element is moved within the container, to define a first chamber containing the mixture of infusible material and extract bounded by said first surface. The plunger element further comprises a second surface extending from said first surface and defining a second chamber, said second surface comprising one or more extract flow openings, wherein said one or more extract flow openings are adapted to permit flow of extract from said first chamber into said second chamber, and wherein at least a portion of said one or more extract flow openings in said second surface are situated at a depth, wherein said depth is separated from said first surface, either above or below said first surface along the vertical axis.

In additional embodiments according to the present invention, the plunger element may additionally comprise one or more of:

one or more vent openings adapted to permit flow of air, and/or at least a portion of a low density component comprised in the mixture, out of the first chamber;

one or more filter elements comprised in one or more of the extract flow openings; and an infusing container adapted to contain the mixture of infusible material and extract, wherein the infusing container comprises one or more substantially vertical inner walls, and the plunger element is adapted to fit within the infusing container.

## BRIEF SUMMARY OF THE DRAWINGS

FIG. 1 depicts a vertical section of an exemplary solvent extraction apparatus according to an embodiment of the present invention, showing a piston/filter plunger element in a starting position inside an infusing container.

FIG. 2 depicts a vertical section of the exemplary solvent extraction apparatus embodiment depicted in FIG. 1, with the piston/filter plunger element in a second position.

FIG. 3 depicts a vertical section of an alternative exemplary embodiment of a piston/filter plunger element according to an embodiment of the invention.

FIG. 4 depicts a vertical section of an alternative exemplary embodiment of a piston/filter plunger element including a porous wall section according to an embodiment of the invention.

FIG. 5 depicts a vertical section of an alternative exemplary embodiment of a piston/filter plunger element including a removable filter element according to an embodiment of the invention.

FIG. 6 depicts a vertical section of an alternative exemplary embodiment of a solvent extraction apparatus according to an embodiment of the present invention, including a piston/filter plunger element in a starting position.

FIG. 7 depicts a vertical section of a further alternative exemplary embodiment of a solvent extraction apparatus according to an embodiment of the present invention, including a piston/filter plunger element in a starting position.

FIG. 8 depicts a vertical section of yet a further alternative exemplary embodiment of a solvent extraction apparatus according to an embodiment of the present invention, including a piston/filter plunger element in a starting position.

FIG. 9 depicts a vertical section of an alternative exemplary embodiment of a solvent extraction apparatus according to an embodiment of the present invention, including a piston/filter plunger element in a lower position for movement in a reverse direction.

FIG. 10 depicts a vertical section of an alternative exemplary embodiment of a piston/filter plunger element including an adjustable screw according to an embodiment of the invention.

FIG. 11 depicts a vertical section of an alternative exemplary embodiment of a piston/filter plunger element including an adjustable vent opening according to an embodiment of the invention.

## DETAILED DESCRIPTION OF SEVERAL EMBODIMENTS

Referring to FIG. 1, a solvent extraction apparatus 1 according to an embodiment of the invention is shown, configured similarly to a french press type coffee or tea making apparatus. The solvent extraction apparatus 1 comprises exemplary walled cylinder infusing container 2 containing a mixture of extract 3 and infusible material 4. Plunger element 5 is adapted to fit within infusing container 2 of solvent extraction apparatus 1, and to be moved within the infusing container 2 along a vertical axis thereof, such as central vertical axis 6, by means of a plunging means attached to the plunger element 5. The plunging means may comprise a central elongated handle 7 comprising rod 8 and optional knob 9, for example, which may be grasped by a user to move the plunger element 5. The extraction apparatus 1 may additionally comprise a lid 10 with central hole 11 through which rod 8 may pass to assist in centering the plunger element 5 and rod 8 inside infusing container 2 and prevent it from tilting. Plunger element 5 additionally comprises sealing means 12 situated at the edge of a first surface or wall 13 of the plunger element 5, which is oriented substantially transverse to the vertical axis 6. In use inside infusing container 2, the first surface 13 and sealing means 12 of the plunger element 5



define a first chamber 14 containing the mixture of extract 3 and infusible material 4. FIG. 1 shows the extraction apparatus 1 in a first or starting position for separating the extract 3 from the mixture of extract 3 and infusible material 4 in infusing container 2.

The plunger element 5 further comprises a second surface or wall 15 depending from and oriented substantially perpendicular to the first surface 13, defining second chamber 16 containing extract 3. In some embodiments, the second surface or wall 15 may enclose the second chamber 16, whereas in other embodiments, second chamber 16 may comprise a partially or completely open top and/or bottom, for example. The joint between the first surface 13 and the second surface 15 is substantially leak proof with respect to extract 3 and infusible material 4. The second surface 15 of plunger element 5 also comprises one or more extract flow openings 17. In an exemplary embodiment, at least a portion of the one or more extract flow openings 17 are situated at a depth 18 separated from the first surface 13 along the vertical axis 6, either above or below the first surface 13. The one or more extract flow openings 17 are adapted to permit flow of extract 3 from the first chamber 14 (containing a mixture of extract 3 and infusible material 4) to the second chamber 16 (containing extract 3) as shown by arrow 19. In another embodiment, the second surface or wall 15 may depend from the first surface 13, extending away from the first surface 13 at a non-perpendicular angle. In an exemplary such embodiment, the second surface or wall 15 may extend away from the first surface 13 at an angle between about 45-85 degrees, for example. The further embodiments of the inventive plunger element described below in FIGS. 2-11 may also be similarly adapted such that the second surface or wall may extend away from the first surface at a non-perpendicular angle.

The one or more extract flow openings 17 in the second wall 15 typically comprise one or more filter elements 20 within or across the extract flow openings 17, such that extract 3 flowing through the openings 17 must substantially pass through the filter elements 20. The one or more filter elements 20 may be desirably adapted to control the passage of infusible material 4 through the openings 17 to allow substantial separation of the extract 3 from the infusible material 4. In some embodiments, apertures in the filter elements 20 may be small enough to substantially exclude the infusible material 4 from passing through the openings 17. The filter elements 20 may be made from any suitable material such as one or a combination of: polymer, metal, ceramic, composite, cloth, felt, paper, or other suitable materials, for example. The filter elements 20 can be formed by any suitable method, such as by one or more of: stamping, chemical etching, laser etching, molding, weaving, welding, machining, sintering, felting, foaming, paper making, piercing, or any other method adapted to create small and preferably uniform apertures. A common embodiment of a filter element 20 includes a screen or mesh having many apertures comprised of a suitable material as described above. Additionally, the filter elements 20 may be multi-staged, comprising a plurality of individual filter elements.

In the exemplary embodiment of the present invention shown in FIG. 1, the infusing container 2 comprises a substantially vertical walled cylinder container, with a substantially circular cross-section, the first surface 13 of plunger element 5 is substantially circular in cross-section adapted to fit inside the cylindrical infusing container 2, and the second surface 15 is substantially cylindrical with a substantially circular cross-section, and a plug or end wall 21 closing the bottom of the second wall 15. Sealing means 12 are situated around the substantially circular outside edge of the first surface **13** of plunger element **5** to provide a seal against the cylindrical wall of the infusing container **2** when the plunger element **5** is moved inside the container, to substantially prevent extract **3** or infusible material **4** from leaking around the sealing means **12**. In alternative embodiments of the invention, the infusing container **2** and mating plunger element **5** and first surface **13** thereof may optionally have another cross-sectional shape, such as a square or rectangular or other shape for example, wherein sealing means **12** may be situated around the edge or edges of the first surface **13** of the plunger element **5**. Further, in alternative embodiments, the second wall **15** of the plunger element **5** may optionally have another shape, such as a rectangular prism, or conical frustum, for example. In an alternative embodiment, plunger element **5** according to the invention may be provided independently, adapted to fit inside an existing infusing container design, for use as an extraction apparatus. In such an embodiment, the inventive plunger element **5** may be adapted for retrofittable use with one or more existing infusing containers, such as one or more standard or commonly available infusing containers from existing french press extraction apparati, as are known in the art.

In embodiments of the invention including an infusing container **2**, the infusing container **2** may be made from any suitable material such as one or more of: glass, plastic, ceramic, metal or other suitable material, for example. Additionally, the infusing container **2** may optionally include a double-layered wall, such as a double metal wall, with a vacuum or other suitable and preferably insulative substance between the two walls of the infusing container **2**, such as to reduce variations in temperature inside the container **2** during the extraction process. Further, the plunger element **5** and first wall **13** and second wall **15** components thereof may be made from any suitable material such as one or more of: polymer, composite, metal, ceramic or other suitable materials, for example.

Sealing means **12** may comprise any suitable known seal material and/or design. Exemplary such seal designs may include single or multiple lip seals, single or multiple wiper seals, and single or multiple U-cup seal designs, for example. Suitable such single or multiple U-cup seal designs may desirably be self-energising, such that an outer edge of the U-cup seal actively engages and seals with the inner wall of container **2** as plunger element **5** is moved within the container **2** and against the fluid mixture of extract **3** and infusible material **4**. Exemplary suitable seal materials may comprise one or more of: silicone, polymers (such as polyurethane for example) and silicone or polymer materials impregnated with carbon or other additives, for example. Additionally, sealing means **12** may comprise one or more such suitable seal materials by themselves, or alternatively, such seal materials may surround or be overmolded over a support material, such as a metal or composite support material, for example. The above-described exemplary sealing means materials and designs may also apply to sealing means incorporated in other embodiments of the invention, such as those described below.

The plunger element **5** may also optionally include one or more vent openings **22**. The vent openings **22** are adapted to permit the flow of air out of the first chamber **14** through the vent openings **22**, as represented in FIG. **1** by arrow **23**, as the plunger element **5** is moved inside the infusing container **2**. In some exemplary embodiments of the invention, extraction of the infusible material **4** may also result in the extraction of low density extractable constituents **24**, such as oils or other constituents having a lower density than the remainder of extract **3**, and which may typically float on top of the extract **3** in first chamber **14**. In such embodiments comprising low density extractable constituents **24**, the one or more optional vent openings **22** may also permit the flow of at least a portion of the low density extractable constituents **24** out of the first chamber **14** through the vent openings **22**. According to another embodiment, vent openings **22** may also optionally include vent filter elements **25**, similar to extract flow opening filter elements **20** described above, and may be made from similar suitable materials and by similar suitable methods to those described above in reference to filter elements **20**. Optional vent filter elements **25** may also be multi-staged, comprising a plurality of individual filter elements. In a further optional embodiment, the one or more vent openings **22** may be adjustable or configurable to control the amount of air and/or low density extractable constituents **24** which may flow out of the first chamber **14** through the vent openings **22**.

In some embodiments of the invention, such as that shown in FIG. **1**, the plunger element **5** may also optionally include one or more extract flow paths **26** in the plunger element **5** to permit flow of extract **3** from the second chamber **16** to a third extract chamber **27** through the flow path **26**, as generally indicated by arrow **28**. Extract flow path **26** may be an opening located in the first surface **13** of the plunger element **5**, or more generally in the plunger element **5**. The extract flow path **26** may also optionally include one or more extract flow path filter elements **29**, substantially similar to extract flow opening filter elements **20** described above, and may be made from similar suitable materials and by similar suitable methods to those described above in reference to filter elements **20**. Optional extract flow path filter elements **29** may also be multi-staged, comprising a plurality of individual filter elements.

In some common exemplary embodiments of the invention, the extraction apparatus **1** may be configured for extracting a hot beverage extract **3** from infusible plant material **4**, such as in embodiments where infusible material **4** may comprise coffee grounds, tea leaves or herbal infusibles, for example, and extract **3** may comprise coffee, tea or herbal tisane, respectively. In the common example of coffee extraction, the extraction of ground coffee infusible material **4** may result in a coffee extract **3**, and one or more aromatic coffee oil low density constituents **24**.

Referring now to FIG. **2**, the solvent extraction apparatus **1** of FIG. **1** is shown in a second position where plunger element **5** has been moved to substantially the bottom of the infusing container **2**, such as by a user pressing on knob **9** of the plunger element **5**. As the plunger element **5** is moved in the infusing container **2** containing a mixture of extract **3**, infusible material **4** and in some embodiments low density constituent(s) **24**, air and at least some of the low density constituent **24** (if present) may flow through vent opening **22** in the first surface **13**, and extract **3** flows through the extract flow opening(s) **17** in the second wall **15** from the first chamber **14** into the second chamber **16**, and then through the extract flow path(s) **26** into the third extract chamber **27**. Extract **3** may typically flow through extract flow opening(s) **17** and subsequently extract flow path(s) **26** rather than through vent opening **22** due to the fact that the accumulation of infusible material **4** against the vent opening **22**, or optionally the small size of vent opening **22**, increases the resistance to fluid flow through the vent opening **22** in comparison to an extract flow opening **17** or extract flow path **26**. The extract filter element(s) **20** and optionally also vent filter element(s) **25** and extract flow path filter element(s) **29** act to substantially prevent the flow of infusible material **4** from the first chamber **14** into either of the second chamber **16** or the third chamber **27**, effectively and desirably separating the extract **3** (and potentially also low density constituent **24** if present) from the infusible material **4**.

Following the separation of extract **3** (and potentially also low density constituent **24** if present) from the infusible material **4** by moving the plunger element **5** inside the infusing container **2**, the separated extract **3** (and any low density constituent **24**) may be stored in the third extract chamber **27** until desired for use without further contact with infusible material **4**. The infusing container **2** may also optionally include a pouring spout **30**, which may be used to pour the separated extract **3** from the third chamber **27** for consumption or other use. The infusing container **2** may further optionally include a handle (not shown) to facilitate lifting or moving the extraction apparatus **1** by a user.

Referring to FIG. **3**, a vertical section of an exemplary embodiment of a plunger element **105** according to an embodiment of the invention is shown, configured similarly to a french press type coffee and/or tea making plunger. Plunger element **105** is adapted to fit within an infusing container similar to that shown in FIG. **1**, and to be moved within the infusing container (not shown) along a vertical axis thereof, such as central vertical axis **106**, by means such as central elongated handle **107**. Handle means **107** may comprise rod **108** and optional knob **109**, for example, which may be grasped by a user to move the plunger element **105**.

Plunger element **105** additionally comprises sealing means **112** situated at the edge of a first surface or wall **113** of the plunger element **105**, which is oriented substantially transverse to the vertical axis **106**.

The plunger element **105** further comprises a second surface or wall **115** depending from and oriented substantially perpendicular to the first surface **113**, defining a fluid chamber **116**, which is substantially open at one end. Similar to the plunger element **5** shown in FIG. **1**, the joint between the first surface **113** and the second surface **115** of plunger **105** is substantially leak proof, and the second surface **115** of plunger element **105** also comprises one or more extract flow openings **117**, wherein at least a portion of the one of more extract flow openings **117** is situated at a depth **118** separated from the first surface **113**, below the first surface **113** along the vertical axis **106**. The one or more extract flow openings **117** are adapted to permit flow of extract into chamber **116** as shown by arrow **119**.

The one or more extract flow openings **117** in the second wall **115** typically comprise one or more filter elements **120** within or across the extract flow openings **117**, such that extract flowing through the openings **117** as shown by arrow **119** must substantially pass through the filter elements **120**. Similar to exemplary plunger element **5** of FIG. **1**, the one or more filter elements **120** may be desirably adapted to control the passage of infusible material through the openings **117** to allow substantial separation of the extract from the infusible material, and optionally, apertures in the filter elements **120** may be small enough to substantially exclude the infusible material from passing through the openings **117**. Extract flow path filter elements **120** are substantially similar to extract flow opening filter elements **20** described above, and may be made from similar suitable materials and by similar suitable methods to those described above in reference to filter elements **20**.

In the exemplary embodiment of the present invention shown in FIG. **3**, the first surface **113** of plunger element **105** is substantially circular in cross-section adapted to fit inside a cylindrical infusing container, and the second surface **115** is substantially cylindrical with a substantially circular cross-section, and a plug or end wall portion **121** closing the bottom of the second surface or wall **115**. Sealing means **112** are essentially similar to the sealing means **12** described above with respect to FIG. **1**, and are situated around the substantially circular outside edge of the first surface **113** of plunger element **105**, performing the same sealing function as described above with reference to FIG. **1**. In alternative embodiments of the invention, the infusing container and mating plunger element **105** and first surface **113** thereof may optionally have another cross-sectional shape, such as a square or rectangular or other shape for example, wherein sealing means **112** may be situated around the edge or edges of the first surface **113** of the plunger element **105**. Further, in alternative embodiments, the second wall **115** of the plunger element **105** may optionally have another shape, such as a rectangular prism, or conical frustum, for example.

The plunger element **105** and first wall **113** and second wall **115** components thereof may be made from suitable materials such as described above in reference to plunger element **5** of FIG. **1**. As in plunger element **5**, plunger element **105** may optionally also include one or more vent openings **122** adapted to permit the flow of air through the vent openings **122**, as represented in FIG. **3** by arrow **123**, as the plunger element **105** is moved inside the infusing container. In some exemplary embodiments of the invention, extraction of the infusible material may also result in the extraction of low density extractable constituents, such as oils or other constituents having a lower density than the remainder of the extract, and which may typically float on top of the extract. In such embodiments comprising low density extractable constituents, the one or more vent openings **122** may also permit the flow of at least a portion of the low density extractable constituents. Vent openings **122** may also optionally include vent filter elements **125**, similar to extract flow opening filter elements **120** described above, and may be made from similar suitable materials and by similar suitable methods to those described above in reference to filter elements **120**. Optional vent filter elements **125** may also be multi-staged, comprising a plurality of individual filter elements. In an alternative such embodiment, the one or more vent openings **122** may be adjustable or configurable to control the amount of low density extractable constituents which may flow through the vent openings **122**.

In another embodiment, the one or more vent openings **122** may be operable to control an amount of infusible material **4** which may pass through vent openings **122**. In one example thereof, vent openings **122** may desirably substantially prevent passage of infusible material **4**. In another example thereof, vent openings may be adjustable or configurable such that they are operable to controllably permit a desired amount of infusible material **4** through the vent openings **122** and into the separated extract **3** in the extract chamber **27**. The passage of a controlled and typically very small amount of infusible material **4** through the vent openings **122** into separated extract **3**, may be desirable in some cases, or by some users, to affect the taste of the separated extract **3**, for example.

In the exemplary embodiment of the present invention shown in FIG. **3**, the fluid chamber **116** defined by the second surface **115** is substantially open at the top and thereby permits flow of extract out of fluid chamber **116**, such as through extract flow path **126**, as generally indicated by arrow **128** as plunger **105** is moved through an infusing container containing a mixture of extract and infusible material, similar to as shown with plunger **5** in FIG. **2**. In other exemplary embodiments, the fluid chamber **116** defined by the second surface **115** may be partially closed or narrowed at the top.

Referring to FIG. **4**, a vertical section of an exemplary embodiment of a plunger element **205** according to an