



(51) International Patent Classification:

A47J 31/44 (2006.01) A47J 31/06 (2006.01)

(21) International Application Number:

PCT/NZ2017/050072

(22) International Filing Date:

31 May 2017 (31.05.2017)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

720732 01 June 2016 (01.06.2016) NZ

(72) Inventor; and

(71) Applicant: DAVIDSON, Gabriel [NZ/NZ]; 29 Tennis Court Road, Raumati South, Paraparaumu, 3052 (NZ).

(72) Inventor: BEN-DROR, Adam Rogan; 134 William Street, Petone, Lower Hutt, 5012 (NZ).

(74) Agent: BALDWINS INTELLECTUAL PROPERTY; Level 20, Dimension Data House, 157 Lambton Quay, Wellington, 6011 (NZ).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM,

PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

— with international search report (Art. 21(3))

(54) Title: DEVICE, METHOD AND SYSTEM FOR DISPENSING FAT-BASED EDIBLE CONSUMABLES

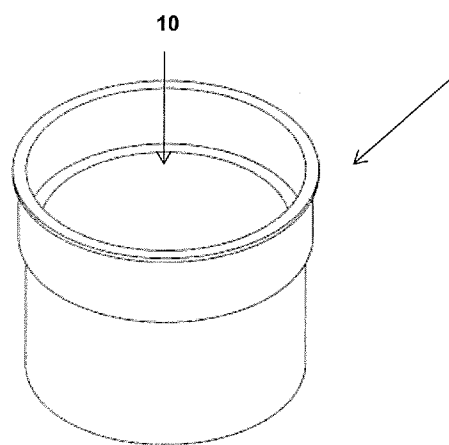


Figure 1a

(57) Abstract: The invention relates to a device, method and system for dispensing a fat-based edible consumable, and more particularly relates to a device, method and system for dispensing melted or softened chocolate. The device includes a receptacle having a chamber configured to receive a fat-based edible consumable and adapted to be coupled with a source of heated and pressurised fluid; and a barrier member adapted to separate heated and pressurised fluid supplied by the source from the consumable, wherein the barrier member is configured to transfer heat and pressure from the heated and pressurised fluid; such that when heated and pressurised fluid is delivered to the barrier member at least a portion of the consumable is softened and is urged through an opening.



Device, method and system for dispensing fat-based edible consumables

Field

The present invention relates to a device, method and system for dispensing a fat-based edible consumable, and more particularly relates to a device, method and system for dispensing melted or softened chocolate.

Background

Any discussion of the prior art throughout the specification should in no way be considered as an admission that such prior art is widely known or that it forms part of common general knowledge in the field.

Hot chocolate, also known as hot cocoa and drinking chocolate, is generally understood to be a warmed, chocolate-flavoured beverage.

Hot chocolate may be prepared by melting solid chocolate directly into warmed milk or water. Chocolate is a fat-based edible consumable, and depending on the type of chocolate (e.g. milk, dark, white) it has a melting or softening point at a temperature between room temperature and 100 °C. Generally, the greater the fat content of the chocolate the lower the melting temperature. However, this method of melting solid chocolate into a beverage can be time consuming and inconvenient, particularly for busy baristas and other staff in commercial beverage serving establishments such as cafes and restaurants, as it takes time to sufficiently melt and disperse the chocolate in the beverage, and additional unwieldy equipment can be required.

Other common methods of preparing a hot chocolate beverage can involve mixing either a chocolate flavoured powder or chocolate flavoured syrup with warmed milk and/or water. Some powders and syrups may be stored in ready to use capsules. However, such powders and syrups do not always provide the same flavour or other sensory (organoleptic) properties as melted chocolate. Further, these powders and syrups often contain higher levels of sugar and/or lower levels of cocoa butter or liquor compared to solid chocolate, which diminishes the desirable rich chocolate taste in the beverage. Further, powders and syrups may contain other artificial agents not present in solid chocolate, which some consumers may find off-putting.

In an effort to provide a more convenient way to make a hot chocolate beverage from melted chocolate (rather than from powder or syrups), it has been known to melt a quantity of chocolate ahead of time and keep it in a melted condition so that a hot chocolate beverage may be prepared and served more quickly. However, keeping chocolate warmed in this way can be unsanitary and otherwise inconvenient, and transferring the melted chocolate to a cup or other vessel can be messy.

Object of the invention

It is an object of the present invention to provide a device, method and system for dispensing a fat-based edible consumable which addresses, overcomes or ameliorates at least one of the abovementioned disadvantages, or at least provides the public with a useful choice.

Summary of the invention

Further aspects of the invention, which should be considered in all its novel aspects, will become apparent from the following description.

In one aspect, there is provided an edible consumable dispensing device for dispensing a fat-based edible consumable, including: a receptacle having a chamber configured to receive a fat-based edible consumable, the chamber having internal walls and a first opening and a second opening, wherein the first opening is adapted to be coupled with a source of heated and pressurised fluid, and a barrier member adapted to separate heated and pressurised fluid supplied by the source from the consumable and at least the second opening, wherein the barrier member is configured to transfer heat and pressure from the heated and pressurised fluid; such that when heated and pressurised fluid is delivered to the barrier member via the first opening, at least a portion of the consumable is softened and urged through the second opening.

Preferably, the fat-based consumable is chocolate.

Preferably, the interior of the chamber of the receptacle is generally cylindrical.

Preferably, the receptacle is adapted to be supported by a holder configured to couple to the source of heated and pressurised fluid.

In one embodiment, the barrier member is preferably adapted to form a seal with the internal walls of the chamber to define a lower chamber within the interior of the receptacle in fluid communication with the second opening.

In another embodiment, the barrier member is preferably a rigid member movably engageable with the interior walls of the receptacle, and wherein supply of the heated and pressurised fluid forces the barrier member to move toward the second opening. In this embodiment, the barrier member preferably includes a flexible member, wherein the heated and pressurised fluid flexes the barrier member toward the second opening during operation. Preferably, the flexible member is elastic.

Preferably, the first opening is adapted to be coupled with a heated and pressurised fluid outlet of an espresso machine.

In a further aspect, there is provided a method for dispensing a fat-based edible consumable, comprising introducing the fat-based edible consumable into a receptacle having a chamber, the chamber having internal walls and a first opening and a second opening; introducing a barrier member to the receptacle so as to sealingly engage with the internal walls of the chamber and define a lower chamber having the consumable and second opening; coupling the first opening to a source of heated and pressurised fluid; and introducing the heated and pressurised fluid to the receptacle through the first opening such that heat and pressure are transferred to the consumable, thereby softening or melting at least a portion of the consumable and urging the consumable through the second opening.

Preferably, the fat-based consumable is chocolate.

Preferably, the receptacle is generally cylindrical.

Preferably, the receptacle is adapted to be supported by a holder which couples the first opening to the source of heated and pressurised fluid.

Preferably, the barrier member is adapted to form a seal with the internal walls of the receptacle to define a lower chamber within the interior of the receptacle in fluid communication with the second opening.

In one embodiment, the barrier member is preferably a rigid member movably engageable with the interior walls of the receptacle, and wherein the heated and pressurised fluid forces the barrier member to slide toward the second opening.

In a further embodiment, the barrier member preferably includes a flexible member, and wherein the heated and pressurised fluid flexes the barrier member toward the second opening. Preferably, the flexible member is elastic.

Preferably, the source of heated and pressurised fluid is an outlet of an espresso machine.

Preferably, the fluid has a temperature of about 85 to about 95 °C.

Preferably, the fluid has a pressure of about 9 bar.

In a further aspect, there is provided a system for dispensing a fat-based consumable, including a source of heated and pressurised fluid; and the device as herein described.

Preferably, the system further comprises a holder for supporting the receptacle, wherein the holder is adapted to couple to the source of heated and pressurised fluid.

Preferably, the source of heated and pressurised fluid is an outlet of an espresso machine.

Preferably, the fluid has a temperature of about 85 °C to about 95 °C.

Preferably, the fluid has a pressure of about 9 bar.

In a further aspect, there is provided a fat-based consumable adapted for use with the device, method, or system as herein described.

Preferably, the barrier member comprises an external wrapper of the fat-based consumable.

Preferably, the wrapper comprises a region of predetermined weakness which is configured to rupture during application of pressure from the source of heated and pressurised fluid.

Preferably, the wrapper comprises means for forming a seal with a lower wall of the receptacle chamber such that the region of weakness is in fluid communication with the lower opening, but sealed from the heated and pressurised fluid.

In a further aspect, there is provided a device, method, system or fat-based consumable substantially as herein described with reference to any of the Figures thereof.

Brief description of the drawings

The invention will now be described by example only and with reference to the Figures, in which:

Figures 1a and 1b are top and bottom perspective views of a receptacle used with an embodiment of the device, method and system of the present invention.

Figure 2 shows a transverse cross section of the receptacle shown in Figures 1a and 1b.

Figure 3 shows a side view of a barrier member used with an embodiment of the device, method and system of the present invention.

Figure 4 shows a perspective view of the barrier member shown in Figure 3.

Figure 5 shows a side view of the barrier member shown in Figures 3 and 4 comprising a seal around its perimeter.

Figure 6 shows a transverse cross section of the receptacle with the barrier member shown in Figure 5 engaging with the internal walls of the receptacle.

Figure 7 shows a perspective view of a device in accordance with the invention including a receptacle and a barrier member having a seal around its perimeter.

Figures 8a to 8e are exploded perspective views, showing the inter-relationship between a holder, a receptacle, a barrier member and an edible consumable, all in accordance with an embodiment of the invention.

Figures 9a and 9b show a transverse cross section of an alternative embodiment of the present invention, wherein the receptacle, containing a chocolate edible consumable, comprises a handle and a flexible/stretchable barrier member.

Detailed description of the invention

Unless the context clearly requires otherwise, throughout the description, the words “comprise”, “comprising”, and the like, are to be construed in an inclusive sense as opposed to an exclusive or exhaustive sense, that is to say, in the sense of “including, but not limited to”.

In one embodiment, there is provided a device for dispensing a fat based edible consumable in the form of melted or softened chocolate.

With reference to Figures 1a, 1b and 2, a device in accordance with an embodiment of the invention includes a generally cylindrical receptacle 1 having an interior side wall, a first, upper opening 10 adapted to couple in fluid communication with a source of heated and pressurised fluid, such as water, and a second, lower opening 12. In this example the first and second openings are longitudinally spaced apart by the interior side wall. In this embodiment, the receptacle 1 has a lip extending outwardly at or near the upper opening to facilitate handling.

The interior of the receptacle 1 is adapted to receive an initially solid, edible chocolate consumable 3 (shown in Figures 8a to 8c, 9a and 9b). The consumable 3 shown in this example is in a cylindrical puck or disc shape, although other suitable shapes are envisaged

and will be apparent to the skilled person. The chocolate consumable may sit at or near the bottom of the interior of the receptacle 1, adjacent the lower opening 12. The consumable 3 is adapted to be dispensed from the lower opening 12 as it is softened or melted by the heated and pressurised fluid.

As shown in Figures 8a, 8b, 8c, 9a and 9b, the present invention includes a portion of meltable edible consumable 3 such as a fat-based consumable, preferably chocolate. The consumable 3 is preferably a single-serve solid consumable with good shelf life, and is preferably made from high quality chocolate ingredients. The consumable 3 is designed to be melted or softened by the heat conducted into a chamber 11 by the heated and pressurised fluid, and at least partially pressed out through the lower opening 12 by the pressure exerted on the barrier member 2 by the pressurised fluid.

As shown in Figures 7 and 8a to 8e, the receptacle 1 is adapted to be supported by a holder 100 suitable for coupling with an espresso type machine.

In espresso machines, heated and pressurised water is ejected from the machine at outlets known as groupheads. The water at the grouphead of a commercial machine has a temperature of about 85 °C to about 95 °C and a pressure of about 9 bar. Ground coffee is added into a filter basket having openings at the bottom through which extracted coffee flows. The filter basket is adapted to sit within a holder which retains the filter basket and has a lower spout and a handle. The holder also has flanges at its upper edge for coupling with the grouphead so as to form a tight fluid communication between the source of the heated and pressurised water and the coffee to be extracted. This holder is often referred to in the art as a "portafilter". When activated, the heated and pressurised water is forced through the coffee, creating a coffee extract, which is pressed through the lower openings of the filter basket, through the bottom of the holder and out of the spout into a cup or other vessel.

In this embodiment, the holder 100 comprises flanges 102 at an upper edge thereof which are adapted to engage with a source of heated and pressurised water (i.e. the grouphead of the espresso machine). However, the receptacle 1 need not be supported by a separate holder 100; and could itself comprise integral coupling means for coupling with a grouphead, for example, by comprising coupling flanges at or near an upper end thereof.

The receptacle 1 may be made from a suitably sterile material able to withstand the temperature and pressure of the heated and pressurised fluid, such as stainless steel. Any other material or combination of materials suitable for handling foodstuffs and withstanding the pressure and temperatures of the heated and pressurised fluid may be used (e.g. brass, ceramic or plastic materials).

A barrier member 2 is included to seal off the consumable 3 and lower opening 12 from direct contact with the heated pressurised water. The barrier member 2 is moveable within the receptacle 1 so as to be able to transfer pressure from the heated and pressurised fluid onto the consumable 3. The barrier member 2 is also conductive to heat, allowing it to transfer heat to the consumable 3 to assist in melting or softening the consumable 3. The combination of heat and pressure on the consumable is most effective to press it through the lower opening 12.

In one embodiment, and with reference to Figures 3 to 6, the barrier member 2 includes a rigid disc 20 engageable with the internal walls of the receptacle 1 so as to form a watertight sliding seal with the receptacle walls. The disc thus functions as a plunger, movable within the receptacle between the first and second openings. When engaged with the internal walls, the barrier member forms a chamber 11 in fluid communication with the lower opening 12. The barrier member 2 separates the chamber from the upper opening 10 and prevents the heated and pressurised water from escaping into the chamber 11. In this embodiment, the barrier member 2 includes a seal 22 around its perimeter which engages the internal walls of the receptacle 1 so as to provide a more effective sliding water and pressure tight seal. The seal 22 may be an O-ring type seal made from rubber, silicone or other appropriate material which fits around the perimeter of the barrier member.

In use, and with reference to Figures 7 and 8a to 8e, the device may be used in a method to prepare a hot chocolate beverage. The receptacle 1 is fitted in the holder 100, and a puck of chocolate 3 is placed in the interior of the receptacle 1. The barrier member 2 is placed over the puck 3 in the receptacle 1 which seals the internal walls of the receptacle 1 such that the puck is in a chamber in fluid communication with the lower opening 12. The receptacle 1 is coupled with the source of heated and pressurised water via flanges 102 on the holder 100 such that the source is in fluid communication with the upper opening 10. When the source of heated and pressurised water is activated, the fluid is brought into contact with a top side of the disc of the barrier member 20. Some of the heat of the water is conducted through the barrier member 2, which melts or softens the chocolate puck 3. The pressure of the water causes the barrier member 2 to slide along the internal walls of the receptacle 1 and press against the puck 3. When the puck 3 has been sufficiently softened or melted, it is pressed out through the lower opening 12 by the barrier member 2. Once pressed through the lower opening 12, the softened or melted chocolate may be dispensed directly into a container or cup, or be transferred for further processing.

In another embodiment, and with reference to Figures 9a and 9b, a barrier member 24 is engageable with the top opening 10 or walls of the receptacle 1 and comprises a flexible/stretchable material (such as silicone or other suitable flexible/stretchable impermeable material) so as to define a chamber with a lower opening 12 which is sealed from the top opening 10. The flexible/stretchable material is made from a material which can seal the consumable from the pressurised and heated water. In this embodiment, some heat of the water is conducted through the barrier member 24 so as to melt or soften the chocolate. The pressure of the water causes the barrier member 24 to flex inwardly into the chamber, thereby transferring pressure onto the chocolate puck 3. When the chocolate has been sufficiently softened or melted, it is pressed out through the lower opening 12. The barrier member 24 may be disposable or reusable. Where the barrier member 24 is reusable, the flexible/stretchable material is sufficiently elastic so as to substantially return to its original shape after the consumable 3 has been dispensed from the receptacle 1.

In another embodiment, an edible fat based consumable comprises an external wrapper or casing. The wrapper preferably comprises a point of weakness configured to rupture at a lower force than the rest of the wrapper. The wrapped consumable is adapted to be placed in the receptacle 1 such that the point of weakness of the wrapper is in close proximity with the lower opening of the receptacle. In this embodiment, the wrapped consumable may be used with the device, method and system to dispense the consumable as described above.

without necessitating removal of the wrapper prior to its use, as the wrapper ruptures upon the heat and pressure of the barrier member.

In another embodiment, the wrapping of the consumable may be adapted to perform the function of the barrier member itself. In this embodiment, the wrapper is adapted to exclude fluid from the consumable, and to transfer heated and pressure from heated and pressurised fluid to the consumable. The wrapper is further adapted to form a seal with a lower part of the receptacle chamber such that the point of weakness of the wrapper is in fluid communication with the lower opening 12, but sealed from the heated and pressurised fluid entering the chamber through the upper opening 10. In use, the wrapped consumable may be placed in the receptacle 1 and coupled with the source of heated and pressurised fluid without the need for an additional barrier layer or plunger.

Dispensing chocolate generally takes from 90 seconds to 30 seconds, depending in part on the type of chocolate used.

The device may be used to dispense consumables other than chocolate, for example, the device may be used to dispense any fat-based consumable which has a melting or softening temperature in a range similar to that of chocolate.

Although this invention has been described by way of example and with reference to possible embodiments thereof, it is to be understood that modifications or improvements may be made thereto without departing from the scope of the invention. The invention may also be said broadly to consist in the parts, elements and features referred to or indicated in the specification of the application, individually or collectively, in any or all combinations of two or more of said parts, elements or features. Furthermore, where reference has been made to specific components or integers of the invention having known equivalents, then such equivalents are herein incorporated as if individually set forth.

What is claimed is:

1. An edible consumable dispensing device for dispensing a fat-based edible consumable, including:

a receptacle having a chamber configured to receive a fat-based edible consumable, the chamber having internal walls and a first opening and a second opening, wherein the first opening is adapted to be coupled with a source of heated and pressurised fluid; and

a barrier member adapted to separate heated and pressurised fluid supplied by the source from the consumable and at least the second opening, wherein the barrier member is configured to transfer heat and pressure from the heated and pressurised fluid;

such that when heated and pressurised fluid is delivered to the barrier member via the first opening, at least a portion of the consumable is softened and urged through the second opening.
2. The device of claim 1, wherein the fat-based consumable is chocolate.
3. The device of claim 1 or 2, wherein the interior of the chamber of the receptacle is generally cylindrical.
4. The device of any one of claims 1 to 3, wherein the receptacle is adapted to be supported by a holder configured to couple to the source of heated and pressurised fluid.
5. The device of any one of the preceding claims, wherein the barrier member is adapted to form a seal with the internal walls of the chamber to define a lower chamber within the interior of the receptacle in fluid communication with the second opening.
6. The device of any one of the preceding claims, wherein the barrier member is a rigid member movably engageable with the interior walls of the receptacle, and wherein supply of the heated and pressurised fluid forces the barrier member to move toward the second opening.
7. The device of any one of claims 1 to 5, wherein the barrier member includes a flexible member, and wherein the heated and pressurised fluid flexes the barrier member toward the second opening.
8. The device of claim 7, wherein the flexible member is elastic.
9. The device of any one of the preceding claims, wherein the first opening is adapted to be coupled with a heated and pressurised fluid outlet of an espresso machine.
10. A method for dispensing a fat-based edible consumable, comprising

introducing the fat-based edible consumable into a receptacle having a chamber, the chamber having internal walls and a first opening and a second opening;

introducing a barrier member to the receptacle so as to sealingly engage with the internal walls of the chamber and define a lower chamber having the consumable and second opening;

coupling the first opening to a source of heated and pressurised fluid; and

introducing the heated and pressurised fluid to the receptacle through the first opening such that heat and pressure are transferred to the consumable, thereby softening or melting at least a portion of the consumable and urging the consumable through the second opening.

11. The method of claim 10, wherein the fat-based consumable is chocolate.
12. The method of claim 10 or 11, wherein the receptacle is generally cylindrical.
13. The method of any one of claims 10 to 12, wherein the receptacle is adapted to be supported by a holder which couples the first opening to the source of heated and pressurised fluid.
14. The method of any one of claims 10 to 13, wherein the barrier member is adapted to form a seal with the internal walls of the receptacle to define a lower chamber within the interior of the receptacle in fluid communication with the second opening.
15. The method of any one of claims 10 to 14, wherein the barrier member is a rigid member movably engageable with the interior walls of the receptacle, and wherein the heated and pressurised fluid forces the barrier member to slide toward the second opening.
16. The method of any one of claims 10 to 14, wherein the barrier member includes a flexible member, and wherein the heated and pressurised fluid flexes the barrier member toward the second opening.
17. The method of claim 16, wherein the flexible member is elastic.
18. The method of any one of claims 10 to 17, wherein the source of heated and pressurised fluid is an outlet of an espresso machine.
19. The method of any one of claims 10 to 18, wherein the fluid has a temperature of about 85 to about 95 °C.
20. The method of any one of claims 10 to 19, wherein the fluid has a pressure of about 9 bar.
21. A system for dispensing a fat-based consumable, including
a source of heated and pressurised fluid; and
the device of any one of claims 1 to 9.
22. The system of claim 21, wherein the system further comprises a holder for supporting the receptacle, wherein the holder is adapted to couple to the source of heated and pressurised fluid.

23. The system of claim 21 or 22, wherein the source of heated and pressurised fluid is an outlet of an espresso machine.
24. The system of any one of claims 21 to 23, wherein the fluid has a temperature of about 85 °C to about 95 °C.
25. The system of any one of claims 21 to 24, wherein the fluid has a pressure of about 9 bar.
26. A fat-based consumable adapted for use with the device of any one of claims 1 to 4, or the method of any one of claims 10 to 15, or the system of any one of claims 21 to 25.
27. The fat-based consumable of claim 26, wherein the barrier member comprises an external wrapper of the fat-based consumable.
28. The fat-based consumable of claim 27, wherein the wrapper comprises a region of predetermined weakness which is configured to rupture during application of pressure from the source of heated and pressurised fluid.
29. The fat-based consumable of claim 28, wherein the wrapper comprises means for forming a seal with a lower wall of the receptacle chamber such that the region of weakness is in fluid communication with the lower opening, but sealed from the heated and pressurised fluid.

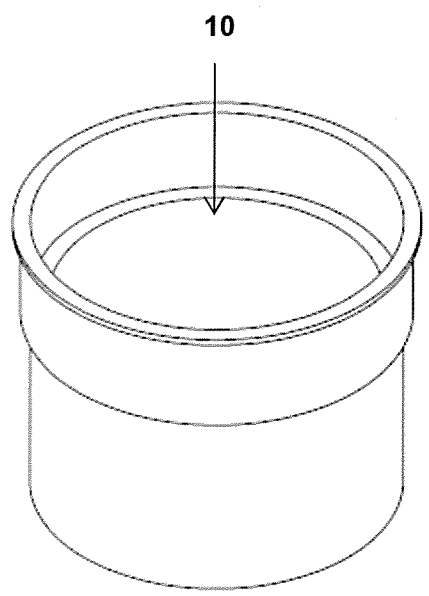


Figure 1a

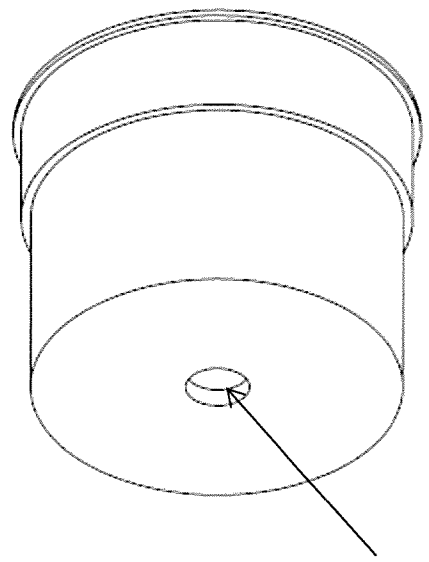
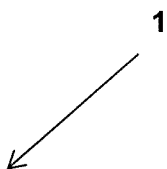


Figure 1b

12

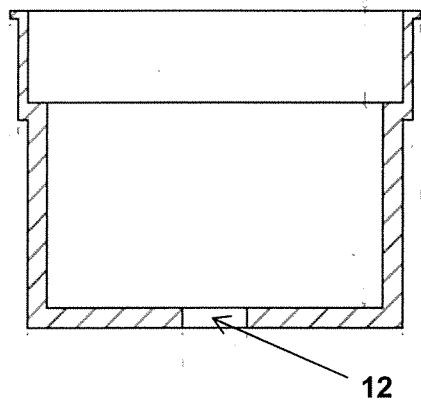


Figure 2

12

2



20

Figure 3

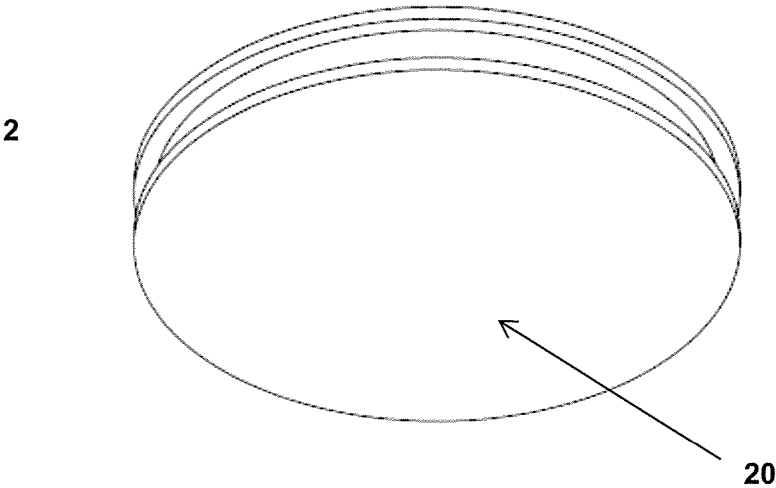


Figure 4

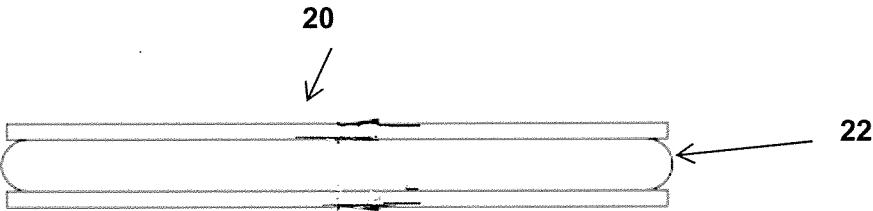
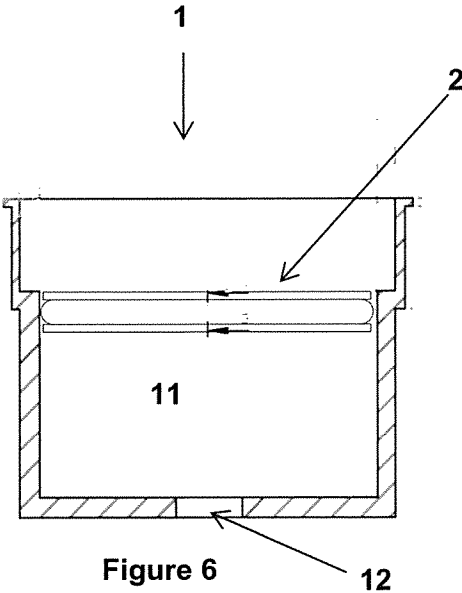


Figure 5



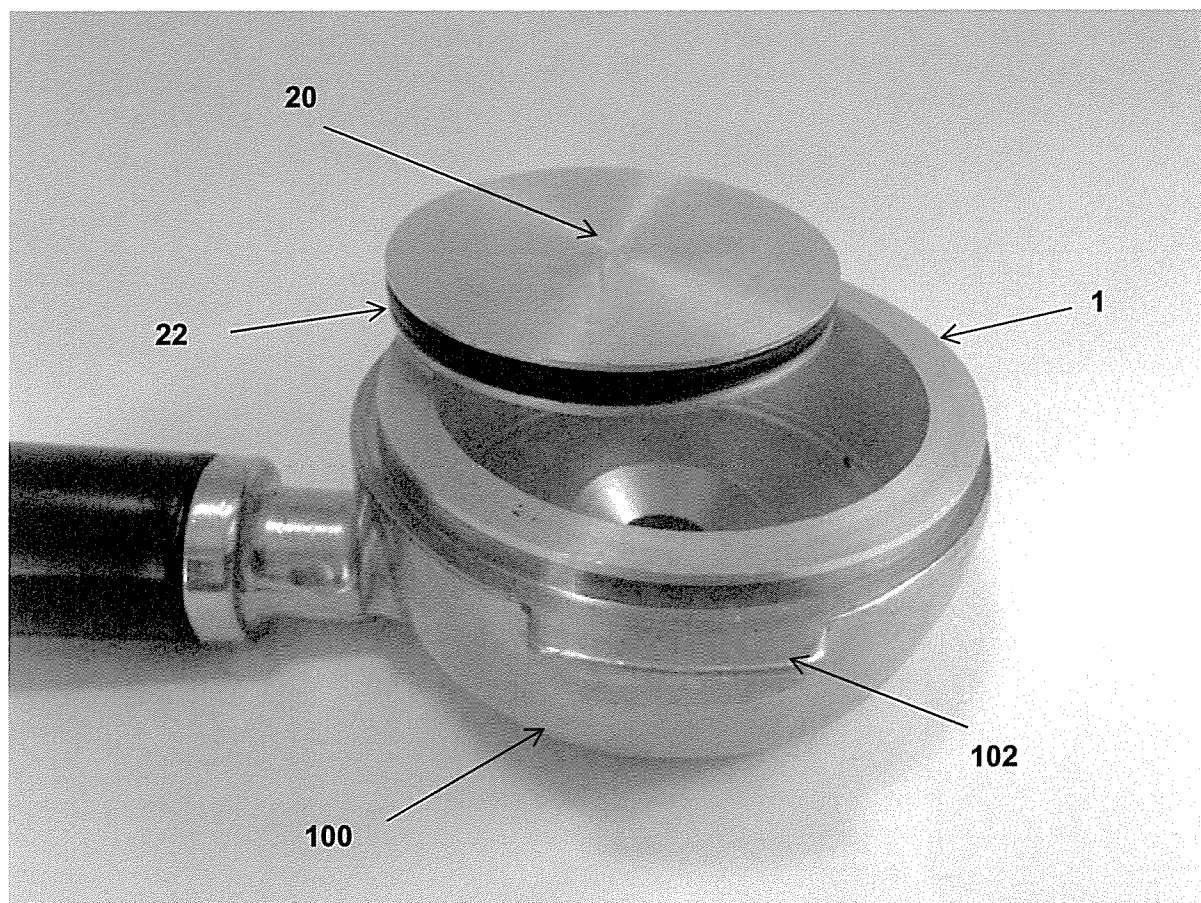


Figure 7

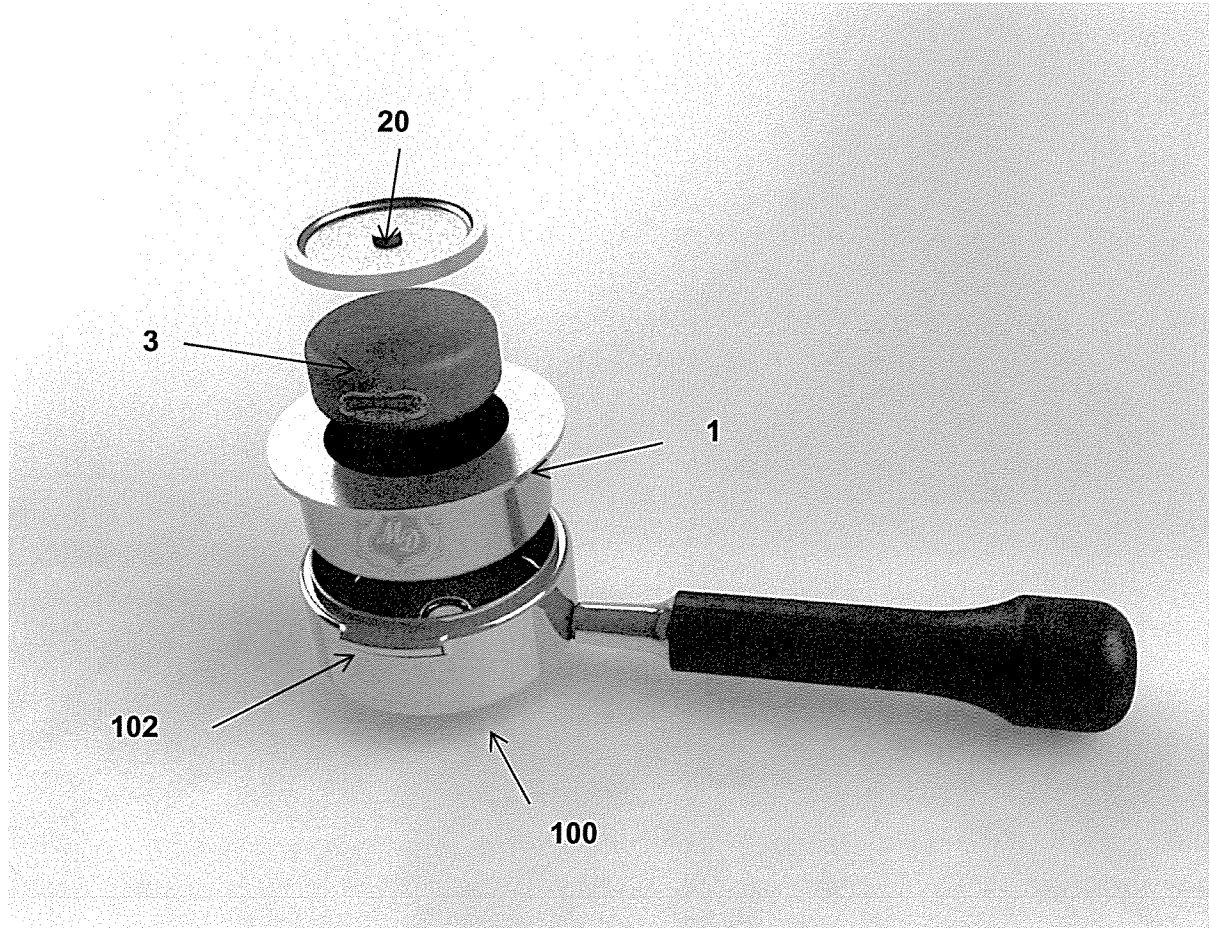
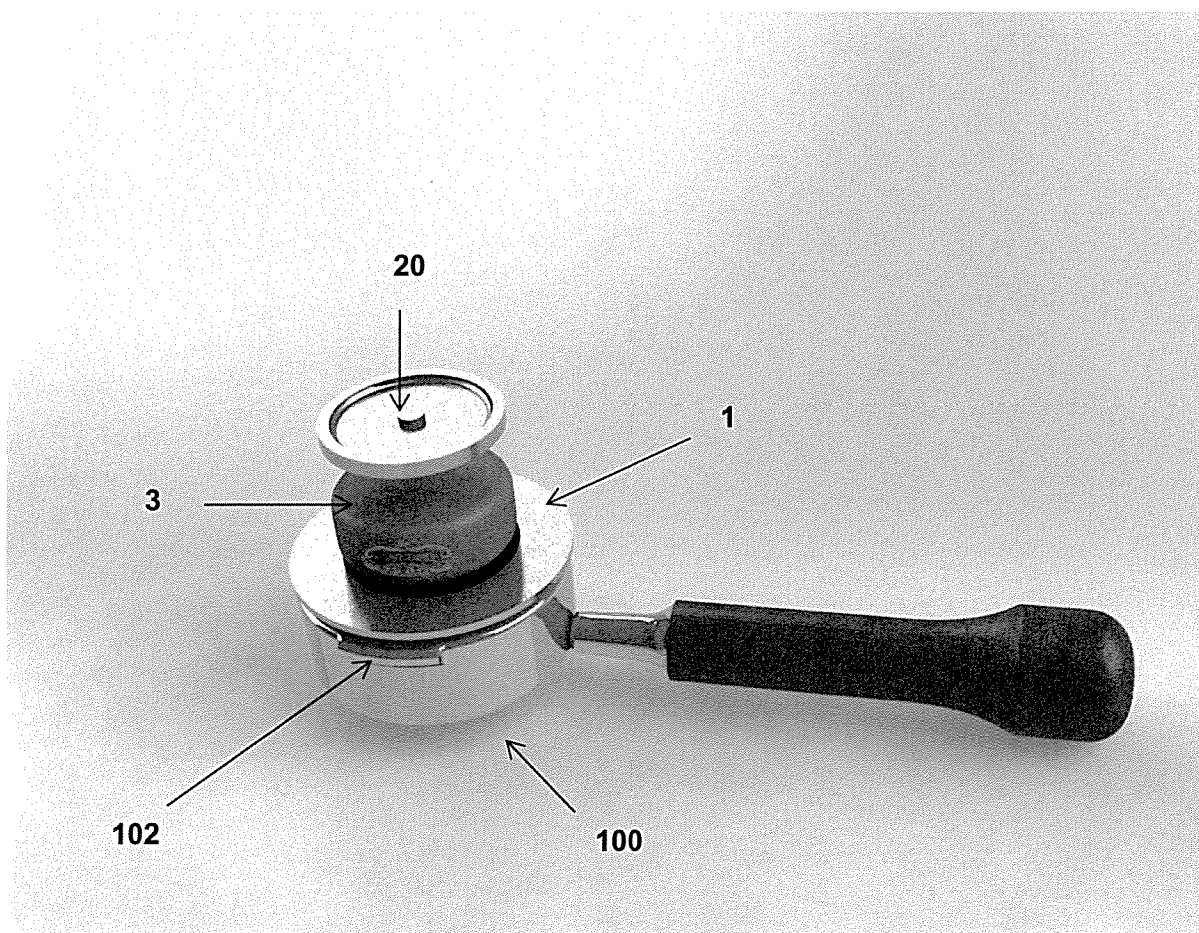


Figure 8a

**Figure 8b**

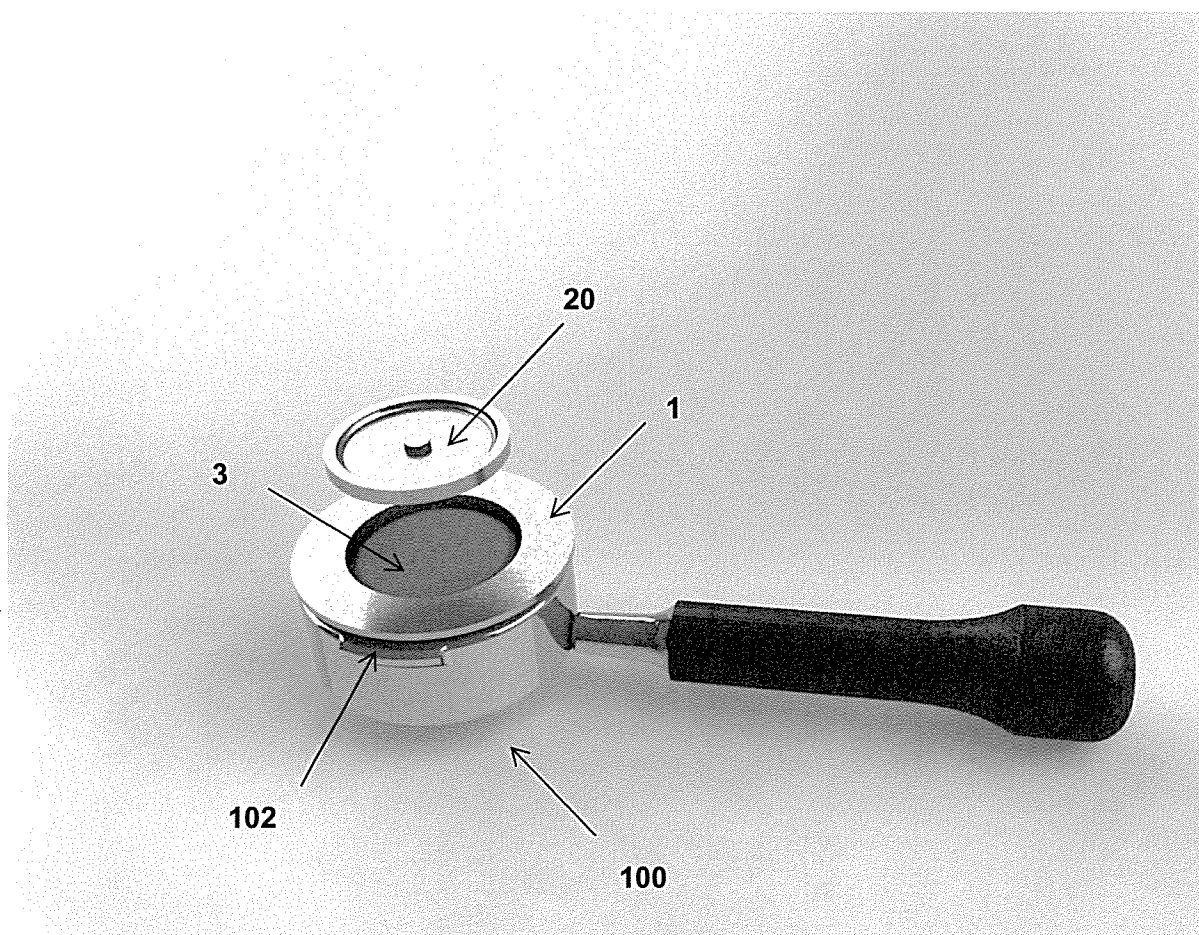


Figure 8c

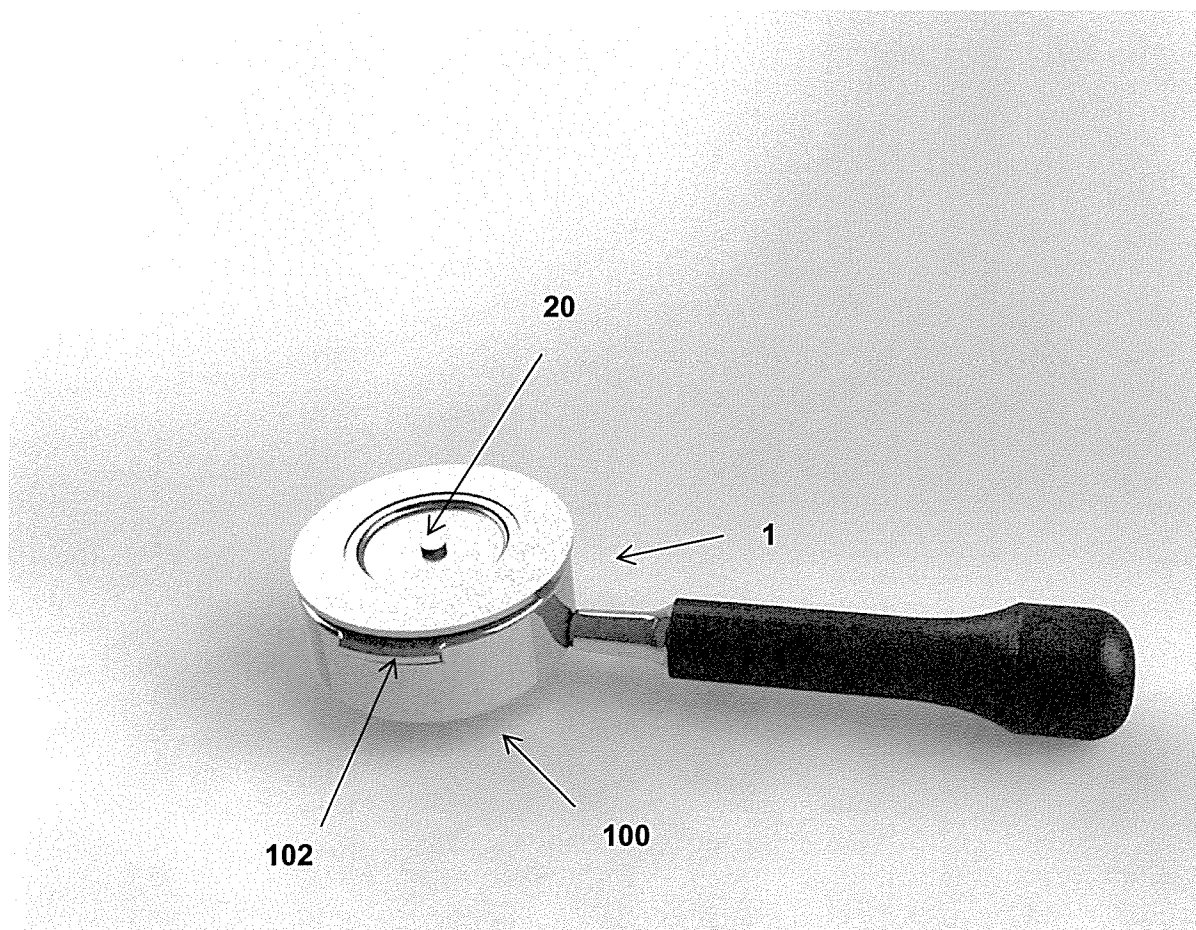


Figure 8d

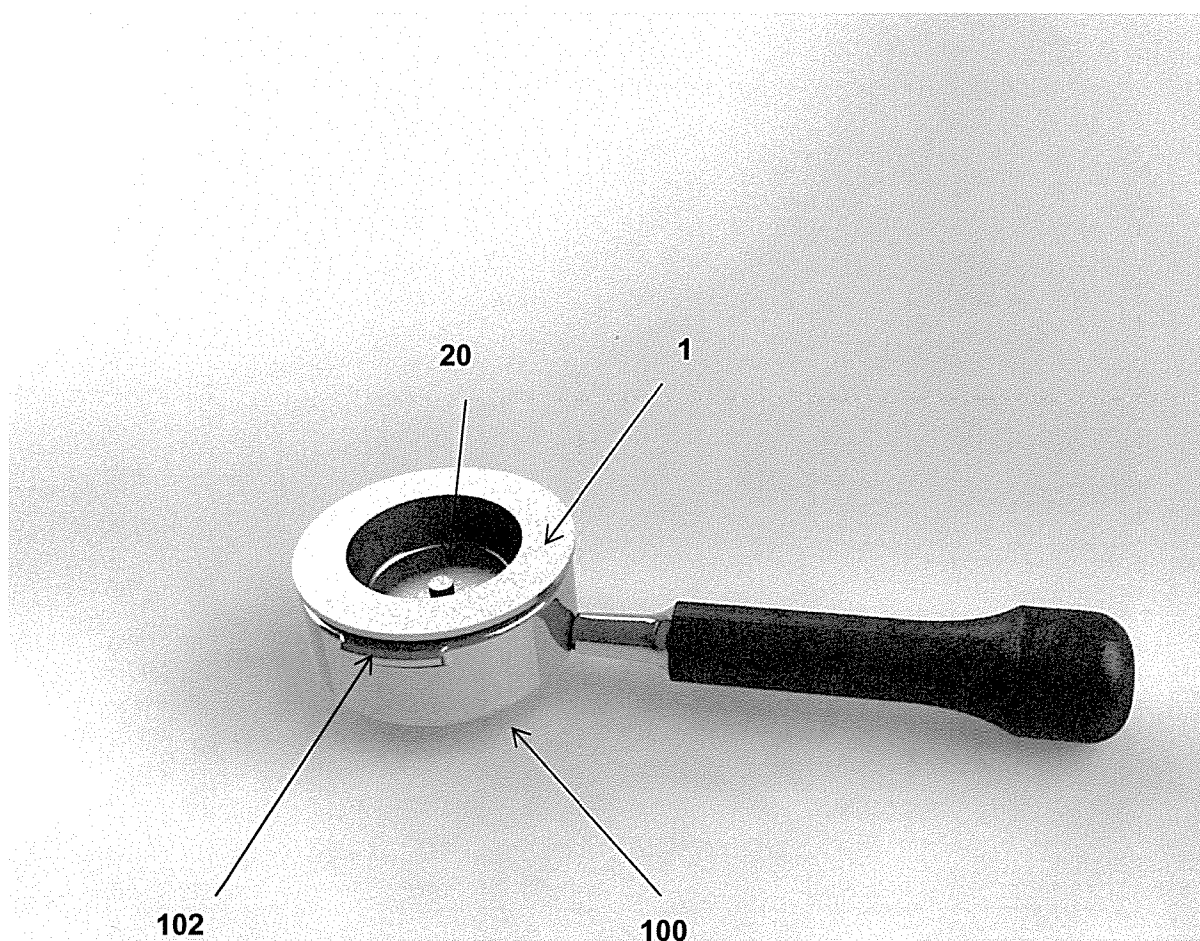


Figure 8e

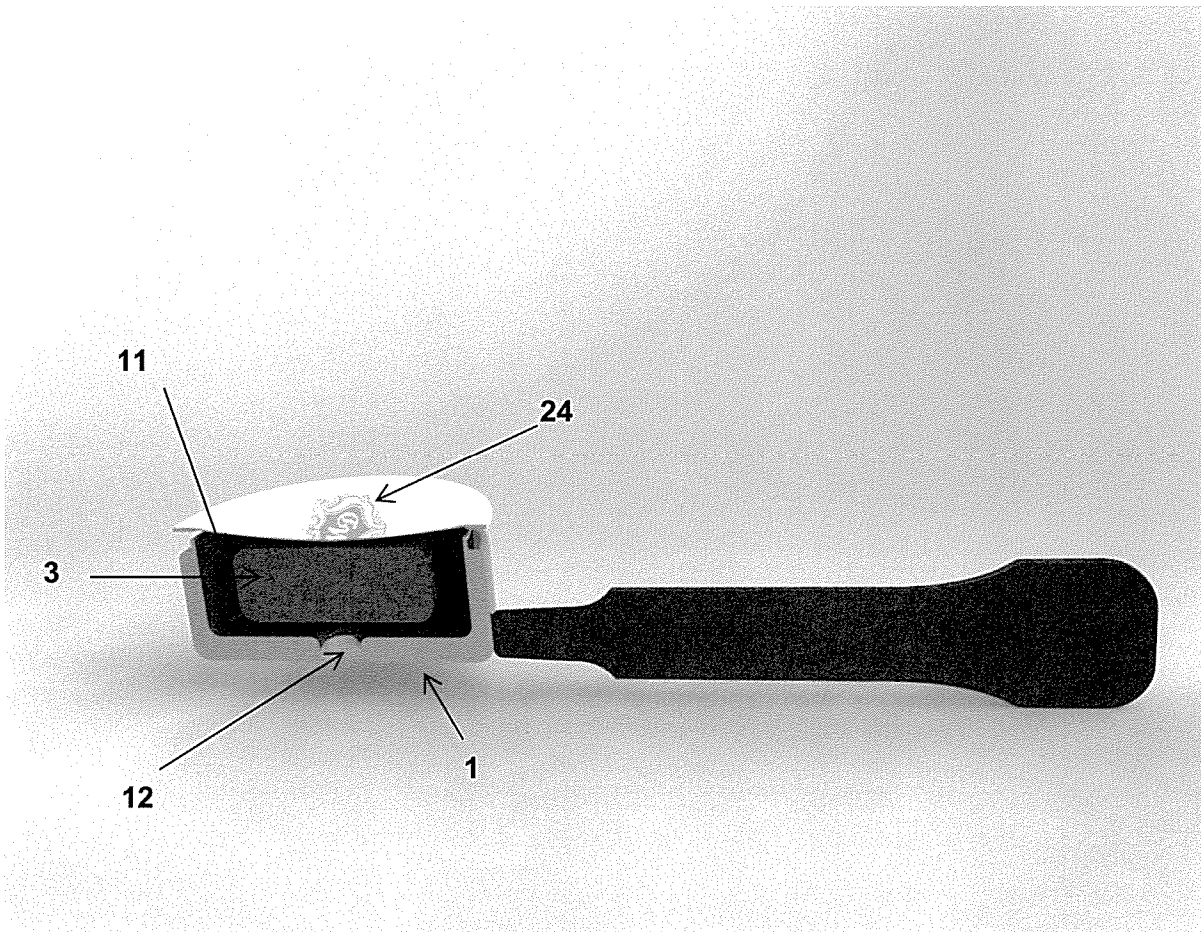


Figure 9a

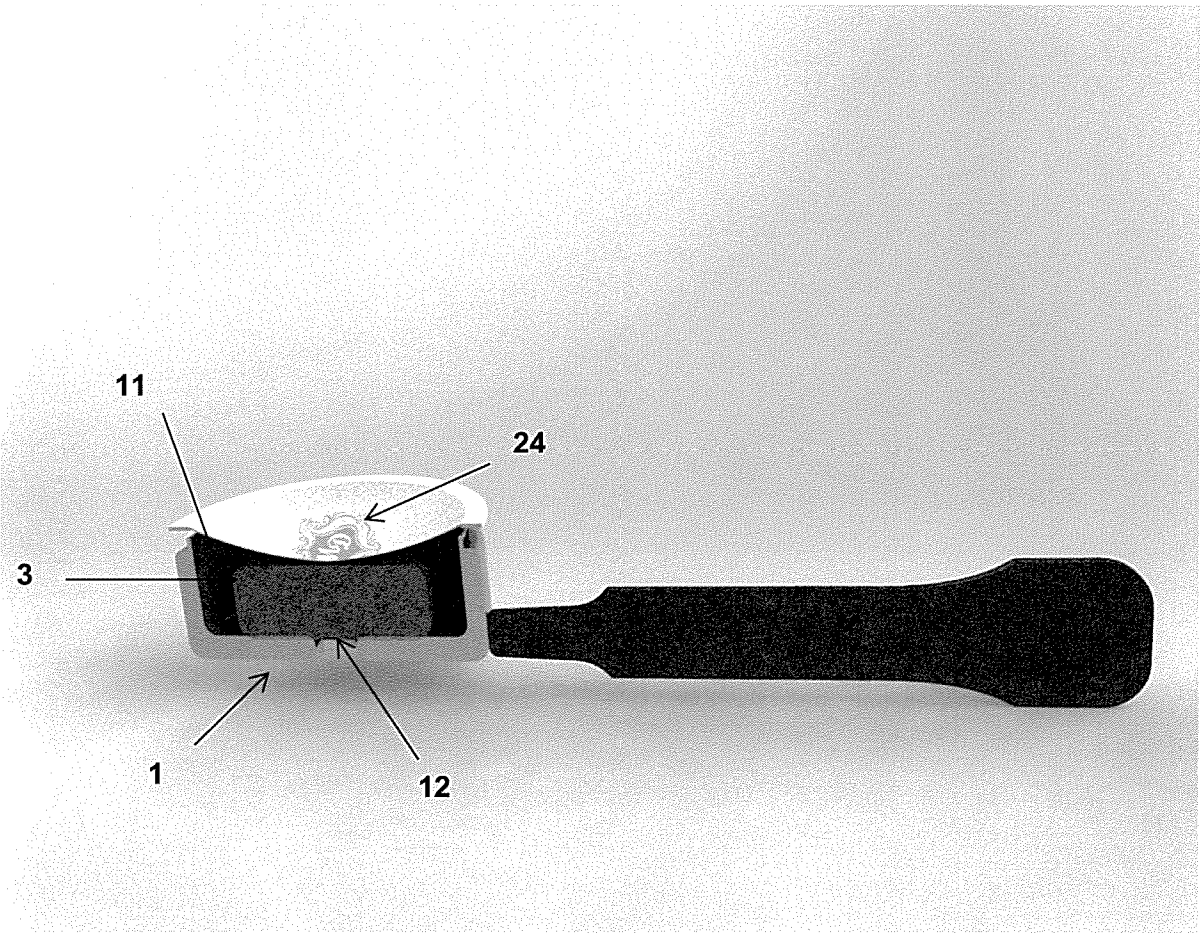


Figure 9b

INTERNATIONAL SEARCH REPORT

 International application No.
PCT/NZ2017/050072

A. CLASSIFICATION OF SUBJECT MATTER

A47J 31/44 (2006.01) A47J 31/06 (2006.01)

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)

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)

PATENW: A47J31/44, A47J31/06, A47J31/0657, A47J31/0663, A47J31/0668 & keywords (Filter+, holder+, receptacle+, chamber+, hole+, aperture+, orifice+, open+, perforat+, bottom+, base+, low+, under+, heat+, warm+, hot+, pressur+, compress+, squeez+, fluid+, liquid+, water+, melt+, soften+, flow+ and the like terms); Espacenet: A47J31/44, A47J31/06, A47J31/0657, A47J31/0663, A47J31/0668 & keywords (Filter+, holder+, receptacle+, chamber+, hole+, aperture+, orifice+, open+, perforat+, bottom+, base+, low+, under+, heat+, warm+, hot+, pressur+, compress+, squeez+, fluid+, liquid+, water+, melt+, soften+, flow+ and the like terms), applicant/inventor names; Google Patents: A47J31/44, A47J31/06, A47J31/0657, A47J31/0663, A47J31/0668 & keywords (Filter+, holder+, receptacle+, chamber+, hole+, aperture+, orifice+, open+, perforat+, bottom+, base+, low+, under+, heat+, warm+, hot+, pressur+, compress+, squeez+, fluid+, liquid+, water+, melt+, soften+, flow+ and the like terms), applicant/inventor names; AusPat and IP Australia internal databases: applicant and inventor names search.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	Documents are listed in the continuation of Box C	



Further documents are listed in the continuation of Box C



See patent family annex

* "A"	Special categories of cited documents: document defining the general state of the art which is not considered to be of particular relevance	"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
"E"	earlier application or patent but published on or after the international filing date	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O"	document referring to an oral disclosure, use, exhibition or other means	"&"	document member of the same patent family
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search 6 September 2017	Date of mailing of the international search report 06 September 2017
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA Email address: pct@ipaustalia.gov.au	Authorised officer Tom Choi AUSTRALIAN PATENT OFFICE (ISO 9001 Quality Certified Service) Telephone No. +61262832526

INTERNATIONAL SEARCH REPORT		International application No.	
Information on patent family members		PCT/NZ2017/050072	
This Annex lists known patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.			
Patent Document/s Cited in Search Report		Patent Family Member/s	
Publication Number	Publication Date	Publication Number	Publication Date
EP 1580144 A1	28 September 2005	EP 1580144 A1	28 Sep 2005
		EP 1580144 B1	01 Aug 2007
		AR 048338 A1	19 Apr 2006
		AR 048511 A1	03 May 2006
		AR 048512 A1	03 May 2006
		AU 2005226884 A1	06 Oct 2005
		AU 2005226884 B2	03 Jun 2010
		BR PI0509166 A	11 Sep 2007
		CA 2560841 A1	06 Oct 2005
		CA 2829795 A1	06 Oct 2005
		CA 2829894 A1	06 Oct 2005
		CN 1933753 A	21 Mar 2007
		CN 1933753 B	04 May 2011
		CN 101618784 A	06 Jan 2010
		CN 101618784 B	28 May 2014
		CN 101618785 A	06 Jan 2010
		CN 101618785 B	27 Jul 2011
		CN 101618786 A	06 Jan 2010
		CN 101618786 B	06 Apr 2011
		EP 1579791 A1	28 Sep 2005
		EP 1579791 B1	01 Aug 2007
		EP 1579792 A1	28 Sep 2005
		EP 1579792 B1	01 Aug 2007
		EP 1579792 B2	10 Nov 2010
		EP 1580143 A1	28 Sep 2005
		EP 1580143 B1	11 Jul 2007
		HK 1140172 A1	25 May 2012
		JP 2007530108 A	01 Nov 2007
		JP 4865697 B2	01 Feb 2012
		MX PA06010862 A	08 Mar 2007
		RU 2006137719 A	10 May 2008
		TW 200605830 A	16 Feb 2006
		TW I358272 B	21 Feb 2012
		TW 200538077 A	01 Dec 2005
		TW I359003 B	01 Mar 2012
		TW 200536502 A	16 Nov 2005
Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.			

INTERNATIONAL SEARCH REPORT		International application No.			
Information on patent family members		PCT/NZ2017/050072			
This Annex lists known patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.					
Patent Document/s Cited in Search Report		Patent Family Member/s			
Publication Number	Publication Date	Publication Number	Publication Date		
EP 1767467 A1	28 March 2007	TW I360403 B	21 Mar 2012		
		TW 201201749 A	16 Jan 2012		
		TW I360404 B	21 Mar 2012		
		US 2007186784 A1	16 Aug 2007		
		US 7836819 B2	23 Nov 2010		
		US 2010043644 A1	25 Feb 2010		
		US 8464630 B2	18 Jun 2013		
		US 2010043645 A1	25 Feb 2010		
		US 8464631 B2	18 Jun 2013		
		US 2010043646 A1	25 Feb 2010		
		US 8464632 B2	18 Jun 2013		
		WO 2005092160 A1	06 Oct 2005		
		EP 1767467 A1	28 Mar 2007		
		EP 1767467 B1	15 Apr 2009		
		AU 2006299282 A1	12 Apr 2007		
		AU 2006299282 B2	12 Jan 2012		
		BR PI0615858 A2	31 May 2011		
		CA 2622933 A1	12 Apr 2007		
		CN 101287662 A	15 Oct 2008		
		CN 101287662 B	05 Oct 2011		
		JP 2009508547 A	05 Mar 2009		
		JP 4990284 B2	01 Aug 2012		
		RU 2008115440 A	27 Oct 2009		
		TW 200722019 A	16 Jun 2007		
		TW I386179 B	21 Feb 2013		
		US 2007062375 A1	22 Mar 2007		
		US 7681492 B2	23 Mar 2010		
		WO 2007039032 A2	12 Apr 2007		
		End of Annex			
		Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001. Form PCT/ISA/210 (Family Annex)(July 2009)			