

(19)



NL Octrooiencentrum

(11)

2006222

(12) C OCTROOI

(21)

Aanvraagnummer: **2006222**

(51)

Int.Cl.:

A47J 31/42 (2006.01)**A47J 42/50** (2006.01)**A47J 31/40** (2006.01)

(22)

Aanvraag ingediend: **17.02.2011**

(30)

Voorrang:

17.02.2010 WO PCTNL2010050077**22.02.2010 NL 2004274****17.08.2010 NL 2005238****26.08.2010 NL 2005278****26.08.2010 NL 2005280**

(43)

Aanvraag gepubliceerd:

24.08.2011

(47)

Octrooi verleend:

07.08.2012

(45)

Octrooischrift uitgegeven:

15.08.2012

(73)

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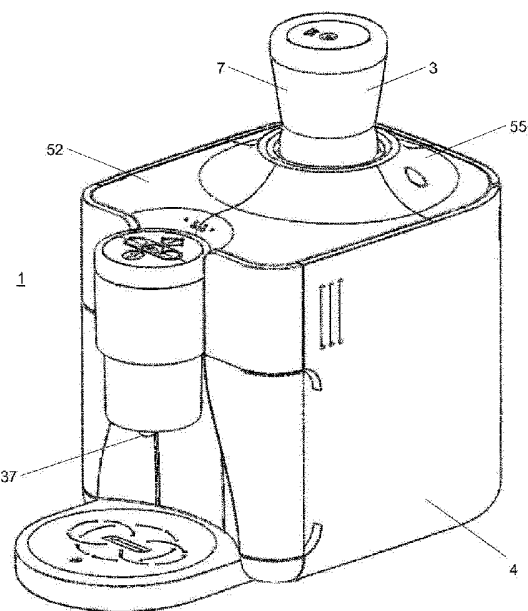
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A system for preparing a coffee beverage, ground coffee packaging cartridge for use with such a system, method of preparing a beverage by means of said system, and method of supplying ground coffee from said ground coffee packaging cartridge.

(57)

A coffee beverage system is described, including a coffee bean packaging cartridge and a coffee brewing apparatus comprising a grinder wherein the coffee bean packaging cartridge is removably connectable to the coffee grinder apparatus. The coffee bean packaging cartridge is arranged for holding and supplying of coffee beans and includes transportation means adapted for enabling transportation of the coffee beans. The coffee brewing apparatus comprises a motor for driving the transportation means of the first coffee bean packaging cartridge. The system further comprises a ground coffee packaging cartridge, preferably having transportation means for enabling transportation of ground coffee which transportation means, which is also removably connectable to the coffee grinder apparatus.



NL C 2006222

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A system for preparing a coffee beverage, ground coffee packaging cartridge for use with such a system, method of preparing a beverage by means of said system, and method of supplying ground
5 **coffee from said ground coffee packaging cartridge**

The present invention relates to a coffee beverage system according to the preamble of claim 1. In such a known system roasted coffee beans in packaging cartridges can be connected to the coffee brewing
10 apparatus that includes a grinding mechanism.

The present invention is concerned with a system for in a versatile way preparing a coffee beverage that allows for the use of not only coffee beans but also already ground coffee as a starting point. It is a further object of the present invention to propose a system for preparing coffee
15 beverages of the above referred to kind, which may be more compact. It is also an object of the present invention to provide alternative structures which may be less cumbersome in assembly and operation and which moreover can be made relatively inexpensively. A further object of the invention is to provide a system as described above with which the size of
20 ground coffee particles can be adjusted to the tastes of the or a particular consumer.

Unless stated otherwise, in the description and claims coffee beans are understood to be burnt/roasted coffee beans. Coffee beans in the description and claims may be understood to cover also fragmented coffee
25 beans, that is, coffee bean fragments, which coffee bean fragments are still to be ground for extracting desired coffee beverage. The coffee beans are for instance broken, before they are packaged. In an embodiment, at least a part of the coffee beans in the coffee bean package is divided into about thirty or less, in particular about fifteen or less, more particularly about ten
30 fragments or less. One coffee bean fragment then comprises for instance

one-thirtieth part, in particular one-fifteenth part, more particularly one-tenth part or more of a coffee bean. For instance, the coffee bean fragments comprise a half or a quarter of a coffee bean. An advantage of the use of coffee bean fragments compared with whole coffee beans can be that coffee
5 bean fragments can be supplied to the grinder relatively simply and/or that the package can be closed off relatively simply. This is because the coffee bean fragments are relatively small and hence can slide relatively easily through openings in the package and the apparatus and/or will block the coffee bean outlet and/or closing means less easily. As the coffee beans may
10 beforehand have been divided into fragments, though not ground, in the meantime comparatively more bean surface can come into contact with any ambient air than would be case with whole coffee beans. On the other hand, less bean surface will come into contact with air than would be the case with ground coffee, so that coffee bean fragments can be preserved better than
15 ground coffee beans. Only just before preparation of the coffee beverage are the coffee bean fragments ground for obtaining coffee beverage. In this description, therefore, coffee bean may also be understood to include a fragmented coffee bean, that is, which is still to be ground for preparing the desired coffee beverage.

20 To this end according to one preferred aspect of the invention there is provided a coffee beverage system, including a coffee bean packaging cartridge and a coffee brewing apparatus. The coffee been packaging cartridge is removable connected to the coffee brewing apparatus and it is arranged for holding and supplying multiple servings of coffee beans. It
25 includes a container comprising an interior volume and at least one exit opening defining a coffee bean outlet, the interior volume holding coffee beans and transportation means adapted for enabling transportation of the coffee beans from the interior volume towards the exit opening of the cartridge. The coffee apparatus comprises an entrance opening for receiving
30 coffee beans which are transported with the aid of the transportation means

towards the exit opening, a grinder for grinding coffee beans which have entered the coffee apparatus via the entrance opening and a brewing device for brewing coffee on the basis of ground coffee obtained by means of the grinder. The system is further provided with a metering chamber for
5 receiving coffee beans which are transported with the aid of the transportation means into the metering chamber. Preferably after being filled the metering chamber will hold a dosed amount of coffee beans. The metering chamber comprises a bottom portion which forms a part of the grinder. The bottom portion is arranged in the coffee apparatus for rotating
10 around an axis extending in a vertical direction. The system is arranged such that upon activation of the grinder the bottom portion is rotating around the vertical axis for transporting the coffee beans from the metering chamber into the grinder and for grinding the coffee beans. The use of a bottom portion of the metering chamber, which is part of the grinder and
15 which rotates for emptying the metering chamber also results in a decreased height of the system compared to the alternative option of providing a separate bottom plate of the metering chamber and a separate grinder. The inventive system is further provided with a ground coffee packaging cartridge which is also removably connectable to the coffee brewing
20 apparatus. The ground coffee packaging cartridge is arranged for being filled with and holding and supplying ground coffee. Preferably, the ground coffee packaging cartridge includes a container comprising an interior volume and at least one exit opening defining a ground coffee outlet, the interior volume being arranged for holding ground coffee, and
25 transportation means adapted for enabling transportation of ground coffee from the interior volume towards the exit opening of the ground coffee packaging cartridge. Advantageously, the coffee beverage system is arranged such that ground coffee is transported from the ground coffee packaging cartridge to the coffee brewing apparatus by gravity.

The metering chamber may be divided in a first chamber portion which is part of the respective cartridge and a second chamber portion which is part of the coffee brewing apparatus. The division of the metering chamber over the respective cartridge and the brewing apparatus enables to
5 provide an even more compact coffee beverage system.

In this regard it can be advantageous for emptying the metering chamber that the bottom portion has a conical shape such that the bottom portion extends downwardly in a direction extending perpendicular to and away from the vertical axis.

10 It is further advantageous for the coffee beverage system according to the invention that the first chamber portion comprises the exit opening and the second chamber portion comprises the entrance opening and that the exit opening extends above the entrance opening. This provides a metering chamber which can be made relatively inexpensive.

15 The metering chamber may be arranged for receiving a portion of coffee beans or ground coffee corresponding to a dosed amount of coffee beans or ground coffee which is preferably necessary for preparing a single serving of coffee beverage. The transportation means may comprise a part which is movable relative to the metering chamber for effectively
20 transporting the coffee beans or ground coffee towards the metering chamber upon driving of said transportation means. The coffee brewing apparatus may be provided with a motor and a vertically extending drive shaft wherein said drive shaft may be releasably connected with the transportation means of the respective cartridge for driving and thereby
25 moving the transportation means upon rotation of the drive shaft by means of the motor. The movable part may comprise a bottom and/or a plurality of vanes, which rotates around a further vertical axis upon driving the transportation means.

Furthermore, the transportation means may comprise a
30 downwardly extending bottom wall for transporting the coffee beans or

ground coffee towards the metering chamber under the influence of gravity. Alternatively, the transportation means may comprise a downwardly extending bottom wall for transporting the coffee beans or ground coffee towards the metering chamber under the influence of gravity only.

5 The first chamber portion may be provided with a top wall which limits the volume of the metering chamber in an upwardly vertical direction wherein the bottom portion of the second chamber portion limits the volume of the metering chamber in a downwardly vertical direction.

 Alternatively or additionally, the first chamber portion may be
10 provided with an upstanding side wall comprising an inlet opening for entering the coffee beans or ground coffee by means of the transportation means into the metering chamber.

 It is further advantageous for the coffee beverage system according to the invention, when the transportation means are arranged for
15 transporting the coffee beans or ground coffee at least in a horizontal direction for transporting the coffee beans or ground coffee into the metering chamber and/or towards the inlet opening of the metering chamber.

 The grinder may be positioned centrically with respect to the second chamber portion. It may comprise a conical part lying in the
20 direction of the vertical axis, wherein the conical part rotates around the vertical axis upon driving the grinder. The grinder may be driven by a motor. The drive shaft and the grinder may be driven by different motors.

 The coffee brewing apparatus may comprise connection means for the removable connection to the respective packaging cartridge. The
25 connection means may comprise a recess at an upper side of the coffee brewing apparatus, the recess being surrounded by a side wall and being configured for receiving a corresponding part protruding from a lower side of the respective packaging cartridge. The side wall may protrude from the upper side of the coffee brewing apparatus and be covered by a housing.

According to an embodiment of the present invention, the side wall comprises openings for receiving bayonet elements of the respective packaging cartridge. The respective packaging cartridge should be inserted into the recess such that the bayonet elements are inserted in the openings and then rotated in order to be connected to the coffee brewing apparatus. The side wall may comprise blocking elements for impeding a further rotation of the respective packaging cartridge, when it has reached its final position. In this way, the user can easily and reliably mount the cartridge on the coffee brewing apparatus. Preferably, the respective packaging cartridge should be rotated approximately 50 degrees in order to reach its final position. The connection between the cartridge and the coffee brewing apparatus may be a snap connection.

Furthermore, the recess may comprise rotatable protruding edges at its center, which are fixed at the end of the driving shaft.

The vertical axis around which the bottom portion of the second chamber portion is rotatable may run centrally through the bottom portion of the second chamber portion. The bottom portion may extend downwardly in a direction extending perpendicular to and away from the vertical axis all around the vertical axis.

The respective packaging cartridge may comprise closing means for closing the outlet when the respective packaging cartridge is not connected to the coffee brewing apparatus. In this way it is avoided that coffee beans or ground coffee fall/falls out of the respective packaging cartridge when it is not connected to the coffee brewing apparatus.

The closing means may be configured for opening the outlet when the respective packaging cartridge is connected to the coffee brewing apparatus.

The closing means comprises a closure member at the bottom side of the container comprising the outlet and a rotatable closing disk having an opening. In order to connect the respective packaging cartridge to

the coffee brewing apparatus the opening of the rotatable closing disk may be brought in a position aligned with the outlet.

The closure member may comprise a pair of fletching arms and the closure disk comprises a detent, which in the closed position is caught
5 behind the fletching arms.

The exit opening may be associated with a removable sealing element sealing the interior volume prior to activation of the respective cartridge wherein preferably said sealing element prevents gasses to escape from the cartridge. The beverage system may comprise means for disrupting
10 and displacing the sealing element, preferably when the respective cartridge is connected to the brewing apparatus for the first time. The sealing element may be a sealing membrane.

The system may be arranged such that, in use, the grinding device is activated for emptying the metering chamber and for grinding the
15 coffee beans or ground coffee collected and/or held in the metering chamber. The grinding device may be activated longer than is required for emptying or at least substantially completely emptying the metering chamber and for grinding all the coffee beans or for further grinding all the ground coffee collected in the metering chamber. In this way, the emptying of the
20 metering chamber is reliably performed. Previous to the emptying of the metering chamber and the grinding of the coffee beans or further grinding of all the ground coffee, in a first step the transportation means may be driven for filling the metering chamber. The transportation means may be driven longer than is required for completely filling or at least substantially
25 completely filling the metering chamber. In this way, the dosing of the metering chamber with coffee beans or ground coffee is reliably performed.

The coffee brewing apparatus may be provided with a control device for controlling the first motor and/or the grinder for performing these steps. The control device may control the brewing device wherein the control
30 device may be arranged such that, in use, in a step which follows after that

the emptying and grinding step is completed the brewing device is brewing coffee based on the ground coffee and heated water heated by a heating device of the coffee brewing apparatus. The volume of the metering chamber may be such that if it is completely filled with coffee beans the amount of
5 beans corresponds with one dose of coffee beans for preparing a cup of coffee. The one dose of coffee beans or ground coffee may comprise 5-11, preferably 6-8 grams of coffee beans.

According to the invention the respective packaging cartridge can also be designed to be (re)fillable with coffee beans or ground coffee by
10 the consumer. Preferably the respective packaging cartridge is filled with coffee beans or ground coffee and is not designed to be refillable with coffee beans or ground coffee. In that case the respective cartridge is a packaging for the coffee beans or ground coffee to be sold in a shop.

According to a further embodiment, the system further
15 comprises a sensor arranged for detecting if the respective packaging cartridge is connected to the coffee brewing apparatus. The sensor is configured to signal a result of the detection to the controller. The sensor may be a switch, for example a micro switch. The respective packaging cartridge comprises a protruding part for activating the switch when it is
20 connected to the coffee brewing apparatus. The protruding part may be located below or above one of the bayonet elements and may activate the switch when the respective packaging cartridge reaches its final position. The switch may be located in an opening in the sidewall surrounding the recess at the upper side of the coffee brewing apparatus, the protruding part
25 activating the switch through the opening. The switch may be hidden behind horizontal wall segments in the side wall and the opening may be a slit between the horizontal wall segments, the protruding part fitting in the slit. The control device may be arranged for controlling the first motor and the grinder so that they can be activated only if it has been detected that the
30 respective packaging cartridge is present. In this way, it is ensured that the

system works with packaging cartridges especially designed thereto. These cartridges may be sold by the manufacturer of the system filled with coffee beans or ground coffee of an elevated quality, thereby guaranteeing the end consumer a good flavor coffee beverage.

5 The system may further comprise an insert piece that is removable connectable to the coffee brewing apparatus *in lieu* of a respective packaging cartridge, preferably in a same or similar way as a respective packaging cartridge by using means for connecting the insert piece to the coffee brewing apparatus, which are the same or similar as the
10 means used for connecting a packaging cartridge to the coffee brewing apparatus. In this case, the insert piece comprises bayonet elements and a protruding part, preferably located below or above one of the bayonet elements, for activating the switch when the insert piece is connected to the coffee brewing apparatus. Since the detection of the connected coffee bean or
15 ground coffee packaging cartridge and the insert piece is executed in the same way, the control device of the coffee brewing apparatus does not see any difference between these two situations. This means that the functionality of the coffee brewing apparatus is also the same.

 The purpose of connecting an insert piece to the coffee brewing
20 apparatus may be twofold. It is usable for unlocking the coffee brewing apparatus, so that the motor(s) and the grinder(s) may be activated, also if no coffee bean packaging cartridge or ground coffee packaging cartridge is connected thereto. This is useful for service and maintenance.

 Alternatively, the insert piece may be used for supplying the
25 coffee brewing apparatus with coffee beans or ground coffee, because the respective packaging cartridges are designed not to be refillable. A favorable embodiment of an insert device for this purpose comprises a cavity having an interior volume and at least one exit opening defining a coffee bean or ground coffee outlet, the interior volume being arranged for receiving coffee
30 beans or ground coffee. The insert piece further comprises closing means for

closing the outlet when the insert piece is not connected to the coffee brewing apparatus or not connected to the coffee brewing apparatus in its final position. The closing means are configured for opening the outlet when the insert piece is connected to the coffee brewing apparatus in its final position. A user fills the cavity with coffee beans or ground coffee when the insert piece is connected to the coffee brewing apparatus in an entry position and then rotates the insert piece to its final position, resulting in the coffee beans or ground coffee to enter the coffee brewing apparatus to be ground.

Advantageously, the system may be arranged such that upon activation of the grinder the bottom portion is rotating around the vertical axis for transporting the dose of coffee beans or ground coffee from the metering chamber into the grinder and for grinding the coffee beans or further grinding the ground coffee. The bottom part with the conical shape may lie in the direction of the first vertical axis, wherein the conical part rotates around the first vertical axis upon driving the grinder. The grinder may comprise a lower grinding disk extending around the bottom portion and an upper grinding disk extending above the lower grinding disk. The grinder may be rotationally driven by a second motor, resulting in the rotation of the bottom part with the conical shape and the lower grinding disk. Upon driving the bottom portion and lower grinding disk coffee beans or ground coffee are moved in an outwardly extending radial direction between the lower grinding disk and the upper grinding disk and in that the coffee beans are crunched and cut into ground coffee or ground coffee is further crunched, because a vertical distance between the lower grinding disk and the upper grinding disk decreases in the outwardly extending radial direction.

The grinder may be a no contamination grinder, wherein after grinding the coffee beans or ground coffee and supplying the ground coffee to the coffee brewing device, substantially no ground coffee remains. As a

result, when the cartridge is replaced by one with a different blend, the coffee of the new blend is not contaminated by the previously used blend.

The second chamber portion may comprise about 100- X% of the volume of the metering chamber and the first chamber portion may
5 comprise about X% of the volume of the metering chamber wherein X is in the range of 2-50, preferably in the range of 5-40, more preferably in the range of 15-30. By placing a larger part of the metering chamber in the brewing apparatus a further decrease in the height of the beverage system may be obtained. This may be an issue, for example in case that the
10 beverage system is to be placed on a kitchen sink under a cupboard.

In an embodiment the system is arranged such that, in use, the grinding device is activated for emptying the metering chamber and for grinding the coffee beans or ground coffee collected in the metering chamber. Preferably the system is arranged such that in use the grinding
15 device is activated longer than is required for emptying or at least substantially completely emptying the metering chamber and for grinding all the coffee beans or further grinding all the ground coffee collected in the metering chamber. In an embodiment previous to the emptying of the metering chamber and the grinding of the coffee beans or further grinding of
20 the ground coffee, in a first step the transportation means is driven for filling the metering chamber with coffee beans or ground coffee. In particular the transportation means is driven longer than is required for completely filling or at least substantially completely filling the metering chamber.

25 The coffee bean packaging cartridge is preferably filled with coffee beans and/or the ground coffee packaging cartridge is preferably filled with ground coffee. The packaging cartridge may be filled with one dose, or alternatively, may be filled with multiple servings.

Since the inventive coffee beverage system includes a ground
30 coffee packaging cartridge which is also removably connectable to the coffee

brewing apparatus, the user is enabled to connect a ground coffee packaging cartridge to the coffee brewing apparatus. Then the grinder subjects ground coffee from the ground coffee packaging cartridge to a further grinding operation before brewing commences. In this way, the user is able to re-

5 calibrate the grind size distribution of ground coffee to meet his or her taste.

Preferably the ground coffee packaging cartridge is not only arranged for being filled with and holding ground coffee but also for supplying ground coffee, in particular to the coffee brewing apparatus. In this way no additional means are necessary to transport ground coffee from

10 the package to the brewing apparatus. A particular compact system is obtained when the ground coffee packaging cartridge includes a container comprising an interior volume and at least one exit opening defining a ground coffee outlet, the interior volume being arranged for holding ground coffee; and transportation means adapted for enabling transportation of

15 ground coffee from the interior volume towards the exit opening of the ground coffee packaging cartridge.

Preferably the coffee beverage system is arranged such that ground coffee is transported from the ground coffee packaging cartridge to the coffee brewing apparatus by gravity.

20 For ease of use it is advantageous when the ground coffee packaging cartridge is adapted to the coffee brewing apparatus so that, if the ground coffee packaging cartridge is connected to the coffee brewing apparatus, ground coffee which is transported with the aid of the transportation means of the ground coffee packaging cartridge towards the

25 exit opening of the ground coffee packaging cartridge can be received by the coffee brewing apparatus via the entrance opening for preparing coffee. Preferably the transportation means of the ground coffee packaging cartridge then can be configured to be actuated by the coffee brewing apparatus. Alternatively the transportation means of the ground coffee

packaging cartridge can be configured to be actuated independently from the coffee brewing apparatus.

According to an embodiment of the invention the transportation means are configured to be actuated manually. This enables
5 the user to control the amount of ground coffee that is supplied in an easy way, by manually actuating the transportation means until the desired amount is reached.

In an embodiment the transportation means of the ground coffee bean package include a moveable structure that is, at least partly,
10 present in the interior volume for contacting the ground coffee, and wherein the transportation means further include manually operable actuation means that are, at least partly, provided outside of the interior volume for manually actuating the moveable structure. By means of the manually operable actuation means, the moveable structure can be moved from
15 outside the interior volume. In this way a force can be applied to the ground coffee, e.g. for forcing the ground coffee to the outlet. Alternatively a blockage for movement of the ground coffee by another force, such as gravity, to the outlet can be removed by moving the moveable structure. In these ways, a user can control the supply of ground coffee to the coffee
20 brewing apparatus.

Unless stated otherwise, in the description and claims ground coffee is understood to be burnt/roasted ground coffee.

In an embodiment the transportation means of the ground coffee packaging cartridge include a rotatable element, such as a rotatable
25 axle, that is at least partly located inside the interior volume. Such a rotatable element offers the possibility to provide a compact structure inside the housing, thus substantially preventing an unnecessary increase of a volume occupied by the ground coffee packaging cartridge.

In an embodiment the actuation means are arranged for rotating the rotatable element. Preferably the actuation means include a crank handle connected to the rotatable element.

In an embodiment the rotatable element is at least partly
5 formed as a conveyor screw. Preferably the moveable structure includes a threaded bore through which the conveyor screw is engaged. Such a structure may be compact while at the same time providing the possibility for rather accurate control of the supply of ground coffee to the outlet.

In an embodiment the moveable structure is rigidly connected
10 to the rotatable element, and wherein the moveable structure is provided with at least one first aperture for letting the ground coffee pass there through, wherein the ground coffee packaging cartridge is provided with at least one second aperture that is positioned, in use, above or below the at least one first aperture and that offers entrance to the outlet, wherein, as a
15 result of rotating the rotatable element, the at least one aperture can be aligned with the at least one second aperture. Preferably the second aperture is formed by the outlet. As a result, the moveable element in use rotates together with the rotatable element. As a result of aligning the at least one aperture with the at least one second aperture, a certain amount of
20 ground coffee may move, e.g. fall, towards the outlet and out of the interior volume. Thus, by repeatedly aligning the at least one aperture with the at least one second outlet, the supply of ground coffee can be controlled. It may thus be clear that, in this or other embodiments, the outlet may comprise a plurality of apertures, e.g. comprising the at least one second aperture. The
25 plurality of apertures that may form the outlet may or may not be mutually interconnected.

In an embodiment the moveable structure includes a plunger.

Preferably the ground coffee packaging cartridge is further
provided with a barrier in the interior volume arranged for hindering
30 passage of ground coffee towards the outlet. Such a barrier may

substantially prevent uncontrolled movement of ground coffee towards the outlet.

Preferably the barrier includes a valve for hindering passage of the ground coffee towards the outlet. Such a valve may substantially
5 prevent uncontrolled movement of ground coffee towards the outlet. Preferably, the valve includes a flexible element that is deformed when the valve is opened.

In an embodiment the barrier includes an internal wall spaced apart from, in use, a top part of the housing, wherein the transportation
10 means are arranged for moving the ground coffee through a space between the, in use, top part of the housing and the internal wall. The internal wall may, in use, form a barrier for ground coffee to reach the outlet. By moving the ground coffee upwards by means of the moveable structure, the ground coffee may be transported over the internal wall. In this way, the ground
15 coffee may reach the outlet.

Preferably the internal wall separates a first part of the interior volume from a second part of the interior volume, wherein the moveable structure is arranged in the first part of the interior volume, and wherein the outlet can be reached via the second part of the interior volume.

20 In an embodiment the moveable structure of the ground coffee packaging cartridge is resiliently attached to the ground coffee packaging cartridge by means of a resilient member, so that the moveable structure is moveable by means of the manually operable actuation means repeatably between a first position and a second position while deforming the resilient
25 member, e.g. from the first position to the second position while deforming the resilient member and vice versa. In use, deformation of the resilient member may e.g. occur during movement from the first position to the second position. During movement back from the second position to the first position, i.e. "vice versa", the deformation of the resilient member may be
30 decreased or may even be completely cancelled. As a result, the resilient

member promotes movement of the moveable structure from the second position back to the first position. As a result, it is sufficient to apply a force on the actuation means substantially in only one direction. This facilitates relatively easy operation of the actuation means.

5 Preferably the second coffee bean packaging cartridge is provided in the interior volume with a passage for ground coffee towards the outlet, wherein in the second position the passage is at least partly obstructed by the moveable structure and in the first position the passage is obstructed less by the moveable structure than in the second position and
10 optionally is not obstructed by the moveable structure. However, alternatively, in the first position the passage is at least partly obstructed by the moveable structure and in the second position the passage is obstructed less by the moveable structure than in the first position and optionally is not obstructed by the moveable structure.

15 Preferably, the first position is located, in use, above or below the second position. Preferably, at least part of the ground coffee is located, in use, above the moveable structure of the ground coffee packaging cartridge. If the first position is located above the second position, and at least part of the ground coffee is located above the moveable structure,
20 moving the moveable structure repeatedly between the first position to the second position, may result in a shaking motion of the ground coffee. During movement from the second position to the first position, the ground coffee may move, in use, upwards, driven by the resiliently deformable member. During movement from the first position to the second position, the ground
25 coffee may move, in use, downwards, driven by gravity. Such a shaking motion is considered advantageous, as it may promote movement of the ground coffee through the interior volume towards the first position.

 In an embodiment, the container of the ground coffee packaging cartridge is provided with a recess for receiving the drive shaft of the coffee
30 brewing apparatus. In this way, the ground coffee packaging cartridge,

although being manually operable, can be used in combination with a coffee brewing apparatus provided with a drive member, such as a motor. Such a drive shaft may be arranged for driving transportation means of an alternative coffee bean packaging cartridge. Preferably the container is
5 closed in the recess.

Alternatively the recess may e.g. be arranged for preventing mechanical contact between the drive shaft and the package. In this way it is enabled that the package may be used in combination with the brewing apparatus or in addition another external apparatus that is provided with a
10 drive member, while the package can also be used in combination with another external apparatus that is not provided with an external drive member.

Preferably, the transportation means are positioned for preventing, in use, driving of the transportation means by means of the
15 drive shaft of the coffee brewing apparatus.

In an embodiment the ground coffee packaging cartridge comprises a scooper for holding and supplying the ground coffee, the scooper, when connected to the coffee brewing apparatus, being aligned with the entrance opening thereof, the scooper being configured to work also as
20 transportation means by turning around its axis, thereby emptying the ground coffee into the entrance opening. The dosing of the amount of ground coffee to be supplied to the coffee brewing apparatus is very simple here, it is done by filling the scooper.

Preferably the ground coffee packaging cartridge comprises a
25 handle for manually turning the scooper.

According to an alternative embodiment the ground coffee packaging cartridge comprises a hopper for holding the ground coffee. The hopper preferably has an outlet, which is aligned with the entrance opening of the coffee brewing apparatus, when the ground coffee packaging cartridge
30 is connected thereto. The transportation means advantageously comprise a

closure plate, which in a first position at least to a large extent and preferably entirely closes the outlet, thereby hindering passage of the ground coffee towards the entrance opening and in a second position does not obstruct or not substantially obstruct the outlet and wherein the

5 transportation means further include manually operable actuation means for actuating the closure plate from the first to the second position and vice versa. The amount of ground coffee supplied to the coffee brewing apparatus may be dosed by moving the closure plate of the transportation means between the first position, wherein ground coffee is supplied to the coffee

10 brewing apparatus and the second position, wherein this is not the case.

Preferably the closure plate in the second position at least substantially delimits a first part of the interior volume of the hopper from a second part of the interior volume of the hopper, thereby hindering the passage of ground coffee from the first part to the second part. The amount

15 in the second part corresponds to a single dose, which when the closure plate is in the first position, is provided to the coffee brewing apparatus.

Preferably the closure plate forms the first part of a virtual cylinder, the other part of the cylinder being open, wherein the manually operable actuation means are configured for rotating the closure plate to the

20 first and second position, respectively. With each rotation, a dose of ground coffee corresponding to the second part of the interior volume of the hopper is supplied to the coffee brewing apparatus.

The ground coffee packaging cartridge may comprise a funnel shaped holder for holding the ground coffee and an outlet for releasing the

25 ground coffee from the holder. The outlet is positioned at an upper end of the funnel shaped holder and, when the ground coffee packaging cartridge is connected to the coffee brewing apparatus is aligned with the entrance opening thereof, wherein the transportation means are spiral shaped transportation means and, in use, rotatably actuated for driving the ground

30 coffee out of the funnel shaped holder towards the outlet The amount of

ground coffee supplied to the coffee brewing apparatus is in this case dependent on the time period that the spiral shaped conveyor means are rotated with ground coffee in the funnel shaped holder.

Preferably the spiral shaped conveyor means are formed by a spiral shaped trajectory for the ground coffee on the inner wall of the funnel, obtained by a spiral shaped protruding edge on the inner wall. The spiral shaped conveyor means may comprise a non-moving block element, impeding the ground coffee to continue rotating on the inner wall, thereby driving the ground coffee to follow the spiral shaped trajectory upwards towards the outlet. As a result, the ground coffee in the funnel shaped holder is driven steadily and reliably towards the outlet thereof.

According to a still further embodiment, the ground coffee packaging cartridge is configured for shaking or vibrating the ground coffee to encourage flow thereof towards an outlet of the ground coffee packaging cartridge for releasing the ground coffee. In this way, an alternative manner of providing the ground coffee to the coffee brewing apparatus is obtained. Preferably the ground coffee packaging cartridge comprises a first module, which is a ground coffee container and a second module, which comprises a motor, the first module being removably connectable to the coffee brewing apparatus and the second module being removably connectable to the first module, when the first module is connected to the coffee brewing apparatus. As a result of this modular structure, the ground coffee of the first module may either be supplied to the coffee brewing apparatus due to the operation of the motor in the second module or, in case that the second module is not connected to the first module, due to operation of the transportation means present in the coffee brewing apparatus.

Still further, the outlet of the ground coffee packaging cartridge is open when it is connected to the coffee brewing apparatus and closed when it is disconnected, and wherein the second module, preferably in a ground coffee refill mode, is connectable to the first module *in lieu* of the

coffee brewing apparatus. Preferably, in the ground coffee refill mode, the second module is connected in a same or similar way to the first module as the coffee brewing apparatus, resulting in the outlet of the first module being open. As a result, the first module, i.e. the coffee bean container, may
5 be refilled with ground coffee in a user friendly way.

In a further embodiment the coffee brewing apparatus comprises connection means for the removable connection to the coffee bean packaging cartridge as well as the ground coffee packaging cartridge, the connection means comprising a recess at an upper side of the coffee brewing
10 apparatus, the recess being surrounded by a side wall and being configured for receiving a corresponding part protruding from a lower side of the coffee bean packaging cartridge and the ground coffee packaging cartridge, respectively.

Preferably, the side wall protrudes from the upper side of the
15 coffee brewing apparatus.

A user can easily and reliably mount the packaging cartridge and the package on the coffee brewing apparatus when the side wall comprises openings for receiving bayonet elements of the coffee bean packaging cartridge and the package, respectively, in particular when the
20 coffee bean packaging cartridge and the ground coffee packaging cartridge comprise the bayonet elements. Especially advantageous is then that the coffee bean packaging cartridge and the ground coffee packaging cartridge should be inserted into the recess such that the bayonet elements are inserted in the openings and then rotated in order to be connected to the
25 coffee brewing apparatus, wherein the side wall comprises blocking elements for impeding a further rotation of the coffee bean packaging cartridge and the ground coffee packaging cartridge, when they have reached their final position. For ease of manual mounting the cartridge and the package the coffee bean packaging cartridge and the ground coffee

packaging cartridge should be rotated approximately 50 degrees in order to reach their final position.

In order to be able to consistently provide uniform doses of ground coffee in an easy and reproducible manner the coffee brewing
5 apparatus is further provided with a metering chamber for receiving ground coffee which is transported with the aid of the transportation means into the metering chamber. In particular the metering chamber is dimensioned to hold a predetermined amount of coffee beans and ground coffee, respectively.

10 In an embodiment, the coffee beverage system comprises a dosing device for supplying a predetermined dose of ground coffee to the coffee brewing apparatus. The dosing device can contribute to the purpose that not more and not less than approximately a predetermined dose of ground coffee is supplied to the brewing device. In a further embodiment the
15 dosing device forms part of the ground coffee packaging cartridge. For instance, the ground coffee packaging cartridge is provided with the predetermined dose of ground coffee so that the package can in principle be emptied into the brewing apparatus.

In an alternative embodiment of the coffee beverage system
20 according to the invention the dosing device forms part of coffee brewing apparatus. In this way, a predetermined dose of ground coffee can be taken from the package, while for instance a residual part remains behind in the package.

Preferably the dosing device comprises a displaceable dosing
25 element.

A predetermined dose of ground coffee comprises for instance a weight of ground coffee of approximately equal to 50 grams or less, in particular 20 grams or less, more particularly 15 grams or less.

In an embodiment the coffee brewing apparatus comprises a
30 ground coffee transport path that extends from the entrance opening of the

coffee brewing apparatus to the brewing device, wherein the coffee beverage system is arranged such that prior to preparing the coffee beverage substantially any remnant ground coffee remaining behind in ground coffee transport path is removed. This prevents ground coffee of a previous
5 preparation of a coffee beverage remaining behind and being entrained in the coffee beverage to be prepared next.

A versatile coffee beverage system is provided when it comprises a first ground coffee packaging cartridge in which a first kind of coffee is contained and a second ground coffee packaging cartridge in which
10 a second kind of coffee is contained, the first and second kinds being different, wherein the coffee beverage system is arranged such that after coffee beverage has been prepared with the coffee brewing apparatus with ground coffee from the first ground coffee packaging cartridge, the first ground coffee packaging cartridge can be disconnected from the coffee
15 brewing apparatus and the second ground coffee packaging cartridge can be connected to the coffee brewing apparatus after which coffee beverage can be prepared with the coffee brewing apparatus with coffee grounds from the second ground coffee packaging cartridge substantially without contamination from ground coffee from the first ground coffee packaging
20 cartridge.

To allow a user to easily replace or refill a package an embodiment of the coffee beverage system according to the invention comprises a check device for checking if any ground coffee is present in the ground coffee outlet of the ground coffee packaging cartridge. Preferably the
25 coffee beverage system further comprises means to detect that a ground coffee packaging cartridge no longer contains sufficient ground coffee for preparing a serving of coffee beverage, such as a cup of coffee beverage. Preferably said means to detect that a ground coffee packaging cartridge no longer contains sufficient ground coffee for preparing a serving of coffee

beverage operates by detecting the emptiness of the ground coffee packaging cartridge.

To maintain the quality of ground coffee as much as possible an embodiment of the coffee beverage system is arranged such that the amount
5 of air that comes into the ground coffee packaging cartridge is at most equal to the volume of the ground coffee that has been supplied from the ground coffee packaging cartridge to the coffee brewing apparatus and/or that the interior of the coffee beverage system where ground coffee is permitted to be present is designed to be substantially air-tight with respect to an
10 environment of the coffee beverage system, while preferably said interior of the coffee beverage system is formed by the inner space of the ground coffee packaging cartridge, a ground coffee transport path from the ground coffee packaging cartridge to the brewing device, and the brewing device itself.

A reproducible way of brewing a coffee beverage is obtained
15 when the coffee brewing device comprises a horizontal brew sleeve for holding a ground coffee puck across the diameter of the brew sleeve and for performing brewing of the ground coffee puck. Preferably, moving parts of the brewing device are driven by a single drive mechanism. In an advantageous way of making a tasteful coffee beverage the coffee brewing
20 apparatus is arranged to prepare coffee beverage under high pressure which is conventional for preparing espresso coffee, under atmospheric pressure which is conventional in pour-on drip extraction systems, or under slightly elevated pressure in the order of 1.1-2, in particular 1.1-1.5 bar.

The grinder is in particular operable to grind already ground
25 coffee, and is preferably switchable to a configuration in which it allows ground coffee to pass there through without undergoing a further grinding operation.

The present invention further relates to a ground coffee packaging cartridge for use with the coffee beverage system according to the
30 invention, the ground coffee packaging cartridge being arranged for holding

and supplying ground coffee and including transportation means adapted for enabling transportation of ground coffee towards an outlet of the ground coffee packaging cartridge, in particular towards entrance opening of a coffee brewing apparatus when it is connected thereto; the ground coffee
5 packaging cartridge comprising bayonet elements to be inserted into the openings of the side wall, which protrudes from the upper side of the coffee brewing apparatus, in particular for connecting the ground coffee packaging cartridge to a coffee brewing apparatus, wherein the transportation means are configured to be actuated independently from the coffee brewing
10 apparatus.

According to a further aspect of the invention a method is provided for preparing a beverage by means of a coffee brewing apparatus as described herein above. The method comprises the following steps: In a filling step the metering chamber may be filled with coffee beans or ground
15 coffee for collecting coffee beans or ground coffee in the metering chamber. The metering chamber may be completely filled with coffee beans or ground coffee or at least substantially completely filled with coffee beans or ground coffee. In an emptying and grinding step the grinding device is activated for emptying the metering chamber and for grinding coffee beans or further
20 grinding ground coffee collected in the metering chamber. The grinding device may be activated longer than is required for emptying or at least substantially completely emptying the metering chamber and for grinding all the coffee beans or all the ground coffee collected in the metering chamber.

25 The invention also relates to a method of preparing a beverage by means of a coffee beverage system according to the invention, the method comprising the following steps:

- connecting the coffee bean packaging cartridge to the coffee brewing apparatus,

- rotating the vertically extending drive shaft with the motor means thereby driving and moving the transportation means of the coffee bean packaging cartridge for transporting coffee beans towards the exit opening of the coffee bean packaging cartridge;

5 - grinding coffee beans which have entered the coffee brewing apparatus via the entrance opening thereof to produce ground coffee;

- brewing coffee on the basis of ground coffee;

- connecting the ground coffee packaging cartridge to the coffee brewing apparatus thereof,

10 - actuating the transportation means of the ground coffee packaging cartridge for transporting ground coffee towards the exit opening of the ground coffee packaging cartridge independently from the coffee brewing apparatus;

- brewing coffee on the basis of ground coffee from the ground
15 coffee packaging cartridge.

The invention still further relates to a method of supplying ground coffee from a ground coffee packaging cartridge according to the invention to an external apparatus, the method comprising the following steps:

20 - holding ground coffee in a housing that encloses an interior volume of the ground coffee packaging cartridge,

- releasing ground coffee from the interior volume through the outlet of the housing,

- transporting ground coffee by means of the transportation
25 means towards the outlet, wherein transporting ground coffee includes contacting ground coffee by means of the moveable structure of the transportation means,

- actuating the moveable structure by means of manually operable actuation means of the transportation means.

Further subsidiary features of preferred embodiments of the present invention are described in the following description and defined in the appended claims.

Exemplary embodiments of the present invention are
5 hereinafter described with reference to the accompanying drawings, in which:

Figure 1 shows a perspective view of an embodiment of the coffee beverage system according to the present invention with the coffee bean packaging cartridge mounted to the coffee brewing apparatus;

10 Figure 2 shows a perspective view of an embodiment of the coffee beverage system according to the present invention without the coffee bean packaging cartridge mounted to the coffee brewing apparatus;

Figure 3A shows a cross sectional view of a part of the coffee brewing apparatus according to figure 1 in perspective;

15 Figure 3B shows a cross sectional view of the grinder used in the coffee brewing apparatus according to figure 1 in perspective;

Figure 3C shows a cross sectional view of the grinder used in the coffee brewing apparatus according to figure 1;

20 Figure 4A shows a perspective detail view of the upper part of the coffee brewing apparatus of figure 2;

Figure 4B shows a perspective detail view of the upper part of the coffee brewing apparatus of figure 2 with a closing plate in open position;

Figure 4C shows a further perspective detail view of the upper part of the coffee brewing apparatus of figure 2;

25 Figure 5A and 5B are two isometric exploded views of an impellor used in the coffee bean packaging cartridge together with a drive shaft coupling end;

Figure 6A is an exploded isometric view of a coffee bean packaging cartridge according to an embodiment of the invention;

Figures 6B, 6C and 6D show different perspective views of the coffee bean packaging cartridge shown in Figure 6A;

Figure 7A is a detailed exploded isometric view of the bottom part of the coffee bean packaging cartridge of Figure 6A;

5 Figure 7B is a detailed exploded view of the bottom part of Figure 7A as seen in an opposite direction;

Figure 7C is a perspective view of a closing plate of the bottom part shown in figures 7A and 7B;

Figure 8 is a cross-sectional detail of the assembled bottom part;

10 Figure 9 is a bottom perspective detail of the bottom part of Figure 7B with a delatching protrusion of the coffee brewing apparatus;

Figure 10 shows a cross sectional view of the coffee bean packaging cartridge connected to the coffee brewing apparatus;

Figure 11A shows an insert piece of a first type;

15 Figure 11B shows the insert piece of figure 11A connected to the coffee brewing apparatus;

Figure 12A shows an insert piece of a second type;

Figure 12B shows the insert piece of figure 12A connected to the coffee brewing apparatus in an entry position;

20 Figure 12C shows the insert piece of figure 12A connected to the coffee brewing apparatus in a final position;

Figure 13A shows in cross-section a first embodiment of a ground coffee packaging cartridge in its not yet activated position;

25 Figure 13B shows the ground coffee packaging cartridge of Figure 13A in its activated position;

Figure 13C shows the component of the ground coffee packaging cartridge of Figures 13A and 13B in half and in an exploded arrangement,

Figure 13D is a perspective view of the ground coffee packaging cartridge of the first embodiment in a condition prior to use;

Figure 14A is a cross-section of a second embodiment of the ground coffee packaging cartridge in its condition prior to use;

Figure 14B is a cross-section similar to Figure 14A, but with the ground coffee packaging cartridge having been activated for use;

5 Figure 14C shows the component of the ground coffee packaging cartridge of Figures 14A and 14B in half and in an exploded arrangement;

Figure 14D is a perspective view of the second embodiment in a condition ready for use;

10 Figure 15A is a cross-section through a third embodiment of ground coffee packaging cartridge in a condition prior to use;

Figure 15B is a cross-section similar to Figure 15A but with the ground coffee packaging cartridge activated for use;

Figure 15C is an exploded view of the components of the third embodiment of the ground coffee packaging cartridge, shown in half;

15 Figure 15D is a perspective view of the third embodiment of the ground coffee packaging cartridge in its assembled form;

Figure 16A is a cross-section showing a fourth embodiment of the ground coffee packaging cartridge in its closed position prior to use;

20 Figure 16B is a cross-section similar to Figure 16A but with the ground coffee packaging cartridge in an opened condition ready for use;

Figure 16C is a first perspective exploded view of the fourth embodiment of the ground coffee packaging cartridge showing the parts in an inversed arrangement;

25 Figure 16D is a second perspective exploded view of the fourth embodiment in an arrangement normal to the position of use;

Figure 16E is a bottom view of the fourth embodiment of the ground coffee packaging cartridge with its sealing membrane removed;

30 Figure 16F is a partially cross-sectioned perspective view of a modified closure member for use with the fourth embodiment of the ground coffee packaging cartridge;

Figure 17 in cross section shows an alternative form of transportation for use in a ground coffee packaging cartridge;

Figure 18 is a plan view of a portion of the transportation means of Figure 17;

5 Figure 19 is a cross section through another ground coffee packaging cartridge according to the invention employing yet another form of transportation means;

Figure 20 is an isometric view of a flexible valve for use in the embodiment of Figure 19;

10 Figure 21 is a variation on the embodiment of Figure 19 using an additional synchronizing means in the coffee brewing apparatus;

Figure 22A in cross section shows a further embodiment of transportation means as part of a ground coffee packaging cartridge;

15 Figure 22B is an isometric ghost view of the package of Figure 22A;

Figure 23A is a cross sectional view through another embodiment of transportation means of a ground coffee packaging cartridge in a first position;

20 Figure 23B is an isometric view of the transportation means of Figure 23A in the first position;

Figure 23C is a cross sectional view of the transportation means of Figure 23A in a second position;

Figure 23D is an isometric view of the transportation means of Figure 23A in the second position;

25 Figure 24A in cross section shows another alternative form of transportation means for a ground coffee packaging cartridge in a first position;

Figure 24B shows the alternative form of the transportation means of Figure 24A in a second position;

Figure 25A shows in cross-section a ground coffee packaging cartridge for holding and supplying ground coffee according to a first aspect of a first manually operated package embodiment of the invention;

5 Figure 25B shows a notch, a plunger, a ridge, and a housing in a cross-section;

Figure 25C shows a variation of the ground coffee packaging cartridge according to the first aspect;

10 Figure 26 shows in cross-section a ground coffee packaging cartridge for holding and supplying ground coffee according to a second aspect of the first manually operated package embodiment of the invention;

Figure 27 shows in cross-section a ground coffee packaging cartridge for holding and supplying ground coffee according to a third aspect of the first embodiment of the invention;

15 Figure 28A shows in cross-section a ground coffee packaging cartridge for holding and supplying ground coffee according to a fourth aspect of the first manually operated package embodiment of the invention, with a moveable structure in a first position;

20 Figure 28B shows in cross-section the ground coffee packaging cartridge for holding and supplying ground coffee according to the fourth aspect of the first manually operated package embodiment of the invention, with the moveable structure in a second position;

Figure 29A shows a perspective view of a ground coffee packaging cartridge according to a second manually operated package embodiment of the invention mounted to the coffee brewing apparatus;

25 Figure 29B shows a perspective view of the ground coffee packaging cartridge shown in Figure 29A disconnected from the coffee brewing apparatus;

Figure 29C shows in cross section the ground coffee packaging cartridge shown in Figure 29A holding an amount of ground coffee;

Figure 29D shows in cross section the ground coffee packaging cartridge shown in Figure 29A supplying ground coffee to the coffee brewing apparatus;

5 Figure 30A shows a perspective view of a ground coffee packaging cartridge according to a third manually operated package embodiment of the invention mounted to the coffee brewing apparatus;

Figure 30B shows the ground coffee packaging cartridge shown in Figure 30A holding an amount of ground coffee;

10 Figure 30C shows the ground coffee bean package shown in Figure 30A supplying ground coffee to the coffee brewing apparatus;

Figures 31A and 31B show two different perspective views of a ground coffee packaging cartridge according to a fourth embodiment of the invention in which the package is independently operable from the coffee brewing apparatus;

15 Figure 31C shows how, in use, the ground coffee is supplied by the ground coffee packaging cartridge shown in Figures 31A and 31B to the coffee brewing apparatus;

20 Figure 32A shows in perspective view how a first module and a second module of a ground coffee packaging cartridge according to a fifth independently operable package embodiment of the invention should be connected to each other in a ground coffee supply mode;

Figure 32B shows a perspective view of the ground coffee packaging cartridge shown in Figure 32A with the first and the second module thereof connected to each other in the ground coffee supply mode;

25 Figure 32C shows a perspective view of the ground coffee packaging cartridge shown in Figure 32A mounted to the coffee brewing apparatus;

30 Figure 32D shows in perspective view how the first module and the second module of the ground coffee packaging cartridge shown in Figure 32A should be connected to each other in a ground coffee refill mode;

Figure 32E shows a perspective view of the ground coffee packaging cartridge shown in Figure 32A with the first and the second module thereof connected to each other in the ground coffee refill mode;

Figure 32F shows how the ground coffee packaging cartridge is
5 refilled with ground coffee;

Figure 33 shows a schematic diagram of a further embodiment of a ground coffee packaging cartridge connected to a coffee brewing apparatus;

Figure 34 shows schematically a section of an embodiment of a
10 ground coffee packaging cartridge with multiple compartments;

Figure 35 shows an exploded perspective representation of an embodiment of a ground coffee packaging cartridge with multiple compartments and a dosing device;

Figure 36 shows an embodiment of a ground coffee packaging
15 cartridge with multiple compartments, a dosing device, and a corresponding activation element;

Figure 37 shows an embodiment of a ground coffee packaging cartridge with a closure;

Figure 38 schematically shows a section of an embodiment of a
20 ground coffee packaging cartridge and a dosing device shown separately from the package;

Figure 39 shows an exploded perspective drawing of an embodiment of a ground coffee packaging cartridge and a dosing device;

Figure 40 shows a section of an embodiment of a ground coffee
25 packaging cartridge with a dosing device;

Figure 41 shows an exploded perspective drawing of an embodiment of a ground coffee packaging cartridge with a dosing device;

Figure 42A-V schematically show steps in a dosing method; and

Figures 43 to 48 show an embodiment of a ground coffee
30 packaging cartridge in various stages of the beverage preparation operation.

In Figure 1 a system 1 for preparing coffee beverages is shown. The system 1 includes a coffee bean packaging cartridge 3 and a coffee brewing apparatus 4. The coffee bean packaging cartridge 3 is removably
5 connected to the coffee brewing apparatus 4. Figure 2 shows the coffee brewing apparatus without the coffee bean packaging cartridge 3 mounted thereon. The coffee bean packaging cartridge 3 comprises a container 7 comprising an interior volume for containing coffee beans and an exit opening. These coffee beans are roasted and include generally roasted half
10 beans. Preferably the coffee beans packaging cartridge 3 is closed airtight and/or under vacuum before it is placed on the coffee brewing apparatus 4. Also the coffee bean packaging cartridge 3 can be in the form of a disposable packaging, so that it can be thrown away after it has been emptied.

Referring now to Figure 3A, the coffee beverage system 1 will be
15 described in more detail. The cartridge comprises transportation means 6 for enabling transportation of the coffee beans from the interior volume of the container 7 (only partially visible in Figure 3A) towards the exit opening 29 of the cartridge 3. The coffee brewing apparatus is provided with an entrance opening 9 for receiving coffee beans which are transported by
20 means of the transportation means towards the exit opening 29. The exit opening 29 extends above the coffee bean entrance opening 9 of the coffee brewing apparatus 4.

A lower part of the container 7 comprises a funnel 8 which forms part of the transportation means 6. The beans of the coffee bean packaging
25 cartridge 3 are guided by means of the funnel 8 towards the exit opening 29 of the cartridge. The transportation means further comprise an impellor 11 having several flexible vanes 13. Upon driving the transportation means, in this example by rotating the impellor around a second axes 19 extending in a vertical direction the coffee beans are transported towards the exit
30 opening 29.

The system further comprises a metering chamber 15. The metering chamber is divided in a first chamber portion 23 which is part of the cartridge and a second chamber portion 25 which is part of the coffee brewing apparatus. The first chamber portion is located above the second chamber portion. The first chamber portion comprises the exit opening 29 of the cartridge and the second chamber portion comprises the entrance opening of the coffee apparatus. The first chamber portion is provided with an upstanding side wall 32 comprising an inlet opening 21 for letting pass coffee beans into the metering chamber which coffee beans are transported by means of the transportations means towards the exit opening of the cartridge. The transportation means are thus configured for transporting the coffee beans towards and into the metering chamber 15 of the coffee brewing apparatus 4 upon driving of the transportation means. This driving is performed by means of a first motor 17 of the coffee brewing apparatus, driving a drive shaft 18 of the coffee brewing apparatus extending along a second vertical axis 19. Due to the driving, the impellor 11 and the vanes 13 rotate around the second vertical axis 19. In this way, the coffee beans are driven in a horizontal direction to the inlet opening 21 of the metering chamber 15. The cartridge comprises a small trickle through edge 22 to avoid the uncontrolled entering of coffee beans in the metering chamber 15 when the impeller 11 is not rotating. The metering chamber 15 comprises the first chamber portion 23 in the cartridge 3 and the second chamber portion 25 in the brewing apparatus 4. The bottom 26 of the metering chamber at least comprises a bottom portion 27 which is part of a grinder 28 for grinding coffee beans. The coffee beans leave the first chamber portion 23 and thereby the cartridge 3 via the exit opening 29 of the cartridge 3 and enter the second chamber portion 25 and thereby the coffee brewing apparatus via the entrance opening 9. The size of the metering chamber is limited by a top wall 31, the bottom 26 and an upstanding side wall 32. The upstanding side wall 32 comprises the upstanding side wall 34 of the first

chamber portion and an upstanding side wall 33 of the second chamber portion. The second chamber portion comprises about 100- X% of the volume of the metering chamber and the first chamber portion comprises about X% of the volume of the metering chamber wherein X is in the range of 2-50, preferably in the range of 5-40, more preferably in the range of 15-30.

The bottom part 27 of the metering chamber has a conical shape such that the bottom portion extends downwardly in a direction extending perpendicular to and away from a first vertical axis 35. The grinder 28 in this embodiment is positioned centrally with respect to the second chamber portion 25. Referring now to figures 3B and 3C, the grinder will be described in more detail. The grinder comprises a second motor (grinder drive motor) 101 and an upper grinding disk/wheel 102, which may be ceramic or steel. The upper grinding disk/wheel is rotationally fixed in its position. Furthermore, the second chamber 103 of the metering chamber is shown (referred to by reference 25 in figure 3), which works as dosing funnel. The grinder furthermore comprises a manual adjustment lock 104 to adjust the grind fineness setting by the consumer. The upper grinding disk 102 is moved up or down in respect to the lower grinding disk/wheel 109 when this key is turned. When the adjustment lock is operated the upper grinding disk moves up and down and the lower grinding disk stays in place. In this way the size of the grind at the exit of the grinding disks, i.e. where they almost touch the outside of the grinder, is determined. The grinder furthermore comprises an exit location 105 for ground coffee out of the circular transport channel 110 into the ground coffee chute 106. The ground coffee chute is a funnel pointing downwards into the brewing device 46 of the coffee brewing apparatus, which is open on the top and placed exactly below this chute when grinding. A rotating drive cone 107 (referred to as bottom part with conical shape 27 of the metering chamber in figure 3) is fixed on the main drive shaft 108. This cone ensures the movement and guidance of the beans out of the metering chamber into the grinding section

consisting of the upper grinding disk 102 and the lower grinding disk 109, which may be ceramic or steel. The upper grinding disk 102 and the lower grinding disk 109 have a suitable milled shape for grinding the coffee beans, as is well known in the art. The main drive shaft drives the lower grinding
5 disk 109 and the rotating drive cone 107. There is formed a circular transport channel 110, which transports the ground coffee exiting out of the slit between upper and lower grinding disk to the exit location 105. The shape of the channel results in a “no contamination” grinder, wherein virtually no coffee beans/ground coffee remains after finishing the grinding.
10 Furthermore, the grinder comprises a motor transmission/gear 111 and a cone protrusion 112 to force the beans between the grinder disks.

The lower grinding disk 109 extends around rotating drive cone 107 and the upper grinding disk 102 extends above the lower grinder disk 109. The grinder is rotationally driven by motor 101 resulting in the
15 rotation of the drive cone 107 and the lower grinding disk 109. Due to the shape of the cone protrusion 112 upon driving the drive cone 107 and the lower grinding disk coffee beans are moved in an outwardly extending radial direction between the lower grinding disk 109 and the upper grinding disk 102. Because a vertical distance between the lower grinding disk 109 and
20 the upper grinding disk 102 decreases in the outwardly extending radial direction the beans are crunched and cut into ground coffee.

As explained, grinder 28 supplies ground coffee to a brewing device 46 (schematically shown in figure 3A) of the coffee brewing apparatus. The brewing device is arranged to receive a supply of water to
25 extract a coffee beverage from the ground coffee. The coffee beverage is discharged from a coffee beverage exit 37 from the coffee brewing apparatus into a cup or like household receptacle. A water supply can be arranged to supply water to the coffee brewing device under pressure for espresso type coffee beverages or may provide a drip feed to the extraction system formed
30 by coffee brewing device.

Before operating the coffee beverage system, the user has to connect the coffee bean package cartridge 3 to the coffee brewing apparatus 4. Figures 4-9 show an embodiment of the connection means of the coffee beverage system, which are used for this purpose.

5 Referring now to figure 4A, the connection means comprise a recess 50 at an upper side 52 of the coffee brewing apparatus 4. The recess 50 is surrounded by a side wall 54 protruding from the upper side of the coffee brewing apparatus 4. The user should place the corresponding part, shown in figures 5A, 5B, 6A, 6B, 6C, 7A, 7B, 7C, 8 and 9, at a lower side of
10 the coffee bean packaging cartridge into the recess. The bayonet elements to be described later of the coffee bean packaging cartridge should be placed in the corresponding openings 58 in the side wall 54 of the recess 50. The user should then rotate the cartridge over 50 degrees until reaching the blocking elements 56 for impeding a further rotation of the coffee bean packaging
15 cartridge. At this position the exit opening 29 of the first chamber portion 23 is aligned with the coffee inlet 9 of the second chamber portion 25. When the cartridge 3 is removed from the coffee brewing apparatus, the second chamber portion 25 in the appliance is closed by means of an appliance closing plate 51 (figure 4B). The appliance closing plate is being driven by a
20 protrusion 1686 (figure 6C) on the neck of the cartridge which slots into a keyhole 53 on the appliance closing plate as the cartridge is being placed into the openings 58 in the side wall 54 of the recess 50. As the user rotates the cartridge over a 50 degrees angle during placement the closing disk in the consumable and the closing plate in the appliance are opened,
25 simultaneously.

One suitable form of impellor 11 is shown in somewhat more detail in Figures 5A and 5B. To prevent the impellor 11 to get jammed by coffee beans that become locked between the perimeter aperture and radially extending vanes 13, such vanes 13 are preferably made from a
30 resilient material. It is also possible to make the entire impellor 11 from a

yieldable resilient material. The impellor 11 has a hollow hub portion engageable by a drive shaft end 1573 of a coffee preparing appliance. The drive shaft end 1573 may have a number of keys 1575 (preferably 4, 6 or 8) for engagement with corresponding protrusions, or keys in the interior of hollow hub 1571. To facilitate engagement of the impeller 11 and the drive shaft end upon placing of the cartridge on the appliance the number of keys may differ between the drive shaft end 1573 and the hollow hub 1571. As illustrated in Figure 5A the vanes 13 do not extend to the perimeter edge of the impeller 11, which may prevent beans from becoming jammed between the vanes 13 and the perimeter aperture. As indicated hereinabove the vanes may also be of a flexible material and to provide more flexibility to the vanes the vanes are conveniently also unattached to the impellor base 1577, by leaving a gap 1579. To fill the metering chamber some fifteen revolutions of the impeller 11 will normally suffice. However, to ensure filling under even adverse conditions, it may be convenient to allow for some extra revolutions such as thirty or twenty-five in total. For filling of the dosing volume the conveying impeller 11 including both the impellor base 1577 (bottom) and the vanes 13 are rotated with a rotational speed in the range of 100 to 500 rpm, and preferably between 250 and 300 rpm. Due to the centrifugal force created by the rotation of the impellor base 1577 and the rotation of the vanes the coffee beans are driven in an outward direction towards the inlet opening 21 of the metering chamber. Once the filling of the dosing volume has been accomplished, the appliance will switch from driving the impeller 11 to driving its grinder. With the impeller 11 immobilised the metering chamber will gradually empty into the grinder. Because the impeller 11 is inactive, no beans will escape from container 7, also because of the presence of the trickle through edge 22.

Referring to Figures 6A, 6B and 6C an embodiment of the coffee bean packaging cartridge 3 is shown in an exploded arrangement and perspective views. This packaging cartridge includes the container 7

defining an interior volume for coffee beans. The container 7 is preferably made from a transparent material so that its contents can be seen.

Optionally, the container 7 may be partially covered by an outer sleeve 1632 which may be printed with a description of the kind of coffee beans inside

5 and may also be provided with a window to reveal a translucent portion of the container 7. The container 7 is also provided at a lower end thereof with bayonet formation 1683, 1685 for coupling with the openings 56 in the side wall 54 of the recess 50 of the coffee brewing apparatus 4. Inserted into an open bottom end of container 7 is a closure member 1633. The closure
10 member 1633 has the ribbed funnel 8 for guiding coffee beans towards the impellor 11 and a base flange 1636. A rotatable closure disk 1635 is rotatably connectable with respect to the base flange 1636 of the closure member 1633. The closure member 1633 and the rotatable closure disk together form an interface between the cartridge and a coffee brewing
15 apparatus. The assemble cartridge can be sealed against deterioration from the ambient air by a sealing membrane 1681 that attaches to the perimeter edge of the container 7. The sealing membrane and barrier foil 1681 may again be equipped with a conventional one-way pressure relief valve for venting excess pressure from gases emanated from freshly roasted beans to
20 the exterior of the packaging cartridge. Preferably such a venting valve should open at a pressure of between 0.1 bar and 0.5 bar to prevent deformation of the container by inflation. To facilitate removal of the sealing membrane 1681 before placing the cartridge on a brewing apparatus, a pulling tab 1682 may be provided.

25 The interface forming bottom parts of the cartridge are separately shown in more detail in Figures 7A, 7B and 7C. The ribbing on funnel 8 as further seen in the exploded view of Figure 7A is useful in preventing sticking of coffee beans to the surface of the funnel 8.

By appropriate spacing between the successive ribs on funnel 8 it
30 is possible to minimize the contact surface between the beans and the funnel

surface. As the skilled person will recognize, such ribbing is merely one of various ways to reduce the contact surface and protruding bulges may be equally effective. Also the inclination given to the funnel may be subject to variation, but an angle in excess of 30 degrees, up to 90 degrees has been
5 found effective.

The rotatable closing disk 1635 has an aperture 1612, which upon appropriate rotation can register with exit opening 29 of the closure member 1633 (see Figure 7B). The closing disk 1635 on its upper surface has protruding there from a first detent 1701 and a second detent 1703 (see
10 Figure 7C). The first abutment is bordered by semi-circular slots 1705 and 1707, respectively. Additionally, protruding from the upper surface of the rotatable closing disk 1635 is a first abutment 1709 and a second abutment 1711 for limiting rotational movement in respect of the exit opening 29. Further provided on a bottom face of the base flange 1636 of the closure
15 member 1633 is a first pair of latching arms 1713 and a second pair of latching arms (not shown). The first pair of flexible latching arms 1713 is positioned to cooperate with the first detent 1701 in the closed position of the rotatable closure disk 1635. The second detent 1703 and the second pair of flexible latching arms also cooperate together in the closed position of the
20 closure disk 1635 and are optional.

In reference to Figure 8 it is shown how the first detent 1701 has been caught behind the converging flexible arms 1713A and 1713B of the first part of flexible arms. The position of the detent 1701, as shown in Figure 8, has resulted from rotation of the closure disk 1635 in respect of
25 the closure member 1633 in the direction of arrow 1717. Rotation in the opposite direction of arrow 1719 is effectively prevented by the flexible arms 1713A and 1713B engaging the first detent 1701. Accordingly when the cartridge is in the closed position as determined in the partial cross-section of Figure 8 it may be removed from the apparatus without any risk of

spilling beans. Also this latching arrangement ensures that the cartridge is not accidentally opened by rotation of the closure disk 1635.

As shown in Figure 9 an unlocking element 1721, which is part of a coffee brewing appliance, can engage through the semi-circular slot 1705
5 in the direction of arrow 1723 when the cartridge is placed on the appliance. The unlocking element 1721 has a V-shaped upper contour that forces apart the flexible arms 1713A and 1713B of the first pair of flexible arms 1713. This will then allow rotation of the closure disk 1635 in the direction of arrow 1719 by allowing the first detent 1701 to pass between the spread
10 apart flexible arms 1713A and 1713B. This rotating movement is obtained by manually rotating the cartridge with respect to the appliance to engage the bayonet means 1683, 1685 on the container 7 with the counter bayonet formations 56 on the brewing apparatus.

The operation of the second detent 1703 in respect of the second
15 pair of flexible latching arms is identical and when optionally provided will give additional protection against accidental opening, when not engaged on a coffee brewing apparatus.

Referring to Figure 4A again, the recess 52 comprises rotatable protruding edges 59 at its center, which are positioned at the end of the
20 driving shaft 18 which is driven by the first motor 17. On these edges the corresponding openings 1716 at the bottom side of the cartridge 3 should be placed. These openings 1716 are formed by a series of protrusions 12 on the bottom side of the impeller 11 (see figure 5B). The openings 1716 receive the edges 59 if the cartridge is connected with the coffee brewing apparatus.
25 Thus by rotating the edges 59 the impellor 11 is rotating too.

The upstanding side wall 54 of the recess 52 may be surrounded by a housing 55, as shown in figures 1-2.

The coffee brewing apparatus comprises a control device unit 40 schematically shown in Figure 3A, preferably a microprocessor for
30 controlling the dosing, grinding and brewing process. Thereto, the controller

may be connected to a sensor acting as a detection means for detecting an identification element such as a barcode or a RFID label of the coffee bean packaging cartridge 3. Thereby the control device unit cannot only detect the presence or removal of the coffee bean cartridge 3, but also receive
5 information about its contents and/or an identifier which identifies the cartridge 3. Preferably the control unit controls the dosing, the grinding and the brewing (including water supply) in dependence on the identifier that was is read by means of the sensor. It thus becomes possible for the control device unit to adjust the dosing, grinding and brewing process in accordance
10 with the particular coffee bean product offered by the cartridge 3. Such information can be supplied to the control unit by the identification element on the cartridge.

Alternatively, as shown in figures 4C, 6D and 10, the sensor is arranged to merely detect the presence and removal of a coffee bean
15 packaging cartridge to the coffee brewing apparatus. The sensor used for this purpose may be a micro switch 60 hidden behind a first horizontal segment 62 and a second horizontal segment 64 in the side wall 54 protruding from the upper side of the coffee brewing apparatus 4. This is to prevent the activation of the micro switch with finger or other object. A
20 protruding part 1687 (see figure 4C) below the large bayonet element 1683 of the cartridge 3 activates the micro switch, when the cartridge is connected to the coffee brewing apparatus by rotating it to its final position. The protruding part 1687 exactly fits in the slit between the horizontal wall segments 62, 64. This signals the controller that a cartridge is correctly
25 connected to the coffee brewing apparatus. The controller may activate the dosing, grinding and brewing processes only when it has been detected that the cartridge 3 has correctly been connected to the coffee brewing apparatus 4.

According to an embodiment, the controller controls these
30 processes as follows. In a first step the metering chamber is completely filled

with coffee beans. Thereto, the controller controls the first motor 17 to drive the transportation means. The transportation means is driven longer than is required for filling the metering chamber with coffee beans. In this example in the first step the transportation means is driven longer than is required for completely filling or at least substantially completely filling the metering chamber (at least substantially means for example for more than 90%). This is possible, because of the use of the flexible vanes 13. The metering chamber is arranged for receiving a portion of coffee beans corresponding to a dosed amount of coffee beans which is preferably necessary for preparing a single serving of coffee beverage, such as a single cup coffee comprising 80-160 ml of coffee. A filled metering chamber comprises in this example one dose of coffee beans. One dose of coffee beans comprises 5-11, preferably 6-8 grams of coffee beans.

Then, in a second step which follows after the completion of the first step, the controller activates the grinder by activating the second motor 101. The grinder is activated longer than is required for emptying the metering chamber and for grinding all the coffee beans which were collected in the metering chamber during the first step. In this example in the second step the grinder is activated longer than required for completely emptying or at least substantially completely emptying the metering chamber (at least substantially completely emptying means for example for more than 90%).

Finally, in a third step which follows after that the second step is completed the controller controls the brewing device to brew coffee based on the grinded coffee and on heated water.

The system may further be provided with one or more insert pieces that can be connected to the coffee brewing apparatus *in lieu* of a coffee bean packaging cartridge. A first type of insert piece 1100 is depicted in figure 11A. It is a ring shaped element with at its outer surface the bayonet elements 1683, 1685 as well as the protruding part 1687 for

activating the micro switch. It may be connected to the coffee brewing apparatus in the same way as a coffee bean packaging cartridge, i.e. by placing the bayonet elements in the corresponding openings 58 in the side wall 54 of the recess 50 in a initial position and then rotate the insert piece over 50 degrees until reaching the final position. When the insert piece is connected to the coffee brewing apparatus, the corresponding activation of the micro switch by the protruding part 1687 signals to the controller that a device is connected to the coffee brewing apparatus. The controller does not know if the activation of the micro switch is caused by a cartridge or by an insert piece. Therefore, when the insert piece 1100 is connected to the coffee brewing apparatus in the final position, as shown in figure 11B, the controller will activate the dosing, grinding and brewing processes, as if there were a coffee bean packaging cartridge connected to the brewing apparatus. So, the insert piece of the first type 1100 may be used to 'unlock' the coffee brewing apparatus.

In an alternative embodiment the insert piece may be a ring shaped element as described above which is integrally provided with a funnel which, when the insert piece is connected to the brewing apparatus, allows a user to manually feed coffee beans or ground coffee into the funnel.

Figure 12 A shows a second type of insert piece 1200 that can be connected to the coffee brewing apparatus. It comprises a cavity 1210 with a size corresponding to a single dose of coffee beans. The insert piece comprises a closure member and closure disk arranged in the same way as in the coffee bean packaging cartridge, as described herein above with reference to figures 7A-C, 8 and 9. When the insert piece is placed in the recess with the bayonet elements in the initial position as shown in figure 12B, the cavity 1220 is closed at its bottom. In this position the user fills the cavity with coffee beans, preferably with round compressed beans or coated compressed beans or bean fragments, because the flow easily. Then the insert piece 1200 is rotated by the user to its final position as shown in

figure 12C, thereby opening the coffee bean outlet of the cavity and aligning it with the coffee bean entry of the coffee brewing apparatus. As a result, the single dose of coffee beans falls into the coffee brewing apparatus and can be ground.

5 The inventive coffee beverage system in addition to including the coffee bean packaging cartridge further comprises a ground coffee packaging cartridge which is also removably connectable to the coffee brewing apparatus. Such a ground coffee packaging cartridge has an inner space which at least before use is filled with ground coffee. The package may, at
10 least before it is placed on the coffee brewing making apparatus, be closed off such that exposure of ground coffee to ambient air is prevented. To that end, the package is, preferably, closed off in an air-tight manner and/or vacuumized. The package can be a disposable package and is manufactured substantially from paper, and/or foil, and/or cellulose, and/or plastic, and/or
15 tin. Below some embodiments of a ground coffee packaging cartridge will be described by way of example only.

Referring to Figure 13A to 13D there is shown a first embodiment of ground coffee packaging cartridge 10103. The ground coffee packaging cartridge 10103 includes a bottle-like container 10131 and a closure member
20 10133. The closure member 10133 is provided with an exit opening defining a ground coffee outlet 10111 for cooperation with the brewing apparatus of the beverage system, such as disclosed in reference to Figure 1. The container 10131 defines an interior volume 10135 and a neck portion 10137 bounding a neck opening 10139 to the container 10131. The neck portion
25 10137 includes a cylindrical inner sleeve 10141 and a cylindrical outer sleeve 10143, defining an annular groove 10145 there between. The outer cylindrical sleeve 10143 is provided with an outer male screw thread 10147. Between the outer cylindrical sleeve 10143 and the major portion of the container 10131 there is provided a radially extending annular ridge 10149.

The closure member 10133 includes a substantially planar bottom 10151 and a circumferential outer wall 10153. The circumferential outer wall 10153 is provided with a circumferential tear strip 10155 that is connected to the outer wall 10153 by a circumferential line of weakening 5 10157. The tear strip 10155 is further provided with a pull tab 10159 that can be manually gripped.

The closure member 10133 further includes a first cylindrical inner wall 10161 and a second inner cylindrical wall 10163 concentrically between the inner cylindrical wall 10161 and the circumferential outer wall 10 10153. The second inner cylindrical wall 10163 is slightly lower than the circumferential outer wall 10153, but higher than the first inner cylindrical wall 10161. As best seen in Figure 13C, the second inner cylindrical wall 10163 has a female screw thread 10165 on an inner surface thereof adapted to cooperate with the male screw thread 10147 of the container neck portion 15 10137. The first inner cylindrical wall 10161 is provided with a perimeter aperture 10167 in its inner surface that is in communication with the ground coffee outlet 10111. The perimeter aperture 10167 is in communication with the ground coffee outlet 10111 by a cavity that is radially outwardly offset with respect to column of ground coffee above the 20 bottom 10151 of the package. This arrangement prevents the ground coffee from finding their way to the ground coffee outlet 111 in an uncontrolled manner.

Within a chamber defined by the bottom 10151 of the closure member 10133 and the first inner cylindrical wall 10161, a ground coffee 25 transportation or conveyor means embodied as a conveyor disc 10169 is rotatably arranged. The package is provided with a coupling means 10171 adapted for drivingly coupling the conveyor means 10169 to the drive shaft of the coffee brewing apparatus. In this example the coupling means comprises a driving hub 10171 being attached to the ground coffee conveyor 30 disc and extending through a central opening 10173 in the bottom 10151.

The driving hub 10171 can be coupled to and rotated by the drive shaft extending from the coffee brewing apparatus 4 and which can be rotated by means of the motor of the coffee brewing apparatus. While such drive shafts and their connections are well known to the skilled person, no further
5 explanation is deemed necessary. The conveyor disc 10169 is further provided with a closing flap 10175 on its outer periphery for closing the perimeter aperture 10167 in at least one rotational position. The closing flap 10175 embodies relatively movable closing means. The driving hub 10171 may further be provided with an axially and upwardly extending piercing
10 pin 10177. Further the conveyor disc may be given an upwardly convex shape to assist in conveying the ground coffee towards the periphery of the conveyor disc. Such a shape, however, is optional and other suitable forms are conceivable as well. For the closing flap 10175 to close the perimeter aperture 10167 it is merely necessary to prevent the passage of ground
15 coffee, which may already be achieved when the perimeter aperture 10167 is only partly blocked by the flap 10175. However to be able to take the ground coffee packaging cartridge from the apparatus for an interval of time, it is preferred that the closure of the aperture 10167 by the flap 10175, at least to some extent, delays deterioration of the remaining ground coffee contents.
20 Hence the flap forms part of the closing member 10133 wherein the closure member has relatively movable closing means in the form of the flap for selectively opening and closing the exit opening by means of closing the aperture 10167, wherein in the closed condition it is prevented that the ground coffee escapes from the package and preferably it is counteracted
25 that content of the ground coffee in the form of gasses escape to surrounding air.

Further, as best seen again in Figure 13C, the second inner cylindrical wall 10163 is provided with an inner peripheral ridge 10179 on its free end. The open end 10139 of the neck portion 10137 of the container
30 10131 may be closed by a sealing means formed by sealing membrane

10181. Further, as best seen in Figure 13D, the closure member 10133 may be provided with radially extending bayonet elements 10183, 10185 for connecting it to the coffee brewing apparatus 4 of Figure 1. Hence the bayonet elements form part of connecting means for connecting the package
5 to the coffee brewing apparatus. The skilled person will understand that any conceivable means, other than a bayonet type connection (such as 10183, 10185), may be suitable as connecting means for connecting the package 10103 to a coffee brewing apparatus.

Reverting now to Figures 13A and 13B there are shown two axial
10 positions of the closure member 10133 with respect to the container 10131. In Figure 13A the package 10103 is shown in a condition in which it is supplied to a user. In this condition of purchase the interior volume 10135 will be completely filled with ground coffee of a selected variety. The properties of such a contents may be communicated by an identification
15 element 1022 attached to the exterior of package 10103. The neck opening 10139 will be hermetically closed by the sealing membrane 10181 to protect the contents of the container 10131 from deterioration by ambient air. The sealing membrane 10181 is attached, preferably only to the outer cylindrical sleeve 10143. When a user wants to bring the package 10103 into a
20 condition of use, as shown in Figure 13B, the tear strip 10155 should first be removed by gripping the pull tab 10159. Through the line of weakening 10157 the tear strip 10155 can be completely removed from the closing member 10133. This can be done with the package 10103 already connected to the coffee brewing apparatus 4. With the tear strip 10155 removed, the
25 container 10131 can be rotated with respect to the closure member 10133. Such rotation, i.e. in a clock wise direction, has the effect that the male and female screw thread 10147, 10165 act together to move the container 10131 and closure member 10132 closer together in an axial direction. By this axial movement the piercing pin 10177 may penetrate the sealing
30 membrane 10181 and allow it to tear across the opening 10139, while the

first inner cylindrical wall 10161 pushes it into the annular groove 10145 of the neck portion 10137 as shown in Figure 13B. This movement of the sealing membrane 10181 by the means for disrupting and displacing embodied by the first inner cylindrical wall 10161 is assisted by attachment
5 of its perimeter to only the outer cylindrical sleeve 10143. It may further be beneficial to prepare the sealing membrane 10181 to tear open along predefined tear lines. Such predefined tear lines can be conveniently created by partial laser cutting of the sealing membrane foil. Removal of the sealing membrane 10181 allows the ground coffee to be gravity fed onto the
10 conveyor disc 10169. With the package 10103 thus having been activated to the condition of use, as shown in Figure 13B, and connected to the brewing apparatus of Figure 1, the control unit may cause rotation of the conveyer disc 10169. During moments of rotation, when the closing flap 10175 does not cover the perimeter aperture 10167 (see Figure 13C), ground coffee is
15 conveyed radially outwardly to pass through the ground coffee outlet 10111 into the metering chamber of the coffee brewing apparatus, or directly into the grinder.

In case the coffee brewing apparatus is provided with a metering chamber, such metering chamber, conveyer disc and flap in combination
20 form a dosing device. The dosing device includes the metering chamber for receiving a portion of ground coffee corresponding to an dosed amount of ground coffee which is preferably necessary for preparing a single serving of coffee beverage wherein the system is arranged for transporting the ground coffee from the package into the metering chamber. The dosing device may
25 further comprise emptying means for emptying the metering chamber.

In case the ground coffee is transported from the package directly into the grinder the conveyor means and the flap of the package form the dosing device in combination with a timer of the control unit. In that case the control unit may comprise the timer for transporting during a
30 predetermined length of time ground coffee into the coffee brewing

apparatus. In case the amount of ground coffee which is transported per second, in use, is known the total amount of ground coffee which is transported can be predetermined. Hence in such an embodiment the dosing device comprises at least one of the transportation or conveyor means and the relatively movable closing means. The control means comprises timing means wherein the control unit is arranged such that, in use, the control unit operates the motor a predetermined length in time for transporting a predetermined amount of ground coffee from the package into the coffee brewing apparatus wherein preferably the predetermined amount of ground coffee corresponds with a dosed amount of ground coffee for preparing a drink.

The skilled person will readily understand that in variations of the brewing apparatus the metering chamber may alternatively be positioned downstream of the grinder. In the latter case, the ground coffee will directly enter the grinder from the package outlet 10111.

It is further seen that in the activated condition shown in Figure 13B, the inner peripheral ridge 10179 has snap-fitted behind the radially extending annular ridge 10149 of the container neck portion 10137. In this position also the male and female screw threads 10147, 10165 have completely disengaged. It is thereby prevented that the container 10131 and closure member 10133 are accidentally moved back to the position of Figure 13A. There is thereby also a clear distinction between packages that are still fresh and unused, as opposed to packages that have been activated for use on a coffee brewing apparatus. Figures 13A-13D thus show a first embodiment of ground coffee packaging cartridge, with a closure cap 10133, provided with a conveyor disc 10169, and a sealing membrane 10181 directly on the bottle-like container 10131. Upon removal of a tamper evident tear strip 10155, with the package 10103 already connected to the apparatus, the package can be manually activated by rotation (180 degrees). The seal, which can be a laser pre-cut foil, tears open in a controlled manner

when activating and is pushed out of the way into a groove 10145 in a ring of the bottle. At the end of its movement an inner ring 10163 of the closure cap 10133 snaps over a thick edge, formed by annular ridge 10149, of the bottle, and can no longer be removed there from because the screw threads
5 10147, 10165 have disengaged. Reverse unscrewing is thereby inhibited.

Figures 14A to 14D show a second embodiment of a ground coffee packaging cartridge 10203 that again includes a container 10231 and a closure member 10233. The closure member 10233 has an annular bottom 10251, provided with a ground coffee outlet 10211. The annular bottom
10 10251 defines a central bore 10254 for the accommodation of a relatively movable auxiliary closure member 10256. The bottle-like container 10231 defines an interior volume 10235 and a neck portion 10237 defining an opening 10239 on one end of the container 10231. Similar to the first embodiment, the neck portion 10237 is composed of concentrically arranged
15 inner and outer cylindrical sleeves 10241, 10243 to define annular groove 10245 there between. As the open end 10239 of the container 10231 is again sealed by a sealing membrane 10281, the annular groove 10245 is again serving to collect the sealing membrane 10281 upon its removal from the opening 10239. Again the sealing membrane 10281 is preferably attached
20 with its outer periphery to only the outer cylindrical sleeve 10243.

The closure member 10233 is further provided with a first inner cylindrical wall 10261 and a second inner cylindrical wall 10263. The second inner cylindrical wall has an inner peripheral ridge 10279 at its upper free end. The closure member 10233 is connected to the container 10231 by the
25 inner peripheral ridge 10279 snap-fitting onto a radially extending annular ridge 10249 on the neck portion 10237 of container 10231. The snap-fit connection is such that it cannot be easily disconnected and thereby prevents the closure member 10233 to be accidentally removed from the container 10231. Further, the closure member 10233 includes within its
30 central bore 10254 a perimeter aperture 10267 in its first inner cylindrical

wall 10261 giving radial access to a cavity in communication with the axially arranged ground coffee outlet 10211. Again the cavity between the radial perimeter aperture 10267 and the axial ground coffee outlet 10211 is offset with respect to the column of ground coffee, or coffee particles, within the package 10203 to allow control over the ground coffee, or particles, that find their way to the outlet 10211. On its inner cylindrical wall 10263 the closure member 10233 also is provided with female screw thread formations 10265 to cooperate with male screw thread formations 10247 on an annular outer wall 10262 on the auxiliary closure member 10256. The auxiliary closure member is generally formed as a cup-like element having a ground coffee transportation or conveyor means in the form of conveyor disc 10269 at its bottom and a cylindrical perimeter wall 10264. The cylindrical perimeter wall 10264 carries the annular outer wall 10262, so as to form an upwardly open perimeter groove 10266 for a purpose to be described later. The auxiliary closure member 10256 is further provided with a driving hub 10271 for coupling with the drive shaft of the brewing apparatus and forming coupling means (not shown, but conventional). The driving hub 10271 can also be provided with a piercing pin to engage and puncture the sealing membrane 10281. The cylindrical perimeter wall 10264 of the auxiliary closure member 10256 is further provided with a number, like three or four, perimeter windows 10274A, 10274B, 10274C, adapted to align with the perimeter aperture 10267. The perimeter windows 10274A, 10274B, 10274C are spaced from one another by interrupting wall sections, which thereby represent the movable closing means.

In use, the package 10203 will be provided to the end user in a condition illustrated in Figure 14A, with the sealing membrane 10281 fully intact and protecting the contents in the interior volume 10235. The auxiliary closure member 10256 is partially projecting from the opening 10254 in bottom 10251. To activate the package 10203 for use it is simply connected to the coffee brewing apparatus by connecting means configured

as bayonet elements 10283, 10285 projecting laterally from the closure member 10233. The driving hub 10271 will engage a resiliently mounted drive shaft in the apparatus and will push this resiliently into a retracted position. Upon operation of the brewing apparatus through an actuating
5 element the drive shaft will rotate the auxiliary closure member 10256 which will thereby move upwardly by the male and female screw thread formations 10247, 10265 to the position shown in Figure 14B. The drive shaft will be resiliently biased to follow the driving hub 10271 and remain in engagement therewith. When the auxiliary closure member 10256 has
10 reached its uppermost position as shown in Figure 14B the screw thread formations 10247, 10265 will have disengaged and not allow reverse movement of the auxiliary closure member 10256 to the position of Figure 14A. During movement of the auxiliary closure member 10256 from the inactive position of Figure 14A to the activated position of Figure 14B, the
15 piercing pin 10277 and the perimeter wall 10264 of the auxiliary member 10256 have pushed the sealing membrane 10281 aside into the annular groove 10254 provided in the neck portion 10237 of the container 10231. The piercing pin 10277 and the perimeter wall 10264 thereby form a means for disrupting and displacing the sealing element. By gravity the ground coffee
20 can now be fed on to the conveyor disc 10269 and be conveyed to the perimeter aperture through any one of perimeter windows 10274 A, B or C, as these align during rotation. Once the dosing device and/or the control unit have determined that dosing is sufficient, the rotation of the auxiliary member 10256 and thereby its conveyor disc 10269 will be interrupted.
25 Thereby a means to interrupt the supply of ground coffee is provided. The operating mechanism of the brewing apparatus ensures that rotation of the auxiliary member 10256 is always with a section of the perimeter wall 10264 between two adjacent ones of the perimeter windows 10274A, B, C in overlap with the perimeter aperture 10267. Not only does this prevent any
30 further transport of ground coffee through the ground coffee outlet 10211,

but it also protects the contents of the container 10231 from contact with the ambient environment. It is conceivable and preferred that the package 10203 in its activated condition of Figure 14B can be safely removed from the brewing apparatus. This may be desirable to allow intermediate use of a
5 package with a different quality of variety of ground coffee, to enable variation of the brewed beverage.

One noticeable difference of the ground coffee packaging cartridge according to the second embodiment, with that of the first embodiment, is that its conveyor disc is integral with a part of the closure member.
10 Conceivably in another variation the entire ground coffee packaging cartridge could rotate together with the conveyor disc.

A third embodiment of a ground coffee packaging cartridge 10303 is shown in Figures 15A to 15D. The ground coffee packaging cartridge 10303 again includes a bottle-like container 10331 and a closure member
15 10333. The closure member 10333 at a bottom 10351 thereof is provided with a ground coffee outlet 10311, for cooperation with the brewing apparatus. The container defines an interior volume 10335 which will be filled with ground coffee (not shown but conventional). The container 10331 is further provided with a neck portion 10337 defining a neck opening
20 10339. The neck opening 10339 defines an open end of the container 331 and is bounded by an inner cylindrical sleeve 10341 and a concentrically arranged outer cylindrical sleeve 10343. Formed between the inner and outer cylindrical sleeves 10341, 10343 is again an annular groove 10345. As such, the container 10331 of the third embodiment 10303 is substantially
25 similar to the containers of the first and second embodiments, without being strictly identical.

The neck portion 10337 is provided with a radially extending annular ridge 10350 extending from the outer cylindrical sleeve 10143 at a location adjacent its free end.

The closure member 10333 includes a circumferential outer wall 10353 which projects axially from its bottom 10352. Also projecting axially from the bottom 10351 is a first inner cylindrical wall 10361 and a second inner cylindrical wall 10363 concentrically between the first inner
5 cylindrical wall 10361 and the circumferential outer wall 10353. The second inner cylindrical wall 10363 is provided with an inwardly projecting peripheral ridge 10379 for snap-fittingly engaging the radially extending annular ridge 10350 to attach the closure member 10333 to the container 10331.

10 Rotatably received on the bottom 10351 is a ground coffee conveyor disc 10369 that has a driving hub 10371 that can be drivingly engaged through central opening 10373 in the bottom 10351. The rotatable ground coffee conveyor disc 10369 includes an upstanding closing flap 10375 for closing a perimeter aperture 10367 in the first cylindrical inner wall
15 10361. The perimeter aperture 10367 communicates with the ground coffee outlet 10311 via a cavity that is offset with respect to column of ground coffee within the interior volume 10335, for a purpose already explained. The closing flap 10375 functions as the movable closing means. As seen in Figure 15C the conveyor disc 10369 may be provided, as part of the conveyor
20 means and guiding means, with a number of radially extending ridges in addition to an upwardly convex shape. These features, which are optional, may be employed to assist conveyance of the ground coffee towards the periphery of the conveyor disc 10369 by forming an agitating and guiding means for the ground coffee. In an alternative arrangement the rotatable
25 ground coffee conveyor may be formed by a paddle wheel with radially extending paddles or vanes. To prevent ground coffee jamming it may be advantageous not to have these paddles or vanes extend the entire radial distance to the perimeter edge of the paddle wheel or impeller. Alternatively or additionally the vanes may be formed in a flexible material. More in
30 particular the entire impeller may be made from an elastic material, in

particular in a plastic material having an E-modulus in the range of 150 to 1200 N/mm², more in particular 175 to 800 N/mm², and preferably between 175 and 300 N/mm². Further it is possible to vary the number of vanes in relation to the area of the perimeter aperture to block the escape of ground
5 coffee with the impeller at rest.

Surrounding the ground coffee conveyor disc 10369, coextensive with the first cylindrical inner wall 10361, is a movable sleeve 10346. The movable sleeve is provided on its exterior with a male screw thread 10347, which engages a female screw thread formation on an interior surface of the
10 first cylindrical inner wall 10361. The movable sleeve 10346 is further provided with inwardly projecting notches, which each engage one of the opposite upstanding sides of closing flap 10375.

In operation, the ground coffee packaging cartridge 10303 will be connected to the coffee brewing apparatus by means of bayonet formation
15 10383, 10385. To activate the package the coffee brewing apparatus initiates a control signal to drive the driving hub 10371 and thereby the conveyor disc 10369 and upstanding closing flap 10375. The closing flap 10375 will thereby engage a relevant one of the notches 10348 to move the movable sleeve 10346 along the engaged screw thread formations 10347, 10365 in an
20 upward direction towards a sealing membrane 10381 that is attached with its periphery to the outer cylindrical sleeve 10343 of container 10331 and thereby forming the sealing means. This movement will rupture the sealing membrane 10381 and push it into the annular groove 10345. Thereby the movable sleeve 10346 forms a means for disrupting and displacing the
25 sealing element. In particular the sealing membrane 10381 may have been prepared to tear open along predefined weakened lines. Once the upward movement of the movable sleeve 10346 is completed the notch 10348 engaged by the closing flap will disengage there from as best shown in Figure 15B. It will be clear to the skilled person that for activating the
30 package 10303 it will only be necessary to provide a single notch 10348 on

the inner circumference of movable sleeve 10346. In this third embodiment the second notch engaging a trailing vertical edge of closing flap 10375 is merely provided for ease of assembling.

The second and third embodiments as described above can both be
5 automatically activated by a driving means in of the system. Continued rotation of the driving hub will start conveyance of the ground coffee once the sealing membrane has been moved out of the way of the container opening.

Figure 16A to 16E show a fourth embodiment of ground coffee
10 packaging cartridge 10403. The package 10403 includes a bottle-like container 10431 defines an interior volume 10435, and has a neck portion 10437 and an outer collar 10442. Received within an open end 10439 defined by the outer collar 10442 is a closure member 10433, which preferably is non-detachably attached to the container 10431. The outer circumference of
15 the outer collar 10442 may be provided with bayonet formations 10483, 10485 or other suitable connecting means for connection to a coffee brewing apparatus such as apparatus 4 of Figure 1.

The closure member 10433 fits snugly into the open end 10439 as defined by the neck 10437 and outer collar 10442 of the container 10431 and
20 may be attached by adhesive or weld bonding. An axial outer edge of the closure member 10433 is slightly recessed from the outer axial edge of the outer collar 10442 as shown in Figures 16A and 16B. The closure member 10433 also has a bottom 10451 with a ground coffee outlet 10411. As best seen in Figures 16C and 16D, the closure member 10433 defines a central
25 cavity wall 10462 with a perimeter aperture 10467. The perimeter aperture communicates with the ground coffee outlet 10411 via a cavity that is again radially offset from the column of ground coffee held in the interior volume 10435. Received in a central cavity defined by cavity wall 10462 and bottom 10451 is a rotatable ground coffee conveyor disc. Axially extending from the
30 conveyor disc 10469 is a closing flap 10475 configured to form a movable

closing means for the perimeter aperture 10467. The ground coffee conveyor disc has a driving hub 10471 protruding through a central opening 10473 in the bottom 10451. It will be clear to the skilled person that conceivably the closure member (10433) of this embodiment may also be designed to engage
5 the outside of the container (10431), in a similar fashion as in the previously described embodiments. In such an alternative arrangement the bayonet formations (10483, 10485) will be part of the closure member (10433) rather than the container (10431).

To protect the ground coffee contents of package 10403, prior to
10 its activation for use in a coffee brewing apparatus, a sealing membrane 10481 is hermetically attached to the axial free edge of the outer collar 10442. In the fourth embodiment the sealing membrane 10481, forming the sealing means, is not automatically removed by the coffee brewing machine but will be removed by the user. For this purpose a manual pull tab 10482
15 may be provided as a configuration of the means for disrupting and displacing the sealing element. The arrangement of the bayonet formations 10483, 10485 on the exterior of the container 10431 with the closure member 10433 recessed in its open end allows the barrier foil or sealing membrane 10481 to be sealingly attached to the outer edge of the container
20 10431. Thereby the sealing barrier 10481 also covers the joint between the container 10431 and the closure member 10433. The sealing membrane or barrier foil 10481 can keep the ground coffee contents fresh and protected from ambient air during shipping and stock keeping prior to the package being put to use. However freshly roasted ground coffee may still emanate
25 gases, such as CO₂. To enable roasted ground coffee to be freshly packed the sealing membrane, or barrier foil such as 10481, may additionally be provided with a one-way pressure relief venting valve (not shown in the drawing, but conventional).

In operation the package 10403 of the fourth embodiment, after
30 manual removal of its sealing membrane 10481 can be coupled to the

brewing apparatus of Figure 1 by the bayonet formations 10483, 10485 or like suitable connecting means. The operation of conveying ground coffee into the coffee brewing apparatus is similar to the other embodiments. Once the brewing apparatus is activated to produce a coffee brew the control unit
5 initiates rotation of the conveyor disc 10469 and the closing flap 10475 will rotate away from the perimeter aperture 10467. The rotation of conveyor disc 10469 will be continuous and the closing flap 10475 will only line up with the perimeter aperture 10467 once per revolution. During the time that closing flap 10475 is not aligned with the perimeter aperture 10467, ground
10 coffee may exit towards the ground coffee outlet 10411 and into the grinder or metering unit of the brewing apparatus. As soon as the required amount of ground coffee to be ground is withdrawn from package 10403, the ground coffee conveyor disc 10469 will stop its rotation in the exact position that the closing flap 10475 aligns with the perimeter aperture 10467. A means to
15 interrupt the supply of ground coffee is thereby provided. Preferably the rotative power and the sturdiness of the components comprising the closing flap 10475 and the perimeter aperture 10467 is such that any ground coffee that may be in the way of closing is cut or crushed, so that this does not present an obstacle to the closing of perimeter aperture 10467.

20 Figure 16F shows a modified alternative closure member for use with the ground coffee packaging cartridge of Figures 16A to 16D. Closure member 10433A of Figure 16F is adapted to be non-detachably attached to the open end of the container 10431 of Figures 16A-D. The axial outer edge of the closure member 10433A may thereby again be slightly recessed from
25 the outer axial edge of the outer collar of the container 10431 as shown in Figures 16A and 16B to allow a sealing membrane only to be attached to the axial free edge of the outer collar of the container. The closure member 10433A also is provided with a bottom 10451A through which a ground coffee outlet 10411A extends. The closure member 10433A defines a central
30 cavity wall 10462A with a perimeter aperture communicating with the

ground coffee outlet 10411A. Accommodated in the central cavity defined by cavity wall 10462A and the bottom 10451A is a rotatable ground coffee conveyor disc 10469A. Guiding means include a plurality of generally radially extending alternating ridges and grooves on an upper surface of the conveyor disc 10469A that in use confronts the interior of container 10431. The plurality of generally radially extending alternating ridges and grooves of the conveyor disc 10469A assist in transporting the ground coffee towards the periphery thereof, by forming an agitating and guiding means for the ground coffee. Alternatively a flat upper surface on the conveyor disc 10469A may be used when it is rotated at a higher speed. In addition the guiding means of the embodiment of Figure 16F includes a stationary guide arm 10491 overlying a portion of the upper surface of the conveyor disc 10469A to guide ground coffee from the conveyor disc 10469A along a generally radially extending guide surface 10493 toward the exit opening 10411A.

In Figures 17 and 18 transportation or conveyor means 101069 is part of the package 101003 and includes a part of counter rotating first and second rubber ground coffee wheels 101051, 101053. The first and second rubber ground coffee wheels 101051, 101053, each have a plurality of flexible radial protrusions extending from their circumferences. Ground coffee 101055 is conveyed between the rubber ground coffee wheels 101051, 101053 when in motion, but the exit of the package 101003 is effectively closed to prevent ground coffee from falling out, when the rubber wheels 101051, 101053 are held stationary, by the radially extending protrusions.

As seen in Figure 17 the package 101003 is positioned on top of a coffee brewing apparatus 101002 and ground coffee 101055 conveyed by the conveyor means 101069 will be allowed to enter a ground coffee supply opening 101029 of the brewing apparatus 101002. As seen in the plan view arrangement of Figure 18, the first rubber ground coffee conveyor wheel 101051 has a first helical drive gear 101057. Similarly the second rubber

conveyor wheel 101053 has a second helical drive gear 101059. Both the first and second helical drive gears 101057, 101059 are driven by an apparatus drive 101061, which is part of the apparatus 101002, rather than of the package 101003. It is clear that the drive coupling here is not in the
5 form of a common shaft coupling, or the like, but rather accomplished through the drive engagement of complementary gear members.

The embodiments illustrated in Figure 19 to 21 use a rotative drive from the apparatus 101102, which is converted into a linear movement in the interior volume 101135 of the package 101103. Drive shaft 101172
10 rotatably engages lead screw 101163 in accordance with arrow 101165 and moves a conveyor piston 101167 in a downward direction, as indicated by arrow 101169. This forces ground coffee 101155 past a flexible valve 101171. The flexible valve 101171, which is shown separately in Figure 20, is of a relatively stiff resilient material and is radially slotted to form a number of
15 deflectable individual flaps 101173. The stiffness given by the material of the valve 101171, to the individual flaps, separated by the radial slots, is sufficient to support a filling of ground coffee 101155 in the package 101103. It is only by the force exerted by the conveyor piston 101167 that ground coffee 101155 is forced through the radial slots between the yieldable flaps
20 101173. Conveniently the flexible valve 101171 can be made from a plastic material. Without pressure being exerted on the flexible valve 101171, through the conveyor piston 101167 and the intervening ground coffee 101155, the ground coffee 101155 will be prevented from falling out of the package 101103. It will thereby be clear that with the package 101103
25 engaged with a grinding and/or brewing apparatus 101102 upon rotation of drive means 101172 interruption of the rotation of drive means 101172 will stop the supply of ground coffee 101155 through the flexible valve 101171.

In the alternative of Figure 21 a rotating chute 101177 is associated with drive shaft 101172 for rotation therewith in a direction
30 indicated by arrow 101175. Internally of the package 101103 the variation of

Figure 21 has a rotating closure member 101179 which rotates together with the lead screw 101163, when driven by the drive shaft 101172. The rotatable closure member 101179 has an exit aperture 101181 that registers with the rotating chute 101177. By stopping the drive shaft 101172 in a position where the chute 101177 is out of register with the ground coffee supply opening 101129 of the apparatus, also the exit aperture 101181 will be out of register with an internal chute 101183, formed in the package 101103. Thereby an additional closure of the package 101103 will be obtained, when ground coffee 101155 is not withdrawn there from by the apparatus 101102. To enable the exchange of unemptied packages 101103 from the apparatus 1102 it would merely suffice when ground coffee is prevented from falling out. However to enable stocking of partly emptied packages for prolonged periods of time it is certainly beneficial to counteract the entrance of air into the package, at least limit exposure to ambient air. For this purpose the additional closure member 101179 may be very useful.

Another variation of the ground coffee packaging cartridge 101203 is illustrated in Figures 22A and 22B. The package 101203 has again a rotatable lead screw 101263, which is arranged to be driven from a coffee brewing apparatus 101202 (such as the brewing apparatus 4 of Figure 1) similar to the previously described embodiments. Rotation of the lead screw 101263 in the direction of arrow 101265 raises a floor forming piston 101267. Raising of the floor forming piston 101267, raises ground coffee 101255 resting on top of the floor forming piston 101267 to a level above internal chute 101283. Arms 101285 rotate together with the lead screw 101263 and assist in sweeping ground coffee 101255 at the upper surface into the internal chute 101283. It is further seen in Figure 22B that the floor forming piston 101267 is formed with a recess 101287 that snugly fits around the internal chute 101283. When the package 101203 is in the form of a cylindrical container, as represented in Figure 22B, then the recess 101287 effectively prevents relative rotation between the floor forming

piston 101267 and the remainder of the package 101203, without the need for other rotation preventing means. The ground coffee 101255 that has been transferred into the chute 101283 will enter the apparatus 101202 through supply opening 101229, as shown in Figure 22A.

5 Yet another form of transportation or conveyor means in a ground coffee packaging cartridge 101303 is shown in Figures 23A to 23D. The package 101303 is adapted to be connected to a brewing appliance 101302 and to be drivingly connected to a drive shaft 101372 of the appliance 101302. The package 101303 has a primary bottom 101389 having a ground
10 coffee outlet 101311, that lines up with the ground coffee supply opening 101329 of the appliance 101303. The package 101303 is further provided with a secondary bottom 101391 that is generally funnel shaped with a lowermost position being interrupted for communication with a shuttle slider 101393.

15 The shuttle slider 101393 is guided for reciprocating movement by an eccentric 101395, rotatably by drive shaft 101382. See in particular Figures 23B and 23D. As shown in Figures 23A and 23B the shuttle slider 101393 has a dosing cavity 101397 holding a predefined quantity of ground coffee 101355. In a first position as shown in Figures 23A and 23B, the
20 shuttle slider 101393 has its dosing cavity 101397 in communication with the supply of ground coffee 101355 supported by the secondary bottom 101391. Rotation of the eccentric 101395 in the direction of arrow 101399 will move the shuttle slider 101393 from the first position shown in Figures 23A en 23B, into a second position shown in figures 23C and 23D. In the
25 second position the dosing cavity 101397 aligns with the exit opening 101311 and ground coffee is allowed to pass through the supply opening 101329 of the appliance 101302. It will be clear to the skilled person that the embodiment of Figures 23A to 23D may be used for both conveyance and dosing of ground coffee to an appliance. The number of rotations of drive
30 shaft 101372, together with the capacity of the dosing cavity 101397 may

provide an accurate dosing for a selected number of beverage servings. Also it will be clear that with the shuttle slider 101393 in either one of the first and second positions the package 101303 will be closed, as communication between the supply of ground coffee 101355 within the package 101303 is
5 not possible with an immobilized shuttle slider 101395.

The transportation or conveying means illustrated in Figures 24A and 24B have again a secondary bottom 101491, which is completed by a tipping section 101492. Tipping section 101492 is pivoted in the vicinity of drive shaft 101472, which protrudes from the appliance 101402 (i.e. the
10 coffee brewing apparatus 4 of Figure 1). A top end of drive shaft 101472 is formed as an eccentric and a follower 101494 is biased against the eccentric top end of drive shaft 101472 by a spring 101496. The rotating speed of the drive shaft 101472 can be configured such that a vibrating movement is induced into the tipping section 101492. The geometry may be chosen to
15 effect that only a specific amount of ground coffee 101455 may be admitted into a chute 101483 every time the tipping section 101492 tips, i.e. upon each rotation of the drive shaft 101472. Clearly still other arrangements will be conceived by the skilled person. While the embodiment of Figures 24A and 24B is shown to be biased to an open position of its tipping section
20 101492, it is indeed easily conceivable to arrange the tipping section in a manner that it will be biased into the closed position of the secondary bottom, so that ground coffee will not fall out when the package is removed from the brewing apparatus.

Further embodiments of such a ground coffee packaging cartridge
25 which are manually operated will be described now with reference to the following Figures.

The ground coffee packaging cartridge is specifically adapted to be connected to the coffee brewing apparatus 4. Thereto, the ground coffee packaging cartridge is provided with connection elements (such as e.,g.
30 bayonet elements) similarly to the coffee bean packaging cartridge.

However, the ground coffee packaging cartridge can in addition be connected to another external apparatus, e.g. a coffee grinder apparatus only used for grinding coffee beans but not for brewing coffee. In view of this the description which follows refers to an external apparatus to which the
5 ground coffee packaging cartridge can be connected rather than to the coffee brewing apparatus.

Figure 25A shows in cross-section of the ground coffee packaging cartridge 201102 for holding and supplying ground coffee according to a first aspect of the first embodiment of manually operated packages. In this
10 example, the package 201102 is filled with roasted ground coffee 201104, being an example of ground coffee.

The ground coffee packaging cartridge 201102 includes a housing 201106 that encloses an interior volume 201108 of the ground coffee packaging cartridge 201102. The housing 201106 may e.g. have a cylindrical
15 shape. In the interior volume 201108, the ground coffee 201104 can be held. The housing 201106 has an outlet 201110 for releasing the ground coffee 201104 from the interior volume 201108. From the outlet 201110, the ground coffee 201104 can be supplied to a hosting external apparatus 201112. The external apparatus 201112 may be arranged for hosting the
20 ground coffee packaging cartridge 201102 by means of a cavity 201115. The cavity 201115 may be present in a, in use, top part of the external apparatus 201112. The external apparatus 201112 may have an inlet 201114 through which the ground coffee 201104 can be received. The inlet 201114 of the external apparatus 201112 may be positioned in the cavity 201115.

25 The ground coffee packaging cartridge 201102 further includes transportation means 201116 for transporting the ground coffee 201104 towards the outlet 201110. The transportation means 201116 include a moveable structure 201118 for contacting the ground coffee 201104. As a result of such contacting, a force may be applied to the ground coffee
30 201104. However, alternatively, as a result of such contacting, movement of

ground coffee can be blocked. Then, the force applied by the moveable structure 201118 may be a reaction force caused by another force that works on the ground coffee, such as gravity force. Thus, the contacting element can be used for actively transporting the ground coffee, and/or can be used for blocking the ground coffee and realizing transport of the ground coffee by releasing the blockage of the ground coffee. The moveable structure 201118 is at least partly, and in this example completely, present in the interior volume 201108. In this example, the moveable structure 201118 may form a plunger 201119.

10 The transportation means 201116 further include manually operable actuation means 201120, in this example a crank handle 201122, for manually actuating the moveable structure 201118. The manually operable actuation means 201120 are at least partly, and in this example completely, provided outside of the interior volume 201108. Their position outside the interior volume 201108 enables that the manually operable actuation means 201120 can be reached by hand by a user.

 In the first example, the transportation means 201116 may further include a rotatable element, such as a rotatable axle 201124. The rotatable axle 201124 may be located at least partly, in this example completely, inside the interior volume 201108. Here, the rotatable axle 201124 in use rotates in a first bearing 201126 provided through the housing 201106, and in a second bearing 201127. The rotatable axle 201124 may be coupled, e.g. outside the housing 201106, to the crank handle 201122. In this way the crank handle 201122 may be arranged for rotating the rotatable axle 201124.

 In the first example, the rotatable axle 201124 may be partly formed as a conveyor screw 201130, provided with screw thread 201132. Additionally, the plunger 201119 may include a threaded bore 201134 through which the conveyor screw 201130 may be engaged. By rotating the conveyor screw 201103 by means of the crank handle 201122, the plunger

201119 may be moved downwards or upwards through the interior volume 201108. As a result of moving the plunger 201119 downwards, a downward force can be applied on the ground coffee 201104.

The ground coffee packaging cartridge 201102 may further
5 include a blocking element, such as a ridge, 201136 for substantially preventing movement of the moveable structure 201118 inside the interior volume 201108 in a direction transverse to an axis of rotation of the rotatable element. In this example, the blocking element is formed as the ridge 201136 that is rigidly attached to an interior side 201138 of the
10 housing 201106. The ridge 201136 may extend along the interior side 201138 of the housing 201106, in a direction approximately parallel with the rotatable axle 201124. In use the ridge 201136 may engage with a notch 201140 in the plunger 201119. Figure 25B shows the notch 201140, the plunger 201119, and the ridge 201136, and the housing 201106 in a cross-
15 section A-A'. It may be clear however that the blocking element can be left out if the housing 201106 and the plunger 201119 have a rectangular shape, or if, more in general, the moveable structure 201118 and the housing 201106 are shaped for preventing movement of the moveable structure 201118 with respect to the housing 201106 in a direction transverse to a
20 direction in which the conveyor screw 201130 extends.

The ground coffee packaging cartridge 201102 may be provided with a valve 201142 for forming a barrier that hinders passage of the ground coffee 201104 towards the outlet 201110. The valve 201142 may be located inside the interior volume 201108. The valve 201142 may include
25 one or more, e.g. a plurality of, flexible elements 201144 that are deformed when the valve 201142 is opened. The flexible elements 201144 may include an elastic material, for example rubber. By means of the valve 201142, the downward force that can be applied on the ground coffee 201104 by means of the plunger 201119, can in use at least partly be counteracted. The valve
30 201142 thus increases possibilities for control of the supply of the ground

coffee 201104, as the valve 201142 may prevent uncontrolled movement of the ground coffee 201104 towards the outlet 201110.

The ground coffee packaging cartridge 201102 may be provided with a recess 201146 in the housing 201106 for receiving an external drive member 201148 of the external apparatus 201112. In the first example, the housing 201106 is closed in the recess 201146. In Figure 25A, the external drive member 201148 is received in the recess 201146. From Figure 25A, it may be clear that the recess 201146 may be dimensioned for preventing mechanical contact between the ground coffee packaging cartridge 201102, in particular the housing 201106 of the ground coffee packaging cartridge 201102, and the external drive member 201148. In this way it is enabled that the ground coffee packaging cartridge 201102 may be used in combination with the external apparatus 201112 that is provided with the external drive member 201148, while the ground coffee packaging cartridge 201102 can also be used in combination with another external apparatus that is not provided with the external drive member 201148.

Figure 25A also shows that the transportation means 201116, in particular the rotatable axle 201124, may be positioned for preventing, in use, mechanical contact with the external drive member 201148. E.g. in Figure 25A an end of the rotatable axle 201124, which in this example is located in the second bearing 201127, is spaced apart from the recess 201146. In this way driving of the transportation means 201116 by means of the external drive member 201148 may be prevented. However, in a variation of the ground coffee packaging cartridge 201102 in the first example shown in Figure 25C, the transportation means 201116, in particular the rotatable axle 201124, may be positioned for establishing, in use, driving of the transportation means 201116 by means of the external drive member 201148. In the variation shown in Figure 25C, the rotatable axle 201124 and the external drive member 201148 in use make mechanical contact. This enables driving of the rotatable axle 201124 by means of both

the manually operable actuation means 201120 and the external drive member 201148.

Figure 26 shows in cross-section a ground coffee packaging cartridge 201102 for holding and supplying ground coffee, e.g. the ground coffee 201104, according to a second aspect of the first embodiment of a manually operated package. The ground coffee packaging cartridge 201102 is provided with the housing 201106, the transportation means 201116, the moveable structure 201118, and the outlet 201110.

In the second example, the ground coffee packaging cartridge 201102 may be provided in the interior volume 201108 with an internal wall 201152. The internal wall 201152 may be spaced apart from, in use, a top part 201154 of the housing 201106. Similar to the first example, the transportation means 201116 are provided with the conveyor screw 201130 provided in the threaded bore 201134 of the moveable structure 201118. By rotating the conveyor screw 201130 by means of the crank handle 201122, the moveable structure 201118 can be moved, in use, upwards. The transportation means 201116 are thus arranged for moving the ground coffee 201104 through a space 201156 between the, in use, top part 201154 of the housing 201106 and the internal wall 201152. Such moving through the space 201156 may occur if the ground coffee 201104 is lifted high enough by means of the moveable structure 201118. As a result of vibrations or sideward instability of the lifted pile of ground coffee 201104 that are not supported anymore by the internal wall 201152, ground coffee 201104 may move sideward over the internal wall 201152.

Figure 26 further illustrates that the internal wall 201152 may separate a first part 201108A of the interior volume 201108 from a second part 201108B of the interior volume 201108. The moveable structure 201118 may be arranged in the first part 201108A of the interior volume 201108. The outlet 201110 may be accessible via the second part 201108B of the interior volume 201108.

Figure 27 shows in cross-section a ground coffee packaging cartridge 201102 for holding and supplying ground coffee , e.g. the ground coffee 201104, according to a third aspect of the first manually operated embodiment. The ground coffee packaging cartridge 201102 is provided with
 5 the housing 201106, the transportation means 201116, the moveable structure 201118, and the outlet 201110.

In the third example, the moveable structure 201118 may be rigidly connected to the rotatable element, e.g. the rotatable axle 201124. The moveable structure 201118 may e.g. be shaped like a disk. The
 10 moveable structure 201118 may be provided with at least one first aperture 201160 for letting the ground coffee 201104 pass there through. In Figure 27, two first apertures 201160 are visible. A total amount of first apertures 201160 may be in a range from 1 to 6, in a range from 7 to 15, and/or larger than 15.

15 The ground coffee packaging cartridge 201102 may be provided with at least one second aperture that is positioned, in use, above or below the at least one first aperture 201160 and that offers entrance to the outlet 201110. As a result of rotating the rotatable axle 201124, the at least one aperture can be aligned with the at least one second aperture. Then, ground
 20 coffee 201104 can fall through both the at least one first and the at least one second aperture. By further rotating the rotatable axle 201124, alignment of the at least first and the at least second apertures can, at least partly be cancelled. In this way supply of the ground coffee 201104 can be stopped. Thus, rotating the rotatable axle 201124 enables control of the supply of the
 25 ground coffee 201104.

In this example, the second aperture is formed by the outlet 201110, in use located below the first apertures 201160. However, alternatively, the at least one second aperture may be spaced apart from the outlet 201110. More in general, a total amount of the second apertures may
 30 be approximately equal to a total amount of the first apertures 201160. It

may thus be clear that the outlet 201110 may include a plurality of apertures, which may or may not be mutually interconnected.

Figures 28A and 28B shows in cross-section a ground coffee packaging cartridge 201102 for holding and supplying ground coffee, e.g. the ground coffee 201104, according to a fourth aspect of the first manually operated embodiment. The ground coffee packaging cartridge 201102 is provided with the housing 201106, the transportation means 201116, the moveable structure 201118 of the transportation means 201116, and the outlet 201110.

In the fourth example, the moveable structure 201118 is resiliently attached to the ground coffee packaging cartridge 201102 by means of a resilient member, here an elastic spring 201164. The moveable structure 201118 is moveable by means of the manually operable actuation means 201120, here comprising a lever 201166, repeatably from a first position to a second position and vice versa.

Figure 28A shows the ground coffee packaging cartridge 201102 in the fourth example with the moveable structure 201118 in the first position. Figure 28B shows the ground coffee packaging cartridge 201102 in the fourth example with the moveable structure 201118 in the second position. It may thus be clear that, by moving the moveable structure 201118 from the first position to the second position, the spring 201164 may be resiliently deformed.

The ground coffee packaging cartridge 201102 in Figures 28A and 28B is provided in the interior volume 201108 with a passage 201168 for the ground coffee towards the outlet 201110. The passage 201168 may be formed by the internal wall 201152 and an additional wall 201170 that extends from the housing 201106 into the interior volume 201108. In this example, in the second position the passage 201168 is at least partly obstructed, in this example substantially completely obstructed, i.e. substantially blocked, by the moveable structure 201118. In this example, in

the first position the passage 201168 is obstructed less by the moveable structure 201118 than in the second position. In this example, in the first position the passage 201168 is not obstructed by the moveable structure 201118. In a variation however, the first and second position may be
5 reversed, so that in the first position the passage 201168 is at least partly obstructed by the moveable structure 201118 and in the second position the passage 201168 is obstructed less by the moveable structure 201118 than in the first position or is not obstructed by the moveable structure 201118.

In the fourth example, the first position is located, in use, below
10 the second position. In addition, at least part of the ground coffee 201104 is located, in use, above the moveable structure 201118. As a result, repeatedly moving the moveable structure 201118 from the first position to the second position and vice versa, may result in a shaking motion of at least part of the ground coffee 201104 that are located above the moveable structure
15 201118. Such a shaking motion may promote movement of the ground coffee through the interior volume 201108.

The ground coffee packaging cartridge 201102 in one of the first, second, first, and fourth examples can be used in a method. The method includes supplying ground coffee, e.g. the ground coffee 201104, from the
20 ground coffee packaging cartridge 201102 to the external apparatus 201112. The method further includes holding the ground coffee 201104 in the housing 201106 that encloses the interior volume 201108 of the ground coffee packaging cartridge 201102. The method further includes transporting the ground coffee 201104 by means of the transportation
25 means 201116 towards the outlet 201110 of the housing 201106. The method further includes releasing the ground coffee 201104 through the outlet 201110 from the interior volume 201108. In the method, transporting the ground coffee 201104 includes contacting the ground coffee 201104 by means of the moveable structure 201118 of the transportation means
30 201116. Here, the moveable structure 201118 is, at least partly, present in

the interior volume 201108. The method further includes actuating the moveable structure 201118 by means of the manually operable actuation means 201120 of the transportation means 201116. Here, the manually operable actuation means 201120 are, at least partly, provided outside of the interior volume 201108. It may be clear however that the method can also be carried out by other embodiments of the ground coffee packaging cartridge 201102. Alternatively, the method may be carried out without making use of the ground coffee packaging cartridge 201102 in one of the example or variations described.

A second embodiment of a manually operated ground coffee packaging cartridge that can be connected to the coffee brewing apparatus (or in addition another external apparatus) will be described now with reference to Figures 29A-29D. As shown in Figures 29A and 29B the ground coffee packaging cartridge 202500 comprises a scooper 202510 for holding and supplying the ground coffee 201140. The ground coffee packaging cartridge 202500 comprises furthermore a body 202520 having bayonet elements (only one bayonet element 201683 is shown) for connecting the ground coffee packaging cartridge 202500 to the coffee brewing apparatus 4 by placing the bayonet elements in the openings 58 in the side wall 54 of the recess 50 and rotating the ground coffee packaging cartridge 202500 to its final position. In this final position, the scooper 202510 is aligned with the entrance opening 9 of the coffee brewing apparatus 4. The ground coffee packaging cartridge 202500 comprises a handle 202530 for manually turning the scooper. The scooper 202510 is connected to the body by means of a pivot 202540, enabling the scooper 202510 to rotate around a horizontal axis by actuating the handle 202530. Please note that throughout this description ground coffee packaging cartridge is intended to also encompass 'holder' so that the scooper which can hold an amount of ground coffee is also identified as package.

Figure 29C shows the scooper 202510 in its upright position holding a dose of ground coffee 201104. The user may supply the ground coffee to the coffee brewing apparatus 4 by simply turning the handle 202530 half, thereby emptying the scooper 202510 as shown in Figure 29D. So, the scooper works as transportation means for transporting the ground coffee towards the ground coffee entrance 9 of the brewing apparatus 4.

A third embodiment of a manually operated ground coffee packaging cartridge that can be connected to the coffee brewing apparatus will be described now with reference to Figures 30A-30C. As shown in Figure 30A, the ground coffee packaging cartridge 202600 comprises a hopper 202610 for holding ground coffee 201104 inserted by a user. The ground coffee packaging cartridge 202600 comprises a plurality of legs 202620. Some or all of the legs are provided with a bayonet element (not shown) for connecting the ground coffee packaging cartridge 202600 to the coffee brewing apparatus 4 by placing the bayonet elements in the openings 58 and subsequently rotating the ground coffee packaging cartridge, as described herein above. When the ground coffee packaging cartridge 202600 is in its final position an outlet 202630 of the hopper 202600, as shown in Figures 30B and 30C is aligned with the ground coffee entrance 9 of the coffee brewing apparatus 4. The transportation means comprise a closure plate 202660, which is manually rotatable around a horizontal axis by means of manually operable actuation means, such as a handle 202670. The closure plate forms a part, of a virtual cylinder, preferably approximately half of it. The other part of the virtual cylinder is open. In a first position as shown in Figure 30B, the closure plate closes or substantially closes the outlet 202630, thereby hindering the passage of ground coffee 201104 from the hopper 202610 to the coffee brewing apparatus 4. In a second position as shown in Figure 30C, the closure plate 202660 delimits or substantially delimits a first broader part 202640 of the interior volume of the hopper 202610 from a second narrower part 202650 of the interior volume of the

hopper 202610. Thereby the passage of the ground coffee 201104 from the first part 202640 to the second part 202650 is hindered.

By rotating the closure plate between the first and the second positions the user can supply doses of ground coffee to the coffee brewing apparatus 4. Indeed, when the closure plate 202660 is in its first position as shown in Figure 30B due to the gravity the ground coffee 201104 will enter the second part 202650 of the hopper. When the closure plate 202660 is rotated to its second position as shown in Figure 30C, the ground coffee in the second part 202650 of the hopper due to the gravity will fall into the coffee brewing apparatus 4. So, one dose of ground coffee 201104 corresponds to the ground coffee that is held in the second part 202650 of the interior volume of the hopper 202610.

A fourth embodiment of a ground coffee packaging cartridge that can be connected to the coffee brewing apparatus and can be operated independently from the brewing apparatus will be described now with reference to Figures 31A-31C. As shown in Figure 31A, the ground coffee packaging cartridge 202700 comprises a funnel shaped holder 202710 for holding the ground coffee. The ground coffee packaging cartridge comprises an upper outlet 202720 at the upper end of the funnel shaped holder 202710, which upper outlet is connected by a tube (not shown) to a lower outlet 202725 (see Figure 31B) for releasing the ground coffee 201104 from the holder. The ground coffee packaging cartridge 202700 can be connected to the coffee brewing apparatus 4 by placing the bayonet elements (only one of them 201683 is shown in Figure 31B) in the openings 58 and subsequently rotating the ground coffee packaging cartridge, as described herein above. When the ground coffee packaging cartridge 202700 is in its final position, the outlets 202720 and 202725 are aligned with the ground coffee entrance opening 9 of the coffee brewing apparatus 4. The transportation means consist of a spiral-shaped trajectory 202740 on the inner wall of the funnel shaped holder. The spiral shaped trajectory 202740

is obtained by a spiral-shaped edge 202730 protruding from the inner wall. The funnel shaped holder 202710 is, in use, rotated, as shown in Figure 31C. A non-moving block element 202750 impedes the ground coffee to continue rotating on the inner wall. As a result, because the spiral shaped trajectory continues to be rotated, the ground coffee is driven to follow the spiral shaped trajectory 202740 upwards towards the outlet 202720.

Preferably, the actuation means for rotating the holder 202710 are formed by a battery operated motor, although in principle also manually operable actuation means may be used. The rotation of the holder may be initiated by moving the drive clutch 202770 to a position 202760, corresponding to the desired rotation speed. By selecting the rotation speed, the user can select the amount of ground coffee supplied to the coffee brewing apparatus and thereby adjust the coffee strength.

Alternatively, the operation of the motor may be initiated and ended, automatically by detecting the start and stop of the grinder in the coffee brewing apparatus 4. The detection may be implemented by means, known *per se* detecting the sound of the grinder or the vibration thereof. In this way, the coffee brewing apparatus is supplied with ground coffee as long as the grinder thereof is working.

According to a fifth embodiment of the invention in which the ground coffee packaging cartridge is activated independently of the brewing apparatus, the ground coffee packaging cartridge comprises a first module, which is a ground coffee packaging and a second module, which comprises a motor. The first module is removably connectable to the coffee brewing apparatus and the second module is removably connectable to the first module, when the first module is connected to the coffee brewing apparatus. This embodiment will now be described with reference to the ground coffee packaging cartridge as shown in Figures 32A-32F.

As shown in Figure 32A, a ground coffee packaging cartridge comprises a first module 202203 being a ground coffee packaging or

container. A second module 201800 is removably connectable to the upper side of the first module 202203 by attaching an element 201810 thereto. When the second module 201800 is connected to the upper side of the first module 202203, the ground coffee packaging cartridge is in a ground coffee supply mode. The second module comprises a battery driven unit with a vibration motor, similar to the ones used in mobile telephones. When the second module 201800 is placed on the first module 202203 as shown in Figure 32B, the motor may be switched on by means of button 201820. The shaking or vibration of the second module encourages the ground coffee present in the first module 202203 to flow towards the outlet thereof, resulting in the supply of the ground coffee to the coffee brewing apparatus 4, as shown in Figure 32C.

In order to bring the ground coffee packaging cartridge in a ground coffee refill mode, the first module 202203 should be detached from the coffee brewing apparatus 4 and the second module should be connected to the bottom side of the first module, as shown in Figures 32D. As described herein above, the outlet 201612 of the first module 202203 is open, when it is connected to the coffee brewing apparatus 4 and closed when it is disconnected. By connecting the second module in the ground coffee refill mode to the first module in the same or a similar way as the coffee brewing apparatus, the outlet of the first module 202203 may be opened and used as inlet for refilling the ground coffee packaging cartridge with ground coffee . Thereto, the second module 201800 comprises a funnel shaped part 201830, for supplying the ground coffee by the user and a ground coffee inlet 201840. It furthermore comprises a ground coffee outlet 201850, which when the second module is connected to the first module 202203 in the ground coffee refill mode, is aligned with the outlet 201612 of the first module, which here has the function of ground coffee inlet. In order to connect the second module 201800 to the first module 202203, the user has to press button 201860 to engage a latch opener, as shown in Figure 32E. By turning the

motor on, the ground coffee 201104 in the funnel shaped part 201830 are assisted into the first module 202203, as shown in Figure 32F.

With reference to Figure 33 a further embodiment of a ground coffee packaging cartridge 3030 is shown which comprises a closing means 3032 for closing off the ground coffee outlet 3031 when the outlet 3031 is uncoupled from the ground coffee inlet 3041 of the brewing apparatus. The closing means 3032 may include a substantially air-tight closure and/or allow the package 3030 to be vacuumized and/or to remain under vacuum, even after the package 3030 is detached from the coffee brewing apparatus 3020. The closing means 3032 also closes off the package 3030 when it is connected to the coffee brewing apparatus 3020, for instance while the ground coffee inlet 3041 and the ground coffee outlet 3031 are coupled, so that also during connection and coupling, respectively, contact between the ground coffee and the ambient air is avoided. The closing means 3032 is of robust design such that if a grain of coffee should be present in or at the inlet 3041 as it is being closed, the closing means will crush or cause its expulsion during the closing operation. The closing means 3032 can then open for delivering ground coffee from the package to the brewing device. After delivering the ground coffee, the closing means 3032 can close the package 3030 again. The opening of the closing means 3032 can be carried out with an opening means 3036, which for instance may be operated by hand and provided with a handle on the package.

In the embodiment of Figure 33, the ground coffee packaging cartridge 3030 is manufactured from tin and has a cylindrical upstanding sidewall 30200. This upstanding sidewall 30200 slides along an upstanding inner wall 30202 of the coffee brewing apparatus 3020 when the package 3030 is to be connected to the coffee brewing apparatus 3020. The ground coffee inlet 3041 is provided with a first part 30204A of a bayonet closure, and the ground coffee outlet 3031 is provided with a second part 30204B of the bayonet closure. Thus the connecting device in this example comprises

the bayonet closure 30204A, 30204B and the walls 30200, 30202. A user can connect the parts 30204A and 30204B of the bayonet closure with each other by rotating the package e.g. 1/8 turn around its axial axis relative to the coffee brewing apparatus 3020. Thus, the ground coffee outlet 3031 and the
5 ground coffee inlet 3041 are directly connected with each other. The closing means 3032 of the ground coffee packaging cartridge includes a flap 30206 which is connected with the rest of the package via a hinge 30208. The hinge 30208 is provided with a spring 30210 which biases the flap 30206 to a closed position. The closing mechanism 3034 hence comprises the spring
10 30210. The flap 30206 further comprises a projecting pin 30212 of soft iron. The coffee brewing apparatus 3020 further comprises an electromagnet 30214 which is operated by a control device of the apparatus. The control device is connected with a sensor 30216 (arranged in or near the side wall
54 of the recess 50: Figure 1) which detects when a package 3030 is
15 connected to the coffee brewing apparatus 3020. When a user operates an operating element of the control device of the coffee brewing apparatus and when the sensor detects the presence of a package, the control device activates the electromagnet 30214 so that the pin 30212 is attracted by the electromagnet, whereby the flap 30206, overcoming the bias of the spring
20 30210, swings open in the direction of the arrow 30218. The open position of the flap 30206 (closing means 3032) is shown in dotted outline in Figure 33. Thereupon, the control device activates a dosing device, to be described in more detail hereinafter, for delivering predetermined doses of ground coffee from the package 3030 to the coffee brewing apparatus 3020. The control
25 device, the sensor 30216 and the electromagnet 30214 form part of opening means for opening the package. When a user uncouples/disconnects the package 3030 from the coffee brewing apparatus 3020, the flap 30206 assumes its closed condition under the influence of the spring 30210. This also happens if the electromagnet 30214 were still energized, because the
30 magnetic field remote from the coffee brewing apparatus is then too weak to

keep the flap 30206 in its open position. It is also possible that the control device 3038, upon detecting with the sensor 30216 that the package is being uncoupled from the machine, deactivates the electromagnet 30214. In that case, the electromagnet 30214 and the control device together with the
5 spring 30210 function as part of the closing mechanism 3034. It is further possible that the control device deactivates the electromagnet 30214 after each preparation of a quantity of coffee beverage, even while the package remains connected to the coffee brewing apparatus 3020. In that case, too, the control device 3038 and the spring 30210 form part of the closing
10 mechanism. The opening means hence can open the package as soon as a connected package is detected with the sensor or as soon as, with the sensor, a connected package is detected and a user activates the operating element for preparing a coffee beverage.

In one embodiment, the control device is activated through
15 detection of the package 3030 by the sensor 30216. The sensor 30216 may comprise an electric, magnetic and/or an optical sensor 30216. Additionally or alternatively, the sensor 30216 may comprise a mechanical detection system, for instance, including a switch which can be tripped by a corresponding part of the package 3030. The mechanical parts of the
20 package 3030 and the sensor 30216 have corresponding shapes so that the package 3030 serves as a “key” to enable the apparatus 3020 to operate. In a further embodiment, the package 3030 includes an RFID tag, and the apparatus includes an RFID reader. The control device is arranged to recognize predetermined codes corresponding to the package 3030, so that
25 the control device activates the apparatus 3020 only when the code on the RFID tag of the package 3030 corresponds to a predetermined code.

In use, when the ground coffee packaging cartridge 3030 is connected directly to the coffee brewing apparatus 3020, the package 3030 is opened, whereby after or upon connection of the package 3030 onto the
30 coffee brewing apparatus 3020 the ground coffee is supplied from the

package 3030 to the brewing device. Preferably, the coffee grinds from the package 3030 are delivered as a dose sufficient for one cup of coffee, for example, less than 20 grams. After the ground coffee has been used up, the package 3030 can be removed. Upon removing the package 3030 from the coffee brewing apparatus 3020, the package 3030 may be thrown away, and during this operation, preferably automatically, be closed off with the closing means, as already explained.

The coffee brewing apparatus 3020 in this example is so arranged that after the preparation of the coffee beverage, substantially no unused ground coffee remains behind in the coffee transport path P.

In an embodiment the coffee beverage system comprises a dosing device 3050 which is, for instance, included in the coffee brewing apparatus 3020. Also, the dosing device 3050 may be included partly in the package 3030 and partly in the coffee brewing apparatus 3020. The dosing device 3050 is arranged such that a dose of coffee grounds can be supplied to the brewing device for making one cup of coffee beverage. The volume of one cup of coffee beverage can vary from about 20 milliliters, for instance for a small amount of strong espresso, to 400 milliliters or more, for instance for a large cup of coffee beverage. The weight of a dose of ground coffee may be approximately equal to 50 grams or less, in particular 20 grams or less, more particularly 15 grams or less. Preferably, the dose approximately corresponds to a weight of between 4 and 10 grams, in particular about 7 grams. The dosing device 3050 is operated through the operating element of the control device, for setting the dose of ground coffee, thereby allowing the dose to be determined by the user during operation. Also, the amount of water to be supplied may be determined through the or an additional operating element.

In Figure 34, there is schematically shown a section of a ground coffee packaging cartridge 3030 with multiple compartments. In Figure 35, the ground coffee packaging cartridge 3030 with multiple compartments is

shown with the package 3030 being provided with a dosing device 3050. To this end, the package 3030, in particular the dosing device 3050 is arranged with multiple compartments 3052 which are each filled with one dose of ground coffee. The package 3030, in particular the dosing device 3050,

5 comprises a displaceable dosing element 3054, being a rotary part in the embodiment shown, which displaceable dosing element 3054 has a ground coffee outlet 3031. In line with the example of Figure 33, the coffee brewing apparatus 3020 corresponding with the package 3030 may be provided with an electric motor which is controlled by the control device for displacing the

10 dosing element 3054. The package 3030 according to Figure 35 is further provided, under the displaceable dosing element 3054, with a flap 30206 and a part 30204B of a bayonet connection as discussed with reference to Figure 33. A difference with the variant according to Figure 3 is that the ground coffee outlet 3031 of Figure 34 and 35 has approximately the same diameter

15 as the compartment 3052, whereas in Figure 33 the diameter of the ground coffee outlet 3031 is much smaller than the diameter of the package. In this description, a displaceable dosing element 3054 may be understood to cover an element which, through displacement, doses an amount of ground coffee for supply to the brewing device. By placing the ground coffee outlet 3031

20 under one of the compartments 3052, the ground coffee from the respective compartment 3052 is able to move through the ground coffee outlet 3031 towards the brewing device, for instance, by gravity. At least one parking position 3056 is provided approximately at the location of which the ground coffee outlet 3031 can park, so that no ground coffee flows out undesirably

25 through the outlet 3031. Furthermore, the package 3030 comprises a closing strip 3057 or the like which closes off an exit side 3058 of the ground coffee packaging cartridge 3030 before use, and which is intended to be removed by the user prior to placement of the package 3030 in the coffee brewing apparatus 3020. In this way, the exit side 3058 of the ground coffee

30 packaging cartridge 3030 is hygienically covered before use. In addition, a

shell 3059 is provided, which encloses the compartments 3052, for example, for providing information and/or advertising on the outside of the package 3030.

In one embodiment, as discussed above with reference to Figures 5 33 to 35, the coffee brewing apparatus 3020 is arranged to operate the dosing device 3050 and/or the closing means. However, other variants are also conceivable. To this end, the coffee brewing apparatus 3020 may be provided with an activation element 3060, as shown in Figure 36. The activation element 3060 comprises the closing mechanism and the opening 10 means. The dosing and closing functions can be integrated advantageously, as will be illustrated below. The activation element 3060 is provided near the connecting device of the brewing apparatus, so that the latter in the connected condition can engage the package 3030. The activation element 3060 comprises a cam and/or notch for engaging a corresponding part of the 15 package 3030, in particular for moving the dosing element 3050. The activation element 3060 has a shape that corresponds to the part of the dosing device 3050 that is to be engaged. The dosing device 3050 may comprise a male part 3050A and a corresponding female part 3050B, with one of the parts 3050A, 3050B being provided in the coffee brewing 20 apparatus 3020 and the corresponding part in the package 3030. The part provided in the coffee brewing apparatus 3020 is preferably the activation element 3060, whereby it can engage the package 3030, in particular the displaceable dosing element 3054, for displacing the outlet 3031 to the respective compartment 3052. The activation element 3060 can be controlled 25 electrically and/or mechanically and/or directly by the user.

The activation element 3060 may be arranged for operating the displaceable dosing element 3054, being a rotary part in the embodiment shown, for placing the ground coffee outlet 3031 opposite one of the compartments 3052, for supplying the dose of ground coffee to the brewing 30 device. The displaceable dosing element 3054 is rotatable in a rotational

direction D for displacing the ground coffee outlet 3031 under and/or opposite the desired compartment 3052. Also, the displaceable dosing element 3054 is arranged to function as a closing means and/or be provided with a closing means. When the dosing element 3050 is rotated such that it
5 only releases an empty compartment, the other compartments are closed off such that the exposure of the ground coffee in the ground coffee packaging cartridge 3030 to ambient air is prevented.

As shown in Figure 36, the displaceable dosing element 3054 is displaceable in the direction L of the compartments 3052. The displaceable
10 dosing element 3054 is moveable relative to the rest of the package 3030 so that the ground coffee outlet 3031 is released, for example, in a downwardly moved condition, or so that the ground coffee outlet 3031 is closed, for example, in an upwardly moved condition (see Figure 36). As can be seen, the outlet 3031 is arranged on the side of the package 3030, in particular
15 the displaceable dosing element 3054.

In Figure 37 an alternative embodiment is shown in which by moving a ring 3062 forming part of the closing means, upwards, the ground coffee outlet 3031 is released. The package 3030 may be provided with multiple compartments 3052. Under the closing means 3032 a rotatable
20 dosing element 3054 is provided, provided with, for example, one outlet 3031. The outlet 3031 can then release one compartment 3052 with coffee beans, if the outlet 3031 is positioned opposite that compartment 3052. The closing means 3062 is arranged for closing off and releasing the ground coffee outlet 3031 upon connection of the package 3030 to the coffee brewing
25 apparatus 3020, in particular onto the connecting device 3040. The closing means 3062 are constructed to slide upwards if the package 3030 is placed in the connecting device of the coffee brewing apparatus 3020. The rotatable dosing element 3054 can place the ground coffee outlet 3031 opposite the respective compartment 3052, through rotation of the activation element

3060, whereby the ground coffee is free to flow out of the respective compartment 3052.

In another embodiment, the package 3030 is provided with multiple coffee outlets 3031, with each compartment 3052 being provided with an outlet 3031. The coffee brewing apparatus 3020 comprises one
5 ground coffee inlet 3041. A displaceable dosing element 3054 is arranged in the coffee brewing apparatus 3020, where the displaceable dosing element 3054 is operable to couple the ground coffee inlet 3041 with one of the ground coffee outlets 3031 for releasing the ground coffee adjacent the
10 respective ground coffee outlet 3031. The system is arranged such that the package 3030 is rotatable relative to the coffee brewing apparatus 3020, for instance for coupling a particular coffee outlet 3031 with the coffee inlet 3041.

In another embodiment, the package 3030 has multiple outlets
15 3031 corresponding to multiple compartments 3052, with all the outlets 3031 comprising associated closing means. The activation element 3060 is then arranged to open or break-through a closure for supplying a dose of ground coffee to the brewing device. The closing means 3032 may comprise a breakable, tearable and/or cuttable foil.

In another embodiment, a dose of ground coffee can be supplied
20 from the respective compartment 3052 directly to the coffee brewing apparatus 3020, without the ground coffee packaging cartridge 3030 first needing to be connected. The package 3030 comprises a dosing device 3050 which the user himself may then operate, for example, by releasing the
25 respective outlet 3031, and/or by displacing the dosing element 3054.

In Figures 38 and 39, another embodiment is shown in which a dosing device 3050 is provided in the coffee brewing apparatus 3020. The dosing device 3050 comprises a rotary and/or sliding mechanism. The dosing device 3050 further comprises a housing 3065 with a chamber 3064, and a
30 closing means 3032 having a closure member 3032A with a ground coffee

inlet 3041 formed therein. The ground coffee inlet 3041 is moveable relative to the chamber 3064, so that the chamber 3064 is either released or is closed off by the closing means 3032, for instance by rotating the closure member 3032A and/or the housing 3065 in a rotational direction D.

5 The package 3030 is provided with a coffee outlet 3031 and a sealing strip 3057. By removing the sealing strip 3057 at least locally, the ground coffee outlet 3031 can be exposed/released. The connecting device is arranged such that upon placement of the package 3030, the sealing strip 3057 is locally or wholly removed in an automatic manner, or at least so
10 that the ground coffee outlet 3031 is released. By placing the chamber 3064 under the ground coffee outlet 3031, ground coffee enters the chamber 3064. Preferably, the volume of the chamber 3064 is sufficient for temporarily storing one dose of ground coffee. After filling of the chamber 3064 with one dose of ground coffee, the chamber 3064 and the outlet 3031 are displaced
15 relative to each other, so that the outlet 3031 is closed off by the upper surface of the housing 3065. By placing the ground coffee inlet 3041 under the chamber 3064, the dose of ground coffee in the chamber 3064 can be released and be passed to the brewing device. As the outlet 3031 and the chamber 3064 are no longer connected, no further ground coffee from the
20 package 3030 will be passed via the chamber 3064 to the brewing device.

 In Figures 40 and 41, an embodiment is shown in which the dosing device 3050 is provided in and at the bottom of the package 3030. The package 3030, in particular the dosing device 3050, is provided with a chamber 3064 for temporarily storing and/or passing a dose of ground coffee.
25 The chamber 3064 may be provided in a first housing part 3065A, while the first housing part 3065A and the chamber 3064 can rotate in and relative to a receiving housing part 3065B about a central axis of the first housing part 3065A. In the exploded drawing of Figure 41, the first housing part 3065A and the chamber 3064 have been rotated 90° about the central axis, with
30 respect to the position shown in Figure 39. The housing parts 3065A, 3065B

may be parts of one housing 3065. The housing 3065 is a part of the dosing device 3050. Furthermore, in the package 3030, above the housing 3065, a space filled with ground coffee is provided. The space may comprise only one compartment, and is filled with multiple dosages of ground coffee.

5 Furthermore, a ground coffee passage 3066 may be provided at the bottom of the space, under the space with ground coffee, and above the dosing device 3050, for supplying the ground coffee to the dosing device 3050 under the influence of gravity. The first housing part 3065A is arranged movably, in particular rotatably, relative to the passage 3066, while the
10 receiving housing part 3065B is arranged fixedly with respect to the passage 3066. Under the chamber 3064, closing means 3032, with a ground coffee outlet 3031, is provided. The closing means 3032 is rotatable with respect to the housing 3065. By rotating the first housing part 3065A relative to the receiving housing part 3065B, the chamber 3064 can be placed under the
15 ground coffee passage 3066, and a portion of the ground coffee, preferably approximately equal to one dose, descends into the chamber 3064. The chamber 3064 can thereupon be displaced again so that it becomes disconnected with the passage 3066, for instance, the upper side of the chamber 3064 is closed off by a bottom part 3065A of the package 3030. By
20 thereupon placing the coffee outlet 3031 under the chamber 3064, the dose of ground coffee is supplied to the brewing device, via the ground coffee inlet 3041. The dosing of the ground coffee is operated through the activation element 3060 which is disposed in the coffee brewing apparatus 3020. The package 3030 is arranged such that by rotating the package 3030 relative to
25 the coffee brewing apparatus 3020, a dose of ground coffee is released.

 The ground coffee packaging cartridge 3030 can, for instance, be made of substantially rectangular or cylindrical shape. The connecting device has a complementary shape so that the two can be connected. In an embodiment, the inner space of the ground coffee packaging cartridge is
30 arranged for holding multiple dosages of ground coffee, for instance, when

this inner space is wholly filled with ground coffee, at least 20 grams, more particularly at least 50 grams, still more particularly at least 70 grams and still more particularly at least 200 grams of ground coffee. In another embodiment, the package 3030 comprises only one dose of ground coffee, so
5 that the system after each connection of the package 3030 processes one dose of ground coffee, for instance, for one cup of coffee beverage. Also, a dose can, for instance, correspond to multiple cups of coffee beverage, or larger cups of coffee beverage, while the user can choose from smaller or larger packages 3030, which in use are placed in their entirety in the coffee
10 brewing apparatus 3020. Different packages 3030 within the system can involve multiple volumes. Such packages 3030 can, for instance, after one dosage be exchanged and/or thrown away.

Figures 42A-V show in chronological order, by way of example, possible steps for a method with a dosing device 3050 for a package 3030
15 with ground coffee. The dosing device 3050 is arranged to enable a predetermined dose of ground coffee to be supplied from the package 3030 to the coffee brewing apparatus 3020. The dosing device 3050 comprises a piston 3073, which is provided in the coffee brewing apparatus 3020, and a displaceable, in particular slidable, dosing element, in the form of a
20 corresponding tube 3074 with coffee outlet 3031. The tube 3074 is provided in the package 3030. The piston 3073 and the tube 3074 can, for example, have a circular cross section or a polygonal cross section. The tube 3074 is filled with at least a part of the ground coffee from the package 3030.

In a first step (Figure 42A) the package 3030 is closed. The
25 package 3030 comprises a sealing strip 3057 which closes off the package 3030 substantially in an airtight manner and/or under vacuum. The package 3030 is connected to a coffee brewing apparatus 3020, which is not further shown. In the package 3030 enough ground coffee may be present for multiple dosages of ground coffee for multiple cups of coffee beverage.

Preferably, the package 3030 is substantially wholly filled with ground coffee.

In a second step, the package 3030 is connected to the coffee brewing apparatus 3020, whereby or whereupon the piston 3073 is inserted
5 through the ground coffee outlet 3031, through interruption or detachment of at least a part of the sealing strip 3017 (Figure 42B). The piston 3073 closes off the outlet 3031, so that no ground coffee exits the package 3030. The piston 3073 is disposed at an end of the tube 3074, so that a considerable part of the tube 3074 is still filled with ground coffee. In a next
10 step, the piston 3073, the tube 3074 and ground coffee in the tube 3074 are partly moved out of the package 3030 (Figure 42C), while the piston 3073 continues to close off the outlet 3031. The upper surface 3075 of the volume of ground coffee in the package 3030 is allowed thereby to descend, so that there is space for the piston 3073 to slide further into the package 3030,
15 whereby said upper surface 3073 will rise (Figure 42D). The piston 3073 continues to ascend until the portion of the ground coffee that is still in the tube 3074 is approximately equal to a predetermined dose of ground coffee (Figure 42E). The piston 3073 moves to a particular height in the tube 3074, which height determines the dose of ground coffee to be supplied to the
20 brewing device. The height can, for example, depend on settings which have been indicated by the user via the apparatus 3020, and/or of a circuit preprogrammed during manufacture of the apparatus 3020.

The tube 3074 and the piston 3073 may ascend up to a top wall 3076, or at least an opposite wall, of the package 3030 (Figures 42F, 42G),
25 with the tube 3074 and the piston 3073 remaining in an approximately equal position relative to each other, so that said dose of ground coffee is confined in the tube 3074, between the piston 3073 and the top wall 3076, preventing any further ground coffee from coming to the piston 3073. As can be seen, the piston 3073 extends between a bottom wall 3077 and the top
30 wall 3076 of the package 3030; preferably, the position of the piston 3073 is

approximately equal to the initial position (Figure 42A). The piston 3073 is then free to descend below the tube 3074, while the dose of ground coffee can descend along with it (Figure 42H). The dose of ground coffee can be released if there is enough free space between the piston 3073 and the tube
5 3074 (Figure 42I). This dose can then be supplied to the brewing device.

If the dose of ground coffee has been carried off (Figure 42J), the piston 3073 may move back into the tube 3074 again, preferably up to the height which determines the dose of ground coffee (Figure 42K). Thereupon the piston 3073 and the tube 3074, in equal position relative to each other,
10 can move down whereby the part of the tube 3074 above the piston 3073 is filled with ground coffee (Figure 42L). The piston 3073 and the tube 3074 can thereupon slide towards the opposite wall 3076, so that the predetermined dose of ground coffee is confined (Figure 42M), which predetermined dose in turn can be released by the piston 3073 coming down
15 (Figures 42N-P). The above steps can be repeated until the package 3030 is empty (Figures 42Q-V).

In an embodiment not shown, the piston 3073 is part of the package 3030, while the piston 3073 is activated by an activation element 3060 in the coffee brewing apparatus 3020, and the dosing device 3050
20 functions approximately according to the same principle as shown in Figures 42A-V. In a further embodiment, the dosing device 3050, or at least a part thereof that is provided in the package 3030, may be manufactured substantially from disposable or recyclable materials, such as, for instance, cellulose, paper, cardboard, or other materials, or, for instance, from plastic.

25 An embodiment of a brewing device is shown in Figures 43 to 48.

Referring to Figure 43, the brewing device 30100 comprises a brew chamber assembly 30102. The brew chamber assembly 30102 comprises a horizontally-oriented, open-ended, stationary brew sleeve 30104 having a ground coffee inlet 30106 on an upper portion thereof that is
30 in direction communication with the ground coffee transport path P of the

connecting device, a water/steam inlet 30107 also on an upper portion thereof, and a beverage outlet 30108 on a lower portion thereof directly below the water/steam inlet 30107 through which prepared coffee beverage is dispensed to the user. A filter screen tube 30109 is
5 disposed across brew sleeve 30104 between the water/steam inlet 30107 and the beverage outlet 30108. A first piston 30110 is mounted for movement back and forth along the brew sleeve 30108 from one end thereof, and a second piston 30112 is mounted for movement back and forth along the brew sleeve 30108 from the opposite end thereof.

10 In the illustrated embodiment, the pistons 30110, 30112 are driven from the same drive mechanism (not shown) via a scotch yoke or cam track mechanism such that they move in predetermined concert as shown in Figures 44 to 48.

Figure 44 shows the brewing device at the start of brewing cycle
15 in which a dosing device 3050 has dispensed a fixed quantity, e.g. 7g, of coffee grounds into the brew sleeve 30104 via the ground coffee inlet 30106, see arrow 1. The coffee grounds drop into a loose pile. Referring to Figure 45, in a first phase of the brewing cycle, the first piston 30110 moves along the brew sleeve 30104 sweeping the coffee grounds into a compact
20 (without voids) puck located within the filter screen tube 30109, see arrow 2. Referring to Figure 46, water is injected from a boiler (not shown) into the water/steam inlet 30107 at low/medium pressure, see arrow 3. A sealing flange 30110a on the piston 30110 ensures that during the water injection the connecting device and ultimately the ground coffee packaging cartridge
25 3030 are protected from steam and water. A sealing flange 30112a on the piston 30112 provides similar sealing on the other end of the brew sleeve 30104. The prepared coffee beverage drains under gravity through the beverage outlet 30108. Referring to Figure 47, in a further phase of the brewing cycle, the pistons 30110, 30112 move in unison leftwards displacing
30 the used puck from the brewing position of Figure 46 out of the left end of

the sleeve to a disposal/discharge position where it is free to fall into a waste bin (not shown). A push arm or flicker 30115 is used to ensure that the puck if it does remain stuck to the faces of the pistons 30110, 30112 and, in fact, falls.

5 In a further embodiment shown Figure 48, the piston 30110 comprises a second sealing flange 30110b which would allow for in-situ cleaning of the brew sleeve in the region of the filter screen tube 30109. The sealing flanges 30110 a, b provide protection for the rest of the system during the cleaning operation.

10 In other embodiments (not shown), while achieving the necessary sweeping, compacting, brewing, and discharge steps, the brew sleeve 30104 need not be stationary; for example, it may be coupled to the driving mechanism for movement, and one of the pistons may replaced by a passive stop.

15 The system may be favorably provided with different ground coffee packaging cartridges in which different kinds of coffee are stored. Prior to connection, the ground coffee packaging cartridges are closed, preferably air-tightly and/or vacuumized. The system may be thus arranged that after coffee beverage has been prepared with ground coffee from a first
20 ground coffee packaging cartridge, the first ground coffee packaging cartridge can be disconnected from the coffee brewing apparatus and the second ground coffee packaging cartridge can be connected to the coffee brewing apparatus, after which coffee beverage can be prepared with the coffee brewing apparatus with coffee grounds from the second coffee
25 package, substantially without ground coffee of the first ground coffee packaging cartridge being used for preparing the coffee beverage. As substantially no ground coffee of a previous serving will remain behind, there will be no contaminations between servings.

 In between servings, the user can therefore exchange ground
30 coffee packaging cartridges with different kinds of ground coffee without the

desired taste of the new coffee beverage being affected. Favorably, the package may be provided with a closure which is reclosable, so that the package can be taken from the coffee brewing apparatus at any moment, with the package closing off automatically. In an embodiment, the package
5 is closed off air-tightly. For instance, the closure is arranged for air-tight closure.

In an embodiment, the closure comprises a flap for closing off the ground coffee outlet. The flap links up with an activation element of the coffee brewing apparatus and comprises a cam which pushes-in the flap
10 upon placement of the package. The activation element can also comprise an actively controlled, for instance, electrically controlled, element which opens the package. In another embodiment, the closure comprises, for instance, a slide or the like, which can also correspond with the activation element, while the activation element is arranged to open and/or close the slide for
15 respectively supplying a dose of ground coffee and/or closing off the package.

In yet another embodiment, air is extracted from the package, whereupon the package is closed off air-tightly, so that the package can be in a substantially vacuum condition. The coffee brewing apparatus is arranged to draw in air and/or ground coffee. For instance, the coffee
20 brewing apparatus may be provided with a pump for carrying off air from the ground coffee packaging cartridge. Also, the package may comprise flexible walls, for instance, allowing the package to shrink upon releasing the ground coffee. Also, the package may, for instance, be partly flexible and partly stiff. In yet another embodiment, upon closure of the package, an
25 inert gas is injected for preserving the ground coffee.

In an embodiment, the coffee brewing apparatus comprises an operating panel with at least one operating element. The operating element may be arranged for activating the activation element that a dose of ground coffee can be supplied to the brewing device for preparing coffee beverage. In

a further embodiment, the at least one operating element is arranged for setting the amount of water and/or the dose of ground coffee.

In an embodiment, the apparatus can for instance also supply, in addition to hot water, cold water for making a cold coffee beverage, like ice
5 coffee. The brewing device can, for instance, comprise a filter or filter holder. The filter can, for instance, be a metal filter or a paper filter, and may be suitable for reuse or be designed as disposable filter. The brewing device can, *inter alia*, comprise a drip coffee maker, a pour-on system, a pressure system, in particular an espresso machine, a percolator and/or a system for
10 making instant coffee. In principle, any coffee preparation method can be used.

In the foregoing, it has been indicated that the closing means can close off the coffee grounds in the package, so that the exposure of the ground coffee in the ground coffee packaging cartridge to ambient air is
15 prevented. This should be understood to mean, *inter alia*, a closure which allows at least substantially no air to pass from the environment to the ground coffee in the package and vice versa. Preferably, the closing means can pass at least substantially no air from the environment to the grounds in the package and vice versa when there is a pressure difference between
20 the space in the package in which the grounds are situated and the environment that is at most 1.1, preferably 1.2, more preferably 1.3 and still more preferably 1.5 bar. Preferably, the amount of air which enters the coffee package is at most equal to the volume of the grounds supplied from the ground coffee packaging cartridge to the coffee brewing apparatus. This
25 can be realized, for instance, by connecting the ground coffee packaging cartridge air-tightly to the coffee brewing apparatus and by making the interior of the system where the ground coffee are permitted to be present at least substantially airtight with respect to an environment ('the outside world') of the system. For instance, in Fig. 33 the ground coffee inlet and the
30 ground coffee outlet are air-tightly connected with each other. This interior

of the system is formed in Figure 33, for instance, by the inner space of the package, the ground coffee transport path P, and the brewing device, itself.

In an embodiment, the coffee brewing apparatus is provided with an emptiness detection system. This is arranged such that the coffee
5 brewing apparatus with the aid of the sensor 30216 can read out an identification code on a package and record the same in the control device of the coffee brewing apparatus. The coffee brewing apparatus then knows on the basis of the identification code what is the amount of grounds (for instance in volume or weight) present when it has not been used before.
10 Thus, the coffee brewing apparatus can monitor on the basis of the dosage of the ground coffee that is successively supplied from this package to the coffee brewing apparatus what the residual amount of ground coffee in the package is. This can also be done when the package is disconnected from the coffee brewing apparatus and is subsequently connected again. Then the
15 coffee brewing apparatus will again determine the identification code of the package and hence know what the residual amount of ground coffee in the package is. The coffee brewing apparatus can update this amount again after ground coffee has been received from the package again. Also, the system may be further provided with means of verifying that, upon closure
20 of the package with the closing means, the closing means are not blocked by coffee grounds. This can, for instance, be carried out with the aid of a CCD camera. This camera generates an image of the closing means which image is supplied to the control device. The control device can for instance
25 comprise image signal processing means for recognizing (pattern recognition) coffee grounds, upon such recognition, generating an alert signal for a user. Also, instead of on the basis of the presence coffee grounds as such, it may be simply detected with the camera that the closing means fails to reach the closed condition, for instance through detection of the position of the pin 30212 in Figure 33.

The inner space of the package 3030 may be provided with oxygen absorbing means, and/or a shelf life enhancing gas. The package may also be vacuum-packed. To obviate unduly high internal pressure, which may for instance be created upon accumulation of gases from the ground coffee, the package may for instance be provided with a valve which may be arranged to let off gas at a predetermined internal pressure. Preferably, the package is provided with a sealing foil for substantially air-tightly closing off the outlet and/or the closing means, to prolong shelf life of the grounds, at least prior to use. The sealing foil may for instance be provided over the closing means. The foil can optionally be provided with a valve.

It is thus believed that the operation and construction of the present invention will be apparent from the foregoing description. The invention is not limited to any embodiment herein described and, within the purview of the skilled person; modifications are possible which should be considered within the scope of the appended claims. For example the top wall of the metering chamber may be located well above the highest part of the inlet opening of the metering chamber. This means that if in the first step the transportation means is activated longer than required for filling the metering chamber, the metering chamber will always be filled up until about the highest part of the inlet opening.

Also, for example, the transportation means for transporting the ground coffee from the container to the metering chamber may be implemented as passive means not driven by a motor, for example by means of a downwardly extending bottom wall for transporting the ground coffee towards the exit opening and into the metering chamber under the influence of gravity only. A special means may in that case be required to close the inlet opening of the metering chamber once it is filled with ground coffee.

Similarly all kinematic inversions are considered inherently disclosed and to be within the scope of the present invention. The term "comprising" when used in this description or the appended claims should

not be construed in an exclusive or exhaustive sense but rather in an inclusive sense. Expressions such as: "means for ..." should be read as: "component configured for ..." or "member constructed to ..." and should be construed to include equivalents for the structures disclosed. The use of

5 expressions like: "critical", "preferred", "especially preferred" etc. is not intended to limit the invention. Features which are not specifically or explicitly described or claimed may be additionally included in the structure according to the present invention without deviating from its scope.

CONCLUSIES

1. Koffiedranksysteem dat een koffiezetapparaat omvat en een koffiebonenverpakkingspatroon, waarbij de koffiebonenverpakkingspatroon losmaakbaar aangebracht wordt op het koffiezetapparaat en is ingericht voor het bevatten en afleveren van een veelvoud van koffiebонendoses en
5 waarbij de koffiebonenverpakkingspatroon omvat:
 - een houder die een binnenruimte en ten minste een uitgangsopening bevat die een koffiebонenuitlaat vormt, waarbij de binnenruimte koffiebonen houdt,
 - transporteermiddelen geschikt voor het mogelijk maken van het
10 transporteren van de koffiebonen van de binnenruimte naar de uitgangsopening van de patroon;
 - waarbij het koffiezetapparaat een ingangsopening bevat voor het opnemen van koffiebonen die getransporteerd worden met behulp van de transporteermiddelen naar de uitgangsopening, een maalinrichting voor het
15 malen van de koffiebonen die het koffiezetapparaat zijn binnengekomen via de ingangsopening en een koffiezetinrichting voor het zetten van koffie op basis van gemalen koffie verkregen door middel van de maalinrichting, waarbij het systeem verder is voorzien van een doseerkamer voor het opnemen van koffiebonen, die getransporteerd worden tot in de
20 doseerkamer met behulp van de transporteermiddelen waarbij de doseerkamer een bodemgedeelte bevat dat een deel vormt van de maalinrichting, waarbij het genoemde bodemgedeelte is ingericht in het koffiezetapparaat voor het roteren rond een eerste as, die zich uitstrekt in een verticale richting, waarbij het systeem zodanig is ingericht dat in
25 reactie op de activering van de maalinrichting het bodemgedeelte rond de verticale as roteert voor het transporteren van de koffiebonen van de doseerkamer tot in de maalinrichting en voor het malen van de koffiebonen,

- met het kenmerk dat het systeem verder is voorzien van een gemalenkoffieverpakkingspatroon die ook losmaakbaar op het koffiezetapparaat aangebracht kan worden en die gevuld is met gemalen
- 5 koffië waarin het gemalenkoffieverpakkingspatroon is ingericht voor het toevoeren van gemalen koffië tot in het koffiezetapparaat via de ingangsopening.
2. Koffiezetsysteem volgens conclusie 1, waarbij de gemalenkoffieverpakkingspatroon is ingericht om te worden gevuld met en
- 10 voor het bevatten en afleveren van gemalen koffië.
3. Koffiezetsysteem volgens conclusie 2, waarbij de gemalenkoffieverpakkingspatroon omvat:
- een houder, die een binnenruimte en ten minste een uitgangsoopening bevat die een gemalenkoffieuitlaat vormt, waarbij de binnenruimte is
- 15 ingericht voor het bevatten van gemalen koffië;
- transporteermiddelen geschikt voor het mogelijk maken van het transporteren van gemalen koffië van de binnenruimte naar de uitgangsoopening van de gemalenkoffieverpakkingspatroon.
4. Koffiezetsysteem volgens conclusie 1, 2 of 3, waarbij het
- 20 koffiezetsysteem zo is ingericht dat de gemalen koffië door de zwaartekracht van de gemalenkoffieverpakkingspatroon naar het koffiezetapparaat wordt getransporteerd.
5. Koffiezetsysteem volgens één van de voorgaande conclusies, waarbij het bodemgedeelte een conische vorm heeft zodanig dat het
- 25 bodemgedeelte zich naar beneden uitstrekt in een richting loodrecht op en zich uitstrekkend vanaf de eerste verticale as.
6. Koffiezetsysteem volgens één van de voorgaande conclusies, waarbij de doseerkamer verdeeld is in een eerste kamergedeelte, dat een deel is van de respectieve patroon en optioneel een tweede kamergedeelte,
- 30 dat een deel is van het koffiezetapparaat, waarbij het tweede kamergedeelte het bodemgedeelte bevat, dat een deel vormt van de maalinrichting, waarbij

het genoemde bodemgedeelte is ingericht in het koffiezetapparaat voor het roteren rond een eerste as, die zich uitstrekt in een verticale richting.

7. Systeem volgens conclusie 6, waarbij het eerste kamergedeelte de uitgangsopening bevat en het tweede kamergedeelte de ingangsopening, waarbij bij voorkeur het eerste kamergedeelte zich boven het tweede kamergedeelte bevindt en waarbij de uitgangsopening zich uitstrekt boven de ingangsopening.

8. Systeem volgens één van de voorgaande conclusies waarbij het systeem zo is ingericht dat na het opnemen van de koffiebonen of de gemalen koffie de doseerkamer een portie koffiebonen of gemalen koffie zal bevatten en/of de doseerkamer is ingericht voor het opnemen van een portie koffiebonen of gemalen koffie, die overeenkomt met een gedoseerde hoeveelheid koffiebonen of gemalen koffie, die bij voorkeur nodig is voor het bereiden van een enkele dosis koffiedrank, zoals een enkele kop koffie, die 80-160 ml koffie bevat.

9. Systeem volgens conclusie 3 of één van de conclusies 4 tot 8 voor zover ze afhankelijk zijn van conclusie 3, waarbij de transportermiddelen een gedeelte bevatten, dat beweegbaar is ten opzichte van de doseerkamer voor het transporteren van de koffiebonen of de gemalen koffie naar en tot in de doseerkamer in reactie op het aandrijven van de transportermiddelen.

10. Systeem volgens conclusie 9, waarbij het koffiezetapparaat is voorzien van een eerste motor en een zich verticaal uitstrekken de aandrijfas, waarbij genoemde aandrijfas losmaakbaar verbonden is met de transportermiddelen van de respectieve patroon voor het aandrijven en daardoor bewegen van de transportermiddelen in reactie op de rotatie van de aandrijfas door middel van de motor.

11. Systeem volgens conclusie 9 of 10, waarbij het beweegbare gedeelte een bodem en/of een veelvoud van schoepen omvat, die rond een tweede

verticale as roteren in reactie op het aandrijven van de transporteer-
middelen.

12. Systeem volgens conclusie 3 of één van de conclusies 4 tot 11 voor
zover ze afhankelijk zijn van conclusie 3, waarbij de transporteermiddelen
5 een zich naar beneden uitstrekkende bodemwand bevatten, zoals een
toevoertrechter van de houder voor het transporteren van de koffiebonen of
gemalen koffie naar de doseerkamer onder invloed van de zwaartekracht.

13. Systeem volgens conclusies 9 en 12, waarbij de
transporteermiddelen de toevoertrechter van de houder bevatten en het
10 gedeelte dat beweegbaar is ten opzichte van de doseerkamer.

14. Systeem volgens conclusie 3 of één van de conclusies 4 tot 13 voor
zover ze afhankelijk zijn van conclusie 3, waarbij de transporteermiddelen
een zich naar beneden uitstrekkende bodemwand bevatten voor het
transporteren van de koffiebonen of gemalen koffie naar de doseerkamer
15 onder invloed van alleen de zwaartekracht.

15. Systeem volgens conclusie 6 of één van de conclusies 7 tot 14 voor
zover ze afhankelijk zijn van conclusie 6, waarbij het eerste kamergedeelte
voorzien is van een bovenwand, die de inhoud van de doseerkamer in een
opwaartse, verticale richting begrenst, waarbij het bodemgedeelte van het
20 tweede kamergedeelte de inhoud van de doseerkamer in een neerwaartse,
verticale richting begrenst.

16. Systeem volgens conclusie 6 of één van de conclusies 7 tot 14 voor
zover afhankelijk zijn van conclusie 6, waarbij het eerste kamergedeelte en
het tweede kamergedeelte ieder voorzien zijn van ten minste een rechtop
25 staande zijwand, die de inhoud van de doseerkamer begrenst.

17. Systeem volgens conclusie 6 of één van de conclusies 7 tot 14 voor
zover ze afhankelijk zijn van conclusie 6, waarbij het eerste kamergedeelte
is voorzien van een rechtop staande zijwand, die een inlaatopening bevat
voor het inbrengen van de koffiebonen of de gemalen koffie in de
30 doseerkamer door middel van de transporteermiddelen.

18. Systeem volgens conclusie 3 of één van de conclusies 4 tot 17
voor zover ze afhankelijk zijn van conclusie 3, waarbij de
transporteermiddelen zijn ingericht voor het transporteren van de
koffiebonen of gemalen koffie ten minste in een horizontale richting voor het
5 transporteren van de koffiebonen of gemalen koffie tot in de doseerkamer.
19. Systeem volgens conclusies 17 en 18, waarbij de
transporteermiddelen zijn ingericht voor het transporteren van de
koffiebonen of gemalen koffie ten minste in een horizontale richting naar de
inlaat opening van de doseerkamer.
- 10 20. Systeem volgens conclusie 19 en één van de conclusies 9 - 11,
waarbij het beweegbare gedeelte van de transporteermiddelen is ingericht
voor het transporteren van de koffiebonen of gemalen koffie ten minste in
een horizontale richting.
21. Systeem volgens één der voorgaande conclusies, waarbij de
15 respectieve verpakkingspatroon afsluitmiddelen bevat voor het afsluiten
van de uitlaat als de respectieve verpakkingspatroon niet aangebracht is op
het koffiezetapparaat.
22. Systeem volgens conclusie 21, waarbij de afsluitmiddelen zijn
gevormd voor het openen van de koffiebonenuitlaat als de respectieve
20 verpakkingspatroon is aangebracht op het koffiezetapparaat.
23. Systeem volgens conclusie 21 of 22, waarbij de afsluitmiddelen een
afsluitdeel bevatten aan de onderkant van de houder, dat de uitlaat en een
draaibare afsluitschijf met een opening bevat.
24. Systeem volgens conclusie 22 en 23, waarbij voor het aanbrengen
25 van de respectieve verpakkingspatroon op het koffiezetapparaat de opening
van de draaibare afsluitschijf in een positie in lijn met de uitlaat wordt
gebracht.
25. Systeem volgens conclusie 24, waarbij het afsluitdeel een paar
pijlvormige armen bevat en de afsluitschijf een pal, die in gesloten positie
30 vast zit achter de pijlvormige armen.

26. Systeem volgens conclusie 3 of één van de conclusies 4 tot 11 voor zover ze afhankelijk zijn van conclusie 3, waarbij de uitgangsopening geassocieerd is met een verwijderbaar afdichting voor het afdichten van de binnenruimte voordat de respectieve patroon geactiveerd is, waarbij bij
5 voorkeur de genoemde afdichting voorkomt dat er gassen ontsnappen uit de respectieve patroon.
27. Systeem volgens conclusie 26, waarbij het verder middelen omvat voor het verbreken en verplaatsen van de afdichting.
- 28.Systeem volgens conclusie 26 of 27, waarbij de afdichting een afdichtvlies
10 is.
29. Systeem volgens conclusie 27, waarbij de middelen voor het verbreken en verplaatsen gevormd worden door een lipje.
30. Systeem volgens één van de voorgaande conclusies, waarbij de maalrichting centrisch geplaatst is ten opzichte van de doseerkamer en/of de
15 maalinrichting centrisch geplaatst is ten opzichte van het tweede kamergedeelte van conclusie 6.
31. Systeem volgens conclusie 5, waarbij het bodemgedeelte met de conische vorm in de richting van de eerste verticale as ligt, waarbij het conische gedeelte roteert rond de eerste verticale as in reactie op het
20 aandrijven van de maalinrichting.
32. Systeem volgens conclusie 31, waarbij de maalinrichting het bodemgedeelte, een lager gelegen maalschijf die zich rond het bodemgedeelte uitstrekt en een hoger gelegen maalschijf die zich boven de lager gelegen maalschijf bevat.
- 25 33. Systeem volgens conclusie 32, waarbij de maalinrichting roteerbaar wordt aangedreven door een tweede motor, resulterend in de rotatie van het bodemgedeelte met de conische vorm en de lager gelegen maalschijf.
34. Systeem volgens conclusie 33, waarbij in reactie op het aandrijven van het bodemgedeelte en de lager gelegen maalschijf koffiebonen worden of
30 gemalen koffie wordt verplaatst in een zich naar buiten uitstreckende radiale richting tussen de lager gelegen en de hoger gelegen maalschijf en

waarbij de koffiebonen worden geplet en gesneden tot gemalen koffie of gemalen koffie verder wordt geplet, omdat een verticale afstand tussen de lager gelegen maalschijf en de hoger gelegen maalschijf afneemt in de zich naar buiten uitstreckende radiale richting.

- 5 35. Systeem volgens één van de voorgaande conclusies, waarbij de maalinrichting een niet vervuilende maalinrichting is, die een uitgangspositie bevat voor gemalen koffie naar buiten toe tot in een kanaal, dat een naar beneden wijzende toevoertrechter is tot in de koffiezetinrichting van het koffiezetapparaat.
- 10 36. Systeem volgens één van de voorgaande conclusies, waarbij het koffiezetapparaat verbindingsmiddelen bevat voor het verwijderbaar aanbrengen van de respectieve verpakkingspatroon, waarbij de verbindingsmiddelen een uitsparing aan een bovenkant van het koffiezetapparaat bevatten, welke uitsparing omringd is door een zijwand
- 15 en gevormd is voor het opnemen van een overeenkomstig gedeelte dat uitsteekt uit een onderkant van de respectieve verpakkingspatroon.
37. Systeem volgens conclusie 36, waarbij de zijwand uitsteekt uit de bovenkant van het koffiezetapparaat.
38. Systeem volgens conclusie 36 of 37, waarbij de zijwand openingen
- 20 bevat voor het opnemen van bajonetonderdelen van de respectieve verpakkingspatroon.
39. Systeem volgens conclusie 38, waarbij de respectieve verpakkingspatroon de bajonetonderdelen bevat.
40. Systeem volgens conclusie 38 of 39 waarbij de respectieve
- 25 verpakkingspatroon in de uitsparing gebracht moeten worden zodanig dat de bajonetonderdelen in de openingen gebracht worden en dan gedraaid om aangebracht te worden op het koffiezetapparaat, waarbij de zijkant blokkeeronderdelen bevat voor het verhinderen van het verder draaien van de respectieve verpakkingspatroon, zodra deze zijn eindpositie bereikt heeft.

41. Systeem volgens conclusie 40, waarbij de respectieve verpakking patroon ongeveer over 50 graden gedraaid moeten worden om zijn eindpositie te bereiken.
42. Systeem volgens één van de conclusies 36-41 en conclusie 10,
5 waarbij de uitsparing in het midden daarvan uitstekende, roteerbare randen bevat, die vastzitten aan de aandrijfas, waarbij de transporteermiddelen van de respectieve patroon voorzien zijn van uitsparingen voor het opnemen van de uitstekende randen zodat in reactie op het roteren van de aandrijfas de roterende uitstekende randen de
10 transporteermiddelen aandrijven.
43. Systeem volgens conclusie 37 of één van de conclusies 38 tot 42, voor zover ze afhankelijk zijn van conclusie 37, waarbij het koffiezetapparaat een behuizing bevat die de uitstekende zijwand omringt.
44. Systeem volgens ten minste conclusie 5 of één van de conclusies 8
15 tot 43, voor zover ze afhankelijk zijn van conclusie 5, waarbij de eerste verticale as centraal door het bodemgedeelte van de doseerkamer loopt en waarbij het bodemgedeelte zich naar beneden toe uitstrekt in een richting, die zich loodrecht ten opzichte van de verticale as en daar vanaf uitstrekt, helemaal rond de verticale as en/of waarbij de eerste verticale as centraal
20 door het bodemgedeelte van het tweede kamergedeelte loopt en dat het bodemgedeelte zich naar beneden toe uitstrekt in een richting, die zich loodrecht ten opzichte van de verticale as en daar vanaf uitstrekt, helemaal rondom de verticale as.
45. Systeem volgens één van de voorgaande conclusies, waarbij het
25 koffiezetapparaat een besturingsinrichting bevat.
46. Systeem volgens conclusie 10 en 45, waarbij de besturingsinrichting is ingericht voor het besturen van de eerste motor en/of de maalinrichting.
47. Systeem volgens conclusie 46, waarbij de besturingsinrichting
30 zodanig is ingericht dat, in gebruik, in een eerste stap de transporteermiddelen aangedreven worden voor het vullen van de

doseerkamer met koffiebonen of gemalen koffie en dat in een tweede stap, die volgt na het afronden van de eerste stap, de maalinrichting geactiveerd wordt voor het leegmaken van de doseerkamer en voor het malen van de koffiebonen of voor het verder malen van gemalen koffie die in de doseerkamer waren/was verzameld gedurende de eerste stap.

48. Systeem volgens conclusie 47, waarbij de besturingsinrichting zodanig is ingericht dat, in gebruik, in de eerste stap de transportermiddelen langer worden aangedreven dan nodig is voor het vullen van de doseerkamer en/of dat in de tweede stap de maalinrichting langer geactiveerd wordt dan nodig is voor het leegmaken of het ten minste in hoofdzaak volledig leeg maken van de doseerkamer en voor het malen van alle koffiebonen of voor het verder malen van alle gemalen koffie die in de doseerkamer waren/was verzameld gedurende de eerste stap.

49. Systeem volgens conclusie 48, waarbij in de eerste stap de transportermiddelen langer worden aangedreven dan nodig is voor het volledig vullen of ten minste in hoofdzaak volledig vullen van de doseerkamer.

50. Systeem volgens één van de conclusies 48 of 49, waarbij de inhoud van de doseerkamer zodanig is dat als hij gevuld wordt met koffiebonen in de eerste stap de hoeveelheid bonen overeenkomt met één dosis koffiebonen voor het bereiden van een kop koffie.

51. Systeem volgens conclusie 47, 48, 49 of 50, waarbij het koffiezetapparaat zodanig is ingericht dat de besturingsinrichting de koffiezetinrichting bestuurt waarbij de besturingsinrichting zodanig is ingericht dat, in gebruik, in een derde stap die volgt nadat de tweede stap is afgerond, de koffiezetinrichting koffie zet op basis van de gemalen koffie en heet water verhit door een verhittingsinrichting van het koffiezetapparaat.

52. Systeem volgens één van de voorgaande conclusies, waarbij het verder een sensor omvat, die ingericht is om te detecteren of de respectieve verpakkingspatroon op het koffiezetapparaat is aangebracht.

53. Systeem volgens conclusie 45 en 52, waarbij de sensor is gevormd om een resultaat van de detectie aan de besturingsinrichting te signaleren.
54. Systeem volgens conclusie 52 of 53, waarbij de sensor een
5 schakelaar is.
55. Systeem volgens conclusie 54, waarbij de schakelaar een microschakelaar is.
56. Systeem volgens conclusie 54 of 55, waarbij de respectieve verpakkingspatroon een uitstekend gedeelte omvat voor het activeren van
10 de schakelaar wanneer hij op het koffiezetapparaat is aangebracht.
57. Systeem volgens conclusie 39 en 56, waarbij het uitstekende gedeelte zich onder of boven een van de bajonetonderdelen bevindt.
58. Systeem volgens conclusie 56 of 57 and conclusie 40, waarbij het uitstekende gedeelte de schakelaar activeert wanneer de respectieve
15 verpakkingspatroon zijn eindpositie bereikt.
- 59 Systeem volgens één van de conclusies 56 – 58 en conclusie 38, waarbij de schakelaar zich bevindt in een opening in de zijwand, die de uitsparing aan de bovenkant van het koffiezetapparaat omringt, waarbij het uitstekende gedeelte de schakelaar door de opening activeert.
- 20 60. Systeem volgens conclusie 59, waarbij de schakelaar achter horizontale wandsegmenten in de zijwand is verborgen en waarbij de opening een spleet tussen de horizontale wandsegmenten is, waarbij het uitstekende gedeelte in de spleet past.
61. Systeem volgens conclusies 52 – 60 en conclusie 46, waarbij de
25 besturing is ingericht om de eerste motor en de maalinrichting zo te besturen dat ze alleen dan geactiveerd kunnen worden als gedetecteerd is dat de respectieve verpakkingspatroon op het koffiezetapparaat is aangebracht.
- 62 Systeem volgens één van de voorgaande conclusies, waarbij het
30 verder een inzetstuk omvat dat verwijderbaar op het koffiezetapparaat is aan te brengen in plaats van de respectieve verpakkingspatroon.

63. Systeem volgens conclusie 62, waarbij het inzetstuk op eenzelfde of overeenkomstige manier op het koffiezetapparaat aan te brengen is als de respectieve verpakkingspatroon.
64. Systeem volgens conclusie 63, waarbij het inzetstuk
5 bajonetonderdelen omvat.
65. Systeem volgens één van de conclusies 62 – 64 voor zover ze afhankelijk zijn van conclusies 54 of 55, waarbij het inzetstuk een uitstekend gedeelte omvat voor het activeren van de schakelaar wanneer het op het koffiezetapparaat is aangebracht.
- 10 66. Systeem volgens conclusie 64 en 65 voor zover ze afhankelijk zijn van conclusie 54 of 55, waarbij het uitstekende gedeelte zich onder of boven de bajonetonderdelen bevinden.
67. Systeem volgens conclusie 65 of 66 en conclusie 40, waarbij het uitstekende gedeelte de schakelaar activeert, wanneer het inzetstuk zijn
15 eindpositie bereikt.
68. Systeem volgens één van de conclusies 62 – 67, waarbij het inzetstuk een holle ruimte omvat die een binnenruimte en ten minste één uitgangsopening omvat, die een uitlaat vormt, waarbij de binnenruimte is ingericht om koffiebonen of gemalen koffie op te nemen, waarin het
20 inzetstuk verder afsluitmiddelen bevat voor het afsluiten van de uitlaat als het inzetstuk niet is aangebracht op het koffiezetapparaat of niet in zijn eindpositie op het koffiezetapparaat is aangebracht.
69. Systeem volgens conclusie 68, waarbij de afsluitmiddelen zijn gevormd voor het openen van de uitlaat als het inzetstuk in zijn eindpositie
25 op het koffiezetapparaat is aangebracht.
70. Systeem volgens conclusie 68 of 69, waarbij de afsluitmiddelen een afsluitdeel bevatten aan de onderkant van de houder, dat de uitlaat omvat en waarbij de afsluitmiddelen verder een draaibare afsluitschijf met een opening bevatten.

71. Systeem volgens conclusie 70, waarbij als het inzetstuk in zijn eindpositie op het koffiezetapparaat is aangebracht, de opening van de draaibare afsluitschijf in een positie in lijn is met de uitlaat.
72. Systeem volgens één van de voorgaande conclusies, waarbij het
5 systeem zodanig is ingericht dat in reactie op het activeren van de maalinrichting, het bodemgedeelte rond de eerste verticale as roteert voor het transporteren van de dosis koffiebonen of gemalen koffie van de doseerkamer tot in de maalinrichting en voor het malen van de koffiebonen of het verder malen van de gemalen koffie.
- 10 73. Systeem volgens conclusie 72, waarbij de ene dosis koffiebonen of de ene dosis gemalen koffie 5-11, en bij voorkeur 6-8 gram koffiebonen of gemalen koffie bevat.
74. Systeem volgens conclusie 6 of één van de conclusies 7 of 73 in zover als ze afhankelijk zijn van conclusie 6, waarbij het tweede
15 kamergedeelte ongeveer 100-X% van de inhoud van de doseerkamer bevat en het eerste kamergedeelte ongeveer X% van de inhoud van de doseerkamer, waarbij X in het bereik van 2-50, bij voorkeur 4-50, meer bij voorkeur 15-30 ligt.
75. Systeem volgens één van de voorgaande conclusies, waarbij het
20 systeem zodanig is ingericht dat, in gebruik, de maalinrichting geactiveerd wordt voor het leegmaken van de doseerkamer en voor het malen van koffiebonen of gemalen koffie verzameld in de doseerkamer.
76. System volgens conclusie 75, waarbij het system zodanig is ingericht dat in gebruik de maalinrichting langer wordt geactiveerd dan
25 nodig voor het leegmaken of ten minste hoofdzakelijk volledig leegmaken van de doseerkamer en voor het malen van alle koffiebonen of het verder malen van alle gemalen koffie verzameld in de doseerkamer.
77. Systeem volgens conclusie 75 of 76, waarbij vóór het leegmaken van de doseerkamer en het malen van de koffiebonen of het verder malen
30 van de gemalen koffie, in een eerste stap de transportermiddelen worden

aangedreven voor het vullen van de doseerkamer met koffiebonen of gemalen koffie.

78. Systeem volgens conclusie 77, waarbij de transportermiddelen langer worden aangedreven dan nodig voor het volledig vullen of ten minste in hoofdzaak volledig vullen van de doseerkamer.

79. Systeem volgens één van de voorgaande conclusies, waarbij de koffiebonenverpakkingspatroon is gevuld met één dosis en/of de gemalenkoffieverpakkingspatroon is gevuld met één dosis.

80. Systeem volgens één van de voorgaande conclusies 1-78, waarbij de gemalenkoffieverpakkingspatroon is gevuld met meerdere porties.

81. Systeem volgens één van de voorgaande conclusies 1-78 of 80, waarbij de gemalenkoffieverpakkingspatroon is gevuld met meerdere porties.

82. Systeem volgens één van de voorgaande conclusies, waarbij de gemalenkoffieverpakkingspatroon zodanig aan het koffiezetapparaat is aangepast dat, als de gemalenkoffieverpakkingspatroon op het koffiezetapparaat is aangebracht, gemalen koffie die met behulp van de transportermiddelen van de gemalenkoffieverpakkingspatroon naar de uitgangsopening van de gemalenkoffieverpakkingspatroon wordt getransporteerd, door het koffiezetapparaat via de ingangsopening kan worden opgenomen voor het bereiden van koffie.

83. Systeem volgens conclusie 82, waarbij de transportermiddelen van de gemalenkoffieverpakkingspatroon zijn gevormd om door het koffiezetapparaat te worden bediend.

84. Systeem volgens conclusie 82, waarbij de transportermiddelen van de gemalenkoffieverpakkingspatroon zijn gevormd om onafhankelijk van het koffiezetapparaat te worden bediend.

85. Systeem volgens conclusie 84, waarbij de transportermiddelen zijn gevormd om handmatig te worden bediend.

86. Systeem volgens conclusie 84 of 85, waarbij de transportermiddelen van de gemalenkoffieverpakkingspatroon een

beweegbare structuur omvatten die, ten minste gedeeltelijk, aanwezig is in de binnenruimte om met de gemalen koffie in contact te komen, en waarbij de transportermiddelen verder handmatig bedienbare bedieningsmiddelen omvatten die, ten minste gedeeltelijk, buiten de binnenruimte zijn voorzien, voor het handmatig bedienen van de beweegbare structuur.

87. Systeem volgens conclusie 86, waarbij de transportermiddelen van de gemalenkoffieverpakkingspatroon een draaibaar onderdeel omvatten, zoals een draaibare as, dat zich ten minste gedeeltelijk in de binnenruimte bevindt.

88. Systeem volgens conclusie 87, waarbij de bedieningsmiddelen zijn ingericht voor het draaien van het draaibare onderdeel.

89. Systeem volgens conclusie 88, waarbij de bedieningsmiddelen een met het draaibare onderdeel verbonden draaikruk omvatten.

90. Systeem volgens één van de conclusies 87 tot 89, waarbij het draaibare onderdeel ten minste gedeeltelijk als een transportschroef is gevormd.

91. Systeem volgens conclusie 90, waarbij de beweegbare structuur een getapt boorgat bevat, door welke de transportschroef wordt vastgehouden.

92. Systeem volgens één van de conclusies 87 tot 89, waarbij de beweegbare structuur stijf met het draaibare onderdeel is verbonden, en waarbij de beweegbare structuur van ten minste één eerste opening voor het daardoor doorlaten van gemalen koffie is voorzien, waarbij de gemalenkoffieverpakkingspatroon van ten minste één tweede opening is voorzien, die in gebruik boven of onder de ten minste ene eerste opening is geplaatst en die een ingang naar de uitlaat verschaft, waarbij, als gevolg van het draaien van het draaibare onderdeel, de ten minste ene opening in lijn gebracht kan worden met de ten minste ene tweede opening.

93. Systeem volgens conclusie 92, waarbij de tweede opening door de uitlaat wordt gevormd.

94. Systeem volgens één van de conclusies 86 tot 93, waarbij de beweegbare structuur een plunjer omvat.
95. Systeem volgens één van de conclusies 86 tot 93, verder voorzien van een versperring in de binnenruimte ingericht voor het bemoeilijken van
5 het passeren van gemalen koffie naar de uitlaat.
96. Systeem volgens conclusie 95, waarbij de versperring een klep voor het bemoeilijken van het passeren van de gemalen koffie naar de uitlaat omvat.
97. Systeem volgens conclusie 96, waarbij de klep een flexibel
10 onderdeel omvat, dat wordt vervormd als de klep geopend wordt.
98. Systeem volgens één van de conclusies 95 tot 97, waarbij de versperring een interne wand omvat, op een afstand van, in gebruik, een bovenste gedeelte van de behuizing, waarbij de transportermiddelen zijn ingericht voor het bewegen van gemalen koffie door een ruimte tussen het,
15 in gebruik, bovenste gedeelte van de behuizing en de interne wand.
99. Systeem volgens conclusie 98, waarbij de interne wand een eerste gedeelte van de binnenruimte scheidt van een tweede gedeelte van de binnenruimte, waarbij de beweegbare structuur is ingericht in het eerste gedeelte van de binnenruimte, en waarbij de uitlaat kan worden bereikt via
20 het tweede gedeelte van de binnenruimte.
100. Systeem volgens één van de conclusies 86 tot 99, waarbij de beweegbare structuur van de gemalenkoffieverpakkingspatroon verend aan de gemalenkoffieverpakkingspatroon is vastgemaakt door middel van een verend onderdeel, zo dat de beweegbare structuur door middel van de
25 handmatig te bedienen bedieningsmiddelen herhaalbaar beweegbaar is tussen een eerste positie en een tweede positie, daarbij het verende onderdeel vervormend.
101. Systeem volgens conclusie 100, in de binnenruimte voorzien van een doorgang voor gemalen koffie naar de uitlaat, waarbij in de tweede
30 positie de doorgang ten minste gedeeltelijk door de beweegbare structuur wordt versperd en in de eerste positie de doorgang minder wordt versperd

door de beweegbare structuur dan in de tweede positie en mogelijk niet wordt versperd door de beweegbare structuur.

102. Systeem volgens conclusie 101, in de binnenruimte voorzien van een doorgang voor gemalen koffie naar de uitlaat, waarbij in de eerste
5 positie de doorgang ten minste gedeeltelijk door de beweegbare structuur wordt versperd en in de tweede positie de doorgang minder wordt versperd door de beweegbare structuur dan in de eerste positie en mogelijk niet wordt versperd door de beweegbare structuur.

103. Systeem volgens conclusie 101 of 102, waarbij de eerste positie
10 zich, in gebruik, boven of onder de tweede positie bevindt.

104. Systeem volgens één van de conclusies 86 tot 103, waarbij ten minste een deel van de gemalen koffie zich, in gebruik, boven de beweegbare structuur van de gemalenkoffieverpakkingspatroon bevindt.

105. Systeem volgens één van de voorgaande conclusies, waarbij de
15 gemalenkoffieverpakkingspatroon is voorzien van een uitsparing in de houder voor het opnemen van de aandrijfas van het koffiezetapparaat.

106. Systeem volgens conclusie 105, waarbij de houder in de uitsparing gesloten is.

107. Systeem volgens conclusie 105 of 106, waarbij de uitsparing
20 gedimensioneerd is om mechanisch contact tussen de gemalenkoffieverpakkingspatroon en de aandrijfas te voorkomen.

108. Systeem volgens één van de conclusies 105 tot 107, waarbij de transportermiddelen zijn geplaatst om, in gebruik, te voorkomen dat de transportermiddelen door middel van de aandrijfas van het
25 koffiezetapparaat worden aangedreven.

109. Systeem volgens één van de voorgaande conclusies, waarbij de gemalenkoffieverpakkingspatroon een schepinrichting omvat voor het bevatten en het afleveren van gemalen koffie, waarbij de schepinrichting, indien verbonden met het koffiezetapparaat, in lijn is met de
30 ingangsopening daarvan, waarbij de schepinrichting gevormd is om ook als

transporteermiddelen te werken door om haar as te draaien, waarbij gemalen koffie tot in de ingangsoopening wordt geleegd.

110. Systeem volgens conclusie 109, waarbij de gemalenkoffieverpakkingspatroon een greep omvat voor het handmatig
5 bedienen van de schepinrichting.

111. Systeem volgens één van de voorgaande conclusies, waarbij de gemalenkoffieverpakkingspatroon een trechter omvat voor het bevatten van gemalen koffie, waarbij de trechter een uitlaat heeft, die in lijn is met de ingangsoopening van het koffiezetapparaat, als de
10 gemalenkoffieverpakkingspatroon daarop aangebracht is, waarbij de transporteermiddelen een afsluitplaat omvatten, die in een eerste positie ten minste voor een groot deel en bij voorkeur volledig de uitlaat afsluit, daarbij het passeren van gemalen koffie naar de ingangsoopening bemoeilijkend, en in een tweede positie de uitlaat niet verspert of niet
15 wezenlijk verspert en waarbij de transporteermiddelen verder handmatig bedienbare bedieningsmiddelen omvatten voor het bedienen van de afsluitplaat van de eerste naar de tweede positie en terug.

112. Systeem volgens conclusie 111, waarbij de afsluitplaat in de tweede positie ten minste wezenlijk een eerste gedeelte van de binnenruimte van de
20 trechter afbakt van een tweede gedeelte van de binnenruimte van de trechter, daarbij het passeren van gemalen koffie van het eerste gedeelte naar het tweede gedeelte bemoeilijkend.

113. Systeem volgens conclusie 111 en 112, waarbij de afsluitplaat het eerste deel van een denkbeeldige cilinder vormt, en het andere deel van de
25 cilinder open is, waarbij de handmatig bedienbare bedieningsmiddelen gevormd zijn om de afsluitplaat respectievelijk naar de eerste en tweede positie te draaien.

114. Systeem volgens één van de voorgaande conclusies, waarbij de gemalenkoffieverpakkingspatroon een trechtersvormige houder voor het
30 bevatten van gemalen koffie omvat en een uitlaat voor het vrijgeven van de gemalen koffie uit de houder, waarbij de uitlaat zich aan een bovenste

uiteinde van de trechtersvormige houder bevindt en, als de gemalenkoffieverpakkingspatroon op het kofffiezetapparaat is aangebracht, zich in lijn met de ingangsopening daarvan bevindt, waarbij de transporteermiddelen spiraalvormige verplaatsingsmiddelen zijn, die, in gebruik, draaibaar aangedreven worden om gemalen koffie vanuit de trechtersvormige houder naar de uitlaat te drijven.

115. Systeem volgens conclusie 114, waarbij de spiraalvormige verplaatsingsmiddelen gevormd worden door een spiraalvormige baan voor gemalen koffie op de binnenwand van de trechter, verkregen door een spiraalvormige uitstekende rand op de binnenwand.

116. Systeem volgens conclusie 114 of 115, waarbij de spiraalvormige verplaatsingsmiddelen een niet-bewegend blokkeeronderdeel omvatten, dat verhindert dat gemalen koffie blijft rondraaien op de binnenwand, daarbij de gemalen koffie dwingend de spiraalvormige baan naar boven in de richting van de uitlaat te volgen.

117. Systeem volgens één van de voorgaande conclusies, waarbij de gemalenkoffieverpakkingspatroon gevormd is voor het schudden en trillen van de gemalen koffie om de doorstroming daarvan in de richting van een uitlaat van de gemalenkoffieverpakkingspatroon te bevorderen, voor het vrijgeven van de gemalen koffie.

118. Systeem volgens conclusie 117, waarbij de gemalenkoffieverpakkingspatroon een eerste module omvat die een gemalenkoffiehouder is, en een tweede module die een motor omvat, waarbij de eerste module verwijderbaar met het kofffiezetapparaat koppelbaar is en de tweede module verwijderbaar met de eerste module koppelbaar is, als de eerste module met het kofffiezetapparaat gekoppeld is.

119. Systeem volgens conclusie 117 of 118, waarbij de uitlaat van de gemalenkoffieverpakkingspatroon open is als hij met het kofffiezetapparaat verbonden is en gesloten als hij losgekoppeld is, en waarbij de tweede module, bij voorkeur in een gemalenkoffiehervulmodus, koppelbaar is met de eerste module in plaats van het kofffiezetapparaat.

120. Systeem volgens conclusie 119, waarbij, bij voorkeur in gemalenkoffiehervulmodus, de tweede module op eenzelfde of soortgelijke wijze met de eerste module is gekoppeld als het koffiezetapparaat, als gevolg waarvan de uitlaat van de eerste module open is.
- 5 121. Systeem volgens één van de voorgaande conclusies, verder een doseerinrichting omvattend voor het afleveren van een vastgestelde dosis gemalen koffie aan het koffiezetapparaat.
122. Systeem volgens conclusie 121, waarbij de doseerinrichting deel uitmaakt van de gemalenkoffieverpakkingspatroon.
- 10 123. Systeem volgens conclusie 121 of 122, waarbij de doseerinrichting deel uitmaakt van het koffiezetapparaat.
124. Systeem volgens één van de conclusies 121 tot 123, waarbij de doseerinrichting een verplaatsbaar doseeronderdeel omvat
125. Systeem volgens één van de conclusies 121 tot 124, waarbij het
15 gewicht van de dosis gemalen koffie ongeveer gelijk is aan 50 gram of minder, in het bijzonder 20 gram of minder, meer in het bijzonder 15 gram of minder.
126. Systeem volgens één van de voorgaande conclusies, waarbij het koffiezetapparaat een gemalenkoffietransportpad omvat, dat zich uitstrekt
20 van de ingangsopening van het koffiezetapparaat naar de koffiezetinrichting, waarbij genoemd pad ten minste een onderste gedeelte van de doseerkamer omvat, waarbij het koffiedranksysteem zo is ingericht dat vóór het bereiden van de koffiedrank wezenlijk ieder overblijfsel van gemalen koffie dat in het gemalenkoffietransportpad achterblijft, verwijderd
25 wordt.
127. Systeem dat het koffiezetapparaat zoals gedefinieerd in één van de voorgaande conclusies omvat en de gemalenkoffieverpakkingspatroon zoals gedefinieerd in één van de voorgaande conclusies.
128. Systeem volgens één van de voorgaande conclusies, dat een eerste
30 gemalenkoffieverpakkingspatroon omvat, die een eerste koffiesoort bevat, en

een tweede gemalenkoffieverpakkingspatroon,
die een tweede koffiesoort bevat, waarin de eerste en de tweede koffiesoort
verschillend zijn,

waarbij het koffiedranksysteem zo is ingericht dat, nadat koffiedrank
5 met het koffiezetapparaat is bereid met gemalen koffie uit de eerste
gemalenkoffieverpakkingspatroon, de eerste
gemalenkoffieverpakkingspatroon van het koffiezetapparaat losgekoppeld
kan worden en de tweede gemalenkoffieverpakkingspatroon op het
koffiezetapparaat aangebracht kan worden, waarna koffiedrank met het
10 koffiezetapparaat bereid kan worden met gemalen koffie uit de tweede
gemalenkoffieverpakkingspatroon zonder wezenlijke verontreiniging van
gemalen koffie uit de eerste gemalenkoffieverpakkingspatroon.

129. Systeem volgens één van de voorgaande conclusies, waarbij het
koffiezetapparaat een controle-inrichting omvat om te controleren of er
15 enige gemalen koffie aanwezig is in de gemalenkoffieuitlaat van de
gemalenkoffieverpakkingspatroon.

130. Systeem volgens één van de voorgaande conclusies, waarbij het
koffiezetapparaat is ingericht voor het bereiden van koffiedrank onder hoge
druk die gebruikelijk is voor het bereiden van espresso koffie, onder
20 atmosferische druk die gebruikelijk is voor opgiet-
druppelextractiesystemen, of onder licht verhoogde druk in de orde van 1.1
– 2, in het bijzonder 1.1 – 1.5 bar.

131. Systeem volgens één van de voorgaande conclusies, dat verder
middelen omvat om te detecteren dat een gemalenkoffieverpakkingspatroon
25 niet langer voldoende gemalen koffie bevat voor het bereiden van een portie
koffiedrank, zoals een kop koffiedrank.

132. Systeem volgens conclusie 131, waarbij genoemde middelen voor
het detecteren dat een gemalenkoffieverpakkingspatroon niet langer
voldoende gemalen koffie bevat voor het bereiden van een portie koffiedrank
30 functioneert door het detecteren van de leegte van de
gemalenkoffieverpakkingspatroon.

133. Systeem volgens één van de voorgaande conclusies, waarbij
het koffiedranksysteem zo is ingericht dat de hoeveelheid lucht die in de
gemalenkoffieverpakkingspatroon komt ten hoogste gelijk is aan het volume
van de gemalen koffie die uit de gemalenkoffieverpakkingspatroon aan het
5 koffiezetapparaat is afgeleverd en/of dat het binnenste van het
koffiedranksysteem waar gemalen aanwezig mag zijn ontworpen is om
hoofdzakelijk luchtdicht te zijn ten opzichte van een omgeving van het
koffiezetsysteem, terwijl bij voorkeur genoemde binnenste van het
koffiezetsysteem wordt gevormd door de binnenruimte van de
10 gemalenkoffieverpakkingspatroon, een gemalenkoffietransportpad vanuit de
gemalenkoffieverpakkingspatroon naar de koffiezetinrichting, en de
koffiezetinrichting zelf.
134. Systeem volgens één van de voorgaande conclusies, waarbij het
koffiezetapparaat een horizontale koffiezetmanchet omvat om een
15 gemalenkoffiepuck over de doorsnede van de koffiezetmanchet vast te
houden en het brouwen van de gemalenkoffiepuck uit te voeren.
135. Systeem volgens conclusie 134, waarbij bewegende delen van de
koffiezetinrichting door één enkel aandrijfmechanisme aangedreven worden.
136. Systeem volgens één van de voorgaande conclusies, waarbij de
20 maalinrichting bruikbaar is voor het malen van al gemalen koffie.
137. Systeem volgens één van de conclusies 1 tot 135, waarbij de
maalinrichting schakelbaar is naar een configuratie waarin ze toestaat dat
gemalen koffie daardoorheen gaat zonder een verdere maalhandeling te
ondergaan.
- 25 138. Systeem volgens één van de voorgaande conclusies, waarbij het
koffiezetapparaat afsluitmiddelen omvat, die zijn gevormd voor het sluiten
en/of openen van de ingangsopening van het koffiezetapparaat, waarbij
genoemde afsluitmiddelen bij voorkeur ingericht zijn om door het
koffiezetapparaat en/of het (ont)koppelen van de patroon van/aan het
30 koffiezetapparaat bestuurd te worden.

139. Gemalenkoffieverpakkingspatroon voor gebruik met het koffiedranksysteem volgens één van de voorgaande conclusies, waarbij de gemalenkoffieverpakkingspatroon is ingericht voor het bevatten en
 5 afleveren van gemalen koffie, en die transporteermiddelen omvat geschikt voor het mogelijk maken van het transporteren van de gemalen koffie naar een uitlaat van de gemalenkoffieverpakkingspatroon, in het bijzonder in de richting van een ingangsopening van een koffiezetapparaat, als hij daaraan is gekoppeld; waarbij de gemalenkoffieverpakkingspatroon
 10 bajonetonderdelen omvat om in de openingen in de zijwand te steken die van de bovenkant van het koffiezetapparaat uitsteekt, in het bijzonder voor het koppelen van de gemalenkoffieverpakkingspatroon aan een koffiezetapparaat, waarbij de transporteermiddelen gevormd zijn om onafhankelijk van het koffiezetapparaat bediend te worden.
- 15 140. Gemalenkoffieverpakkingspatroon volgens conclusie 139, waarbij de transporteermiddelen gevormd zijn om handmatig bediend te worden.
141. Gemalenkoffieverpakkingspatroon voor gebruik met het koffiedranksysteem volgens één van de conclusies 1 to 138 volgens conclusie 140, waarbij de gemalenkoffieverpakkingspatroon een behuizing omvat die
 20 een binnenruimte omsluit waarin gemalen koffie gehouden kan worden, en een uitlaat voor het vrijgeven van gemalen koffie uit de binnenruimte, die zich in de behuizing bevindt, waarbij de transporteermiddelen een beweegbare structuur omvatten, die zich, ten minste gedeeltelijk, in de binnenruimte bevindt om in contact te komen met de gemalen koffie, en
 25 waarbij de transporteermiddelen verder handmatig bedienbare bedieningsmiddelen omvatten, die, ten minste gedeeltelijk, buiten de binnenruimte voorzien zijn om de beweegbare structuur handmatig te bedienen.
142. Gemalenkoffieverpakkingspatroon volgens conclusie 140, die een
 30 schepinrichting omvat voor het bevatten en het afleveren van gemalen koffie, waarbij de schepinrichting, indien verbonden met het

koffiezetapparaat, in lijn is met de ingangsoopening daarvan, waarbij de schepinrichting gevormd is om ook als transporteermiddelen te werken door om haar as te draaien, waarbij gemalen koffie tot in de ingangsoopening wordt geleege.

- 5 143. Gemalenkoffieverpakkingspatroon volgens conclusie 142, die een greep omvat voor het handmatig draaien van de schepinrichting.
144. Gemalenkoffieverpakkingspatroon volgens conclusie 140, die een trechter omvat voor het bevatten van gemalen koffie, waarbij de trechter een uitlaat heeft, die in lijn is met de ingangsoopening van het
- 10 koffiezetapparaat, als de gemalenkoffieverpakkingspatroon daarop aangebracht is, waarbij de transporteermiddelen een afsluitplaat omvatten, die in een eerste positie ten minste voor een groot deel en bij voorkeur volledig de uitlaat afsluit, daarbij het passeren van gemalen koffie naar de ingangsoopening bemoeilijkend, en in een tweede positie de uitlaat niet
- 15 verspert of niet wezenlijk verspert en waarbij de transporteermiddelen verder handmatig bedienbare bedieningsmiddelen omvatten voor het bedienen van de afsluitplaat van de eerste naar de tweede positie en terug.
145. Gemalenkoffieverpakkingspatroon volgens conclusie 144, waarbij de afsluitplaat in de tweede positie ten minste wezenlijk een eerste gedeelte
- 20 van de binnenruimte van de trechter afbakt van een tweede gedeelte van de binnenruimte van de trechter, daarbij het passeren van gemalen koffie van het eerste gedeelte naar het tweede gedeelte bemoeilijkend.
146. Gemalenkoffieverpakkingspatroon volgens conclusie 144 en 145, waarbij de afsluitplaat het eerste deel van een denkbeeldige cilinder vormt,
- 25 waarbij het andere deel van de cilinder open is, waarbij de handmatig bedienbare bedieningsmiddelen gevormd zijn om de afsluitplaat respectievelijk naar de eerste en tweede positie te draaien.
147. Gemalenkoffieverpakkingspatroon volgens één van de conclusies 139 tot 146, waarbij de transporteermiddelen een draaibaar onderdeel
- 30 omvatten, zoals een draaibare as, die zich ten minste gedeeltelijk binnen de binnenruimte bevindt.

148. Gemalenkoffieverpakkingspatroon volgens conclusie 147, waarbij de bedieningsmiddelen zijn ingericht voor het draaien van het draaibare onderdeel.
- 5 149. Gemalenkoffieverpakkingspatroon volgens conclusie 148, waarbij de bedieningsmiddelen een met het draaibare onderdeel verbonden draaikruk omvatten.
150. Gemalenkoffieverpakkingspatroon volgens één van de conclusies 147 tot 149, waarbij het draaibare onderdeel ten minste gedeeltelijk als een
- 10 transportschroef is gevormd.
151. Gemalenkoffieverpakkingspatroon volgens conclusie 141 en 150, waarbij de beweegbare structuur een getapt boorgat bevat, door welke de transportschroef wordt vastgehouden.
152. Gemalenkoffieverpakkingspatroon volgens één van de conclusies
- 15 147 tot 149, waarbij de beweegbare structuur stijf met het draaibare onderdeel is verbonden, en waarbij de beweegbare structuur van ten minste één eerste opening voor het daardoor doorlaten van gemalen koffie is voorzien, waarbij de patroon van ten minste één tweede opening is voorzien, die in gebruik boven of onder de ten minste ene eerste opening is geplaatst
- 20 en die een ingang naar de uitlaat verschaft, waarbij, als gevolg van het draaien van het draaibare onderdeel, de ten minste ene opening in lijn gebracht kan worden met de ten minste ene tweede opening.
153. Gemalenkoffieverpakkingspatroon volgens conclusie 152, waarbij de tweede opening door de uitlaat wordt gevormd.
- 25 154. Gemalenkoffieverpakkingspatroon volgens één van de conclusies 141 tot 148, waarbij de beweegbare structuur een plunjer omvat.
155. Gemalenkoffieverpakkingspatroon volgens één van de conclusies 141 tot 154, verder voorzien van een versperring in de binnenruimte, ingericht voor het bemoeilijken van het passeren van gemalen koffie naar de
- 30 uitlaat.

156. Gemalenkoffieverpakkingspatroon volgens conclusie 155, waarbij de versperring een klep voor het bemoeilijken van het passeren van de gemalen koffie naar de uitlaat omvat.
- 5 157. Gemalenkoffieverpakkingspatroon volgens conclusie 156, waarbij de klep een flexibel onderdeel omvat, dat wordt vervormd als de klep geopend wordt.
158. Gemalenkoffieverpakkingspatroon volgens één van de conclusies 155 tot 157, waarbij de versperring een interne wand omvat, op een afstand
- 10 van, in gebruik, een bovenste gedeelte van de behuizing, waarbij de transportermiddelen zijn ingericht voor het bewegen van gemalen koffie door een ruimte tussen het, in gebruik, bovenste gedeelte van de behuizing en de interne wand.
159. Gemalenkoffieverpakkingspatroon volgens conclusie 158, waarbij
- 15 de interne wand een eerste gedeelte van de binnenruimte scheidt van een tweede gedeelte van de binnenruimte, waarbij de beweegbare structuur is ingericht in het eerste gedeelte van de binnenruimte, en waarbij de uitlaat kan worden bereikt via het tweede gedeelte van de binnenruimte.
160. Gemalenkoffieverpakkingspatroon volgens één van de conclusies
- 20 141 tot 159, waarbij de beweegbare structuur verend aan de verpakkingspatroon is vastgemaakt door middel van een verend onderdeel, zo dat de beweegbare structuur door middel van de bedieningsmiddelen herhaalbaar beweegbaar is tussen een eerste positie en een tweede positie, daarbij het verende onderdeel vervormend.
- 25 161. Gemalenkoffieverpakkingspatroon volgens conclusie 160, in de binnenruimte voorzien van een doorgang voor gemalen koffie naar de uitlaat, waarbij in de tweede positie de doorgang ten minste gedeeltelijk door de beweegbare structuur wordt versperd en in de eerste positie de doorgang minder wordt versperd door de beweegbare structuur dan in de
- 30 tweede positie en mogelijk niet wordt versperd door de beweegbare structuur.

162. Gemalenkoffieverpakkingspatroon volgens conclusie 160, in de binnenruimte voorzien van een doorgang voor gemalen koffie naar de uitlaat, waarbij in de eerste positie de doorgang ten minste gedeeltelijk door de beweegbare structuur wordt versperd en in de tweede positie de doorgang minder wordt versperd door de beweegbare structuur dan in de eerste positie en mogelijk niet wordt versperd door de beweegbare structuur.
163. Gemalenkoffieverpakkingspatroon volgens conclusie 161 of 162, waarbij de eerste positie zich, in gebruik, boven of onder de tweede positie bevindt.
164. Gemalenkoffieverpakkingspatroon volgens één van de conclusies 141 tot 163, waarbij ten minste een deel van de gemalen koffie zich, in gebruik, boven de beweegbare structuur bevindt.
165. Gemalenkoffieverpakkingspatroon voor gebruik met het koffiedranksysteem volgens één van de conclusies 1 tot 138, bedieningsmiddelen omvattend voor het bedienen van de verplaatsingsmiddelen, waarbij de bedieningsmiddelen een motor omvatten.
166. Gemalenkoffieverpakkingspatroon volgens conclusie 165, die een trechtersvormige houder voor het bevatten van gemalen koffie omvat en een uitlaat voor het vrijgeven van de gemalen koffie uit de ruimte, waarbij de uitlaat zich bij een bovenste uiteinde van de trechtersvormige houder bevindt en, als de gemalenkoffieverpakkingspatroon op het koffiezetapparaat is aangebracht, zich in lijn met de ingangsopening daarvan bevindt, waarbij de transporteermiddelen spiraalvormige verplaatsingsmiddelen zijn, die, in gebruik, draaibaar aangedreven worden om gemalen koffie vanuit de trechtersvormige houder naar de uitlaat te drijven.
167. Gemalenkoffieverpakkingspatroon volgens conclusie 166, waarbij de spiraalvormige verplaatsingsmiddelen gevormd worden door een spiraalvormige baan voor gemalen koffie aan de binnenkant van de trechter, verkregen door een spiraalvormige uitstekende rand aan de binnenkant.

168. Gemalenkoffieverpakkingspatroon volgens conclusie 166 of 167, waarbij de verplaatsingsmiddelen een niet-bewegend blokkeeronderdeel omvatten, dat verhindert dat gemalen koffie blijft rondraaien aan de
5 binnenkant, daarbij de gemalen koffie dwingend de spiraalvormige baan naar boven in de richting van de uitlaat te volgen.
169. Gemalenkoffieverpakkingspatroon volgens conclusie 139 of 165, gevormd voor het schudden en trillen van gemalen koffie om de
10 doorstroming daarvan in de richting van een uitlaat van de gemalenkoffieverpakkingspatroon te bevorderen, voor het vrijgeven van de gemalen koffie.
170. Gemalenkoffieverpakkingspatroon volgens conclusie 169, die een eerste module omvat die een gemalenkoffiehouder is, en een tweede module die een motor omvat, waarbij de eerste module verwijderbaar met het
15 koffiezetapparaat koppelbaar is en de tweede module verwijderbaar met de eerste module koppelbaar is, als de eerste module met het koffiezetapparaat gekoppeld is.
171. Gemalenkoffieverpakkingspatroon volgens conclusie 169 of 170, waarbij de uitlaat van de gemalenkoffieverpakkingspatroon open is als hij
20 met het koffiezetapparaat verbonden is en gesloten als hij losgekoppeld is, en waarbij de tweede module, bij voorkeur in een gemalenkoffiehervulmodus, koppelbaar is met de eerste module in plaats van het koffiezetapparaat.
172. Gemalenkoffieverpakkingspatroon volgens conclusie 171, waarbij,
25 bij voorkeur in gemalenkoffiehervulmodus, de tweede module op dezelfde of soortgelijke wijze met de eerste module is gekoppeld als het koffiezetapparaat, als gevolg waarvan de uitlaat van de eerste module open is.
173. Gemalenkoffieverpakkingspatroon volgens één van de conclusies
30 139 tot 172, waarin de gemalenkoffieverpakkingspatroon een

doseerinrichting omvat voor het afleveren van een vastgestelde dosis gemalen koffie door de uitlaat.

174. Gemalenkoffieverpakkingspatroon volgens conclusie 173, waarbij de doseerinrichting een verplaatsbaar doseeronderdeel omvat.

5 175. Gemalenkoffieverpakkingspatroon volgens conclusie 173 of 174, waarbij het gewicht van de vastgestelde dosis gemalen koffie ongeveer gelijk is aan 50 gram of minder, in het bijzonder 20 gram of minder, meer in het bijzonder 15 gram of minder.

176. Gemalenkoffieverpakkingspatroon volgens één van de conclusies
10 141 tot 175, waarbij de binnenruimte van de gemalenkoffieverpakkingspatroon, als hij niet eerder gebruikt is, ten minste 20 gram, in het bijzonder ten minste 50 gram, meer in het bijzonder ten minste 70 gram en nog meer in het bijzonder ten minste 200 gram gemalen koffie bevat of dat, als de binnenruimte van de
15 gemalenkoffieverpakkingspatroon, als hij nog niet gebruikt is, nog een hoeveelheid gemalen koffie voor het bereiden van een portie koffie zoals een kop koffie bevat, bij voorkeur ongeveer 5 -10 gram, meer bij voorkeur ongeveer 6 – 8 gram gemalen koffie.

177. Gemalenkoffieverpakkingspatroon volgens één van de conclusies
20 139 tot 176, waarbij de gemalenkoffieverpakkingspatroon ten minste hoofdzakelijk gevormd is van tin en/of als een blik.

178. Gemalenkoffieverpakkingspatroon volgens één van de conclusies 139 tot 177, die een veelvoud van compartimenten omvat, die althans vóór gebruik met gemalen koffie zijn gevuld.

25 179. Gemalenkoffieverpakkingspatroon volgens conclusie 178, waarbij elk van de veelvoud van compartimenten is gevuld met een dosis gemalen koffie, waarbij elke dosis een gewicht heeft van ongeveer 20 gram of minder.

180. Koffiezetsysteem dat het koffiezetapparaat als gedefinieerd in één van de conclusies 1 – 138 and de gemalenkoffieverpakkingspatroon als
30 gedefinieerd in één van de conclusies 139 – 179 omvat.

181. Werkwijze voor het bereiden van een drank door middel van een systeem volgens één van de conclusies 1 - 138, waarbij de werkwijze de volgende stappen omvat: in een stap van leegmaken en malen wordt de maalinrichting geactiveerd voor het leegmaken van de doseerkamer en voor
5 het malen van koffiebonen of gemalen koffie verzameld in de doseerkamer.
182. Werkwijze volgens conclusie 181, waarin de maalinrichting langer geactiveerd wordt dan nodig is voor het leegmaken of het ten minste in hoofdzaak volledig leegmaken van de doseerkamer en voor het malen van alle koffiebonen of alle gemalen koffie verzameld in de doseerkamer.
- 10 183. Werkwijze volgens conclusie 181 of 182, waarbij de doseerkamer wordt gevuld met koffiebonen of gemalen koffie vóór het leegmaken en het malen van de koffiebonen verzameld in de doseerkamer.
184. Werkwijze volgens conclusie 183, waarbij de doseerkamer volledig gevuld wordt met koffiebonen of gemalen koffie of ten minste hoofdzakelijk
15 volledig gevuld wordt met koffiebonen of gemalen koffie.
185. Werkwijze volgens conclusie 184, waarbij de transportermiddelen langer worden aangedreven dan nodig is voor het volledig vullen of ten minste hoofdzakelijk volledig vullen van de doseerkamer met koffiebonen of gemalen koffie.
- 20 186. Werkwijze voor het bereiden van een drank door middel van een systeem volgens één van de conclusies 1 – 138, waarbij de werkwijze de volgende stappen omvat: in een eerste stap worden de transportermiddelen langer aangedreven dan nodig is voor het vullen van de doseerkamer met koffiebonen of gemalen koffie; en
25 in een tweede stap, die volgt op het afronden van de eerste stap, wordt de maalinrichting langer geactiveerd dan nodig is voor het leegmaken van de doseerkamer en voor het malen van alle koffiebonen of voor het verder malen van alle gemalen koffie die in de doseerkamer waren/was verzameld gedurende de eerste stap.
- 30 187. Werkwijze volgens conclusie 186, waarbij de werkwijze verder de volgende stap omvat: in een derde stap, die volgt op het afronden van de

tweede stap, zet de koffiezetinrichting koffie op basis van gemalen koffie en verhit water.

188. Werkwijze voor het zetten van koffie waarbij een patroon gevuld met koffiebonen of gemalen koffie gekoppeld wordt met een
- 5 koffiezetapparaat, waarbij door middel van de koppeling tussen de patroon en het koffiezetapparaat een doseerkamer wordt gevormd, waarbij vervolgens de doseerkamer wordt gevuld met koffiebonen of gemalen koffie uit de patroon, vervolgens de doseerkamer geleegd wordt door middel van
- 10 het activeren van een maalinrichting, waarbij de koffiebonen of gemalen koffie van de doseerkamer gemalen of verder gemalen worden door het activeren van de maalinrichting en vervolgens koffie gezet wordt met het koffiezetapparaat op basis van de gemalen koffie en verhit water.
189. Werkwijze volgens conclusie 188, waarbij gebruik gemaakt wordt
- 15 van een doseerkamer met een bodem, die ten minste gedeeltelijk gevormd wordt door een roterend gedeelte van de maalinrichting, waarbij door het aandrijven van de maalinrichting het roterende gedeelte rond een verticale as roteert, waarbij door middel van het roteren van het gedeelte de doseerkamer wordt geleegd en de bonen of de gemalen koffie van de
- 20 doseerkamer gemalen/verder gemalen worden met de maalinrichting.
190. Werkwijze volgens conclusie 188 of 189, waarbij de stap van het vullen van de doseerkamer gedurende een langere tijd wordt uitgevoerd dan nodig voor het volledig of in hoofdzaak volledig vullen van de
- 25 doseerkamer en/of de maalinrichting langer geactiveerd wordt dan nodig is voor het leegmaken of ten minste in hoofdzaak volledig leegmaken van de doseerkamer en voor het malen van alle koffiebonen of het verder malen van alle gemalen koffie die in de doseerkamer waren/was verzameld gedurende de vulstap.
191. Werkwijze voor het bereiden van een drank door middel van een
- 30 systeem volgens één van de voorgaande conclusies 1 - 138, waarbij de werkwijze de volgende stappen omvat:

in een eerste stap wordt de doseerkamer gevuld met
koffiebonen of gemalen koffie; en

in een tweede stap die volgt na het afronden van de eerste stap de
maalinrichting geactiveerd wordt voor het leegmaken van de doseerkamer

5 en voor het malen van koffiebonen of verder malen van gemalen koffie die in
de doseerkamer waren verzameld gedurende de eerste stap.

192. Werkwijze volgens conclusie 191, waarbij in de eerste stap de
doseerkamer volledig wordt gevuld met koffiebonen of gemalen koffie of ten
minste hoofdzakelijk volledig wordt gevuld met koffiebonen of gemalen

10 koffie.

193. Werkwijze volgens conclusie 191 of 192, waarbij in de eerste stap
de transportermiddelen langer worden aangedreven dan nodig is voor het
vullen van de doseerkamer met koffiebonen of gemalen koffie.

194 Werkwijze volgens conclusies 191, 192 of 193, waarbij in de tweede
15 stap de maalinrichting langer geactiveerd wordt dan nodig is voor het
volledig leegmaken of het ten minste in hoofdzaak volledig leeg maken van
de doseerkamer en voor het malen van alle of ten minste hoofdzakelijk alle
koffiebonen of gemalen koffie verzameld in de doseerkamer gedurende de
eerste stap.

20 195 Werkwijze voor het bereiden van een drank door middel van een
systeem volgens één van de conclusies 1 – 138, waarbij de werkwijze de
volgende stappen omvat:

in een eerste stap worden de transportermiddelen langer aangedreven dan
nodig is voor het vullen van de doseerkamer met koffiebonen of gemalen

25 koffie; en

in een tweede stap, die volgt op het afronden van de eerste stap, wordt de
maalinrichting langer geactiveerd dan nodig is voor het leegmaken van de
doseerkamer en voor het malen van alle koffiebonen of gemalen koffie
verzameld in de doseerkamer gedurende de eerste stap.

30 196. Werkwijze volgens één voorgaande conclusie 191 - 195, waarbij de
werkwijze verder de volgende stap bevat:

in een derde stap, die volgt op het afronden van de tweede stap, zet de koffiezetinrichting koffie op basis van de gemalen koffie en verhit water.

197. Werkwijze voor het bereiden van een drank door middel van een koffiedranksysteem volgens één van de conclusies 1 tot 138, waarbij de

5 werkwijze de volgende stappen omvat:

- aanbrengen van de koffiebonenverpakkingspatroon op het koffiezetapparaat;

10 - draaien van de zich verticaal uitstreckende aandrijfas met de motor, daarbij de transporteermiddelen van de koffiebonenverpakkingspatroon aandrijvend en bewegend voor het transporteren van koffiebonen naar de uitgangsoening van de koffiebonenverpakkingspatroon;

- malen van koffiebonen die het koffiezetapparaat zijn binnengekomen via de ingangsoening daarvan om gemalen koffie te

15 produceren;

- koffie zetten op basis van gemalen koffie;

- aanbrengen van de gemalenkoffieverpakkingspatroon op het koffiezetapparaat daarvan,

20 - bedienen van de transporteermiddelen van de gemalenkoffieverpakkingspatroon om gemalen koffie naar de uitgangsoening van de gemalenkoffieverpakkingspatroon te transporteren onafhankelijk van het koffiezetapparaat;

- zetten van koffie op basis van gemalen koffie uit de gemalenkoffieverpakkingspatroon.

25 198. Werkwijze volgens conclusie 197, waarbij de transporteermiddelen van de gemalenkoffieverpakkingspatroon handmatig bediend worden.

199. Werkwijze volgens conclusie 197 of 198, waarbij de transporteermiddelen van de gemalenkoffieverpakkingspatroon worden bediend om de doseerkamer te vullen en waarbij in een volgende stap, die

30 volgt nadat de stap van het vullen van de doseerkamer met gemalen koffie

afgerond is, de maalinrichting geactiveerd wordt om de doseerkamer leeg te maken.

200. Werkwijze volgens conclusie 199, waarbij tijdens de vulstap de maalinrichting langer wordt geactiveerd dan nodig is voor het leegmaken of
5 ten minste hoofdzakelijk volledig leegmaken van de doseerkamer.

201. Werkwijze volgens conclusie 199 of 200, waarbij na afronding van de stap van het vullen van de doseerkamer met gemalen koffie de maalinrichting wordt geactiveerd om gemalen koffie te malen.

202. Werkwijze volgens conclusie 201, waarbij de maalinrichting langer
10 wordt geactiveerd dan nodig is voor het malen van alle gemalen koffie verzameld in de doseerkamer tijdens de vulstap.

203. Werkwijze voor het afleveren van gemalen koffie uit een gemalenkoffieverpakkingspatroon volgens één van de conclusies 139 tot 179 naar een extern apparaat, waarbij de werkwijze de volgende stappen omvat:

15 - houden van gemalen koffie in een behuizing die een binnenruimte van de gemalenkoffieverpakkingspatroon omsluit, vrijgeven van gemalen koffie uit de binnenruimte door de uitlaat van de behuizing,

- transporteren van gemalen koffie door middel van de transporteermiddelen naar de uitlaat, waarbij het transporteren van
20 gemalen koffie het contact maken met gemalen koffie door middel van de beweegbare structuur van de transporteermiddelen omvat,

- bedienen van de beweegbare structuur door middel van handmatig bedienbare bedieningsmiddelen van de transporteermiddelen.

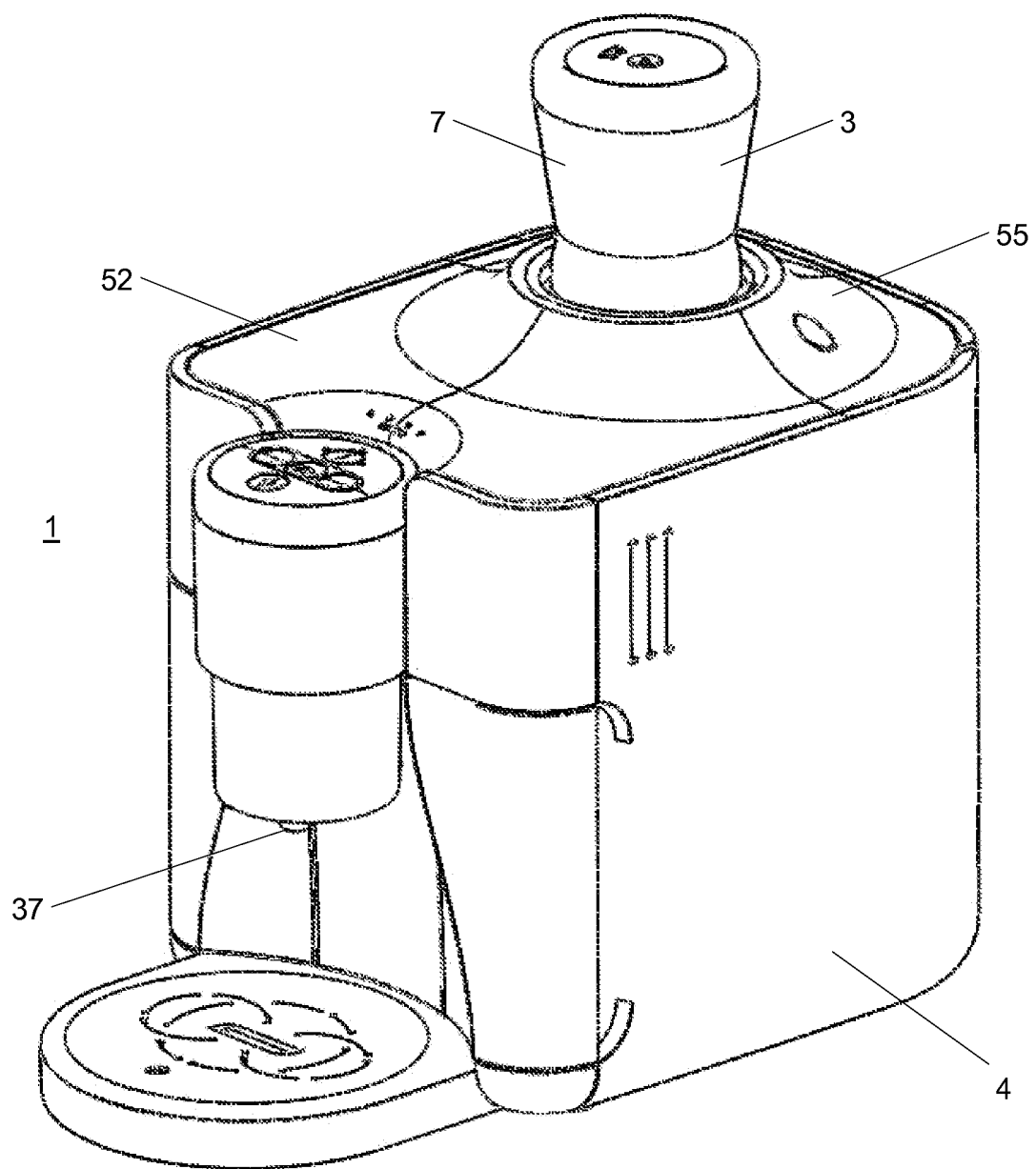


Fig. 1

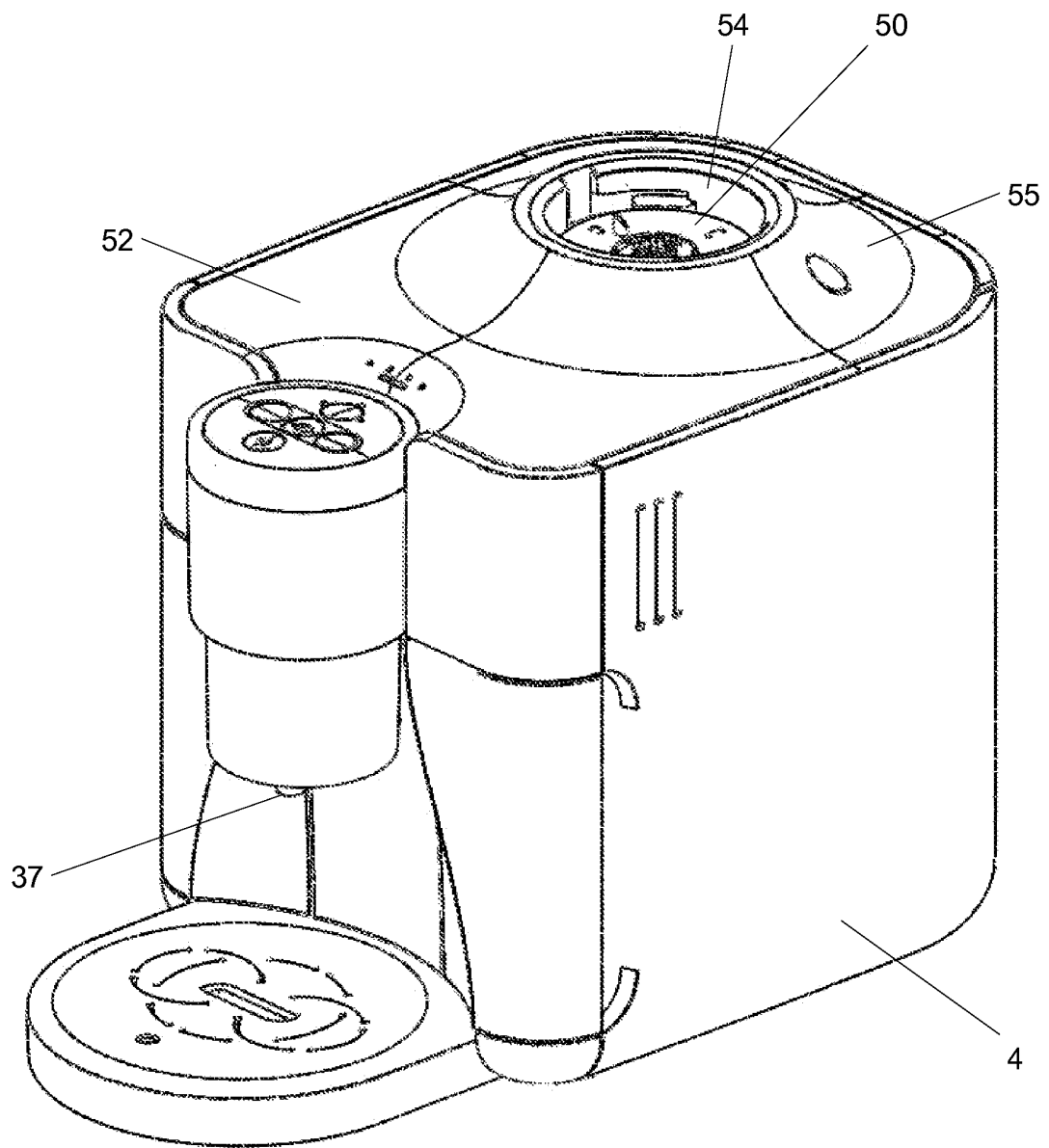


Fig. 2

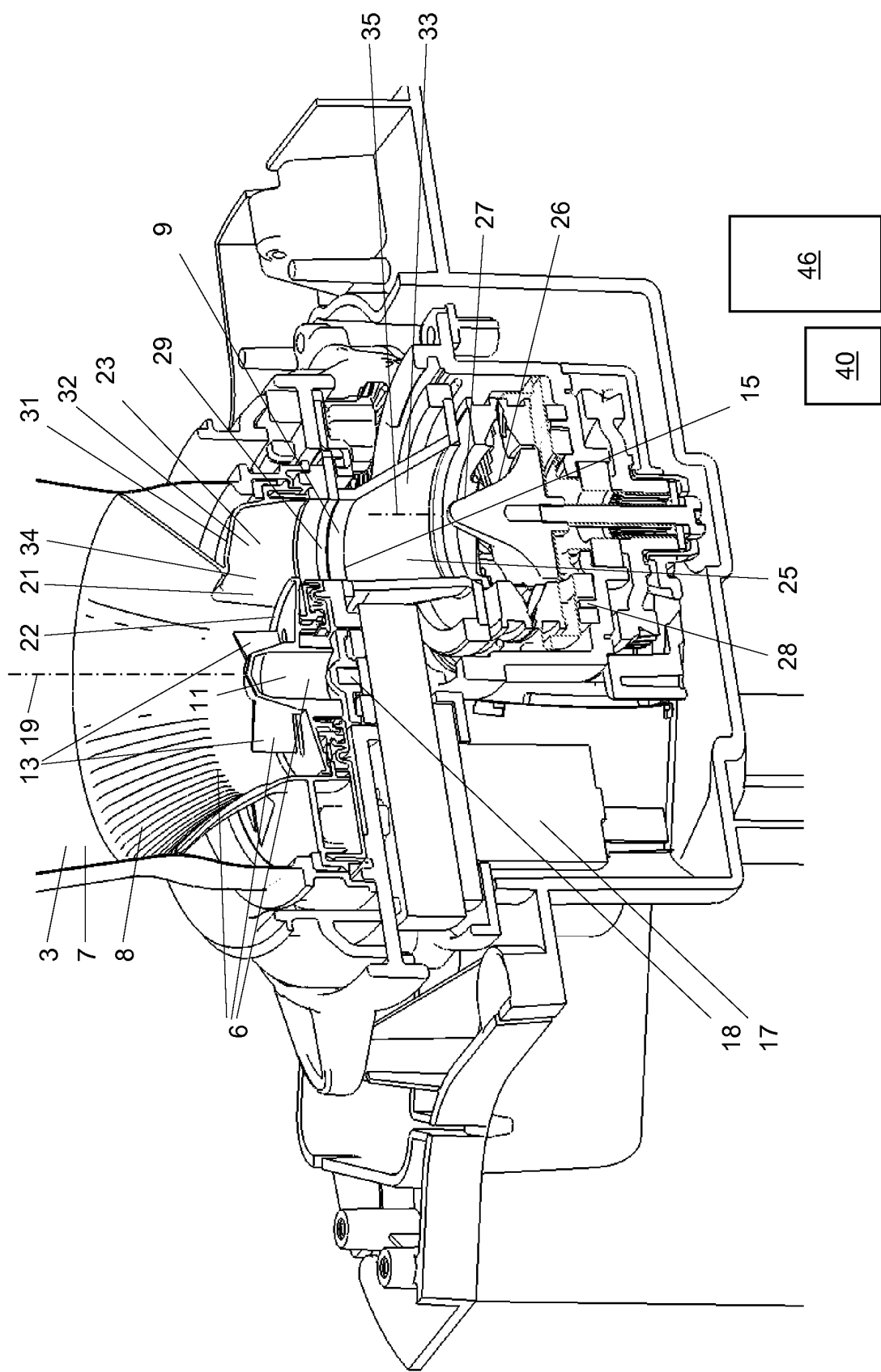


Fig. 3A

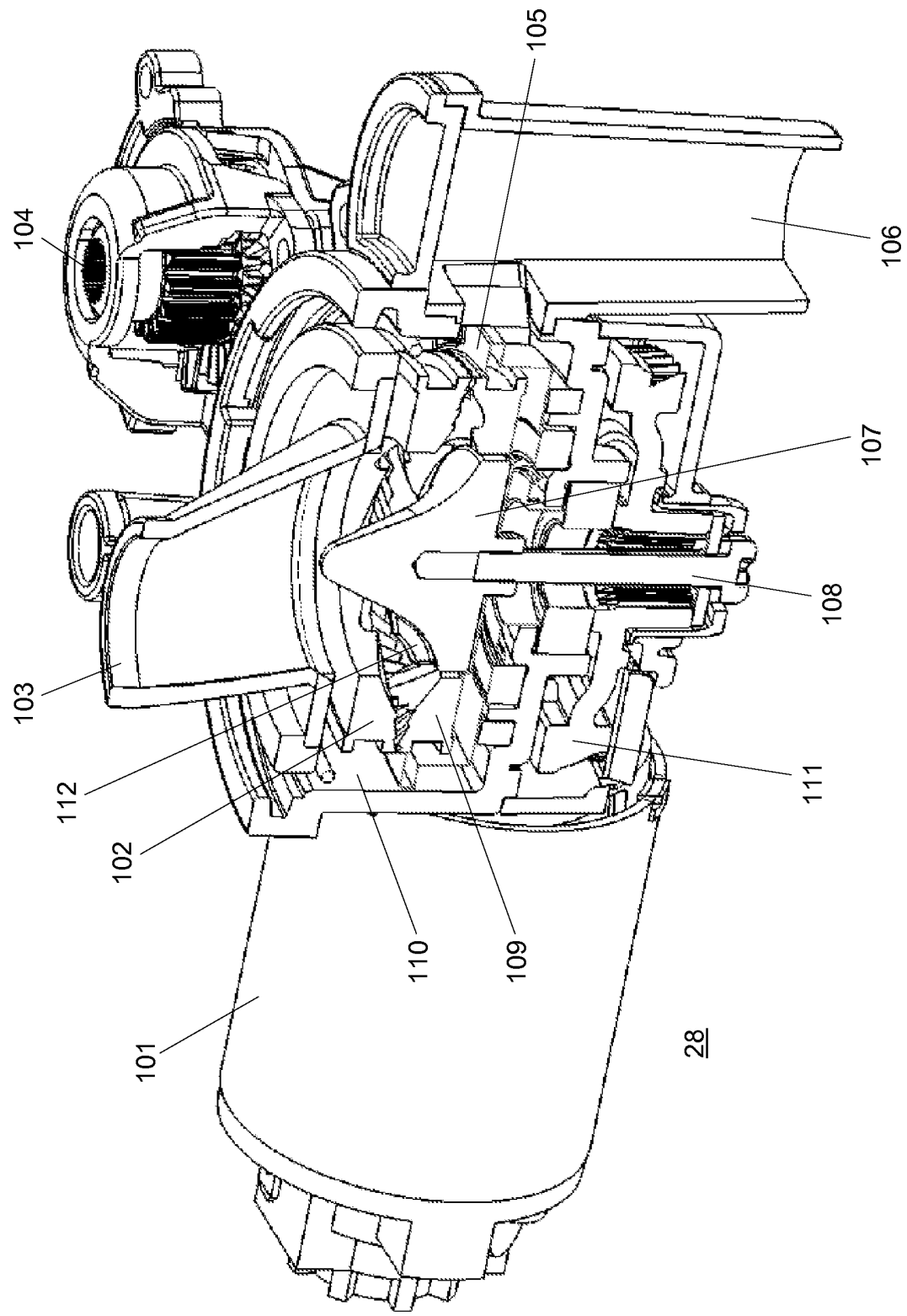


Fig. 3B

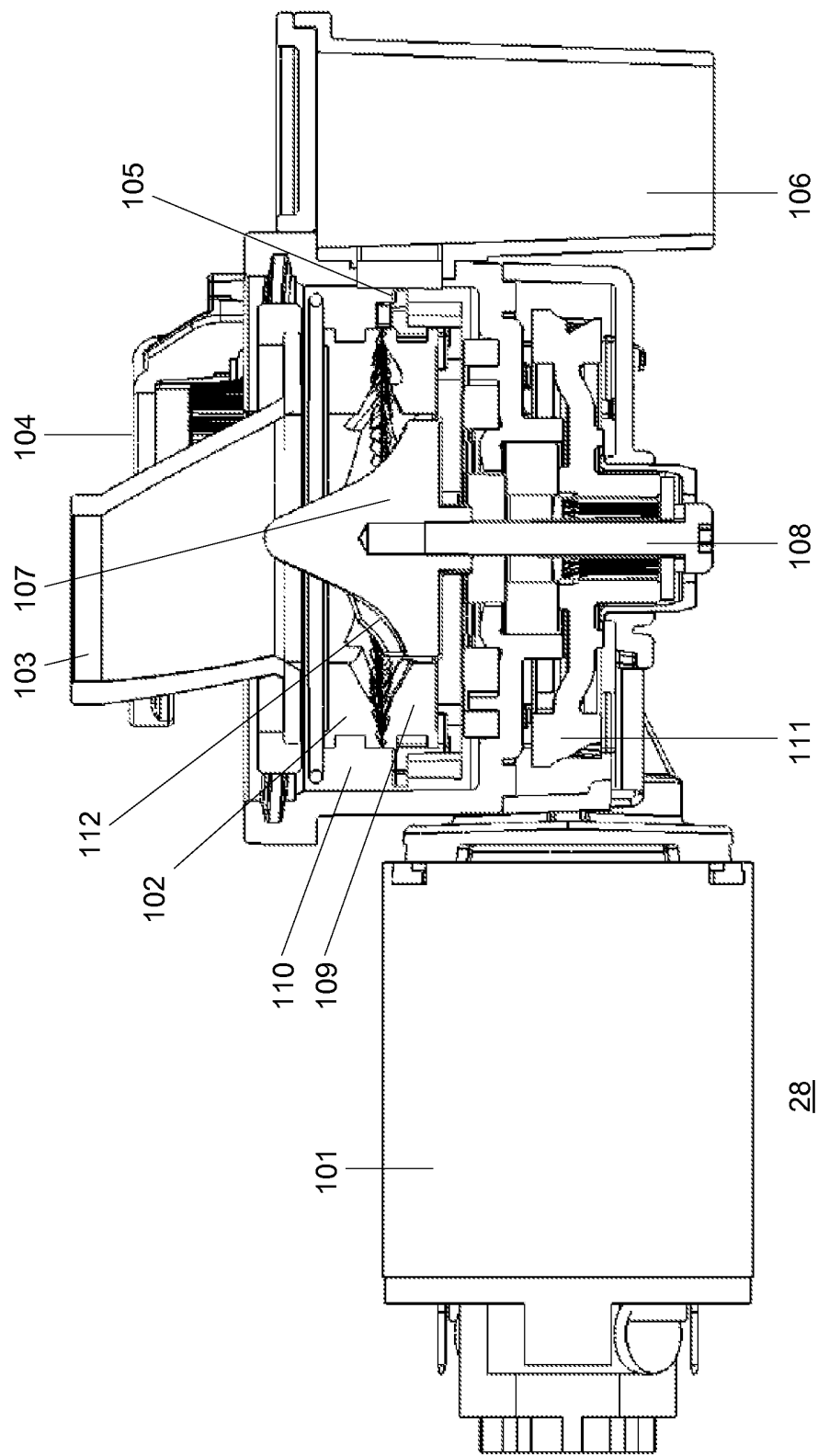


Fig. 3C

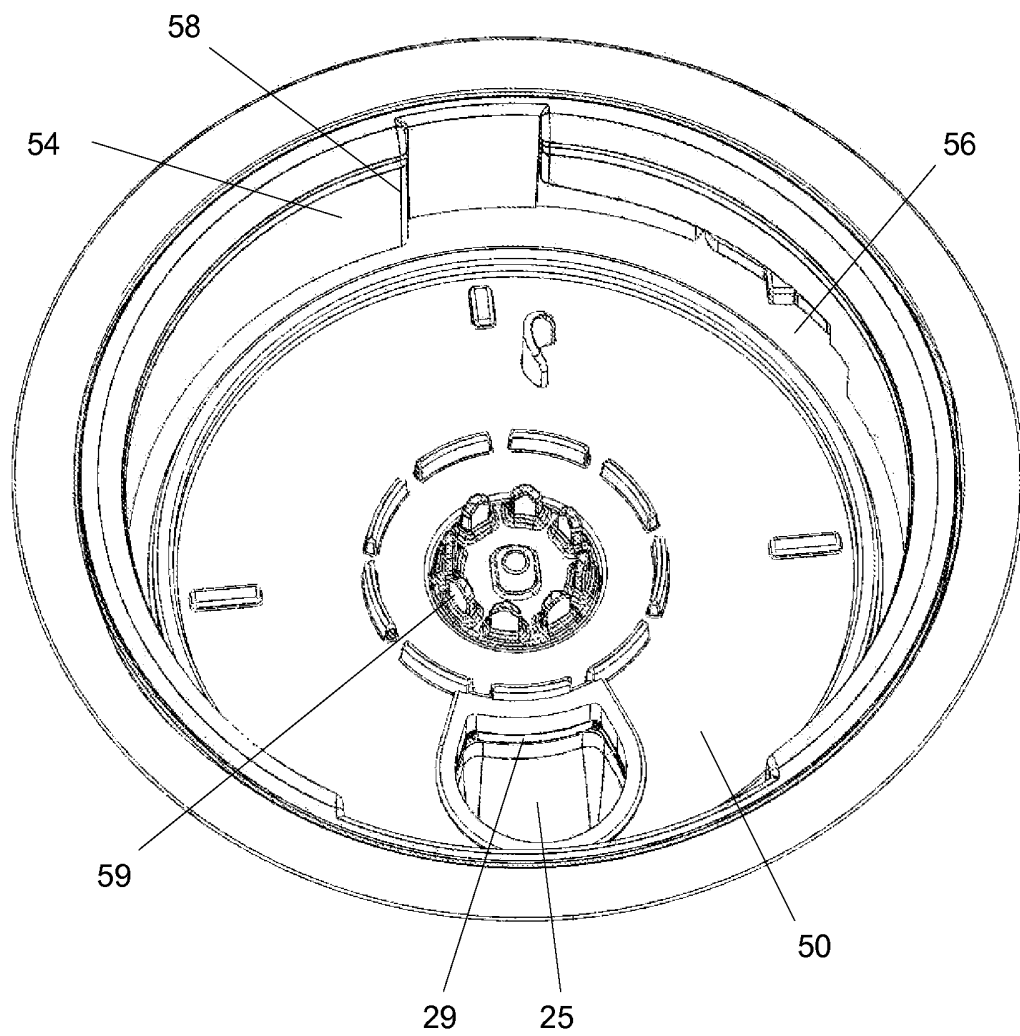


Fig. 4A

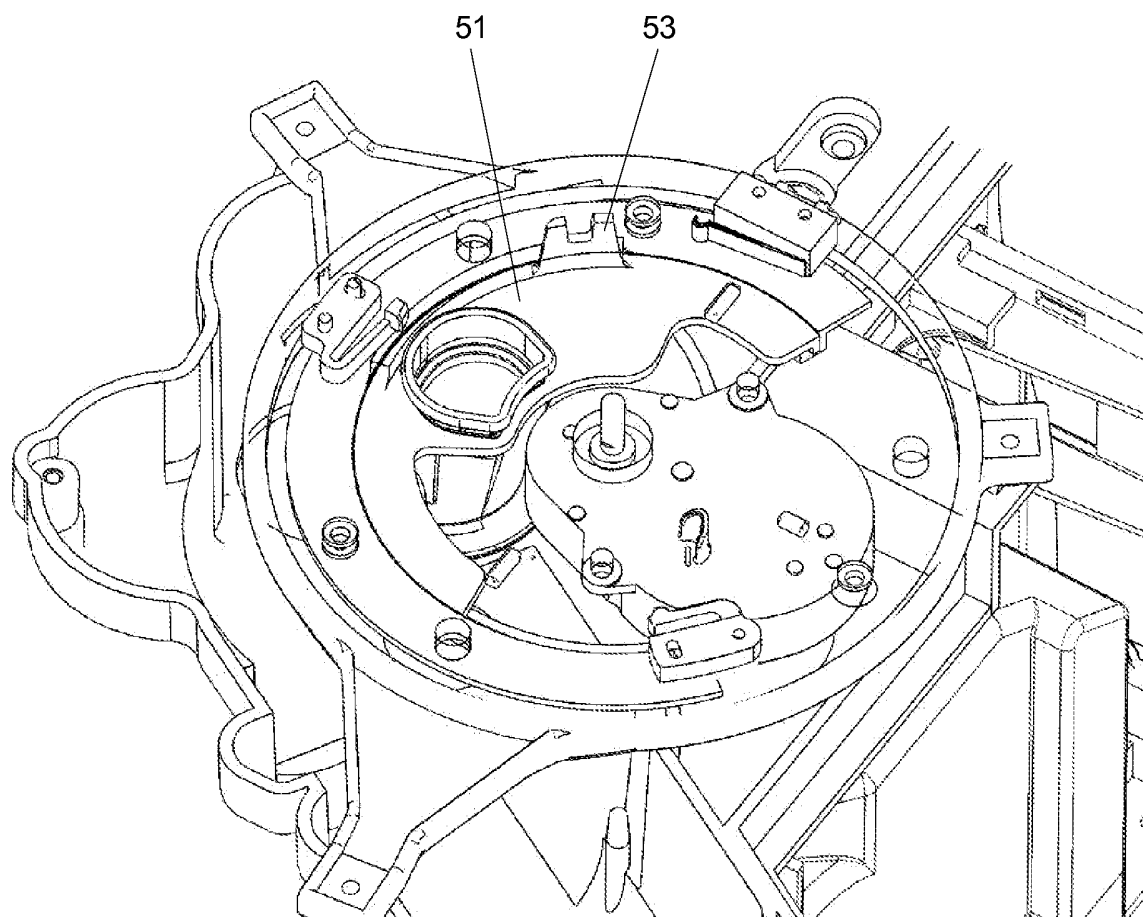


Fig. 4B

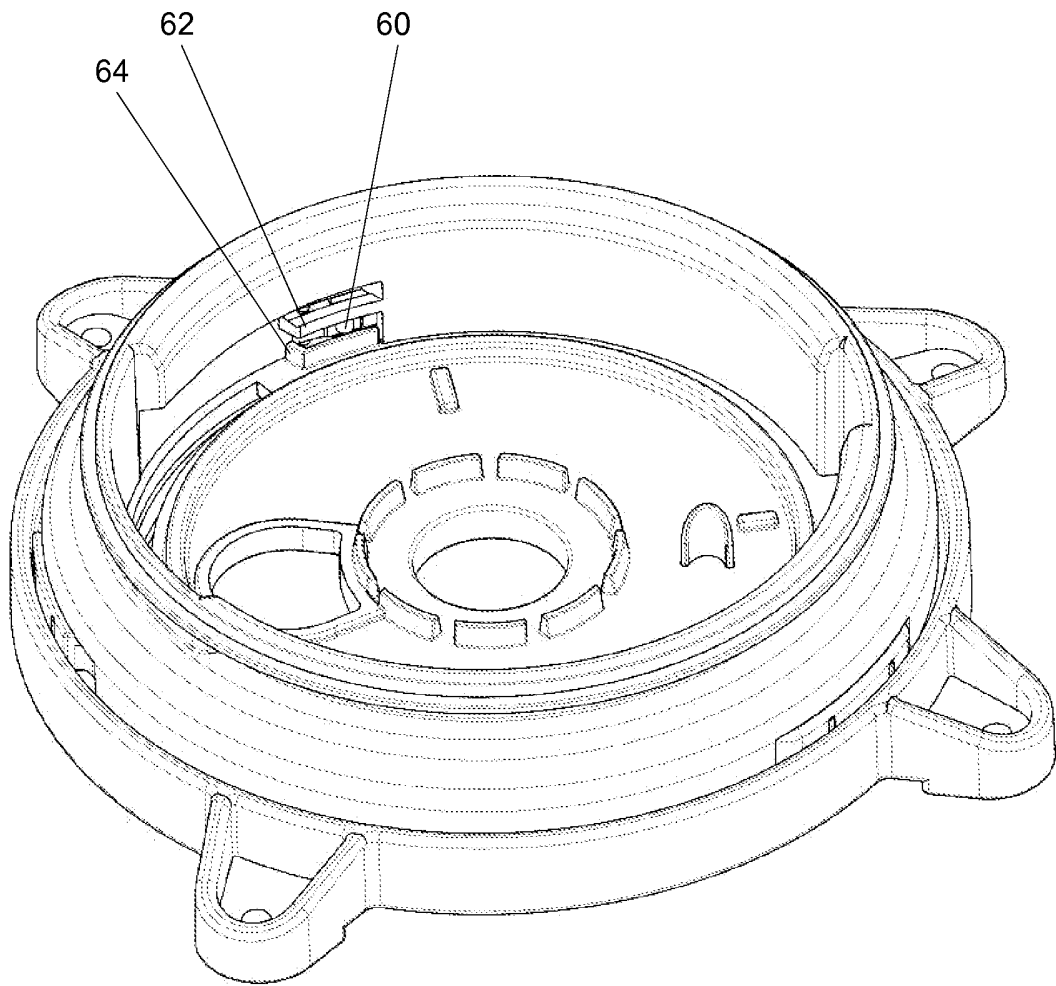


Fig. 4C

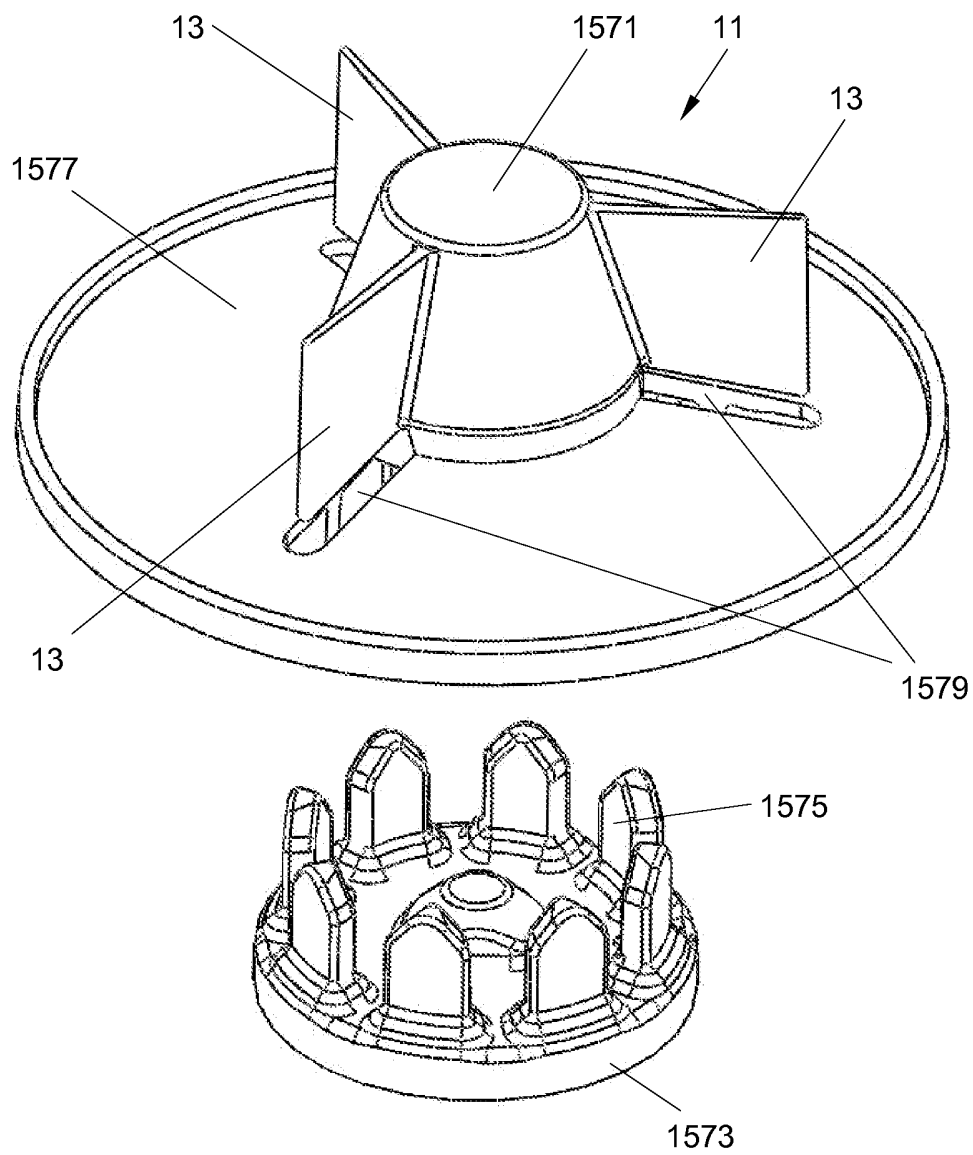


Fig. 5A

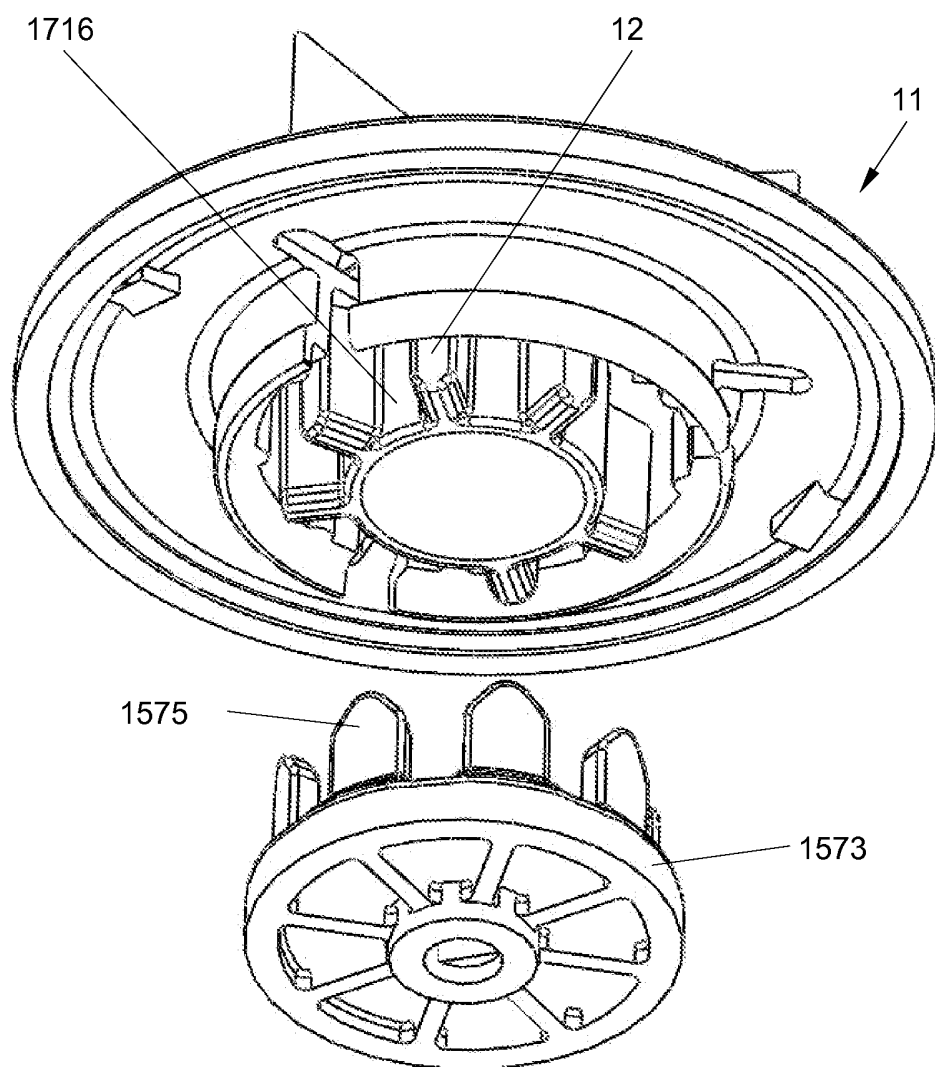


Fig. 5B

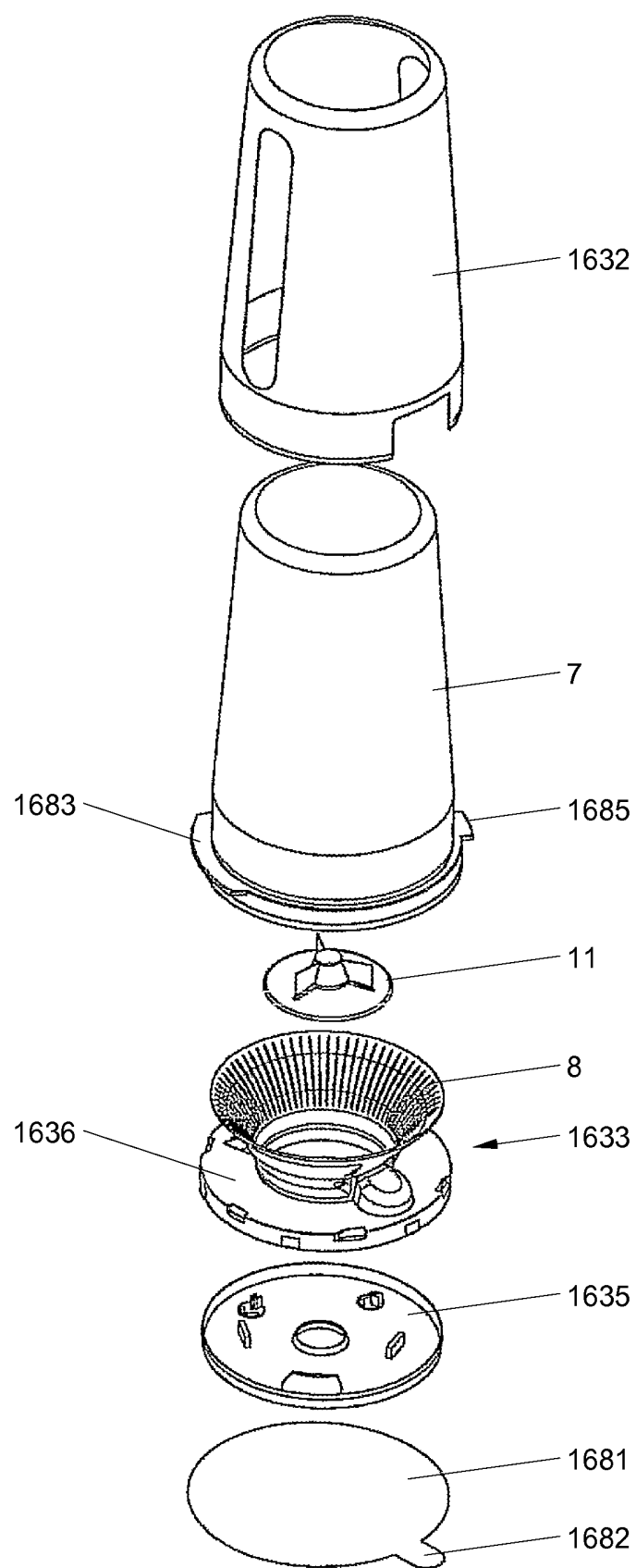


Fig. 6A

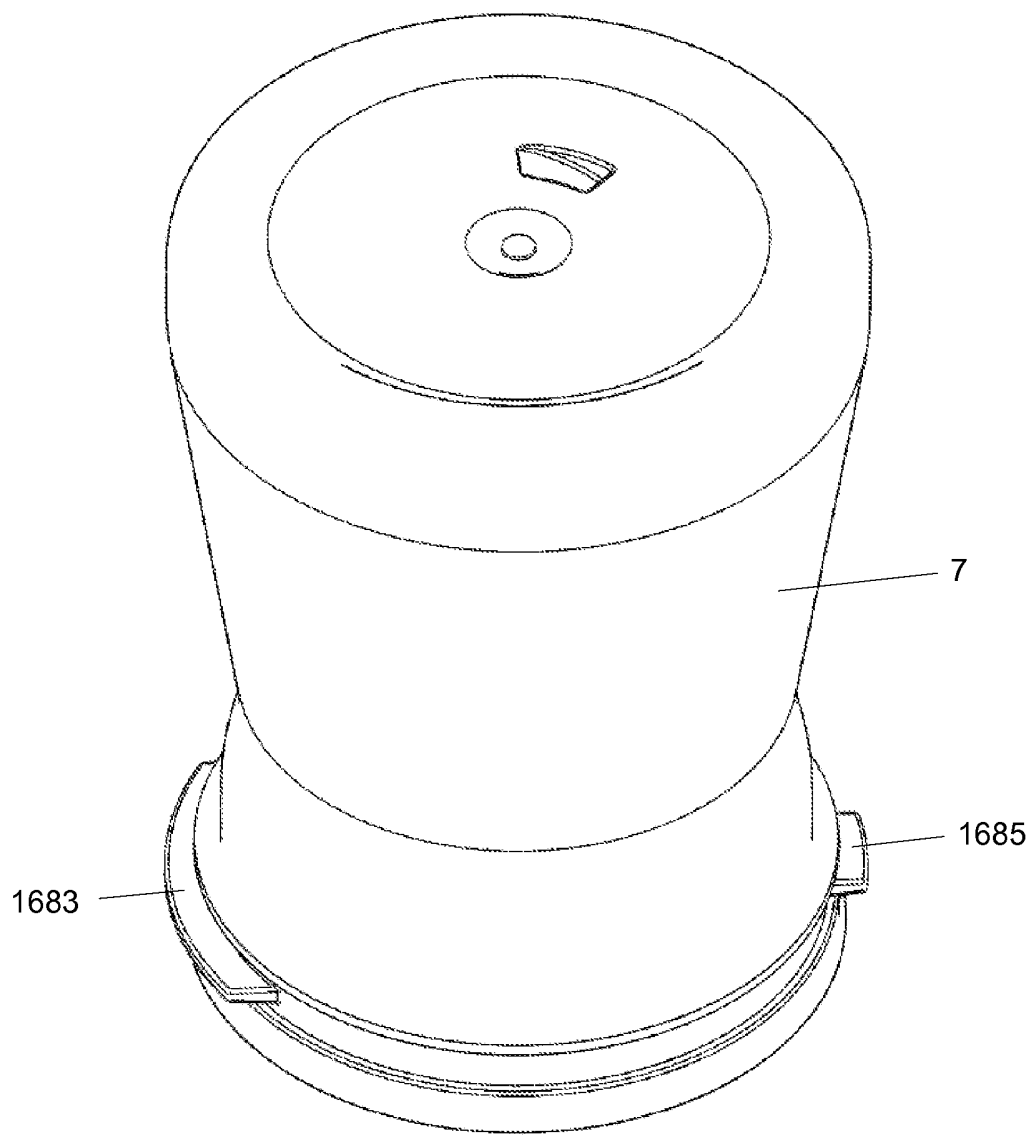


Fig. 6B

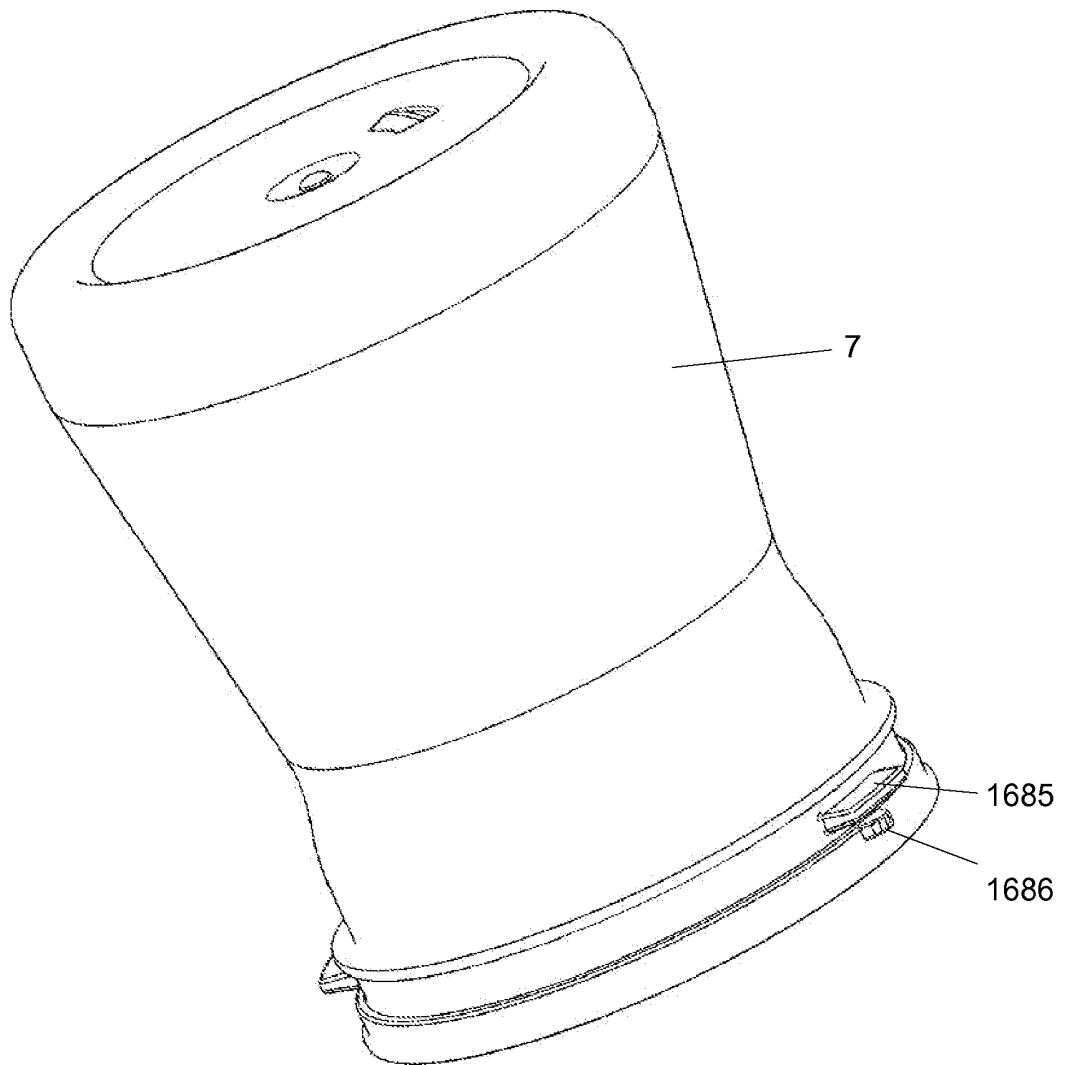


Fig. 6C

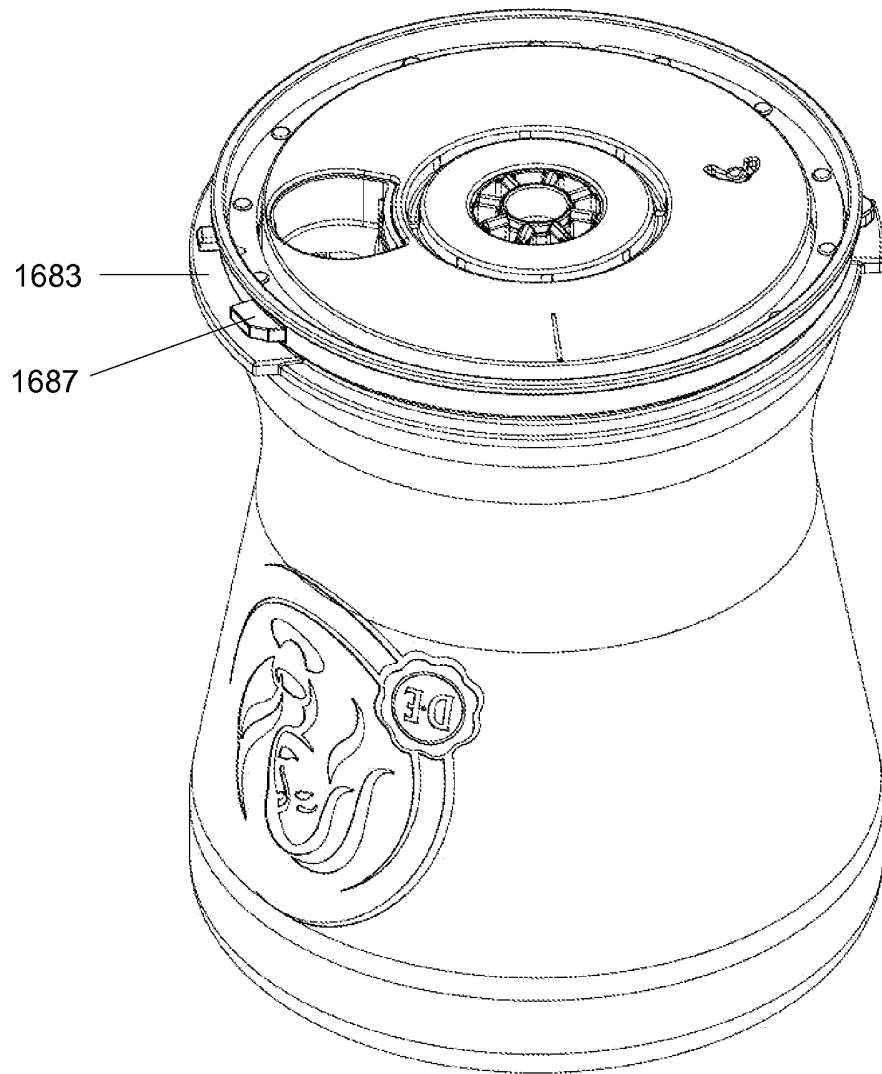


Fig. 6D

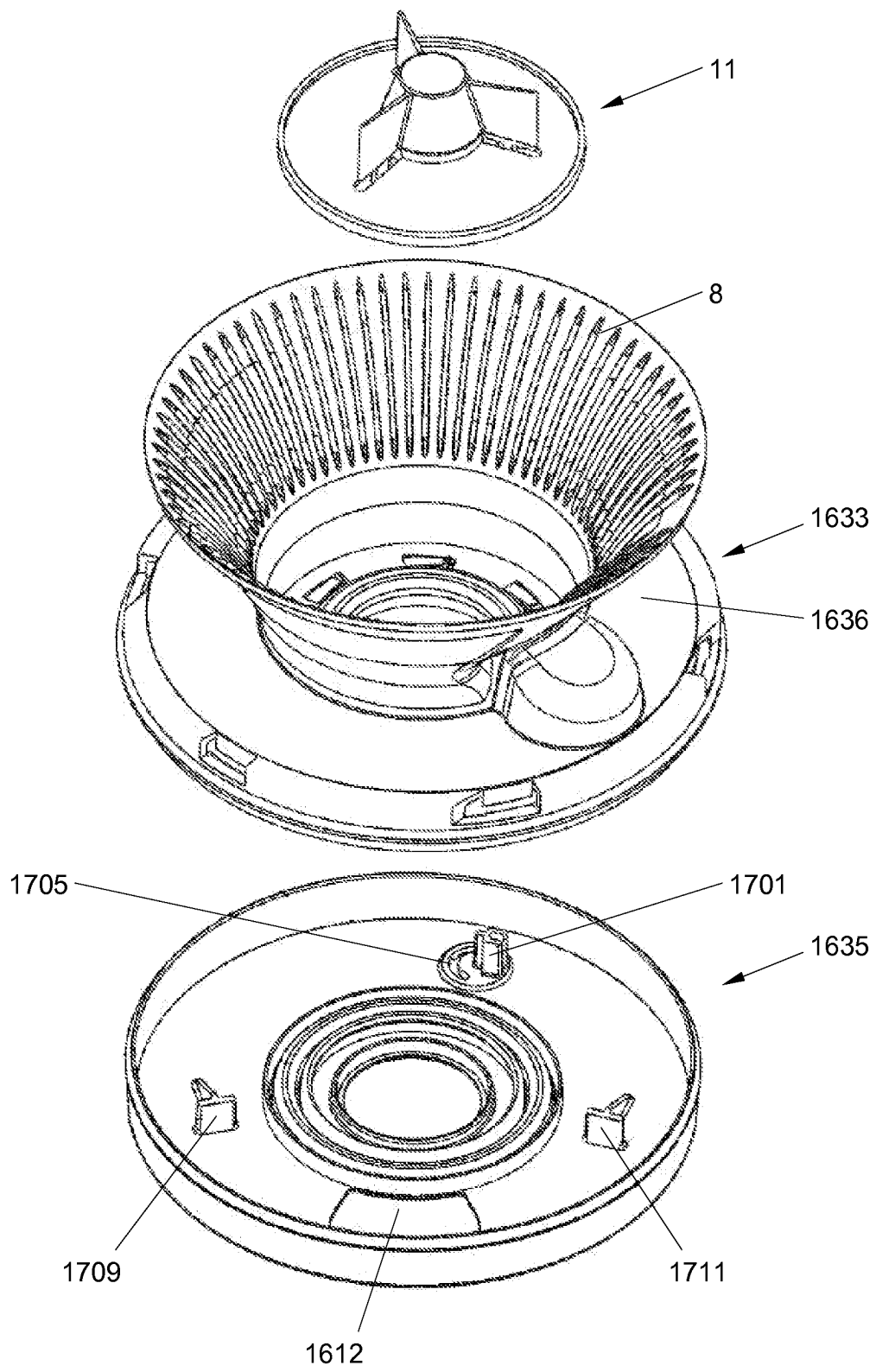


Fig. 7A

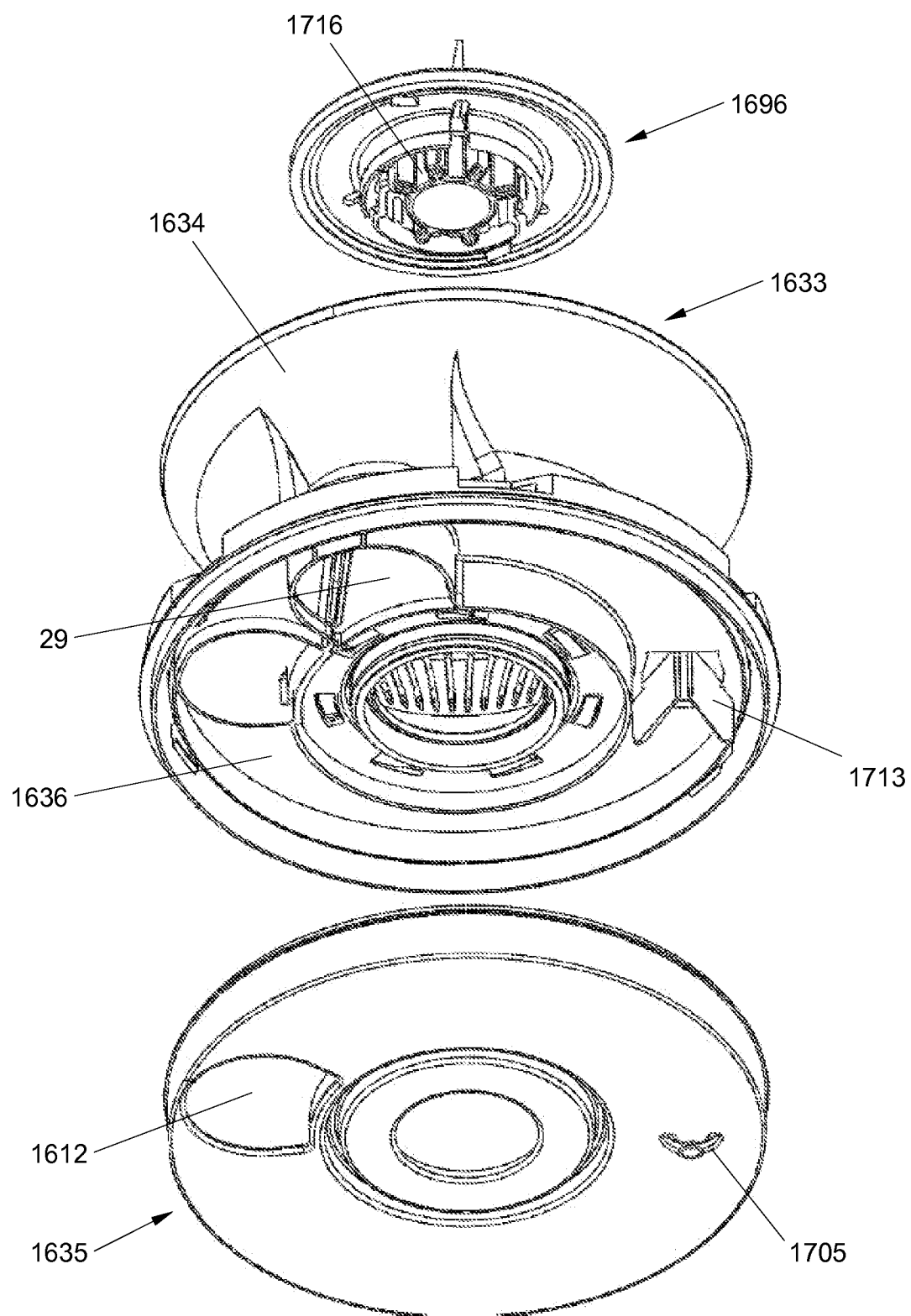


Fig. 7B

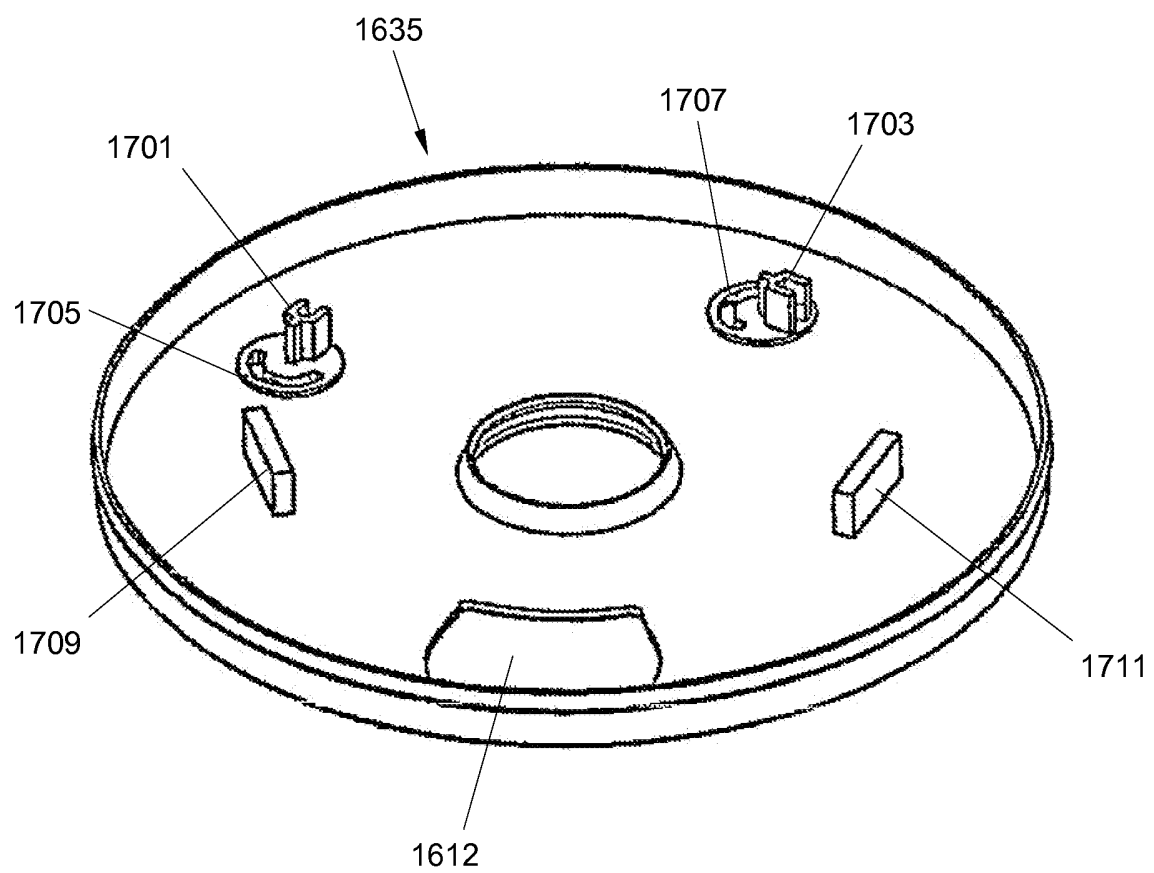


Fig. 7C

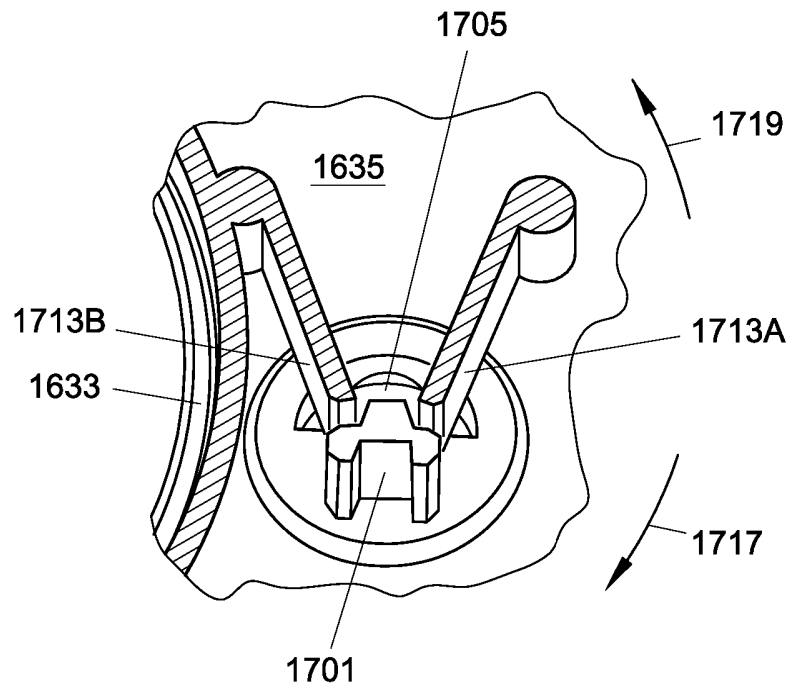


Fig. 8

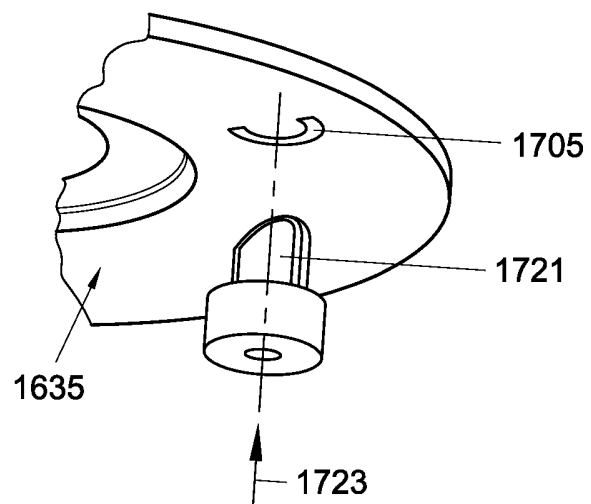


Fig. 9

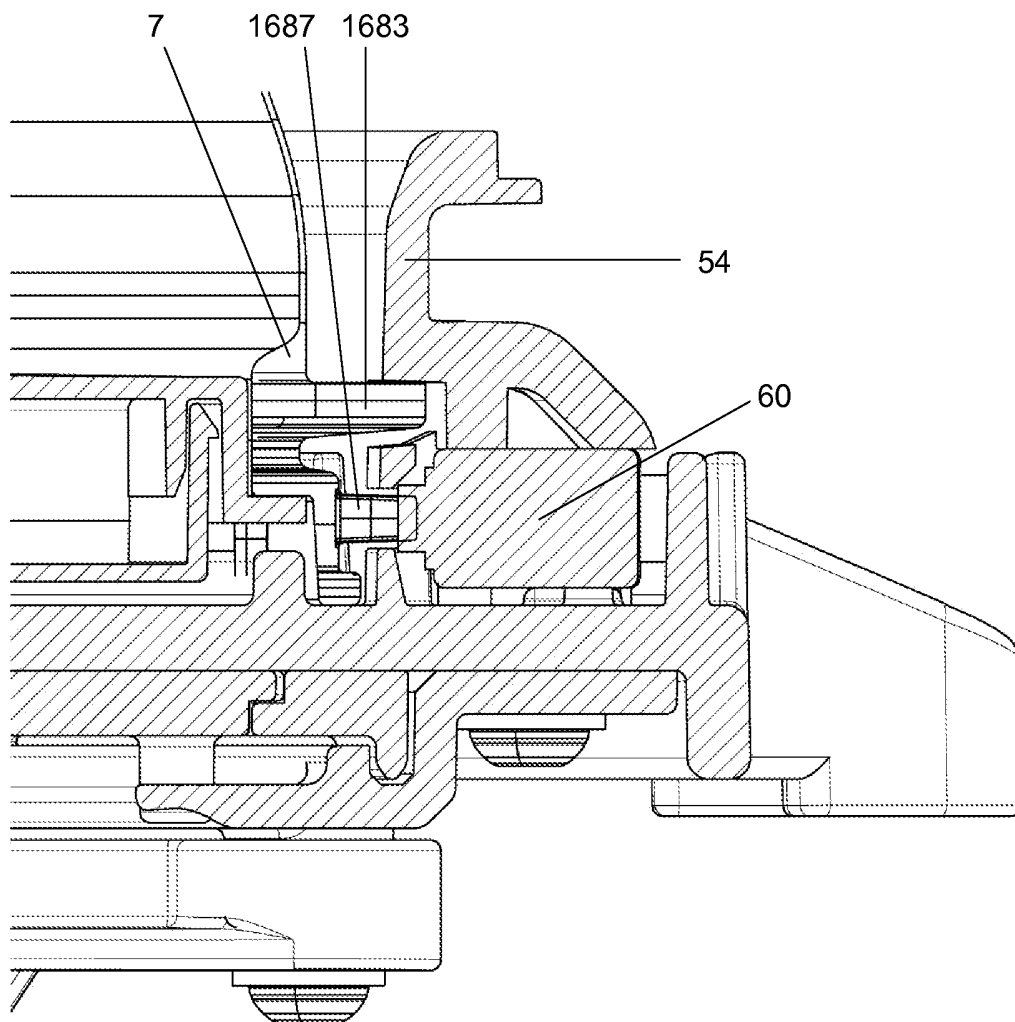


Fig. 10

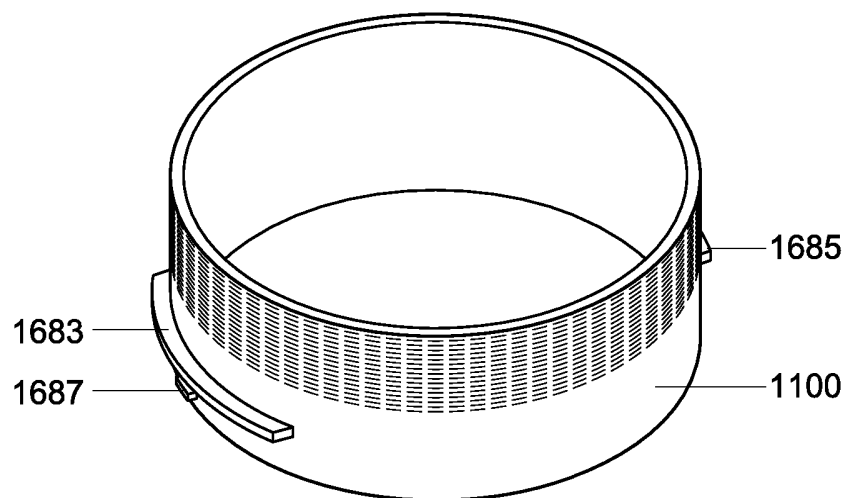


Fig. 11A

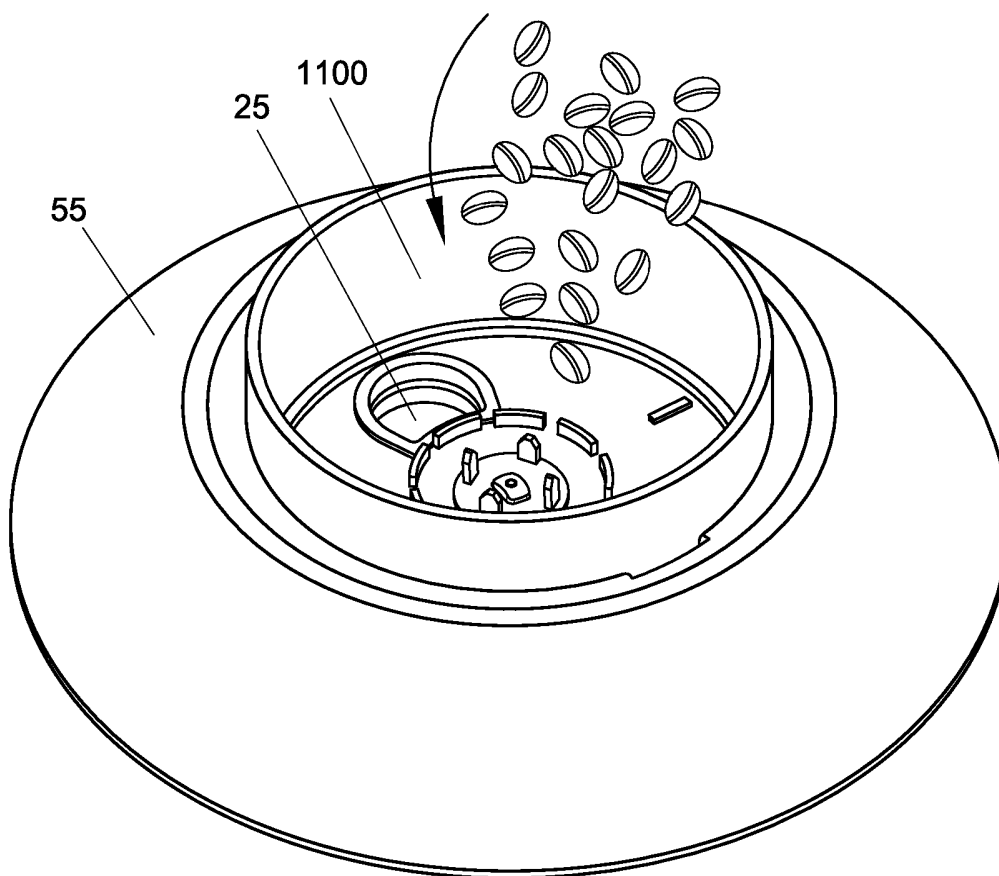


Fig. 11B

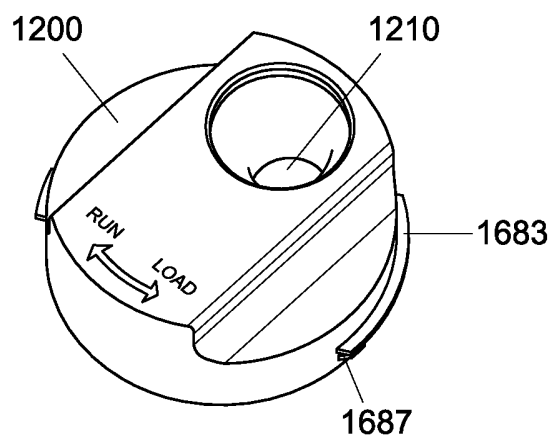


Fig. 12A

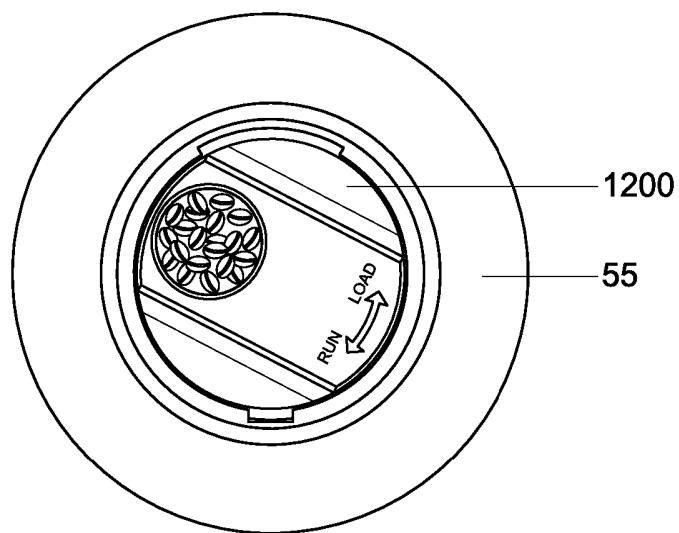


Fig. 12B

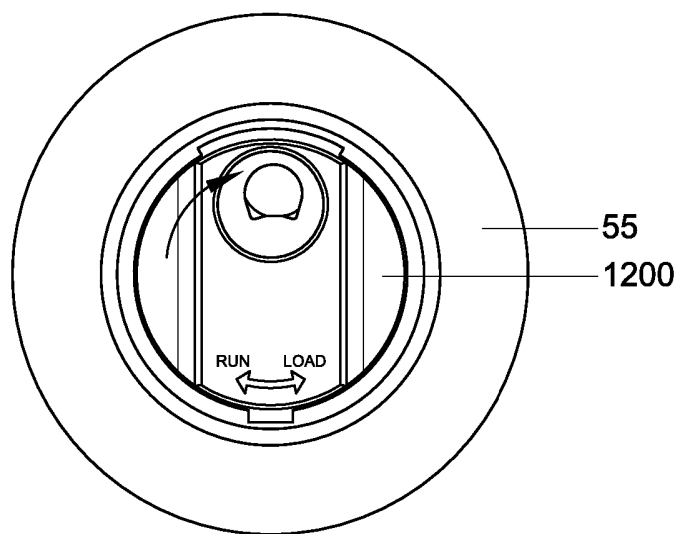


Fig. 12C

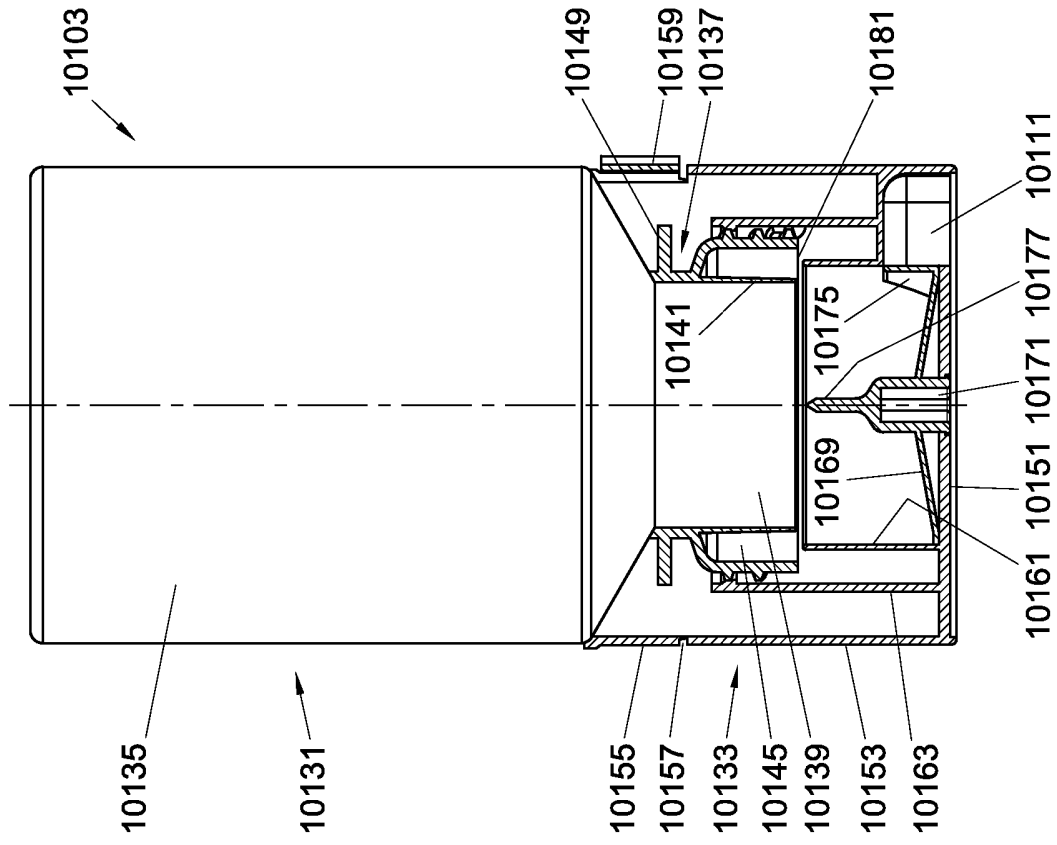


Fig. 13A

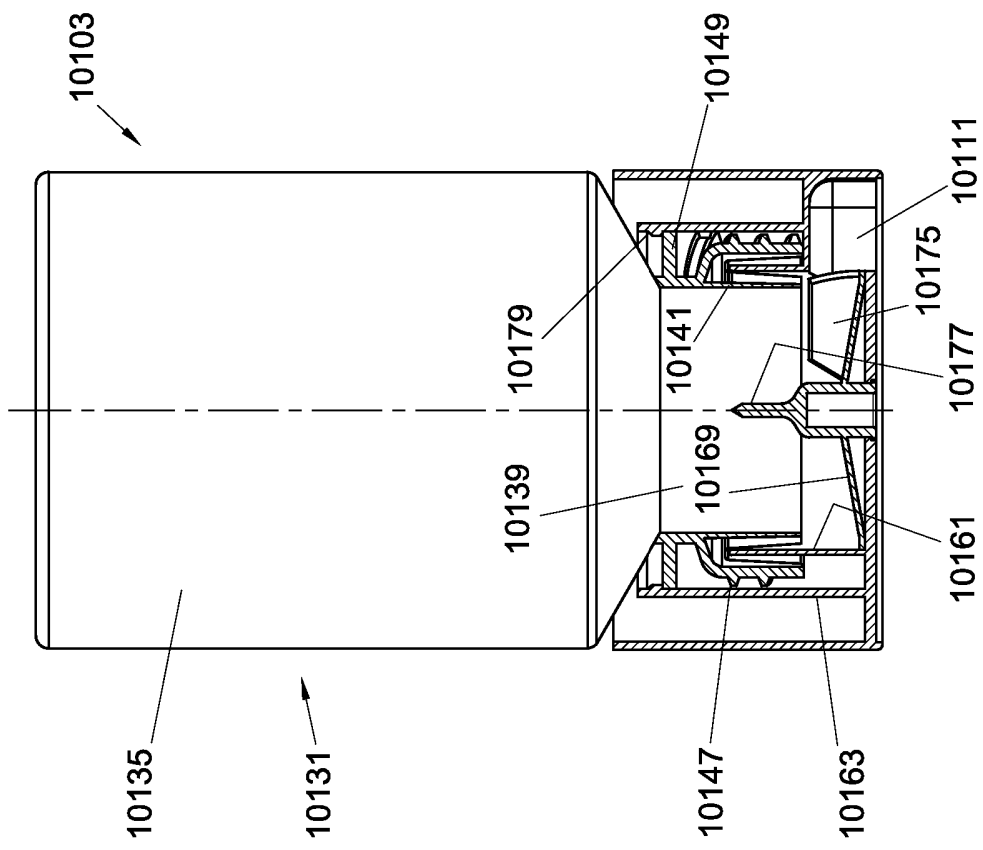


Fig. 13B

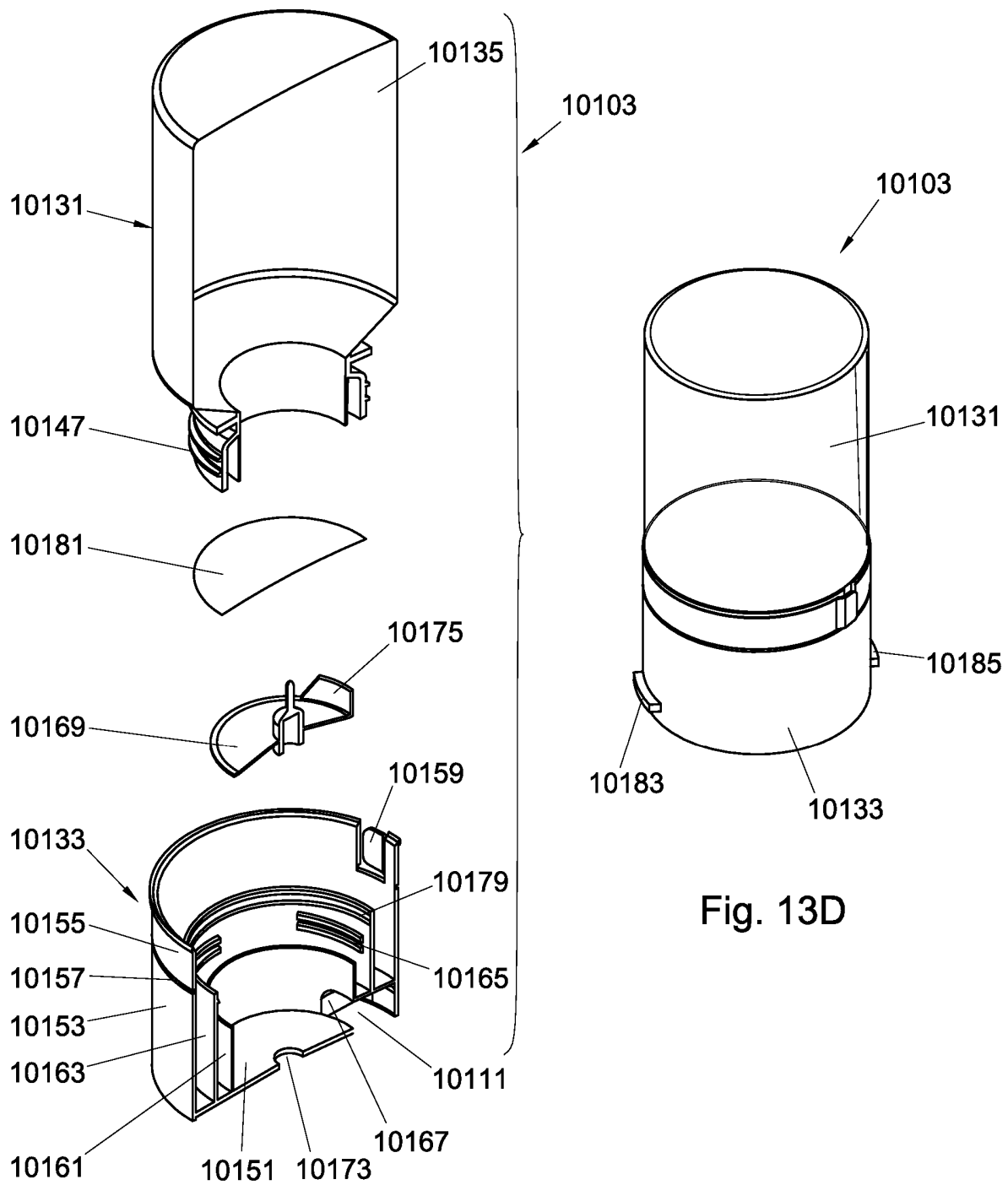


Fig. 13C

Fig. 13D

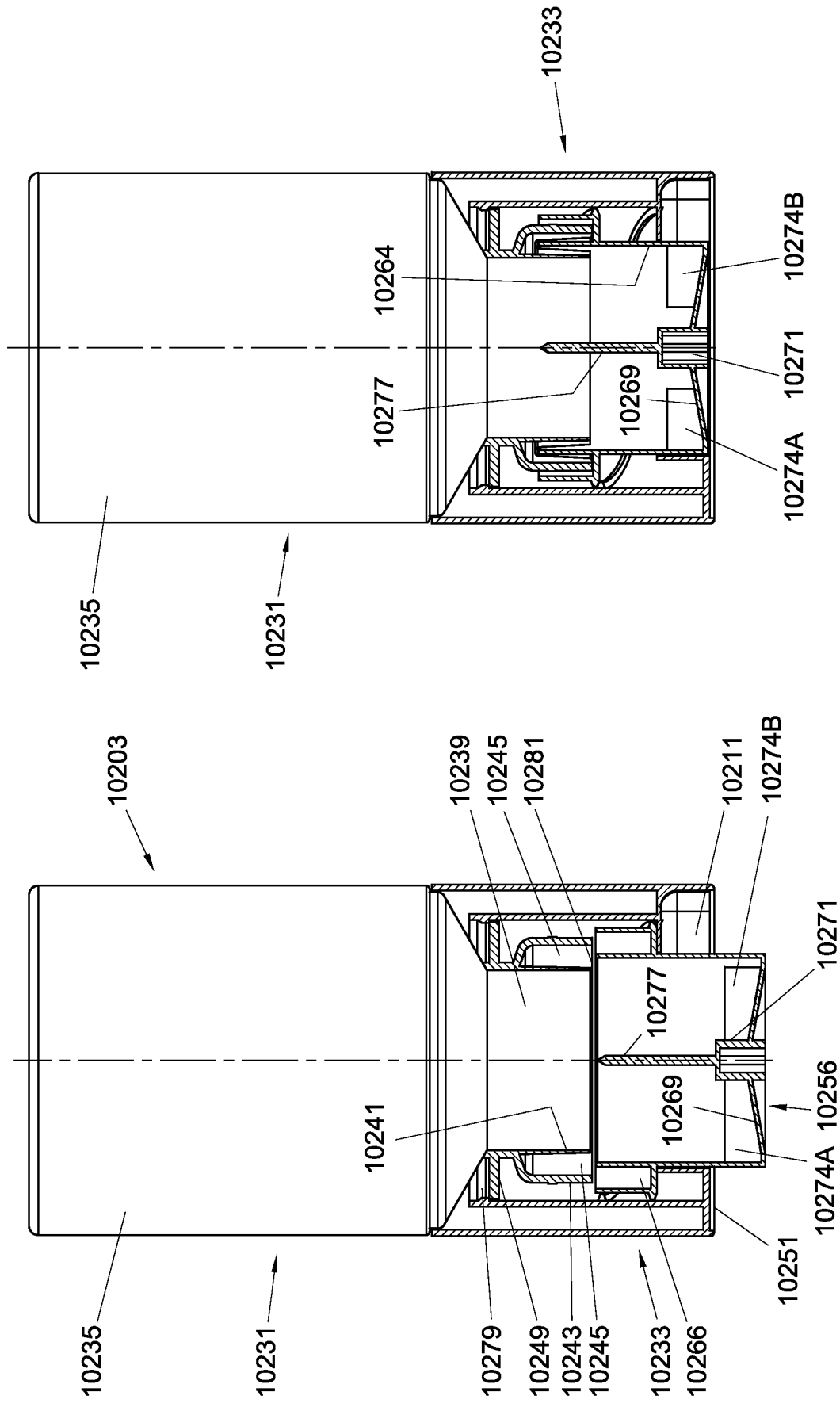


Fig. 14A

Fig. 14B

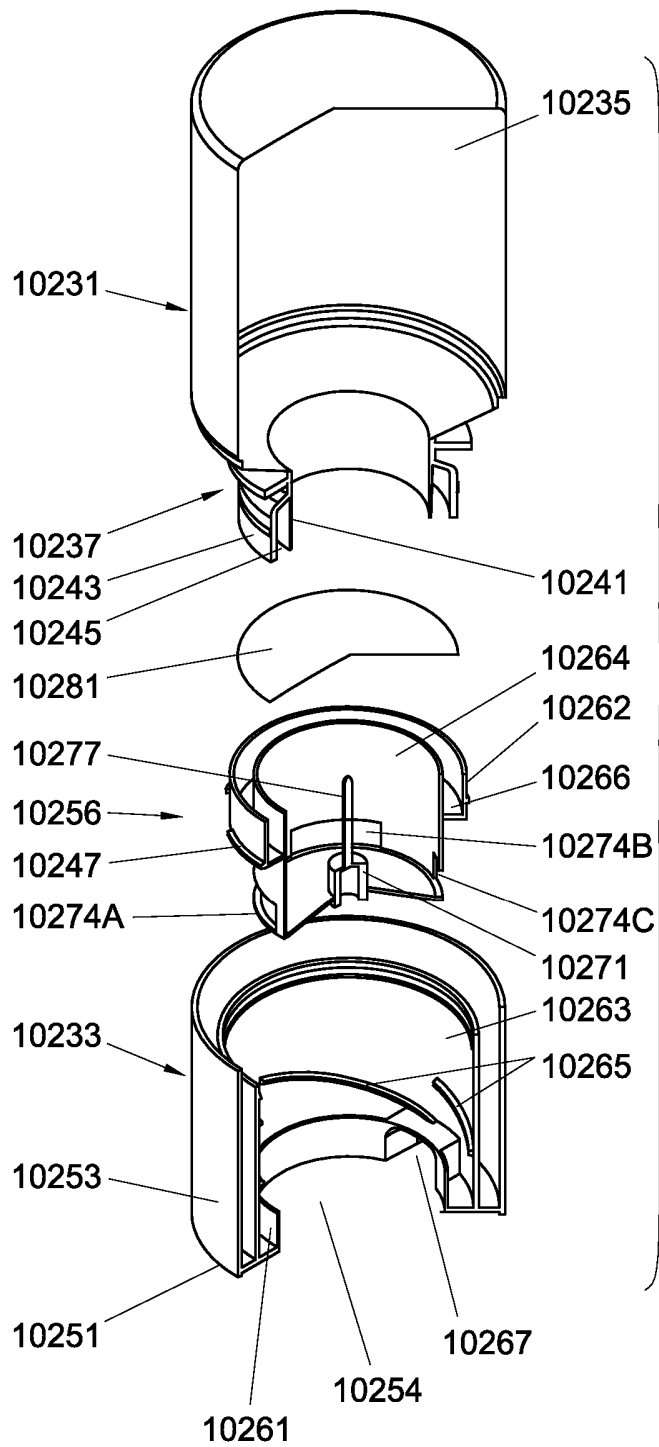


Fig. 14C

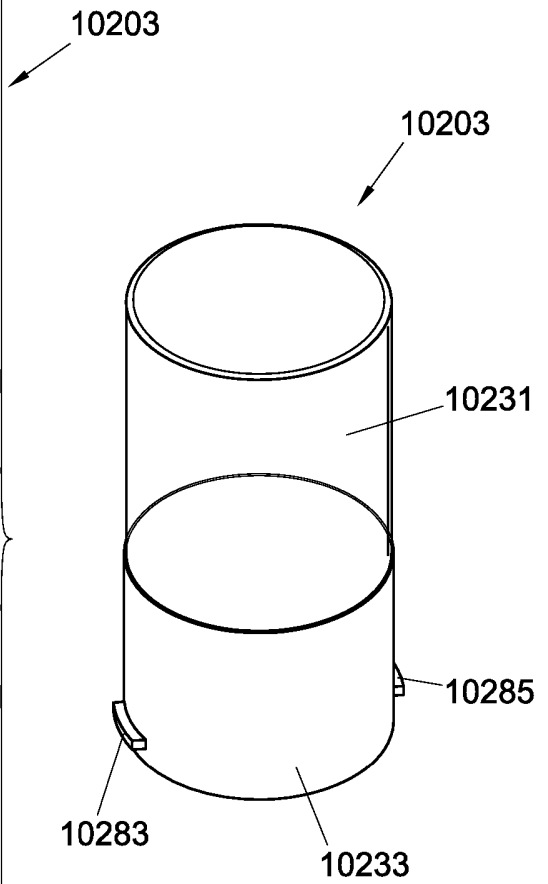


Fig. 14D

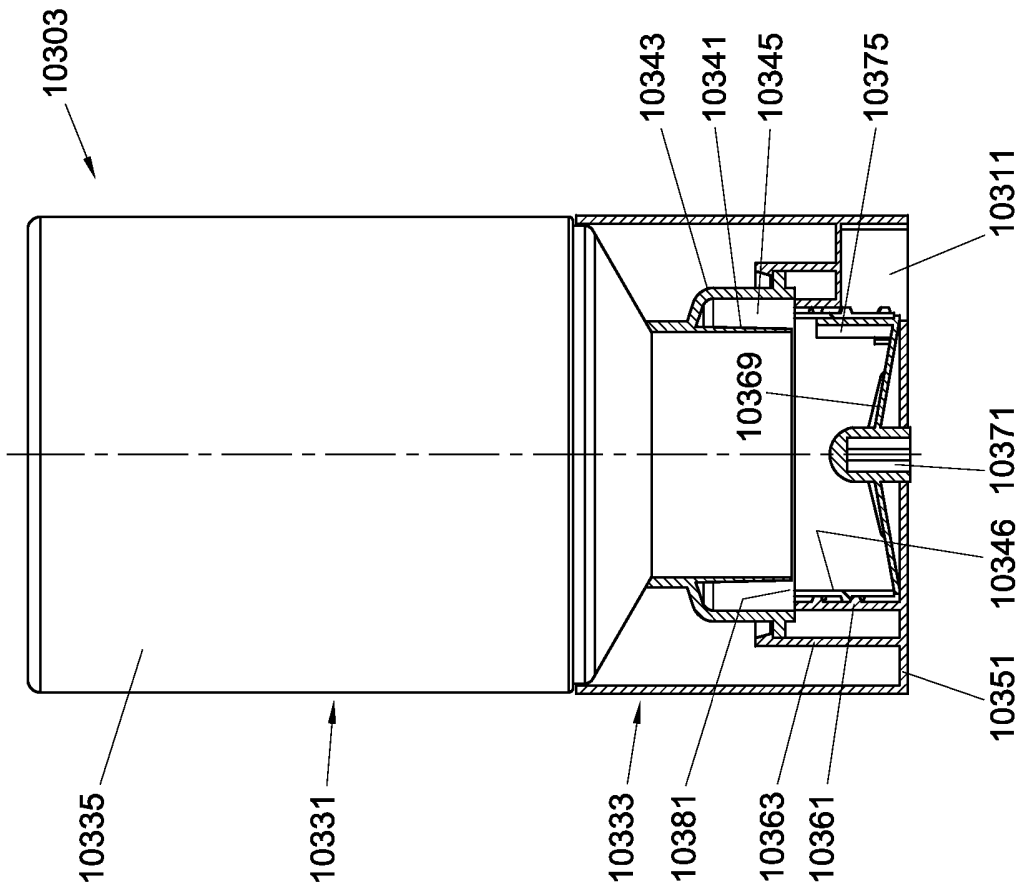


Fig. 15A

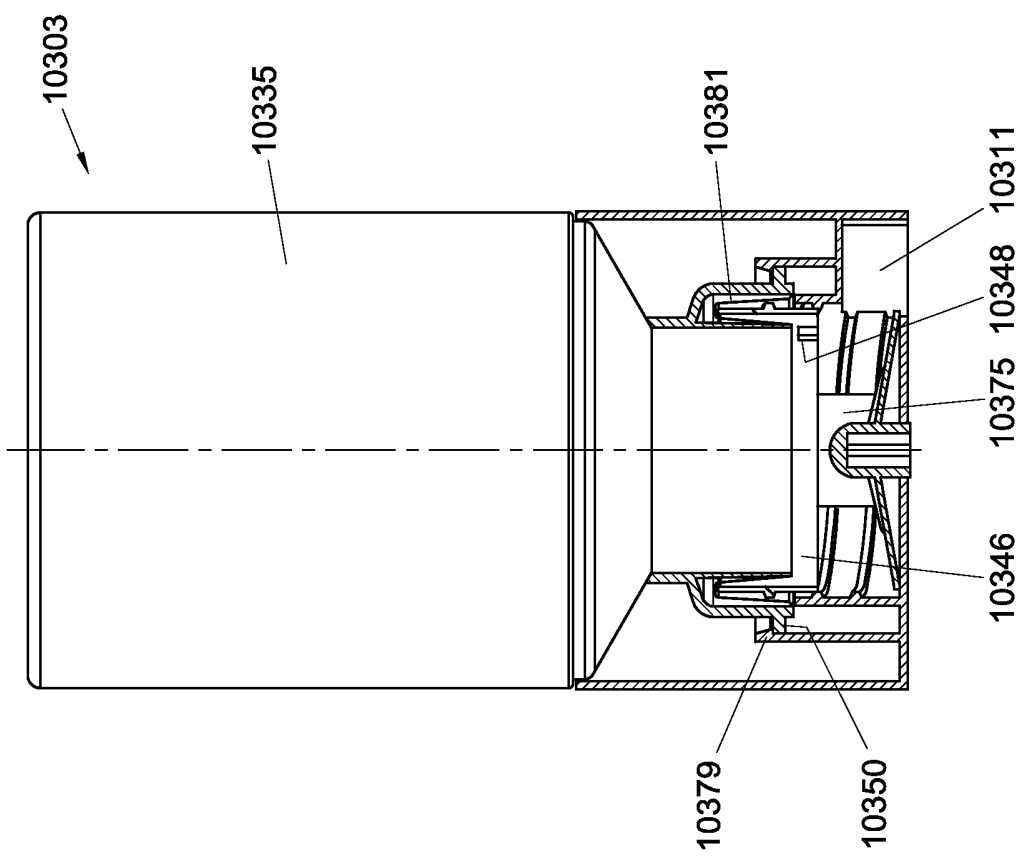


Fig. 15B

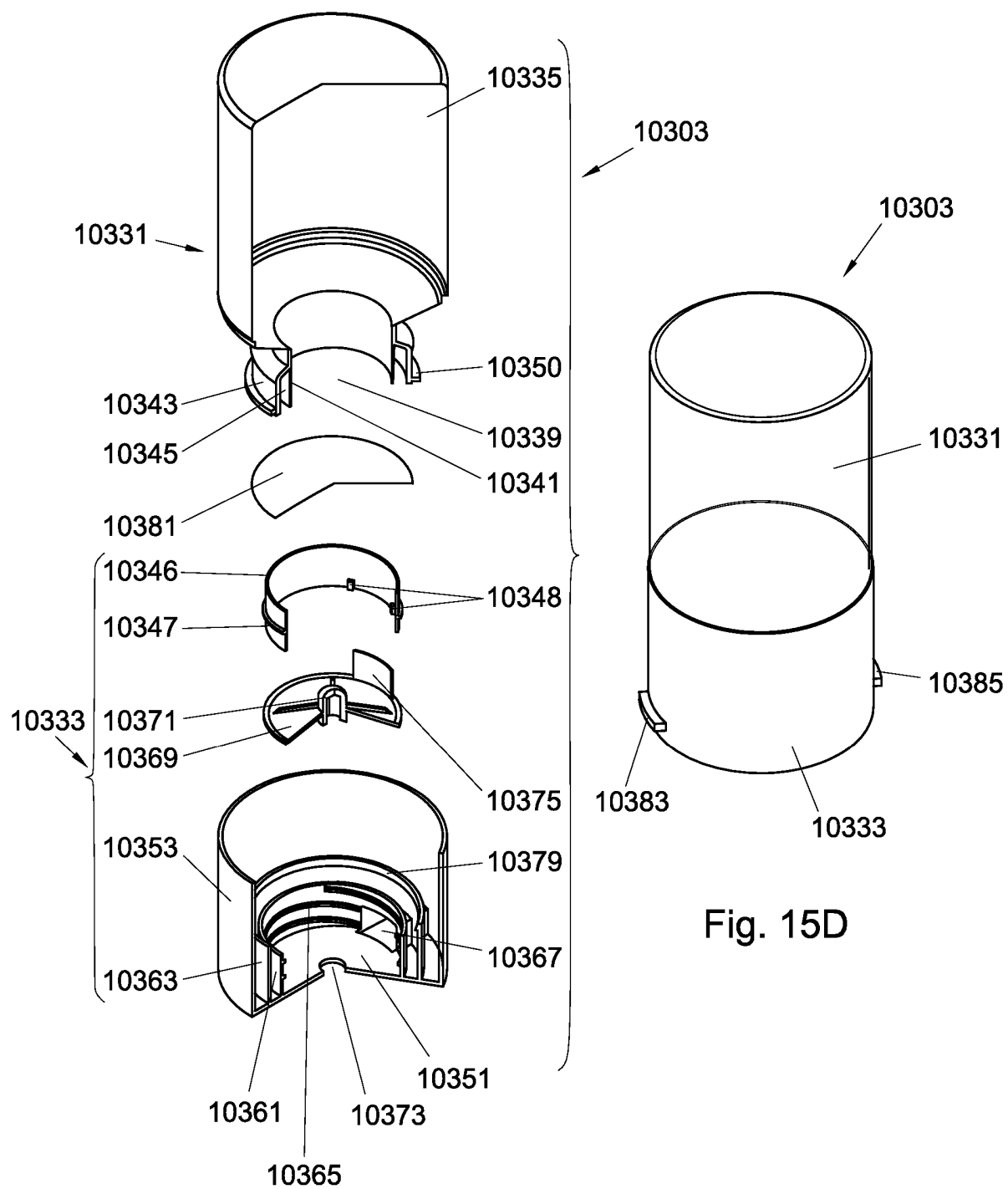


Fig. 15C

Fig. 15D

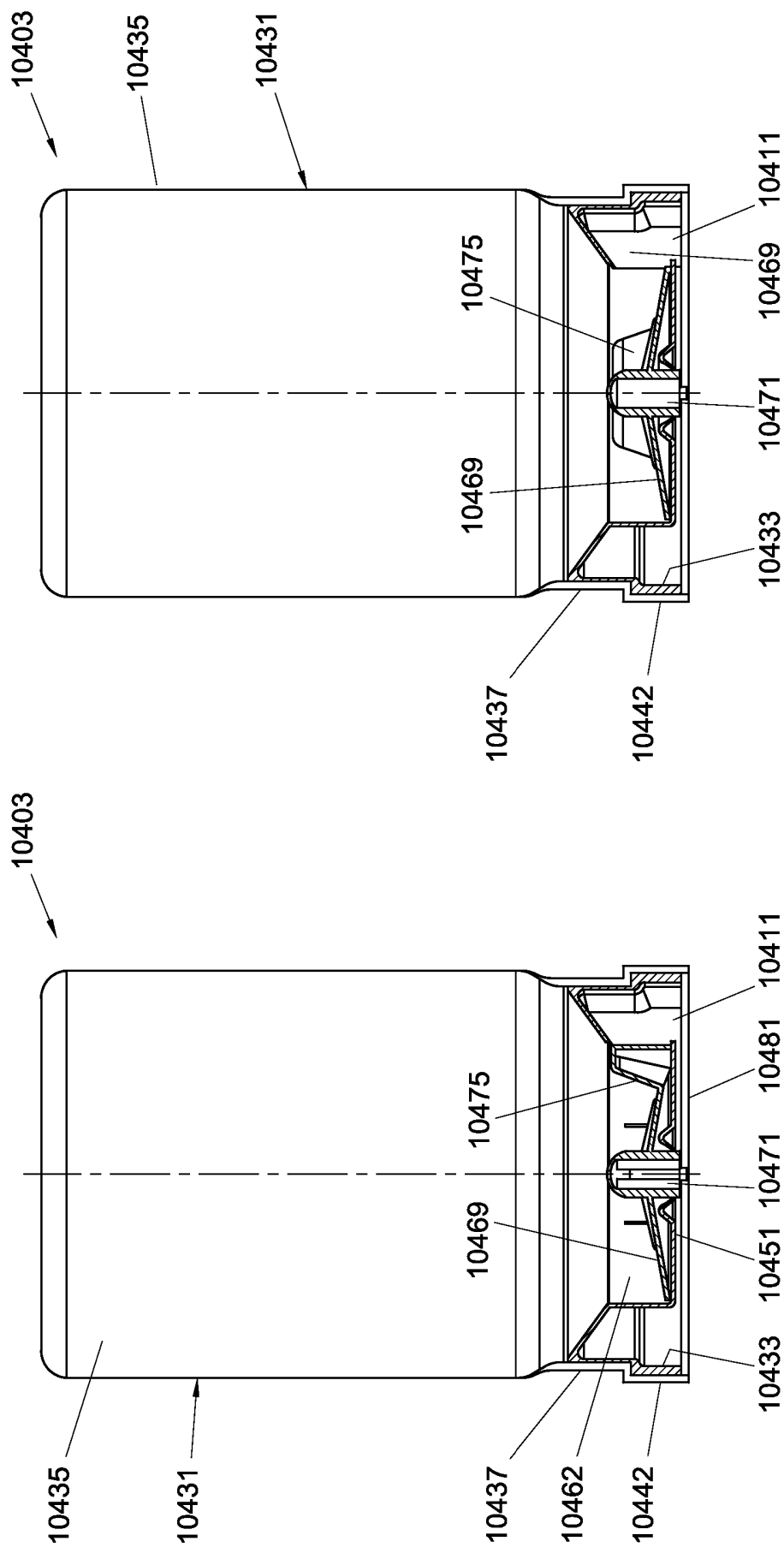


Fig. 16A

Fig. 16B

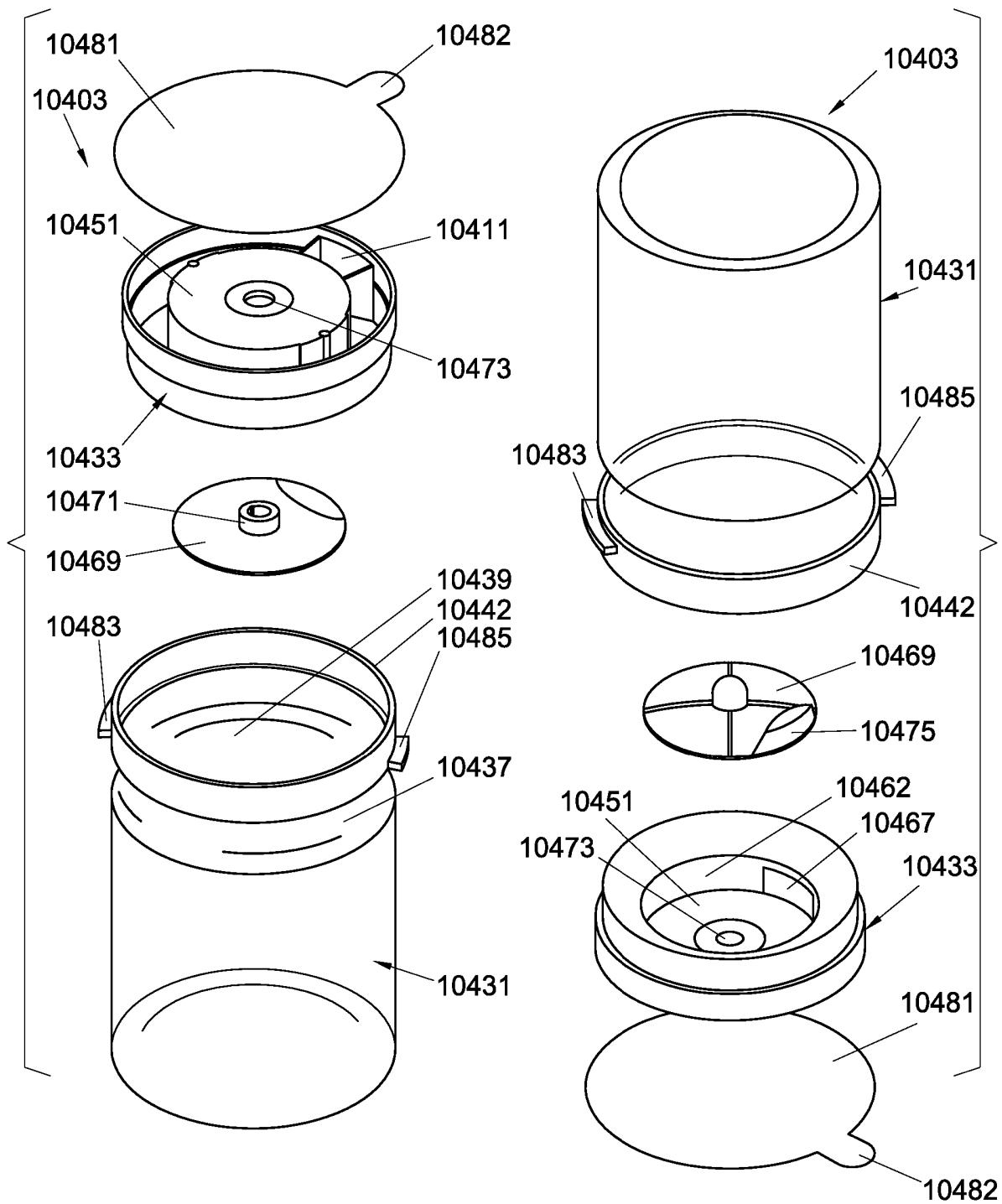


Fig. 16C

Fig. 16D

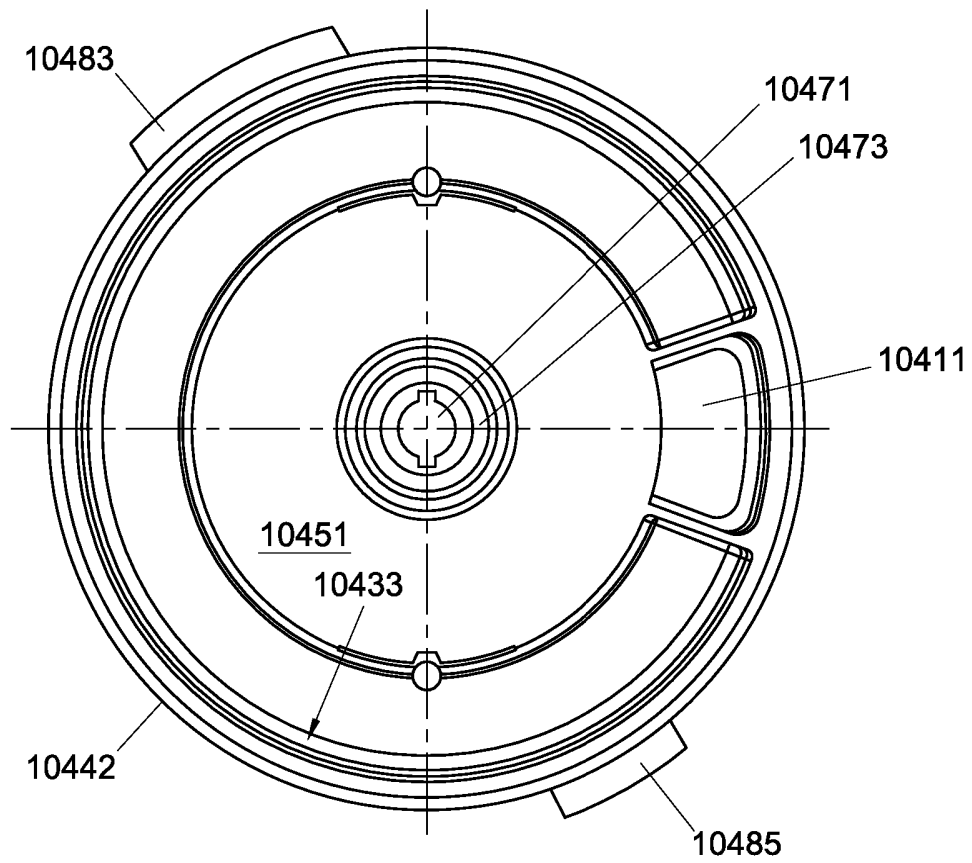


Fig. 16E

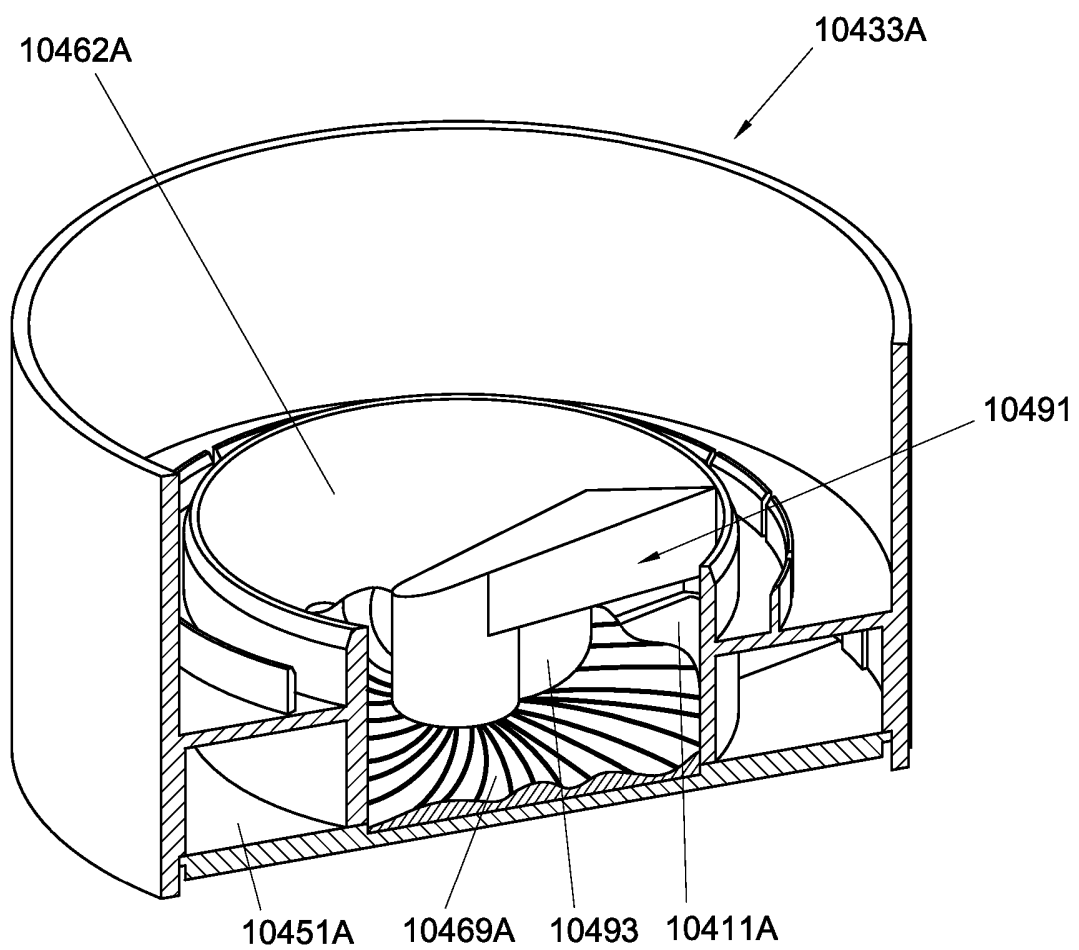


Fig. 16F

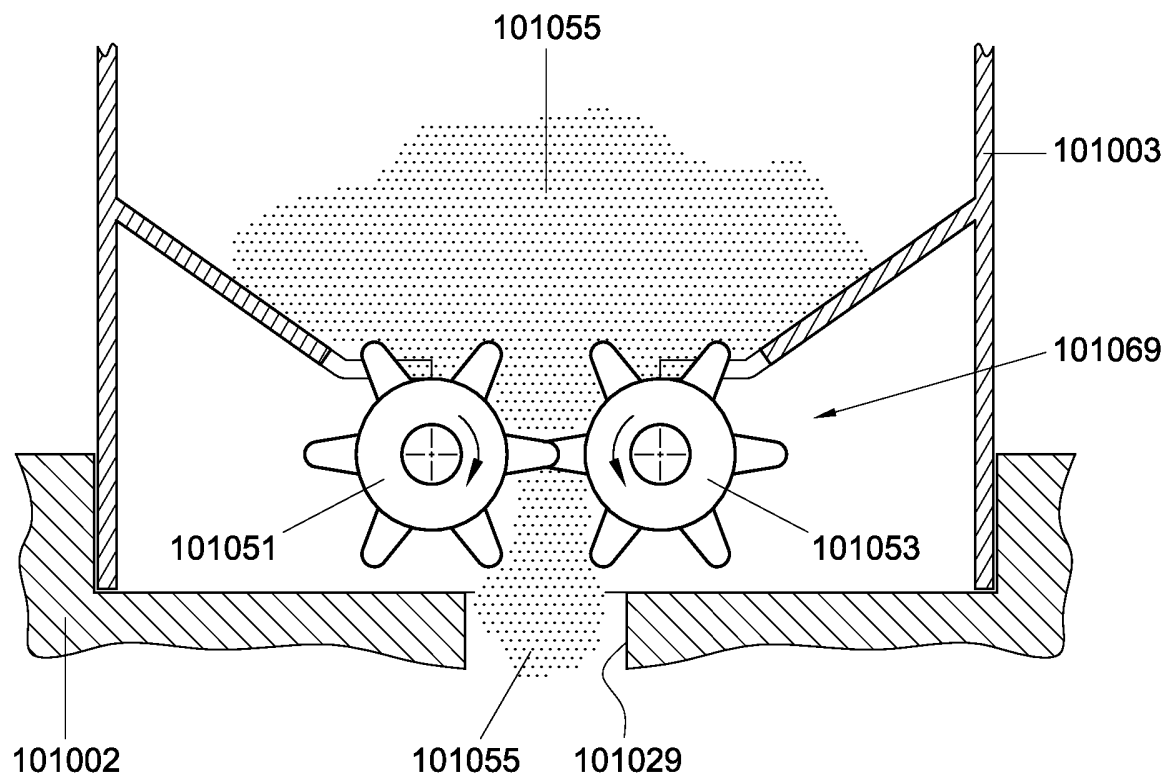


Fig. 17

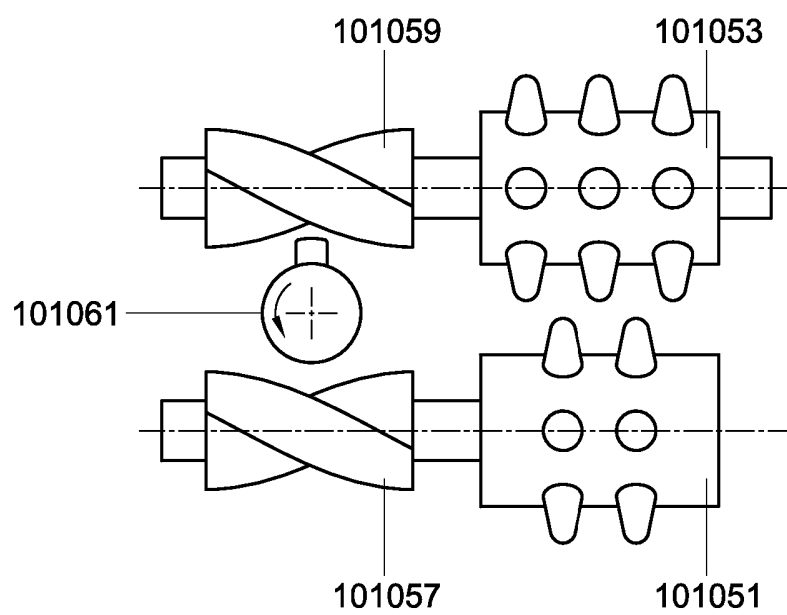


Fig. 18

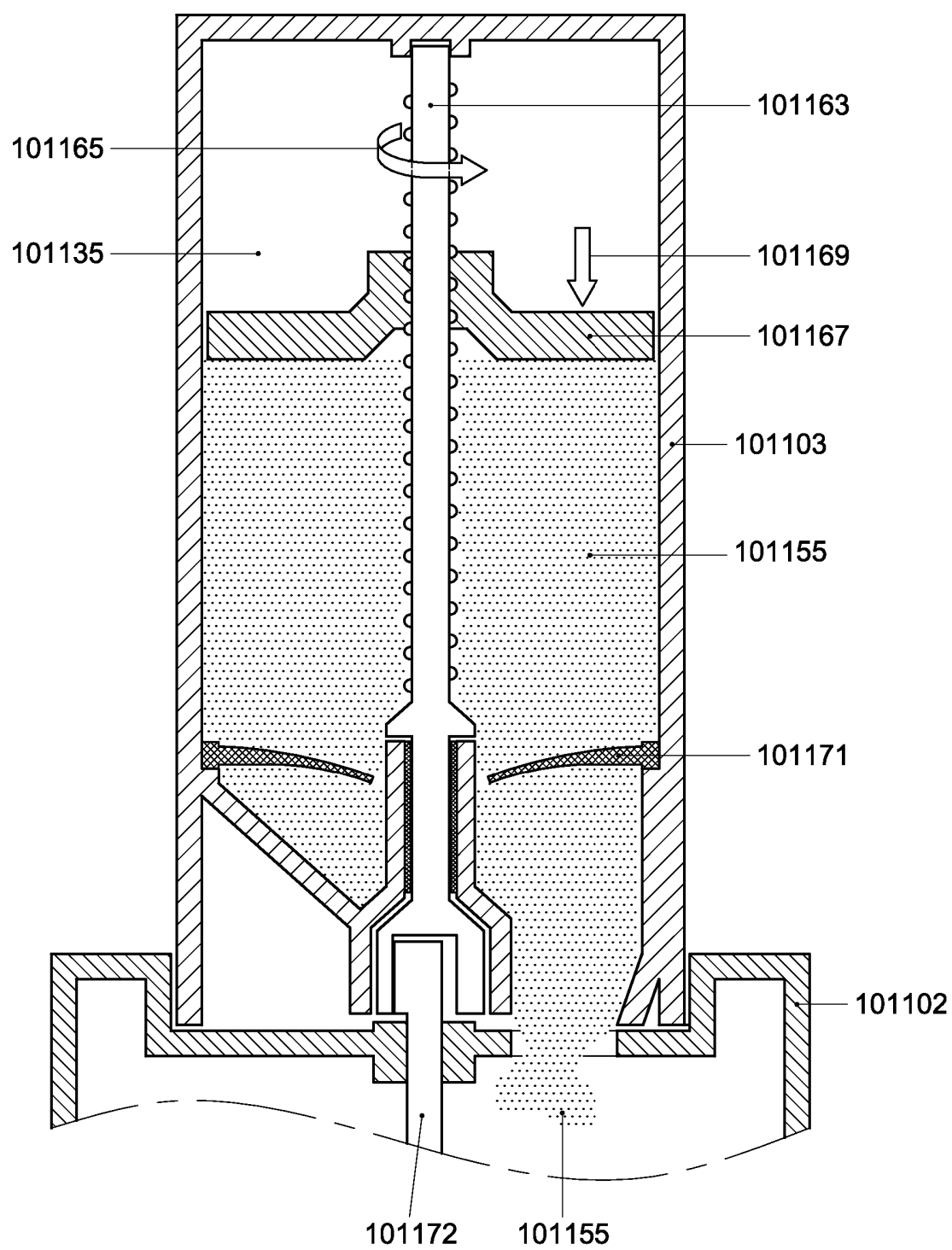


Fig. 19

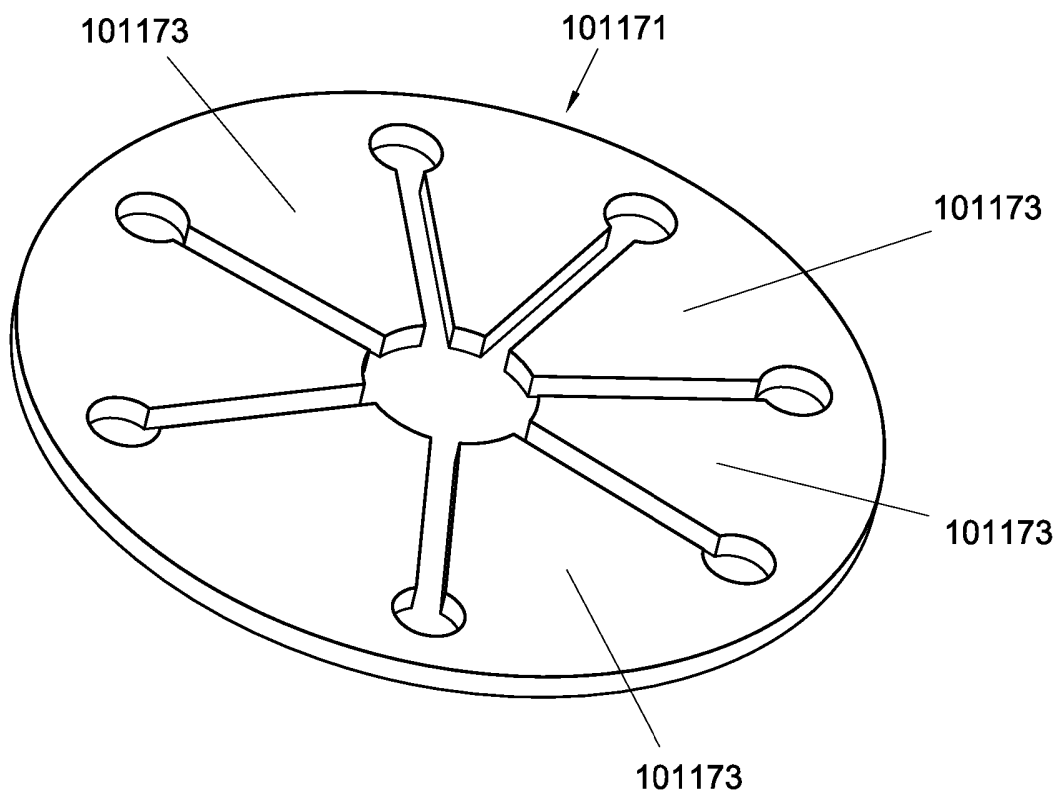


Fig. 20

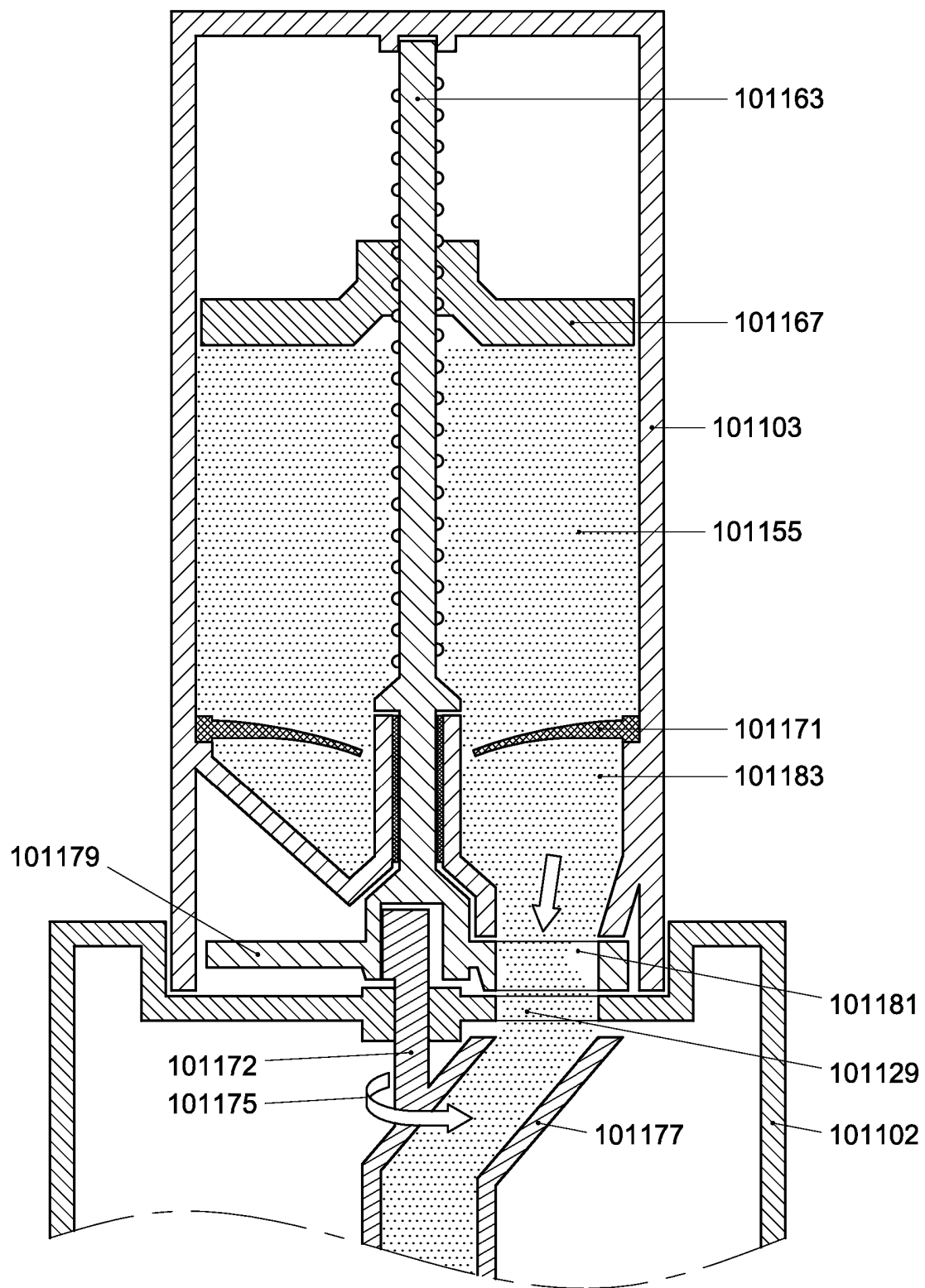


Fig. 21

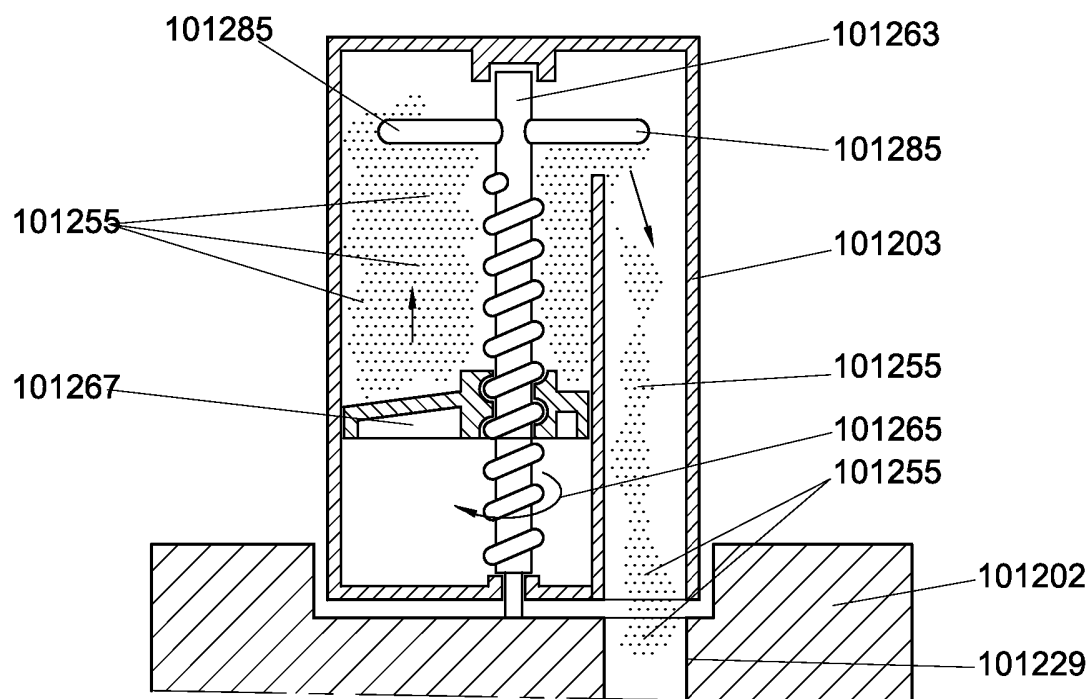


Fig. 22A

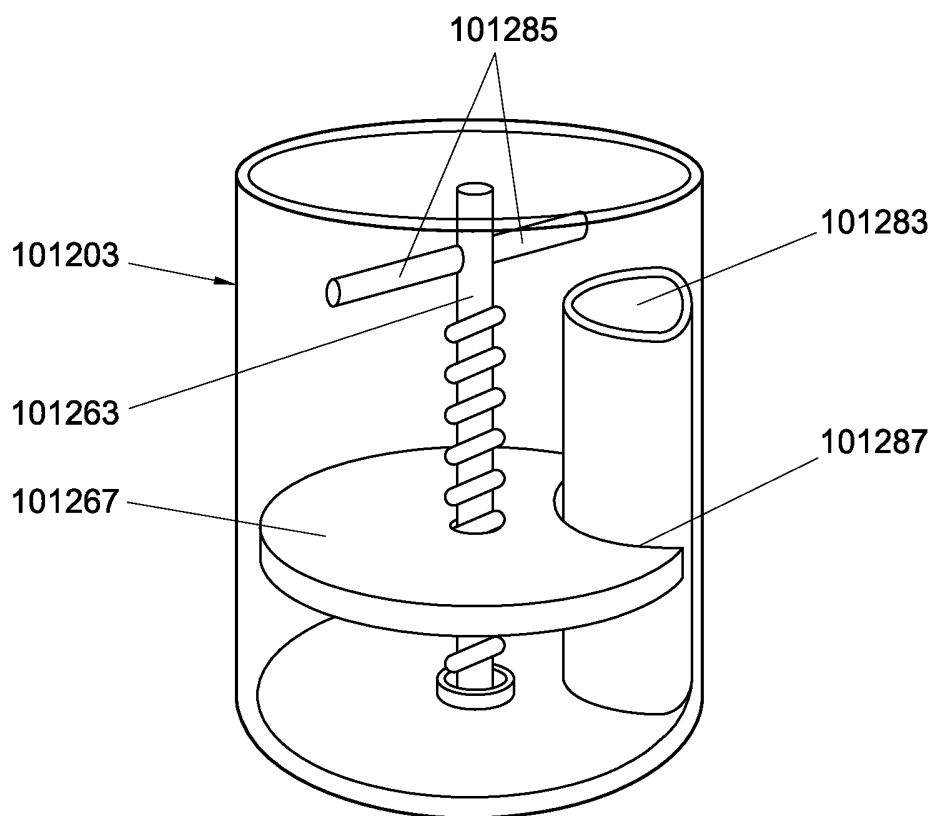


Fig. 22B

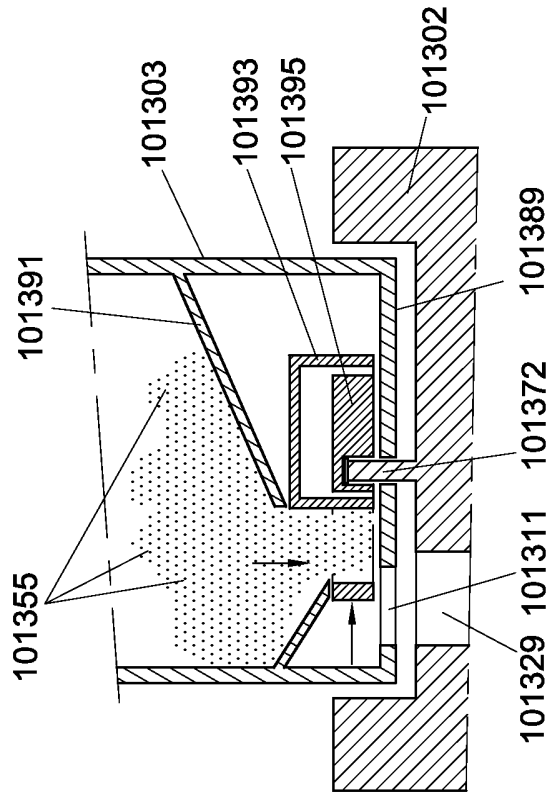


Fig. 23A

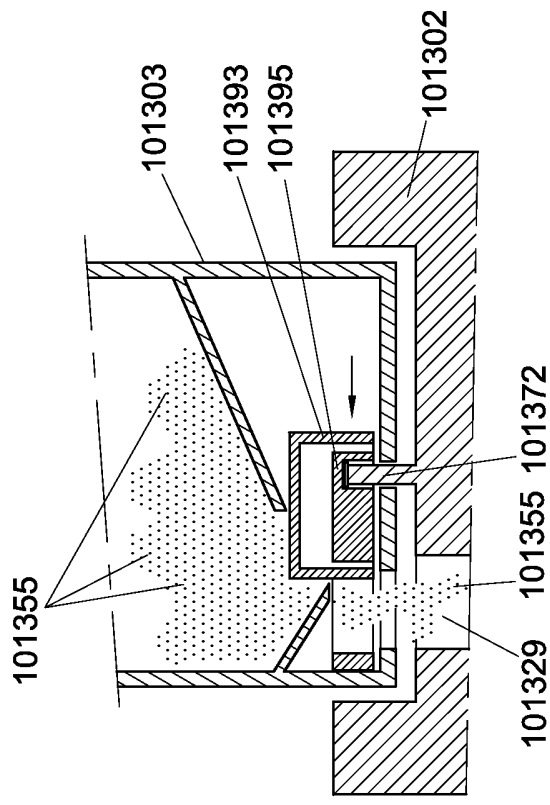


Fig. 23C

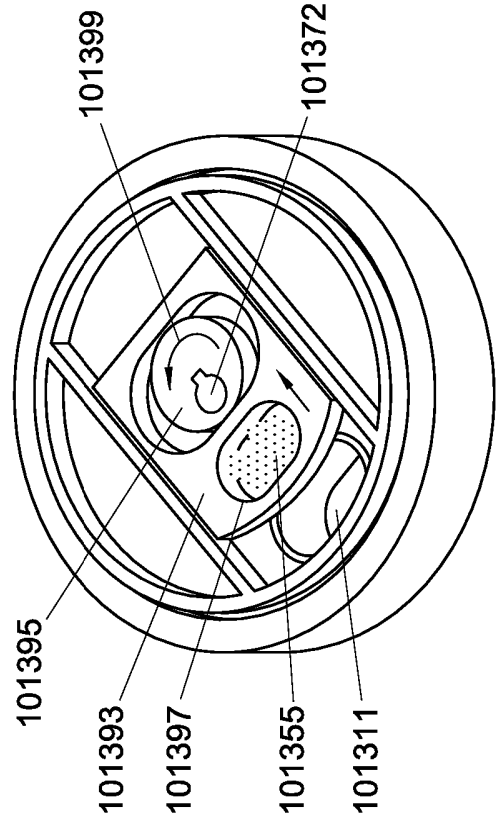


Fig. 23B

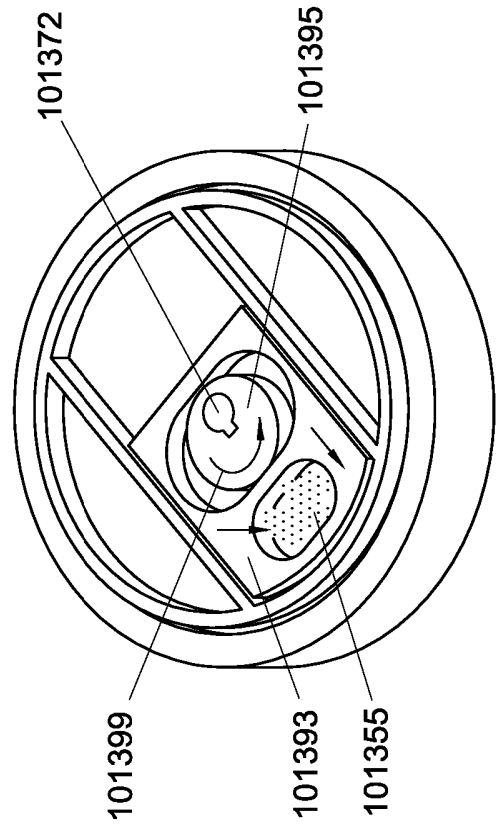


Fig. 23D

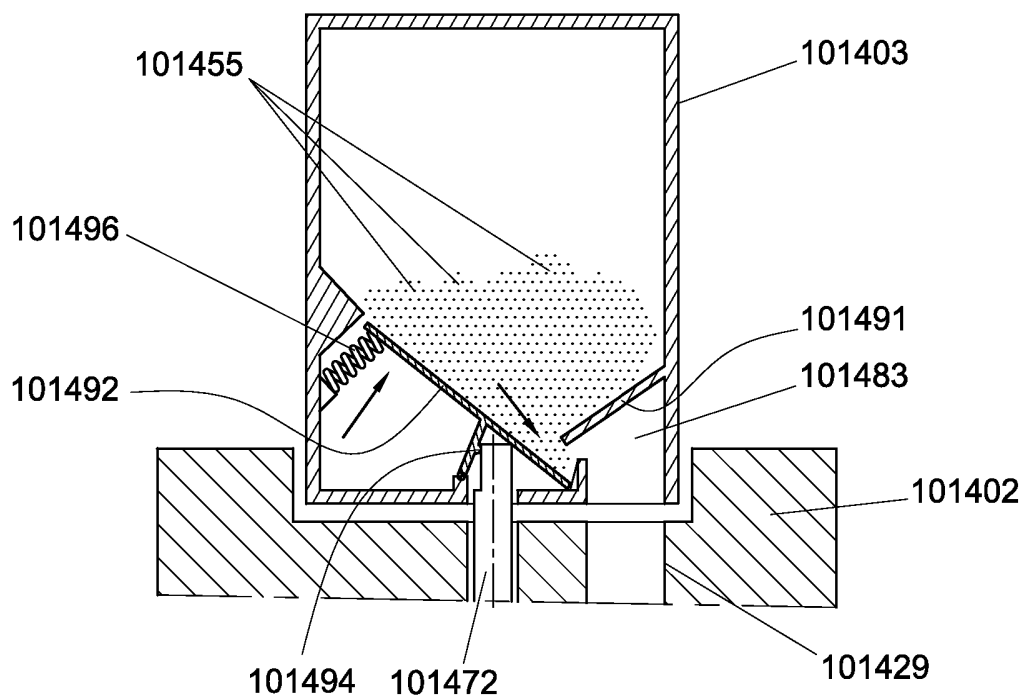


Fig. 24A

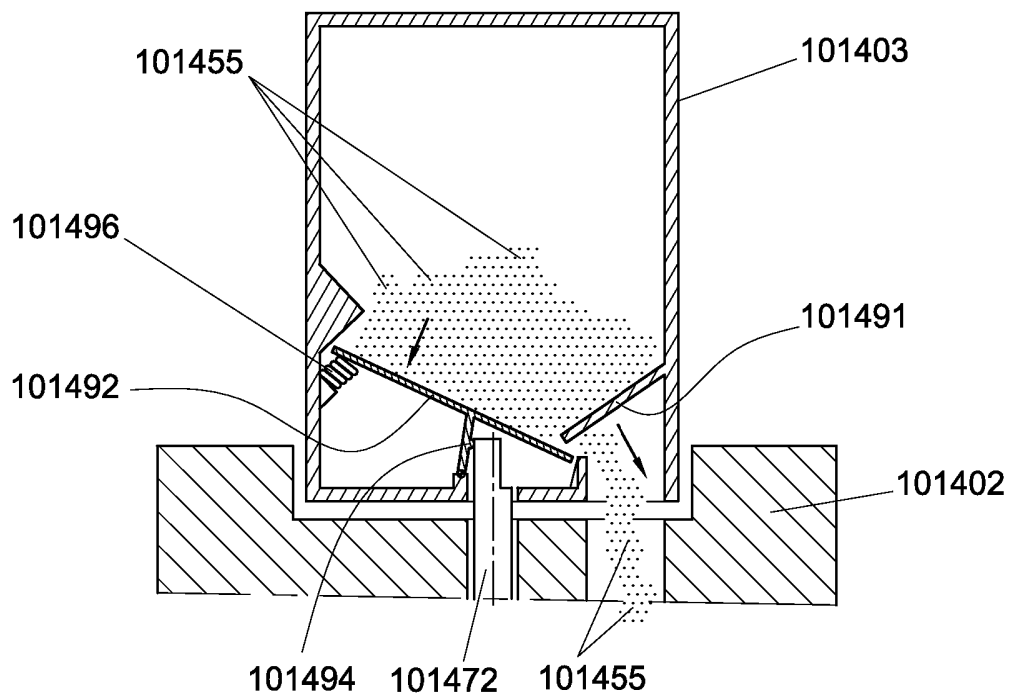


Fig. 24B

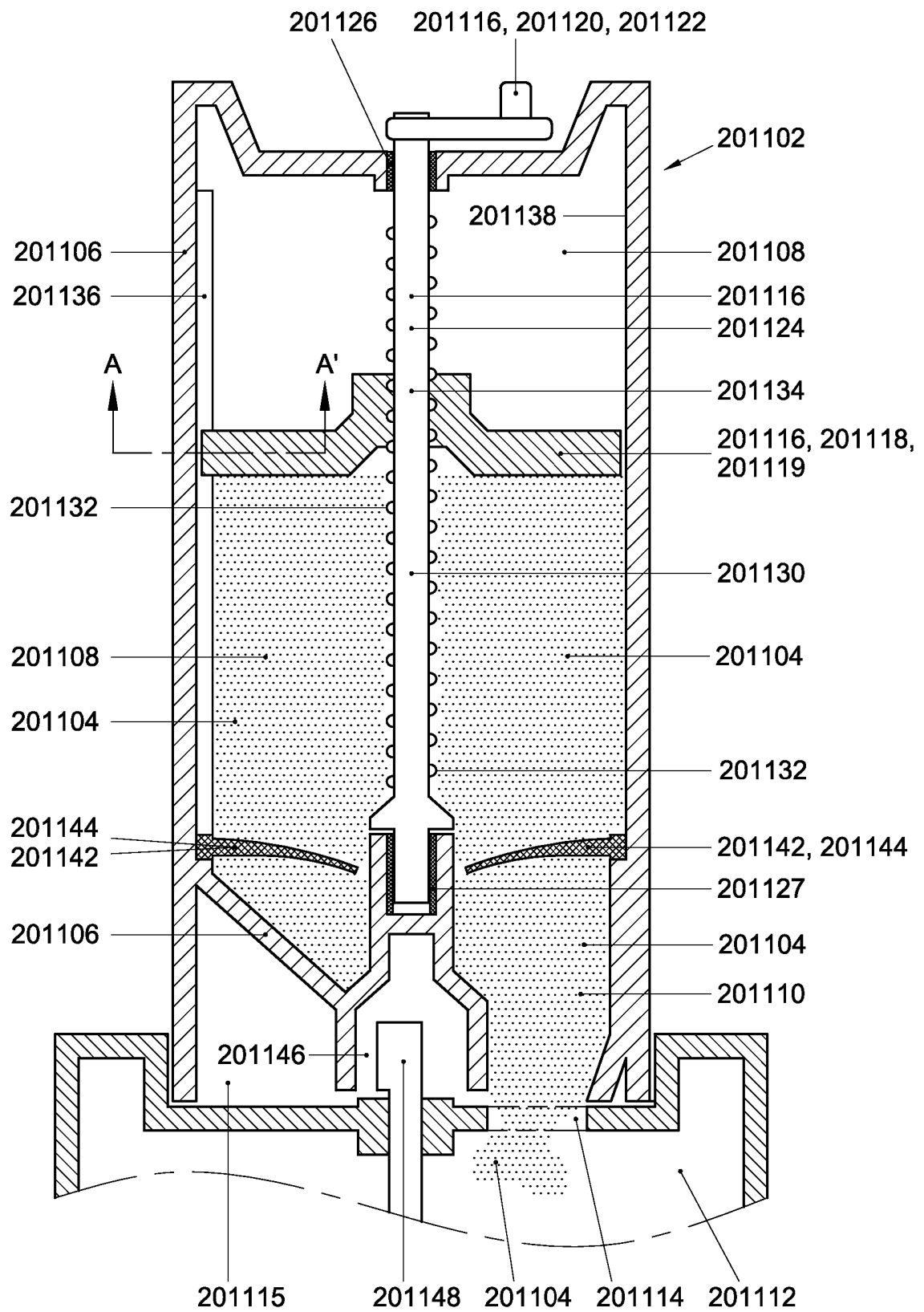


Fig. 25A

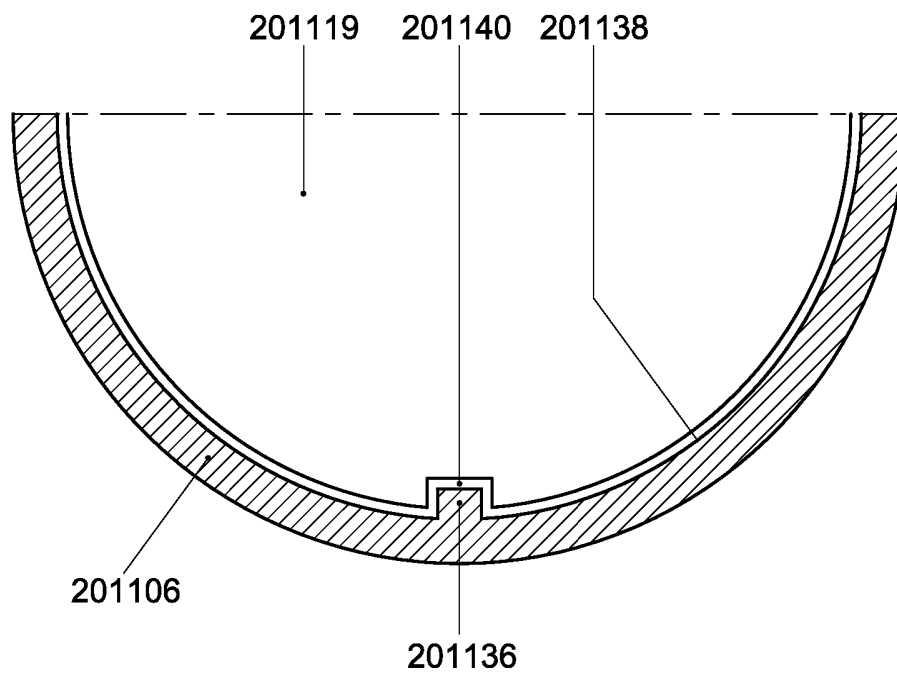


Fig. 25B

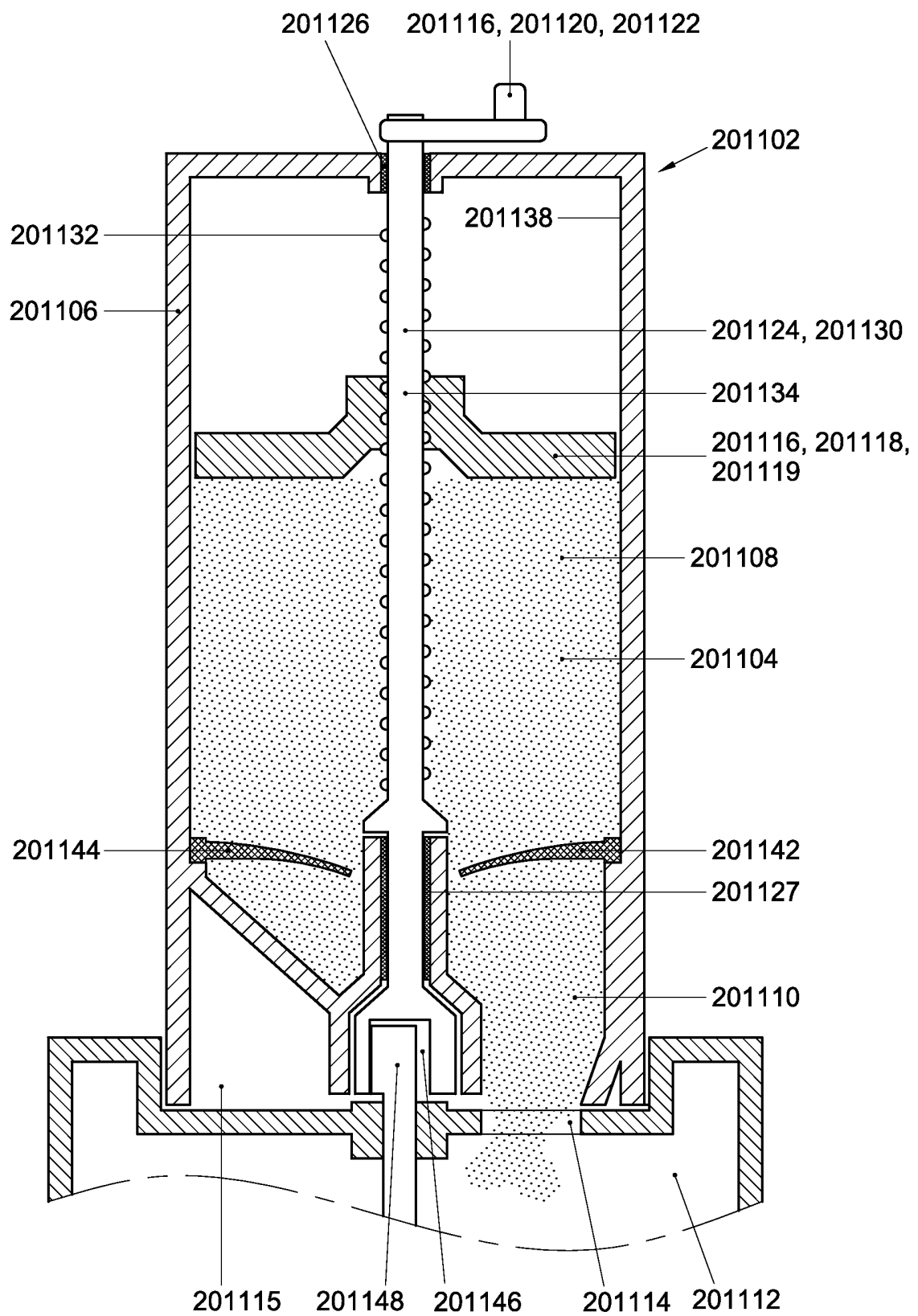


Fig. 25C

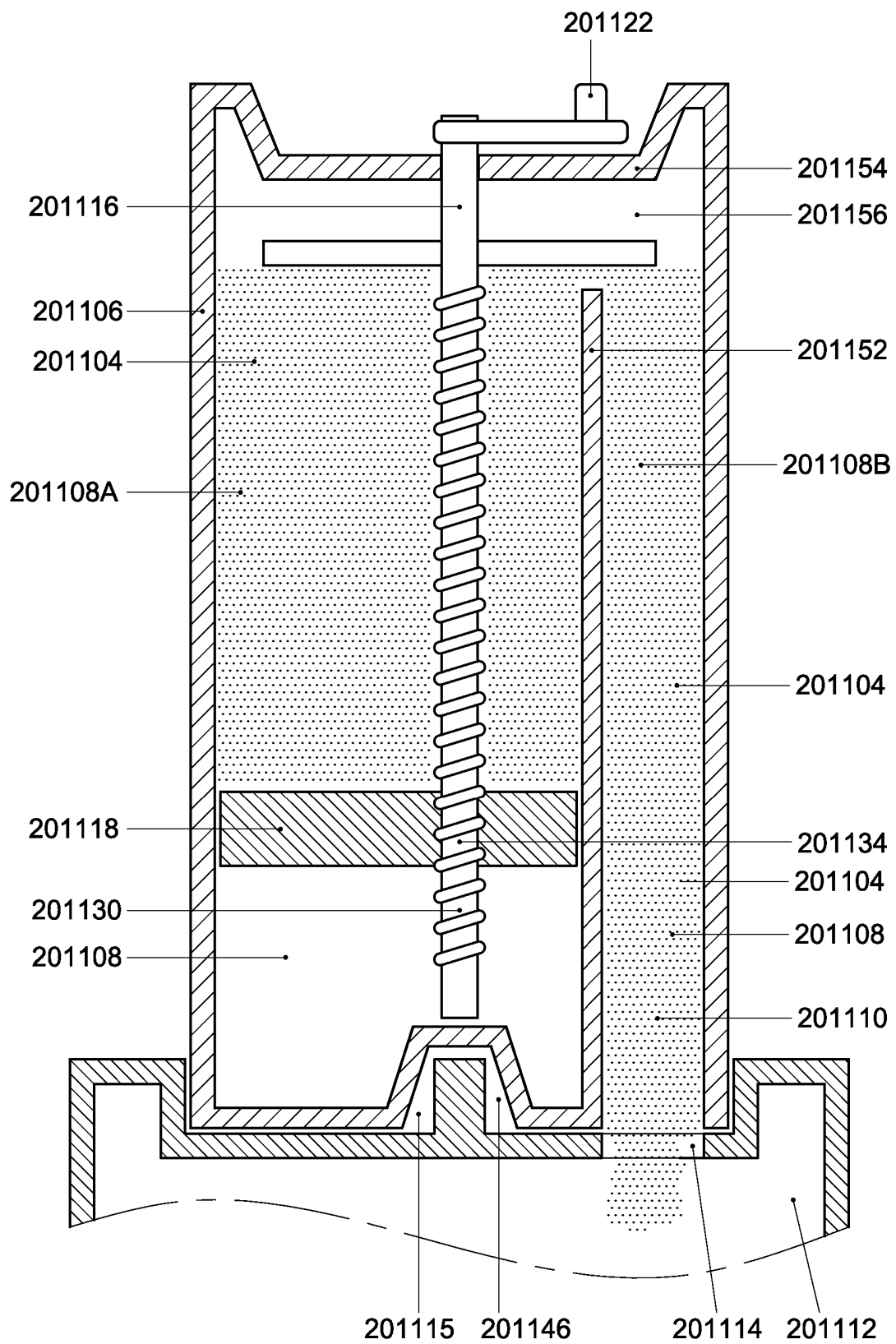


Fig. 26

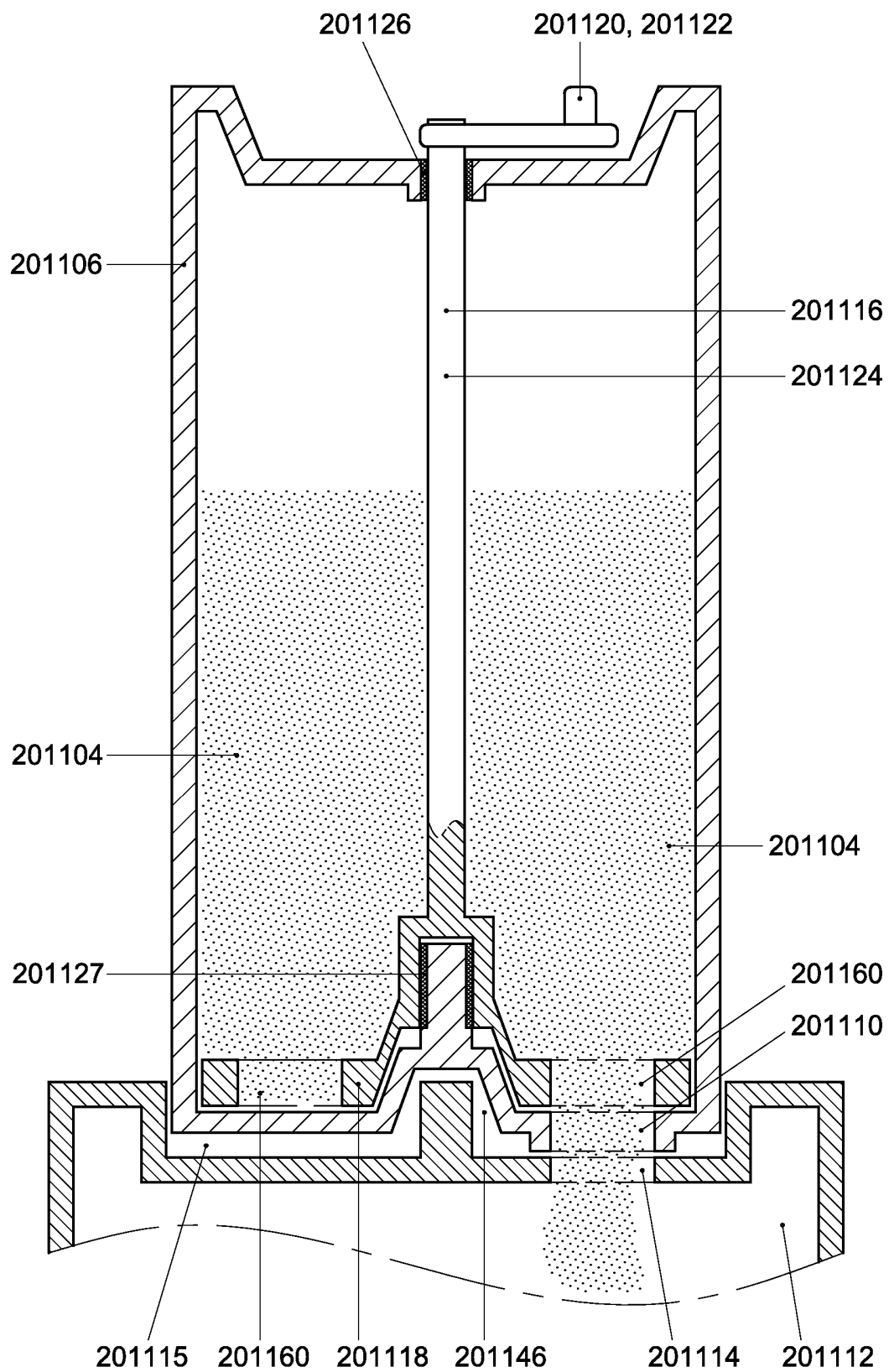


Fig. 27

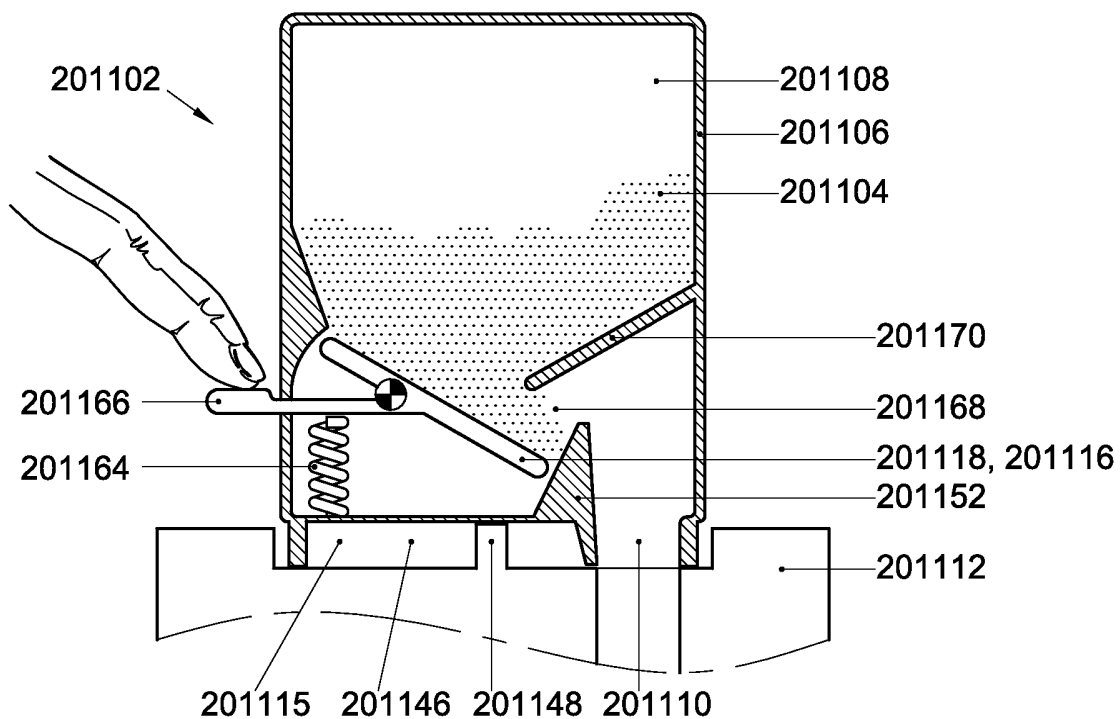


Fig. 28A

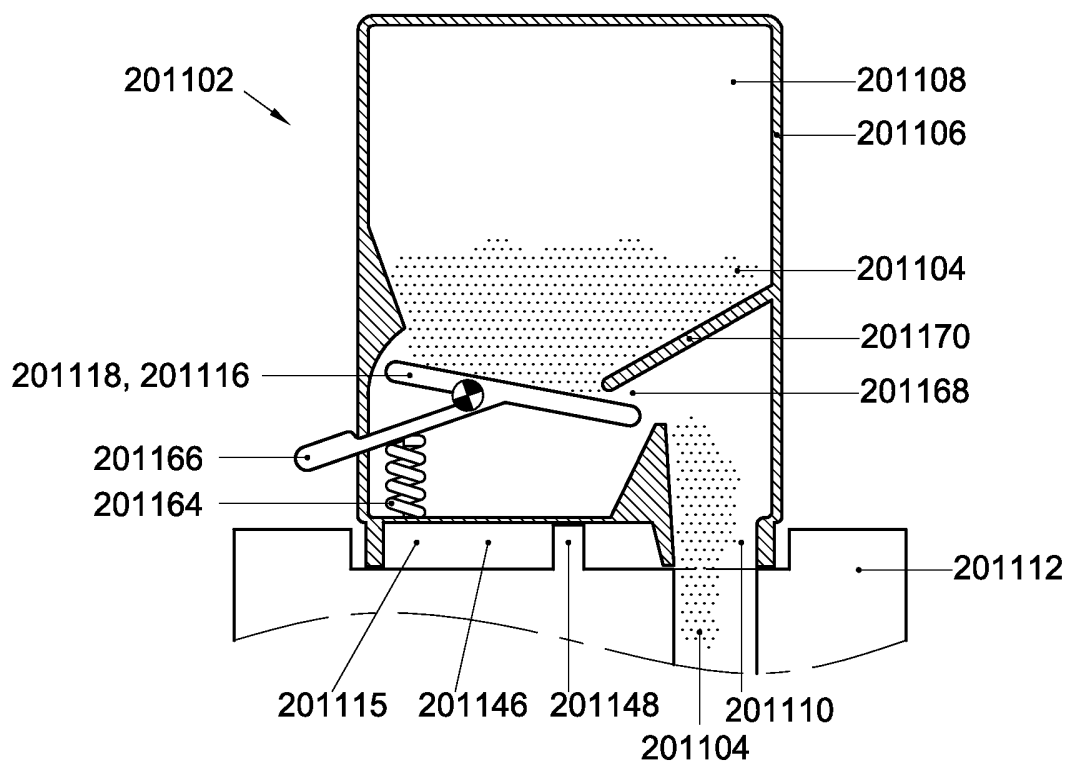


Fig. 28B

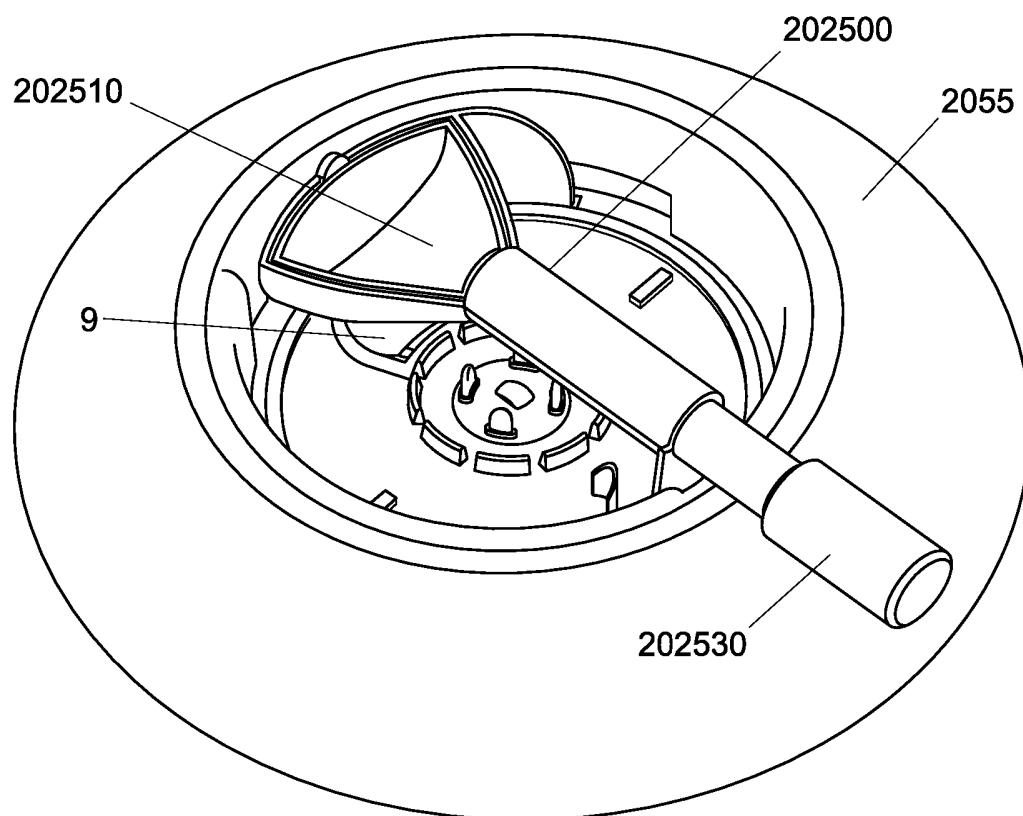


Fig. 29A

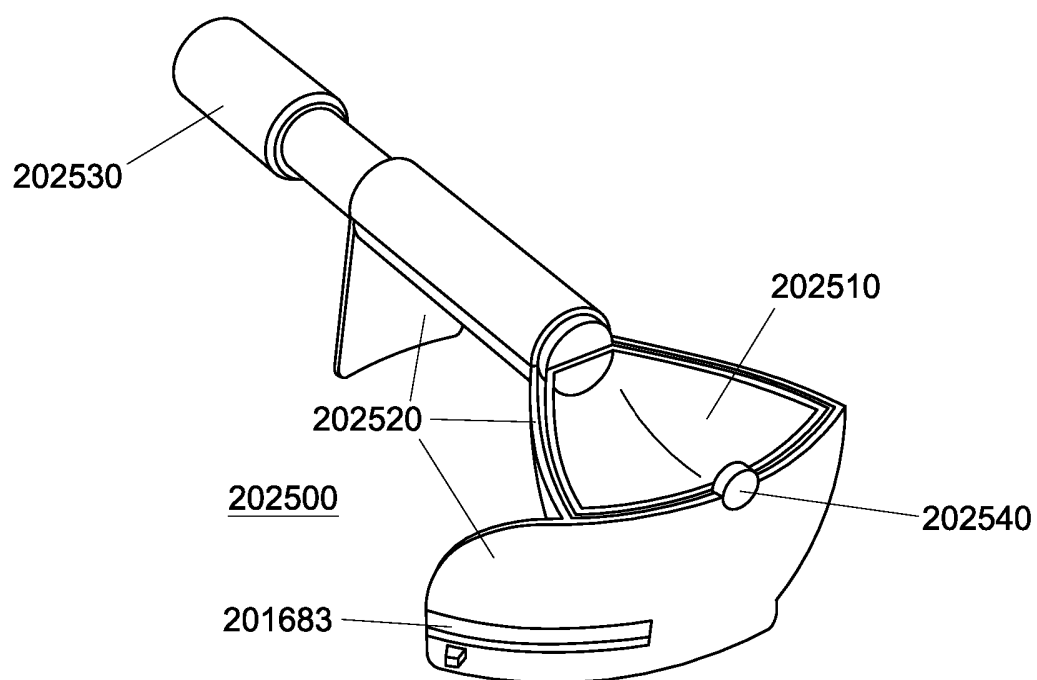


Fig. 29B

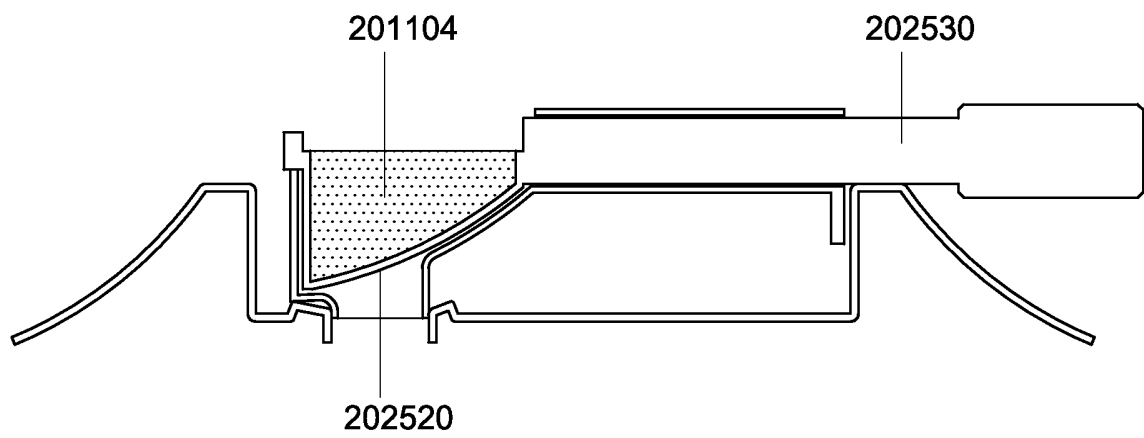


Fig. 29C

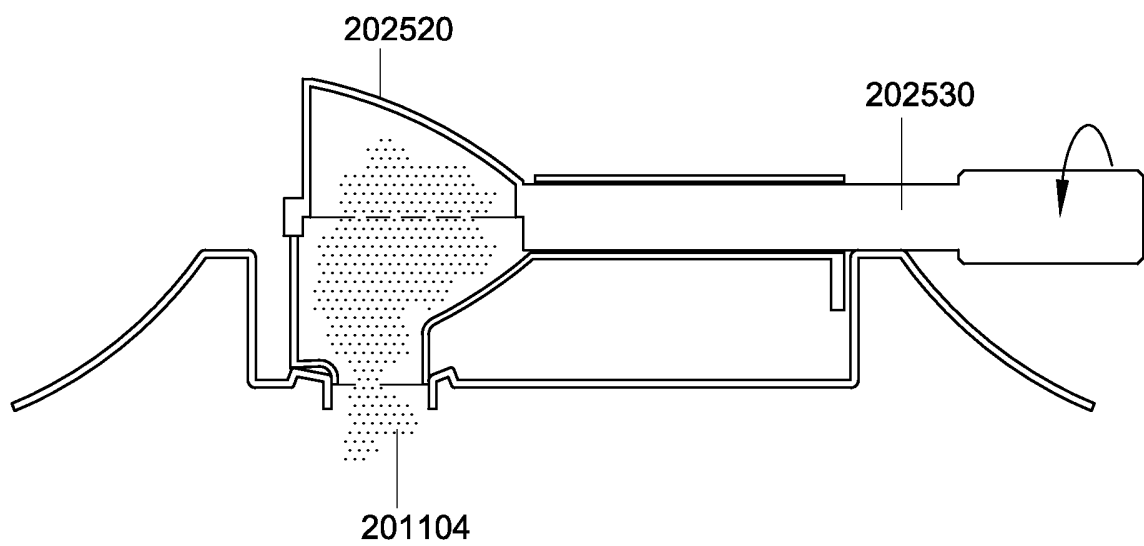


Fig. 29D

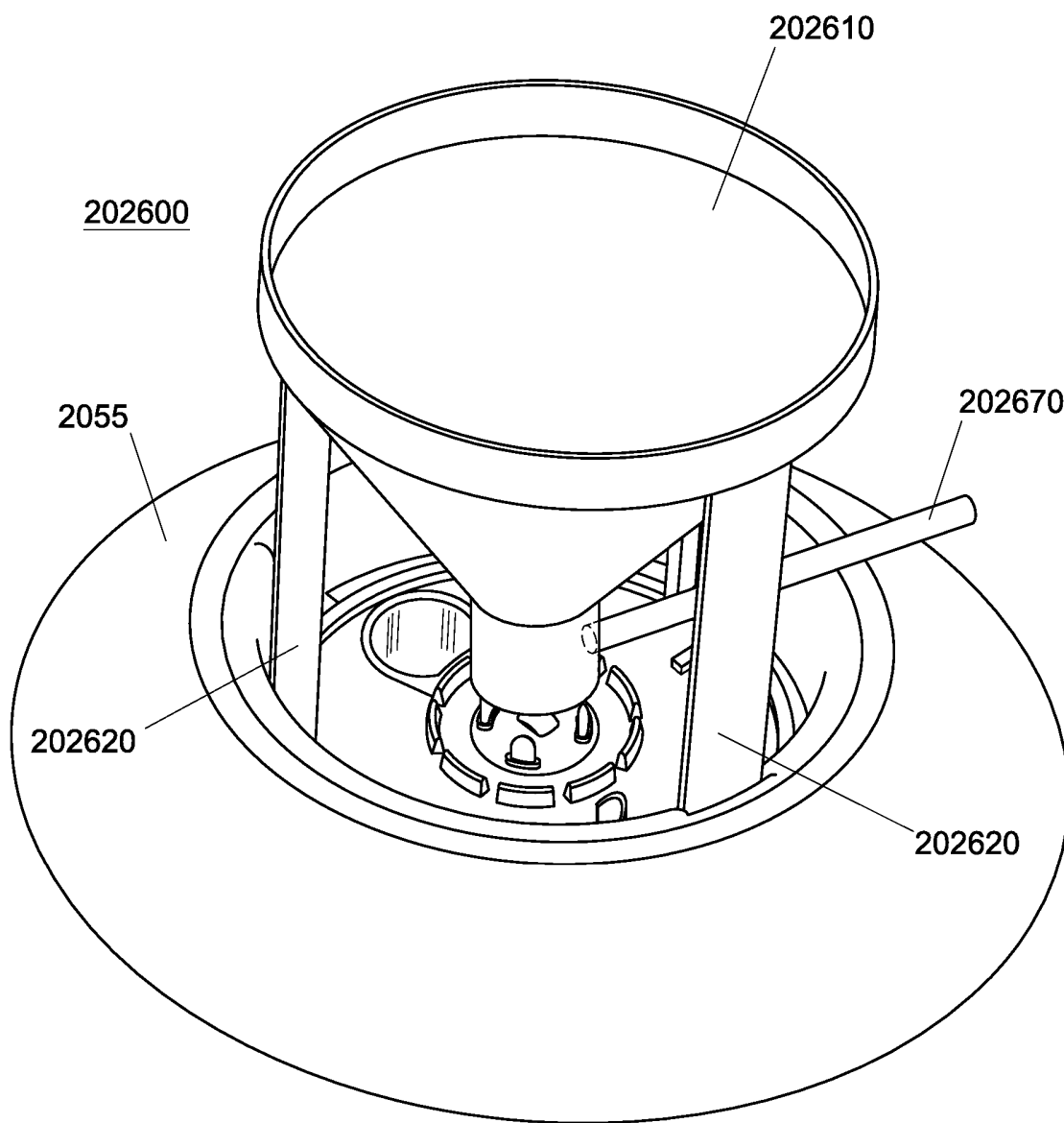


Fig. 30A

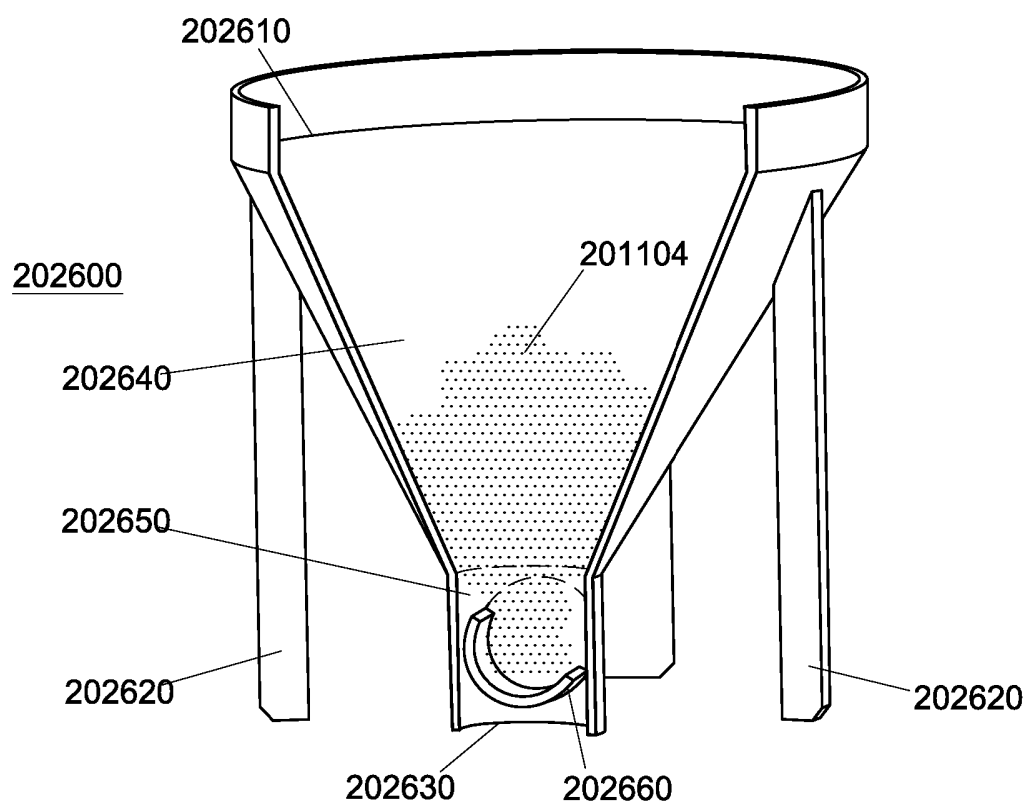


Fig. 30B

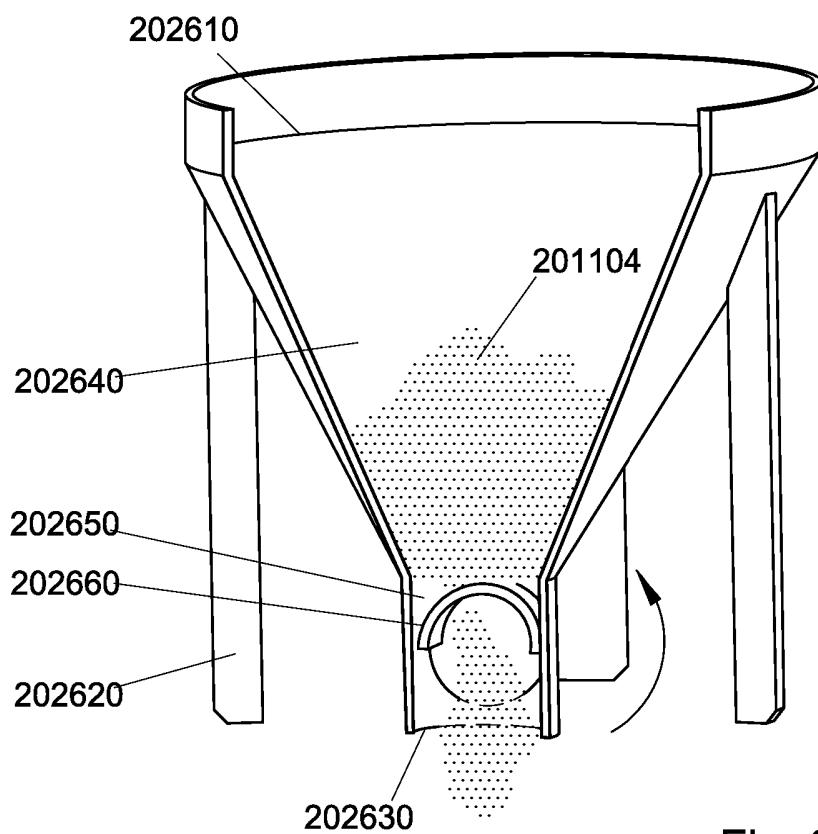


Fig. 30C

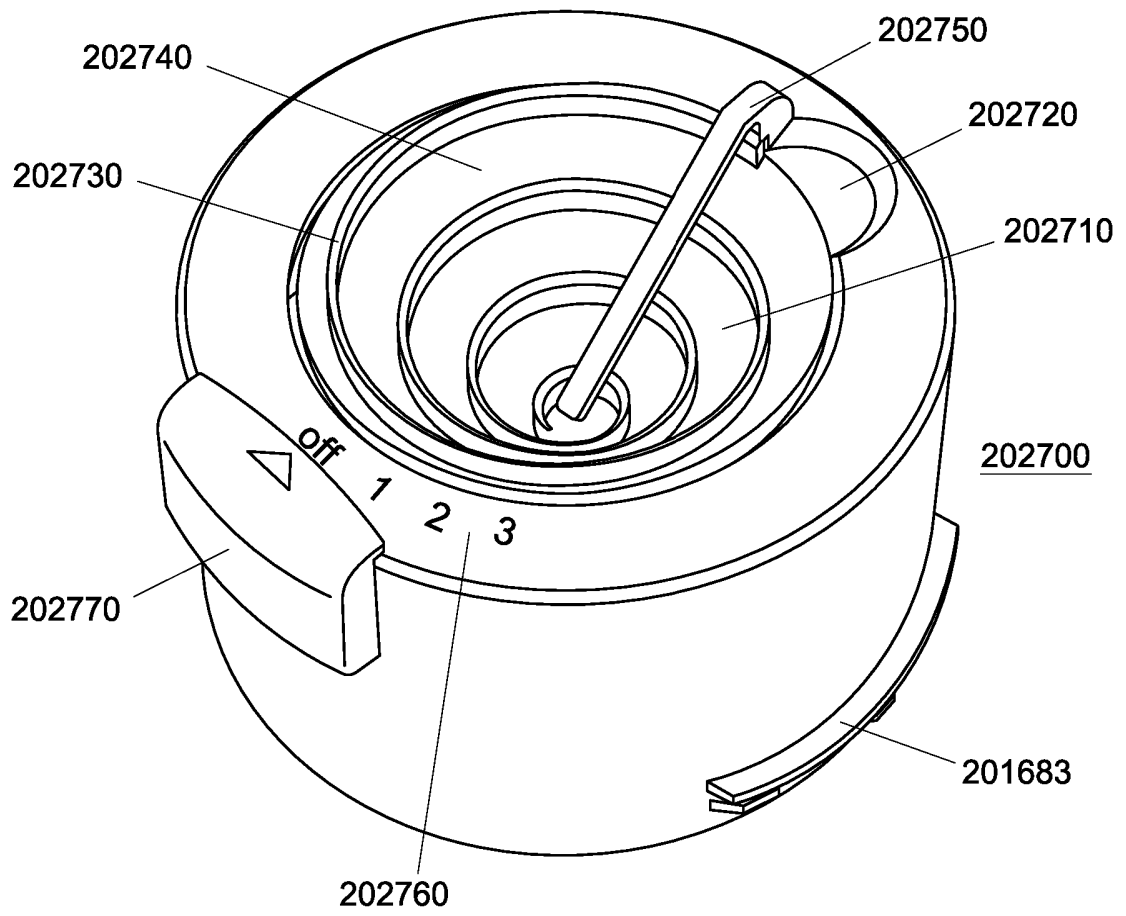


Fig. 31A

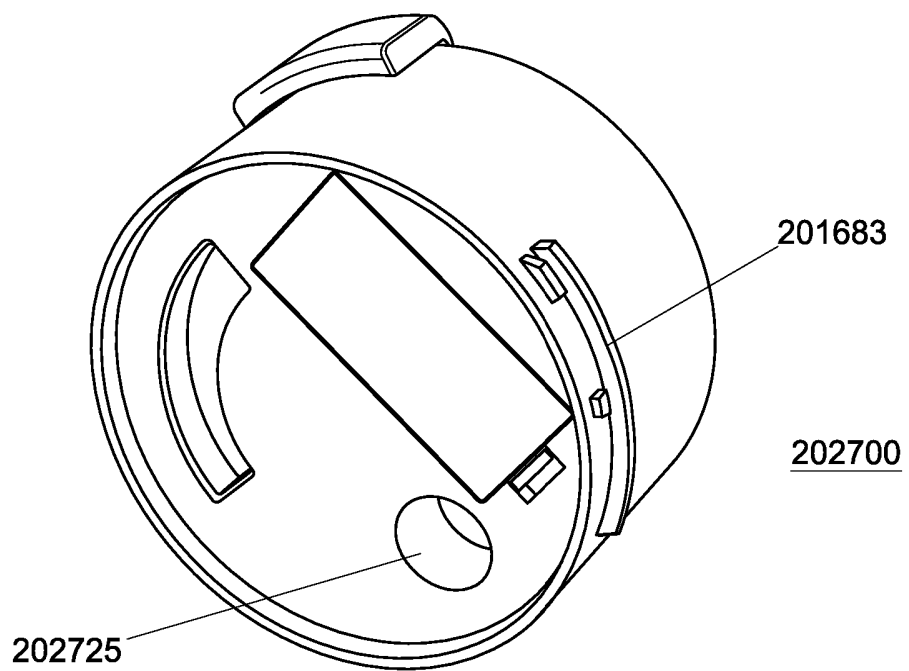


Fig. 31B

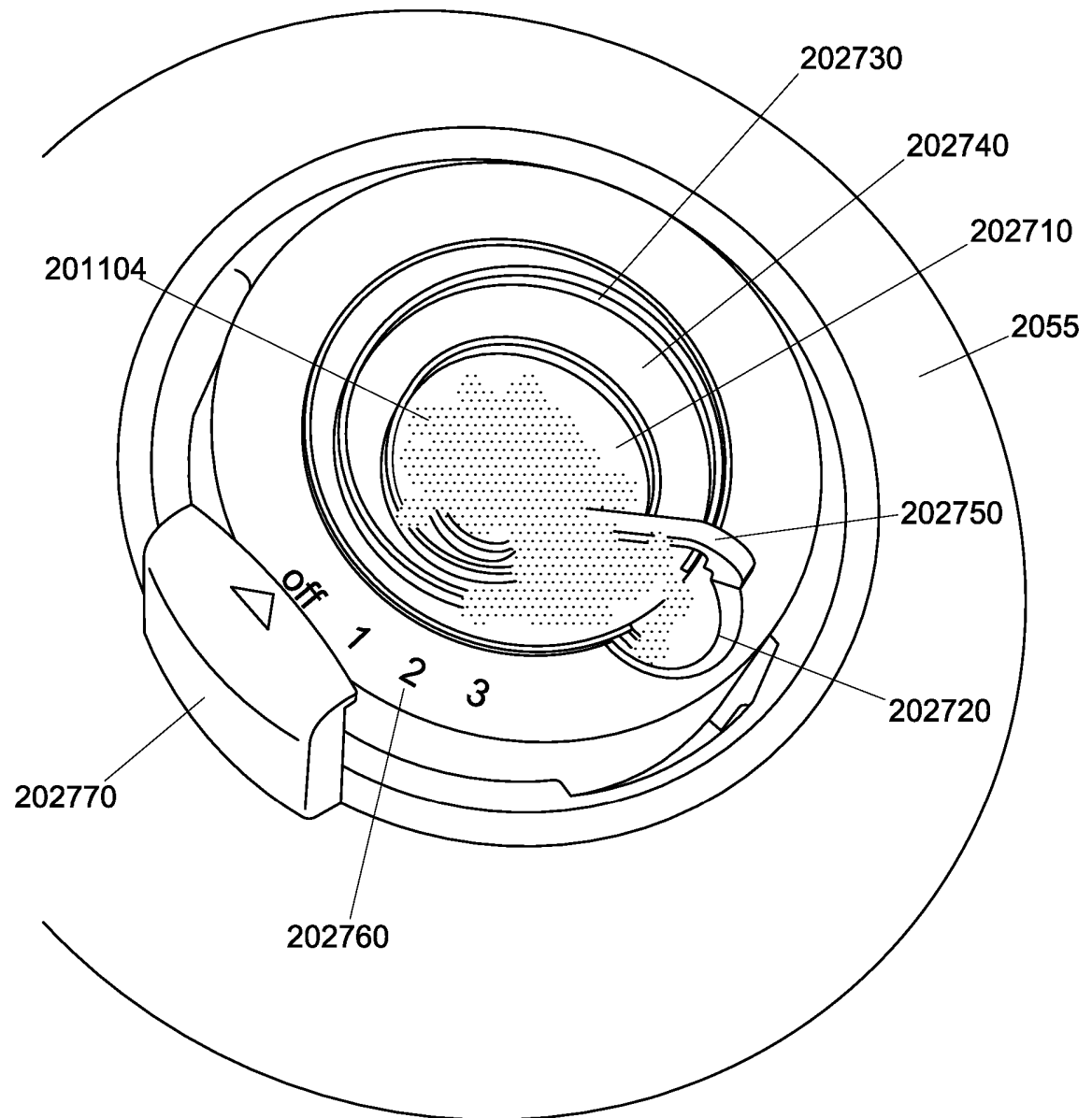


Fig. 31C

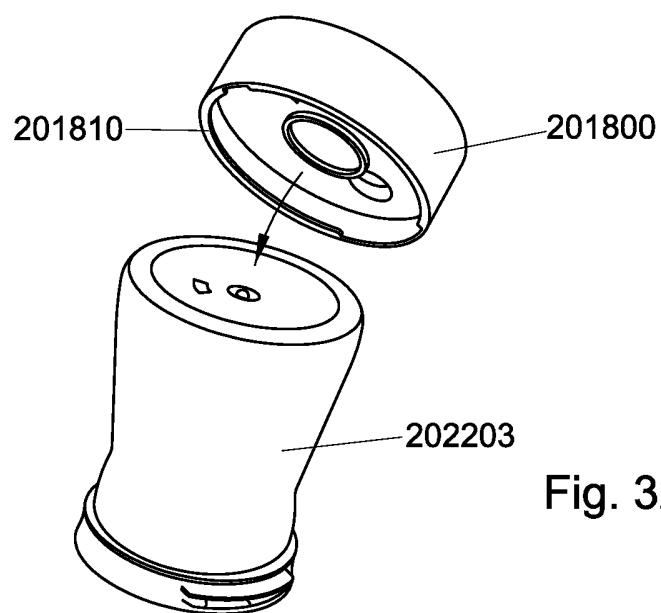


Fig. 32A

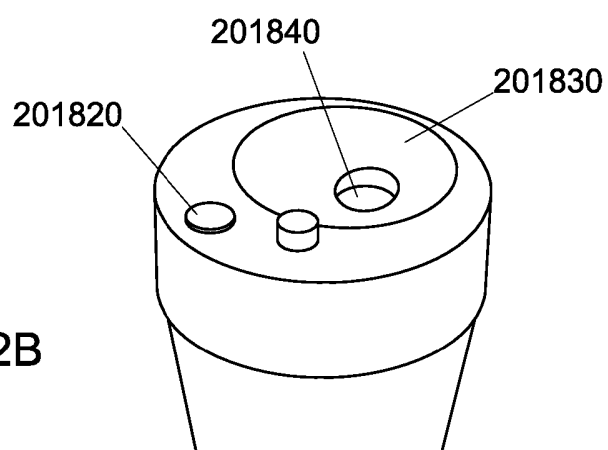


Fig. 32B

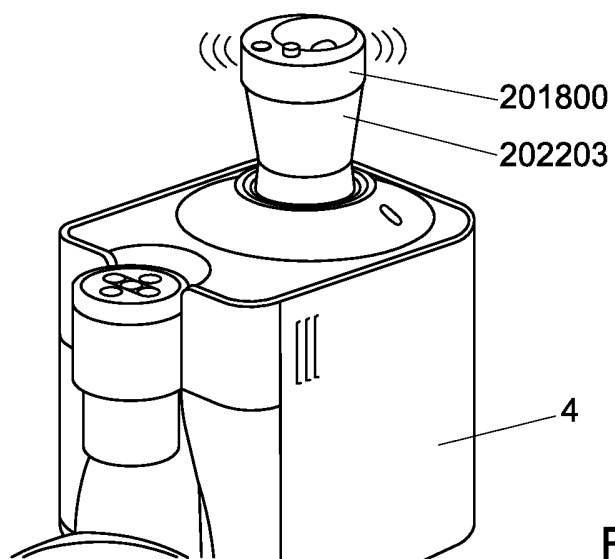


Fig. 32C

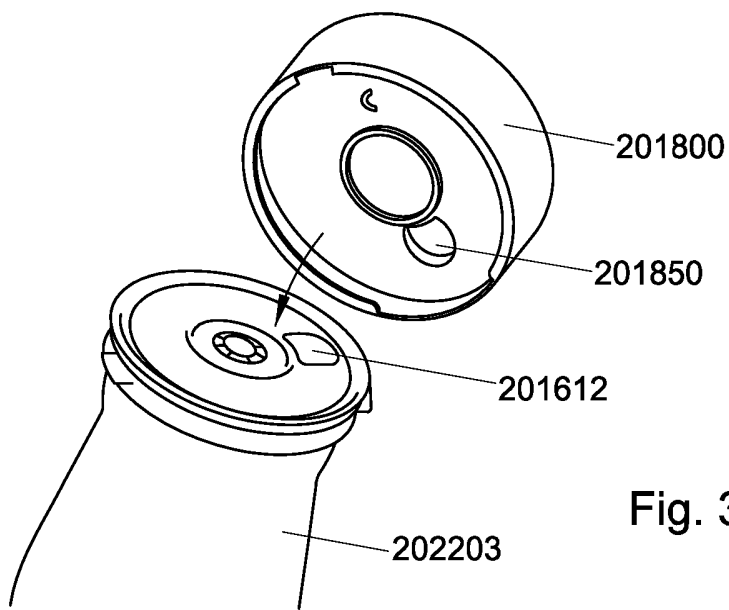


Fig. 32D

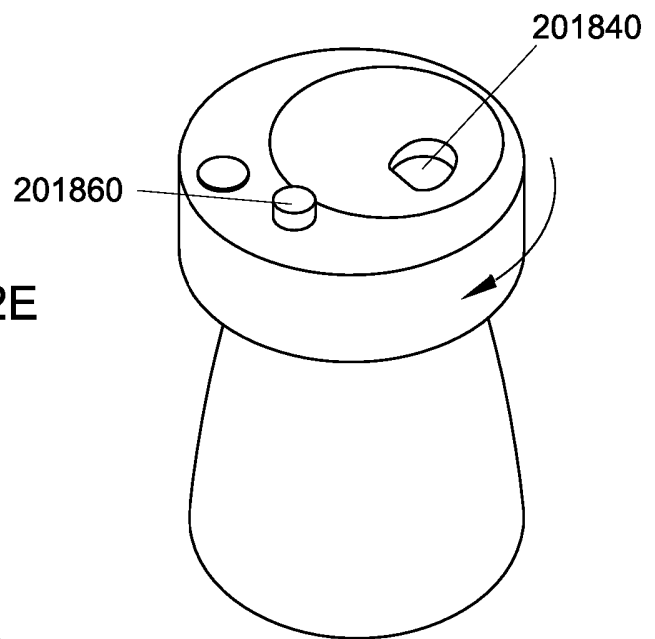


Fig. 32E

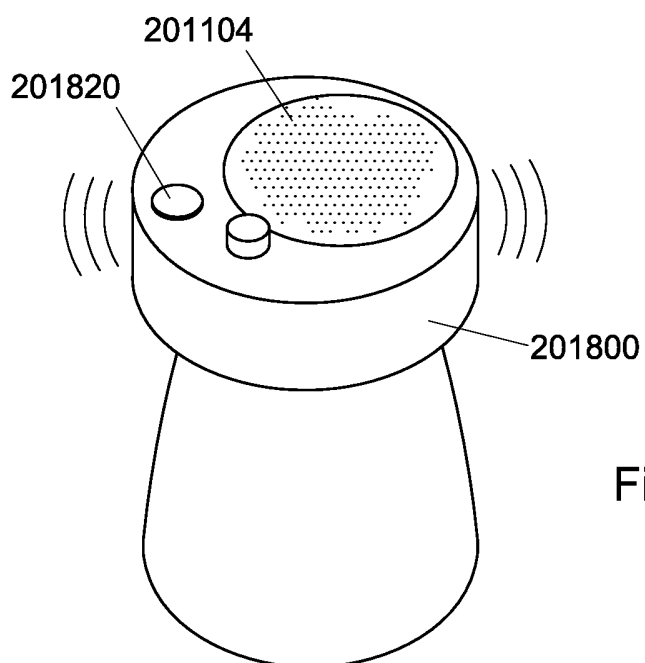


Fig. 32F

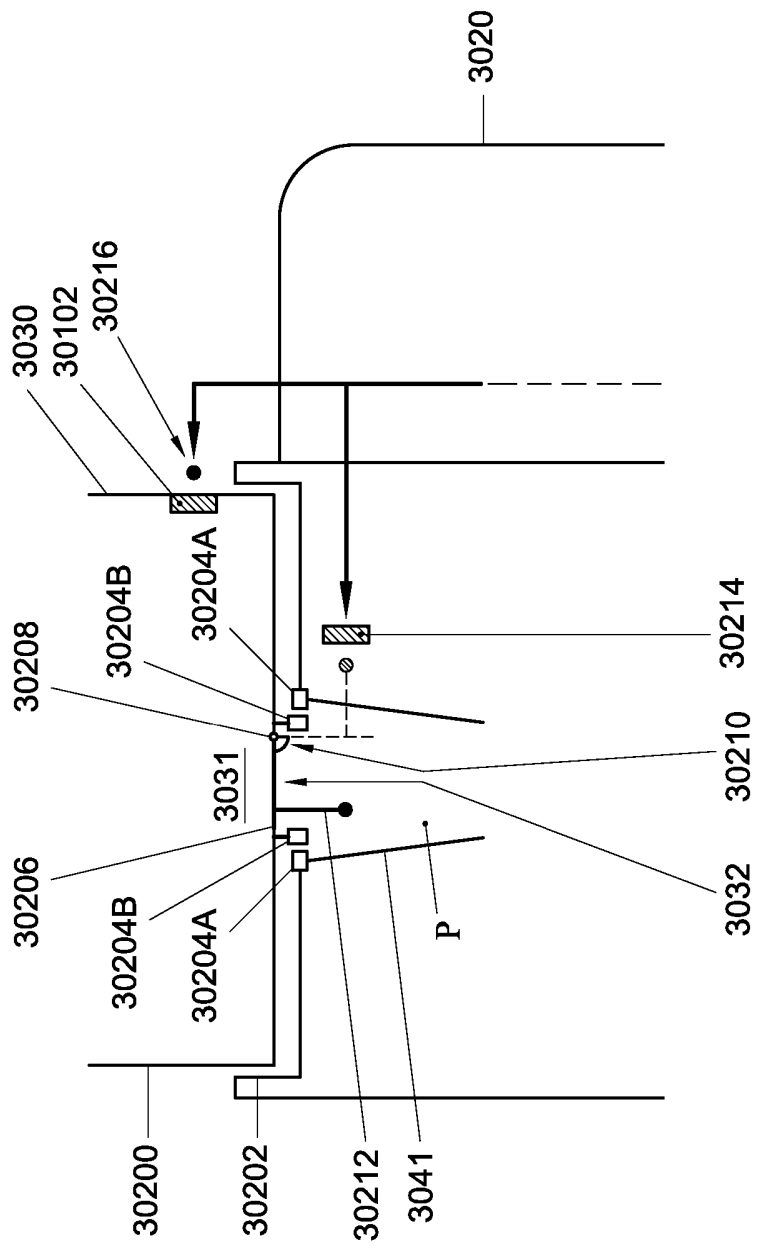


Fig. 33

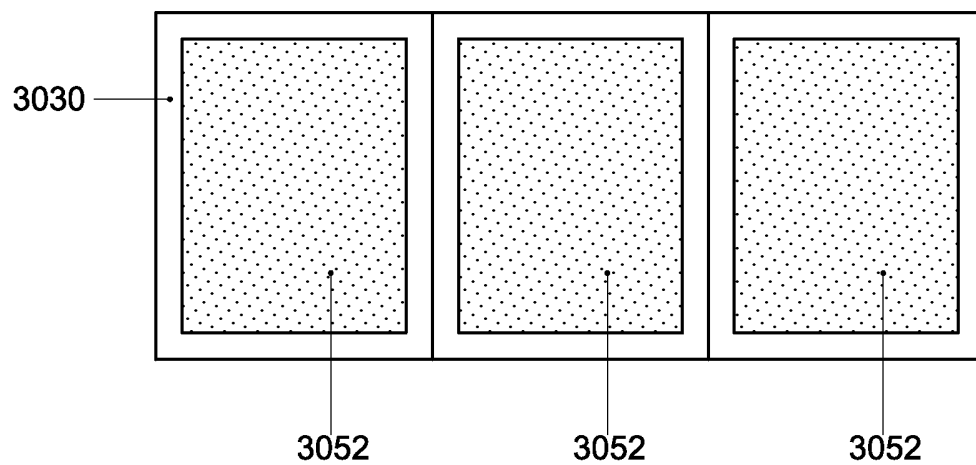


Fig. 34

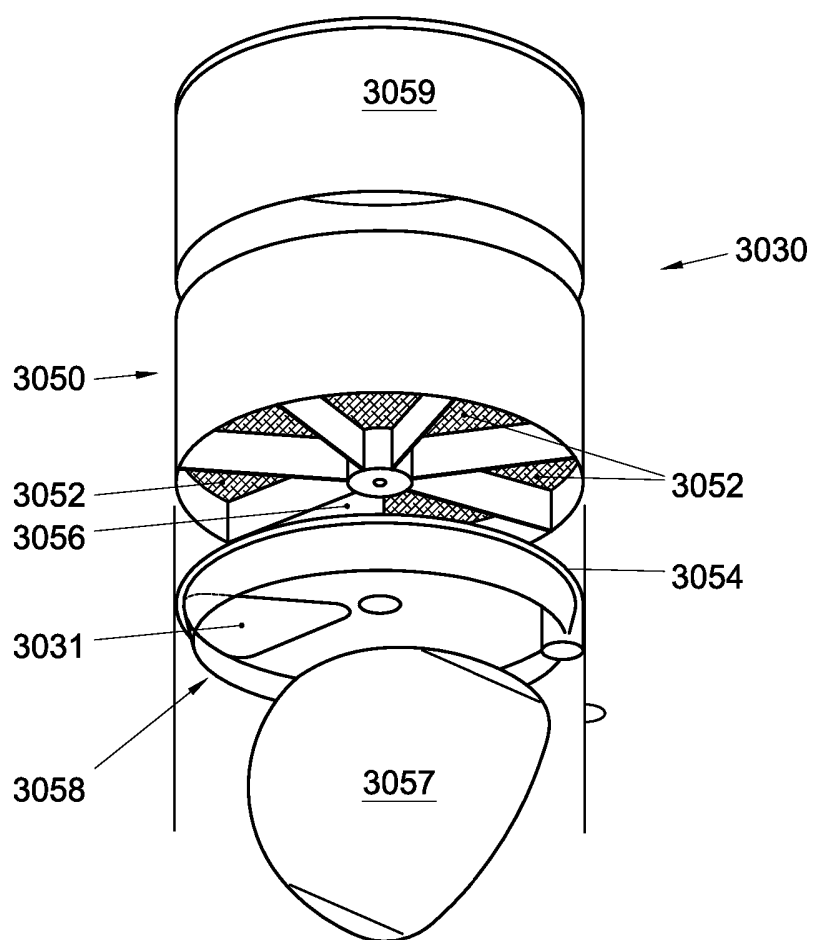


Fig. 35

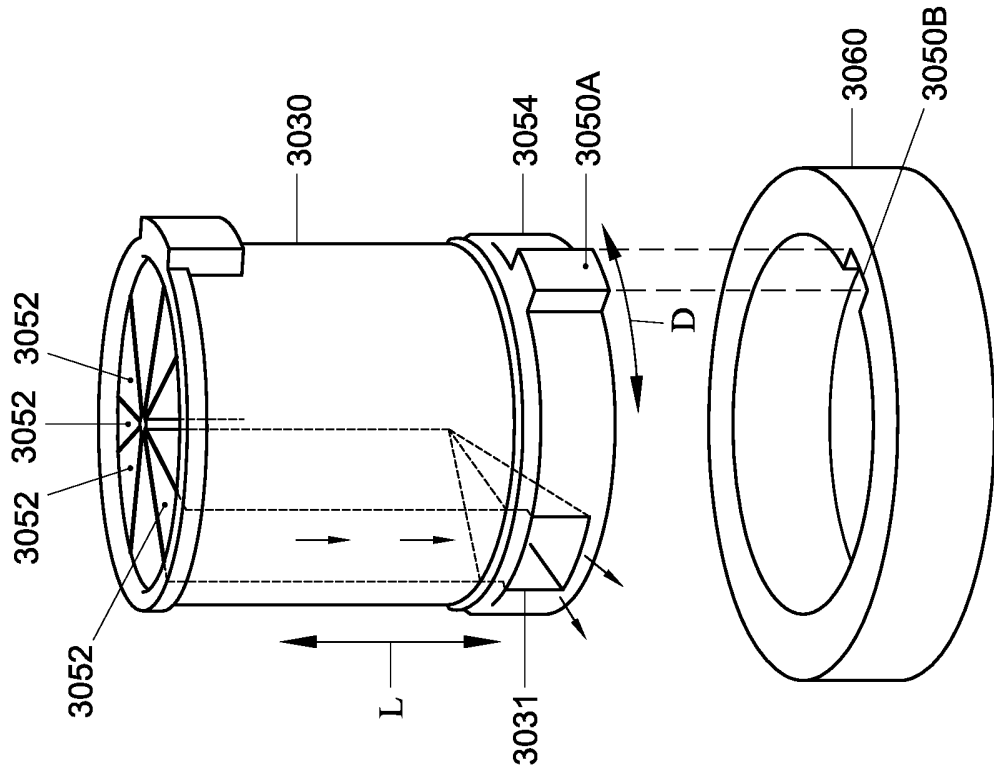


Fig. 36

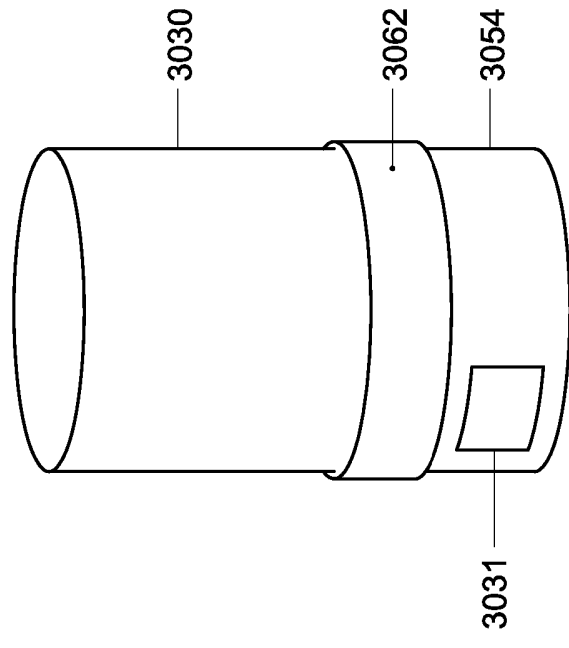


Fig. 37

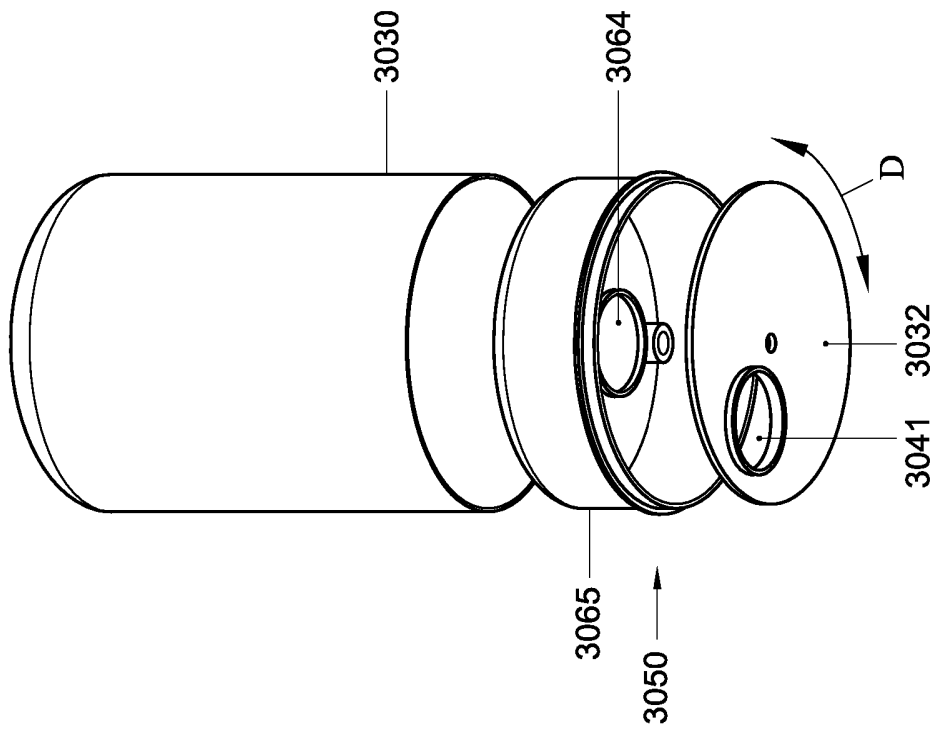


Fig. 39

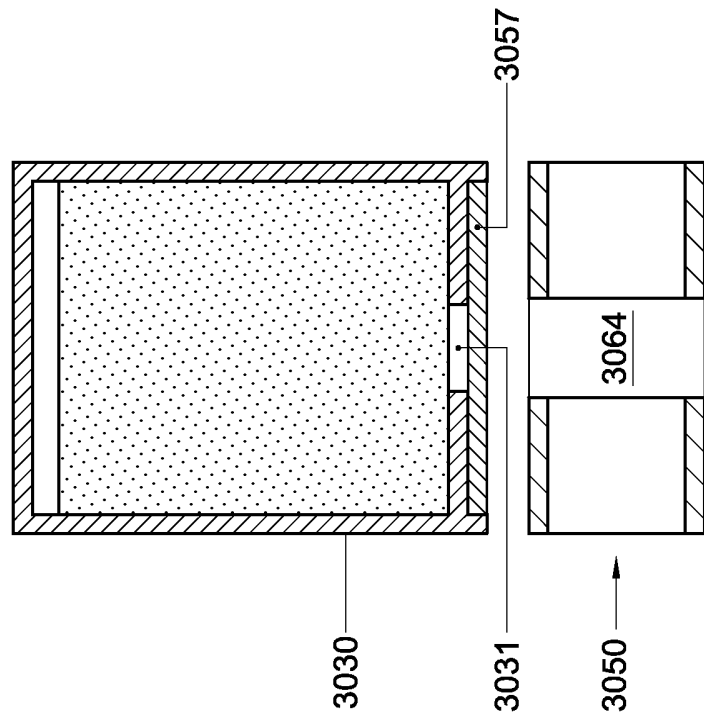


Fig. 38

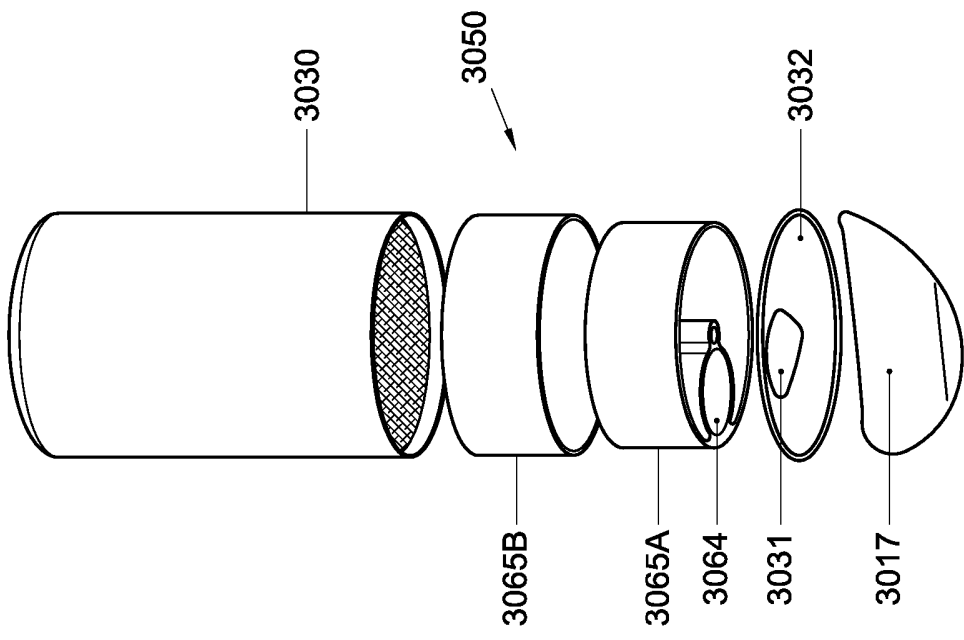


Fig. 41

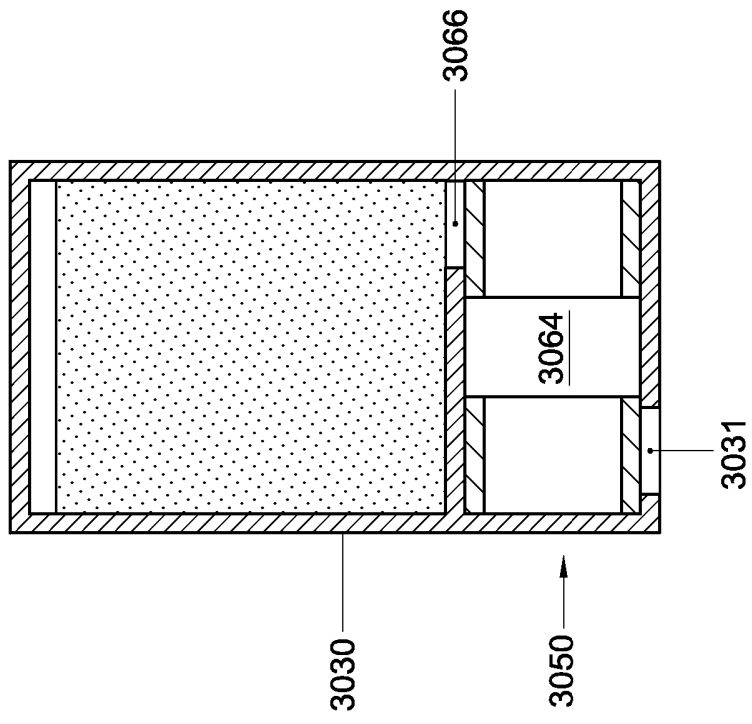


Fig. 40

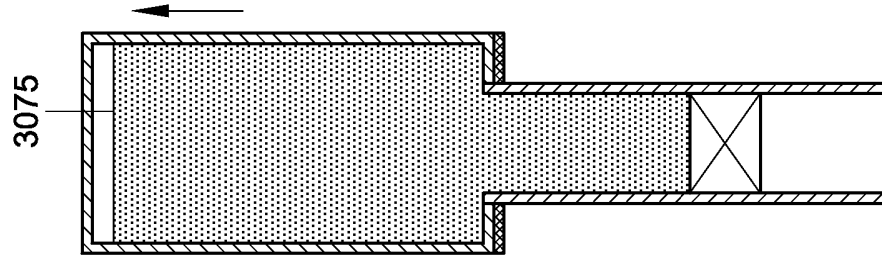


Fig. 42D

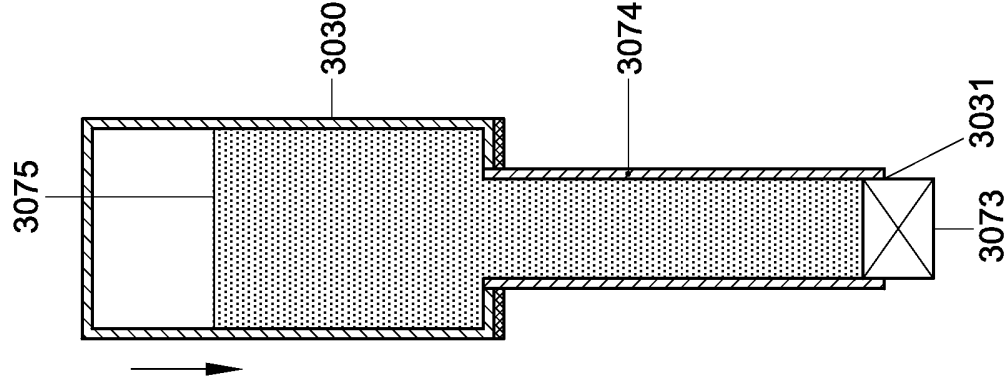


Fig. 42C

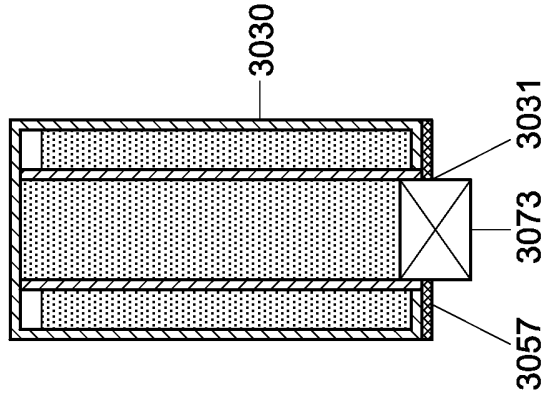


Fig. 42B

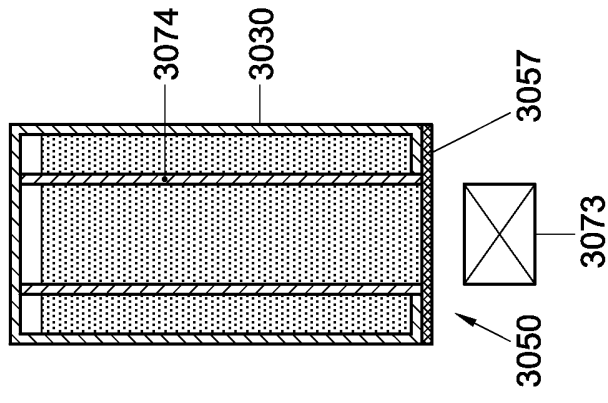


Fig. 42A

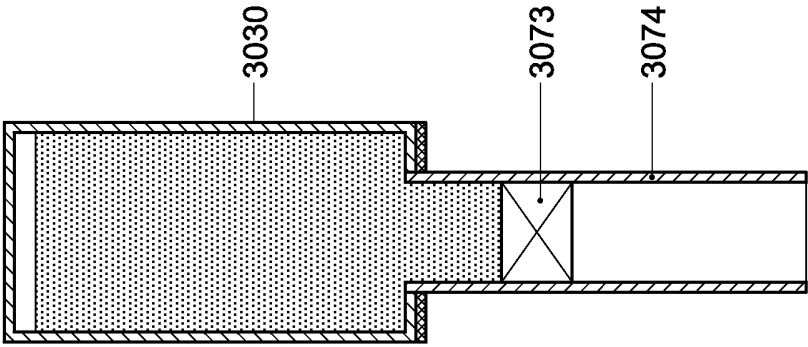


Fig. 42E

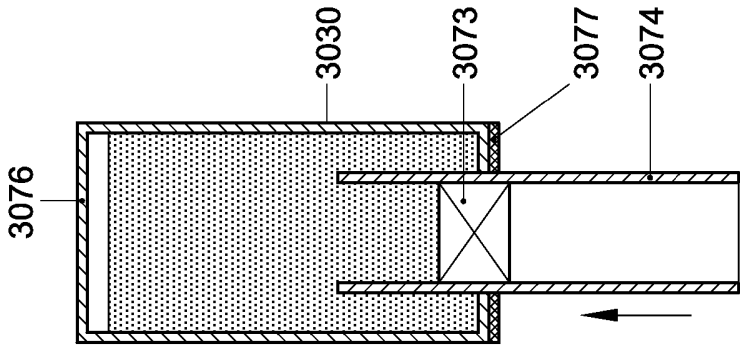


Fig. 42F

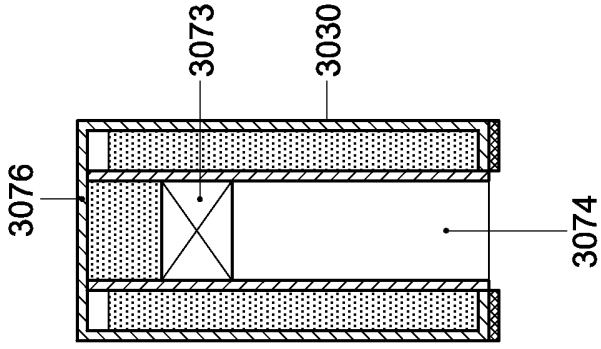


Fig. 42G

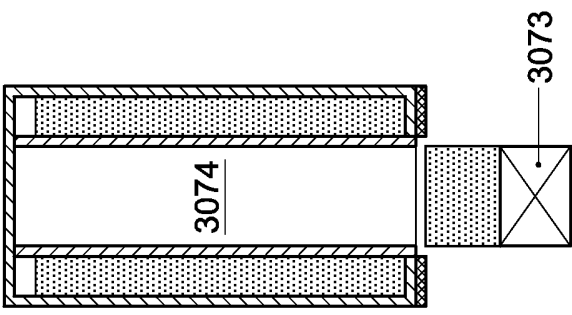


Fig. 42H

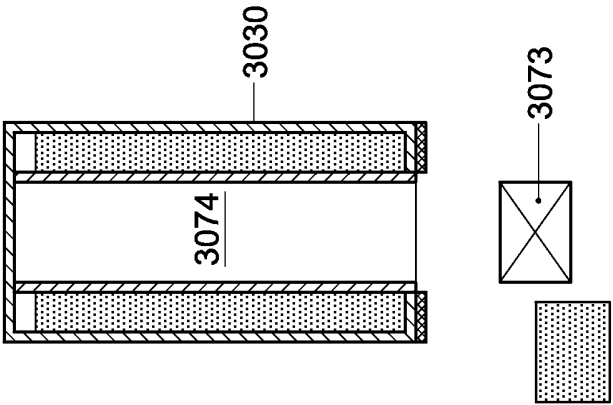


Fig. 42I

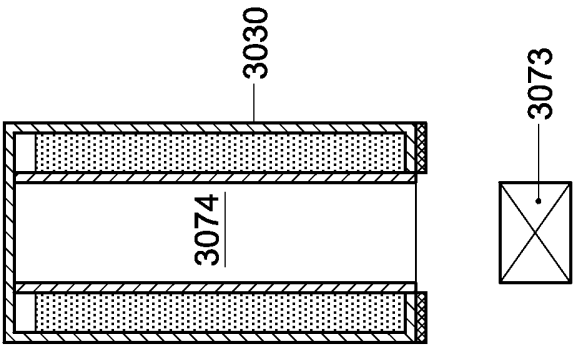


Fig. 42J

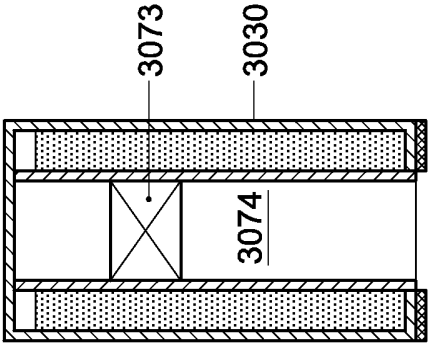


Fig. 42K

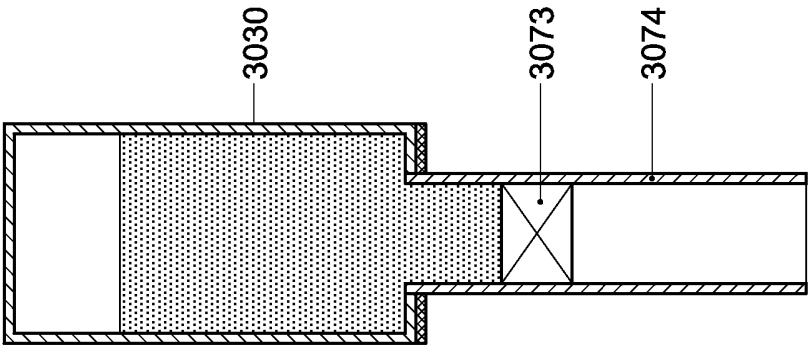


Fig. 42L

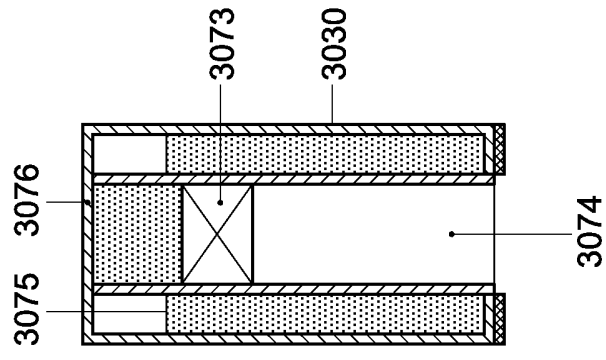


Fig. 42M

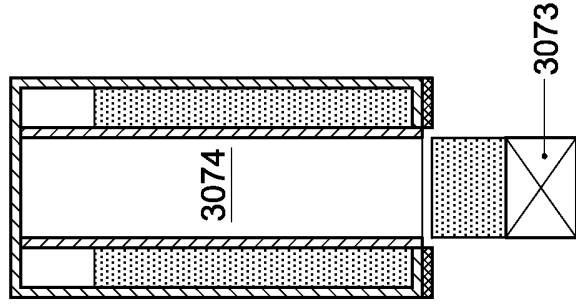


Fig. 42N

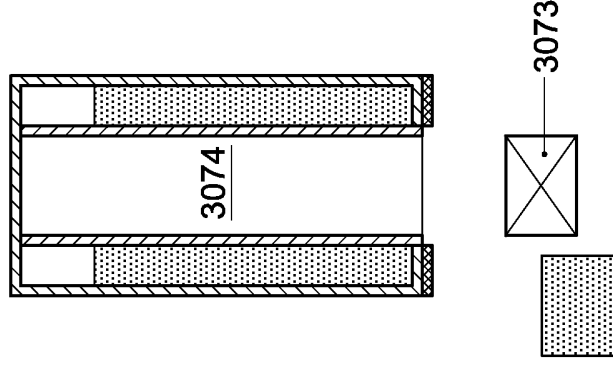


Fig. 42O

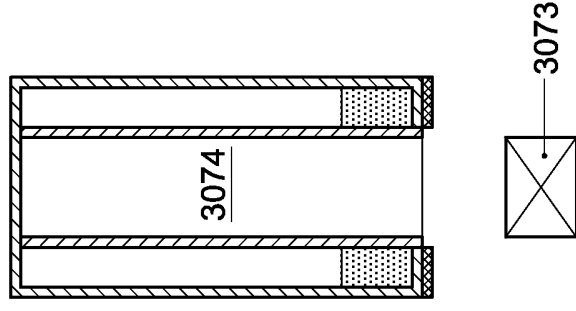


Fig. 42P

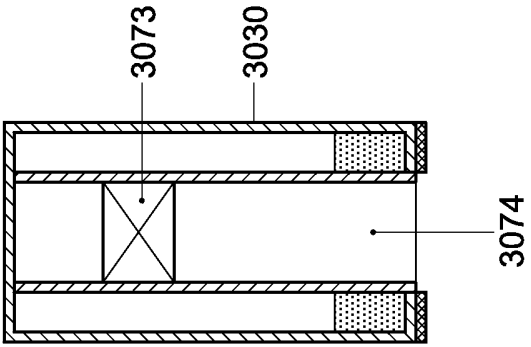


Fig. 42Q

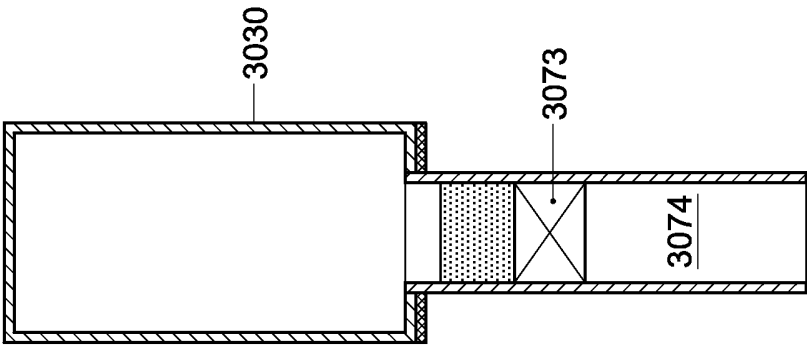


Fig. 42R

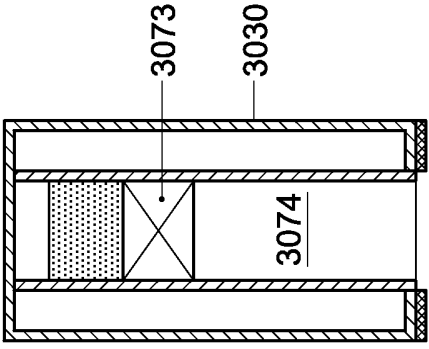


Fig. 42S

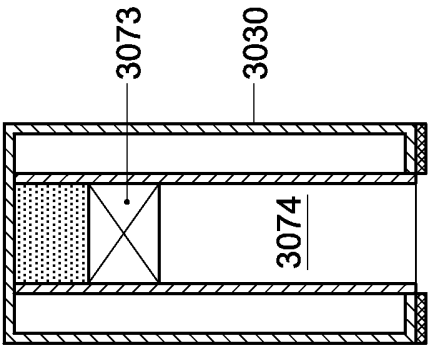


Fig. 42T

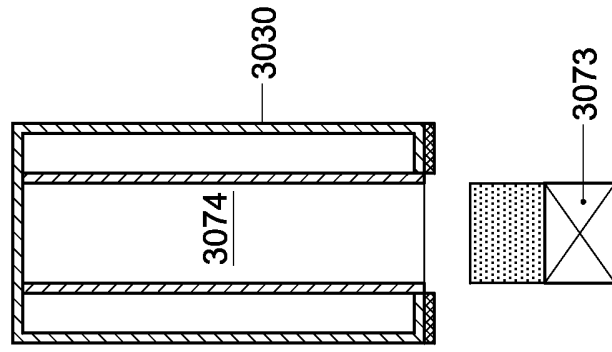


Fig. 42U

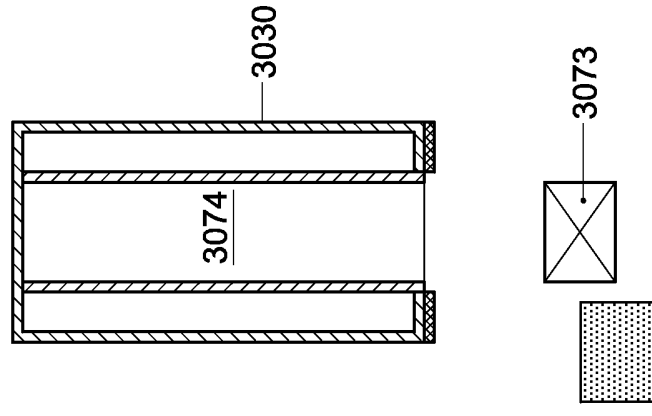


Fig. 42V

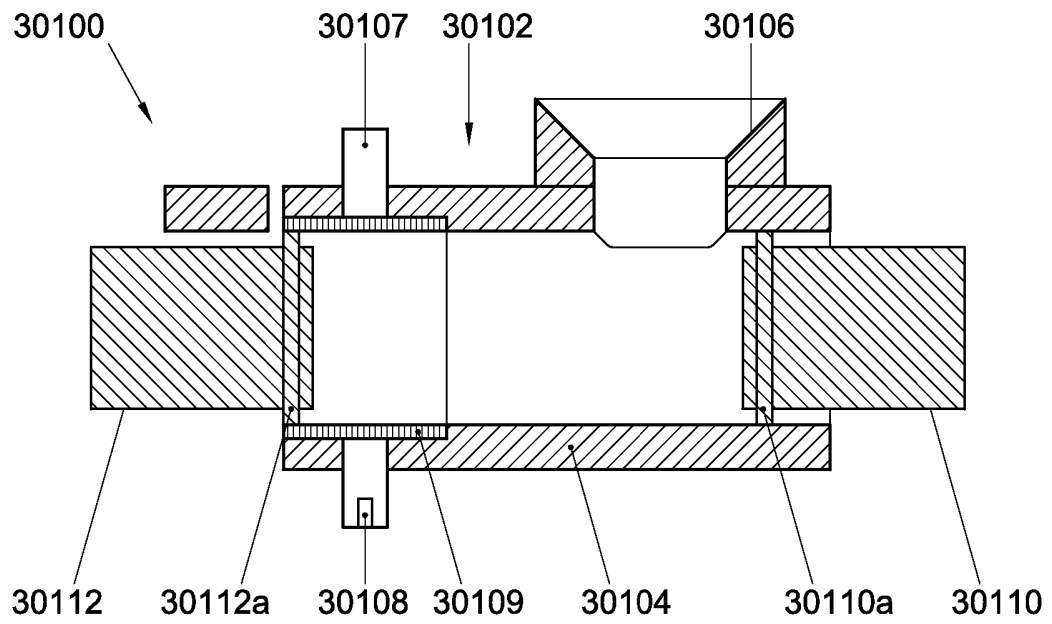


Fig. 43

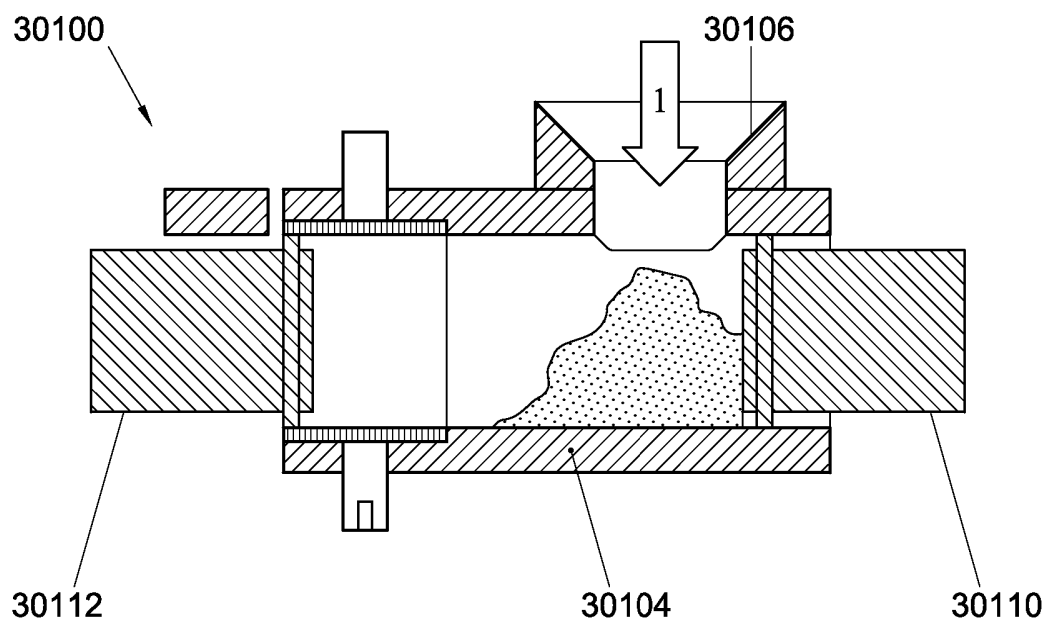


Fig. 44

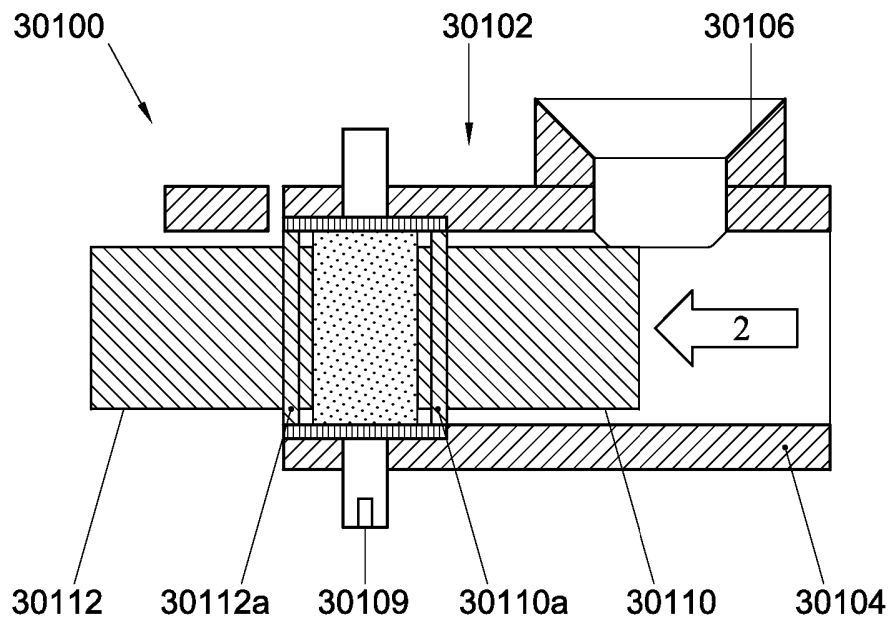


Fig. 45

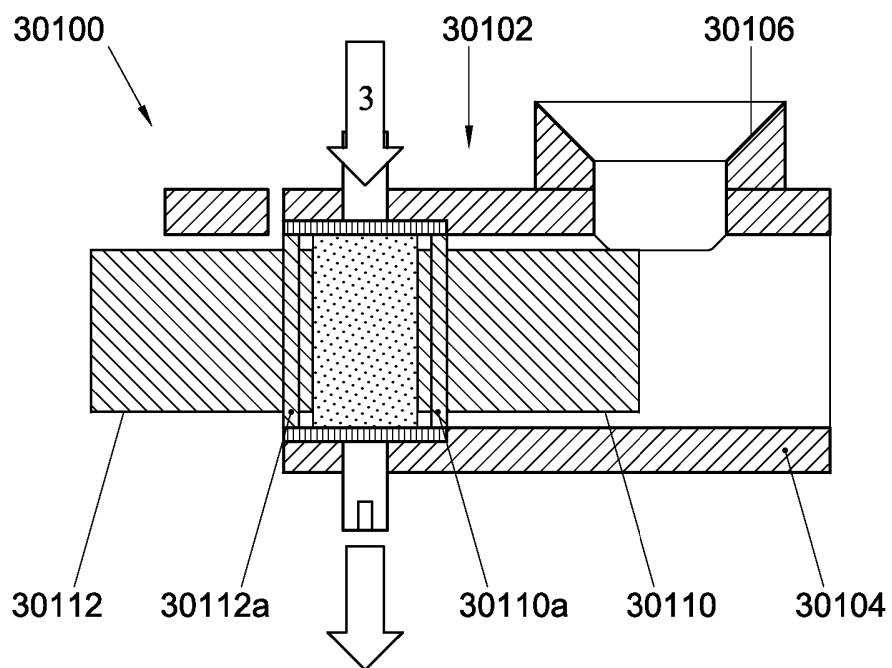


Fig. 46

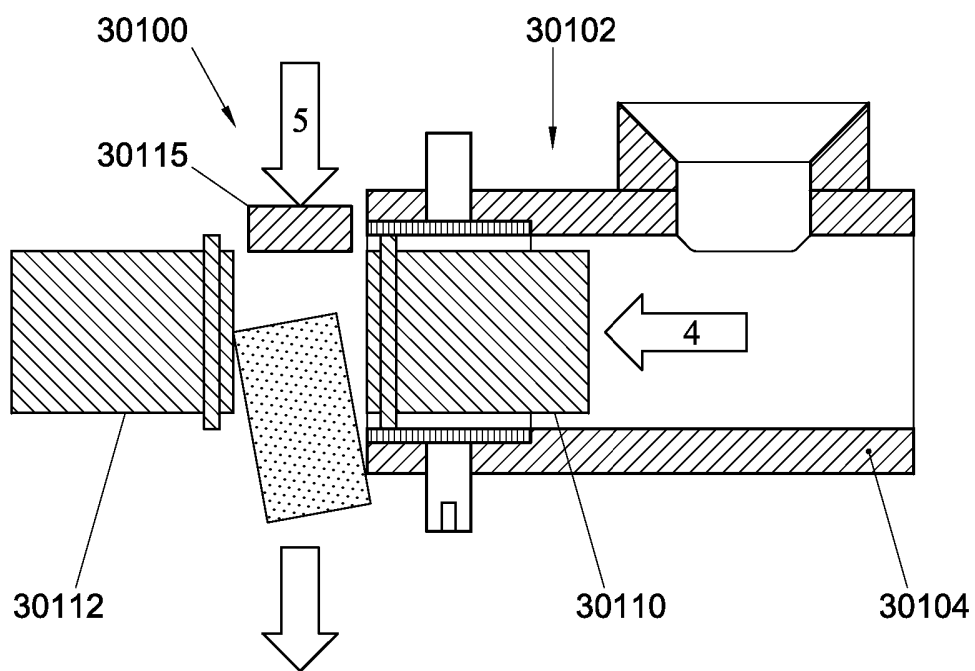


Fig. 47

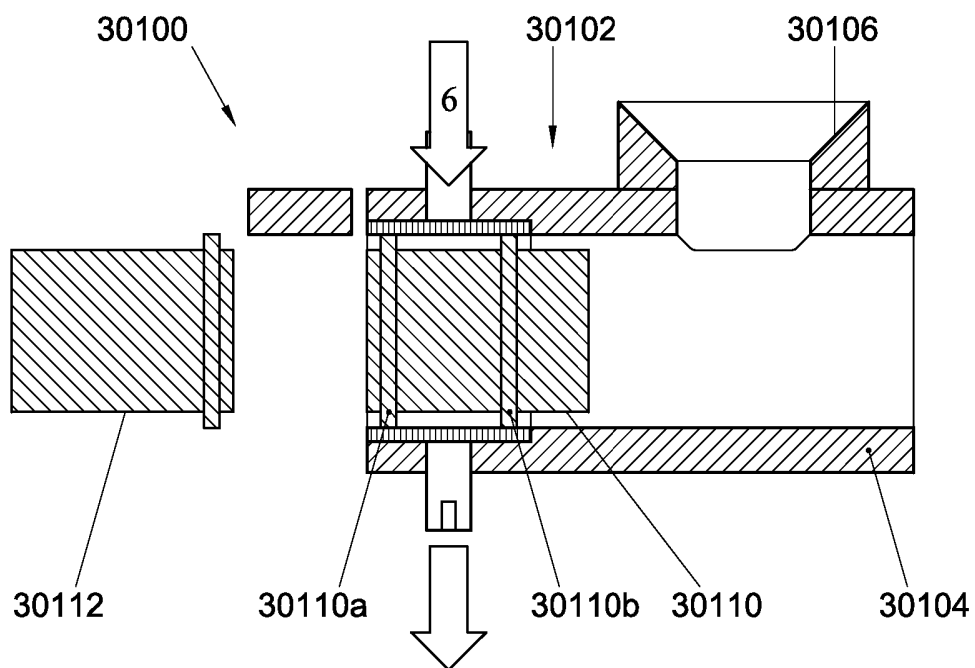


Fig. 48

SAMENWERKINGSVERDRAG (PCT)

RAPPORT BETREFFENDE NIEUWHEIDSONDERZOEK VAN INTERNATIONAAL TYPE

IDENTIFICATIE VAN DE NATIONALE AANVRAGE	KENMERK VAN DE AANVRAGER OF VAN DE GEMACHTIGDE P89876NL00
Nederlands aanvraag nr. 2006222	Indieningsdatum 17-02-2011
	Ingeroepen voorrangsdatum 22-02-2010
Aanvrager (Naam) Sara Lee/DE N.V.	
Datum van het verzoek voor een onderzoek van internationaal type 11-06-2011	Door de Instantie voor Internationaal Onderzoek aan het verzoek voor een onderzoek van internationaal type toegekend nr. SN 56315
I. CLASSIFICATIE VAN HET ONDERWERP (bij toepassing van verschillende classificaties, alle classificatiesymbolen opgeven)	
Volgens de internationale classificatie (IPC) A47J31/42 A47J42/50 A47J31/40	
II. ONDERZOCHE GEBIEDEN VAN DE TECHNIEK	
Onderzochte minimumdocumentatie	
Classificatiesysteem	Classificatiesymbolen
IPC	A47J
Onderzochte andere documentatie dan de minimum documentatie, voor zover dergelijke documenten in de onderzochte gebieden zijn opgenomen	
III. ☒ GEEN ONDERZOEK MOGELIJK VOOR BEPAALDE CONCLUSIES (opmerkingen op aanvullingsblad)	
IV. ☒ GEBREK AAN EENHEID VAN UITVINDING (opmerkingen op aanvullingsblad)	

**ONDERZOEKSRAPPORT BETREFFENDE HET
RESULTAAT VAN HET ONDERZOEK NAAR DE STAND
VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE**

Nummer van het verzoek om een onderzoek naar
de stand van de techniek
NL 2006222

A. CLASSIFICATIE VAN HET ONDERWERP

INV. A47J31/42 A47J42/50 A47J31/40
ADD.

Volgens de Internationale Classificatie van octrooien (IPC) of zowel volgens de nationale classificatie als volgens de IPC.

B. ONDERZOCHE GEBIEDEN VAN DE TECHNIEK

Onderzochte minimum documentatie (classificatie gevolgd door classificatiesymbolen)
A47J

Onderzochte andere documentatie dan de minimum documentatie, voor dergelijke documenten, voor zover dergelijke documenten in de onderzochte gebieden zijn opgenomen

Tijdens het onderzoek geraadpleegde elektronische gegevensbestanden (naam van de gegevensbestanden en, waar uitvoerbaar, gebruikte trefwoorden)

EPO-Internal, PAJ, WPI Data

C. VAN BELANG GEACHTE DOCUMENTEN

Categorie °	Geciteerde documenten, eventueel met aanduiding van speciaal van belang zijnde passages	Van belang voor conclusie nr.
X,P	EENHEID VAN UITVINDING ONTBREEKT zie aanvullingsblad B ONVOLLEDIG ONDERZOEK zie aanvullingsblad C ----- US 2010/080886 A1 (HOURIZADEH RICHARD [US]) 1 april 2010 (2010-04-01) * figuren 4,5,9-11 *	1,197, 203
Y	----- GB 2 447 678 A (DYSON TECHNOLOGY LTD [GB]) 24 september 2008 (2008-09-24) * figuren 2-5 *	1,197, 203
Y	----- EP 1 700 549 A1 (SAECO IPR LTD [IE]) 13 september 2006 (2006-09-13) * figuur 1 *	1,197, 203
	----- -/-	



Verdere documenten worden vermeld in het vervolg van vak C.



Leden van dezelfde octrooifamilie zijn vermeld in een bijlage

° Speciale categorieën van aangehaalde documenten

A niet tot de categorie X of Y behorende literatuur die de stand van de techniek beschrijft

D in de octrooiaanvraag vermeld

E eerdere octrooi(aanvraag), gepubliceerd op of na de indieningsdatum, waarin dezelfde uitvinding wordt beschreven

L om andere redenen vermelde literatuur

O niet-schriftelijke stand van de techniek

P tussen de voorrangsdatum en de indieningsdatum gepubliceerde literatuur

T na de indieningsdatum of de voorrangsdatum gepubliceerde literatuur die niet bezwarend is voor de octrooiaanvraag, maar wordt vermeld ter verheldering van de theorie of het principe dat ten grondslag ligt aan de uitvinding

X de conclusie wordt als niet nieuw of niet inventief beschouwd ten opzichte van deze literatuur

Y de conclusie wordt als niet inventief beschouwd ten opzichte van de combinatie van deze literatuur met andere geciteerde literatuur van dezelfde categorie, waarbij de combinatie voor de vakman voor de hand liggend wordt geacht

Z lid van dezelfde octrooifamilie of overeenkomstige octrooi-publicatie

Datum waarop het onderzoek naar de stand van de techniek van internationaal type werd voltooid

28 oktober 2011

Verzenddatum van het rapport van het onderzoek naar de stand van de techniek van internationaal type

Naam en adres van de instantie

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

De bevoegde ambtenaar

Fritsch, Klaus

**ONDERZOEKSRAPPORT BETREFFENDE HET
RESULTAAT VAN HET ONDERZOEK NAAR DE STAND
VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE**

Nummer van het verzoek om een onderzoek naar
de stand van de techniek
NL 2006222

C.(Vervolg). VAN BELANG GEACHTE DOCUMENTEN		
Categorie °	Geciteerde documenten, eventueel met aanduiding van speciaal van belang zijnde passages	Van belang voor conclusie nr.
A	DE 203 00 933 U1 (WIK FAR EAST LTD [HK]) 27 mei 2004 (2004-05-27) * figuren 2,3 *	1,197, 203
Y	WO 01/48711 A1 (PEREZ VALES MARIA PILAR [IT]) 5 juli 2001 (2001-07-05) * figuren 2,8 *	1,197, 203

**ONVOLLEDIG ONDERZOEK
AANVULLINGSBLAD C**

Octrooiaanvraag Nr.:

SN 56315
NL 2006222

Dit verslag van het onderzoek heeft geen betrekking op bepaalde conclusies omdat deze betrekking hebben op delen van de nationale aanvraag die niet voldoen aan de voorgeschreven vereisten, en wel in die mate dat geen zinvol nieuwheidsonderzoek verricht kan worden, in het bijzonder:

Volledig onderzoekbare conclusie(s):

1, 197, 203

Niet onderzochte conclusie(s):

2-196, 198-202

Reden voor de beperking van het onderzoek:

The present application contains 203 claims. There are so many dependent claims, and they are drafted in such a way that the claims as a whole are not in compliance with the provisions of clarity and conciseness, as they create a smoke screen in front of the skilled reader when assessing what should be the subject-matter to search. The non-compliance with the substantive provisions is to such an extent, that the search was performed taking into consideration the non-compliance in determining the extent of the search.

The extent of the search was consequently limited to claims 1, 197 and 203 which appear to comprise a reasonable definition of what is understood to be the invention for which protection is sought.

AANVULLINGSBLAD B

De Instantie belast met het uitvoeren van het onderzoek naar de stand van de techniek heeft vastgesteld dat deze aanvraag meerdere uitvindingen bevat, te weten:

1. conclusies: 1-180, 197-203

Coffee beverage system comprising a ground coffee packaging cartridge which is also removably connectable to the coffee brewing apparatus, a ground coffee packaging cartridge and method of preparing a beverage by means of such a system.

2. conclusies: 181-185

Method for preparing a beverage, wherein the comprises the following steps: in an emptying and grinding step the grinding device is activated for emptying the metering chamber and for grinding coffee beans or ground coffee collected in the metering chamber.

3. conclusies: 186, 187, 191-196

Method for preparing a beverage, wherein the method comprises the following steps: in a first step the metering chamber is filled with coffee beans or ground coffee; and in a second step which follows after the completion of the first step the grinding device is activated longer than is required for emptying the metering chamber and for grinding all the coffee beans or for further grinding all the ground coffee collected in the metering chamber during the first step.

4. conclusies: 188-190

Method for brewing coffee, wherein a cartridge filled with coffee beans is coupled to a coffee brewing apparatus, wherein by means of the coupling between the cartridge and the coffee brewing apparatus a metering chamber is formed, wherein subsequently the metering chamber is filled with coffee beans from the cartridge, the metering chamber subsequently is emptied by means of activation of a grinder, wherein the coffee beans of the metering chamber are ground by the activation of the grinder and subsequently coffee is brewed with the coffee brewing apparatus based on the ground beans and heated water.

Het vooronderzoek werd tot het eerste onderwerp beperkt.

The inventions solve by these special technical features different problems and the link between the inventions 1- 4 has no technical relationship which finds expression in the claims in terms of the same or corresponding special technical features.

GEBREK AAN EENHEID VAN UITVINDING

Octrooiaanvraag Nr.:

SN 56315

NL 2006222

AANVULLINGSBLAD B

De Instantie belast met het uitvoeren van het onderzoek naar de stand van de techniek heeft vastgesteld dat deze aanvraag meerdere uitvindingen bevat, te weten:

Consequently, neither the objective problem underlying the subjects of the claimed inventions, nor their solutions defined by the special technical features allow for a relationship to be established between the said inventions, which involves a single general inventive concept. In conclusion, the groups of claims are not linked by common or corresponding special technical features and define 4 different inventions not linked by a single general inventive concept. The application, hence does not meet the requirements of unity of invention.

**ONDERZOEKSRAPPORT BETREFFENDE HET
RESULTAAT VAN HET ONDERZOEK NAAR DE STAND
VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE**

Informatie over leden van dezelfde octrooifamilie

Nummer van het verzoek om een onderzoek naar
de stand van de techniek

NL 2006222

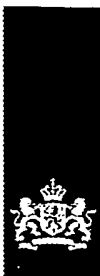
In het rapport genoemd octrooi geschrift	Datum van publicatie	Overeenkomend(e) geschrift(en)	Datum van publicatie
US 2010080886	A1	01-04-2010	GEEN

GB 2447678	A	24-09-2008	CN 101268915 A 24-09-2008
		EP 2120655 A1 25-11-2009	
		WO 2008113998 A1 25-09-2008	
		JP 2008230857 A 02-10-2008	
		US 2008277512 A1 13-11-2008	

EP 1700549	A1	13-09-2006	AT 368413 T 15-08-2007
		AU 2006200594 A1 28-09-2006	
		BR PI0600773 A 07-11-2006	
		CN 1830369 A 13-09-2006	
		ES 2289736 T3 01-02-2008	
		HK 1092665 A1 24-12-2010	
		KR 20060099424 A 19-09-2006	
		MX PA06002655 A 26-09-2006	
		RU 2314739 C1 20-01-2008	
		US 2006201339 A1 14-09-2006	

DE 20300933	U1	27-05-2004	AT 301413 T 15-08-2005
		CN 2684713 Y 16-03-2005	
		DE 502004000037 D1 15-09-2005	
		EP 1440642 A1 28-07-2004	
		ES 2243911 T3 01-12-2005	
		HK 1061149 A2 13-08-2004	
		JP 3104362 U 16-09-2004	
		KR 20040068030 A 30-07-2004	
		TW M262133 U 21-04-2005	
		US 2005017107 A1 27-01-2005	

WO 0148711	A1	05-07-2001	AU 2395601 A 09-07-2001
		CN 1413340 A 23-04-2003	
		CZ 20022201 A3 16-10-2002	
		EP 1257979 A1 20-11-2002	
		HR 20020597 A2 31-08-2004	
		HU 0203715 A2 28-02-2003	
		IT FI990261 A1 25-06-2001	
		JP 2003518676 A 10-06-2003	
		NO 20022986 A 30-07-2002	
		PL 363986 A1 29-11-2004	
		US 2003057234 A1 27-03-2003	



Agentschap NL
Ministerie van Economische Zaken,
Landbouw en Innovatie

WRITTEN OPINION

File No. SN56315	Filing date (day/month/year) 17.02.2011	Priority date (day/month/year) 17.02.2010	Application No. NL2006222
International Patent Classification (IPC) INV. A47J31/42 A47J42/50 A47J31/40			
Applicant Sara Lee/DE N.V., et al			

This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☒ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the application
- ☒ Box No. VIII Certain observations on the application

	Examiner Fritsch, Klaus
--	----------------------------

WRITTEN OPINION

Application number
NL2006222

Box No. I Basis of this opinion

1. This opinion has been established on the basis of the latest set of claims filed before the start of the search.
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ on paper
 - ☐ in electronic form
 - c. time of filing/furnishing:
 - ☐ contained in the application as filed.
 - ☐ filed together with the application in electronic form.
 - ☐ furnished subsequently for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

WRITTEN OPINION

Application number
NL2006222

Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step, or to be industrially applicable have not been examined in respect of

- ☐ the entire application
- ☒ claims Nos. 2-196, 198-202

because:

- ☐ the said application, or the said claims Nos. relate to the following subject matter which does not require a search (*specify*):
- ☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):
- ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed (*specify*):
- ☒ no search report has been established for the whole application or for said claims Nos. 2-196, 198-202
- ☐ a meaningful opinion could not be formed as the sequence listing was either not available, or was not furnished in the international format (WIPO ST25).
- ☐ a meaningful opinion could not be formed without the tables related to the sequence listings; or such tables were not available in electronic form.
- ☐ See Supplemental Box for further details.

Box No. IV Lack of unity of invention

1. The requirement of unity of invention is not complied with for the following reasons:

see separate sheet

2. This report has been established in respect of the following parts of the application:

- ☐ all parts.
- ☒ the parts relating to claims Nos. (see Search Report)

WRITTEN OPINION

Application number
NL2006222

Box No. V Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty	Yes: Claims	1, 197, 203
	No: Claims	
Inventive step	Yes: Claims	
	No: Claims	1, 197, 203
Industrial applicability	Yes: Claims	1, 197, 203
	No: Claims	

2. Citations and explanations

see separate sheet

Box No. VII Certain defects in the application

see separate sheet

Box No. VIII Certain observations on the application

see separate sheet

Re Item III

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

- 1 The present application contains 203 claims. There are so many dependent claims, and they are drafted in such a way that the claims as a whole are not in compliance with the provisions of clarity and conciseness, as they create a smoke screen in front of the skilled reader when assessing what should be the subject-matter to search. The non-compliance with the substantive provisions is to such an extent, that the search was performed taking into consideration the non-compliance in determining the extent of the search. The extent of the search was consequently limited to claims 1, 197 and 203 which appear to comprise a reasonable definition of what is understood to be the invention for which protection is sought.

Re Item IV

Lack of unity of invention

- 1 This Authority considers that there are 4 inventions covered by the claims indicated as follows:
1. Claims 1 - 180 and 197 - 203 disclose a coffee beverage system comprising a ground coffee packaging cartridge which is also removable connectable to the coffee brewing apparatus, a ground coffee packaging cartridge and method of preparing a beverage by means of such a system.
 2. Claims 181 - 185 disclose a method for preparing a beverage, wherein the comprises the following steps: in an emptying and grinding step the grinding device is activated for emptying the metering chamber and for grinding coffee beans or ground coffee collected in the metering chamber.
 3. Claims 186 - 187 and 191 - 196 disclose a method for preparing a beverage, wherein the method comprises the following steps: in a first step the metering chamber is filled with coffee beans or ground coffee; and

in a second step which follows after the completion of the first step the grinding device is activated longer than is required for emptying the metering chamber and for grinding all the coffee beans or for further grinding all the ground coffee collected in the metering chamber during the first step.

4. Claims 188 - 190 disclose a method for brewing coffee wherein a cartridge filled with coffee beans is coupled to a coffee brewing apparatus, wherein by means of the coupling between the cartridge and the coffee brewing apparatus a metering chamber is formed, wherein subsequently the metering chamber is filled with coffee beans from the cartridge, the metering chamber subsequently is emptied by means of activation of a grinder, wherein the coffee beans of the metering chamber are ground by the activation of the grinder and subsequently coffee is brewed with the coffee brewing apparatus based on the ground beans and heated water.

The reasons for which the inventions are not so linked as to form a single general inventive concept, are as follows:

The inventions solve by these special technical features different problems and the link between the inventions 1 - 4 has no technical relationship which finds expression in the claims in terms of the same or corresponding special technical features.

Consequently, neither the objective problem underlying the subjects of the claimed inventions, nor their solutions defined by the special technical features allow for a relationship to be established between the said inventions, which involves a single general inventive concept.

In conclusion, the groups of claims are not linked by common or corresponding special technical features and define 4 different inventions not linked by a single general inventive concept.

The application, hence does not meet the requirements of unity of invention.

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1 Reference is made to the following document(s):

D1 US 2010/080886 A1

D2 GB 2 447 678 A

D3 EP 1 700 549 A1

D4 DE 203 00 933 U1

D5 WO 01/48711 A1

2 The present application does not meet the criteria of novelty, because the subject-matter of claims 1, 197 and 203 is not new.

Document D1, which is considered to represent the most relevant state of the art, discloses (cf. Fig. 4 - 6, 10 and 11) a coffee beverage system, including a coffee bean packaging cartridge (23) and a coffee brewing apparatus wherein the coffee bean packaging cartridge (23) is removably connected to the coffee brewing apparatus, the coffee bean packaging cartridge (23) being arranged for holding and supplying multiple servings of coffee beans, the coffee beans packaging cartridge (23) including:

a container comprising an interior volume and at least one exit opening defining a coffee bean outlet, the interior volume holding coffee beans; transportation means (conical shape at the bottom of the cartridge 23) adapted for enabling transportation of the coffee beans from the interior volume towards the exit opening of the cartridge; wherein the coffee brewing apparatus comprises an entrance opening for receiving coffee beans which are transported with the aid of the transportation means towards the exit opening, a grinder (24) for grinding coffee beans which have entered the coffee apparatus via the entrance opening and a brewing device for brewing coffee on the basis of ground coffee obtained by means of the grinder (24), wherein the system is further provided with a metering chamber (25) for receiving coffee beans which are transported with the aid of the transportation means (conical shape at the bottom of the cartridge 23) into the metering chamber (25) wherein the metering chamber (25) comprises a bottom portion (26) which forms a part of the grinder (24), said bottom portion (26) being arranged in the coffee brewing apparatus for rotating around a first axis extending in a vertical direction wherein the system is arranged such that upon activation of the grinder (24) the bottom portion (26) is rotating around the vertical axis for transporting the coffee beans from the metering chamber

(25) into the grinder (24) and for grinding the coffee beans, showing all the features of the subject-matter of claim 1, in that the system is further provided with a ground coffee packaging cartridge (23) which is also removable connectable to the coffee brewing apparatus and which is preferably arranged for feeding ground coffee into the coffee brewing apparatus via the entrance opening.

The features of the method claims 197 and 203 are also disclosed in document D1.

It has to be said that the subject-matter of claims 1, 197 and 203 is also known from the combination of the documents D2 with D3.

Re Item VII

Certain defects in the international application

- 1 Although claim 1 is drafted in the two-part form, some features are incorrectly placed in the characterising portion, as it is disclosed in *D1* in combination with the features placed in the preamble.
- 2 Independent claims 197 and 203 are not in the two-part form, which in the present case would be appropriate, with those features known in combination from the prior art D1 being placed in the preamble and the remaining features being included in the characterising part.
- 3 The features of the claims are not provided with reference signs placed in parentheses.
- 4 The relevant background art disclosed in *D1* is not mentioned in the description, nor is this document identified therein.

Re Item VIII

Certain observations on the international application

- 1 Claim 127 is not clear.
Claim 127 discloses a coffee beverage system comprising the coffee brewing apparatus as defined in any of the preceding claims, but the preceding claims

disclose a coffee beverage system and not a coffee brewing apparatus. It is therefore not clear which technical features disclose the coffee brewing apparatus as defined in any of the preceding claims, therefore claim 127 could not be searched.

- 2 Claim 180 is not clear.
Claim 180 discloses a coffee beverage system comprising the coffee brewing apparatus as defined in any of the claims 1 - 138, but the claims 1 - 138 disclose a coffee beverage system and not a coffee brewing apparatus. It is therefore not clear which technical features disclose the coffee brewing apparatus as defined in any of the claims 1 - 138, therefore claim 180 could not be searched.
- 3 As explained below, some of the features in the cartridge claims 139 and 165 relate to a method of using the cartridge rather than clearly defining the cartridge in terms of its technical features. The intended limitations are therefore not clear from these claims. Claims 139 and 165 could for this reason not be searched.
The statement "for use with the coffee beverage system according to any of the claims ..." does not enable the skilled person to determine which technical features are necessary to perform the stated use.
- 4 Although claims 186, 191 and 195 have been drafted as separate independent claims, they appear to relate effectively to the same subject-matter and to differ from each other only with regard to the definition of the subject-matter for which protection is sought and/or in respect of the terminology used for the features of that subject-matter. The aforementioned claims therefore lack conciseness.
- 5 Although claims 197 and 203 have been drafted as separate independent claims, they appear to relate effectively to the same subject-matter and to differ from each other only with regard to the definition of the subject-matter for which protection is sought and/or in respect of the terminology used for the features of that subject-matter. The aforementioned claims therefore lack conciseness.