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(54) **COFFEE CAPSULE FILLING MACHINE**

KAFFEEKAPSEL BEFÜLLUNGSMASCHINE

MACHINE DE REMPLISSAGE DE DOSETTES POUR CAFÉ

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Description

TECHNICAL APPLICATION

[0001] The current invention refers to a coffee capsule maker device for domestic or for a small-scale use that allows consumers to prepare coffee in the best conditions and with the best quality.

TECHNICAL STATUS

[0002] Machines that prepare coffee or other infusions from capsules in which boiling water is introduced, and from which it is subsequently extracted are known in the state of the art. The most known ones are the *Nespresso* commercial brand.

[0003] The capsules are commercialized in batches prepared and packed several days or weeks before, which requires its packaging in a protective atmosphere, and generally, it is made from coffee that was previously ground. An example is shown in ES2452215. This solution makes the machines complicated, not suitable for domestic use and that quality of the coffee is not optimal.

[0004] From US2007144356 it is known a machine for packaging coffee in capsules, which solves part of this problem, but without automating the manufacture of the capsules, so that its managing is complicated, and that requires other devices to perform the rest of operations.

[0005] From WO2009080383 -A1 is known a device for filling and closing individual metering containers for automatic beverage dispensers, particularly coffee machines, comprising filling material, particularly coffee. The device comprises a filling station for filling a metering cup with the filling material, and a sealing station for closing the filled metering cup, wherein a shaft is provided, which is connected to a drive for creating a predetermined rotational angle of the shaft and to the filling station and the sealing station via a gearbox.

[0006] Document CN203970134U reveals a coffee bean grinder and a coffee capsule manufacturing combination device that comprises a base plate, a grinding device fixed on the base plate and a sealing device. The grinding device comprises a grinding machine frame, a coffee funnel and a filtering groove. The coffee funnel is fixed on the grinding machine frame. A grinding rod is arranged in the coffee funnel. The lower end of the coffee funnel is connected with a filtering groove.

[0007] A coffee capsule maker is therefore required that allows and automatic and controlled manufacture of coffee capsules, with the best hygienic and quality conditions.

SHORT ESPECIFICATION OF THE INVENTION

[0008] The objectives of the invention are achieved by a coffee capsule maker according to claim 1. Dependent claims 2-11 represent further advantages.

[0009] It is about a small electrical household appli-

ance which combines coffee grinding with packaging of commercial-type capsules for use in domestic coffee makers that used said capsules.

[0010] For this purpose, the coffee capsule maker comprises a rotating carousel with at least one capsule hitch that goes through a capsule deposit, a coffee grain deposit with a coffee grinder in its lower part, a capsule cover deposit with a sealing piston having an electrical resistance for sealing the capsule cover on the capsule and an extracting window with means for releasing the capsule from the hitch. As is evident to a person skilled in the art, the part of the deposit that the carousel goes through will be the lower part, for taking an element or a certain amount of content. As the case, extractor elements of the content will be arranged to assure that the quantity extracted is correct (a capsule, a predetermined amount of coffee, a capsule cover).

[0011] The coffee capsule maker may comprise a panel with at least one pilot and an on/off button, to which a programming button for the number of capsules to be prepared and a screen may be added.

[0012] If you wish a larger coffee, a sealing piston may be arranged to slightly press the coffee into the capsule.

[0013] The housing of the coffee capsule maker will preferably be cylindrical, and preferably dismountable to facilitate its maintenance and cleaning.

[0014] The main movable rotating elements, the carousel and the coffee grinder are activated by a common shaft with different gears. Preferably, one of them will be a master gear or a drive gear that coordinates, activates or allows the operation of the different element.

[0015] The master gear can be made as a disc similar in size to the carousel and concentric to it on an upper plane, which has at least a hole that can be aligned in the rotation of the master gear according to its axis with the pistons, which have a down drive spring. The set of gears will assure that when the capsule carried by the carousel passes below the corresponding piston, the master gear has a hole. A retraction guide of the pistons will be placed slightly behind each hole.

[0016] The elements of the invention will be more conveniently explained in the following sections of the report.

DESIGN DESCRIPTION

[0017] For a better comprehension of the invention, the following figures are included:

Figure 1: corresponds to an exploded view of an embodiment.

Figure 2: correspond to a section of the embodiment of the previous figure.

Figure 3: a detail of the lower part of the coffee deposit is shown, specially the master gear, the nozzle and the carousel.

MANNERS TO MAKE THE INVENTION

[0018] The following is a brief description of an embodiment of the invention, as an illustrative and non-limiting example thereof.

[0019] The coffee capsule maker shown in the embodiment of the figures comprises a housing 1, which has been represented cylindrical because it is the most compact design, which has three deposits 2, 3, 4: a coffee deposit 2, a deposit of prefabricated capsules without cover deposit 3, and a capsule cover deposit 4. Alternatively, the capsule cover deposit 4 can be replaced with a suitable multilayer material roll, from which the capsule covers will be cut when applied to the capsules without a cover. Each deposit 2, 3, 4 may have its own top closure or a common closure, as shown in figure 1.

[0020] The coffee deposit 2 is prepared for coffee grain, for which it has a small coffee grinder 5 in its lower part, with an optional gate between them. The coffee will be ground per unit of capsule, so that it is stored immediately in the same with the maximum aroma.

[0021] In a plane below the deposits 2, 3, 4 there is placed a carousel 6 with at least one hitch 7 for capsules. This hitch 7, with the rotation of the carousel 6, will go consecutively passing below the deposits 2, 3, 4, taking a capsule, filling it with coffee and closing and sealing the capsule cover. Finally, the carousel 6 will place the hitch 7 in the extracting position of the closed capsule. If the arch which has been gone through between the coffee filling and the capsule extraction is less than 180°, it will be allowed to place two hitches 7 in the carousel 6.

[0022] The coffee capsule maker also has two pistons 8, 9 with spring, a pressing piston 8 to press lightly the coffee inside the capsule (optional) before placing and sealing the capsule cover, and a sealing piston 9 to tighten the cover against the capsule, and through an electric resistance, produce a partial fusion of the material and heat sealing of the capsule. If the capsule covers are provided from a roll, the temperature reached by the sealing piston 9 will be somewhat higher to perform the capsule cover cut.

[0023] After passing by the sealing piston 9, the capsule will be taken to an extracting window 10 which comprises means for releasing the capsule from the hitch 7. These may be a pusher or a ramp capable that forces the capsule out of the hitch 7.

[0024] Therefore, the hitch 7 will consecutively go through the capsules deposit 3, from which it takes the lower capsule, the coffee grain deposit 2 (downstream the coffee grinder 5), the capsule cover deposit 4 with the sealing piston 9 and the extracting window 10.

[0025] The carousel 6 and the coffee grinder 5 may comprise a common shaft 11 driven by one or two electric motors 12 and a set of gears 13, generally planetary gears, to coordinate the action of the pistons 8, 9 and of other elements with the carousel 6. This way it will be possible to stop the rotation of the coffee grinder 5 at the moments when it is not necessary to take coffee from

the coffee deposit. To do it, the coffee capsule maker will disconnect the coffee grinder 5 from the shaft 11 when enough coffee has been ground, generally measured by the time elapsed.

[0026] To coordinate the capsule movements with the different elements of the coffee capsule maker, it can be defined in the gears a master gear 14 or a dragging gear, that drives or allows the operation of the different elements. To do this, the master gear will have holes 15 and guides 16 for activating pistons 8, 9 to allow their activation by the correspondent spring and their retraction. The hole 15 will allow the passage of the piston 8, 9 pushed down by the spring, while the guide 16 will retract the piston 8, 9 for its next action and will allow the master gear 14 to follow its rotation.

[0027] This master gear 14 will also assure the ground coffee supply to the capsule. The coffee falls through a nozzle 17 made in the base of the coffee deposit 2, after the coffee grinder 5, and ends centered in the capsule. This nozzle 17 can be provided with a little shutter (not illustrated). Preferably, part of this nozzle 17 will correspond to the master gear 14 so that discharge is allowed only when the capsule it is situated on the right position. Likewise, a hole 15 has to be rightly positioned on the capsule to allow the passing through of the coffee.

[0028] The invention will preferably have a control unit (not illustrated) to manage its operation and a panel with buttons, pilots and screens to properly program and monitor the operations. For example, it may comprise a pilot (usually LED) to turn on, a button to start up and another one to program the number of capsules to prepare (for example between 1 and 6). The pilot to turn on the device may comprise an intermittence code to indicate operational errors, or it may be provided with a second button. A screen, for example LCD, will include error messages ("lack of covers", "lack of capsules", "carousel blocked", etc.). Other pilots or codes may be included to indicate the grinding process, the sealing process, etc. The electronic circuit where the control unit is installed has several positioning sensors for the carousel and for the condition of the deposits.

[0029] It's preferable that the top part of the housing 1 is easily dismountable for cleaning the coffee powders or plastic remains from the heat sealing operation.

[0030] The assembly will preferably be connected to a power outlet (not illustrated). Its mechanism and operation can be incorporated in other type of compact coffee machines.

Claims

1. A coffee capsule maker comprising a rotating carousel (6) with at least one capsule hitch (7), a capsule deposit (3), a coffee deposit (2), a capsule cover provider having a sealing piston (9), and an extracting window (10) with means for releasing the capsule from the hitch (7), wherein the rotating carousel (6)

goes through consecutively the capsule deposit (3), the coffee deposit (2), the capsule cover provider and the extracting window (10), **characterized in that** the coffee deposit (2) is a coffee grain deposit with a coffee grinder (5) in its lower part, wherein the rotating carousel (6) and the coffee grinder (5) are activated by a common shaft (11); and **in that** the sealing piston (9) has an electrical resistance to seal the capsule cover on the capsule.

2. The coffee capsule maker according to the previous claim, wherein it has a set of gears (13) with a master or drive gear (14) with similar size as the carousel (6), concentric and on top of it, which operates or allows the operation of the different elements of the coffee capsule maker.
3. The coffee capsule maker according to the previous claim, comprising a pressing piston (8) to press the ground coffee inside the capsule and wherein the master gear (14) has at least a hole (15) that can be aligned in the rotation of the carousel (6) with the pressing piston (8) and with the sealing piston (9), the pistons (8, 9) having a down drive spring.
4. The coffee capsule maker according to the previous claim, wherein the coffee capsule maker has a retraction guide (16) of the pistons (8, 9) for each hole (15).
5. The coffee capsule maker according to any one of the previous claims, wherein the capsule cover provider is a capsule cover deposit (4).
6. The coffee capsule maker according to any one of claims 1 to 4, wherein the capsule cover provider comprises a multilayer material roll from which the coffee cover is cut and applied on the coffee capsules without cover, and wherein the sealing piston (9) is able to reach a temperature to produce the cut of said cover.
7. The coffee capsule maker according to any one of the previous claims that comprises a panel with at least one pilot and an on/off button.
8. The coffee capsule maker according to the previous claim, wherein the panel further comprises a programming button for the number of capsules to prepare.
9. The coffee capsule maker according to any one of claims 8 and 9, wherein the panel further comprises a screen.
10. The coffee capsule maker according to any one of the previous claims, wherein it comprises a cylindrical housing (1).

11. The coffee capsule maker according to any of the previous claims, wherein it has a dismountable housing (1).

Patentansprüche

1. Kaffee kapselmaschine umfassend ein rotierendes Karussell (6) mit mindestens einem Kapselhaken (7), eine Kapselablagerung (3), eine Kaffeeablagerung (2), einen Kapseldeckelversorger aufweisend einen Dichtungskolben (5), und ein Ausziehfenster (10) mit Mitteln zum Freisetzen der Kapsel aus dem Haken (7), wobei das rotierende Karussell (6) hintereinander durch die Kapselablagerung (3), die Kaffeeablagerung (2), den Kapseldeckelversorger und das Ausziehfenster (10) geht, **dadurch gekennzeichnet, dass** die Kaffeeablagerung (2) eine Kaffeebohnenablagerung mit einer Kaffeemühle (5) in deren unteren Teil ist, wobei das rotierende Karussell (6) und die Kaffeemühle (5) von einer gemeinsamen Welle (11) aktiviert werden; und dass der Dichtungskolben (9) einen elektrischen Widerstand aufweist, um den Kapseldeckel auf der Kapsel abzudichten.
2. Kaffee kapselmaschine nach dem vorhergehenden Anspruch, wobei sie einen Satz von Getriebeeinheiten (13) mit einem Haupt- oder Antriebsgetriebe (14) mit einer ähnlichen Größe wie das Karussell (6), konzentrisch und darauf, aufweist, welches die unterschiedlichen Elemente der Kaffee kapselmaschine betreibt oder den Betrieb derselben erlaubt.
3. Kaffee kapselmaschine nach dem vorhergehenden Anspruch, umfassend einen Preßkolben (8) zum Pressen des gemahlten Kaffees innerhalb der Kapsel und wobei das Hauptgetriebe (14) mindestens ein Loch (15) aufweist, welches bei der Rotation des Karussells (6) mit dem Preßkolben (8) und mit dem Dichtungskolben (9) ausgerichtet werden kann, wobei die Kolben (8, 9) eine Abwärtsantriebsfeder aufweisen.
4. Kaffee kapselmaschine nach dem vorhergehenden Anspruch, wobei die Kaffee kapselmaschine eine Rückzugsführung (16) der Kolben (8, 9) für jedes Loch (15) aufweist.
5. Kaffee kapselmaschine nach einem der vorhergehenden Ansprüche, wobei der Kapseldeckelversorger eine Kapseldeckelablagerung (4) ist.
6. Kaffee kapselmaschine nach einem der Ansprüche 1 bis 4, wobei der Kapseldeckelversorger eine Rolle aus Mehrschichtmaterial umfasst, aus welcher der Kaffeedeckel geschnitten wird und auf den Kaffee kapseln ohne Deckel aufgebracht wird, und wobei

der Dichtungskolben (9) in der Lage ist, eine Temperatur zu erreichen, um den Schnitt des genannten Deckels zu erzeugen.

7. Kaffee kapselmaschine nach einem der vorhergehenden Ansprüche, welche eine Tafel mit mindestens einer Leuchte und einen Ein-/Ausschaltknopf umfasst. 5
8. Kaffee kapselmaschine nach dem vorhergehenden Anspruch, wobei die Tafel zusätzlich einen Programmierknopf für die Anzahl von zu bereitstellenden Kapseln umfasst. 10
9. Kaffee kapselmaschine nach einem der Ansprüche 8 und 9, wobei die Tafel zusätzlich einen Bildschirm umfasst. 15
10. Kaffee kapselmaschine nach einem der vorhergehenden Ansprüche, wobei sie ein zylindrisches Gehäuse (1) umfasst. 20
11. Kaffee kapselmaschine nach einem der vorhergehenden Ansprüche, wobei sie ein abbaubares Gehäuse (1) aufweist. 25

Revendications

1. Fabricant de capsule de café comprenant un carrousel (6) rotatif avec au moins un attelage (7) de capsule, un dépôt (3) de capsule, un dépôt (2) de café, un fournisseur de couvercles de capsules ayant un piston (9) d'étanchéité, et une fenêtre (10) d'extraction avec des moyen pour libérer la capsule de l'attelage (7), dans lequel le carrousel (6) rotatif passe consécutivement à travers le dépôt de capsule, le dépôt (2) de café, le fournisseur de couvercles de capsules et la fenêtre (10) d'extraction **caractérisé en ce que** le dépôt (2) de café est un dépôt de grains de café avec un moulin (5) à café dans sa partie inférieure, dans lequel le carrousel (6) rotatif et le moulin (5) à café sont activé par un arbre (11) commun; et **en ce que** le piston (9) d'étanchéité a une résistance électrique pour étanchéifier le couvercle de capsule sur la capsule. 30 35 40 45
2. Fabricant de capsules de café selon la revendication précédente, dans lequel il a un ensemble (13) d'engrenages avec un pignon-étalon (14) ou engrenage d'entraînement avec une dimension similaire au carrousel (6), concentrique et sur sa partie supérieure qui favorise ou permet l'opération des différents éléments du fabricant de capsules de café. 50
3. Fabricant de capsules de café selon la revendication précédente, comprenant un piston (8) de pression pour presser le café moulu au sein de la capsule et 55

dans lequel le pignon-étalon (14) a au moins un trou (15) qui peu être aligné dans la rotation du carrousel (6) avec le piston (8) de pression et avec le piston (9) d'étanchéité, les pistons (8, 9) ayant un ressort d'entraînement déprimé.

4. Fabricant de capsules de café selon la revendication précédente, dans lequel le fabricant de capsules de café a un guide (16) de rétraction des pistons (8, 9) pour chaque trou (15).
5. Fabricant de capsules de café selon l'une quelconque des revendications précédentes, dans lequel le fournisseur de couvercles de capsules est un dépôt de couvercles de capsules (4).
6. Fabricant de capsules de café selon l'une quelconque des revendications 1 à 4, dans lequel le fournisseur de couvercles de capsules comprend un rouleau de matière multicouche à partir duquel le couvercle de café est coupé et appliqué sur les capsules de café sans le couvercle, et dans lequel le piston (9) d'étanchéité est apte à atteindre une température de production d'une coupe de ladite couvercle.
7. Fabricant de capsules de café selon l'une quelconque des revendications précédentes qui comprend un panneau avec au moins une veilleuse et un bouton de mise en marche-arrêt.
8. Fabricant de capsules de café selon la revendication précédente, dans lequel le panneau comprend en outre un bouton de programmation pour le nombre de capsules à préparer.
9. Fabricant de capsules de café selon l'une quelconque des revendications 8 et 9, dans lequel le panneau comprend en outre un écran.
10. Fabricant de capsules de café selon l'une quelconque des revendications précédentes, dans lequel il comprend un logement (1) cylindrique.
11. Fabricant de capsules de café selon l'une quelconque des revendications précédentes, dans lequel il a un logement (1) démontable.

FIGURES

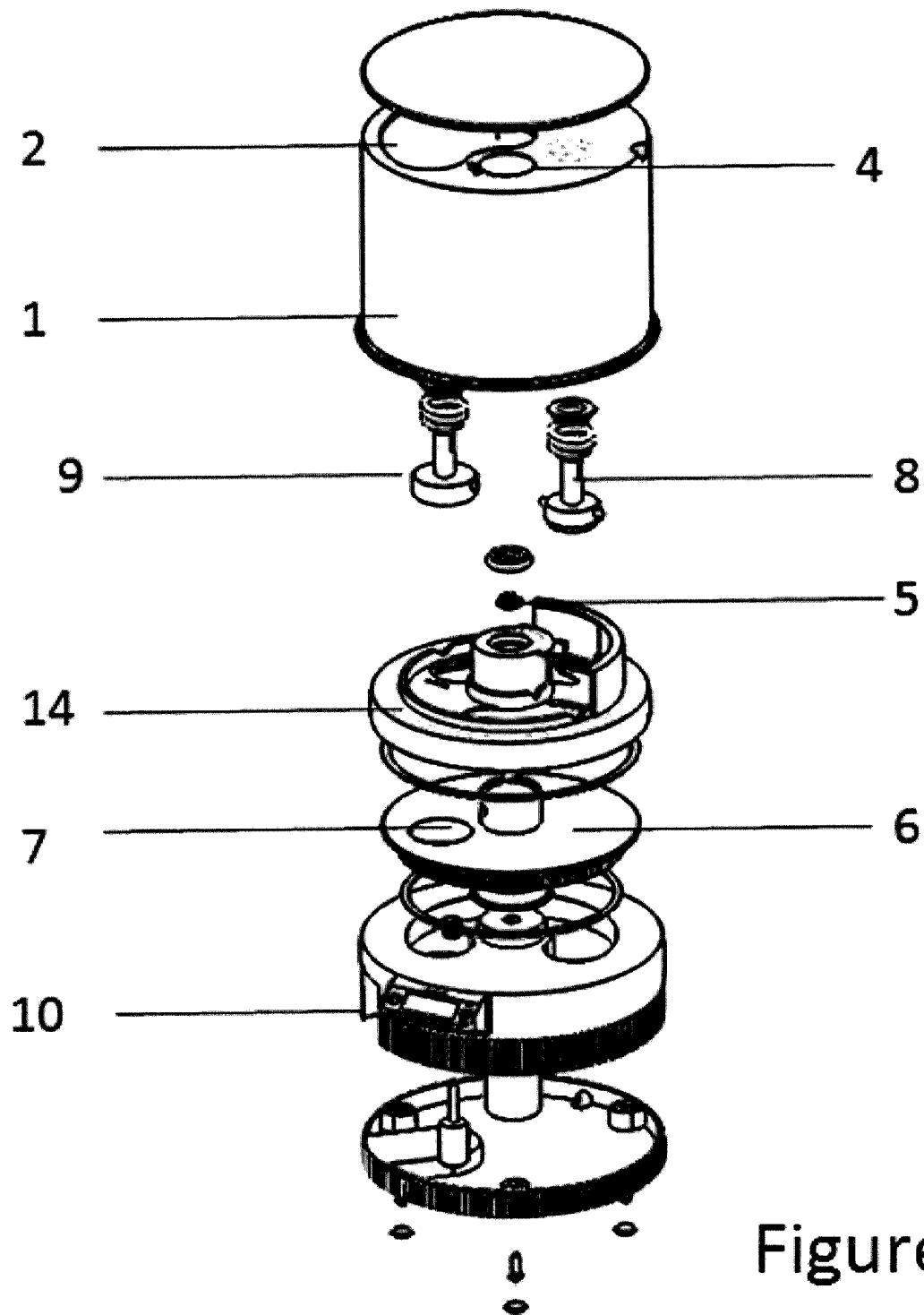


Figure 1

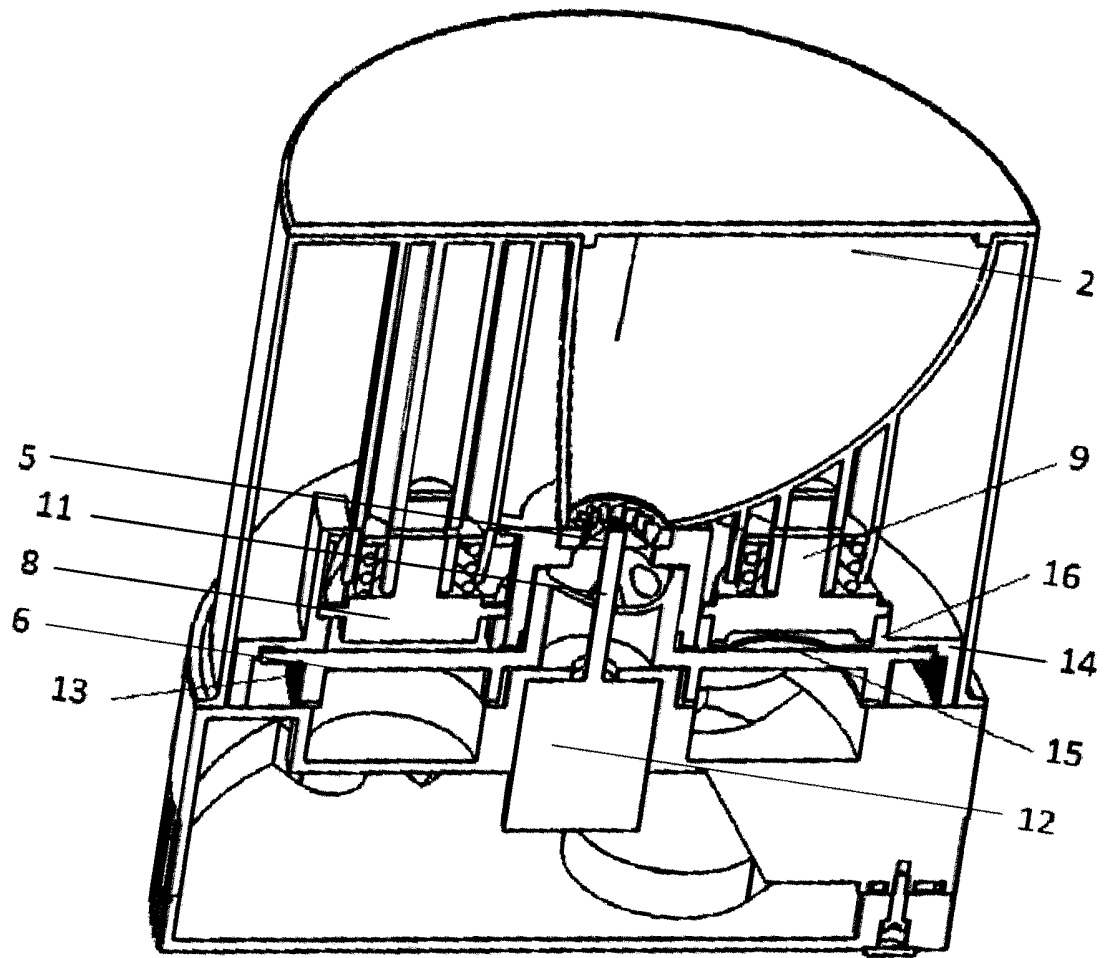


Figure 2

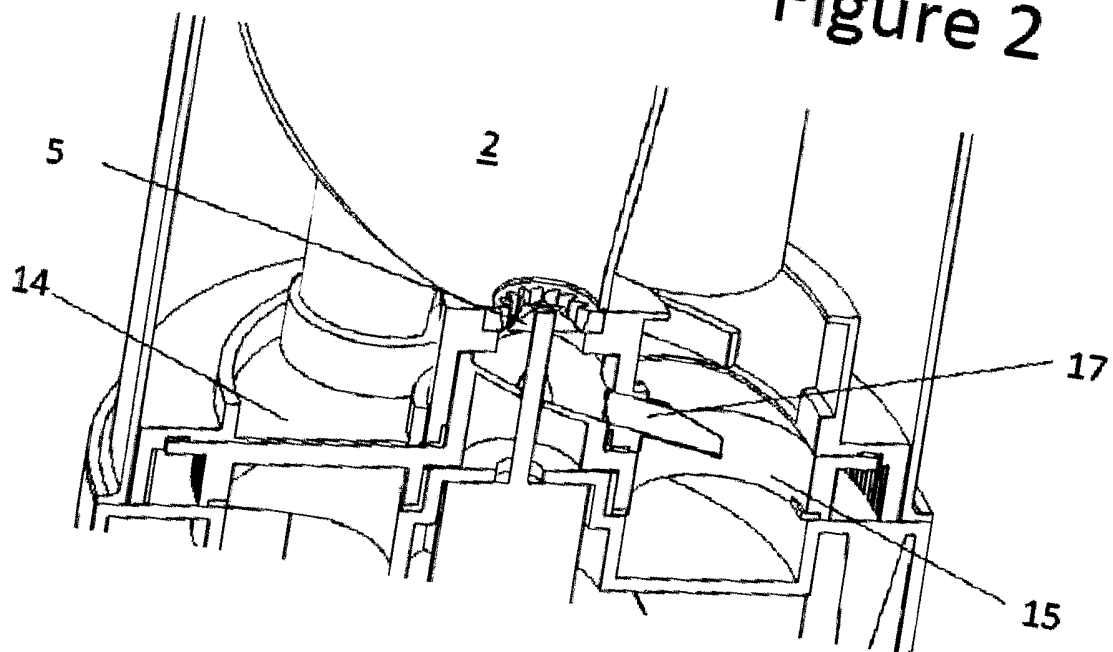


Figure 3

REFERENCES CITED IN THE DESCRIPTION

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