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(54) COFFEE CAPSULE FILLING MACHINE

(57) **The invention consists of a coffee capsule maker, a little electro household device which combine grounding coffee with packing capsules, commercial packing type, to use it on domestic coffee makers appliances for its similitude with the same commercialized type of capsules.**

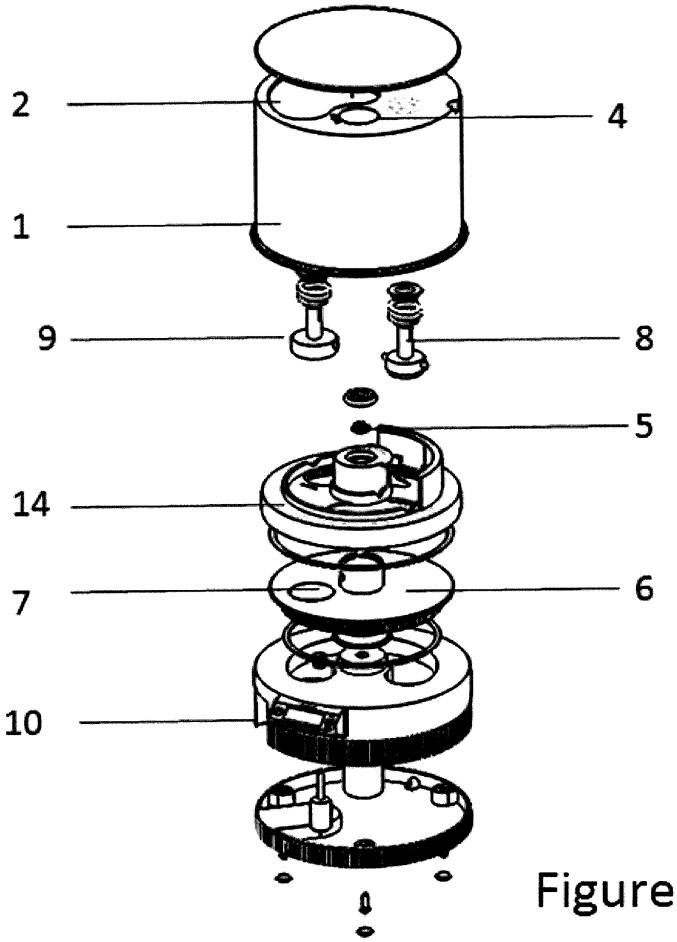

Figure 1

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Description

TECHNICAL APLICATION

[0001] The current invention refers to a coffee capsule maker device for domestic use or for a small scale use, which allows preparing coffee in the best conditions with the best quality.

TECHNICAL STATUS

[0002] There are known in the technical status, devices that prepare coffee or other infusions using capsules, introducing boiled water in it and extracting it later on.

[0003] The most known ones are the Nespresso commercial brand.

[0004] The capsules are commercialized in prepared batches and packed many days or weeks before, which requires its packaging in protective atmosphere, and generally, it's made by ground coffee. An example is ES2452215. This solution makes the device being complicated, no suitable for domestic use and no optimal coffee quality is obtained.

[0005] About US2007144356, it is known like a capsule packing coffee device, which solve a part of this problem, but without automating the capsules fabrication, that's why its managing is complicated and asks other devices to do the rest of operations.

[0006] So, that's why it is necessary a coffee capsule maker, to permits the automatic and controlled fabrication of the coffee capsules, on the best hygienically and qualitative conditions.

SHORT ESPECIFICATION OF THE INVENTION

[0007] The invention consists of a coffee capsule maker, such as the claims.

[0008] It is about a little electrohousehold device which combine grounding coffee with packing capsules, commercial packing type, to use it on domestic coffee makers that are using the same commercialized type of capsules.

[0009] The coffee capsule maker contains a rotating carrousel with at least one capsule hitch that goes through a capsule deposit, a grain coffee deposit with a coffee grinder on the bottom, a capsule cover deposit with a sealing piston possessing an electrical resistance to seal de capsule cover and an extracting window with means for releasing the capsule from the hitch. Obviously, for an expert, the deposit part which the carrousel goes through will be on the lower part, for picking up an element or a certain amount of content. As the case, there are arranged content extractor elements to assure a correct quantity extracted (a capsule, a certain amount of coffee, a capsule cover).

[0010] The coffee capsule maker could contain a panel with at least one pilot and an on/off button, and to this panel it could be added a selecting button for the number of capsules to prepare, and a screen panel.

[0011] If you wish a larger coffee, it can be disposed a sealing piston to easily press de coffee within the capsule.

[0012] The device housing will be preferably cylindrical and if it is possible removable to facilitate maintenance and cleaning.

[0013] The principal movable rotating elements, the carrousel and the coffee grinder, could be activated by the same axis with different gears. Preferable, one of those would be a master gear or a dragging gear to coordinate, activate or permit the function of each different element.

[0014] The master gear could be made as a disc like the carrousel disc's size and concentric with it on an upper plane, and possessing at least a hole alienable on the master gear rotation, as its axis with the pistons requires, which ones are getting a down drive spring. The gear units will assure that when the capsule carried by the carrousel passes under the correspondent piston, the master gear will have to dispose of a hole. Slightly behind of every hole it will be placed a retraction guide of the pistons.

[0015] The invention elements will be more conveniently explained on the next sections of the report.

DESIGN DESCRIPTION

[0016] For a better comprehension of the invention, the next 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: it shows a detail from the lower part of the coffee deposit, specially the master gear, the nozzle and the carrousel.

MANNERS TO MAKE THE INVENTION

[0017] Next we pass to shortly describing a manner of making the invention, like for example illustrative, but not limitative of it.

[0018] The coffee capsule maker illustrated in those figures contents a device housing (1), which is cylindrical represented for being the design more compact, and possess three deposits (2,3,4): a coffee deposit (2), a prefabricated capsules without cover deposit (3), and a coffee cover deposit (4). The coffee cover deposit (4) can be alternative replaced by an adequate multilayer material roll, from which the coffee cover will be cut and immediately applied on the no covered coffee capsules. Each one of the coffee deposits will have its own top closure or it can be disposed a common closure, like the one illustrated on the figure 1.

[0019] The coffee deposit (2) is prepared for grain coffee, that's why it possesses a little coffee grinder (5) on

the bottom, like an optional gate between two of them. The coffee will be grinded for any capsule unit and stored immediately within, conserving at maximum the coffee aroma.

[0020] At the bottom of deposits (2, 3, 4,), it is placed a carrousel (6) with at least one hitch (7), for capsules. This hitch (7), with the carrousel rotation (6), will consecutively passing bellow the deposits (2, 3, 4), picking up a capsule, coffee filling it, closing and sealing the capsule cover. Finally the carrousel (6) will place the hitch (7) on the sealed capsule extracting position. If the rotating movement between filling the coffee deposit (5) and the capsule extraction is less than 180º, it will be allowed to place two hitches (7) on the carrousel (6).

[0021] The coffee capsule maker shall also possess two spring pistons (8, 9), a clamping piston (8) to easily press the coffee within the capsule (optional) before placing and sealing the capsule cover, and a sealing piston (9) to tight the cover on the capsule, and getting through an electric resistance, to produce a partial fusion of the material and the capsule heat sealing.

[0022] If the capsule covers are roll provided, the piston temperature will reach major levels, to cut the capsule cover.

[0023] After passing by the sealing piston (9), the capsule will go to an extracting window, which has means to drop the capsule from the hitch (7). Those ones could be a pusher or a ramp capable to force the capsule getting off from the hitch.

[0024] So on, the hitch (7) will consecutively go through the capsules deposit from where it takes the lower capsule, the grain coffee deposit(2) (we have water below the coffee grinder(5)), the capsule covers deposit (4) with the sealing piston (9) and the extracting window (10).
The carrousel (6) and the coffee grinder could have a common axis (11) activated by one or two electric engines (12) and a gear unit (13), generally planetariums, to coordinate the pistons activity (8, 9) and of the others elements with the carrousel(6). This way it could be stopped the grinding coffee (5) rotation precisely when it has to stop recollecting coffee from the coffee deposit. To do it, the coffee capsule maker device will disconnect the coffee grinder from the axis (11) when enough coffee is already grinded, generally measured by the elapsed time.

[0025] To coordinate the capsule movements with the coffee capsule maker device different elements, it has to be defined a master gear (14) or a dragging gear, which is acting to allow different elements activity. For this reason, the master gear will have holes (15) and guides (16) to activate pistons (8, 9), to allow its action to the correspondent spring and its retraction. The hole (15) will allow the piston (8, 9) passing through, driven down by the spring, while the guide will retract the piston (8, 9) for its next performance and will allow the master gear to follow its rotation.

[0026] This master gear (14) also will assure the ground coffee supply of the capsule. The coffee will get out through a nuzzle (17) situated on the coffee deposit base (2), back to the coffee grinder (5), and finally centered within the capsule. This nozzle (17) can be provided by a little shutter (not illustrated). Preferably, part of this nozzle (17) will correspond to the master gear (14) in such manner that discharge is allowed only when the capsule it is situated on the right position. In the same time it has to be right positioned a hole (15) over the capsule to allow the coffee passing through.

[0027] The invention will have a control unit (not illustrated) to manage its operation and a button panel, pilots and programming displays and screen panel to program and look out to an accurate operation. For example, it should be situated a pilot (usually LED) to turn on, a button to start up and another one to program capsules number to prepare (for example between 1 and 6). The pilot to turn on the device may have an intermittence code to sign operational errors, or it could be provided by another button. A screen panel (for example LCD), will include error messages ("no cover", "no capsule", "carrousel locked", etc.) It could be included other pilots or codes to sign the grinding process, the sealing process... The electronic circuit where the control unit is installed has 20 different positioning sensors of the carrousel and deposits placement. It's preferable the device housing top to be easily removable for cleaning of coffee or plastic remains from heat sealing operation. The device will be connected to an electric plug (not illustrated). Its mechanism and operation can be incorporated on other type of compact coffee devices too.

Claims

1. The coffee capsule maker contains a rotating carousel (6) with at least one capsule hitch (7) that goes through consecutively:

   a capsule deposit (3);
   a grain coffee deposit (2) with a coffee grinder (5) on the lower part;
   a capsule cover deposit (4) with a sealing piston (5) that it has an electrical resistance to seal de capsule cover;
   an extracting window (10) with means for releasing the capsule from the hitch (7).

2. The coffee capsule maker, according to the claim no. 1, contains a panel with at least one pilot and an on/off button.

3. The coffee capsule maker's panel, according to the anterior claim, also includes a programming button for the number of capsule to prepare.

4. The coffee capsule maker's panel, according to the claims no. 2 and 3, also includes a screen panel.

5. The coffee capsule maker, according to the anterior claims, contains a pressing plunger (8) used to slightly press the coffee ground inside the capsule.

6. The coffee capsule maker, according to the anterior claims, is covered by a cylindrical housing (1).

7. The coffee capsule maker's housing (1), according to the anterior claims, is dismountable.

8. The coffee capsule maker's coffee grinder (5), according to the anterior claims, shares its axis (11) with the carrousel (8).

9. The coffee capsule maker, according to the anterior claim, has a gear units (13) with a master or drive gear (14), with the same size as the carousel (6), concentric and on top of it, which operates or allows to operation of the different elements.

10. The coffee capsule maker's master gear (14), according to the anterior claim, which possess at least a hole (15) alienable on the carousel's (6) rotation, with the pistons (8, 9), which they have a down drive spring.

11. The coffee capsule maker, according to the anterior claim, has a retraction guide (16) of the pistons (8, 9) for every hole (15).

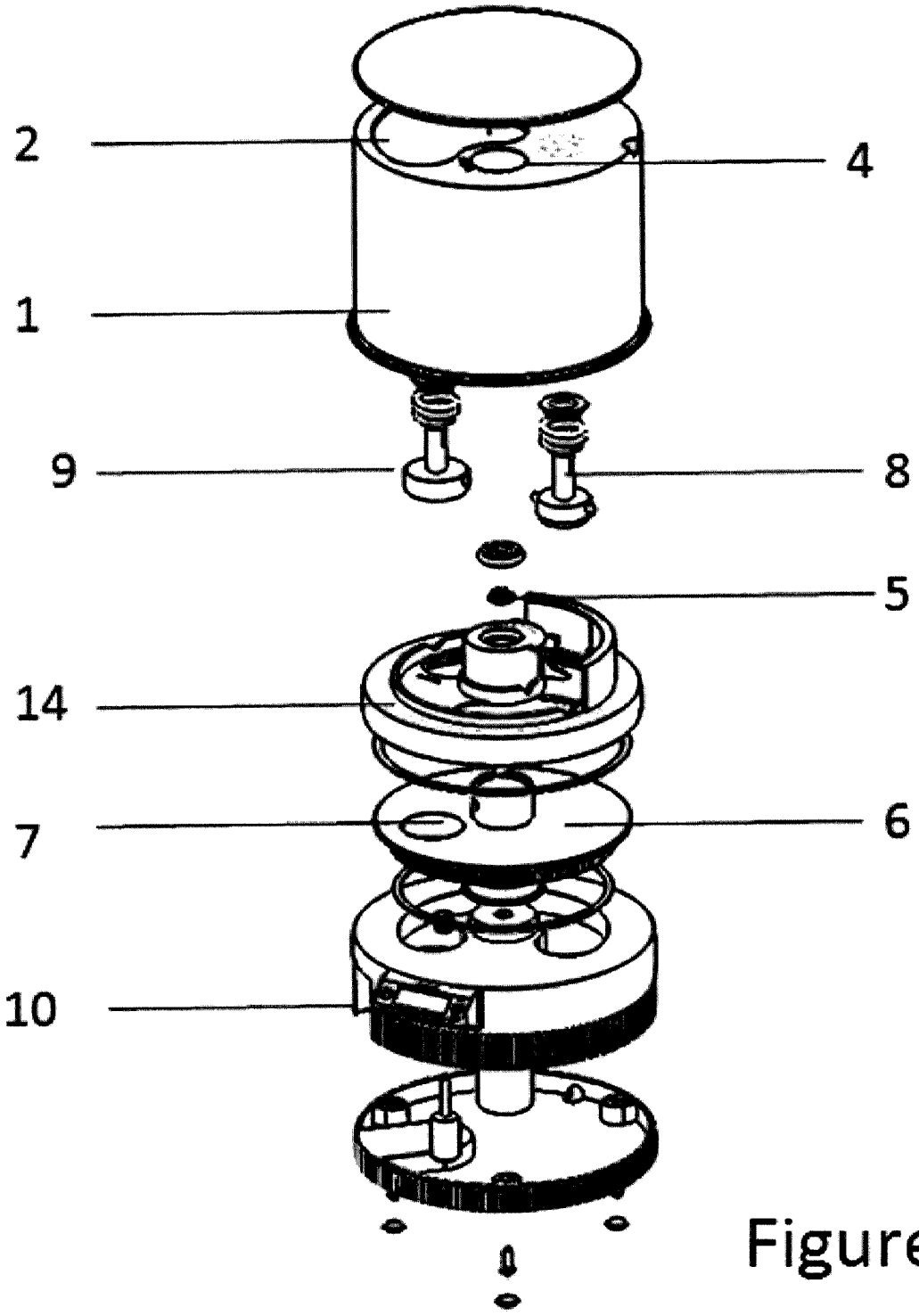

Figure 1

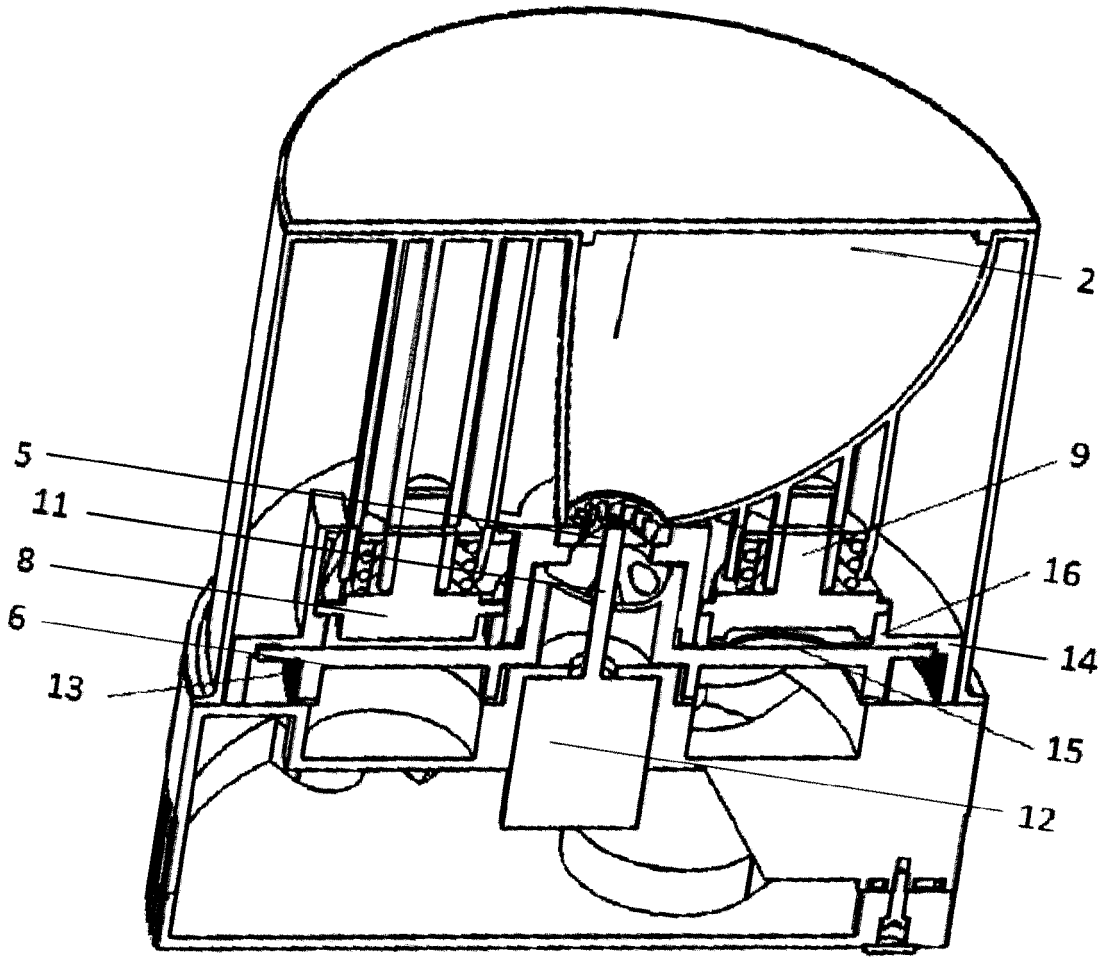

Figure 2

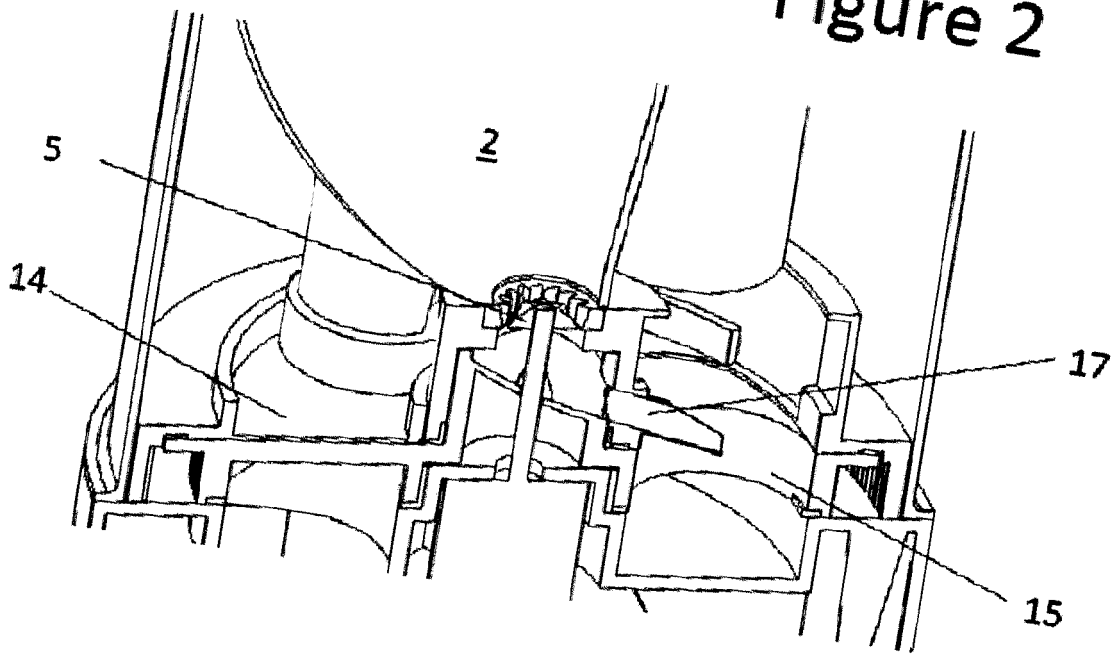

Figure 3

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EUROPEAN SEARCH REPORT

Application Number
EP 16 38 0001

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	WO 2009/080383 A1 (MAREK CHRISTIAN [AT]) 2 July 2009 (2009-07-02)	1-7	INV. B65B29/02
A	* page 8, line 7 - page 15, line 21 * * figures 7-11 *	8-11	B65B43/50 B65B59/04 B65B7/16
Y	CN 203 970 134 U (NINGBO BESTT ELECTRIC APPLIANCE CO LTD) 3 December 2014 (2014-12-03) * paragraph [0001] - paragraph [0017] * * figure 1 *	1-7	B65B7/28 B65B1/24
A	US 3 618 642 A (BEAULIEU JEAN-GUY) 9 November 1971 (1971-11-09) * column 1, line 71 - column 4, line 7 * * figures 1-3 *	1-11	

TECHNICAL FIELDS SEARCHED (IPC)

B65B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	15 March 2018	Rodriguez Gombau, F

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
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T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 16 38 0001

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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15-03-2018

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REFERENCES CITED IN THE DESCRIPTION

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- ES 2452215 **[0004]**
- US 2007144356 A **[0005]**