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(54) Title: DEVICE FOR EXTRACTING COFFEE GROUNDS AND FOR CLEANING THE FILTER HOLDER

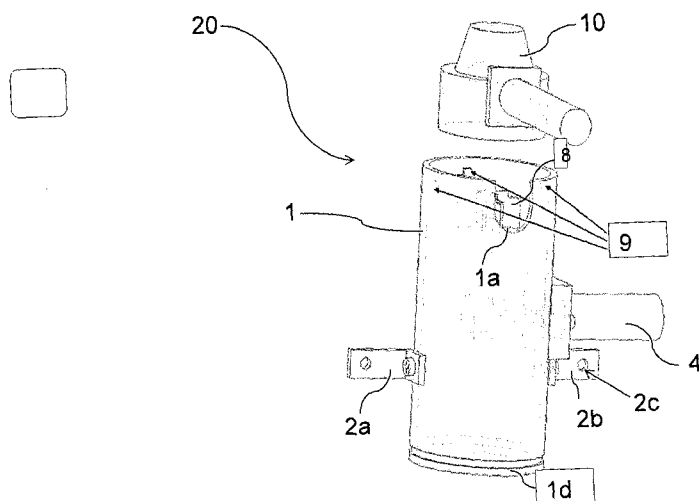


Fig.1

(57) Abstract: Device (20) for extracting coffee grounds and for cleaning the filter holder (10) comprising: an hollow cylindrical element (1); a motor (4) fixed on a side of the hollow cylindrical element (1) equipped with a first shaft (5); a transmission box (6) placed inside the hollow cylindrical element (1) and able to receive the first shaft (5) and transmitting the motion to a second shaft (7); an extraction element (8), mounted on the second shaft (7), comprising a blade having sectors (8a) and brush elements (8b); a photodetector system (9), placed inside the hollow cylindrical element (1), above the extraction element (8), configured to activate the motor (4) when the filter holder (10) is located inside the hollow cylindrical element (1).

DESCRIPTION

Title: Device for extracting coffee grounds and for cleaning the filter holder

5 The present invention relates to a device for extracting the ground coffee from the filter holder, in particular for automatically extracting the ground coffee from the filter holder of an espresso machines with a complete cleaning of the filter holder.

10 In the sector of espresso machines and other similar machines, it's very well known that the user prepares the coffee dose to be inserted in the filter holder, he compresses it and then inserts the filter holder inside the machine in order the coffee can be brewed into a cup. At the end of the coffee preparation, the user removes the filter
15 holder from the machine and let the ground coffee falls into a waste container after having hit, by hand, the filter holder against a wood element positioned in correspondence of the waste container. This operation involves some problems due to the number of times the coffee has to be prepared,
20 especially in restaurants and coffee bars, and to the fact that the filter holder is reused without cleaning it between a coffee and another one.

A first known solution to these problems is describes in the patent application EP1803380, published on July 4th, 2007, to
25 Da Silva and Campos da Costa, concerning a device for extracting ground coffee comprising the rotation of an extracting head determined only by the force exerted putting the filter holder on the head. Nevertheless, this solution solves only partially the above problems.

30 A second solution is described in the patent application WO2009127983, published on October 22th, 2009, to Ambrosini Marco, concerning an automatic device for extracting the ground coffee having an electric motor which can be activated by pressure actuators or electric actuators.

Even if this solution solves the problem of easy management and of the cleaning of the waste container of the espresso machines, it doesn't solve the problem of cleaning the filter holder and, in addition, it introduces the drawback of having
5 a motor inside the waste container, that's potentially dangerous for the user and difficult to be subjected to maintenance.

A third known solution for an automatic espresso and cappuccino machine is disclosed in the US patent N. 5,490,447
10 issued on February 13th, 1996 to Faema S.p.A. This patent describes an automatic espresso and cappuccino machine in which a number of individual filter units are movable with respect to a coffee filling station, a coffee dispensing station and a filter cleaning station. Four separate filter
15 units are carried by the filter indexing device and are selectively moved to each of the three stations mentioned above. Each of the filter units includes a filter holder having an open top or inlet, an outlet and a filter disc mounted between the inlet and outlet. After the espresso or
20 cappuccino is brewed at the coffee dispensing station, the filter indexing device moves each filter unit from the coffee dispensing station to a filter cleaning station having a rotatable and vertically reciprocating cleaning blade or auger, where the cake or layer of coffee grounds is removed
25 and allowed to fall by gravity into a waste container. Whereas the filter indexing device maintains the filter holder of each filter unit in an upright position at the coffee filling station and at the coffee dispensing station, each filter holder is turned upside down by the filter
30 indexing device in the course of movement to the filter cleaning station. In this inverted position, each filter holder is aligned with the cleaning blade or auger which is moved vertically upwardly into the interior of the filter holder and rotated to dislodge the cake or compacted ground
35 coffee therein. The movement of the cleaning blade is

associated to a motor. Then, the grounds fall by gravity into a waste container for disposal and the filter holder of each filter unit is returned to the upright position in the course of movement from the filter cleaning station to the coffee
5 filling station in preparation for another brewing operation. Even if this solution is advantageous under many aspects, the motor is activated manually when the filter holder comes into contact with the cleaning blade.

Another known solution is disclosed in the patent application
10 N. FR2840521 published on December 12th, 2003 to Yilmaz Ali and describes a filter holder cleaner consisting of a housing containing a rotary brush with surface and side bristles, and a hole for fitting it to the end of a drive motor shaft. The motor is located in a small inner housing on a support with
15 four vanes connecting it to the outer housing. When a filter holder is placed on the brush its handle depresses a spring-loaded switch that starts the motor and brush turning.

Even if this solution is more compact having the motor comprised inside the housing, continues to present the
20 problem that the motor is activated manually when the filter holder comes into contact with the brush and the side bristles.

Aim of the present invention is to provide a device for extracting coffee grounds and for cleaning the filter holder,
25 in particular activating the motor in a simple, fast and automatic way, reducing the fabrication costs and adaptable either to existing or to new machines.

According to the present invention a device for extracting coffee grounds and for cleaning the filter holder is
30 realized, as defined in the claim 1.

For a better understanding of the present invention a preferred embodiment is described, by way of non limitative example, referring to the accompanying drawings, in which:

- figure 1 is a three-dimensional view of a device for extracting coffee grounds and for cleaning the filter holder, according to the invention;

5 - figures 2a-2b are three-dimensional views of a hollow cylindrical element comprised in the device for extracting coffee grounds and for cleaning the filter holder, according to the invention;

10 - figure 3 is a three-dimensional view of a motor, a transmission box, two shafts and an extraction element coupled with the hollow cylindrical element comprised in the device for extracting coffee grounds and for cleaning the filter holder, according to the invention;

15 - the figure 4 is a three-dimensional detailed view of the motor and the extraction element coupled with the hollow cylindrical element comprised in the device for extracting coffee grounds and for cleaning the filter holder, according to the invention.

Referring to those figures, and, in particular, to the figure 1, a device 20 for extracting coffee grounds and for cleaning a filter holder of an espresso machine is shown, according to the invention. The device 20 comprises a hollow cylindrical element 1 having a slot 1a placed on its upper part able to allocate the handle of a filter holder 10 guiding its positioning on the device 20. The hollow cylindrical element 1 is equipped also with two L shaped brackets 2a and 2b mounted on opposite sides, each one having a hole 2c useful for fixing the cylindrical element 1 hollow cylindrical element 1 on a plane or walls. The brackets 2a and 2b are fixed, trough one side of the L shape, to the hollow cylindrical element 1 in correspondence of two holes 1c comprised laterally on opposite sides of the hollow cylindrical element 1. Trough a rotation of the other side of the L shape of the brackets 2a and 2b, the anchorage on a plane or on walls or on inclined surfaces can be allowed fixing.

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According to an aspect of the invention, the slot 1a is provided with brush elements, not showed, for removing a residual material from the filter holder 10.

5 According to another aspect of the invention, the slot 1a is provided with a gasket, not showed, able to limit the vibrations and to mitigate noise.

According to another aspect of the invention, the hollow cylindrical element 1 is metal or steel made.

10 The figures 2a and 2b show the hollow cylindrical element 1 in more details.

According to an aspect of the invention, the hollow cylindrical element 1 is equipped, in the inferior portion, with a socket 1d useful for coupling the hollow cylindrical element 1 to a container bag, not showed in the figure.

15 According to another aspect of the invention, the hollow cylindrical element 1 is equipped, on a side, with a first trough hole 1b having a second and a third trough holes 1e placed respectively at left and at right of the trough hole 1b, which are useful for fixing the hollow cylindrical element 1 to a motor 4.

20 As the figure 3 shows, the motor 4 is coupled to a first shaft 5 entering inside the hollow cylindrical element 1 via the trough hole 1b and placing perpendicularly to a central axis X of the hollow cylindrical element 1. A transmission box 6 is placed inside the hollow cylindrical element 1 so that it is able to receive the first shaft 5 and to transmit the motion to a second shaft 7 developing inside an upper part of the hollow cylindrical element 1 along the central axis X. An extraction element 8, being mounted on the second shaft 7, comprises a pallet having two or more sectors 8a, each one having a brush element 8b.

30 Advantageously, according to the invention, the pallet is shaped so that it can enter inside the filter holder 10, extracting the coffee grounds from all types of filter holders.

Advantageously, according to the invention, the brushing elements 8b, which are preferably positioned on the pallet periphery, clean the angular portions of the filter holder 10.

5 In addition, as shown in figure 1 and 2, a plurality of photodetectors 9 are placed inside the hollow cylindrical element 1, above the extraction element 8 and are configured for activating the motor 4 when the filter holder 10 is located inside the hollow cylindrical element 1 and becomes
10 able to be revealed.

According to an aspect of the invention, the motor 4 is a low voltage type motor.

The figure 4 shows a detailed view of the coupling of the motor 4 and the extraction element 8 with the transmission
15 box 6. More in particular, the first shaft 5 and the second shaft 7 are coupled with the transmission box 6 through conical wheels 11a and 11b, configured in a manner that the first shaft 5 transmits the motion to the second 7 inside the transmission box 6.

20 Advantageously, according to the invention, the conic wheels 11a and 11b allow the regulation of the laps of the motor to be transmitted to the extraction element 8 on respect of the rotation laps of the shaft 5.

On functioning, the user executes the first operation of
25 unfastening the handle of the filter holder 10 from the espresso machine and rotates it of 180° inverting the filter holder 10. Then, the user insert the handle of the filter holder 10 on the hollow cylindrical element 1, with its handle allocated in the slot 1a, so that the filter holder 10
30 is stacked on the extraction element 8. The presence of the handle of the filter holder 10 inside the hollow cylindrical element 1 is revealed by the system of photodetectors 9 which activates the motor 4. The motor 4 transmits the motion, via the shaft 5, to the transmission box 6 and, at the end, to
35 the shaft 7 connected to the extraction element 8.

Consequently, the extraction element 8 rotates and cleans the filter holder 10 through the movements of the brushing elements 8b. At the same time, the ground coffee is collected in a container bag that can be substituted when it is full.

5 The device for extracting coffee grounds and for cleaning the filter holder of an espresso machine according to the invention allows to extract the coffee ground in a completely automatic way.

10 Another advantage consists in the possibility to mounting the device for extracting coffee grounds and for cleaning the filter holder in a simple manner in an espresso machine.

Moreover, the device for extracting coffee grounds and for cleaning the filter holder according to the invention complies with the security European and not European
15 standards.

Another advantage consists in the possibility to easily do the maintenance of the espresso machine.

Another advantage consists in the possibility to deeply clean the filter holder of the espresso machine.

20 At the end, the device according to the invention makes the operation of cleaning the filter holder quicker and costly saving.

It should be clear that other modifications and embodiments carried out to the described device can be done falling
25 within the scope of the present invention, as defined in the appended claims.

CLAIMS

1. Device (20) for extracting coffee grounds and for cleaning the filter holder (10), characterized in comprising:

5 - an hollow cylindrical element (1) having, on its upper part, a slot (1a) able to guide the positioning of the filter holder (10) allocating its handle, and laterally equipped with at least one trough hole (1b) for coupling the cylindrical element (1) to a container bag and with brackets
10 (2a,2b) allowing the cylindrical element (1) to be fixed on a plane or walls;

 - a motor (4) fixed on a side of the hollow cylindrical element (1) equipped with a first shaft (5) entering inside the trough hole (1b) and placing perpendicularly to a central
15 axis X of the hollow cylindrical element (1);

 - a transmission box (6) placed inside the hollow cylindrical element (1) and able to receive the first shaft (5) and transmitting the motion to a second shaft (7) developing inside the upper part of the hollow cylindrical
20 element (1) along the central axis X;

 - an extraction element (8), mounted on said second shaft (7), comprising a blade having sectors (8a) and brush elements (8b);

 - a photodetector system (9), placed inside the hollow
25 cylindrical element (1), above said extraction element (8), configured to activate the motor (4) when the filter holder (10) is located inside the hollow cylindrical element (1) and becomes able to be revealed.

2. Device (20) for extracting coffee grounds and for
30 cleaning the filter holder (10) according to the claim 1, characterized in that said motor (4) is a low voltage type motor.

3. Device (20) for extracting coffee grounds and for
cleaning the filter holder (10) according to the claim 1,
35 characterized in that the first shaft (5) transmits the

motion to the second (7) inside the transmission box (6) through conical wheels.

4. Device (20) for extracting coffee grounds and for cleaning the filter holder (10) according to the claim 1, characterized in that said slot (1a) is provided with brush elements for removing the residual material from the filter holder (10).

5. Device (20) for extracting coffee grounds and for cleaning the filter holder (10) according to the claim 1, characterized in that said slot (1a) is provided with a gasket able to limit the vibrations and to mitigate noise.

6. Device (20) for extracting coffee grounds and for cleaning the filter holder (10) according to the claim 1, characterized in that the brackets (2) are fixed in correspondence of holes (1c) comprised laterally in the hollow cylindrical element (1).

7. Device (20) for extracting coffee grounds and for cleaning the filter holder (10) according to the claim 1, characterized in that the container bag (3) is coupled to the hollow cylindrical element (10) via a socket (1d) located in the inferior portion of the hollow cylindrical element (10).

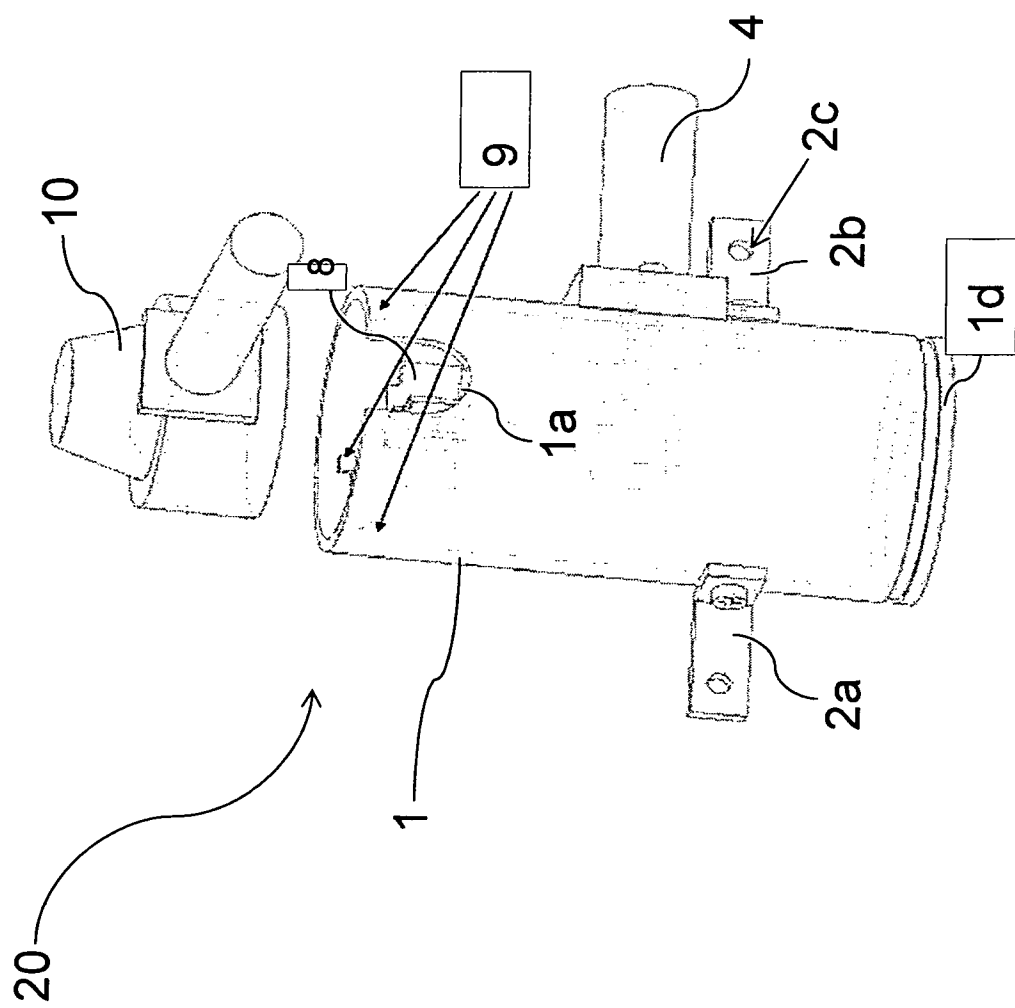


Fig.1

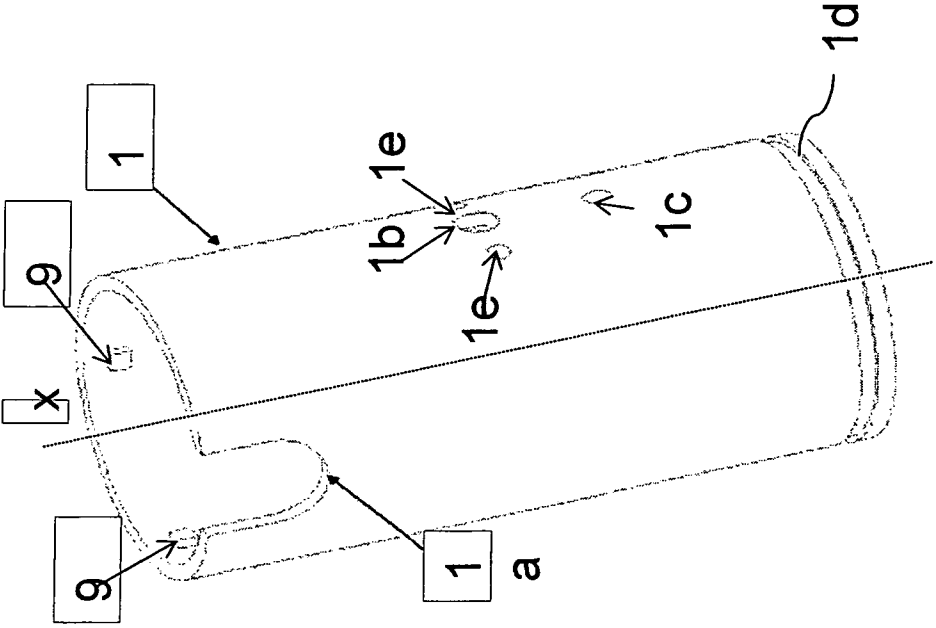


Fig. 2a

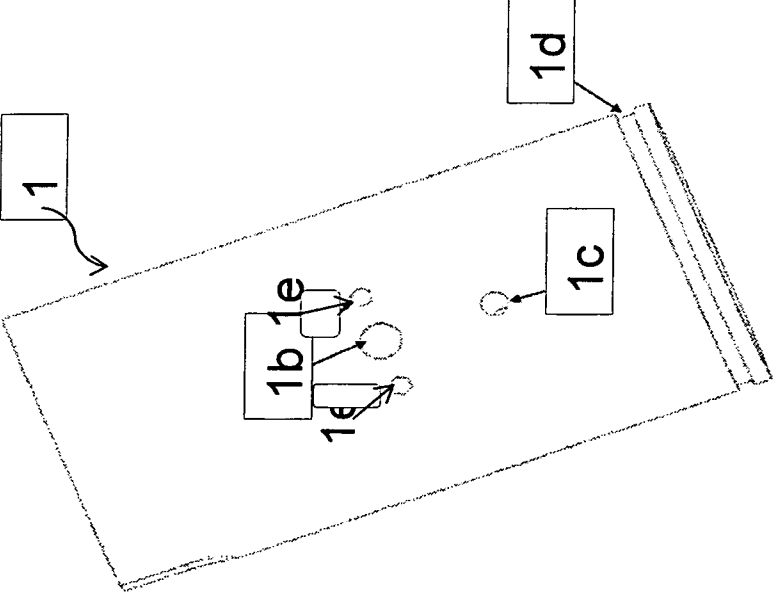


Fig. 2b

Fig. 2

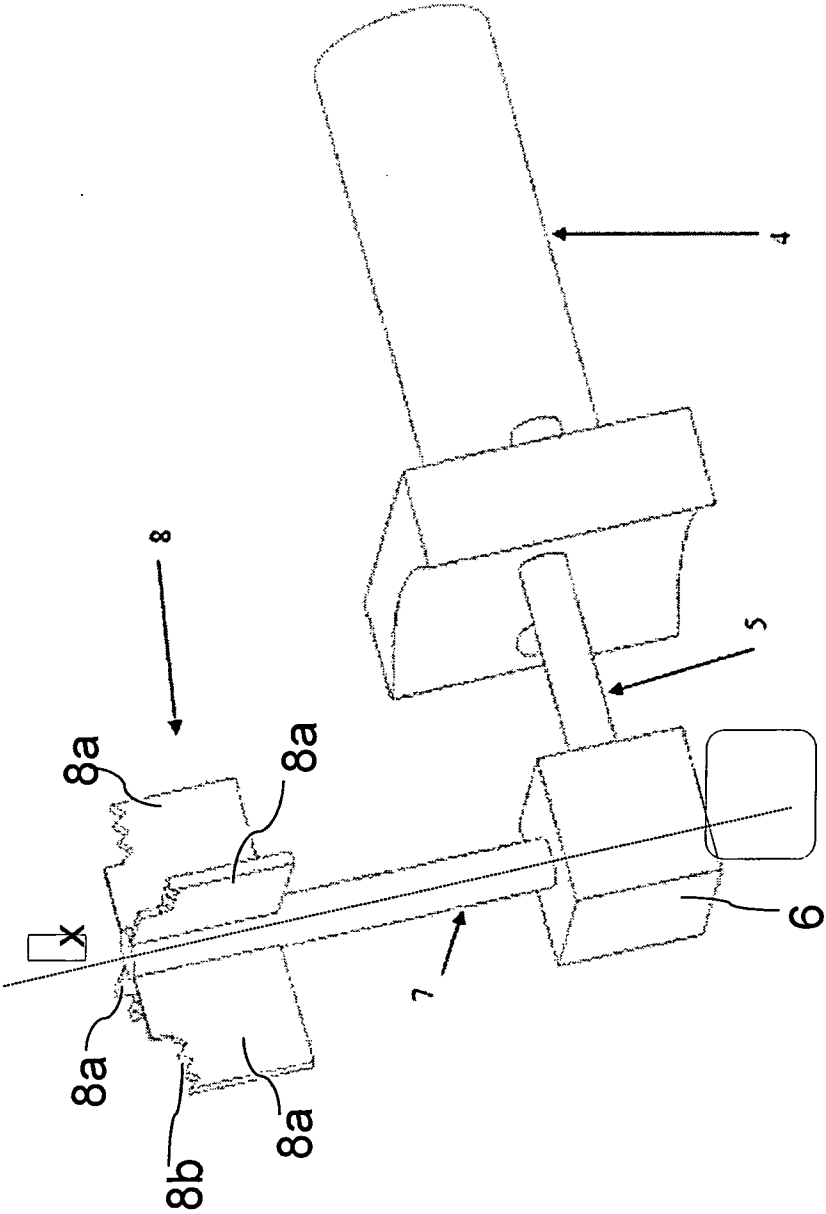


Fig.3

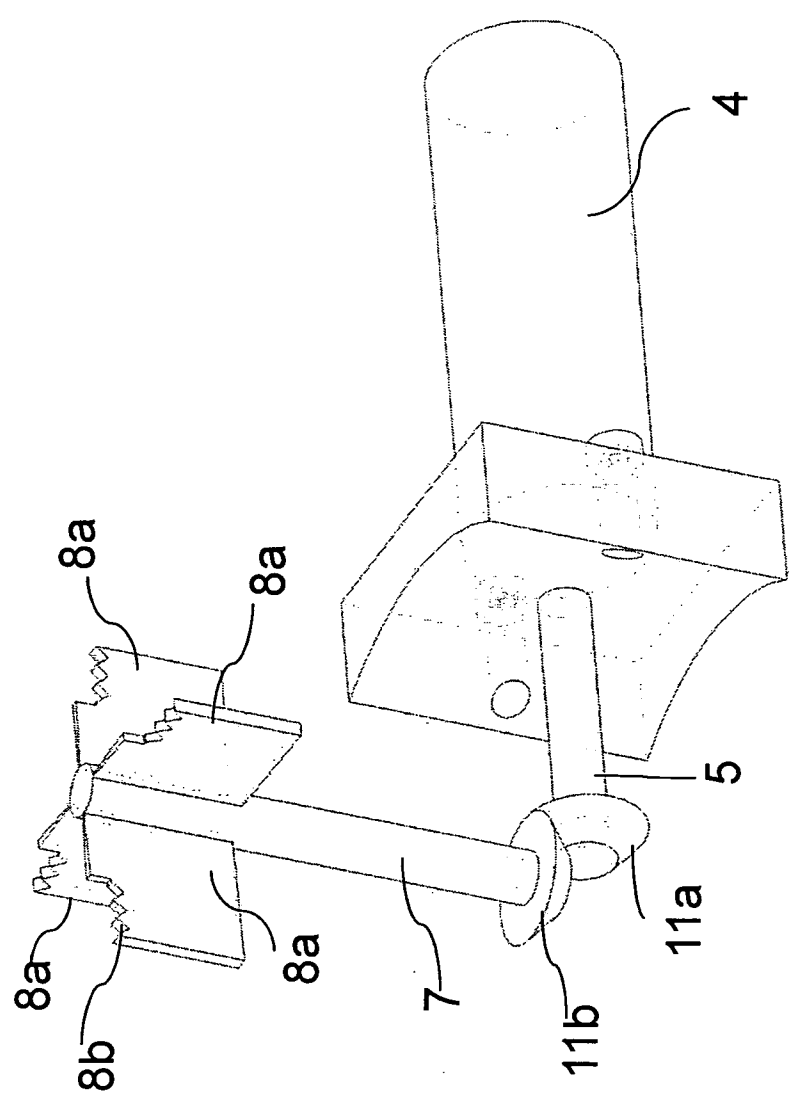


Fig.4

INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
INV. A47J31/60
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A47J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 490 447 A (GIULIANO MARIO [IT]) 13 February 1996 (1996-02-13) abstract figures 1A,11 column 17, line 18 - column 18, line 8 -----	1-7
A	WO 2009/127983 A1 (AMBROSINI MARCO [IT]) 22 October 2009 (2009-10-22) abstract figures 1-7 page 4, line 25 - page 6, line 21 -----	1-7
A	FR 2 840 521 A1 (YILMAZ ALI [FR]) 12 December 2003 (2003-12-12) abstract figure 1 page 1, line 18 - page 2, line 30 ----- -/-	1-7



Further documents are listed in the continuation of Box C.



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INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2012/001179

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2008/030577 A2 (KEURIG INC [US]; HUANG JIANMING [US]; BRUDEVOLD FINN [US]; SULLIVAN KE) 13 March 2008 (2008-03-13) abstract page 10, line 18 - page 11, line 6 -----	1-7

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2012/001179

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