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(54) Title: DEVICE AND METHOD FOR PRESSING CITRUS FRUITS

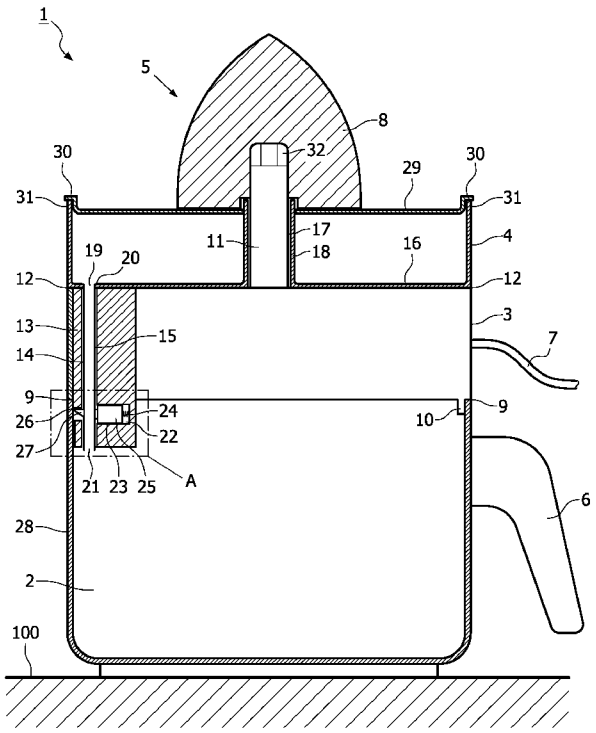

FIG. 2

(57) Abstract: The present invention relates to a device for pressing citrus fruits (1), comprising: pressing means (8) for pressing juice out of the citrus fruits, a receptacle (4) for receiving the pressed juice flowing out of the pressing means, a discharge channel (21) connected to the receptacle for discharging the pressed juice out of the receptacle, a container (2) which can be placed in a draining position for the purpose of collecting and holding the pressed juice flowing out of the discharge channel, and drive means (3) for the pressing means, wherein the device also comprises a closing valve (23) accommodated in the discharge channel, which closing valve is displaceable between a position opening the discharge channel and a position closing the discharge channel, and which is provided with an operating element (27) for operating the closing valve such that it is opened only when the container is placed in a draining position.

WO 2010/036105 A1

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Device and method for pressing citrus fruits

The present invention relates to a device and to a method for pressing citrus fruits.

Convenience of use is an important requirement in the use of a citrus press for household use. Convenience of use is here understood to mean the preparation for pressing, the pressing of the citrus fruits themselves, and the cleaning of the components and the immediate vicinity of the pressing. Present devices for pressing citrus fruits only partially meet this requirement. Although many known devices for pressing citrus fruits are simple to clean, such devices are not provided with means for limiting soiling of the immediate vicinity of the device. A device for pressing citrus fruits is for instance known from US-A-6 363 837.

This document describes a device for pressing citrus fruits, comprising: pressing means for pressing juice out of the citrus fruits, a receptacle for receiving the pressed juice flowing out of the pressing means, a discharge channel connected to the receptacle for discharging the pressed juice out of the receptacle, a container which can be placed in a draining position for the purpose of collecting and holding the pressed juice flowing out of the discharge channel, and drive means for the pressing means.

When the container is removed from the other components of the device, there is the chance of pressed juice present in the other components leaking out of these components onto for instance a kitchen worktop or a table, and thereby soiling the worktop or table in undesirable manner. This adversely affects the user-friendliness, since the user has to clean the vicinity where pressing takes place.

The present invention has for its object to provide a device and a method for pressing citrus fruits, wherein the user-friendliness is improved.

The invention provides for this purpose a device for pressing citrus fruits of the above stated type, wherein the device comprises a closing valve accommodated in the discharge channel, which closing valve is displaceable between a position opening the discharge channel and a position closing the discharge channel, and which is provided

with an operating element for operating the closing valve such that it is opened only when the container is placed in a draining position.

The draining position is here understood to mean a position of the container wherein the pressed juice flowing out of the discharge channel is collected and held by the container. Owing to these measures according to the invention the discharge channel is then opened only when the container is placed in a draining position and the discharge channel is closed by the closing valve in any other position. This prevents dripping of the pressed juice out of the receptacle when the pressed juice cannot be received and collected by the container, thereby improving the user-friendliness of the pressing device. The user need not after all clean the surrounding area.

In a first embodiment the container placed in a draining position is displaceable relative to the discharge channel. This measure further increases the user-friendliness of the device, since there are multiple draining positions. The container is particularly given a rotation-symmetrical form, and the container can be displaced rotatably relative to at least the discharge channel.
In a practical embodiment the closing valve comprises a valve connected pivotally to the discharge channel. This results in a closing valve which closes the discharge channel efficiently as well as being a durable closing valve.

The discharge channel particularly extends from the bottom of the receptacle substantially vertically in downward correction, and the valve is pivotally connected to a wall part of the discharge channel.

In yet another embodiment the closing valve is adapted to close the discharge channel under bias in the position closing the discharge channel. This enhances closure of the discharge channel, since a force, for instance the force exerted by the pressed juice on the closing valve, must first exceed a determined threshold value before the valve is displaced to a position opening the discharge channel.

The valve is particularly connected to the discharge channel via a resilient element, for instance a torsion spring or a wire spring, and the resilient element exerts a force on the valve in the position closing the discharge channel.

In yet another embodiment the container can be coupled to the receptacle via the drive means. It is precisely in such a configuration that the invention can be advantageously applied. This is because the drive means are located here between the receptacle and the container and, if the container is taken out of the draining position, the discharge channel will be closed by the closing valve. This prevents possible dripping of the pressed juice onto the drive means. This results not only in a durable device, since the drive means can be damaged by the pressed juice, but also in an enhanced user-friendliness, since the drive means do not need to be cleaned.

In an advantageous embodiment the discharge channel is connected integrally to the receptacle. This not only results in a less expensive device, but the device is hereby also easier to clean. This is because there are fewer components, and therefore also fewer transitions and edges between which the fouling can accumulate.

There are different ways of pressing citrus fruits. The pressing means particularly comprise a pressing cone drivable in rotation by the drive means. Not only does the use of a pressing cone result in a high juice yield, a pressing cone is also easy to clean. A pressing cone is also readily interchangeable, and pressing cones of variable dimensions can be used for the purpose of pressing citrus fruits with mutually variable dimensions. The drive means can here for instance comprise an electric motor.

It is also advantageous to provide the pressing device with a filter positionable upstream of the discharge channel. Such a filter, also referred to as a pulp filter, separates the pulp of the citrus fruits from the pressed juice to be received by the container, whereby the closing valve accommodated in the discharge channel continues to operate more reliably. Without the use of such a filter, the pulp could block the closing valve in a position opening the discharge channel, wherein citrus fruits can still be pressed but dripping is not prevented, or could block the closing valve in the closing position, wherein pressed juice flowing out of the receptacle cannot flow out of the discharge channel to the container.

In another advantageous embodiment the device comprises a number of segments. More particularly the pressing means are received in a pressing segment, the receptacle is

received in a collecting segment positionable under the pressing means, the drive means are received in a drive segment positionable under the collecting segment and the container is received in a container segment positionable under the drive segment. Owing to these measures the device is easy to keep clean, and a segment can be replaced in simple manner, for instance if a segment is damaged. The pressing segment, the collecting segment, the drive segment and the container segment are particularly positioned successively below each other. This results in a compact device, this being advantageous particularly for household use.

The drive segment particularly comprises a continuous cavity here, and the discharge channel extends through the cavity of the drive segment positioned under the collecting segment. This makes the device compact and user-friendly. It is also possible to embody the drive segment such that the discharge channel extends inside the drive segment positioned under the collecting segment, and that an upper part of the container extends in a draining position at least partially inside the drive segment. Because the discharge channel here extends inside the drive segment, the pressing segment, the collecting segment and the drive segment can be removed relative to the container and be placed on a surface of for instance a kitchen worktop or a table, wherein the danger of possible damage to the discharge channel is reduced.

The invention also provides a method for pressing citrus fruits, comprising the steps of: providing citrus fruits for pressing, positioning a container in a draining position relative to a receptacle located under pressing means and provided with a discharge channel, pressing the citrus fruits for pressing using the pressing means, and removing the container from the draining position, wherein a closing valve is accommodated in the discharge channel, which closing valve is displaceable between a position opening the discharge channel and a position closing the discharge channel and which is provided with an operating element for operating the closing valve such that the discharge channel is opened only during removal of the container from the draining position. For the advantages of the method reference is made to the advantages of the device.

The present invention will be further elucidated on the basis of the non-limitative exemplary embodiments shown in the following figures. Identical components are designated in the figures with the same reference numerals. Herein:

Figure 1 is a schematic side view of a device according to the present invention,
figure 2 shows a cross-section of the device of figure 1,
figure 3a shows a detail cross-sectional view of figure 2 within box A in the situation where the discharge channel is closed,
figure 3b shows a detail cross-sectional view of figure 2 within box A in the situation where the discharge channel is opened,
figure 4a shows a cross-section along B-B in figure 3a, and
figure 4b shows a cross-section along B-B in figure 3b.

Figure 1 shows a schematic side view of a device for pressing citrus fruits, designated in its entirety with 1, which device 1 is positioned on a table 100. A container 2, a drive segment 3, a collecting segment 4 and pressing segment 5 are positioned successively one above another. Container 2 and segments 3, 4, 5 are shown here in a draining position, wherein container 2 and segments 3, 4, 5 are mutually coupled by locating and positioning edges (not shown). Container 2 comprises a handle 6. Drive segment 3 comprises an electric motor (not shown), this electric motor being connectable to the mains electricity via an electrically conductive cord 7. Collecting segment 4 comprises a bottom (not shown) with an opening and a discharge channel (not shown here) which is connected to the opening and embodied as flexible tube and which extends through drive segment 3 into container 2. Pressing segment 5 further comprises a pressing cone 8 drivable in rotation by the electric motor. Also arranged are means, not shown in the drawing, for preventing relative rotation of segments 2, 3, 4 and 5. Pressing of a citrus fruit does after all cause a torque on pressing cone 8, which must be transmitted to the surface 100 in order to prevent co-rotation of pressing cone 8.

Figure 2 shows a cross-section of device 1 of figure 1. Drive segment 3 lies against an upper edge 9 of container 2 and is coupled to container 2 via locating and positioning edges 10. Drive segment 3 further comprises a drive shaft 11, which extends upward in substantially vertical direction and which is displaceable in vertical direction relative to a switch (not shown) connected to the drive segment for operating the electric motor, and a continuous opening 15. Collecting segment 4 lies against an upper edge 12 of drive segment 3 and is coupled form-fittingly to drive segment 3 in that a housing 13 of a discharge channel 14 of collecting segment 3 extends through the continuous opening

15. Collecting segment 4 is provided with a first opening 17 which is arranged in a bottom 16 and around which is located a wall part 18 extending upward in vertical direction. Drive shaft 11 extends through opening 17.

The collecting segment also comprises a second opening 19. A discharge channel 21 embodied as a flexible tube is connected liquid-tightly to edges 20 of second opening 19. Close to an underside of housing 13 a closing valve 23 is placed in a first opening 22 arranged in the housing. The closing valve comprises a sealing element 25 connected to a housing 13 via a spring 24. An operating element 27 is located at a distance from discharge channel 21 in a second opening 26 arranged in housing 13. In the situation shown here operating element 27 is pressed by a wall part 28 of container 2 in the direction of sealing element 25, whereby sealing element 25 is pressed into the first opening counter to the force of spring 24. Discharge channel 21 is hereby opened as shown in figures 3b and 4b. A pulp filter 29 is further placed on collecting segment 4, which pulp filter 29 lies unambiguously on an upper edge 31 of collecting segment 4 via locating and positioning edges 30. Pressing cone 8 is placed on pulp filter 29, pressing cone 8 being provided with a cavity 32. Drive shaft 11 herein extends into cavity 32 of pressing cone 8 and is releasably connected to pressing cone 8 and adapted for form-fitting rotation.

Pressing of citrus fruits proceeds as follows. By pressing a citrus fruit against pressing cone 8, drive shaft 11 will be displaced downward and activate the switch of the electric motor. Pressing cone 8 is herein driven in rotation by drive shaft 11, whereby juice is pressed out of the citrus fruit. The pressed juice will flow through pulp filter 29 and be discharged through the opened discharge channel 21 and collected by container 2.

Once pressing of the citrus fruits is completed, drive segment 3, collecting segment 4 and pressing segment 5 can be removed from container 2. As soon as operating element 27 here extends above container 2, sealing element 25 of closing valve 23 will be pressed, under the action of the spring force of spring 24, in the direction of discharge channel 21 in the form of a flexible tube and close discharge channel 21, as shown in figures 3a and 4a, which will be elucidated below. Pressed juice present in discharge channel 21 will as a result not drip out of discharge channel 21.

Figure 3a shows a detail cross-sectional view of device 1 of figure 2 within box A, and so the closing valve, in the situation where it closes the discharge channel 21 embodied as flexible tube. Operating element 27 herein extends above wall part 28 of container 2 and, under spring force of spring 24 and via sealing element 25, it is pressed in horizontal direction through the second opening 26 of housing 13. A surface 25a of sealing element 25 here presses against flexible tube 21, whereby the flexible tube is closed to liquid. Operating element 27 herein extends in front of discharge channel 21 as shown in figure 4a.

Figure 3b shows a view corresponding to figure 3a, wherein the closing valve is situated in the open position. Discharge channel 21 herein extends at least partially inside container 2. Operating element 27 is herein displaced in the direction toward sealing element 25 by wall part 28 of container 2, this element 27 pressing sealing element 25 into first opening 22 counter to the spring force of spring 24. Discharge channel 21 is hereby opened and pressed juice can flow through discharge channel 21 into the container.

Figure 4a shows a cross-section along the line B-B in figure 3a. Operating element 27 here extends above wall part 28 of container 2 as according to figure 3a. This figure shows that the surface 25a presses against operating element 27 as well as discharge channel 21, wherein operating element 27 extends at least partially into second opening 26. The discharge channel 21 embodied as flexible tube is herein closed to liquid.

Figure 4b corresponds to figure 4a, but in the opened position of the valve. Operating element 27 here extends inside container 2 as according to figure 3b. This figure shows that operating element 27 presses against surface 25a counter to the spring force of spring 24 and extends at least partially into second opening 26. Surface 25a of sealing element 25 does not exert any force here on discharge channel 21, whereby it is opened and pressed juice can flow out of collecting segment 4 through discharge channel 21 into container 2.

It will be apparent that within the scope of the invention it is possible to depart in diverse ways from the above described embodiments; other valve configurations can particularly be applied.

Claims

1. Device for pressing citrus fruits, comprising:
   - pressing means for pressing juice out of the citrus fruits,
   - a receptacle for receiving the pressed juice flowing out of the pressing means,
   - a discharge channel connected to the receptacle for discharging the pressed juice out of the receptacle,
   - a container which can be placed in a draining position for the purpose of collecting and holding the pressed juice flowing out of the discharge channel, and
   - drive means for the pressing means,

characterized in that the device comprises a closing valve accommodated in the discharge channel, which closing valve is displaceable between a position opening the discharge channel and a position closing the discharge channel, and which is provided with an operating element for operating the closing valve such that it is opened only when the container is placed in a draining position.

2. Pressing device as claimed in claim 1, **characterized in that** the container placed in a draining position is displaceable relative to the discharge channel.

3. Pressing device as claimed in claim 1 or 2, **characterized in that** the closing valve comprises a valve connected pivotally to the discharge channel.

4. Pressing device as claimed in any of the foregoing claims, **characterized in that** the closing valve is adapted to close the discharge channel under bias in the position closing the discharge channel.

5. Pressing device as claimed in any of the foregoing claims, **characterized in that** the container can be coupled to the receptacle via the drive means.

6. Pressing device as claimed in any of the foregoing claims, **characterized in that** the discharge channel is connected integrally to the receptacle.

7. Pressing device as claimed in any of the foregoing claims, **characterized in that** the pressing means comprise a pressing cone drivable in rotation by the drive means.

8. Pressing device as claimed in any of the foregoing claims, **characterized in that** the device also comprises a filter positionable upstream of the discharge channel.

9. Pressing device as claimed in any of the foregoing claims, **characterized in that** the pressing means are received in a pressing segment, the receptacle is received in a collecting segment positionable under the pressing means, the drive means are received in a drive segment positionable under the collecting segment and that the container is received in a container segment positionable under the drive segment.

10. Pressing device as claimed in claim 9, **characterized in that** the drive segment comprises a continuous cavity and that the discharge channel extends through the cavity of the drive segment positioned under the collecting segment.

11. Method for pressing citrus fruits, comprising the steps of:

(A) providing citrus fruits for pressing,

(B) positioning a container in a draining position relative to a receptacle located under pressing means and provided with a discharge channel,

(C) pressing the citrus fruits for pressing using the pressing means, and

(D) removing the container from the draining position,

characterized in that a closing valve is accommodated in the discharge channel, which closing valve is displaceable between a position opening the discharge channel and a position closing the discharge channel, and which is provided with an operating element for operating the closing valve such that the discharge channel is opened only during step (D).

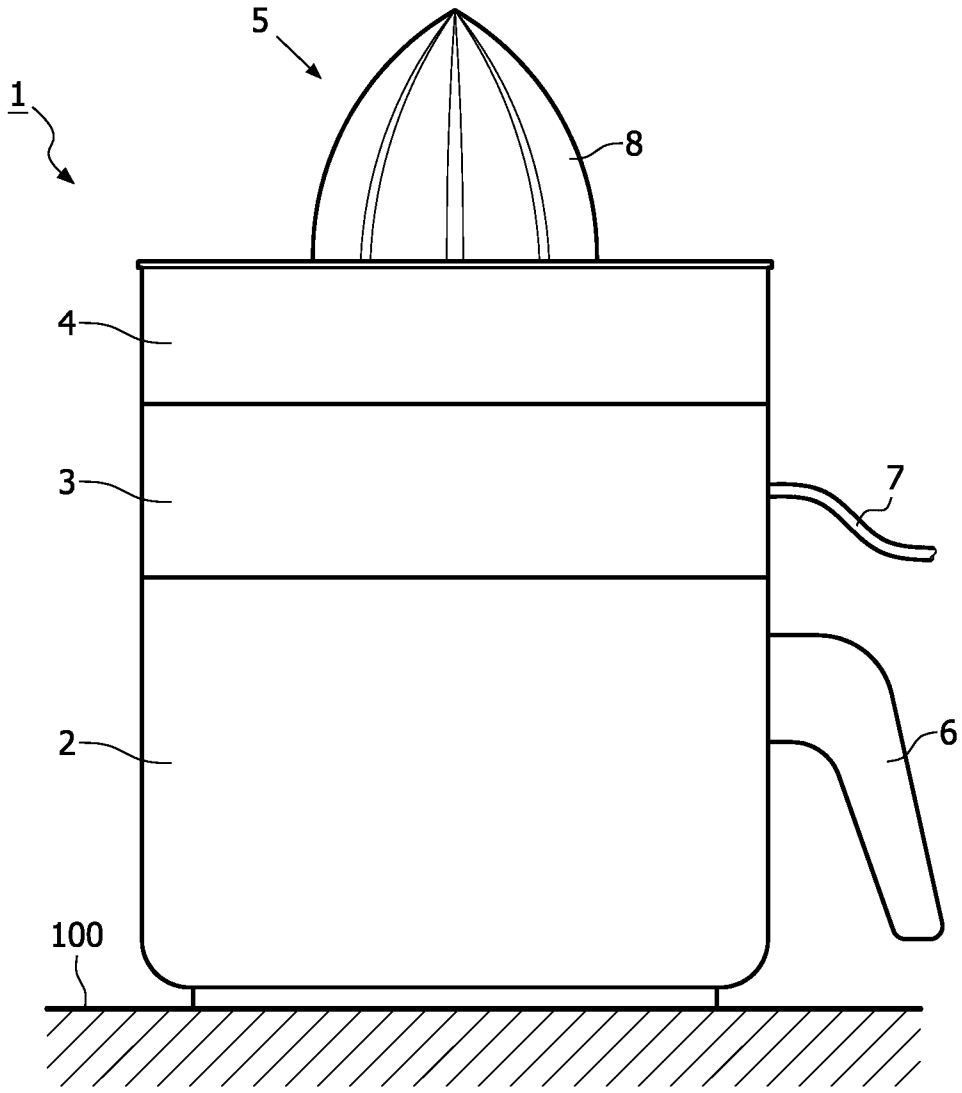

FIG. 1

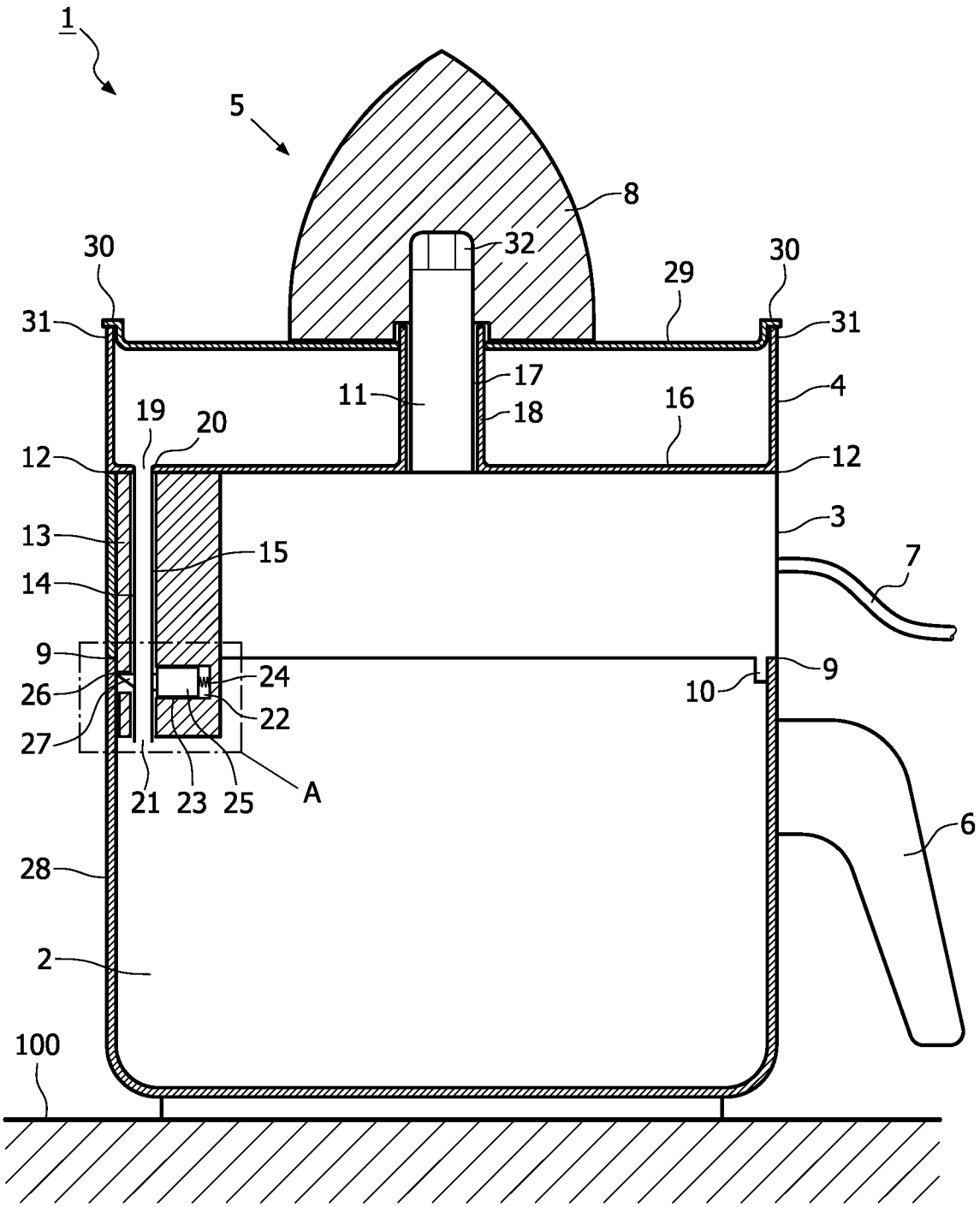
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FIG. 2

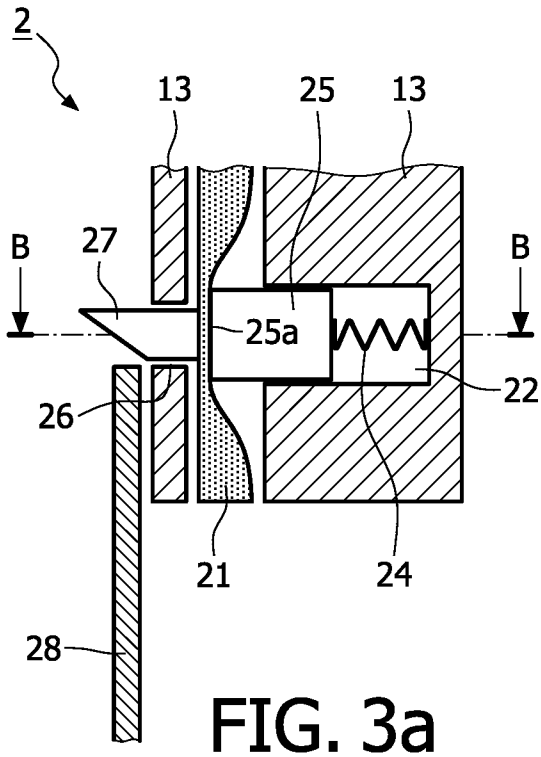

FIG. 3a

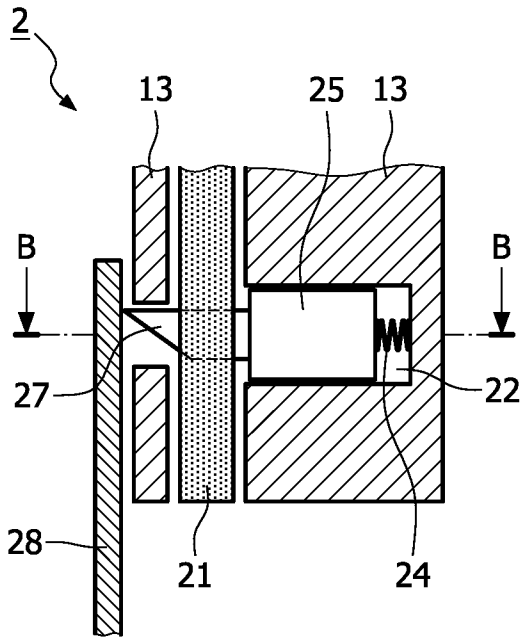

FIG. 3b

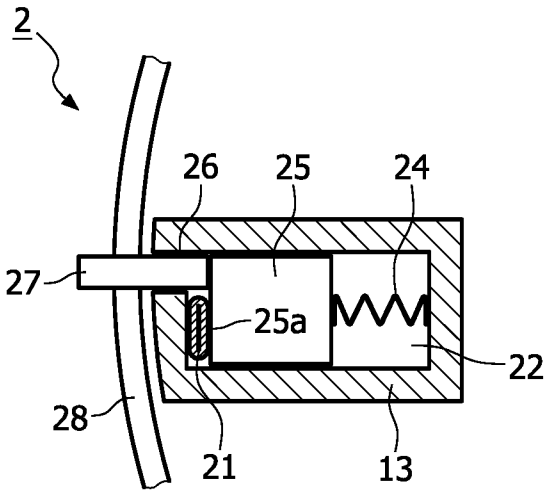

FIG. 4a

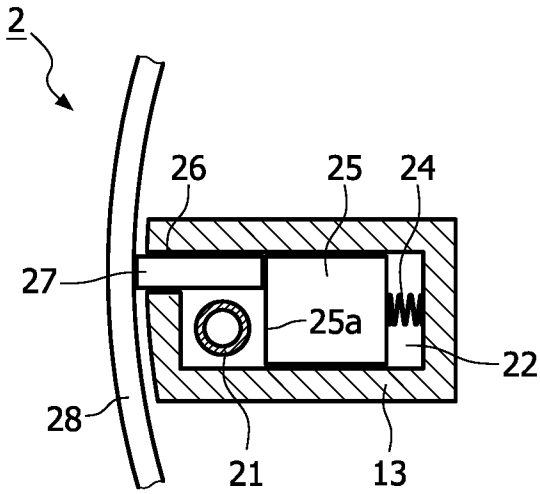

FIG. 4b

INTERNATIONAL SEARCH REPORT

International application No
PCT/NL2009/050537

A. CLASSIFICATION OF SUBJECT MATTER
INV. A47J19/02

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 practical, search terms used)
EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6 363 837 B1 (SHAM JOHN C K [HK] ET AL) 2 April 2002 (2002-04-02) cited in the application column 3, line 54 - column 8, line 60; figures	1-11
A	WO 2006/048850 A (ORANGE JUICE HOME S L [ES]; HORCHE TRUEBA IGNACIO [ES]; APARICIO ADARO) 11 May 2006 (2006-05-11) page 6, line 20 - page 8, line 27; figures	1-11
A	WO 03/020091 A (BSH BOSCH SIEMENS HAUSGERAETE [DE]; STEFFL MICHAEL [DE]; KRAMER SIEGMU) 13 March 2003 (2003-03-13) page 2, line 26 - page 3, line 32; figures	1

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

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Date of the actual completion of the international search	Date of mailing of the international search report
4 November 2009	20/11/2009

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	De Terlizzi, Marino

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/NL2009/050537

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