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- (71) **Applicant: NESTEC S.A.** [CH/CH]; CT-IAM, Av. Nestle 55, 1800 Vevey (CH).
- (72) **Inventors: GUYON, Bertrand;** Rue de la Rochette 16, 25160 Saint Point Lac (FR). **MAGATTI, Marco;** Chemin De champ-rond, 54, 1010 Lausanne (CH). **BYUN, Da Mi;** Chemin du Reposoir 10, 1007 Lausanne (CH).
- (74) **Agent: SCHNYDER, Frank;** CT-IAM, Avenue Nestle 55, 1800 Vevey (CH).
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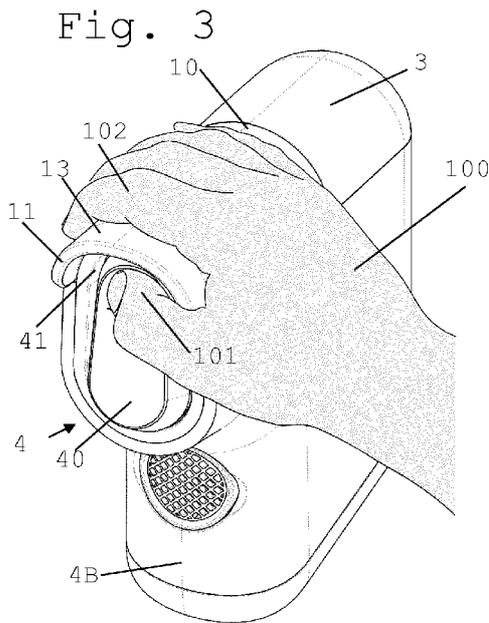
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(54) **Title: ERGONOMIC HANDLE ARRANGEMENT**



(57) **Abstract:** A machine (1) for preparing a beverage from at least one ingredient has: an external top face (3) and an external upright side or front face (3',4); an ingredient processing module (5) having first and second parts (54,55) relatively movable between ingredient processing and transfer positions; and a user-handle (10,11,12,13) that comprises a lever bar (10) movable between first and second positions to relatively move the first and/or second parts (54,55). The lever bar (10) has an end portion (11) that extends, in the first position, longitudinally along the top face (3) away from the external upright face (3',4) and beyond the external upright face (3',4) in front thereof. The end portion extends in the second position longitudinally angled away from the top face (3). The end portion has a first surface (12) that delimits in the first position with the external upright face (3',4) a seat (4,4') for accommodating a normal human thumb (101) of an adult user hand (100) to actuate the end portion (11) towards the second position so as to move the lever bar (10) out of the first position.

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ERGONOMIC HANDLE ARRANGEMENT

Field of the Invention

5 The field of the invention pertains to beverage preparation machines provided with a user-handle, e.g. machines using capsules of an ingredient of the beverage to be prepared.

10 For the purpose of the present description, a "beverage" is meant to include any human-consumable liquid substance, such as tea, coffee, hot or cold chocolate, milk, soup, baby food, etc... A "capsule" is meant to include any pre-portioned beverage ingredient, such as a flavouring ingredient, within an enclosing packaging of any material, in particular an airtight
15 packaging, e.g. plastic, aluminium, recyclable and/or biodegradable packagings, and of any shape and structure, including soft pods or rigid cartridges containing the ingredient. The capsule may contain an amount of ingredient for preparing a single beverage serving or a
20 plurality of beverage servings.

Background Art

25 Certain beverage preparation machines use capsules containing ingredients to be extracted or to be dissolved and/or ingredients that are stored and dosed automatically in the machine or else are added at the time of preparation of the drink. Some beverage machines possess filling means that include a pump for liquid, usually water, which pumps the liquid from a source of
30 water that is cold or indeed heated through heating means, e.g. a thermoblock or the like.

Especially in the field of coffee preparation, machines have been widely developed in which a capsule containing beverage ingredients is inserted in a brewing
35 device. The brewing device is tightly closed about the capsule, water is injected at the first face of the capsule, the beverage is produced in the closed volume of the capsule and a brewed beverage can be drained from a second face of the capsule and collected into a
40 receptacle such as a cup or glass.

Brewing devices have been developed to facilitate insertion of a "fresh" capsule and removal of the capsule upon use. Typically, the brewing devices comprise two parts relatively movable from a configuration for inserting/removing a capsule to a configuration for brewing the ingredient in the capsule.

The actuation of the movable part of the brewing device may be motorized. Such a system is for example disclosed in EP 1 767 129. In this case, the user does not have to provide any manual effort to open or close the brewing device. The brewing device has a capsule insertion passage provided with a safety door assembled to the movable part of the brewing device via a switch for detecting an undesired presence of a finger in the passage during closure and prevent injuries by squeezing. Alternative covers for a capsule insertion passage are disclosed WO 2012/093107 and WO 2013/127906.

The actuation of the movable part of the brewing device may be manual.

WO 2009/043630 discloses a beverage preparation machine including a brewing unit having a front part with a passage for inserting a capsule into the brewing unit. An arched handle pivotable above the machine's housing is seizable by the user's hand and configured for driving the brewing unit to form a brewing chamber around the capsule and remove the capsule upon use. U-shaped handles are also disclosed in WO 01/15581, WO 02/43541, WO 2010/015427, WO 2010/128109, WO 2011/144719 and WO 2012/032019.

WO 2005/004683 and WO 2007/135136 disclose a device comprising a frame, a fixed holding part for the capsule, a movable holding part which is mounted relative to the frame in a sliding relationship, one or two knuckle joint mechanisms that provide a mechanical system which enables to close in a steady and fluid-tight manner the holding parts about the capsule while also resisting to the counter-force acting while re-opening and generated by the internal brewing pressure, and a handle for directly levering the knuckle joint mechanism. Such a device forms a simple assembly enabling insertion of the capsule by vertical fall through a passage in the frame and removal

of the used capsule in the same direction as the insertion direction. The handle is in the form of a lever that is manually pivotable about an end thereof adjacent the machine's housing. In the closed position, the handle
5 is pivoted down against the machine's housing and over the capsule inlet passage to cover it. In the open position, the handle is pivoted up away from the capsule inlet passage to uncover this passage. Hence, in addition to moving the holding part, the handle serves to cover
10 and uncover the passage for the capsule. The manual force required to move the movable parts varies during closure and opening of the machine and depends on the dimensional tolerances of the capsules used, the positioning of the capsule and the temperature of the brewing unit.

15 It has been proposed to use other lever configurations, e.g. in WO 2005/004683, in which the user can grip the pivotable lever handle from a side of the extraction device and move it up and down without significantly changing the position of his/her hand for
20 seizing the lever. Pivotable lever handles can also be arranged above the extraction device, as for instance disclosed in WO WO2007/135136, WO 2009/074553 and WO 2011/042401 .

Handles in the form of pivotable lever bars are for
25 instance disclosed in EP 1867260, WO 2008/138710, WO 2009/074550, WO 2009/074555, WO 2009/074557, WO 2009/074559, WO 2010/037806, WO 2011/042400 and WO 2011/144720 .

Typically, the pivotable lever bars have an end
30 position that extends flat along a top housing face of the beverage machine. The free end of the lever bar can be slight spaced from the top housing face for allowing the user to pull or push it upwards by urging the end of the tip of one of his/her fingers under the free end of
35 the pivotable bar or against an edge of this free end. The force that the user can apply to the bar to move it away from the machine's top housing face is thus rather limited. For bringing the pivotable bar into this end
40 position, the user will normally adopt a different position and push the lever downwards with his/her fingers placed above the lever so as to be in a position

to exercise much greater force onto the lever into this end position than for moving it away from this end position .

5

Summary of the Invention

The invention relates to a machine for dispensing a beverage. The beverage preparation machine can be an in-home or out of home machine. The machine may be for the preparation of coffee, tea, chocolate, cacao, milk, soup,
10 baby food, etc....

The machine may be arranged for preparing within a beverage preparation module a beverage by passing hot or cold water or another liquid through a capsule containing an ingredient, such as a flavouring ingredient, of the
15 beverage to be prepared, such as ground coffee or tea or chocolate or cacao or milk powder.

The beverage preparation typically includes the mixing of a plurality of beverage ingredients, e.g. water and milk powder, and/or the infusion of a beverage
20 ingredient, such as an infusion of ground coffee or tea with water. One or more of such ingredients may be supplied in loose and/or agglomerate powder form and/or in liquid form, in particular in a concentrate form. A carrier or diluents liquid, e.g. water, may be mixed with
25 such ingredient to form the beverage. Typically, a predetermined amount of beverage is formed and dispensed on user-request, which corresponds to a serving. The volume of such a serving may be in the range of 25 to 200 ml and even up to 300 or 400 ml, e.g. the volume for
30 filling a cup, depending on the type of beverage. Formed and dispensed beverages may be selected from ristrettos, espressos, lungos, cappuccinos, latte macchiato, cafe latte, americano coffees, teas, etc... In particular, a coffee machine may be configured for dispensing
35 espressos, e.g. an adjustable volume of 20 to 60 ml per serving, and/or for dispensing lungos, e.g. a volume in the range of 70 to 150 ml per serving.

The machine comprises an external top face and an external upright side or front face. The external top
40 face can be generally perpendicular to the external

upright face. For instance, the top face is at an angle to the external upright face in the range of 75 to 105 deg. such as 80 to 95 deg. or 85 to 90 deg.

5 The machine includes an ingredient processing module having a first part and a second part movable relative to the first part from a position for processing therein the ingredient to a transfer position for inserting the ingredient into the processing module and/or for evacuating the ingredient from the processing module. For
10 instance, the first part having an outlet for dispensing beverage to a user-receptacle directly or via a machine outlet. Optionally, the second part has an inlet for an inflow of liquid from a source.

15 The processing module may have a cavity formed between the first and second parts, the cavity being configured for holding and housing an ingredient, such as a flavouring ingredient, e.g. as tea or coffee or chocolate or powder milk. As mentioned above, the ingredient may be inserted pre-portioned within a capsule
20 into this cavity.

A flavoured beverage may be prepared by circulating (by means of the liquid driver) a carrier liquid, such as water, into the ingredient cavity to flavour the liquid by exposure to the flavouring ingredient held in the
25 cavity.

When closed capsules of ingredients are used, e.g. flavouring ingredients, the first and second parts delimiting the ingredient cavity may include a capsule opener such as blades and/or a tearing tool, e.g. a plate
30 with a tearing profile, for instance as known from Nespresso™ machines or as disclosed in EP 0 512 470, EP 2 068 684 and WO 2014/076041 and the references cited therein .

35 For instance, the module includes or is connected to an upstream fluid arrangement, e.g. incorporating a liquid driver, such as a pump, and a thermal conditioner, such as a heater, for circulating thermally conditioned liquid, such as water, from a source, e.g. a liquid reservoir, into the ingredient processing cavity.

Examples of upstream fluid arrangements are disclosed in WO 2009/074550 and in WO 2009/130099.

The thermal conditioner may be a boiler or a thermoblock or an on demand heater (ODH), for instance an
5 ODH type disclosed in EP 1 253 844, EP 1 380 243 and EP 1 809 151.

Examples of pumps and there incorporation into beverage machines are disclosed in WO 2009/150030, WO 2010/108700, WO 2011/107574 and WO 2013/098173.

10 Examples of suitable processing modules for handling ingredient capsules are for example disclosed in WO 2005/004683, WO2007/135136 and WO 2009/043630, which are hereby incorporated by way of reference. Suitable fluid circuits of beverage preparation modules are for instance
15 disclosed in WO 2009/074550 and WO 2009/130099.

The machine has a user-handle that comprises a lever bar, such as a plate-like lever bar, connected to the module and movable between a first position and a second position to relatively move the first and/or second parts
20 of the processing module between the processing position and the transfer position. Typically, the handle is configured to relatively move the processing module from the processing position into the transfer position and/or vice versa. The lever bar can be pivotable about an axis
25 such as an axis that is generally parallel to the top face .

The lever bar has an end portion that extends:

- in the first position, longitudinally along the top face away from the external upright face and at an
30 angle thereto; and
- in the second position, longitudinally angled away from the top face, such as at an angle to the top face in the range of 30 to 135 deg. e.g. 45 to 120 deg. for instance 75 to 105 deg. optionally 80 to 95
35 deg.

Optionally, the end portion is generally perpendicular to the external upright face. For instance, the end portion is at an angle to the external upright

face in the range of 75 to 105 deg. such as 80 to 95 deg.
or 85 to 90 deg.

Typically, the beverage preparation machine
comprises a stationary structure, such as a housing
5 and/or a frame.

The structure may be arranged to rest on a support
surface such as a table. The lever bar of the user-handle
may be movable relative to the structure between the
first and second positions.

10 The second part of the processing module can be made
movable relative to the first part and relative to the
stationary structure. The first part may be stationary
relative to the structure or movable thereto.

The second part can be arranged to move in a
15 direction, in particular an arched and/or linear
direction. Typically, the first and second parts in their
processing position delimit a cavity for housing the
beverage ingredient, such as tea or coffee or chocolate
or powder milk. The ingredient processing module may
20 include an upstream fluid circuit for delivering a
carrier liquid, such as water, into the cavity and a
downstream fluid circuit having a beverage outlet for
delivering from the cavity the beverage formed by the
carrier liquid flavoured by the beverage (flavouring)
25 ingredient, the ingredient being in particular inserted
into the cavity within a capsule.

As discussed above, the ingredient is optionally
inserted into the processing module and/or evacuated
therefrom within an ingredient capsule, e.g. an aluminium
30 or plastic or paper enclosure containing the ingredient.

In accordance with the invention, the end portion
extends in the first position beyond the external upright
face in front thereof. The end portion has a first
surface that delimits in the first position with the
35 external upright face a seat for accommodating a normal
human thumb of an adult user hand to actuate the end
portion towards the second position so as to move the
lever bar out of the first position.

Hence, the machine has a thumb seat adjacent the end
40 portion of the user-handle for accommodating the user's

thumb that is used to push the end portion out of the first position towards the second position.

Hence, the end portion of the handle can be provided with a free extremity and may be mounted in the machine so that it can be contacted and pushed by the user's thumb to be moved out of the first position.

By providing a seat adjacent the user-handle in the first position for receiving a user's thumb, the user's thumb may occupy this seat for moving the handle from the first to the second position. Furthermore, the seat may be occupied by the user's thumb when the handle is moved from the second position into the first position by the user's fingers (of the same hand), e.g. the index finger, pushing on the side of the handle's end portion that is opposite the end portion's side adjacent to the user's thumb. It follows that the user does not have to change the position of his hand (and fingers) for moving the handle from the first position to the second position or from the second position into the first position.

Thus the end portion has a shape that allows a user, e.g. via its thumb, to manually push it for moving it between the first and second positions during normal use. For example the end portion has a surface structure or composition, in particular an anti-skid surface, that provides friction against a human hand to reduce the necessary gripping force needed to achieve a reliable user-control of the end portion.

The end portion in the first position may extend beyond the external face in front thereof over a depth (d1) of at least 5 mm, such as at least 7 mm e.g. at least 9 mm, the seat having at least this depth. This depth represents a distance from a reference plane (P1) extending generally over and against the external upright face to a reference plane (P2) that is parallel to the reference plane (P1) and that contacts a free extremity of the end portion.

The external upright face can extend from the end portion in the first position over a height (hi) of at least 5 mm, optionally at least 10 mm such as at least 20 mm e.g. at least 30 mm, at a distance of at least the

above depth (d_1) from the parallel plane (P_2) over the entire height (h_1), the seat having at least this height.

The external upright face can have a protruding part and a recessed part, the recessed part being located
5 between the protruding part and the end portion in the first position to delimit therewith the thumb seat. The recessed part may extend from the protruding part to the end portion in the first position over a height (h_2) of at least 5 mm, optionally at least 7 mm such as at least
10 10 mm e.g. at least 15 mm, the thumb seat having at least this height (h_2). The end portion in its first position can extend from the recessed part over a depth (d_2) of at least 10 mm, such as at least 15 mm e.g. at least 20 mm, the thumb seat having at least this depth (h_2). The
15 protruding part may have a top face and a joining face extending from the top face to the recessed part or to adjacent the recessed part, the joining face forming with the recessed part and the end portion a general tilted u-shape or v-shape in cross-section. For instance, the
20 joining face is: perpendicular or inclined to the top face and/or to the recessed part; and/or parallel or inclined to the end portion.

The external upright face can have a user-interface actuatable by a normal human thumb. Such a user-interface
25 can delimit the seat and/or can be adjacent to the seat so as to be actuatable by the normal human thumb without moving an index finger (of the same hand as the thumb's hand) placed on the end portion while the thumb is located in the seat to actuate the end portion. The user-
30 interface can be a push-button, such as a button which is pivotally mounted on a pivot axis that is distant from the end portion, such as extending at or beyond an end of the seat opposite to the end portion. For instance, the push-button has :

- 35 - at least one resilient element, such as a spring, for urging the push-button into at least one position, e.g. the push button being a mono-stable or bi-stable push button; and/or
- 40 - a pusher, e.g. an arm fixed to or integral with the push button, that is urged against a switch of the module in at least one position of the push-button.

The user-interface can be configured to operate the processing module by activating a driver, such as a pump, to drive liquid from a source via the first and second parts and an outlet to an area for placing a user-receptacle. This area can be delimited by foot of such machine or by an external support surface for supporting such machine, e.g. a table, a shelf or a cupboard.

Such placing areas are well known in the art, e.g. as disclosed in EP 1 867 260, WO 2009/074557, WO 2011/154492, WO 2012/007313 and WO 2013/186339.

For instance, the driver is configured to drive liquid from a source via a thermal conditioner such as a heater and/or a cooler.

The end portion may form a curved or angled plate having a general shape of a longitudinally truncated cylinder, prism, cone or pyramid. The general shape of the end portion can be a longitudinally truncated right cylinder, prism, cone or pyramid. The general shape may be a longitudinally truncated cylinder or cone with a circular or elliptic base or of a longitudinally truncated prism or pyramid with a rectangular, pentagonal, hexagonal, heptagonal, octagonal, nonagonal, decagonal, hendecagonal, dodecagonal base e.g. a regular polygonal base. The general shape can be a longitudinally truncated cylinder, prism, cone or pyramid having a cross-sectional opening angle in the range of 90 to 175 deg., optionally at least 120 deg. e.g. at least 135 deg. The general shape may be a longitudinally truncated cylinder, prism, cone or pyramid having a cross-sectional width (w_0) over height (h_0) ratio of at least 2, optionally at least 3 such as at least 4. The general shape may be a longitudinally truncated cylinder, prism, cone or pyramid having at an extremity of the end portion a cross-sectional width in the range of 3 to 8 cm, such as about 5 cm \pm 0.5 cm. The general shape can be a longitudinally truncated cylinder, prism, cone or pyramid that is delimited inwards by the first surface. Typically, the ratio of the plate's thickness over the plate's width is in the range of 0.01 to 0.2 such as 0.05 to 0.15, e.g. about 0.1.

The end portion may form a plate, such as the above mentioned curved or angled plate, that has a second surface opposite the first surface, the second surface being configured for accommodating a normal index finger (of the same hand as the thumb's hand) and optionally a middle finger, to allow the end portion in the first position to be held between the thumb against the first surface and the index finger (and optionally the middle finger) against the second surface to move the lever bar out of the first position and towards the second position .

The lever bar in its first position can be generally flush with an external upper face and/or with a lateral external face extending from a side of the external upright face.

The external upright face may form or be part of:

- a front face bearing a beverage outlet, such as a front face that comprises a lower upright face and, as an upper face, the external upright face, optionally the external upright face delimiting a dispensing head above a lower upright face and overhanging a dispensing area, the dispensing head bearing the beverage outlet; or
- a side face that extends from a side of a front face bearing a beverage outlet.

In a typical embodiment, the machine has an ingredient transfer passage for transferring an ingredient into and/or out of the processing module when the first and second parts are in the transfer position, the lever bar covering the transfer passage in its first position and uncovering the transfer passage in its second position. The transfer passage may include:

- an upstream transfer passage for introducing the ingredient into the module, e.g. by gravity; and/or
- a downstream transfer passage for removing the ingredient out of the processing module, e.g. by gravity .

For instance, the transfer passage comprises one or more rails and/or grooves for guiding one or more

protruding or recessed guiding edges of a capsule containing the ingredient.

5 The transfer passage can be generally upright so that the ingredient, optionally contained within a capsule, is movable in the passage under the effect of gravity (when the machine is in oriented, e.g. placed on a support surface such as a table, for preparing a beverage) .

10 Such capsule can have a generally cup-shaped body, e.g. a generally cylindrical or frusto-conical body, with a rim to which a lid is sealed for enclosing the ingredient. The transfer passage may have a shape that generally fits the shape of capsule or a part thereof. For instance, the passage has a pair of facing guide
15 portions that fit and guide the rim of the capsule when inserted into the passage.

The interaction between the processing module (and optionally the transfer passage) and the ingredient, when provided within a capsule, may be of the type disclosed
20 in WO 2005/004683, WO 2007/135135, WO2007/135136 and WO 2008/037642 .

The machine typically includes a control unit, in particular a unit for controlling the ingredient processing module. The user-handle may form or be part of
25 a user-interface in data communication with the control unit, optionally the handle comprising or being associated with a sensor connected to the control unit for sensing a position of the cover such as a sensor selected from an electro-mechanical switch sensor, a
30 magnetic sensor, an electromagnetic sensor and an optical sensor. The control unit may comprise a power management module arranged to power the control unit and optionally further electric components, such as a user-interface and/or a thermal conditioner in particular a heater
35 and/or a cooler, when the control unit is unpowered or in standby state and the user-handle is moved, in particular into the second position.

The machine may have a control unit for controlling the ingredient processing module, such as a liquid driver
40 of the module e.g. a pump.

Brief Description of the Drawings

The invention will now be described with reference to the schematic drawings, wherein:

- 5 - Figure 1 illustrates a beverage machine with a user-handle according to the invention;
- Figure 2 is a cross-section view of part of the machine of Fig. 1;
- 10 - Figs 3 to 6 illustrate the machine of Fig. 1 when operated by a user; and
- Figures 7a to 7c and 8a to 8c show cross-sections of different variations of the user-handle of the machine of Fig. 1.

15 Detailed description

Figures 1 to 6 illustrate an exemplary embodiment of a machine 1 for preparing a beverage from at least one ingredient in accordance with the invention. The ingredient may be supplied in the form of an ingredient capsule, e.g. of the type described above under the header "field of the invention".

20

Structural details of machine 1 are illustrated in particular in Figs 1 and 2, variations thereof being illustrated in Figs 7a to 8c. Possible handling by a user of machine 1 is illustrated in Figs 3 to 6, in which Figs 3 and 4 shows a seizure of the handle's end portion 11 by a hand 100 in a position suitable for driving end portion 11 into the first position and into the second position. Fig. 4 illustrates an ordinary seizure of the handle's end portion 11 by a hand 100 in a position suitable for driving end portion 11 out of the second position but unsuitable for driving end portion 11 out of the first position. Fig. 3 illustrates the operation of a touch/push button 40 by a user's thumb 101 in position for moving end portion 11 of handle 10. Fig. 6 illustrates an ordinary operation of touch/push button 4 by a user's index finger 102.

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Machine 1 has an external top face 3 and an external upright side or front face 3', 4. For instance, external top face 3 is generally perpendicular to external upright face 3', 4. Top face 3 can be at an angle to external upright face 3', 4 in the range of 75 to 105 deg. such as 80 to 95 deg. or 85 to 90 deg.

Machine 1 includes an ingredient processing module 5 having a first part 54 and a second part 55 movable relative to first part 54 from a position for processing therein the ingredient to a transfer position for inserting the ingredient into processing module 5 and/or for evacuating the ingredient from processing module 5. First part 54 may have an outlet 54' for dispensing beverage to a user-receptacle 60 directly or via a machine outlet 53. Second part can have an inlet 55' for an inflow of liquid from a source.

Machine 1 comprises a user-handle 10, 11, 12, 13 that has a lever bar 10, such as a plate-like lever bar, connected to module 5 and movable between a first position and a second position to relatively move the first and/or second parts 54, 55 of module 5 between the processing position and the transfer position. For instance, lever bar 10 is pivotable about an axis 14 such as an axis 14 that is generally parallel to top face 3.

Lever bar 10 has an end portion 11 that extends, in the first position, longitudinally along the top face 3 away from the external upright face 3', 4 and at an angle thereto. End portion 11 extends in the second position longitudinally angled away from top face 3, such as at an angle to top face 3 in the range of 30 to 135 deg. e.g. 45 to 120 deg. for instance 75 to 105 deg. optionally 80 to 95 deg.

End portion 11 can be generally perpendicular to external upright face 3', 4. For example, end portion 11 is at an angle to external upright face 3', 4 in the range of 75 to 105 deg., such as 80 to 95 deg. or 85 to 90 deg.

End portion 11 extends in the first position beyond external upright face 3', 4 in front thereof.

End portion 11 has a first surface 12 that delimits in the first position with the external upright face 3', 4

a seat 4', 4'' for accommodating a normal human thumb 101 of an adult user hand 100 to actuate end portion 11 towards the second position so as to move lever bar 10 out of the first position.

5 End portion 11 in the first position may extend beyond external face 3 in front thereof over a depth d1 of at least 5 mm, such as at least 7 mm e.g. at least 9 mm, seat 4' having at least this depth d1. Depth d1 represents a distance from a reference plane P1 extending
10 generally over and against external upright face 3', 4 to a reference plane P2 that is parallel to reference plane P1 and that contacts a free extremity 11' of the end portion 11. See in particular Fig. 2. External upright face 3', 4 can extend from end portion 11 in the first
15 position over a height hi of at least 5 mm, optionally at least 10 mm such as at least 20 mm e.g. at least 30 mm, at a distance of at least said depth d1 from parallel plane P2 over the entire height hi, seat 4' having at least this height.

20 External upright face 3', 4 can have a protruding part 40 and a recessed part 41, recessed part 41 being located between protruding part 40 and end portion 11 in the first position to delimit therewith seat 4''. See in particular Fig. 2. Recessed part 41 may extend from
25 protruding part 40 to end portion 11 in the first position over a height h2 of at least 5 mm, optionally at least 7 mm such as at least 10 mm e.g. at least 15 mm, seat 4'' having at least this height h2. End portion 11 in its first position may extend from recessed part 41
30 over a depth d2 of at least 10 mm, such as at least 15 mm e.g. at least 20 mm, seat 4'' having at least this depth h2. Protruding part 40 can have a top face 42 and a joining face 43 extending from top face 42 to recessed part 41 or to adjacent recessed part 41, joining face 43
35 forming with recessed part 41 and end portion 11 a general tilted u-shape or v-shape in cross-section. For instance, joining face 43 is: perpendicular or inclined to top face 42 and/or to recessed part 41; and/or parallel or inclined to end portion 11.

40 External upright face 3', 4 may have a user-interface 40 actuatable by said normal human thumb 101 that:

- delimits seat 4' (see Fig. 2); and/or
- is adjacent to seat 4'' so as to be actuatable by said normal human thumb 101 without moving an index finger 102 placed on end portion 11 while said thumb 101 is located in seat 4'' to actuate end portion 11 (see Figs 2 and 4).

User-interface 40 can be a push-button, such as a button which is pivotally mounted on a pivot axis 40' that is distant from end portion 11, such as extending at or beyond an end of seat 4', 4'' opposite to end portion 11. For instance, push-button 40 has:

- at least one resilient element 44, such as a spring, for urging the push-button into at least one position e.g. a mono-stable or bi-stable push button; and/or
- a pusher (40''), e.g. an arm fixed to or integral with the push button (40), that is urged against a switch (56) of the module (5) in at least one position of the push-button (40).

User-interface 40 may be configured to operate processing module 50 by activating a driver, such as a pump, to drive liquid from a source via first and second parts 54, 55 and an outlet 53 to an area 6 for placing a user-receptacle 60. Area 6 may be delimited by a foot of such machine 1 or by an external support surface, e.g. a table or shelf or cupboard, for supporting such machine 1. For instance, the driver is configured to drive liquid from a source via a thermal conditioner such as a heater and/or a cooler.

End portion 11 may form a curved or angled plate having a general shape of a longitudinally truncated prism or pyramid (Figs 7a to 7c), cylinder or cone (Figs 8a to 8c), such as:

- a) a general shape of a longitudinally truncated right cylinder or cone (Figs 1, 4 and 6), prism or pyramid;
- b) a general shape of a longitudinally truncated cylinder or cone with a circular (Figs 1, 4, 6, 8a and 8b) or elliptic (Fig. 8c) base or of a longitudinally truncated prism or pyramid with a rectangular, pentagonal, hexagonal (Figs 7b and 7c), heptagonal,

octagonal (Fig. 7a), nonagonal, decagonal, hendecagonal, dodecagonal base e.g. a regular polygonal base (Figs 7a to 7c);

5 c) a general shape of a longitudinally truncated cylinder, prism, cone or pyramid having a cross-sectional opening angle α in the range of 90 to 175 deg., optionally at least 120 deg. e.g. at least 135 deg. (Figs 1, 7a to 8c);

10 d) a general shape of a longitudinally truncated cylinder, prism, cone or pyramid having a cross-sectional width (w_0) over height (h_0) ratio of at least 2, optionally at least 3 such as at least 4 (Figs 1, 7a to 8c);

15 e) a general shape of a longitudinally truncated cylinder, prism, cone or pyramid having at an extremity 11' of end portion 11 a cross-sectional width in the range of 3 to 8 cm, such as about 5 cm +/- 0.5 cm;

20 f) a general shape of a longitudinally truncated cylinder, prism, cone or pyramid that is delimited inwards by first surface 12;

g) a curved or angled plate having a ratio of a thickness (t_h) over width (w) in the range of 0.01 to 0.2 such as 0.05 to 0.15, e.g. about 0.1 (Figs 1, 7a to 8c); or

25 k) any combination of two or more of features a) to g).

End portion 11 forms a plate, such as said curved or angled plate defined in claim 8, that has a second surface 13 opposite first surface 12, second surface being configured for accommodating a normal index finger 30 102, and optionally a middle finger, of said adult user hand 100 to allow end portion 11 in the first position to be held between thumb 101 against first surface 12 and index finger 102, and optionally the middle finger, against second surface 13, to move lever bar 10 out of 35 the first position and towards the second position.

Lever bar 10 in its first position is generally flush with an external upper face 3 and/or with a lateral external face 3' extending from a side of external upright face 4.

External upright face 3', 4 may form or be part of:

- a front face 4A bearing a beverage outlet 53, such as a front face 4A that comprises a lower upright face 4B and, as an upper face, external upright face 4, optionally external upright face 4 delimiting a dispensing head 4A' above a lower upright face 4B and overhanging a dispensing area 6, dispensing head 4A' bearing beverage outlet 53; or
- a side face 3' that extends from a side of a front face bearing a beverage outlet.

Machine 1 can have an ingredient transfer passage 51,52 for transferring an ingredient into and/or out of processing module 5 when first and second parts 54,55 are in the transfer position, lever bar 10 covering transfer passage 51,52 in its first position and uncovering the transfer passage in its second position. Transfer passage 51,52 may include:

- an upstream transfer passage 51 for introducing the ingredient into module 5, e.g. by gravity; and/or
- a downstream transfer passage 52 for removing the ingredient out of the processing module, e.g. by gravity .

Transfer passage 51,52 can have one or more rails and/or grooves 51' for guiding one or more protruding or recessed guiding edges of a capsule containing the ingredient .

Transfer passage 51,52 can be generally upright so that the ingredient, optionally contained within a capsule, is movable in the passage under the effect of gravity (when the machine is in oriented, e.g. placed on a support surface such as a table, for preparing a beverage) .

Claims

1. A machine (1) for preparing a beverage from at least one ingredient comprising:

- 5 - an external top face (3) and an external upright side or front face (3',4), the external top face (3) being optionally generally perpendicular to the external upright face (3',4), e.g. the top face (3) being at an angle to the external upright face (3',4) in the range
10 of 75 to 105 deg. such as 80 to 95 deg. or 85 to 90 deg.;
- an ingredient processing module (5) having a first part (54) and a second part (55) movable relative to
15 the first part (54) from a position for processing therein said ingredient to a transfer position for inserting said ingredient into the processing module and/or for evacuating the ingredient from the processing module, optionally the first part (54)
20 having an outlet (54') for dispensing beverage to a user-receptacle (60) directly or via a machine outlet (53) and/or the second part having an inlet (55') for an inflow of liquid from a source; and
- a user-handle (10,11,12,13) that comprises a lever bar (10), such as a plate-like lever bar, connected to the
25 module (5) and movable between a first position and a second position to relatively move the first and/or second parts (54,55) of the processing module (5) between the processing position and the transfer position, the lever bar (10) being optionally
30 pivotable about an axis (14) such as an axis (14) that is generally parallel to the top face (3),
- the lever bar (10) having an end portion (11) that extends :
- 35 - in the first position, longitudinally along the top face (3) away from the external upright face (3',4) and at an angle thereto; and
- in the second position, longitudinally angled away from the top face (3), such as at an angle to the top face (3) in the range of 30 to 135 deg. e.g. 45

- 20 -

to 120 deg. for instance 75 to 105 deg. optionally
80 to 95 deg.,

the end portion (11) being optionally generally
perpendicular to the external upright face (3',4), e.g.
5 the end portion (11) being at an angle to the external
upright face (3',4) in the range of 75 to 105 deg. such
as 80 to 95 deg. or 85 to 90 deg.,

characterised in that the end portion (11) :

- 10 - extends in the first position beyond the external
upright face (3',4) in front thereof; and
- has a first surface (12) that delimits in the first
position with the external upright face (3',4) a seat
(4',4'') for accommodating a normal human thumb (101)
of an adult user hand (100) to actuate the end portion
15 (11) towards the second position so as to move the
lever bar (10) out of the first position.

2. The machine of claim 1, wherein the end portion (11)
in the first position extends beyond the external face
(3) in front thereof over a depth (d1) of at least 5 mm,
20 such as at least 7 mm e.g. at least 9 mm, the seat (4')
having at least this depth, the depth representing a
distance from a reference plane (PI) extending generally
over and against the external upright face (3',4) to a
reference plane (P2) that is parallel to the reference
25 plane (PI) and that contacts a free extremity (11') of
the end portion (11) .

3. The machine of claim 2, wherein the external upright
face (3',4) extends from the end portion (11) in the
first position over a height (hi) of at least 5 mm,
30 optionally at least 10 mm such as at least 20 mm e.g. at
least 30 mm, at a distance of at least said depth (d1)
from said parallel plane (P2) over the entire height
(hi), the seat (4') having at least this height.

4. The machine of any preceding claim, wherein the
35 external upright face (3',4) has a protruding part (40)
and a recessed part (41), the recessed part (41) being
located between the protruding part (40) and the end
portion (11) in the first position to delimit therewith
the seat (4' ').

5. The machine of claim 4, wherein the recessed part (41) extends from the protruding part (40) to the end portion (11) in the first position over a height (h2) of at least 5 mm, optionally at least 7 mm such as at least 10 mm e.g. at least 15 mm, the seat (4'') having at least this height (h2) .

6. The machine of claim 4 or 5, wherein the end portion (11) in its first position extends from the recessed part (41) over a depth (d2) of at least 10 mm, such as at least 15 mm e.g. at least 20 mm, the seat (4'') having at least this depth (h2) .

7. The machine of any one of claims 4 to 6, wherein the protruding part (40) has a top face (42) and a joining face (43) extending from the top face (42) to the recessed part (41) or to adjacent the recessed part (41), the joining face (43) forming with the recessed part (41) and the end portion (11) a general tilted u-shape or v-shape in cross-section, the joining face (43) being optionally: perpendicular or inclined to the top face (42) and/or to the recessed part (41); and/or parallel or inclined to the end portion (11) .

8. The machine of any preceding claim, wherein the external upright face (3',4) has a user-interface (40) actuatable by said normal human thumb (101) that:

25 - delimits the seat (4'); and/or
- is adjacent to the seat (4'') so as to be actuatable by said normal human thumb (101) without moving an index finger (102) placed on the end portion (11) while said thumb (101) is located in the seat (4'') to
30 actuate the end portion (11) .

9. The machine of claim 8, wherein the user-interface (40) is a push-button, such as a button which is pivotally mounted on a pivot axis (40') that is distant from the end portion (11), such as extending at or beyond
35 an end of said seat (4',4'') opposite to the end portion (11), optionally the push-button having:

- at least one resilient element (44), such as a spring, for urging the push-button into at least one position e.g. a mono-stable or bi-stable push button; and/or

- a pusher (40'), e.g. an arm fixed to or integral with the push button (40), that is urged against a switch (56) of the module (5) in at least one position of the push-button (40).

5 10. The machine of claim 8 or 9, wherein the user-interface (40) is configured to operate the processing module (50) by activating a driver, such has a pump, to drive liquid from a source via the first and second parts (54, 55) and an outlet (53) to an area (6) for placing a
10 user-receptacle (60), for instance an area (6) delimited by foot of such machine (1) or by an external support surface for supporting such machine (1) e.g. a table or shelf or cupboard, optionally the driver being configured to drive liquid from a source via a thermal conditioner
15 such as a heater and/or a cooler.

11. The machine of any preceding claim, wherein the end portion (11) forms a curved or angled plate having a general shape of a longitudinally truncated cylinder, prism, cone or pyramid, such as:

20 a) a general shape of a longitudinally truncated right cylinder, prism, cone or pyramid;

b) a general shape of a longitudinally truncated cylinder or cone with a circular or elliptic base or of a longitudinally truncated prism or pyramid with a
25 rectangular, pentagonal, hexagonal, heptagonal, octagonal, nonagonal, decagonal, hendecagonal, dodecagonal base e.g. a regular polygonal base;

c) a general shape of a longitudinally truncated cylinder, prism, cone or pyramid having a cross-sectional opening angle (a) in the range of 90 to 175
30 deg., optionally at least 120 deg. e.g. at least 135 deg.;

d) a general shape of a longitudinally truncated cylinder, prism, cone or pyramid having a cross-sectional width (w₀) over height (h₀) ratio of at
35 least 2, optionally at least 3 such as at least 4;

e) a general shape of a longitudinally truncated cylinder, prism, cone or pyramid having at an extremity (11') of the end portion (11) a cross-

sectional width in the range of 3 to 8 cm, such as about 5 cm;

f) a general shape of a longitudinally truncated cylinder, prism, cone or pyramid that is delimited inwards by the first surface;

g) a curved or angled plate having a ratio of a thickness (th) over width (w) in the range of 0.01 to 0.2 such as 0.05 to 0.15, e.g. about 0.1; or

k) any combination of two or more of features a) to g).

12. The machine of any preceding claim, wherein the end portion (11) forms a plate, such as said curved or angled plate defined in claim 8, that has a second surface (13) opposite the first surface (12), the second surface being configured for accommodating a normal index finger (102), and optionally a middle finger, of said adult user hand (100) to allow the end portion (11) in the first position to be held between said thumb (101) against the first surface and said index finger (102), and optionally said middle finger, against the second surface (13) to move the lever bar (10) out of the first position and towards the second position.

13. The machine of any preceding claim, wherein the lever bar (10) in its first position is generally flush with an external upper face (3) and/or with a lateral external face (3') extending from a side of the external upright face (4).

14. The machine of any preceding claim, wherein the external upright face (3',4) forms or is part of:

- a front face (4A) bearing a beverage outlet (53), such as a front face (4A) that comprises a lower upright face (4B) and, as an upper face, said external upright face (4), optionally the external upright face (4) delimiting a dispensing head (4A') above a lower upright face (4B) and overhanging a dispensing area (6), the dispensing head (4A') bearing said beverage outlet (53); or

- a side face (3') that extends from a side of a front face bearing a beverage outlet.

15. The machine of any preceding claim, which has an ingredient transfer passage (51,52) for transferring an ingredient into and/or out of the processing module (5) when the first and second parts (54,55) are in the transfer position, such as an upstream transfer passage (51) for introducing said ingredient into the module (5) e.g. by gravity and/or a downstream transfer passage (52) for removing said ingredient out of the processing module e.g. by gravity, the lever bar (10) covering the transfer passage (51,52) in its first position and uncovering the transfer passage in its second position, optionally the transfer passage (51,52) comprising one or more rails and/or grooves (51') for guiding one or more protruding or recessed guiding edges of a capsule containing said ingredient .

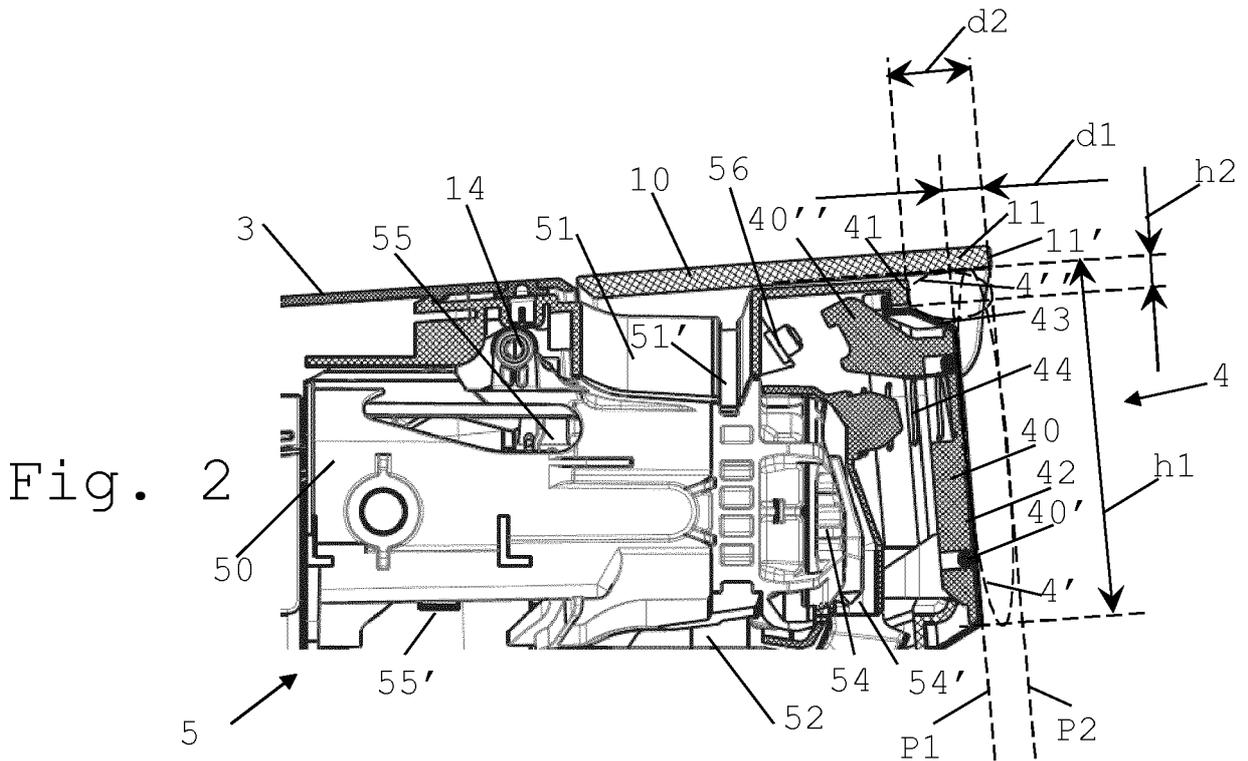
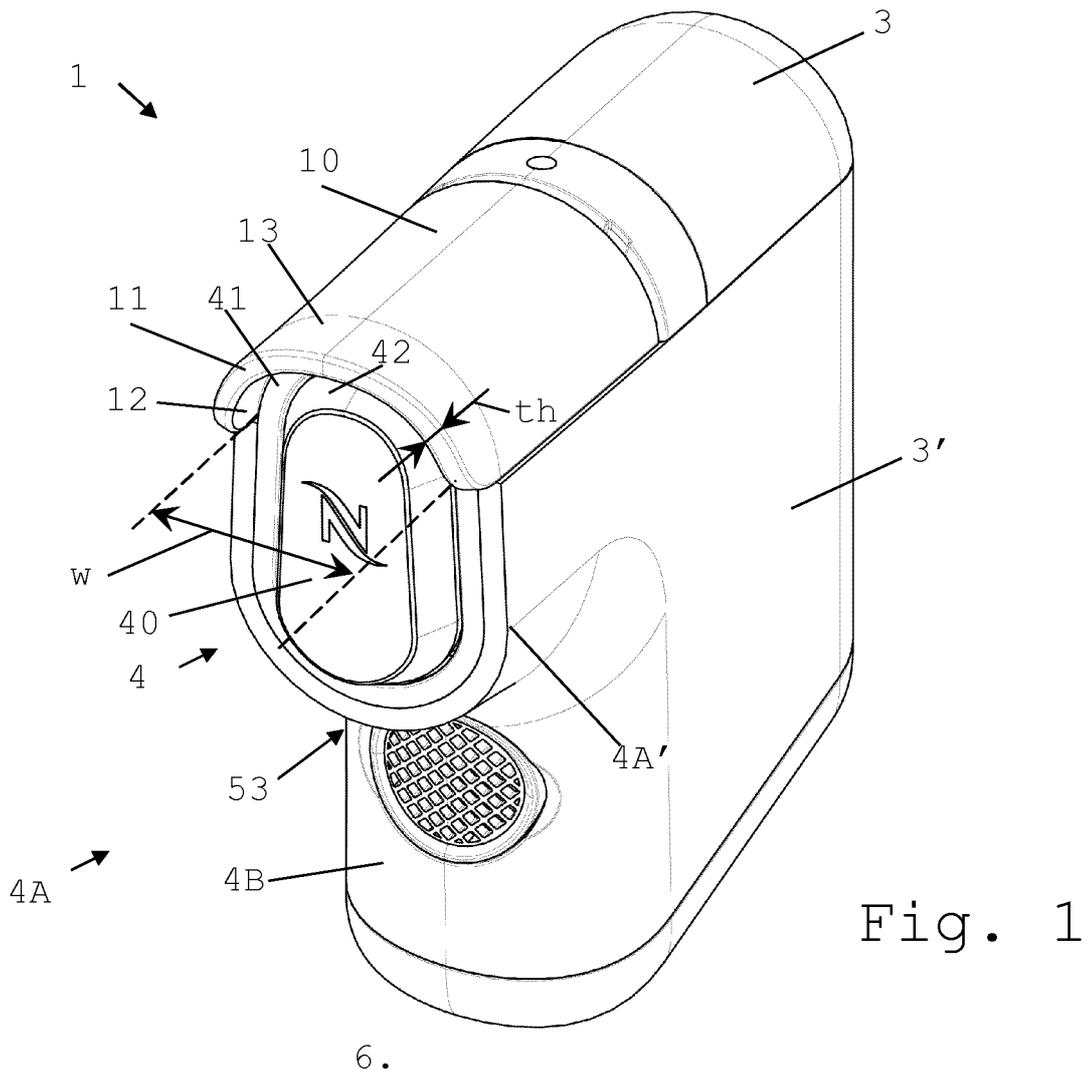


Fig. 3

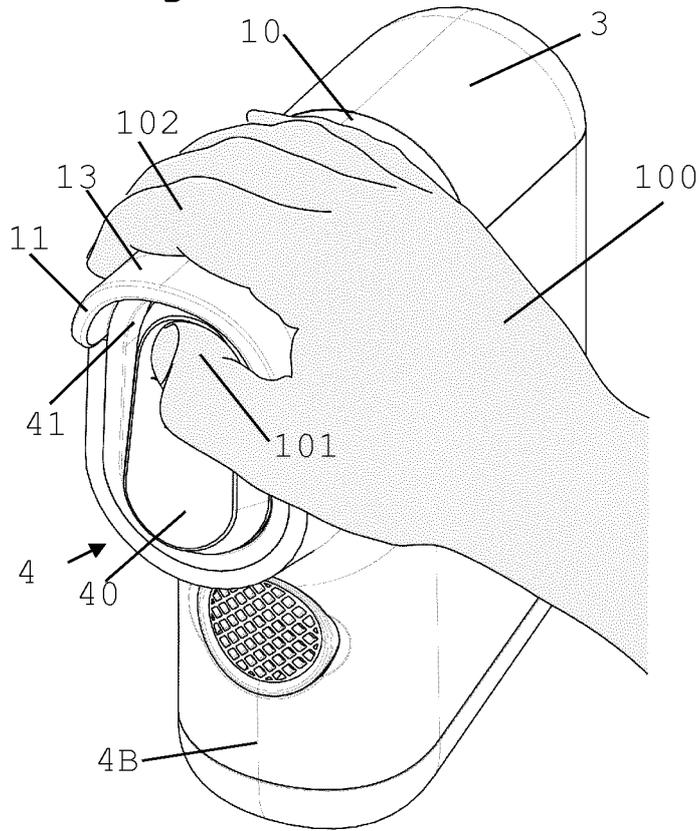


Fig. 4

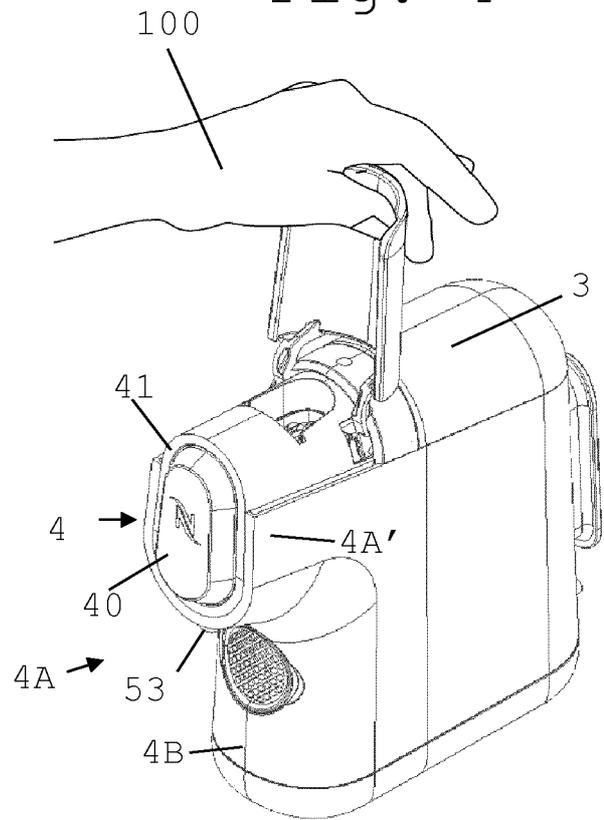


Fig. 5

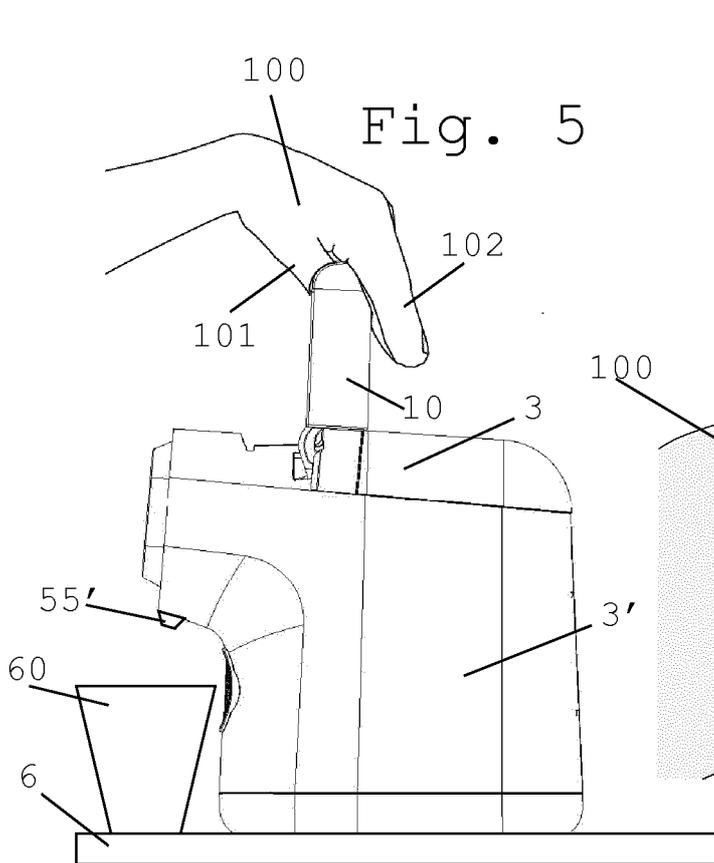
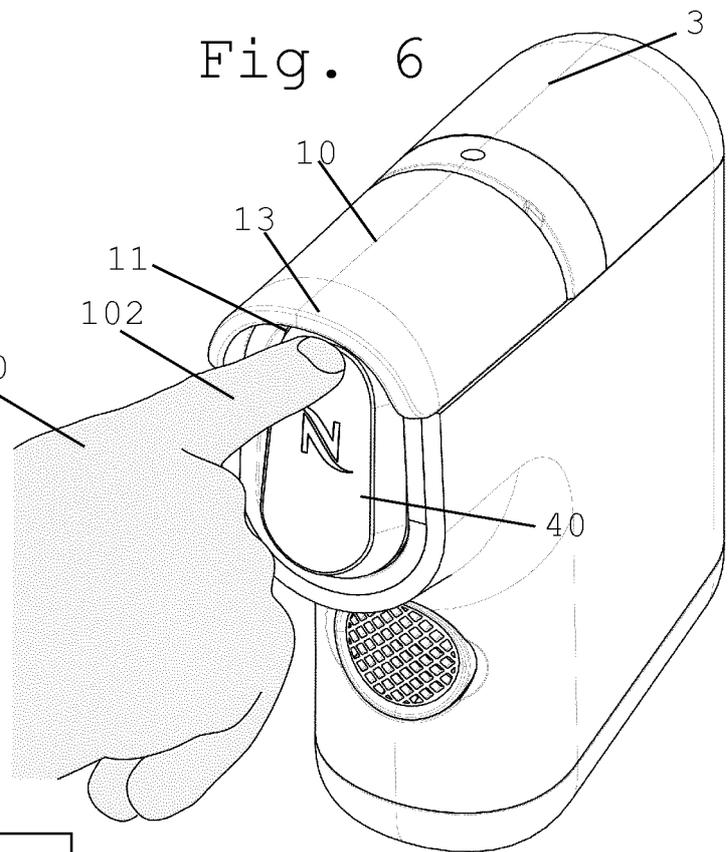


Fig. 6



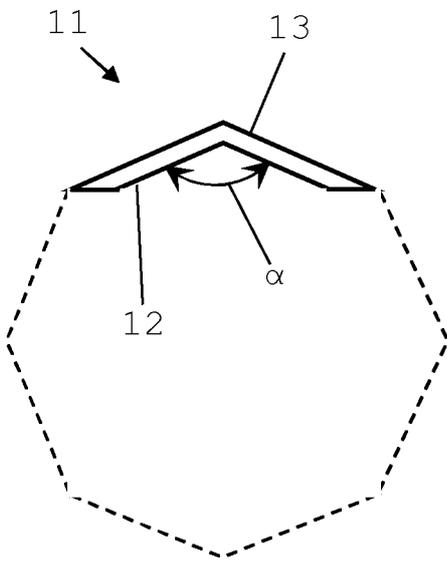


Fig. 7a

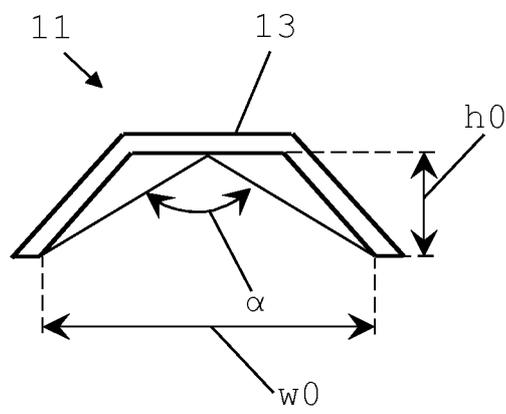


Fig. 7b

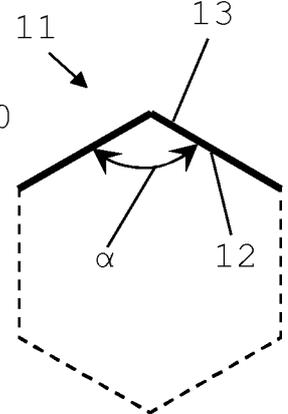


Fig. 7c

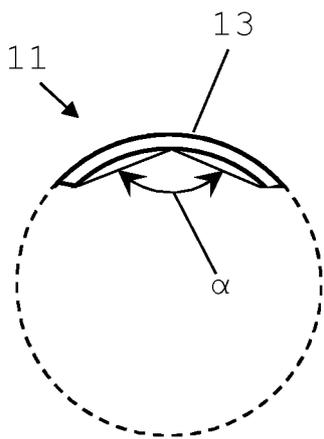


Fig. 8a

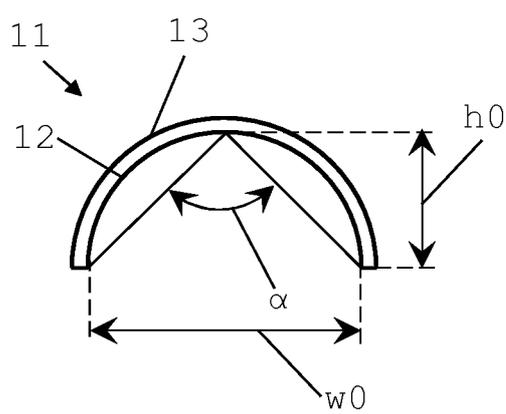


Fig. 8b

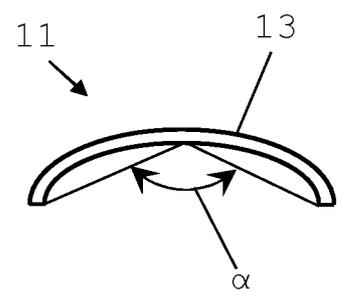


Fig. 8c

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2015/077714

A. CLASSIFICATION OF SUBJECT MATTER
INV. A47J31/36 A47J31/44
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 , WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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X,P	EP 2 859 821 AI (TSANN KUEN ZHANGZHOU ENTPR CO [CN]) 15 April 2015 (2015-04-15) paragraphs [0009] - [0013] , [0018] - [0025] ; figures 1-8 -----	1,8, 13-15
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	-/- .	

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

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"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search 21 January 2016	Date of mailing of the international search report 02/02/2016
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Escudero, Raquel
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INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2015/077714

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
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X	wo 2011/086088 AI (NESTEC SA [CH]; SCHNYDER FRANK [CH]) 21 July 2011 (2011-07-21) page 14, line 38 - page 15, line 17; figure 2 -----	1-3,8-15

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