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- (71) **Applicant (for all designated States except US):**  
NESTEC S.A. [CH/CH]; Av. Nestlé 55, CH-1800 Vevey (CH).
- (72) **Inventors; and**
- (75) **Inventors/Applicants (for US only):** CAHEN, Antoine [CH/CH]; Les Ateliers du Nord, Pl. du Nord 2, CH-1005 Lausanne (CH). RITHENER, Blaise [CH/CH]; Ch de la Crausaz 40, CH-1814 La Tour-de-Peilz (CH). GRANGER, Eric [FR/CH]; Chemin de Chandolin 3, c/o Widmer, CH-1005 Lausanne (CH).
- (74) **Agent:** SCHNYDER, Frank; Avenue Nestlé 55, CH-1800 Vevey (CH).
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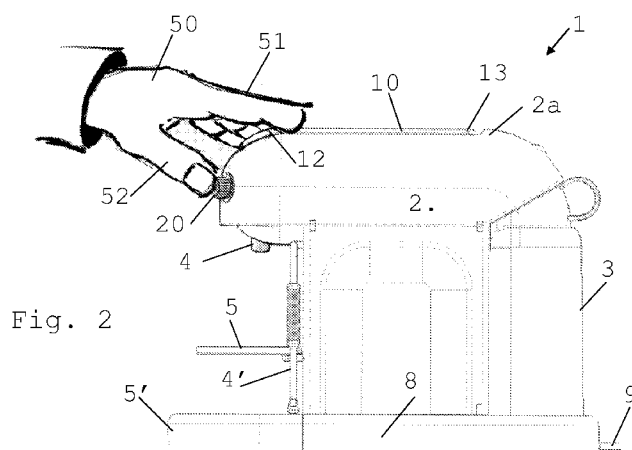
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(54) **Title:** ERGONOMIC HANDLE & USER-INTERFACE



(57) **Abstract:** A machine (1) for preparing a beverage having: a beverage preparation module (1') for holding a flavouring ingredient and circulating a liquid there through to form said beverage; a handle (10,12,10',12') movable between a transfer position for loading said ingredient into the module and/or evacuating said ingredient from the module, and a circulation position for circulating said liquid through said ingredient; and a user-interface (20,20a,20b) for initiating circulation of the liquid through the flavouring ingredient in the beverage preparation module. The handle has a drive portion (12,12') arranged to be contacted and driven by a human hand (50) to move the handle between the transfer position and the circulation position. The handle (10,12,10',12') and the user-interface (20,20a,20b) are arranged so that said user-interface is operable by said human hand (50) while said hand is still in contact with the drive portion (12,12') of the handle upon driving the handle into the circulation position.



## ERGONOMIC HANDLE &amp; USER-INTERFACE

Field of the Invention

5 The field of the invention pertains to machines for preparing beverages from a liquid circulating through a flavouring ingredient. In particular, the field pertains to the ergonomic handling of such machines by users in order to prepare a beverage.

10 For the purpose of the present description, a "beverage" is meant to include any liquid food, such as tea, coffee, hot or cold chocolate, milk, soup, baby food, etc... A "capsule" is meant to include any pre-portioned beverage 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.

20

Background Art

Certain beverage preparation machines use capsules containing ingredients to be extracted or to be dissolved; for other machines, the ingredients are stored and dosed automatically in the machine or else are added  
25 at the time of preparation of the drink.

Most coffee machines possess filling means that include a pump for liquid, usually water, which pumps the liquid from a source of water that is cold or indeed heated through heating means, such as a heating resistor,  
30 a thermoblock or the like.

Such machine typically have a brewing unit for holding and extraction the beverage ingredient. To introduce the ingredient into the brewing unit and then remove the ingredient upon use, the brewing unit has a  
35 closure mechanism that may be driven by a handle that is

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operable by a user. Various configurations for manipulating the machine have been disclosed in the art.

EP 1 208 782 discloses a coffee machine having a main body including a brewing unit for extracting coffee capsules. The brewing unit is opened and closed with the aid of a handle that can be turned over the main body by an angle of about a 180 deg. from behind to the front of the main body. The handle has a pair of generally L-shaped levers connected at one end by a hand-drivable transverse rod and pivotally mounted at the opposite end to the opening and closing mechanism of the brewing unit. The pivotable L-shaped levers drive a movable part of the brewing unit via a pair of intermediate levers connected at a first end to this movable brewing unit part and at a second end to the corner of the L-shaped levers. US 2008/0006159 discloses a brewing unit that has a horizontally movable drawer for introducing an ingredient pouch and a vertically movable top part with a piercing mechanism for opening the pouch. These elements are driven by a generally U-shaped movable handle that can be pivoted from an upright open position down to a generally horizontal closed position. US 7,165,488, WO 2007/111884 and EP 1 829 469 disclose a beverage machine having a brewing unit that can be opened and closed manually by a handle system that is linked to a movable top part of the brewing unit and indirectly to a top front part of the main body.

More recently, efforts have been specifically devoted to the ease of operation of a beverage preparation machine for a user and ergonomic configuration of such machines, as illustrated in the following documents.

EP 1 878 368 discloses a beverage machine having a functional block that is rotatably mounted on a support base. The functional block can be designed to be removable from the support base. EP 1 864 598 discloses an autonomous beverage machine that can be mounted onto a docking station. The beverage machine is arranged to be

operable whether connected to the docking station or disconnected therefrom. WO 2009/074553 and WO 2010/015427 disclose beverage preparation machines that are configured so that they can be lifted single-handed by a user.

For allowing the user to control machine operation various systems have been disclosed in the art, for instance as mentioned in the following references: AT 410 377, CH 682 798, DE 44 29 353, DE 202 00 419, DE 20 2006 019 039, DE 2007 008 590, EP 1 448 084, EP 1 676 509, EP 08155851.2, FR 2 624 844, GB 2 397 510, US 4,377,049, US 4,458,735, US 4,554,419, US 4,767,632, US 4,954,697, US 5,312,020, US 5,335,705, US 5,372,061, US 5,375,508, US 5,731,981, US 5,645,230, US 5,836,236, US 5,959,869, US 6,182,555, US 6,354,341, US 6,759,072, US 2007/0157820, WO 97/25634, WO99/50172, WO 2004/030435, WO 2004/030438, WO 2006/063645, WO 2006/090183, WO 2007/003062, WO 2007/003990, WO 2008/104751, WO 2008/138710, WO 2008/138820, WO 2009/135821 and WO 2010/003932.

DE 20 2006 019 039, AT 410 377, US 4,377,049, US 4,554,419, US 4,954,697, US 5,685,435, US 6,759,072, US 6,182,555, WO 2004/030438, WO 2006/090183, WO 2007/003990 WO 2008/138710 and WO 2010/003932 disclose beverage dispensing machines with a generally upright front face having a lower open cavity for receiving a receptacle to be filled via a beverage outlet in the cavity and, on an upper part of the front face, above the opening of this cavity, a generally vertical upper screen, touch screen and/or touch pad arranged as a user-interface. FR 2 624 844 discloses a beverage dispenser having a front face with an open cavity for filling a receptacle and a micro-computer with a keyboard and a monitor housed in the machine's front face next to the cavity opening.

More advanced user-interface systems may include user-movable laser pointers for setting a level of fill directly on a user-cup, as taught in WO 2006/063645, or a sensor for acquiring the position of a finger or a user-operated object pointing onto a desired level of fill on

a cup, as disclosed in WO 2009/135821, and filling automatically the cup to such a level.

However, there is still a need to further improve the ergonomics of a coffee machine arranged so that its operation by a user is facilitate, in particular accelerated.

#### Summary of the Invention

The invention thus relates to a machine for preparing a beverage. The machine includes:

- a beverage preparation module for holding a flavouring ingredient, in particular a pre-portioned ingredient such as an ingredient supplied to such module within a capsule, and circulating a liquid, e.g. water, therethrough to form such beverage;
- a handle movable between a transfer position for loading the flavouring ingredient into the module and/or evacuating this ingredient from the module, and a circulation position for circulating the liquid through this ingredient; and
- a user-interface for initiating circulation of this liquid through the flavouring ingredient in the beverage preparation module.

The handle has a drive portion arranged to be contacted and driven by a human hand to move the handle between the transfer position and the circulation position. Typically, the handle is movable from the transfer position to the circulation position.

For instance, the machine is a coffee, tea or soup machine. The machine may be arranged for preparing within a brewing unit a beverage by passing hot or cold water or another liquid through a capsule containing a flavouring ingredient of the beverage to be prepared, such as ground coffee or tea or chocolate or cacao or milk powder.

The brewing unit may be moved by the handle from a first configuration, namely a transfer configuration, in which the flavouring ingredient is introduced into the brewing unit and/or evacuated therefrom, and a second  
5 configuration, namely a circulation configuration, in which the liquid is circulated through the flavouring ingredient to prepare the beverage. The circulation and transfer configurations of the brewing unit typically correspond to the handle's circulation and transfer  
10 positions, respectively.

Typically, the machine includes one or more of a pump, heater, drip tray, ingredient collector, liquid tank and fluid connection system for providing a fluid connection between the liquid tank and the brewing unit,  
15 etc.. The configuration of a fluid circuit between a source of liquid, e.g. a reservoir, and a brewing unit, i.e. a suitable beverage preparation module, is for example disclosed in greater details in WO 2009/074550.

In accordance with the invention, the handle and the  
20 user-interface are arranged so that the user-interface is operable by the user's hand while this hand is still in contact with the drive portion of the handle upon driving the handle into the circulation position.

It follows that a user operating the machine by  
25 moving the handle into a circulation position for circulating the liquid through the flavouring ingredient brings at the same time his or her hand to the interface for initiating the circulation of the liquid through the ingredient. In other words, the user does not have to  
30 displace his or her hand to a different location on the machine or use another hand to start the beverage making process after the flavouring ingredient has been properly positioned in the beverage preparation module by bringing the handle into the circulation position. Hence, the  
35 manual operation of the machine is simplified and accelerated by minimising the user's manipulation effort.

The drive portion can be arranged to be pushed and/or pulled by a human hand for driving the handle, the user-interface being operable by the human hand while the hand is still in a pushing and/or pulling position  
5 against the drive portion of the handle upon driving the handle into the circulation position. The handle may be pushed by the user's fingertips and/or pulled by gripping the handle.

The drive portion can be arranged to be seized by  
10 the human hand for driving the handle, the user-interface being operable by the human hand while the hand is still seizing the drive portion of the handle upon driving the handle into the circulation position.

Hence, the handle and the interface may be so  
15 configured that the user can operate the interface with the hand used for bringing the handle into the circulation position without having to move the hand away from the handle.

Advantageously, the drive portion forms a part of  
20 least counter-force of the handle against the human hand while driving the handle. Hence, in this configuration, the user will drive the handle to the circulation position by actuating the drive portion of the handle that generates least mechanical resistance during the  
25 movement.

The user-interface may include at least one user-selector selected from push-buttons, turn-buttons, toggle-switches, slide buttons, touch-buttons, touch pads and touch screens. The user-interface may comprise a  
30 plurality of selectors for selecting different drinks, in particular drinks of different sizes and/or different types, such as espresso, regular coffee and/or lungos, extra-long coffee and milk coffee.

The user-interface may be fixed to the machine's  
35 housing and the handle movable relative thereto, in particular pivotable relative to the housing.

The handle can be pivotally movable, in particular pivotally movable over a top part of the machine. The handle can be generally U-shaped, the drive portion forming in particular a middle part of the generally U-shaped handle. The handle can have a pair of levers and the drive portion between the levers, in particular a pair of levers having first end portions that are pivotally mounted and second end portions that are joined via the drive portion. The handle may be a single-arm lever, in particular a lever having a first end portion that is pivotally mounted and a second end portion that forms the drive portion.

The machine may have a front face bearing an outlet for delivering said beverage, the user-interface being located on or adjacent to said front face. The user-interface is on a top face, in particular adjacent the front face.

The user-interface may extend below the drive portion when the handle is in the circulation position, the user-interface being optionally located in front of the handle. The user-interface may extend above and/or behind the drive portion when the handle is in the circulation position.

When the handle is in the circulation position, the user-interface can be spaced from the drive portion by a distance in the range of 0 to 10 cm, in particular in the range of 0.5 to 7 cm such as 1 to 5 cm, optionally 1.5 to 3 cm.

The beverage preparation machine may have a passage for introducing by gravity the flavouring ingredient, in particular within a capsule, into the beverage preparation module, the drive portion being located generally above and/or adjacent the passage when the handle is in the transfer position. Hence, the handle in its transfer position is located closely to the user's hand that inserts the ingredient into the machine's passage so that minimal movement of the hand is required



from the insertion of the ingredient to manually actuating the handle.

### Brief Description of the Drawings

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

- Figures 1 and 2 illustrate an embodiment of a beverage machine according to the invention; and

10 - Figures 3 to 5 illustrate part of another embodiment of a beverage machine according to the invention.

### Detailed description

15 Figures 1 and 2 illustrate a first embodiment of a beverage preparation machine 1 according to the invention.

Machine 1 can be electrically powered, typically by the mains, via an electric cord 9.

20 Machine 1 has an internal beverage preparation module covered by a housing 2. The beverage preparation module is arranged for holding a flavouring ingredient, in particular a pre-portioned ingredient such as an ingredient supplied to such module within a capsule, and circulating a liquid therethrough to form the beverage.

25 The liquid, e.g. water, may be stored and supplied to the beverage preparation module from a tank 3. The beverage, upon formation, can be dispensed via an outlet 4 to a dispensing area 5,5', e.g. a support for holding a user cup or mug. The dispensing area may include a first cup support 5 that is movable away from under outlet 4 so  
30 as to give access to a lower second cup support 5' for larger cups, e.g. for dispensing lungos or extra-large beverages. The lower cup support 5' may be connected to a base 8 of machine 1. Suitable movable cup supports are  
35 for example disclosed in EP 1867260 and in WO

2009/074557, the contents of which are hereby incorporated by way of reference.

Machine 1 also includes a steam and/or hot water generator connected to an outlet 4', e.g. for the preparation of frothed milk and/or tea.

Adjacent to the beverage preparation module, machine 1 may have a collector 6 for used flavouring ingredient, e.g. ground coffee or tea upon brewing, for instance contained within capsules. Collector 6 may be positioned underneath the beverage preparation module to collect upon beverage preparation the used flavouring ingredient evacuated to collector 6, e.g. by gravity. Suitable collectors are for example disclosed in WO 2009/074559 and in WO 2009/135869, which are hereby incorporated by way of reference.

Machine 1 has a handle 10 movable between: a transfer position for loading the ingredient, e.g. within a capsule, into the module and/or evacuating such ingredient from the module; and a circulation position for circulating the liquid through the ingredient.

Typically, handle 10 actuates an ingredient holder with an ingredient chamber, such as a brewing unit, of the beverage preparation module from: a transfer position for insertion of the flavouring ingredient into the holder and/or evacuation of this ingredient therefrom; and a circulation position for circulating the liquid through this ingredient in the ingredient holder to form the beverage. Typically, the ingredient holder, e.g. a brewing unit, has two relatively movable parts that are moved apart for opening the ingredient holder into the transfer position and moved together for closing the ingredient holder into the circulation position. In the circulation position, the ingredient holder may tightly enclose the flavouring ingredient to ensure proper guidance of the liquid through the ingredient.

The circulation position is illustrated in Fig. 2, in which handle 10 is resting on or in a top face 2a of

machine 1. In particular handle 10 can be flush with housing 2.

As shown in Figs 1 and 2, handle 10 is a single-arm lever generally shaped as a straight bar that is slightly curved or bent at its extremity 11 for ergonomic reasons, namely for facilitating the manual application of force onto handle 10 by a convenient orientation of contact surface 12 for hand 50 when handle 10 is moved from the transfer position to the circulation position. In the circulation position (Fig. 2), handle 10 with its extremity 11 may be flush with housing 2 that has a corresponding shape, e.g. to facilitate cleaning of the surface of housing 2.

Hence, handle 10 has a drive portion 12 arranged to be contacted and driven by a human hand 50 to move the handle between the transfer position in which the flavouring ingredient, e.g. enclosed in a capsule, is inserted into the beverage preparation module for instance via a passage 7, and the circulation position in which the flavouring ingredient is housed in the beverage preparation module and liquid may be circulated therethrough to form the beverage.

Fig. 1 shows handle 10 in an intermediate position between the transfer position and the circulation position (Fig. 2). In the transfer position, handle 10 entirely uncovers passage 7 for allowing the insertion of the flavouring ingredient, e.g. within a capsule, into the beverage preparation module.

Passage 7 can be arranged for introduction by gravity of the flavouring ingredient into the beverage preparation module, drive portion 12 being located generally above and/or adjacent passage 7 when handle 10 is in the transfer position to facilitate the coordination between manual introduction of a flavouring ingredient, e.g. within a capsule, into passage 7 and manually actuating handle 10, in particular using the same hand 50.

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Furthermore, machine 1 includes a user-interface 20 for initiating circulation of the liquid through the flavouring ingredient in the beverage preparation module.

The beverage preparation module typically includes  
5 one or more of the following components:

- 10 a) the ingredient holder, such as a brewing unit, for receiving the flavouring ingredient of this beverage, in particular a pre-portioned ingredient supplied within a capsule, and for guiding an incoming flow of liquid, such as water, through this ingredient to beverage outlet 4;
- b) an in-line heater, such as a thermoblock, for heating this flow of liquid to be supplied to the ingredient holder;
- 15 c) a pump for pumping this liquid through the in-line heater;
- d) one or more fluid connecting members for guiding this liquid from a source of liquid, such as tank 3 of liquid, to beverage outlet 4;
- 20 e) an electric control unit, in particular comprising a printed circuit board (PCB), for receiving instructions from a user via an interface and for controlling the in-line heater and the pump; and
- 25 f) one or more electric sensors for sensing at least one operational characteristic selected from characteristics of the ingredient holder, the in-line heater, the pump, liquid reservoir 3, ingredient collector 6, a flow of this liquid, a pressure of this liquid and a temperature of this liquid, and for communicating such  
30 characteristic(s) to the control unit.

The heater may be a thermoblock or an on demand heater (ODH), for instance an ODH type disclosed in EP 1 253 844, EP 1 380 243 and EP 1 809 151. Examples of  
35 suitable brewing units and capsule management are for example disclosed in WO 2005/004683, WO2007/135136 and WO

2009/043630, which are hereby incorporated by way of reference. Suitable beverage preparation modules are for instance disclosed in WO 2009/074550 and WO 2009/130099 which are hereby incorporated by way of reference.

5 In accordance with the invention, handle 10 and user-interface 20 are arranged so that user-interface 20 is operable by a human hand 50 while it is still in contact with drive portion 12 of handle 10 upon driving handle 10 into the circulation position, as illustrated  
10 in Fig. 2.

For instance, drive portion 12 is contacted and actuatable by one or more of the index finger, middle finger, ring finger and little finger 51, user-interface 20 being operable by the hand's thumb 52 while finger(s)  
15 51 is/are still in contact with handle 10, i.e. without having to move hand 50 away from handle 10 after moving handle 10 into its circulation position. For convenience, drive portion 12 may have a surface or profile specially adapted for being hand driven, e.g. the surface of drive  
20 portion 12 may include a means, such as a surface structure or composition, in particular an anti-skid surface that provides friction against hand 50.

As illustrated in Fig. 2, drive portion 12 is arranged to be pushed by human hand 50 for driving handle  
25 10. User-interface 20 is operable by hand 50 while it is still in a pushing position against drive portion 12 upon driving handle 10 into the circulation position (Fig. 2). User-interface 20 may include a plurality of user selectors for initiating preparation of beverages of  
30 different flavours and/or of different sizes and/or different types. For instance, user-interface 20 includes a first user-selector and a second user-selector, e.g. in the form of push-buttons, for selecting the dispensing of espresso coffee and of lungo coffee.

35 Machine 1 illustrated in Figs 1 and 2 has a front face 2b bearing outlet 4 for delivering the beverage, user-interface 20 being located on or adjacent to front

face 2b. In particular, user interface 20 is located below drive portion 12 to be easily accessible by the user's hand 50 while still in position on drive portion 12 on handle 10 upon reaching the handle's circulation position (Fig. 2). For instance, when handle 10 is in the circulation position, user-interface 20 is spaced from drive portion 12 by a distance in the range of 2 to 4 cm.

Drive portion 12 may form a part of least counter-force of handle 10 against human hand 50 while driving handle 10. For instance, handle 10 is arranged to pivot at a first end portion 13 thereof and drive portion 12 is located at the opposite end of handle 10 so that the lever arm is maximised and the force applied by hand 50 and necessary to vanquish the counter-force of the system minimised.

Figs 3 to 5, in which the same numeric references generally designate the same elements, illustrate a part of another embodiment of a machine 1 according to the invention. Figs 3 and 4 illustrate a brewing unit 1' that is part of a beverage preparation module (not further shown) and connected to a handle 10',12'.

Brewing unit 1' has a front part 14 and a rear part 15. Front and rear parts 14,15 can be moved apart (Fig. 3) to form between them passage 7 for the insertion of a capsule and may be moved together (Fig. 4) around the inserted capsule for closing passage 7, for forming a brewing chamber around the capsule and for circulating liquid, e.g. water, through the chamber and the capsule therein to form a beverage.

Handle 10',12' is movable between a transfer position (Fig. 3) in which parts 14,15 are spaced apart to form passage 7 and a circulation position (Figs 4 and 5) in which parts 14,15 are urged together around a capsule for circulating liquid through the capsule. The handle has a drive portion 12' arranged to be contacted and driven by a human hand. Drive portion 12' can be transverse and extend between a pair of levers 10'

forming therewith generally a u-shape. Hence, drive portion 12' forms a middle part of handle 10',12'. Levers 10' are pivotally mounted opposite drive portion 12' about a pivot axis 13' in rear part 15 of brewing unit 1'. Lever 10' extends beyond pivot axis 13' and is connected to an extremity of a traction arm 16 via a pivot joint 16'. An opposite extremity of traction arm 16 is connected via a second pivot joint 16'' to front part 14 of brewing unit 1'.

Hence, moving handle 10',12' from the transfer position (Fig. 3) to the circulation position (Fig. 4) causes front part 14 to be pulled against rear part 15 via traction arm 16. The relative movement of parts 14,15 may be further assisted by a hydraulic system (not shown), in particular for tightly closing the brewing unit.

Like in the previous embodiment, drive portion 12' forms a part of least counter-force of handle 10',12' against hand 50 while driving the handle.

As mentioned above, for convenience, drive portion 12 may have a surface or profile specially adapted for being hand driven, e.g. the surface of drive portion 12 may include a means, such as a surface structure or composition, in particular an anti-skid surface that provides friction against a human hand.

Further details of a brewing unit 1' and extraction module of this kind are disclosed in greater details in co-pending application EP 09172187.8 and EP 09177592.4 which are hereby incorporated by way of reference. Examples of handling of a capsule in such a brewing unit via an insertion passage for a flavouring ingredient are disclosed in WO 2007/135135.

Fig. 5 illustrates a part of machine 1 with its housing 2 and handle 10',12' in the circulation position.

Machine 1 has a user-interface 20a,20b for initiating circulation of liquid through the ingredient in the beverage preparation module.

In accordance with the invention, handle 10',12' and user-interface 20a,20b are arranged so that this user-interface is operable by human hand 50 while the hand is still in contact with drive portion 12' of the handle upon driving handle 10',12' into its circulation position.

Drive portion 12 is arranged to be pushed, pulled and/or seized by a human hand for driving handle 10',12'. User-interface 20a,20b can be operated by such a hand while the hand is still in a pushing, pulling and/or seizure position against drive portion 12' of the handle upon driving the handle into the circulation position (Figs 4 and 5).

As illustrated in Figs 3 to 5, handle 10',12' is pivotally movable over a top part of machine 1. Moreover, machine 1 has a front face 2b bearing outlets 4a,4b,4c for delivering the beverage into a user-cup or user-mug (not shown) located therebelow.

As illustrated in Fig. 5, user-interface 20a,20b is located on front face 2b. User-interface 20a,20b may extend behind, above and below drive portion 12' when handle 10',12' is in the circulation position. User-interface 20a,20b includes four user-selectors, namely three upper push or touch buttons 20a and one lower touch button 20b. The various buttons may trigger the dispensing of beverages differing in size and/or flavour.

For instance, the upper three buttons 20a are arranged for selection of three different dispensing volumes, e.g. espresso coffee, lungo coffee or American coffee, and the lower button 20b may be arranged for selecting optional milk addition into the selected coffee. For example, machine 1 is arranged to dispense coffee via outlet 4a, hot water via outlet 4b for mixing with coffee to prepare Americano coffee, and milk via outlet 4c for incorporation into any coffee or for dispensing as such into a cup or mug. A fluid circuit suitable for preparing Americano coffee or extra-long



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coffee is disclosed in EP 10152556.6 which is hereby incorporated by way of reference.

In a variation, the upper three buttons 20a are configured for selecting the size of a beverage to be prepared and initiating beverage preparation. The lower button 20b may serve a different purpose. For instance, the lower button is a master switch or a service switch.

When handle 10',12' is in the circulation position, user-interface 20a,20b may be spaced from drive portion 12' by a distance in the range of 1 to 10 cm. This distance depends on the length of arms 10' and the distance between pivoting points 13' and user-interface 20a,20b.

Hence, in the transfer position of handle 10',12' (Fig. 3), a user may introduce with his/her hand 50 a flavouring ingredient capsule (not shown) into passage 7 down and along which the capsule is guided by gravity inbetween parts 14,15, and then use the same hand 50 to seize the adjacent drive portion 12' of the handle. By pulling down drive portion 12' over the top and front faces 2a,2b of machine 1, handle 10',12' and brewing unit 1' with the introduced capsule are brought from the transfer position into the circulation position (Figs 4 and 5) in which the capsule is enclosed and secured ready for the circulation of liquid therethrough.

By driving handle 10',12' with hand 50 into the circulation position, drive portion 12' with actuating hand 50 is brought in front of user-interface 20a,20b. With his or her hand 50 still on drive portion 12' a user may then operate user-interface 20a,20b, e.g. gripping handle 10',12' with fingers 51 and operating lower button 20b with thumb 52 or holding drive portion 12' with the palm of hand 50 and operating upper buttons 20a with fingers 51. Hence, the user does not have to move hand 50 away from drive portion 12' or involve his/her second hand to initiate beverage dispensing via outlets

4a, 4b, 4c. Thus user-movements for dispensing a beverage are reduced.

The beverage machine of the invention is particularly simple and is configured, in a simple manner, to be easily and safely operated single-handed by a user with few movements.

Claims

1. A machine (1) for preparing a beverage having:

- a beverage preparation module (1') for holding a  
flavouring ingredient, in particular a pre-portioned  
5 ingredient such as an ingredient supplied to such  
module within a capsule, and circulating a liquid  
therethrough to form said beverage;

- a handle (10,12,10',12') movable between a transfer  
10 position for loading said ingredient into the module  
and/or evacuating said ingredient from the module, and  
a circulation position for circulating said liquid  
through said ingredient; and

- a user-interface (20,20a,20b) for initiating  
15 circulation of said liquid through said ingredient in  
the beverage preparation module,

the handle having a drive portion (12,12') arranged to be  
contacted and driven by a human hand (50) to move the  
handle between the transfer position and the circulation  
position,

20 characterised in that the handle (10,12,10',12') and the  
user-interface (20,20a,20b) are arranged so that said  
user-interface is operable by said human hand (50) while  
said hand is still in contact with the drive portion  
(12,12') of the handle upon driving the handle into the  
25 circulation position.

2. The machine of claim 1, wherein the drive portion  
(12,12') of the handle (10,12,10',12') is arranged to be  
pushed and/or pulled by said human hand (50) for driving  
the handle, the user-interface (20,20a,20b) being  
30 operable by said human hand while said hand is still in a  
pushing and/or pulling position against the drive portion  
upon driving the handle into the circulation position.

3. The machine of claim 1 or 2, wherein the drive  
portion (12') of the handle (10,12,10',12') is arranged  
35 to be seized by said human hand (50) for driving the  
handle, the user-interface (20a,20b) being operable by

said human hand while said hand is still seizing the drive portion (12') upon driving the handle into the circulation position.

4. The machine of any preceding claim, wherein the  
5 drive portion (12,12') forms a part of least counter-force of the handle (10,12,10',12') against said human hand (50) while driving the handle.

5. The machine of any preceding claim, wherein the  
10 user-interface (20,20a,20b) includes at least one user-selector selected from push-buttons, turn-buttons, toggle-switches, slide buttons, touch-buttons, touch pads and touch screens.

6. The machine of claim 5, wherein the user-interface  
15 (20,20a,20b) comprise a plurality of selectors for selecting different drinks, in particular drinks of different sizes and/or different types.

7. The machine of any preceding claim, wherein the  
20 handle (10,12,10',12') is pivotally movable, in particular pivotally movable over a top part (2a) of said machine (1).

8. The machine of any preceding claim, wherein the  
handle (10',12') is generally U-shaped, the drive portion (12') forming in particular a middle part of the generally U-shaped handle.

9. The machine of any preceding claim, wherein the  
25 handle (10',12') has a pair of levers (10') and the drive portion (12') therebetween, in particular a pair of levers having first end portions (13') that are pivotally mounted and second end portions that are joined via the  
30 drive portion (12').

10. The machine of any one of claims 1 to 7, wherein the  
35 handle (10,12) is a single-arm lever, in particular a lever having a first end portion (13) that is pivotally mounted and another end portion that forms said drive portion (12).

11. The machine of any preceding claim, wherein the machine has a front face (2b) bearing an outlet (4,4a,4b,4c) for delivering said beverage, the user-interface (20,20a,20b) being located on or adjacent to  
5 said front face.

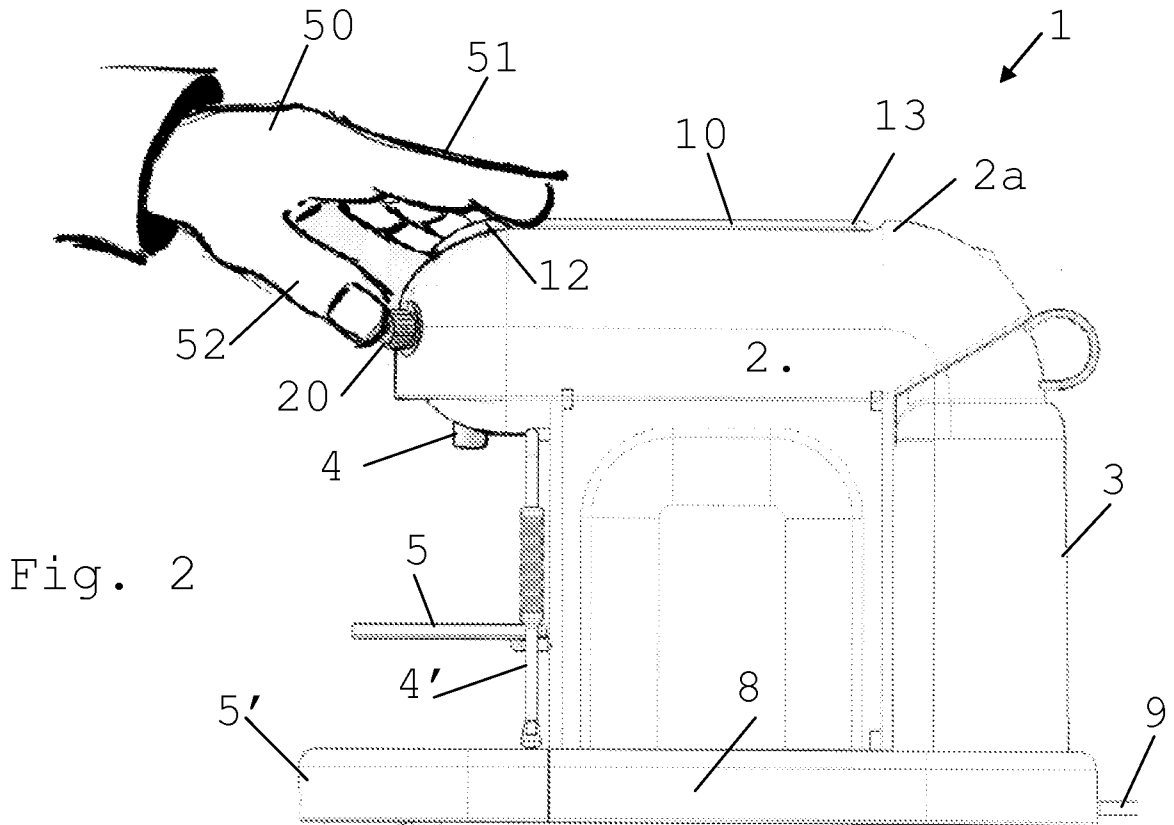
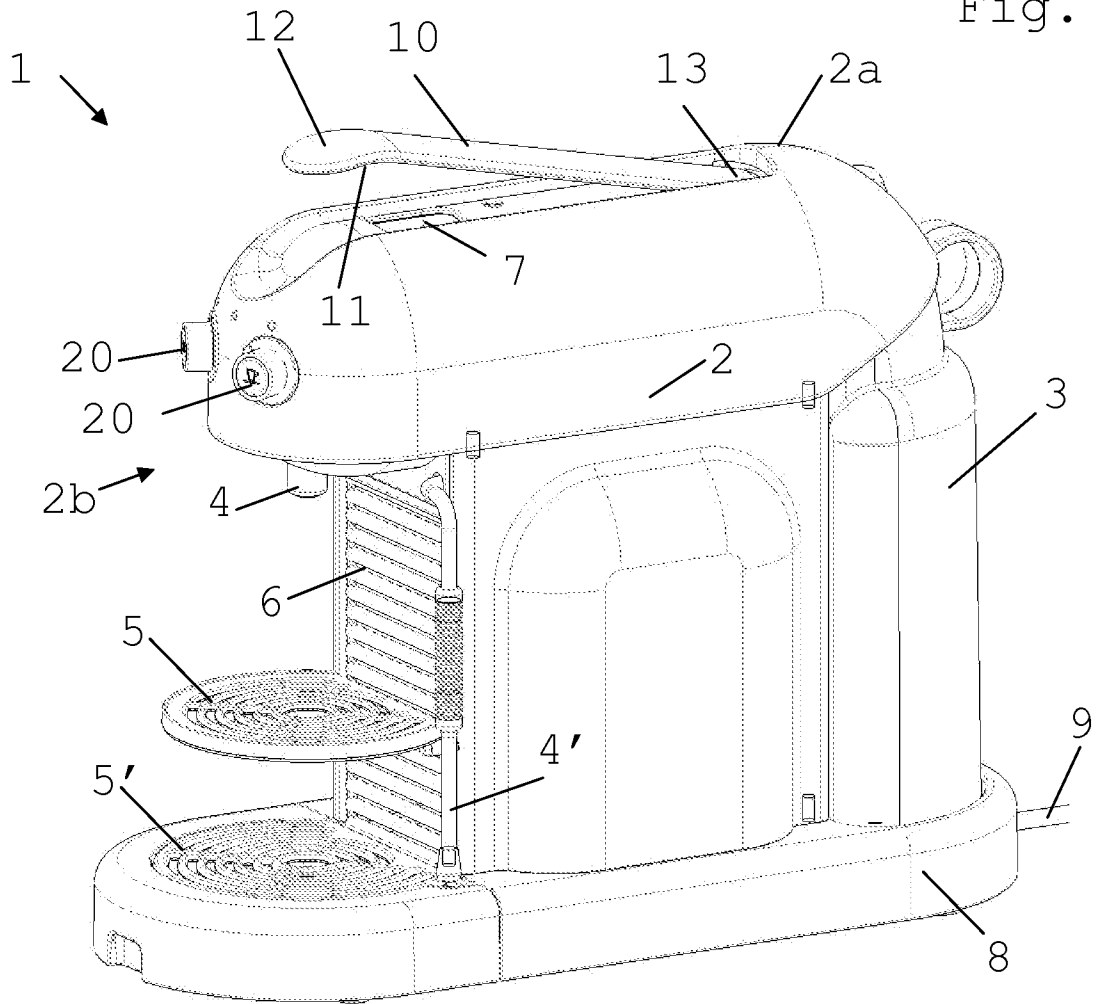
12. The machine of any preceding claim, wherein the user-interface (20,20b) extends below the drive portion when the handle (10,12,10',12') is in the circulation position, the user-interface (20) being optionally  
10 located in front of the handle (10,12).

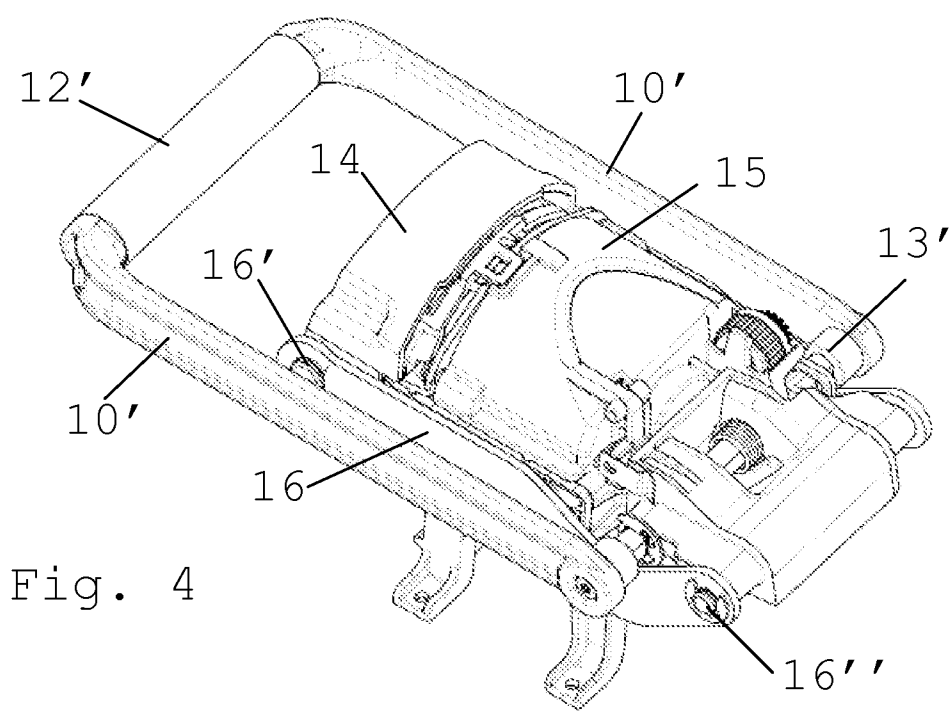
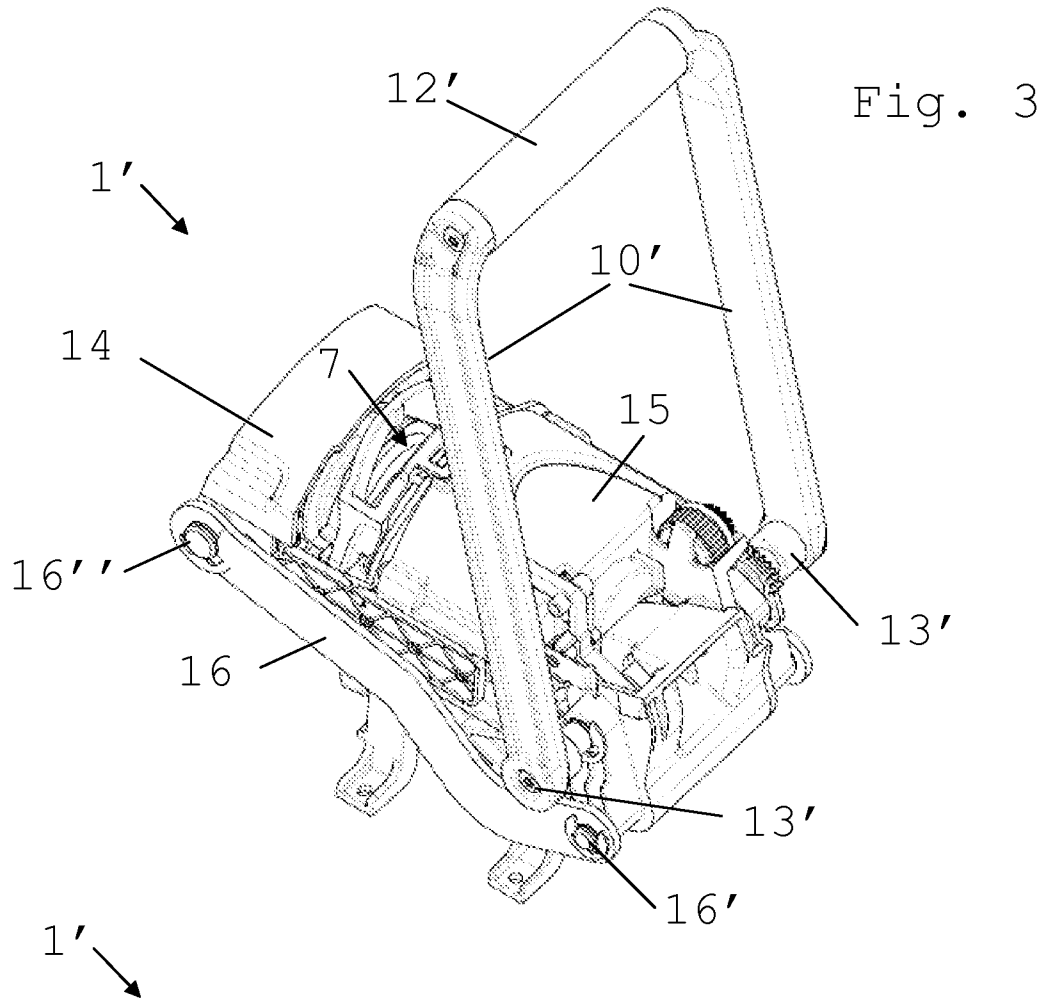
13. The machine of any preceding claim, wherein the user-interface (20a,20b) extends above and/or behind the drive portion (12') when the handle (10',12') is in the circulation position.

14. The machine of any preceding claim, wherein, when the handle (10,12,10',12') is in the circulation position, the user-interface (20,20a,20b) is spaced from the drive portion (12,12') by a distance in the range of 0 to 10 cm, in particular in the range of 0.5 to 7 cm  
20 such as 1 to 5 cm, optionally 1.5 to 3 cm.

15. The machine of any preceding claim, which has a passage (7) for introducing by gravity said flavouring ingredient into the beverage preparation module, the drive portion (12,12') being located generally above  
25 and/or adjacent the passage when the handle (10,12,10',12') is in the transfer position.

Fig. 1





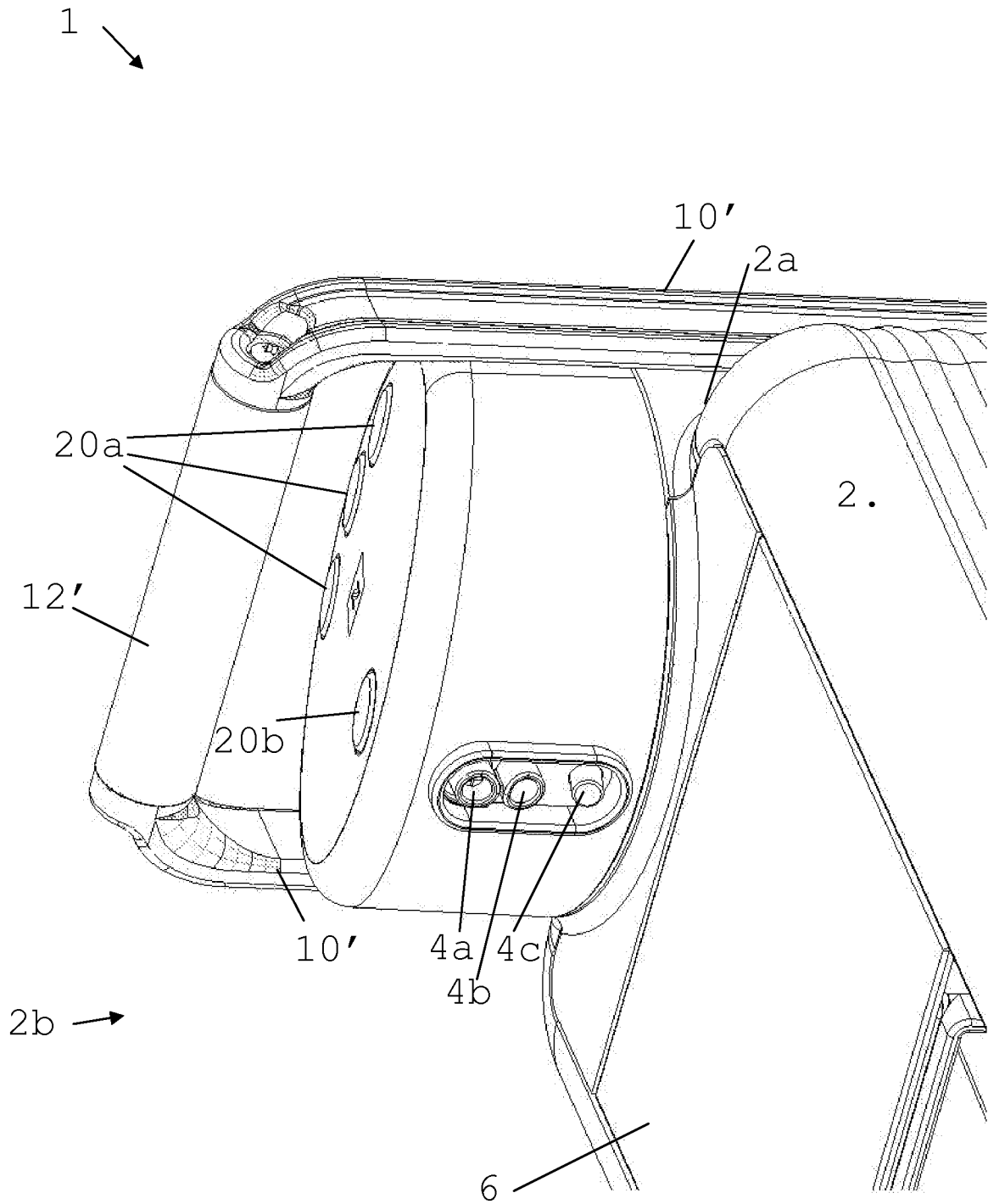


Fig. 5



INTERNATIONAL SEARCH REPORT

International application No  
PCT/EP2011/058222

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2009/074557 A1 (NESTEC SA [CH]; CAHEN ANTOINE [CH]; KAESER STEFAN [CH]; KOLLEP ALEXAND) 18 June 2009 (2009-06-18) page 7, line 25 - page 13, line 20; figure 1	1-10, 13-15
X	WO 2009/074550 A2 (NESTEC SA [CH]; KRAEUCHI FRANK [CH]; OZANNE MATTHIEU [CH]; KAESER STEF) 18 June 2009 (2009-06-18) cited in the application page 18, lines 1-8 pages 13-20; figures	1-12,14, 15
X	WO 2009/135034 A1 (BUNN O MATIC CORP [US]; RAHN CHRISTOPHER W [US]; MILLER JAMES I [US]) 5 November 2009 (2009-11-05) paragraphs [0023] - [0048]; figures	1-7, 10-14
	-/--	

Further documents are listed in the continuation of Box C.

See patent family annex.

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Date of the actual completion of the international search <b>4 August 2011</b>	Date of mailing of the international search report <b>11/08/2011</b>
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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 <b>De Terlizzi, Marino</b>
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## INTERNATIONAL SEARCH REPORT

International application No  
PCT/EP2011/058222

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2010/032271 A1 (SAECO IPR LTD [IE]; CASTELLANI ANDREA [IT]) 25 March 2010 (2010-03-25) page 5, line 5 - page 18, line 19; figure 1	1-5,7-9, 11,14,15
X	----- WO 2005/060801 A1 (KEURIG INC [US]; BRAGG TIMM A [US]; LAI C ANTHONY [US]; STREETER RICHA) 7 July 2005 (2005-07-07) page 2, paragraph 12 - page 5, paragraph 2; figure 3	1-9, 11-13
X	----- WO 2008/072295 A1 (DEVICESTYLE HOLDINGS CORP [JP]; SUZUKI TAKAO [JP]) 19 June 2008 (2008-06-19) abstract; figures 1-4	1
A	----- EP 1 440 640 A2 (KRAFT FOODS R & D INC [DE]) 28 July 2004 (2004-07-28) paragraphs [0018] - [0132]; figures -----	1-15

## INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2011/058222

Patent document cited in search report	Publication date	Patent family member(s)	Publication date			
WO 2009074557	A1	18-06-2009	AR 069696 A1 10-02-2010			
			AR 069760 A1 17-02-2010			
			AU 2008334682 A1 18-06-2009			
			AU 2008334685 A1 18-06-2009			
			AU 2008334687 A1 18-06-2009			
			AU 2008334689 A1 18-06-2009			
			CA 2707807 A1 18-06-2009			
			CA 2708075 A1 18-06-2009			
			CA 2709225 A1 18-06-2009			
			CA 2709228 A1 18-06-2009			
			CN 101896096 A 24-11-2010			
			CN 101896097 A 24-11-2010			
			CN 101896099 A 24-11-2010			
			CN 101896100 A 24-11-2010			
			EP 2070454 A1 17-06-2009			
			EP 2222210 A2 01-09-2010			
			EP 2222211 A2 01-09-2010			
			EP 2222212 A2 01-09-2010			
			EP 2227122 A1 15-09-2010			
			EP 2236062 A1 06-10-2010			
			WO 2009074550 A2 18-06-2009			
			WO 2009074553 A2 18-06-2009			
			WO 2009074555 A2 18-06-2009			
			JP 2011505933 A 03-03-2011			
			JP 2011505934 A 03-03-2011			
			JP 2011505935 A 03-03-2011			
			JP 2011505936 A 03-03-2011			
			US 2010263543 A1 21-10-2010			
			US 2010263550 A1 21-10-2010			
			US 2010300301 A1 02-12-2010			
			US 2010263547 A1 21-10-2010			
			-----			
			WO 2009074550	A2	18-06-2009	AR 069696 A1 10-02-2010
AR 069760 A1 17-02-2010						
AU 2008334682 A1 18-06-2009						
AU 2008334685 A1 18-06-2009						
AU 2008334687 A1 18-06-2009						
AU 2008334689 A1 18-06-2009						
CA 2707807 A1 18-06-2009						
CA 2708075 A1 18-06-2009						
CA 2709225 A1 18-06-2009						
CA 2709228 A1 18-06-2009						
CN 101896096 A 24-11-2010						
CN 101896097 A 24-11-2010						
CN 101896099 A 24-11-2010						
CN 101896100 A 24-11-2010						
WO 2009074550	A2					EP 2070454 A1 17-06-2009
			EP 2222210 A2 01-09-2010			
			EP 2222211 A2 01-09-2010			
			EP 2222212 A2 01-09-2010			
			EP 2227122 A1 15-09-2010			
			EP 2236062 A1 06-10-2010			
			WO 2009074553 A2 18-06-2009			
			WO 2009074555 A2 18-06-2009			
			WO 2009074557 A1 18-06-2009			
			JP 2011505933 A 03-03-2011			
JP 2011505934 A 03-03-2011						

## INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2011/058222

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		JP 2011505935 A	03-03-2011
		JP 2011505936 A	03-03-2011
		US 2010263543 A1	21-10-2010
		US 2010263550 A1	21-10-2010
		US 2010300301 A1	02-12-2010
		US 2010263547 A1	21-10-2010
-----			
WO 2009135034	A1 05-11-2009	CA 2723189 A1	05-11-2009
		CN 102076249 A	25-05-2011
		US 2011111107 A1	12-05-2011
-----			
WO 2010032271	A1 25-03-2010	AU 2008361871 A1	25-03-2010
		EP 2337479 A1	29-06-2011
		US 2011162530 A1	07-07-2011
-----			
WO 2005060801	A1 07-07-2005	AU 2004304979 A1	07-07-2005
		CA 2549689 A1	07-07-2005
		EP 1691651 A1	23-08-2006
		JP 2007513697 A	31-05-2007
		KR 20060129253 A	15-12-2006
-----			
WO 2008072295	A1 19-06-2008	NONE	
-----			
EP 1440640	A2 28-07-2004	AR 042914 A1	06-07-2005
		AT 376793 T	15-11-2007
		AT 439783 T	15-09-2009
		AU 2004206100 A1	05-08-2004
		BR PI0406892 A	03-01-2006
		CA 2513891 A1	05-08-2004
		CN 1780574 A	31-05-2006
		DE 602004009718 T2	28-08-2008
		DK 1440640 T3	10-03-2008
		EP 1629752 A2	01-03-2006
		ES 2295778 T3	16-04-2008
		ES 2332098 T3	26-01-2010
-----			
EP 1440640	A2	GB 2397509 A	28-07-2004
		GB 2409965 A	20-07-2005
		WO 2004064585 A1	05-08-2004
		HK 1065693 A1	09-05-2008
		HK 1083301 A1	19-03-2010
		JP 2006517429 A	27-07-2006
		KR 20050105986 A	08-11-2005
		MX PA05007864 A	18-10-2005
		PE 10292004 A1	30-12-2004
		PL 204367 B1	29-01-2010
		RU 2331348 C2	20-08-2008
		SI 1629752 T1	29-01-2010
-----			