



(51) International Patent Classification:
A47J 31/44 (2006.01)

(21) International Application Number:
PCT/EP2016/056879

(22) International Filing Date:
30 March 2016 (30.03.2016)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
15162304.8 2 April 2015 (02.04.2015) EP

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

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(54) Title: LOCKING CUP SUPPORT

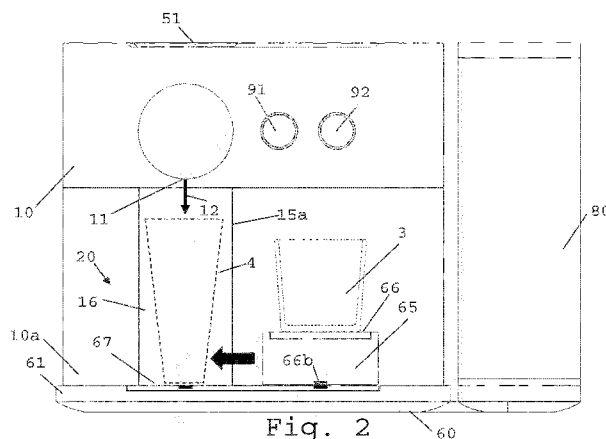


Fig. 2

(57) Abstract: A machine (1) for dispensing a beverage (84) has: an external housing (10,30,30',40,50,60) having an external front face (10); a beverage outlet (11) located on the external front face (10); a seat (15) for receiving a removable service unit (16) via an opening (15a) in the external front face (10); and a movable user-receptacle support body (65) that is movable between a first position for placing on a upper placement surface (66) of the body (65) a short user-receptacle (3) under the outlet (11) and a second position for placing a large user-receptacle (4) under the outlet (11). The support body (65) is directly or indirectly connected to the external front face (10) and located in front thereof in the first and second positions. The service unit (16) is prevented from being removed or inserted into the seat (15) by the support body (65) when adjacent to and in front of the opening (15a): in the first position of the body (15a), the service unit (16) being removable or insertable into the seat (15) when the support body (65) is in the second position; or in the second position of the body (15a), the service unit (16) being removable or insertable into the seat (15) when the support body (65) is in the first position. The support body (65) is movable horizontally in translation from the first position in front of the external front face (10) to the second position in front of the external front face (10) and vice versa.



— *of inventorship (Rule 4.17(iv))*

Published:

— *with international search report (Art. 21(3))*

LOCKING CUP SUPPORT

Field of the Invention

5 The field of the invention pertains to beverage dispensing machines having a beverage outlet, a service unit and a movable cup support.

Background Art

10 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 at the time of preparation of the drink.

15 Most beverage machines possess within a housing: 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, a thermoblock or the like, a brewing unit in which an ingredient is brewed with water or a
20 mixing unit in which ingredients are mixed together, and a beverage outlet for dispensing the prepared beverage. Examples of fluid circuits are disclosed in US 2,715,868, 5,392,694, 5,943,472, 5,992,298, 6,554,588, WO 2006/032599, WO 2009/024500, WO 2009/150030 and WO
25 2010/006953. The brewing unit may be manual, as for instance disclosed in WO 2005/004683, WO2007/135136 and WO 2009/043630, or motorized, as for instance disclosed in EP1767129, WO 2012/025258, WO 2012/025259, WO 2012/093108, WO 2013/127476, WO 2014/056642, WO
30 2014/056821, WO 2014/060370, WO 2014/096122, WO 2014/096123, EP2014163793.4 and EP14163810.6, and the references cited therein.

The machines may be arranged to dispense beverages for small and large cups. Arrangements to properly
35 position the cups under the outlet are known. Examples of such machines are disclosed in EP 0 549 887, EP 1 440 639, EP 1 731 065, EP 1 867 260, US 5,161,455, US 5,353,692, WO 2009/074557, WO 2009/074559, WO 2009/135869, WO 2011/154492, WO 2012/007313, WO
40 2013/186339, EP2014198712.3, EP2014198710.7 and EP2014198715.6, and the references cited therein.

Such machines are usually arranged to be placed at some convenient location on a support surface in a

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kitchen or bar or in an office or in another suitable environment, typically close to the mains and to a source of water such as close to the kitchen sink, and are not easily movable. Moveable coffee machine are however known
5 as disclosed in EP 1 878 368 and EP 1 864 598, and the references cited therein.

With the view of reducing the machine's footprint or operating volume, it is known to integrate the machine components, e.g. as disclosed in WO 2009/130099, WO
10 2012/072764, WO 2012/072766, WO 2012/093107, WO 2012/126971, WO 2013/127906. To adapt the shape of the machine to different environments, it is known to makes the machine articulated, e.g. as disclosed in WO 2012/055767 and WO 2013/104643.

15

Summary of the Invention

An objective of the invention is to provide a solution or at least an alternative to the prior art configurations. A particular object of the invention is
20 to provide a beverage dispensing machine with a cup support and a service unit that are coordinated in an ergonomic manner.

The invention thus relates to a machine for dispensing a beverage, such as a beverage prepared from a capsule containing a beverage ingredient.
25

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
30 meant to include any pre-portioned beverage ingredient, such as a flavouring ingredient, within an enclosing packaging of any material, in particular an airtight packaging, e.g. plastic, aluminium, recyclable and/or biodegradable packagings, and of any shape and structure,
35 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 plurality of beverage servings.

The beverage preparation typically includes the
40 mixing of a plurality of beverage ingredients, e.g. water and milk powder, and/or the infusion of a beverage 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

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in liquid form, e.g. in a concentrate form. A carrier or dilution liquid, e.g. water, may be mixed with such ingredient to form the beverage.

For instance, 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 or up to 300 or 400 ml, e.g. the volume for filling a cup or mug, depending on the type of beverage. Formed and dispensed beverages may be selected from ristrettos, espressos, lungos, cappuccinos, café latte, americano coffees, teas, etc... A coffee machine may be configured for dispensing 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 includes an external housing having an external front face. The housing may have at least one of: one or more external lateral side faces; an external rear face; an external top face; and an external bottom face.

The machine may have a generally prismatic, e.g. parallelepipedic, main body over which the housing extends.

The machine includes a beverage outlet located on the external front face.

Suitable advanced beverage outlet configurations, that include drop management arrangements, are for instance disclosed in WO 2006/050769, WO 2012/072758, WO 2013/127907, EP2014186738.2, EP2014195048.5 and EP14195067.5. For the purpose of implementing the present invention, such drop management is optional. For instance, a simple machine outlet of the type disclosed in US8091469 or WO 2009/074550 can be used.

The machine has a seat for receiving a removable service unit via an opening in the external front face.

Examples of service units are disclosed in EP 1 731 065, EP 1 867 260, WO 2009/013778, WO 2009/074559, WO 2009/135869, WO 2010/128109, WO 2011/086087 and WO 2011/086088.

For instance, the service unit includes:

- a receptacle for collecting waste material such as capsules upon use and/or residual liquid; and/or

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- a feeder for supplying a beverage ingredient capsules and/or another ingredient for forming the beverage to be dispensed and/or a cleaning agent.

5 The machine has a movable user-receptacle support body that is movable between a first position for placing on a upper placement surface of the body a short user-receptacle under the outlet and a second position for placing a large user-receptacle under the outlet.

10 The user-receptacle support body is directly or indirectly connected to the external front face and located in front thereof in the first position and in the second position.

15 The service unit is prevented from being removed or inserted into the seat by the user-receptacle support body when the support body is adjacent to and in front of the opening:

- in the first position of the body, the service unit being removable or insertable into the seat when the support body is in the second position; or
- 20 - in the second position of the body, the service unit being removable or insertable into the seat when the support body is in the first position.

25 In accordance with the invention, the user-receptacle support body is movable horizontally in translation from the first position in front of the external front face to the second position in front of the external front face and vice versa.

30 Hence, when the machine is mainly intended to be used for serving small beverages into short user-receptacle, the seat's opening for service unit may be located adjacent to and behind the support body in the first position, so that the service unit is prevented from being removed from the seat during the main use of the machine. Likewise, when the machine is mainly
35 intended to be used for serving large beverages into short user-receptacle, the seat's opening for service unit may be located adjacent to and behind the support body in the second position, so that the service unit is prevented from being removed from the seat during the
40 main use of the machine.

The machine may include a connection means for connecting the user-receptacle support body to external front face, the user-receptacle having a connector that

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is connected or connectable to the connection means to maintain the user-receptacle body in the first and second positions. The connection means may guide the user-receptacle body from the first position into the second position and vice versa. The connection means can have a direction that extends generally along a bottom part of the external front face so that the user-receptacle support body is movable with its connector in connection with the connection means from the first position into the second position and vice versa along the direction extending along the bottom part. For instance, the direction of the connection means extends on: the bottom part of the external front face; and/or a front area formed by a machine foot projecting in front of the bottom part of the external front face and extending along the external front face.

Hence, the support body can be in connection with the connection means during the entire travel from the first position to the second position and vice versa. Consequently, the travel direction of the support body between the first and second positions can be entirely determined by the configuration of the connection means from the first to the second positions and vice versa.

The machine can have a machine bottom face and the direction of the connection means can be generally parallel to the bottom face.

The machine may have two external spaced-apart lateral side faces, the user-receptacle support body being movable with its connector in connection with the connection means from the first position into the second position and vice versa along the above direction from adjacent or close to one external lateral side face to adjacent or close to the other external lateral side face.

The connection means may have a mechanical arrangement comprising at least one of:

- a rail cooperating with a rail connector of the support body and/or a groove cooperating with a groove connector of the support body, such as a rail slider and/or groove slider of the support body having a single degree of freedom along the rail and/or the groove when connected thereto, the rail and/or groove and the rail and/or groove slider having optionally a generally dovetail shape for cooperating together along a single degree of freedom;

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- a belt or chain secured to the user-receptacle support body and movable along the external front face, such as a belt or chain in an open or closed loop; and
- a local releasable positioner for guiding the support body into the first position or second position, such as a plug-and-socket positioner or a hook positioner or a snap positioner.

The connection means and the connector may be magnetically constrained.

The connector can include a magnetic field-generating element that is arranged to be magnetically constrained against a corresponding ferromagnetic element of the connection means.

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The magnetic field-generating element can have an electromagnet element or a permanent magnet element, e.g. made of at least one of iron, nickel, cobalt, rare earth metals, e.g. lanthanide, and alloys and oxides containing such metals as well as polymers (e.g. plastics) carrying such elements and components.

The ferromagnetic element may be made of at least one of of Co, Fe, Fe₂O₃, FeOFe₂O₃, NiOFe₂O₃, CuOFe₂O₃, MgO Fe₂O₃, Nd₂Fe₁₄B, Mn, Bi, Ni, MnSb, MnOFe₂O₃, Y₃Fe₅O₁₂, CrO₂, MnAs, Gd, Dy, EuO, Cu₂MnAl, Cu₂MnIn, Cu₂MnSn, Ni₂MnAl, Ni₂MnIn, Ni₂MnSn, Ni₂MnSb, Ni₂MnGa, Co₂MnAl, Co₂MnSi, Co₂MnGa, Co₂MnGe, SmCo₅, Sm₂Co₁₇, Pd₂MnAl, Pd₂MnIn, Pd₂MnSn, Pd₂MnSb, Co₂FeSi, Fe₃Si, Fe₂VAl, Mn₂VGa and Co₂FeGe.

Such magnetic field-generative element and/or such ferromagnetic element can be made of sub-elements dispersed in a polymer matrix or agglomerated with binder.

The connector can include one or more magnetic and/or ferromagnetic elements, e.g. pin or rod or cylinder or prism or spot element, wherein the connection means having:

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- 5 - one or more magnetic and/or ferromagnetic local positioner elements, e.g. pin or rod or cylinder or prism or spot element, on a path of the connector when the user-receptacle support body is moved between the first and second positions along the direction generally extending along the bottom part, such as at least one of discrete end-of-path positioners and intermediate positioners, e.g. a plurality of spaced apart positioners; and/or
- 10 - one or more path elements along a path of the connector when the user-receptacle support body is moved between the first and second positions along the direction generally extending along the bottom part, optionally the connection means comprising stripe or
- 15 bar or wire elements or a plurality of side-by-side local positioner elements along the above direction to from a spotted path and/or end-of-path positioners defining the first and second positions of the user-receptacle support body.
- 20 The machine may have a capsule handling device that is located in the housing, such as behind the external front face, and that is fluidically connected to the outlet, the device having a first part and a second part that are relatively movable between:
- 25 - a transfer position for receiving and/or evacuating a capsule containing a beverage ingredient, optionally the capsule handling device being so arranged as to evacuate the capsule to the removable service unit when located in the seat; and
- 30 - an extraction position for extracting the capsule between the first and second parts.

For instance, the first and second parts are:

- 35 - movable manually, such as by a user-handle, and/or movable automatically, such as by a motor, between the transfer and the extraction positions; and/or
- 40 - arranged to form in the extraction position a mixing chamber for housing the capsule, e.g. a brewing chamber, such as a chamber delimited by at least a cavity in one part of the first and second parts and by a cooperating cavity or lid formed by the other part of the first and second parts.

Examples of suitable capsule handling devices, as well as their actuation (manual, automatic, semi-

automatic, or fully motorized) and integration into a beverage machine, are provided in greater details in EP 1 646 305, EP 1 859 713, EP 1 859 714, WO 2009/043630, WO 2012/025258 and WO 2013/127476 and in the other
5 references cited above.

At least one part of the first and second parts of the capsule handling device may be arranged to translate towards and away from at least one of the two external lateral side faces when the first and second parts
10 relatively move between the transfer and the extraction positions.

Such a configuration departs from a standard state of the art configurations, e.g. as disclosed in WO 2009/043630, in which the capsule handling device extends and moves longitudinally orthogonally to the machine's front face. In the latter configuration the machine extends narrowly behind the front face over a significant depth. In the present configuration, the machine has a large front face that extends over a short depth.
15
20 Consequently, the machine can be placed on a support surface that has a short depth, e.g. a shelf.

Typically the machine may have an overall depth over its overall height of 10 to 30 cm, e.g. 15 to 25 cm. The overall height of the machine may be of the order of 20
25 to 35 cm, e.g. 25 to 30 cm. The machine's overall width can be about 25 to 45 cm, e.g. 35 to 40 cm.

For instance, the at least one of the first and second parts that is arranged to translate towards and away from the at least one of the two external lateral side faces is configured to move generally in parallel to
30 at least one of: the external front face; the external rear face (when present); the external top face (when present); and the external bottom face (when present).

The first and second parts of the capsule handling device can be relatively movable between a transfer position for receiving and/or evacuating the capsule and an extraction position for extracting the capsule between the first and second parts along a translation axis that intercepts at least one of the first and second external lateral side faces. The translation axis may extend
35
40 generally in parallel to at least one of: the external front face; the external rear face; the external top face; and the external bottom face.

The beverage preparation module may be connected to a source of liquid, e.g. water.

The source may be a liquid reservoir. Further details on suitable reservoirs are for example disclosed
5 in WO2007/135136, WO 2010/128109, WO 2011/083103, WO 2011/089210 and EP 2 228 633.

The machine may include a fluid circuit for circulating beverage ingredient from the capsule when extracted between the first and second parts.

10 Examples of fluid circuits are disclosed in WO 2009/074550 and WO 2009/130099, the fluid sequence of which can be adapted in a machine according to the present invention.

For instance, the fluid circuit is fluidically
15 connected to the source of liquid and comprising a liquid driver, such as a pump, for driving the liquid from the source into the capsule handling device for feeding the liquid to the capsule (and combining the liquid with the beverage ingredient of the capsule), for instance via a
20 temperature conditioner, such as a heater and/or a cooler, and via an inlet of the first or second part.

Examples of modules provided with a fluid circuit including a thermal conditioner and/or a liquid driver are disclosed in EP 1 253 844, EP 1 380 243 and EP 1 809
25 151, WO 2009/074550, WO 2009/130099, WO 2009/150030, WO 2010/108700, WO 2011/107574 and WO 2013/098173.

The machine may include a user-interface configured to control the liquid driver to drive the liquid from the source of liquid into the capsule handling device.

30 The machine may have one or more further user-interfaces such as further user-interfaces for setting at least one parameter relating to beverage preparation, power management and machine servicing. Such beverage preparation parameters may relate to the beverage
35 volumes, beverage temperatures as well as preparation sequences, such as beverages made of different phases such as more or less separate coffee and milk phases, e.g. cappuccinos and latte machiattos.

Typically, the user-interface(s) is/are connected to
40 a control unit that controls the machine elements active for preparing the beverage. Such control units and active elements, e.g. liquid driver and thermal conditioner, etc... are well known in the art of beverage machines.

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The at least one part of the first and second parts that is arranged to translate towards and away from the at least one of the two external lateral side faces can be arranged to move generally in parallel to an overall direction of extraction of the beverage ingredient in the capsule when extracted between the first and second parts.

The machine may include a fluid guide for fluidically connecting the capsule handling device to the outlet along a guide direction, the overall direction of extraction and a direction of dispensing of the beverage out of the outlet extending along skew lines. For instance, the dispensing direction and the guide direction are in a plane that is generally orthogonal to the overall direction of extraction.

The machine can have a liquid reservoir, such as a water tank, the liquid reservoir being in fluid connection with the fluid circuit.

The liquid reservoir can be removable from the machine for servicing, such as for filling, emptying and/or cleaning.

The liquid reservoir may be mounted on a machine foot projecting beyond:

- at least one of the external lateral side faces, the reservoir being located adjacent to the at least one of the external side faces;
- the external front face, the reservoir being located adjacent to the external front face; or
- the external rear face, the reservoir being located adjacent to the external rear face.

The liquid reservoir can have a shape that extends over substantially at least one of the entire external lateral side face and/or over substantially the entire external rear face.

The liquid reservoir may have a shape that is generally parallelepipedic.

The liquid reservoir can have a shape that is generally cylindrical with a circular or part-circular or crescent or elliptic or semi-elliptic base.

The external top face can have a capsule insertion opening leading into a passage for guiding the capsule to the capsule handling device and to a position between the

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first and second parts of the handling device in the transfer position which parts are then relatively movable to their extraction position for extracting the capsule. For instance, the capsule insertion opening is associated with a cover that is movable adjacent to the external housing, such as slidable and/or pivotable, between an open position away from the opening for allowing insertion of the capsule into the passage via the opening and a closed position over or across the opening to prevent insertion of the capsule into the passage via the opening.

Examples of such passages and covers are for example disclosed in WO2007/135136, WO 2012/072766, WO 2012/093107, WO 2012/126971, WO 2013/127906, WO 2014/056641, WO 2014/056642 and PCT/EP14/076211.

The machine may include a user-interface which is operable by a user to extract the capsule between the first and second parts in their extraction position.

The user-interface can be:

- covered by the cover when the cover is in the open position so that the user-interface is inoperable by the user when the capsule handling device is accessible from outside via the opening and the passage; and
- uncovered by the cover when the cover is in the closed position so that the user-interface is operable by the user when the capsule handling device is inaccessible from outside via the opening and the passage.

Hence, a user is prevented from operating the user-interface when the cover is not covering the opening. When the user-interface controls the circulation of liquid in the capsule handling device, the cover must first be moved onto the opening leading to the capsule handling device so that the user is not exposed to liquid or gas projections from the capsule handling device. Likewise, when the user-interface controls the relative movement of the first and second parts of the capsule handling device, the opening leading to the capsule handling device must first be covered by the cover before the user-interface can be operated by the user to cause the relative movement of the first and second parts of the capsule handling device, whereby the user is inhibited from sticking body parts (e.g. a finger) via

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the opening into the capsule handling device when the first and second parts are relatively moving.

5 The user-interface can be configured to control the above liquid driver to drive the liquid from the source of liquid into the capsule handling device.

10 The machine can include a foot forming a lower placement surface for a large user-receptacle under the outlet and/or supporting the movable user-receptacle support body in at least one of the first and second positions.

15 The beverage preparation machine can be an in-home or out of home machine. The machine may be a coffee, tea, chocolate, cacao, milk, soup, baby food, etc.. preparation machine. The machine may be arranged for preparing within a beverage processing module, which may include (when present) the above capsule handling device, a beverage by passing hot or cold water or another liquid through a capsule containing an ingredient, such as a flavoring ingredient, of the beverage to be prepared, such as 20 ground coffee or tea or chocolate or cacao or milk powder.

25 In the context of the present disclosure, the relative orientation of the machine, e.g. references to the machine's top, front, bottom, side, rear, etc., unless specified otherwise, typically relate to the orientation of operation of the machine, e.g. on top of a table, with the machine's outlet in front of a user for naturally operating the machine to dispense a beverage.

30 Brief Description of the Drawings

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

35 - Figures 1 and 2 are front views of a beverage machine according to the invention having a beverage outlet and a cup support that is movable under the outlet for placing a small cup under the outlet and movable away from under the outlet for placing a large cup under the outlet as illustrated in Figs 1 and 2, respectively;

40 - Figures 3a to 3d illustrate schematically the operation and the fluid line of a capsule handling device of the machine of Figs 1 and 2;

- Figures 4 and 5 are side view of the beverage machine shown in Figs 1 and 2 with a service unit

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inserted into and removed from its machine as illustrated in Figs 4 and 5, respectively; and

- 5 - Figures 6 and 7 are top views of the beverage machine shown in Figs 1 and 2 with a cover for covering a capsule insertion opening, the cover being in the closed position over and across the opening and in the open position away from the opening, as illustrated in Figs 6 and 7, respectively.

10 Detailed description

As illustrated in Figures 1 to 7, an exemplary embodiment of a machine 1 according to the invention is configured for dispensing a beverage 84.

15 Machine 1 has an external housing 10,30,30',40,50,60 with an external front face 10. Typically, housing 10,30,30',40,50,60 further includes at least one of: one or more external lateral side faces 30,30'; an external rear face 40; an external top face 50; and an external bottom face 60.

20 Machine 1 includes a beverage outlet 11 located on the external front face 10.

25 Machine 1 has a seat 15 for receiving a removable service unit 16 via an opening 15a in external front face 10. For instance, service unit 16 comprises: a receptacle for collecting waste material such as capsules 2 upon use and/or residual liquid; and/or a feeder for supplying beverage ingredient capsules 2 and/or another ingredient for forming beverage 84 to be dispensed and/or a cleaning agent. See Figs 1-2 and 4-5.

30 Machine 1a includes a user-receptacle support body 65 that is movable between a first position for placing on a upper placement surface 66 of body 65 a short user-receptacle 3 under outlet 11 and a second position for placing a large user-receptacle 4 under outlet 11, support body 65 being directly or indirectly connected to external front face 10 and located in front thereof in the first position and in the second position.

35 As illustrated in Figs 1-2 and 4-5, service unit 16 is prevented from being removed or inserted into seat 15 by user-receptacle support body 65 when support body 65 is adjacent to and in front of opening 15a:

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- in the first position of body 15a, service unit 16 being removable or insertable into seat 15 when support body 65 is in the second position; or
- in the second position of body 15a, service unit 16 being removable or insertable into seat 15 when support body 65 is in the first position.

In accordance with the invention, user-receptacle support body 65 is movable horizontally in translation from the first position in front of external front face 10 to second position in front of external front face 10 and vice versa.

Machine 1 can be provided with a connection means 68,69,69a for connecting user-receptacle support body 65 to external front face 10 (Figs 1-2 and 6-7). User-receptacle support body 65 may have a connector 66a,66b that is connected or connectable to connection means 68,69,69a to maintain user-receptacle body 65 in the first and second positions. For instance, connection means 68,69,69a guides user-receptacle body 65 from the first position into the second position and vice versa.

Connection means 68,69,69a may have a direction 68' that extends generally along a bottom part 10a of external front face 10 so that user-receptacle support body 65 is movable with its connector 66a,66b in connection with connection means 68,69,69a from the first position into the second position and vice versa along direction 68' extending along bottom part 10a. See Figs 1 and 7.

Direction 68' of connection means 68,69,69a may extend on: bottom part 10a of external front face 10; and/or a front area 20 formed by a machine foot 61,61' projecting in front of bottom part 10a of external front face 10 and extending therealong (Figs 1 and 7).

Machine 1 can have a machine bottom face 60, direction 68' of connection means 68,69,69a being generally parallel to bottom face 60 (Fig. 1).

Machine 1 may have two external spaced-apart lateral side faces 30,30', user-receptacle support body 65 being movable with its connector 66a,66b in connection with connection means 68,69,69a from the first position into the second position and vice versa along direction 68' from adjacent or close to one external lateral side face 30 to adjacent or close to the other external lateral side face 30 (Figs 1 and 7).

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Connection means 68,69,69a can have a mechanical arrangement comprising at least one of:

- a rail cooperating with a rail connector of support body 65 and/or a groove 68 cooperating with a groove connector 66a of support body 65, such as a rail slider and/or groove slider 66a of support body 65 having a single degree of freedom along the rail and/or the groove when connected thereto, the rail and/or groove and the rail and/or groove slider having optionally a generally dovetail shape for cooperating together along a single degree of freedom (Figs 1-2);
- a belt or chain secured to the user-receptacle support body and movable along the external front face, such as a belt or chain in an open or closed loop; and
- a local releasable positioner for guiding support body 65 into the first position or second position, such as a plug-and-socket positioner or a hook positioner or a snap positioner.

Connection means 69,69a and connector 66b can be magnetically constrained (Figs 1-2).

Connector 66b may include a magnetic field-generating element that is arranged to be magnetically constrained against a corresponding ferromagnetic element of the connection means 68,69a.

Connection means 68,69a can include a magnetic field-generating element that is arranged to be magnetically constrained against a corresponding ferromagnetic element of the connector 66b.

Connection means 68,69a may include a magnetic field-generating element that is arranged to be magnetically constrained against a corresponding magnetic field-generating element of the connector 66b.

The magnetic field-generating element can include an electromagnet element or a permanent magnet element, e.g. made of at least one of iron, nickel, cobalt, rare earth metals, e.g. lanthanide, and alloys and oxides containing such metals as well as polymers (e.g. plastics) carrying such elements and components.

The ferromagnetic element may be made of at least one of of Co, Fe, Fe₂O₃, FeOFe₂O₃, NiOFe₂O₃, CuOFe₂O₃, MgO Fe₂O₃, Nd₂Fe₁₄B, Mn, Bi, Ni, MnSb, MnOFe₂O₃, Y₃Fe₅O₁₂, CrO₂, MnAs, Gd, Dy, EuO, Cu₂MnAl, Cu₂MnIn, Cu₂MnSn, Ni₂MnAl, Ni₂MnIn, Ni₂MnSn, Ni₂MnSb, Ni₂MnGa, Co₂MnAl, Co₂MnSi,

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Co₂MnGa, Co₂MnGe, SmCo₅, Sm₂Co₁₇, Pd₂MnAl, Pd₂MnIn, Pd₂MnSn, Pd₂MnSb, Co₂FeSi, Fe₃Si, Fe₂VAl, Mn₂VGa and Co₂FeGe.

Such magnetic field-generative element and/or such ferromagnetic element can be made of sub-elements dispersed in a polymer matrix or agglomerated with binder.

The connector can have one or more magnetic and/or ferromagnetic elements 66b (Figs 1-2), e.g. pin or rod or cylinder or prism or spot element, the connection means comprising:

- one or more magnetic and/or ferromagnetic local positioner elements 69a, e.g. pin or rod or cylinder or prism or spot element, on a path of connector 66b when user-receptacle support body 65 is moved between the first and second positions along direction 68' generally extending along bottom part 10a, such as at least one of discrete end-of-path positioners and intermediate positioners, e.g. a plurality of spaced apart positioners; and/or
- one or more path elements along a path of connector 66b when user-receptacle support body 65 is moved between first and second positions along direction 68' generally extending along the bottom part 10a, optionally the connection means 69, 69a comprising stripe or bar or wire elements or a plurality of side-by-side local positioner elements 69 along direction 68' to from a spotted path and/or end-of-path positioners 69 defining the first and second positions of user-receptacle support body 65.

Machine 1 can include a capsule handling device 70 that is located in housing 10, 30, 30', 40, 50, 60, such as behind external front face 10, and that is fluidically connected to outlet 11 (Figs 3a-3d and Figs 6-7). Device 70 may have a first part 71 and a second part 72 (Fig. 3a) that are relatively movable between: a transfer position (Figs 3a-3b) for receiving and/or evacuating a capsule 2 containing a beverage ingredient; and an extraction position (Figs 3c-2d) for extracting capsule 2 between the first and second parts 71, 72.

Capsule handling device 70 can be so arranged as to evacuate capsule 2 to removable service unit 16 when located in seat 15.

For instance, first and second parts 71, 72 are movable manually, such as by a user-handle (e.g. as

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disclosed in WO 2005/004683 or WO 2007/135136), and/or movable automatically, such as by a motor (e.g. as disclosed in EP1767129 or WO 2012/025258), between the transfer and the extraction positions.

5 First and second parts 71,72 may be arranged to form in the extraction position a mixing chamber 73 for housing capsule 2 (Fig. 3c-3d), e.g. a brewing chamber 73. For instance, chamber 73 is delimited by at least a cavity 71' in one part 71 of first and second parts 71,72
10 and by a cooperating cavity or lid 72' formed by the other part 72 of first and second parts 71,72 (Fig. 3a).

At least one part 72 of first and second parts 71,72 of capsule handling device 70 can be arranged to translate towards and away from at least one of the two
15 external lateral side faces 30,30' when first and second parts 71,72 relatively move between the transfer and the extraction positions (Figs 3a-3d and 6-7).

As illustrated in Figs 3a-3d, downstream part 72 is movable towards and away from side face 30,30'. This
20 corresponds to a configuration of a capsule handling device as for instance disclosed in WO 2012/025258. Obviously, it is possible to move the upstream part of the capsule handling device towards and away from side face 30,30', e.g. with a capsule handling device
25 configuration as for instance disclosed in WO2007/135136. In a yet further alternative, it is also possible to have both the upstream and the downstream part moving towards and away from side faces 30,30'.

This at least one part 72 of first and second parts
30 71,72 that is arranged to translate towards and away from one of the two external lateral side faces 30,30' can be configured to move generally in parallel to at least one of: external front face 10; external rear face 40 (when present); external top face 50 (when present); and
35 external bottom face 60 (when present). See Figs 3a-3d and 6-7.

First and second parts 71,72 may be relatively movable between a transfer position for receiving and/or
40 evacuating capsule 2 and an extraction position for extracting capsule 2 between first and second parts 71,72 along a translation axis 70' that intercepts at least one of first and second external lateral side faces 30,30' (Figs 3b and 3d). Translation axis 70' may extend generally in parallel to at least one of: external front
45 face 10; external rear face 40 (when present); external

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top face 5 (when present); and external bottom face 60 (when present). See Figs 3a-3d.

Machine 1 may include a fluid circuit for circulating beverage ingredient from capsule 2 when extracted between first and second parts 71,72, the fluid circuit being fluidically connected to a source of liquid 80,80' and comprising a liquid driver 81, such as a pump, for driving liquid from source 80,80' into capsule handling device 70 for feeding the liquid to capsule 2, for instance via a temperature conditioner 82, such as a heater and/or a cooler, and via an inlet of the first or second part 71,72. See Fig. 3d.

Machine 1 may include a user-interface 90 configured to control liquid driver 81 to drive liquid from source of liquid 80,80' into capsule handling device 70. See Figs 6-7.

Machine 1 can have or more further user-interfaces 91,92 such as further user-interfaces 91,92 for setting at least one parameter relating to beverage preparation, power management and machine servicing. See Figs 1-2. Such beverage preparation parameters may relate to the beverage volumes, beverage temperatures as well as preparation sequences, such as beverages made of different phases such as more or less separate coffee and milk phases, e.g. cappuccinos and latte machiattos.

The at least one part 72 of first and second parts 71,72 that is arranged to translate towards and away from the at least one of the two external lateral side faces 30,30' may be arranged to move generally in parallel to an overall direction of extraction 70' of the beverage ingredient in capsule 2 when extracted between first and second parts 71,72. See Figs 3b and 3d.

Machine 1 can include a fluid guide 83 for fluidically connecting capsule handling device 70 to outlet 11 along a guide direction 83', the overall direction of extraction 70' and a direction 12 of dispensing of beverage 84 out of outlet 11 extending along skew lines. Dispensing direction 12 and guide direction 83' may be in a plane that is generally orthogonal to the overall direction of extraction 70'. See Fig. 3d.

Machine 1 may comprise a liquid reservoir 80,80', such as a water tank, liquid reservoir 80,80' being in

fluid connection with the fluid circuit. See Figs 1-2, 3d and 6-7.

Liquid reservoir 80,80' can be removable from such machine 1 for servicing, such as for filling, emptying and/or cleaning.

Liquid reservoir 80,80' may be mounted on a machine foot 61' projecting beyond:

- at least one of external lateral side faces 30', the reservoir 80' being located adjacent to at least one of the external side faces (Fig. 7);
- the external front face, the reservoir being located adjacent to the external front face; or
- the external rear face, the reservoir being located adjacent to the external rear face.

Liquid reservoir 80,80' can have a shape that extends over substantially at least one of the entire external lateral side face 30' and/or over substantially the entire external rear face (Fig. 7).

Liquid reservoir 80,80' may have a shape that is generally parallelepipedic (Fig. 7).

Liquid reservoir 80 may have a shape that is generally cylindrical with a circular or part-circular or crescent or elliptic or semi-elliptic base (Fig. 6-7).

External top face 50 can have a capsule insertion opening 51 leading into a passage 52 for guiding capsule 2 to capsule handling device 70 and to a position between first and second parts 71,72 of handling device 70 in the transfer position, which parts 71,72 are then relatively movable to their extraction position for extracting capsule 2. See Figs 6-7. For instance, capsule insertion opening 51 is associated with a cover 55 that is movable adjacent to external housing 10,30,30',40,50,60, such as slidable and/or pivotable, between an open position away from opening 51 for allowing insertion of capsule 2 into passage 52 via opening 51 and a closed position over or across opening 51 to prevent insertion of capsule 2 into passage 52 via opening 51.

For example, such machine 1 has a user-interface 90 which is operable by a user to extract capsule 2 between first and second parts 71,72 in their extraction position.

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User-interface 90 can be covered by the cover 55 when cover 55 is in the open position so that user-interface 90 is inoperable by a user when capsule handling device 70 is accessible from outside via opening 51 and passage 52. See Fig. 7.

User-interface 90 can be uncovered by cover 55 when cover 55 is in the closed position so that user-interface 90 is operable by a user when capsule handling device 70 is inaccessible from outside via opening 51 and passage 52. See Fig. 6.

Machine 1 can have a foot 61,61' forming a lower placement surface 67 for a large user-receptacle 4 under outlet 11 and/or supporting movable user-receptacle support body 65 in at least one of the first and second positions. See Figs 1-2.

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Claims

1. A machine (1) for dispensing a beverage (84), such as a beverage prepared from a capsule (2) containing a beverage ingredient, comprising:

5 - an external housing (10,30,30',40,50,60) having an external front face (10) and optionally at least one of: one or more external lateral side faces (30,30'); an external rear face (40); an external top face (50);
10 and an external bottom face (60);

- a beverage outlet (11) located on the external front face (10);

15 - a seat (15) for receiving a removable service unit (16) via an opening (15a) in the external front face (10), optionally the service unit (16) comprising:

- a receptacle for collecting waste material such as capsules (2) upon use and/or residual liquid; and/or

20 - a feeder for supplying said beverage ingredient capsules (2) and/or another ingredient for forming said beverage (84) to be dispensed and/or a cleaning agent;

25 - a movable user-receptacle support body (65) that is movable between a first position for placing on a upper placement surface (66) of the body (65) a short user-receptacle (3) under the outlet (11) and a second position for placing a large user-receptacle (4) under the outlet (11), the user-receptacle support body being directly or indirectly connected to the external
30 front face (10) and located in front thereof in said first position and in said second position,

the service unit (16) being prevented from being removed or inserted into the seat (15) by the user-receptacle support body (65) when the support body (65) is adjacent
35 to and in front of the opening (15a):

- in the first position of the body (15a), the service unit (16) being removable or insertable into the seat (15) when the support body (65) is in the second position; or

40 - in the second position of the body (15a), the service unit (16) being removable or insertable into the seat

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(15) when the support body (65) is in the first position,

characterised in that the user-receptacle support body (65) is movable horizontally in translation from the first position in front of the external front face (10) to the second position in front of the external front face (10) and vice versa.

2. The machine of claim 1, which comprises a connection means (68,69,69a) for connecting the user-receptacle support body (65) to external front face, the user-receptacle support body (65) having a connector (66a,66b) that is connected or connectable to the connection means (68,69,69a) to maintain the user-receptacle body (65) in the first and second positions, and for instance to guide the user-receptacle body (65) from the first position into the second position and vice versa, the connection means (68,69,69a) having a direction (68') that extends generally along a bottom part (10a) of the external front face (10) so that the user-receptacle support body (65) is movable with its connector (66a,66b) in connection with the connection means (68,69,69a) from the first position into the second position and vice versa along said direction (68') extending along the bottom part (10a), optionally the direction (68') of the connection means (68,69,69a) extending on:

- the bottom part (10a) of the external front face (10); and/or
- a front area (20) formed by a machine foot (61,61') projecting in front of the bottom part (10a) of the external front face (10) and extending along the external front face (10).

3. The machine of claim 2, which has:

- a machine bottom face (60) and wherein the direction (68') of the connection means (68,69,69a) is generally parallel to the bottom face (60); and/or
- said two external spaced-apart lateral side faces (30,30') and wherein the user-receptacle support body (65) is movable with its connector (66a,66b) in connection with the connection means (68,69,69a) from the first position into the second position and vice versa along said direction (68') from adjacent or close to one external lateral side face (30,30') to adjacent or close to the other external lateral side face (30,30').

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4. The machine of claim 2 or 3, wherein the connection means (68) has a mechanical arrangement comprising at least one of:

- 5 - a rail cooperating with a rail connector of the support body (65) and/or a groove (68) cooperating with a groove connector (66a) of the support body (65), such as a rail slider and/or groove slider (66a) of the support body having a single degree of freedom along the rail and/or the groove when connected thereto, the rail and/or groove and the rail and/or groove slider having optionally a generally dovetail shape for cooperating together along a single degree of freedom;
- 10 - a belt or chain secured to the user-receptacle support body and movable along the external front face, such as a belt or chain in an open or closed loop; and
- 15 - a local releasable positioner for guiding the support body (65) into the first position or second position, such as a plug-and-socket positioner or a hook positioner or a snap positioner.
- 20

5. The machine of any one of claims 2 to 4, wherein the connection means (69,69a) and the connector (66b) are magnetically constrained, optionally:

- 25 - the connector (66b) comprising a magnetic field-generating element that is arranged to be magnetically constrained against a corresponding ferromagnetic element of the connection means (68,69a); or
- 30 - the connection means (68,69a) comprising a magnetic field-generating element that is arranged to be magnetically constrained against a corresponding ferromagnetic element of the connector (66b); or
- 35 - the connection means (68,69a) comprising a magnetic field-generating element that is arranged to be magnetically constrained against a corresponding magnetic field-generating element of the connector (66b),

for instance:

- 40 - the magnetic field-generating element comprising an electromagnet element or a permanent magnet element, e.g. made of at least one of iron, nickel, cobalt, rare earth metals, e.g. lanthanide, and alloys and oxides containing such metals as well as polymers

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(e.g. plastics) carrying such elements and components; and/or

- the ferromagnetic element being made of at least one of of Co, Fe, Fe₂O₃, FeOFe₂O₃, NiOFe₂O₃, CuOFe₂O₃, MgO Fe₂O₃, Nd₂Fe₁₄B, Mn, Bi, Ni, MnSb, MnOFe₂O₃, Y₃Fe₅O₁₂, CrO₂, MnAs, Gd, Dy, EuO, Cu₂MnAl, Cu₂MnIn, Cu₂MnSn, Ni₂MnAl, Ni₂MnIn, Ni₂MnSn, Ni₂MnSb, Ni₂MnGa, Co₂MnAl, Co₂MnSi, Co₂MnGa, Co₂MnGe, SmCo₅, Sm₂Co₁₇, Pd₂MnAl, Pd₂MnIn, Pd₂MnSn, Pd₂MnSb, Co₂FeSi, Fe₃Si, Fe₂VAl, Mn₂VGa and Co₂FeGe.

6. The machine of claim 5, wherein the connector comprises one or more magnetic and/or ferromagnetic elements (66b), e.g. pin or rod or cylinder or prism or spot element, and wherein the connection means comprises:

- one or more magnetic and/or ferromagnetic local positioner elements (69a), e.g. pin or rod or cylinder or prism or spot element, on a path of the connector (66b) when the user-receptacle support body (65) is moved between the first and second positions along said direction (68') generally extending along the bottom part (10a), such as at least one of discrete end-of-path positioners and intermediate positioners, e.g. a plurality of spaced apart positioners; and/or
- one or more path elements along a path of the connector (66b) when the user-receptacle support body (65) is moved between the first and second positions along said direction (68') generally extending along the bottom part (10a), optionally the connection means (69,69a) comprising stripe or bar or wire elements or a plurality of side-by-side local positioner elements (69) along said direction (68') to from a spotted path and/or end-of-path positioners (69) defining the first and second positions of the user-receptacle support body (65).

7. The machine of any preceding claim, which comprises a capsule handling device (70) that is located in the housing (10,30,30',40,50,60), such as behind the external front face (10), and that is fluidically connected to the outlet (11), the device having a first part (71) and a second part (72) that are relatively movable between:

- a transfer position for receiving and/or evacuating a capsule (2) containing a beverage ingredient, optionally the capsule handling device (70) being so arranged as to evacuate said capsule (2) to the

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removable service unit (16) when located in the seat (15); and

- an extraction position for extracting said capsule (2) between the first and second parts (71,72),

5 optionally the first and second parts (71,72) being:

- movable manually, such as by a user-handle, and/or movable automatically, such as by a motor, between the transfer and the extraction positions; and/or

10 - arranged to form in the extraction position a mixing chamber (73) for housing said capsule (2), e.g. a brewing chamber (73), such as a chamber delimited by at least a cavity (71') in one (71) of said first and second parts (71,72) and by a cooperating cavity or lid (72') formed by the other (72) of said first and
15 second parts (71,72),

optionally at least one (72) of the first and second parts (71,72) of the capsule handling device (70) is arranged to translate towards and away from at least one of said two external lateral side faces (30,30') when the
20 first and second parts (71,72) relatively move between the transfer and the extraction positions, for instance said at least one of the first and second parts (71,72) that is arranged to translate towards and away from said at least one of the two external lateral side faces
25 (30,30') is configured to move generally in parallel to at least one of: the external front face (10); said external rear face (40); said external top face (50); and said external bottom face (60).

8. The machine of claim 7, wherein the first and second
30 parts (71,72) are relatively movable between a transfer position for receiving and/or evacuating said capsule (2) and an extraction position for extracting said capsule (2) between the first and second parts (71,72) along a translation axis (70') that intercepts at least one of
35 said first and second external lateral side faces (30,30'), the translation axis (70') extending optionally generally in parallel to at least one of: the external front face (10); said external rear face (40); said external top face (50); and said external bottom face
40 (60).

9. The machine of claim 7 or 8, which comprises a fluid circuit for circulating beverage ingredient from said capsule (2) when extracted between the first and second parts (71,72), optionally the fluid circuit being

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fluidically connected to a source of liquid (80,80') and comprising a liquid driver (81), such as a pump, for driving said liquid from the source (80,80') into the capsule handling device (70) for feeding said liquid to said capsule (2), for instance via a temperature conditioner (82), such as a heater and/or a cooler, and via an inlet of the first or second part (71,72), such machine (1) optionally including:

- a user-interface (90) configured to control the liquid driver (81) to drive said liquid from the source of liquid (80,80') into the capsule handling device (70); and/or
- one or more further user-interfaces (91,92) such as further user-interfaces (91,92) for setting at least one parameter relating to beverage preparation, power management and machine servicing.

10. The machine of claim 9, wherein said at least one (72) of the first and second parts (71,72) that is arranged to translate towards and away from said at least one of the two external lateral side faces (30,30') is arranged to move generally in parallel to an overall direction (70') of extraction of said beverage ingredient in said capsule (2) when extracted between the first and second parts (71,72).

11. The machine of claim 10, which comprises a fluid guide (83) for fluidically connecting the capsule handling device (70) to the outlet (11) along a guide direction (83'), the overall direction of extraction (70') and a direction (12) of dispensing of said beverage (84) out of the outlet (11) extending along skew lines, optionally the dispensing direction (12) and the guide direction (83') being in a plane that is generally orthogonal to the overall direction of extraction (70').

12. The machine of any one of claims 9 to 11, which comprises a liquid reservoir (80,80'), such as a water tank, the liquid reservoir being in fluid connection with the fluid circuit, optionally the liquid reservoir (80,80') being:

- removable from such machine (1) for servicing, such as for filling, emptying and/or cleaning; and/or
- mounted on a machine foot (61') projecting beyond:

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- at least one of said external lateral side faces (30'), the reservoir (80') being located adjacent to said at least one of the external side faces;
- the external front face, the reservoir being located adjacent to the external front face; or
- said external rear face, the reservoir being located adjacent to said external rear face.

13. The machine of claim 12, wherein the liquid reservoir (80,80') has a shape that:

- A) extends over substantially at least one of the entire external lateral side face (30') and and/or over substantially the entire external rear face;
- B) is generally parallelepipedic;
- C) is generally cylindrical with a circular or part-circular or crescent or elliptic or semi-elliptic base; or
- D) combines at least two of features A), B) and C).

14. The machine of any one of claims 7 to 13, wherein said external top face (50) has a capsule insertion opening (51) leading into a passage (52) for guiding said capsule (2) to the capsule handling device (70) and to a position between the first and second parts (71,72) of the handling device (70) in the transfer position which parts are then relatively movable to their extraction position for extracting said capsule (2), optionally the capsule insertion opening (51) being associated with a cover (55) that is movable adjacent to the external housing (10,30,30',40,50,60), such as slidable and/or pivotable, between an open position away from the opening (51) for allowing insertion of said capsule (2) into the passage (52) via the opening (51) and a closed position over or across the opening (51) to prevent insertion of said capsule (2) into the passage (52) via the opening (51), for instance such machine (1) having a user-interface (90) which is operable by a user to extract said capsule (2) between the first and second parts (71,72) in their extraction position, the user-interface (90) is:

- covered by the cover (55) when the cover is in the open position so that the user-interface is inoperable by said user when the capsule handling device (70) is accessible from outside via the opening (51) and the passage (52); and

- 28 -

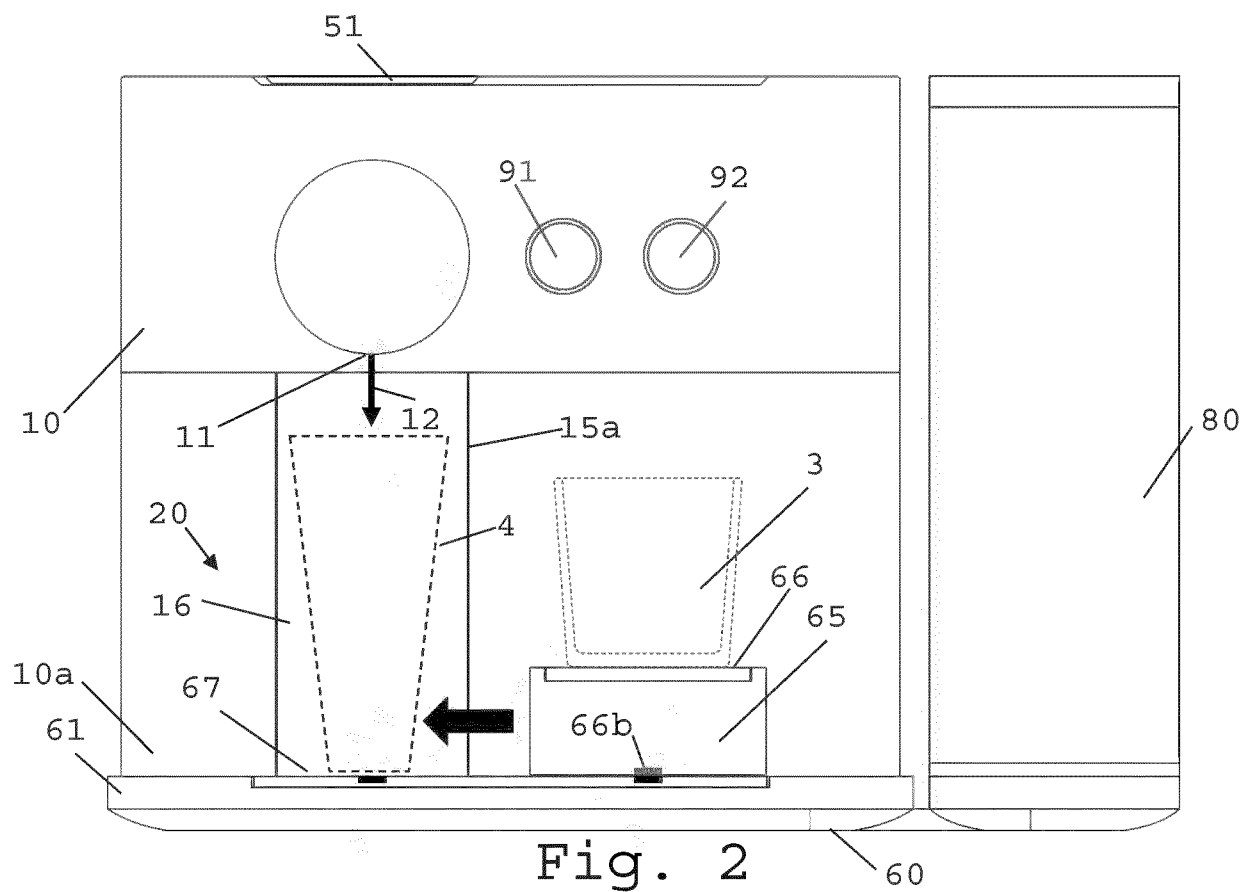
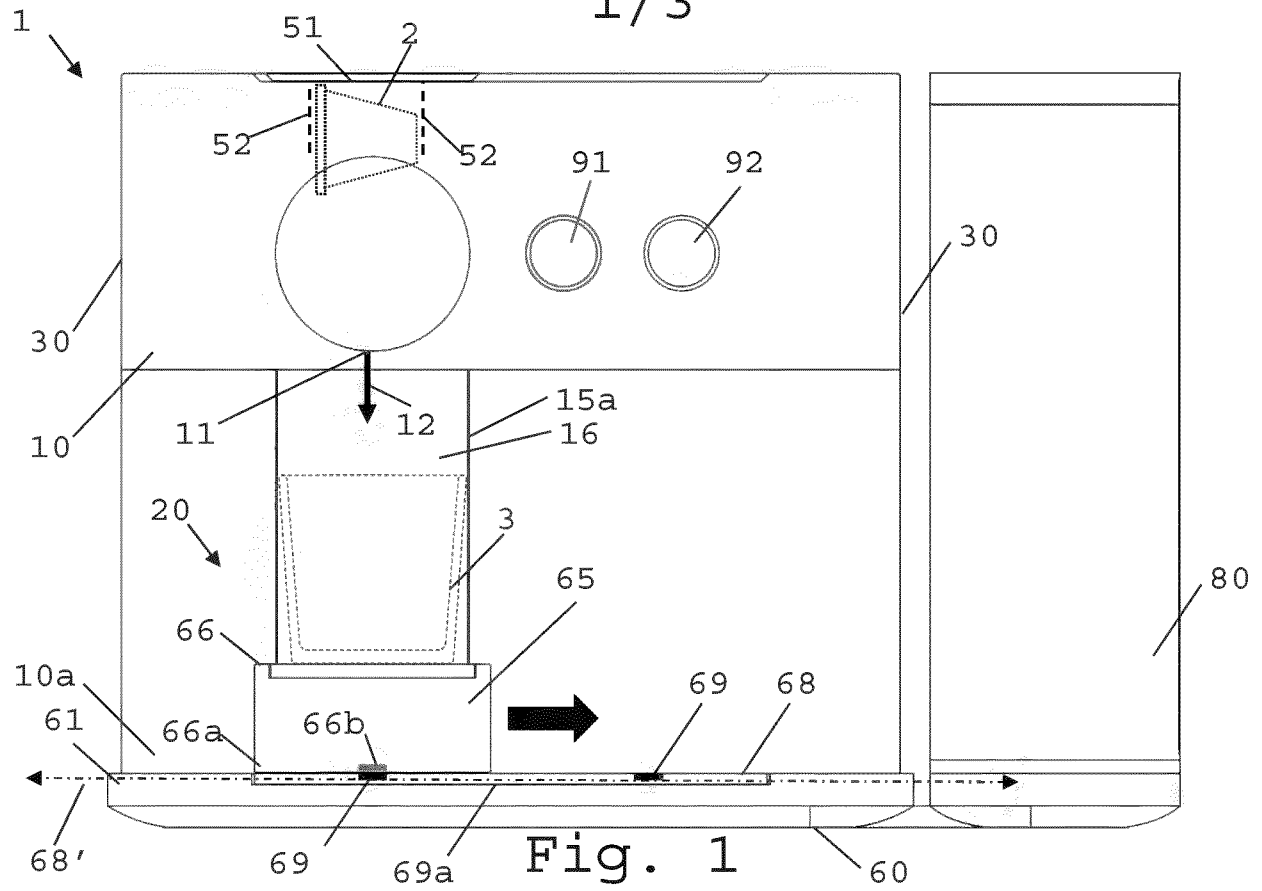
- uncovered by the cover (55) when the cover is in the closed position so that the user-interface is operable by said user when the capsule handling device (70) is inaccessible from outside via the opening (51) and the passage (52).

5

15. The machine of any preceding claim, which comprises a foot (61,61') forming a lower placement surface (67) for a large user-receptacle (4) under the outlet (11) and/or supporting the movable user-receptacle support body (65) in at least one of the first and second positions.

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1/3



2/3

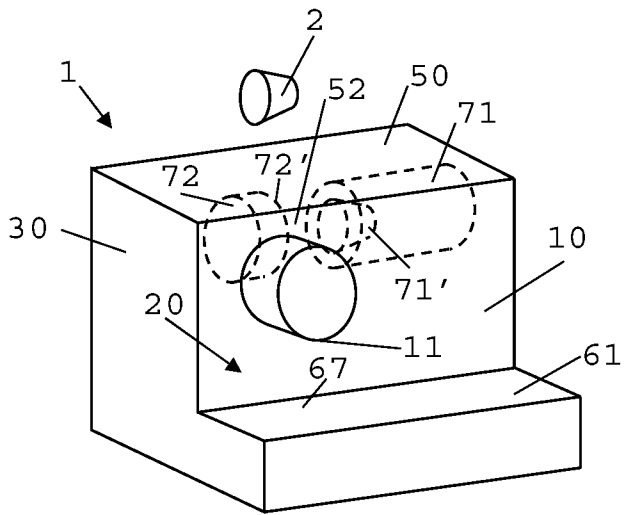


Fig. 3a

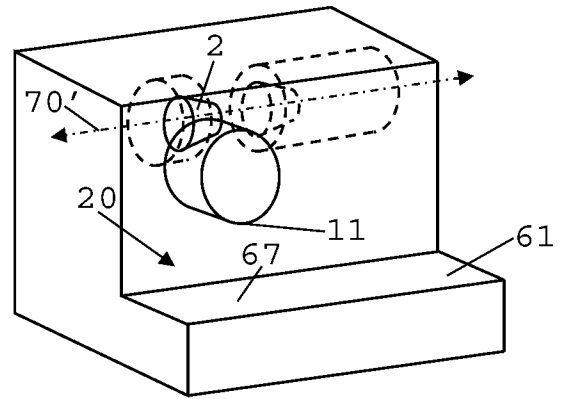


Fig. 3b

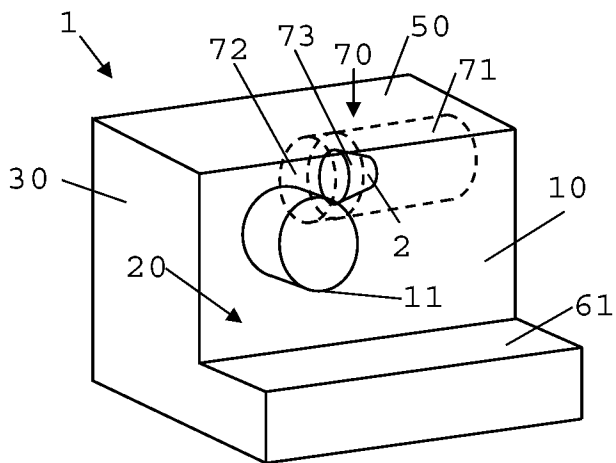


Fig. 3c

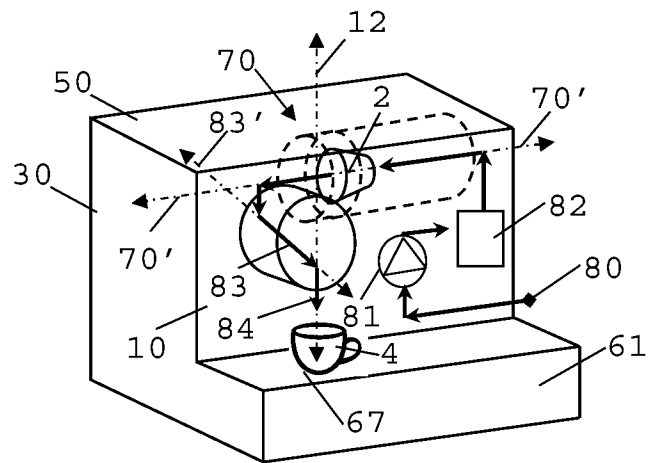
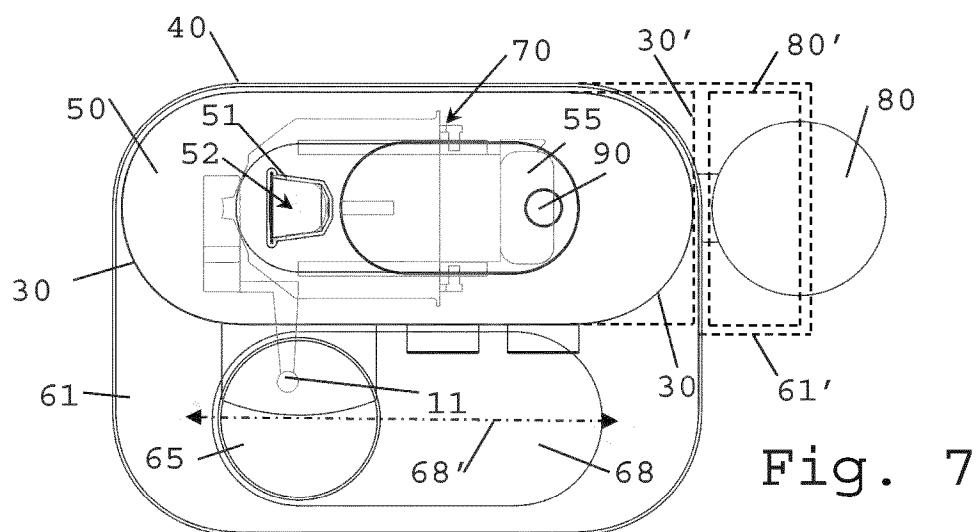
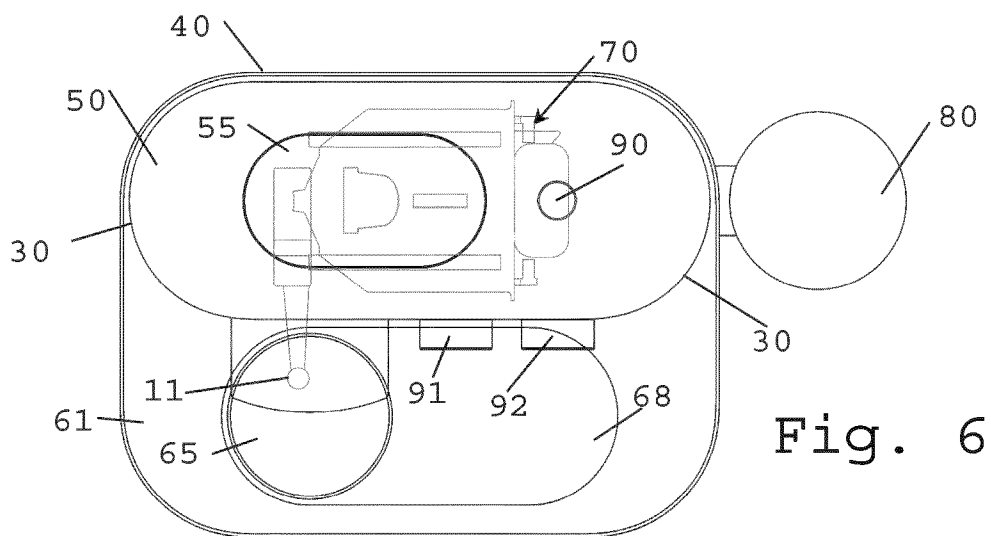
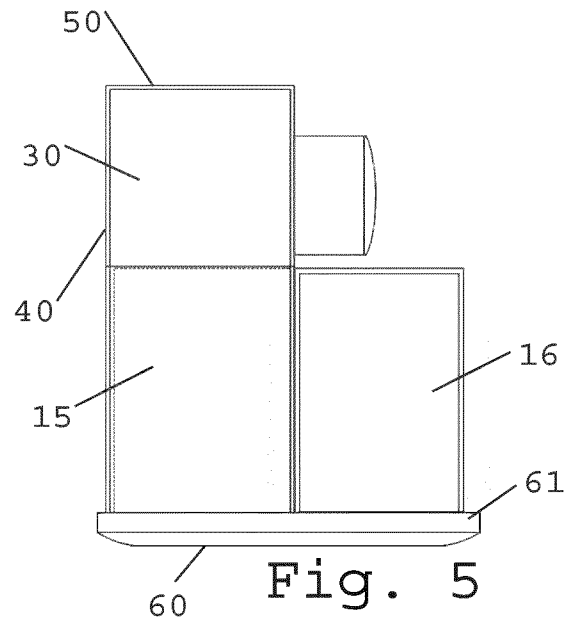
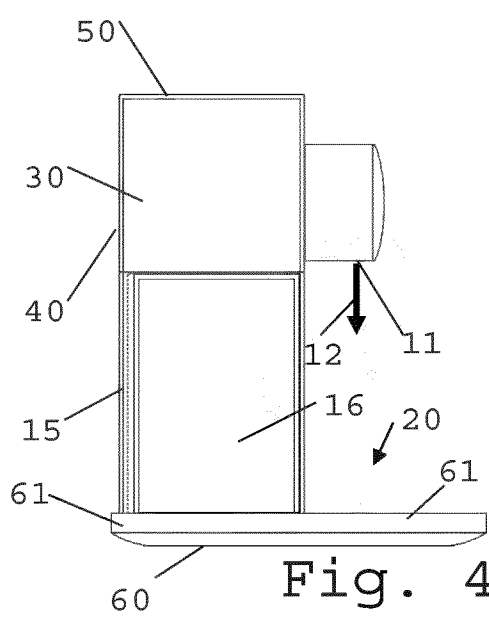


Fig. 3d



INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2016/056879A. CLASSIFICATION OF SUBJECT MATTER
INV. 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

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	EP 2 342 997 A1 (WIK FAR EAST LTD [CN]) 13 July 2011 (2011-07-13) the whole document -----	1 2-15



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

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Date of the actual completion of the international search

28 April 2016

Date of mailing of the international search report

09/05/2016

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2016/056879

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