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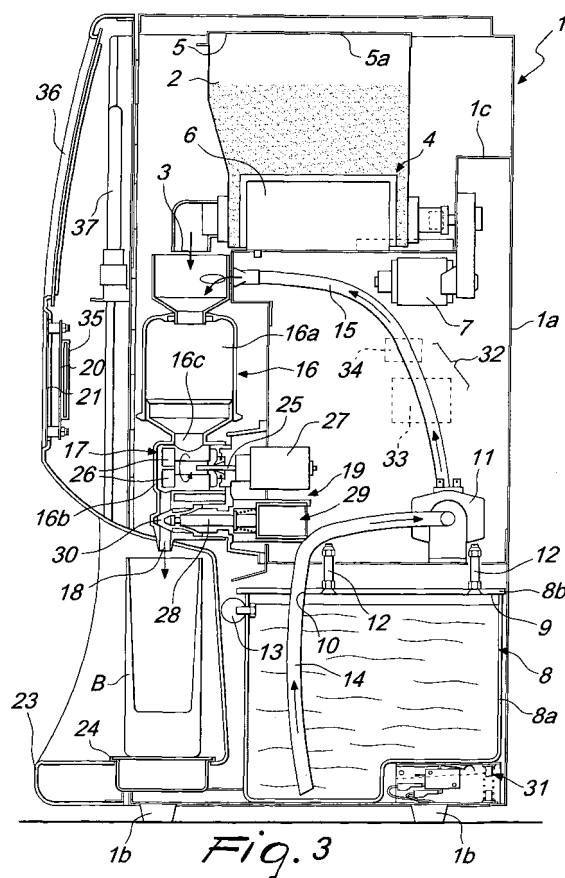
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(54) **Machine for preparing and dispensing beverages**

(57) A machine (1) for preparing and dispensing beverages, comprising at least one container (2) for storing a powdered soluble preparation for preparing a beverage, which is provided with a discharge port (3) associated with dosage means (4) for dispensing a specific dose of preparation; at least one tank (8) for collecting a liquid for dissolving the preparation, which is provided with a discharge opening (10) associated with pumping means (11) for drawing a specific amount of liquid; and at least one chamber (16), which is associated with, and connected to, the discharge port (3) and the discharge opening (10) in order to collect the dose of preparation and the amount of liquid, and inside which means (17) for mixing the preparation and the liquid in order to obtain the beverage are associated, the chamber (16) being provided with at least one opening (18) for dispensing the beverage, which is associated with flow control means (19), which can move alternately between a configuration for closing the dispensing opening (18) and a configuration for opening it, the flow control means (19) being in the closure configuration when the mixing means (17) are active, so as to keep the beverage in the vicinity of the mixing means.



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## Description

**[0001]** The present invention relates to a machine for preparing and dispensing beverages.

**[0002]** Machines for preparing beverages based on one or more freeze-dried powdered components dissolved in water and for dispensing such beverages are known in the field of the manufacture of public catering equipment.

**[0003]** These machines are substantially constituted by a container of a powdered soluble preparation for preparing a beverage, which is provided with a loading port and with a discharge port that is associated with dosage means for the outflow of a specific dose of preparation; by a tank of liquid for dissolving the preparation, which is provided with a filling opening and with a discharge opening that is associated with pumping means for drawing a given quantity of liquid; and by a duct provided with a beverage dispensing port, which is associated with, and connected to, the discharge port and the discharge opening and inside which a rotating element is accommodated.

**[0004]** In each operating cycle, predefined doses of powdered preparation and solution liquid are sent into the duct, along which they mix by way of the action of the rotating element.

**[0005]** If, for example, it is necessary to serve so-called shaken or blended beverages, such as cold coffees or shakes, the effect obtained by means of the rotating element is sometimes insufficient.

**[0006]** In flowing toward the dispensing port, the liquid in fact encounters the rotating element, which mixes and stirs it so as to dissolve the powdered preparation inside it.

**[0007]** However, the resulting beverage does not remain in the vicinity of the rotating element but tends by gravity to flow toward the dispensing port.

**[0008]** Accordingly, the action of the rotating element does not always allow to whisk up the beverage and obtain a considerable surface layer of froth, as typically occurs by using a blender or shaker or by heating said beverage with jets of steam.

**[0009]** Therefore, these known machines are not free from drawbacks, which are linked in particular to the preparation of blended or shaken beverages, and include the fact that sometimes they do not allow to obtain an optimum whisking of the beverage, such as to serve a product that is appreciated by customers as much as those prepared traditionally without resorting to soluble preparations.

**[0010]** In order to obviate this drawback, it is known to act again on the beverage dispensed by conventional machines inside shakers or blender.

**[0011]** This method entails an increase in beverage preparation times, a deterioration of the level of service offered to customers, and requires the bartender, restaurateur or other individual to have accessory instruments, such as indeed shakers, blenders or the like,

which must be washed and stored every time they are used.

**[0012]** The aim of the present invention is to eliminate the above-mentioned drawbacks of the background art, by providing a machine for preparing and dispensing beverages that allows to obtain simply and rapidly blended beverages and the like of optimum quality that are appreciated by customers.

**[0013]** Within this aim, an object of the present invention is to facilitate the task of bartenders, restaurateurs or other individuals in preparing said beverages and to not require the use of auxiliary devices.

**[0014]** Another object of the present invention is to provide a machine that is simple, relatively easy to provide in practice, safe in use, effective in operation, and has a relatively low cost.

**[0015]** This aim and this and other objects that will become better apparent hereinafter are achieved by the present machine for preparing and dispensing beverages, which comprises at least one container for storing a powdered soluble preparation for preparing a beverage, which is provided with a discharge port associated with dosage means for dispensing a specific dose of said preparation, and at least one tank for collecting a liquid for dissolving said preparation, which is provided with a discharge opening associated with pumping means for drawing a specific amount of said liquid, characterized in that it comprises at least one chamber, which is associated with, and connected to, said discharge port and said discharge opening in order to collect said dose of preparation and said amount of liquid, and inside which means for mixing said preparation and said liquid in order to obtain said beverage are associated, said chamber being provided with at least one opening for dispensing said beverage, which is associated with flow control means, which can move alternately between a configuration for closing said dispensing opening and a configuration for opening it, the flow control means being in the closure configuration when the mixing means are active, so as to keep the beverage in the vicinity of said mixing means.

**[0016]** Further characteristics and advantages of the present invention will become better apparent from the following detailed description of a preferred but not exclusive embodiment of a machine for preparing and dispensing beverages, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a front view of the machine according to the invention;

Figure 2 is a front view of the machine according to the invention, from which the front portion of the external framework has been removed;

Figure 3 is a transverse sectional view, taken along the line III-III of Figure 1.

**[0017]** With reference to the figures, the reference numeral 1 generally designates a machine for preparing

and dispensing beverages, particularly hot and cold coffee-flavored beverages, shakes and the like.

**[0018]** The machine 1 comprises a substantially box-shaped framework 1a, which rests on feet 1b and is internally associated with a contoured frame 1c for supporting the various components.

**[0019]** Inside the upper portion of the framework 1a, the frame 1c supports at least one container 2 for storing a powdered soluble preparation for preparing a beverage, which is provided at the front with a discharge port 3, which is associated with dosage means 4 for dispensing a specific dose of preparation, and, in an upper region, with a loading port 5, which is closed by a removable lid 5a.

**[0020]** It should be noted that the adjectives "front", "forward" and other terms similar to these are understood to be referred to the side of the machine 1 that faces the user during use.

**[0021]** The dosage means 4, shown schematically in Figure 3 since they are of a conventional type, comprise a screw feeder 6, which is accommodated inside the container 2, proximate to its bottom, and is rotationally actuated about its own longitudinal axis by an electric gear motor 7.

**[0022]** The rotation of the screw feeder 6 causes the advancement of the preparation toward the discharge port 3.

**[0023]** The preparation used in the machine 1 is of the type conventionally used to prepare beverages and can contain, for example, powdered coffee, pounded barley, powdered cocoa, freeze-dried milk, freeze-dried fruit, or a mixture of these ingredients.

**[0024]** The machine 1 further has at least one tank 8 for collecting a liquid for dissolving the preparation, which is provided with a filling opening 9 and with a discharge opening 10 for said liquid, which is associated with pumping means 11 for drawing a specific amount of liquid from the inside of the tank 8.

**[0025]** The liquid is water or milk or the like and is preferably kept inside the tank 8 at room temperature; however, alternative uses of the machine 1 in which the liquid in said tank is cooled or heated are not excluded.

**[0026]** The tank 8 is accommodated in the lower portion of the framework 1a and is constituted by a tub 8a, which is open upward so as to form the filling opening 9, and by a lid 8b, which is arranged so as to rest on said tub and is provided with a through hole that forms the discharge opening 10.

**[0027]** Conveniently, the lid 8b is fitted rigidly to the frame 1c by means of screws 12, and the tub 8a can be at least partially removed in order to introduce liquid after at least partially disassembling the front portion of the frame 1a.

**[0028]** The tub 8a is in fact provided on the front wall with a knob 13 in order to facilitate its extraction during filling.

**[0029]** The pumping means 11 are constituted by a conventional pump, in which the intake is connected to

the tank 8 by means of the discharge opening 10; the machine 1 is provided with an intake duct 14, which is inserted in the discharge opening 10 and has a first end that draws from the bottom of the tub 8a and a second end that is opposite with respect to the first end and is associated with the intake of said pump.

**[0030]** The delivery of the pump is instead associated with a delivery duct 15.

**[0031]** According to the invention, the machine 1 further comprises at least one chamber 16, which is open in an upper region and is associated with, and connected to, the discharge port 3 and the discharge opening 10 in order to collect the dose of preparation and the amount of liquid fed respectively from the container 2 and from the tank 8, inside which means 17 for mixing the preparation and liquid to obtain the beverage are associated, and is provided with at least one dispensing opening 18 for the resulting beverage, which is associated with flow control means 19, which can move alternately between a configuration for opening said opening and for closing said opening (Figure 3).

**[0032]** The flow control means 19 are in the closed configuration when the mixing means 17 are operating, so as to keep the beverage in the vicinity of said mixing means.

**[0033]** In this manner, the resulting beverage can be whisked up as if it were blended or shaken in a conventional manner, since it remains for a chosen time in the vicinity of the mixing means 17.

**[0034]** The served beverage therefore has a good consistency and a pleasant surface layer of froth.

**[0035]** The delivery duct 15 leads into the chamber 16 so as to connect it to the discharge opening 10.

**[0036]** The flow of the beverage through the chamber 16 occurs substantially in a downward vertical direction.

**[0037]** Advantageously, the machine 1 is provided with a management and control unit 20, such as a conventional electronic board, which is not shown in detail and is functionally associated with the dosage means 4, with the pumping means 11, with the mixing means 17 and with the flow control means 19; the unit 20 is suitable to manage the automatic operation of the machine 1 and to time the sequential activation of the dosage means 4 and of the pumping means 11, of the mixing means 17 and finally of the flow control means 19.

**[0038]** Preferably, the unit 20 is of the type that can be programmed by a user in order to set the intervention times of one or more of the dosage means 4, the pumping means 11, the mixing means 17, and the flow control means 19.

**[0039]** Accordingly, the unit 20 is associated with user interface means, such as a keypad 21, which is not shown in detail and is arranged on the external front wall of the framework 1a and is provided for example with a button for starting an operating cycle for preparing a beverage, with a button for starting the washing cycle (which excludes the operation of the dosage means 4), and with a plurality of buttons or the like for adjusting

the intervention times of said means.

**[0040]** In particular, by adjusting at will the intervention time of the dosage means 4 and of the pumping means 11 it is possible to vary respectively the dose of the preparation and the amount of liquid fed toward the chamber 16; further, by setting a different actuation time of the mixing means 17, it is possible to obtain more or less dense and frothy beverages.

**[0041]** The intervention (opening) time of the flow control means 19 can, as an alternative, be fixed and at least equal to the value for which the chamber 16 is emptied.

**[0042]** The unit 20 is further associated with a plurality of switches 22 for starting the operation of the machine 1, which are arranged inside the removable front portion of the framework 1a: a first general switch 22a for switching on and off said machine, a second switch 22b for actuating the pumping means 11 for filling the circuit, and a third switch 22c for actuating the opening of the flow control means 19 in order to evacuate residues of liquid or other matter in the chamber 16.

**[0043]** The mixing means 17 are arranged proximate to the bottom of the chamber 16; the dispensing opening 18 is arranged below said mixing means.

**[0044]** Below the dispensing opening 18, the framework 1a protrudes so as to form a bracket 23 for supporting a cup B in which the beverage is served, and in which a removable tray 24 for collecting drops of beverage is inserted.

**[0045]** The chamber 16 is constituted by a first portion 16a for receiving the dose of preparation and the amount of liquid fed respectively through the discharge port 3 and the discharge opening 10 and a second portion 16b, arranged below the first portion, for accommodating the mixing means 17, which is connected to the dispensing opening 18.

**[0046]** The dispensing opening 18 is formed in the bottom of the second portion 16b, and the framework 1a is open at said dispensing opening.

**[0047]** The first and second portions, respectively 16a and 16b, are mutually connected by means of an intermediate connecting portion 16c.

**[0048]** The mixing means 17 comprise a rotating element, which is constituted by a shaft 25, which is supported by the second portion 16b so that it can rotate about its own longitudinal axis, and by a plurality of vanes 26, which are associated at a first end of said shaft that is supported in a cantilever fashion inside the second portion 16b.

**[0049]** The shaft 25 is arranged horizontally and transversely with respect to the flow of the beverage along the second portion 16b, and has a second end, which is arranged opposite the first end and protrudes outside said second portion and is associated with motor means 27 for rotating it, sealing means being interposed between the shaft 25 and the wall of the second portion 16b in order to prevent any seepage of beverage.

**[0050]** The flow control means 19 comprise a stem 28,

which is arranged horizontally and transversely with respect to the flow of the beverage along the second portion 16b and is associated with means 29 for actuating its alternating translational motion between the open and closed configurations.

**[0051]** The stem 28 is provided with an end for closing the dispensing opening 18, which is supported in a cantilever fashion inside the second portion 16b, and with an opposite end that protrudes outside said second portion and is associated with the actuation means 29, sealing means being interposed between the stem 28 and the wall of the second portion 16b in order to avoid any seepage of beverage.

**[0052]** Conveniently, the flow control means 19 are provided with a membrane 30, which is associated with the closure end of the stem 28, said stem being suitable to produce the translational motion of the membrane 30 between the open configuration and the closed configuration.

**[0053]** The membrane 30 allows to avoid any leakage of beverage in the closed configuration.

**[0054]** The stem 28 has, at its closure end, a head that is contoured so as to form a shoulder for retaining the membrane 30.

**[0055]** The membrane 30 is constituted by a sort of contoured hood made of substantially flexible material, which is fitted on the closure end of the stem 28 and is perimetrically coupled to the internal wall of the second portion 16b.

**[0056]** The actuation means 29 may have, for example, an electromagnet that is associated with the stem 28 for actuating the translational motion from the closed configuration to the open configuration and cooperates with a compression contrast spring for returning said stem to the closed configuration.

**[0057]** Conveniently, the machine 1 is provided with conventional means 31 for sensing when the liquid in the tank 8 is about to be depleted; said means are arranged below said tank and are substantially constituted by a microswitch, which cooperates with a compression contrast spring; the microswitch remains in the closed configuration until the weight of the liquid contained in the tank 8 is such as to overcome the reaction of the contrast spring, which is preloaded so as to trip the microswitch when the weight of the liquid drops below a threshold value for which it is convenient to perform a top-up.

**[0058]** The sensing means 31 are associated with corresponding indicator means, such as a warning light or the like, not shown in the figures.

**[0059]** Advantageously, the machine 1 can be provided with means 32 (schematically shown in dashed lines in Figure 3) for regulating the temperature of the amount of liquid drawn from the tank 8, so as to be able to serve hot or cold beverages while keeping the liquid inside said tank at room temperature.

**[0060]** In particular, the temperature regulation means 32 may have heating means 33 arranged along

the delivery duct 15 and preferably valve means 34 for flow control, which are interposed between said heating means and the chamber 16.

[0061] The heating means 33 may be for example of the electrical (resistor-based) type.

[0062] In this way, the machine 1 allows to obtain hot beverages, such as for example cappuccinos, that are entirely similar to those obtained with conventional bar machines with steam jets.

[0063] Conveniently, the machine 1 can be equipped with a smart card reader 35 or the like for exchanging information regarding for example the status or the operation of the machine with the unit 20.

[0064] The front wall of the framework 1a may have a transparent panel 36 bearing decorative patterns, advertising messages or others, associated with a corresponding light source 37 fitted inside said framework.

[0065] With reference to the cycle for preparing a beverage, the operation of the machine 1 is as follows: from the keypad 21, the user controls the activation of a work cycle, as set on the unit 20.

[0066] While the flow control means 19 are kept in the closed configuration, the unit 20 activates in succession the operation of the dosage means 4 and the pumping means 11 for the set time, so as to send the intended dose of preparation and the intended amount of liquid into the chamber 16 and the operation of the motor means 27 so as to turn the rotating element for a chosen time, and finally activates the excitation of the electromagnet so as to cause the return of the stem 28 into the open configuration and serve the resulting beverage into the cup B arranged below the dispensing opening 18.

[0067] After a set time, the unit 20 interrupts the excitation of the electromagnet so as to return the stem 28 to the closed configuration by way of the action of the contrast spring.

[0068] In practice it has been found that the described invention achieves the intended aim and objects, and in particular it achieves the aim of obtaining automatically a beverage that is entirely similar, in the appreciation of the customer, to those conventionally obtained with blenders, shakers or jets of steam.

[0069] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

[0070] All the details may further be replaced with other technically equivalent ones.

[0071] In practice, the materials used, as well as the shapes and dimensions, may be any according to requirements without thereby abandoning the scope of the protection of the appended claims.

[0072] The disclosures in Italian Patent Application No. MO2004A000020 from which this application claims priority are incorporated herein by reference.

[0073] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly,

such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

## Claims

1. A machine for preparing and dispensing beverages, comprising at least one container for storing a powdered soluble preparation for preparing a beverage, which is provided with a discharge port associated with dosage means for dispensing a specific dose of said preparation, and at least one tank for collecting a liquid for dissolving said preparation, which is provided with a discharge opening associated with pumping means for drawing a specific amount of said liquid, **characterized in that** it comprises at least one chamber, which is associated with, and connected to, said discharge port and said discharge opening in order to collect said dose of preparation and said amount of liquid, and inside which means for mixing said preparation and said liquid in order to obtain said beverage are associated, said chamber being provided with at least one opening for dispensing said beverage, which is associated with flow control means, which can move alternately between a configuration for closing said dispensing opening and a configuration for opening it, the flow control means being in the closure configuration when the mixing means are active, so as to keep the beverage in the vicinity of said mixing means.
2. The machine according to claim 1, **characterized in that** it comprises a management and control unit, which is functionally associated with said dosage means, said pumping means, said mixing means and said flow control means, the unit being suitable to time the sequential activation of the dosage means, of the pumping means, of the mixing means, and finally of the flow control means.
3. The machine according to one or more of the preceding claims, **characterized in that** said management and control unit is of the type that can be programmed by a user in order to set the intervention time of at least one among said dosage means, said pumping means, said mixing means and said flow control means.
4. The machine according to one or more of the preceding claims, **characterized in that** said mixing means are arranged proximate to the bottom of said chamber.
5. The machine according to one or more of the preceding claims, **characterized in that** said dispensing port is arranged below said mixing means.

6. The machine according to one or more of the preceding claims, **characterized in that** said chamber comprises a first portion for receiving said dose of preparation and said quantity of liquid, which is associated with, and connected to, said discharge port and said discharge opening, and a second portion for at least partially accommodating said mixing means, which is associated with said dispensing outlet, said first and second portions being mutually connected. 5
7. The machine according to one or more of the preceding claims, **characterized in that** said chamber comprises a connecting portion that is interposed between said first and second portions. 10
8. The machine according to one or more of the preceding claims, **characterized in that** said first portion is arranged substantially above said second portion, the dispensing opening being arranged proximate to the bottom of said second portion. 15
9. The machine according to one or more of the preceding claims, **characterized in that** said mixing means comprise at least one rotating element. 20
10. The machine according to one or more of the preceding claims, **characterized in that** said rotating element comprises a shaft, which is supported by said chamber so that it can rotate about its longitudinal axis, and at least one vane, which is associated with said stem and is accommodated inside said chamber. 25
11. The machine according to one or more of the preceding claims, **characterized in that** said vane is associated with said stem proximate to a first end arranged inside said chamber. 30
12. The machine according to one or more of the preceding claims, **characterized in that** said shaft is arranged substantially transversely to the flow of said beverage inside said second portion, so that said first end is accommodated inside said second portion and the opposite end protrudes externally and is associated with motor means for its rotational actuation. 35
13. The machine according to one or more of the preceding claims, **characterized in that** said flow control means comprise a stem, which is arranged substantially transversely to the flow of said beverage inside said chamber and is associated with means for actuating its alternating translational motion between said open and closed configurations. 40
14. The machine according to one or more of the preceding claims, **characterized in that** said stem is provided with an end for closing said dispensing port, which is accommodated inside said chamber, and with an opposite end, which protrudes externally and is associated with said actuation means. 45
15. The machine according to one or more of the preceding claims, **characterized in that** said flow control means comprise a sealing membrane associated with said closure end, the stem being suitable to move the membrane between the open configuration and the closed configuration. 50
16. The machine according to one or more of the preceding claims, **characterized in that** said stem comprises a head that is arranged proximate to said closure end and is contoured so as to form a shoulder for retaining said membrane. 55
17. The machine according to one or more of the preceding claims, **characterized in that** said membrane is constituted by a sort of contoured hood, which is made of substantially flexible material and is fitted on said closure end.
18. The machine according to one or more of the preceding claims, **characterized in that** said actuation means comprise an electromagnet, which is associated with said stem for translational actuation from said closed configuration to said open configuration, and a contrast spring for the return of said stem to said closed configuration.
19. The machine according to one or more of the preceding claims, **characterized in that** said dosage means comprise a motorized screw feeder.
20. The machine according to one or more of the preceding claims, **characterized in that** said pumping means comprise a pump in which the intake is associated with said tank and the delivery is associated with said chamber.
21. The machine according to one or more of the preceding claims, **characterized in that** it comprises means for regulating the temperature of said liquid.
22. The machine according to one or more of the preceding claims, **characterized in that** said temperature regulation means comprise heating means, which are interposed between said pumping means and said chamber.
23. The machine according to one or more of the preceding claims, **characterized in that** said heating means are of the electrical type.
24. The machine according to one or more of the preceding claims, **characterized in that** said temper-

ature regulation means comprise valve means for flow control, which are interposed between said heating means and said chamber.

25. The machine according to one or more of the preceding claims, **characterized in that** it comprises means for sensing when the liquid contained inside said tank is nearly depleted. 5
26. The machine according to one or more of the preceding claims, **characterized in that** said tank comprises a tub, which is open upward so as to form an opening for filling with said liquid and a lid that is arranged so as to rest on said tub and is provided with a through hole that forms said outlet, the tub being at least partially removable in order to fill it with liquid. 10 15
27. The machine according to one or more of the preceding claims, **characterized in that** said container is provided with a port for loading said preparation. 20
28. The machine according to one or more of the preceding claims, **characterized in that** said preparation comprises at least one among powdered coffee, powdered barley, powdered cocoa, freeze-dried milk and freeze-dried fruit. 25
29. The machine according to one or more of the preceding claims, **characterized in that** said liquid is water or milk or the like. 30
30. The machine according to one or more of the preceding claims, **characterized in that** said liquid inside said tank is kept at a temperature that is close to the ambient temperature. 35

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