

MIXING DEVICE

The objective of the invention is a mixing device, preferably to be used with drink makers and preferably with hot water chocolate drink makers.

Drink automats making hot chocolate drinks are used to dose a timed portion of hot chocolate. The device is intended to dose and mix a syrupy chocolate concentrate (hereafter
10 syrup) with liquid, e.g. water. Generally one part syrup is mixed with five parts water. The capacity can be sixty cups /hour or more. The size of the portions is generally 150 - 250 ml.

15 Automats dispensing ready-made chocolate or alike are today used in institutional kitchens, restaurants or corresponding. These dispensers use a syrupy substance in which the flavorings are concentrated. These dispensers function in principle as follows: A dosing pump is dosing the syrup to a
20 mixing chamber where water is added. The mixing is made by a rotating blade to achieve a desired froth of the substance and the water before the prepared mixture is dispensed to a cup or alike. When cleaning the substance passages of the automats, the available hot water is generally changed over
25 through certain devices.

The DE publication 3607623 presents a device with water injection and pressure water pipe connections and differs essentially from the solution of the invention. The device
30 is fairly complicated even though called an unit. No mixing mechanism is provided for the mixture of syrup and water, but everything is made by pressure, which requires fairly special connections. The solution according to the subject invention provides a much more simple cleaning of the mixing
35 space after use, and all surfaces coming into contact with water or syrup can be dismantled. According to the invention, the mixing chamber can be dismantled in order to enable free access of water to the spaces. This is not the

case in the cited publication.

In the DE publications 2734992 and 2852109, which do not contain intake of syrup, powder is moreover fed, not syrup,
5 by means of a device outside the mixing chamber. The powder sinks due to gravitation.

These known devices have several disadvantages. The dosing pump contains different cavities and valves which are difficult to clean. The changing over to cleaning with hot water requires extra devices. If the dispenser is not attended to properly, the dried substance can block the substance passages, and cause demounting of the device. This can especially happen when the machine is not used during weekends.

15 The subject invention provides an easy and simple construction enabling an easy cleaning of all parts coming in contact with the chocolate. The embodiment of the invention utilizes a device characterized by what is presented in the
20 claims.

The device according to the invention is both simple and safe to use. The part of the device coming in contact with the syrup is hygienic, as it can be washed separately in
25 e.g. a dish-washer. It can easily be dismantled. The dirty parts are easy to change. The maintenance of the device is simple.

The invention is below presented more in detail with reference to the enclosed drawing, in which

- fig. 1 presents a schematic picture of a chocolate automat according to the invention,
fig. 2 shows an interior and sectional view of a chocolate automat cassette according to the invention,
35 fig. 3 shows a packing for the cassette,
fig. 4 presents an example of the changing over of the blender motor and the cassette,

fig. 5 presents an example of the water intake to the cassette,

fig. 6 shows the valves of the packing,

fig. 7 shows an example of a needle valve.

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The chocolate automat generally comprises a water heater 10 with a thermostatically controlled element, not presented in the figure. The water heater 10 is connected to a cold water pipe line 11, or the water heater 10 can be filled with
10 water in different ways. The line 11 is generally provided with a filling valve 12, having different functions, i.a. level sensing. From the water heater 10 there is a connection to the electric valve 13 for the water dosing. The electric valve 13 doses the water to a so called cassette 14
15 comprising three parts, namely an upper part 15, a lower part 16 and a packing 17 between these parts. The upper part 15 has a connection 5 for the chocolate container 18 and a hot water connection 9 for the water intake. The upper part 15 is also provided with an output shaft 3 for a rotatable
20 blender 1. The shaft 3 is operated by a driving device outside the cassette. The shaft 3 is splash-proof and drivable inside the cassette material. The driving device 19 has been connected with a quick coupling to the shaft 3 in order to facilitate the dismantling of the driving device
25 for cleaning or maintenance. The rotatable blender 1 is furnished with a depression 8 in the upper part 15 as well as on the opposite place in the lower part 16.

The packing 21 contains the required valve functions. The
30 packing is provided with two flaps 22 and 23 which are elastic to bend when the piston is pushed in or pulled out. The syrup can 18 is attached to the hole 5 of the upper part for the intake of the chocolate. The hole 4 for the piston 4A is provided on the opposite place in the lower part 16.
35 Between the piston hole 4 and syrup intake there is the first flap 22 of the packing. When the piston 4A is pulled downwards, a predetermined amount of chocolate syrup is extracted from the can 18. The flap 22 turns against the

piston 4A and makes simultaneously a hole for the syrup to flow to the surface of the piston 4A. When the amount is sufficient, the piston 4A starts pushing the chocolate upward so that the first flap 22 remains closed and even
5 closes the hole to the can 18, while the second flap 23 is opened. The chocolate amount extracted is pushed through the other flap 23 into the mixing chamber 8 with the assistance of water which is fed from the opening 9. A separate depression 26 is provided for the flowing of the water in the
10 upper part 15 so that water is fed in one end of the depression 26 and water meets the chocolate in the other end of the channel 26. Through the chocolate end of the channel 26, the predetermined amount of chocolate together with the water is fed into the mixing chamber 8. For this purpose a
15 free passage is left from the depression 26 to the mixing chamber 8 in the packing 21. After mixing, the drink is dispensed through the hole 6, located in one end of the mixing chamber 8, to the cup 25 with the assistance of an as such previously known dosing valve, which is not shown, and
20 which operates together with the automatics at the intake of water and chocolate. The dosing pump 20 controls the movement of the piston 4A according to the program, and pulls and pushes the piston in the direction of the arrows either upward or downward. The packing 21 seals the space between
25 the upper and lower parts 15, 16 when they are close together to prevent chocolate and water from flowing out of the cassette 14.

The lower part 16 is provided with a half-cylinder, which
30 forms part of the mixing chamber 8 on the opposite place of the upper part 15, so that the half-cylinders of the upper and lower parts 15, 16 define a space 8 for the mixing of syrup and water in predetermined quantities when the upper and lower parts 15, 16 are attached to each other. The lower
35 part 16 is also provided with the outlet 6 for the ready-made liquid chocolate drink to be fed to the cup 25 below the outlet 6.

The packing 21 has the openings 24, 25 in the middle of the packing to enable the flow of water and syrup within the cassette 14 from the chocolate container connection 5 to the mixing space 8. The opening has the shape of the mixing chamber's cross section, and the opening 25 proceeds through the space 24 as far as the flap 23.

The drink dosing pump 20 controls the piston movement. The piston bar 27 is attached detachably to the pump 20 from the cassette 14 by a quick coupling. The quick coupling can be like a clothespin attached to the piston bar 27, whereby the piston 4A can be pulled and pushed by this coupling and the driving device 20.

The cassette 14 is provided with holes 5, 9 for the syrup and water intake in one part, 15, 16. The upper and lower parts 15, 16 are attached rotatably from one end by e.g. hinges or alike. When the cassette 14 is opened, the dirty parts of the cassette can easily be cleaned. The packing 21 can also be detached and washed separately. The packing 21 has a pair of pivots 10 for a better adaption. The lower part has corresponding holes for these pivots. Water and chocolate can generally be fed from one end of the mixing chamber 8 and discharged from the other end of the mixing chamber 8, to make the mixing as proper as possible. The mixing can be made in horizontal or vertical position.

The syrup intake can be arranged correspondingly, wherefore the described example is not to be considered as a restriction but only as an example of the embodiment. The intake can be made by a vacuum pump or corresponding. The intake and the discharge can be controlled with a microprocessor according to known techniques.

At the intake of different substances, their amounts, mixing times and drink temperature, etc. can be controlled.

Fig. 4 shows an example of the quick coupling of the blender

motor shaft and the cassette. For the rotation, a conic rubber part 31 has been attached or pushed to a bowl 30. The angle of the cone α is between approx. 5 - 10°. The change over can thus be a so called friction coupling. The bowl 30, which is preferably of metal, is attached to the blender shaft 3. Through the connection between the rubber part 31 of the blender motor and the bowl 30, the blender 1 can be rotated by the blender motor 2. A corresponding material can be used instead of rubber.

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Fig. 5 shows an example of the water intake into the cassette. The water coming through the electric valve 13 is taken into the basin 32, located above the upper part of the cassette, and having a hole 9 for the flowing of the water into the cassette mixing chamber 7, 8. The cassette is generally horizontally inclined. The outlet 6 can therefore be provided with a nozzle 33, which can be turned so that the ready-made drink can be dispensed to the cup 25.

20 Fig. 6 shows the packing valves 22, 23. The inlet valve 22 opens when the syrup is fed, and closes when the piston pushes the syrup upward and when the valve 23 is open. The arrows show the direction and route of the syrup when the piston is moved.

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Fig. 7 shows a needle for the syrup can. When the needle 35 has been attached to the cassette, the needle makes a hole in the can and keeps the can in its place. The needle has the holes 36 for the syrup to pass therethrough and all the way into the cassette. At the intake of the substance, the valve 22 is kept closed with a magnetic lid so that the corresponding areas of the valve 22 and the cassette 14 are provided with a magnetic counter part.

35 When the upper and lower parts of the cassette are assembled, the parts are kept attached with a clamp ring or corresponding. The cassette can be pushed between two or several fixed rails in the device so that the cassette stays

between the rails, in order to obtain a tight connection and enable the placing of the cassette on the right place for the mixing of syrup and water.

CLAIMS

1. A mixing device for the mixing of a syrupy substance and water in a predetermined proportion, which device comprises
- 5 - a dosing device (20) including a valve (13) for the feeding of water into a basin (32) above the mixing device,
- a feeding pipe (9) for the steering of the water separately from the basin (32) to the mixing area (7, 8),
- a feeding pipe (5) for bringing the syrupy substance from
- 10 a container attached to the mixing device to a dosing device (4A),
- a mixing gear (1) in the mixing area (7, 8),
- driving devices (19, 20) for operating the mixing gear (1) and the dosing devices (4A),
- 15 - a channel from the dosing device (4A) to the mixing area (7, 8), and
- a discharge (6) of the ready drink from the mixing area (7, 8), c h a r a c t e r i z e d in that the parts (1, 4A, 5, 6, 7, 8, 9, 14, 32) that come into
- 20 contact with the syrupy substance are detachable from the rest of the device (13, 18, 19, 20) in one unit, and can be opened into separate parts for washing.
2. A mixing device according to claim 1, c h a r a c t e r -
- 25 i z e d in that the mixing chamber comprises a dismantlable cassette (14) having a lower part (16) and an upper part (15).
3. A mixing device according to claims 1 or 2, c h a r -
- 30 a c t e r i z e d in that the lower part (16) and the upper part (15) have on opposite places half-cylindric depressions (7, 8) forming together the mixing area for water and the syrupy substance.
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4. A mixing device according to one or several of the claims 1 - 3, c h a r a c t e r i z e d in that the lower part (16) and the upper part (15) are turnable from one end of

the parts.

5. A mixing device according to one or several of the claims 1 - 4, characterized in that a packing (21) is provided between the upper and the lower part (15, 16), and that a hole is provided in the packing for a cylindric mixing area (7, 8).

6. A mixing device according to one or several of the claims 1 - 5, characterized in that one part (15, 16) has connections (5, 9) for the syrupy substance and the water supply, and the opposite place of the syrupy substance connection (5) in the other part is provided with a hole (4) for a piston (4A) for the intake and pushing of the syrupy substance.

7. A mixing device according to one or several of the claims 1 - 6, characterized in that the packing (21) of elastic material comprises the valves (22, 23), one valve (22) being between the syrupy substance connection (5) and the opening (4) of the piston for the opening and closing of the syrupy substance connection (5), and the other valve (23) for the feeding of the syrupy substance to the mixing area (7, 8) for mixing with water.

8. A mixing device according to one or several of the claims 1 - 7, characterized in that a blender (1) is installed in the mixing chamber (7, 8), the shaft (3) of which is turnably embedded in the material of the part (15), and which one end is detachably attached to the driving device (2), and that the piston bar (27) is detachably mounted to its driving device (20).

9. A mixing device according to one or several of the claims 1 - 8, characterized in that a channel is provided in the packing between the valve (23) and the mixing area (7, 8).

10. A mixing device according to one or several of the claims 1 - 9, characterized in that syrupy substance is dosed by means of intake devices (4A) to the cylinder (4) through a first valve (22) and that the dosed amount of the syrupy substance is pushed from the chamber through another valve (23) to the mixing area (7, 8).

11. A mixing device according to one or several of the claims 1 - 10, characterized in that the intake device (4A) pushes the substance from the cylinder (4) with a cylinder / piston construction to the mixing area (7, 8).

12. A mixing device according to one or several of the claims 1 - 11, characterized in that when the lower part and the upper part and the intermediate packing are dismantled into separate parts, the parts can be washed from the inside.

13. A mixing device according to one or several of the claims 1 - 12, characterized in that the grooves for the openings (5, 6, 7, 8, 9) in the lower and the upper parts (16, 15) are open towards the dismantling line.

14. A mixing device according to one or several of the claims 1 - 13, characterized in that a disposable container (18) for the syrupy substance can be attached to a pointed piece (35) having openings (36) in the butt of the mixing device (14) to enable the passage of the substance into the cylinder (4).

15. A mixing device according to one or several of the claims 1 - 14, characterized in that at the intake of the substance, the valve (22) is kept closed by a magnetic lid so that the opposite places of the valve (22) and the cassette are provided with a magnet.

16. A device for the mixing of a syrupy substance and water to be used in chocolate dispensers or corresponding, which device comprises a mixing area (7, 8) and intake openings (5, 9) for the mixing concentrate, a mixing device (1),
5 dosing devices (4A, 20) for the intake of the concentrate and discharge of the mixed substance, c h a r a c t e r - i z e d in that the mixing chamber (7, 8) is arranged in an entirety to be detachable from the driving devices (13, 19, 20) so that the parts (4A, 14) that come in contact with the
10 syrupy substance can be dismantled with quick couplings or corresponding for cleaning.