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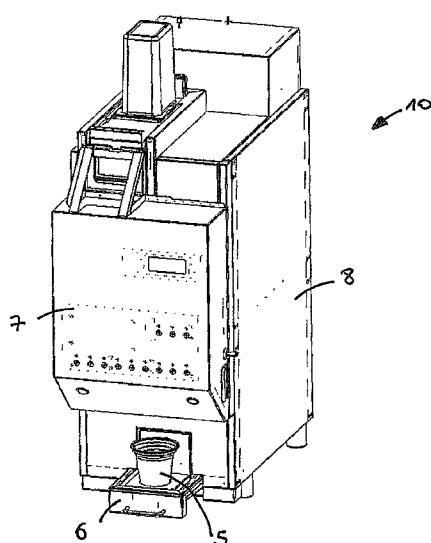
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(54) Title: BEVERAGE DISPENSER WITH POWDER CONTAINERS



(57) Abstract: The invention concerns a beverage preparation apparatus comprising : - a main frame (8), and - a front door (7), and - a supply (9) of water, and - several containers (311, 321) configured for storing and dosing bulk beverage ingredients, each container comprising an ingredient discharge outlet (312, 322), the containers being divided in a first group (31) and a second group (32), - one mixing chamber (1) configured for mixing at least one dose of bulk beverage ingredient and water and positioned below the first group and the second group of containers, and - several chutes (41, 42) for guiding doses of bulk beverage ingredient from the discharge outlets of the containers to the mixing chamber, wherein in each group of containers, the containers are aligned side by side and form a rank, wherein the mixing chamber, the first group of containers and the chutes are positioned inside the internal volume of the main frame, and wherein the second group (32) of containers is held on a tray (11), said tray being movable between an operating position and a maintenance position.

Description

Title of Invention: BEVERAGE DISPENSER WITH POWDER CONTAINERS

Technical Field

[0001] Field of the invention

The present invention relates to beverage dispensers comprising several canisters of beverage ingredients and preparing beverage by dispensing water and doses of beverage ingredients from canisters in a mixing chamber.

Background Art

[0002] Background of the invention

Many beverages like espresso and other coffee beverages, milk beverages, chocolate beverages are prepared by mixing a dose of soluble beverage powder container, with a diluent inside a mixing chamber. Mixing chambers are known for speedier preparation of such beverages by mixing the beverage soluble powder with the diluent, such as water.

Out of home machines usually provides consumers with a large offer of different types of beverages with the same machine. These machines comprise several containers storing different types of soluble powders (instant coffee, milk powder, chocolate powder, instant tea, fruit powders, ...) and several mixing devices. Usually, containers are positioned side by side along the whole width of the machine and mixing chambers are positioned below in order to receive doses of powders by gravity fall through a powder chute. Usually, in order to avoid cross contamination, it is preferred to have one mixing chamber dedicated to similar products. For example, the same chamber can be used to prepare coffee and decaffeinated coffee : this chamber is positioned below and between the containers of instant coffee and instant decaffeinated coffee and receives the powders from the two chutes guiding powders from containers to the chamber. The same chamber can receive powders from two different containers and chutes placed above to prepare different beverages. As a result the number of mixing chambers is inferior to the number of containers. WO 2013/014142 illustrates such types of machines.

[0003] In some machines, only one single mixing chamber can be supplied. It is the case for example for complex machines preparing frozen beverages. The mixing device is configured for blending simultaneously ingredients such as : pieces of ice, water and different beverage ingredients. The chamber itself is larger than usual beverage mixing chambers and comprises particular blades. With these machines, the place for holding several chambers is limited. Only one chamber is provided and the architecture of the

machine has to be configured so that any beverage ingredients can be discharged from any storing container to the chamber. The problem of cross contamination is solved by operating an efficient rinsing of the mixing chamber after each beverage preparation. Yet, when one single chamber is provided, it becomes difficult to propose a large variety of beverages due to the problem of discharging correctly powder ingredients from several containers above the same mixing chamber. Indeed, even if the machine is able to store several beverage ingredient powders above the chamber, dispensing ingredients powders from the containers at the farthest lateral sides can create an issue because the chutes of these containers are not inclined enough. Depending on the flowability of the beverage ingredient powder, powder may be trapped in the chute presenting a low angle of inclination.

[0004] An object of the invention is to address the issue of the usual architecture of beverage preparation machines when one mixing chamber only is fed with several powder containers..

Summary of Invention

[0005] Summary of the invention

In a first aspect of the invention, there is provided a beverage preparation apparatus comprising :

- a main frame, and
- a front door, and
- a supply of water, and
- several containers configured for storing and dosing bulk beverage ingredients, each container comprising an ingredient discharge outlet, the containers being divided in a first group and a second group, and
- one mixing chamber configured for mixing at least one dose of bulk beverage ingredient and water, said chamber being positioned below the first group and the second group of containers, and
- several chutes for guiding doses of bulk beverage ingredient from the discharge outlets of the containers to the mixing chamber,

wherein in each group of containers, the containers are aligned side by side and form a rank,

wherein the mixing chamber, the first group of containers and the chutes are positioned inside the internal volume of the main frame, and

wherein the second group of containers is hold on a tray, said tray being movable between :

- an operating position where the tray holds the second group of containers along the front side of the frame so that the discharge outlets of the second group of containers

feed corresponding chutes, and

- a maintenance position where the tray holds the second group of containers away from the front side of the frame and liberates the access to the internal volume of the main frame.

[0006] The apparatus comprises a frame in which different functional elements for preparing the beverages are positioned as described hereunder.

[0007] The apparatus comprises several containers for storing and dosing bulk beverage ingredients. These containers are usually non disposable and refillable. The bulk beverage ingredients stored inside are generally powders, pellets or granules. The beverage ingredients are preferably soluble ingredients like instant coffee powder, chocolate powder, milk flavour powder, instant tea powder, a fruit powder or a soluble frappe base powder.

The containers comprise means for dosing the stored bulk beverage ingredients therefrom. This dosing means is preferably a rotatable volumetric dosing means placed at the bottom of the tank like a screw auger or a spring auger. This screw auger or a spring auger usually longitudinally extends along the bottom of the tank and guides bulk beverage ingredient to the discharge outlet of the tank. At the outlet of the tank, the dose of bulk beverage ingredient falls by gravity.

This type of storing and dosing canister is commonly named canister.

[0008] The apparatus comprises several chutes for guiding doses of bulk beverage ingredient falling from the discharge outlets of the containers to the top opening of the mixing chamber positioned below.

[0009] The apparatus comprises one mixing chamber configured for mixing at least one dose of bulk beverage ingredient dosed from any one of the containers and water. This chamber is positioned below the containers so that bulk ingredients fall by gravity. Preferably the chamber comprises a mixing device such as a blade or a whipper actuated by a motor. A motorised blade is particularly necessary for the preparation of frozen beverages prepared with pieces of ice.

The mixing chamber is hold inside the internal volume of the main frame of the apparatus.

[0010] The apparatus comprises several chutes for guiding doses of bulk beverage ingredient from each discharge outlets of the containers to the mixing chamber. Usually the apparatus comprises one chute per container, the chute extending from the container discharge outlet to the top of the mixing chamber.

The chutes are hold inside the internal volume of the main frame of the apparatus.

[0011] The apparatus comprises a supply of water to feed water to the mixing chamber, preferably hot water. This supply of water can comprise a water boiler and a tube connecting the boiler to the mixing chamber. Pump and valves can be used for

particular control of water feed.

The supply of water can be hold inside the frame of the apparatus or alternatively an external supply of water can be provided. In that latter case, a tube connects this external supply with the mixing chamber.

[0012] The containers configured for storing and dosing bulk beverage ingredients are divided in a first group and a second group. In each of these groups of containers, the containers are aligned side by side and accordingly form a straight rank or line. In the operation state of the apparatus, each rank of containers extends between the lateral sides of the apparatus.

The first group of containers are positioned inside the internal volume of the main frame of the apparatus.

The second group of containers are hold on a movable tray. The tray can move between two positions :

- in one operating position, the apparatus is able to dispense beverages. The tray holds the second group of containers along the front side of the frame so that the discharge outlets of the second group of containers feed their corresponding chutes to supply ingredients to the mixing chamber. The rank formed by the second group of containers extend along the front side of the frame and between the lateral sides of the apparatus.

- in another maintenance position, the apparatus is opened for maintenance such as cleaning of the internal devices and refilling of at least the first group of containers. Here, the operator needs to get access to the devices positioned in the internal volume of the main frame and the tray holds the second group of containers away from the front side of the frame in order to liberate the access to this internal volume of the frame.

[0013] As a result, the second group of containers - that are hold on the tray - feed the mixing chamber through chutes positioned on the front side of the frame whereas the first group of containers - that are hold inside the frame - feeds the mixing chamber through chutes positioned on the back side of the frame (this first group reproducing the current practice).

The second group of containers increase the number of containers and sources of ingredients compared to what is usually implemented. Yet, although the number of containers is high, the width of the apparatus is not increased because a part of the containers is in the front part of the apparatus contrary to the usual practice positioning all the containers on a same rank inside the frame.

In addition, all the additional containers of the second group remain positioned close above the mixing chamber meaning that the angle of these chutes stay close to vertical and consequently these chutes are able to discharge powder efficiently.

[0014] With the above described apparatus, all the chutes can be oriented according to an angle comprised between 90° and 60° with horizontal. Such an angle guarantees that bulk beverage ingredient can be discharged whatever the nature of the bulk beverage ingredient.

[0015] According to the preferred embodiment, when the tray is in the operating position, the discharge outlets of the second group of containers extend inside the volume of the main frame.

Accordingly the second group of containers are essentially outside the internal space of the main frame, yet, since the mixing chamber is positioned inside this internal space, usually the discharge ends of the chutes are positioned above the top opening of the mixing chamber inside the main frame.

[0016] Preferably, the movable tray comprises a bottom plate extending under and beyond the discharge outlets of the second group of canisters. This plate is configured to receive some bulk beverage ingredients falling from the discharge outlets of the second group of containers. For example, discrete part of bulk ingredients can fall during the movement of the tray or if the tray is shaken during the refilling of one of the containers or when the tray is pushed against the frame and the front door is closed.

Since the bottom plate extends beyond the discharge outlets of the second group of canisters, when the tray is in the operation position, the plate is usually positioned inside the space of the frame.

Usually, in the chutes for guiding doses of bulk beverage ingredient from the second group of containers to the mixing chamber, the bottom end of the chute is positioned inside the frame at a backwards position compared to the top end of the chute. It means that, for the chutes of the second group of canisters, the top end is close to the front side of the housing and the bottom end is closer to the inside of the housing. Accordingly, when considering the vertical plane extending between the front and the back of the apparatus, these chutes can be inclined relatively to vertical in that plane. Yet, the chutes are inclined by an angle (α) that remains comprised between 60° and 90° with horizontal.

[0017] In one embodiment, this bottom plate is horizontal and is attached to the movable tray in a fixed manner. Preferably this plate extends horizontally.

[0018] In another embodiment, the bottom plate is configured to be tilted upwardly when the tray is moved between the maintenance position and the operating position. As a result, the bottom plate creates a slope for beverage ingredient falling above which urges ingredient away from the edge of the plate and limits dirtiness at the front side of the apparatus.

In this embodiment, the bottom plate can be spring loaded in order to move from an essentially horizontal position to the tilted position and back automatically when the

tray moves between the maintenance position and the operating position.

[0019] Preferably, a deflector can be attached transversely along the front side of the chutes of the second group of container in order to guide some bulk beverage ingredient to the bottom plate and away from the edge of the bottom plate.

This deflector avoids that, during the movement of the tray, some beverage ingredient slides outside the chutes of the second group of canisters and then along the front part of the chute down to the bottom plate and near from the edge of said bottom plate. The risk is that some beverage ingredient settling near from the edge easily fall down from the bottom plate when the tray is moved at the maintenance operation step. The deflector guarantees that beverage ingredient falls and settles away from the edge of the plate with less risk of creating dirtiness in maintenance operation. In addition, it becomes easy for the operator to clean the bottom plate with a sponge and to remove beverage ingredient therefrom.

[0020] According to one embodiment, for each group of containers, all the chutes of the containers are attached one to the other and form a chute assembly. Preferably the chutes are laterally attached side by side one to the other.

Consequently, several chutes can be positioned closely above the top opening of the mixing chamber.

[0021] In one embodiment, the chute assembly of the second group of containers is fixed inside the frame along and in front of the chute assembly of the first group.

Again, this embodiment enables the optimisation of the position of several chutes above the top opening of the mixing chamber

[0022] The tray can comprise a heater. This heater aims to avoid the presence of moisture in the dosing area of the ingredient and to prevent the ingredients from caking there. The heater heats air around the discharge area and maintains a temperature preventing steam from reaching this area and condensing there. A heating at a temperature of at most 60°C is sufficient to obtain the sought-after effect.

Preferably, the heater is directly or indirectly in contact with the chutes of the second group of containers

The heater can be lodged in a frame made of a heat conductive material and parts of said frame can be directly or indirectly in contact with the chutes.

Preferably the frame of the heater is designed so that, when the tray is in operative position, one side of the frame of the heater is in contact with the surface of the chutes of the second group of containers. If these chutes are attached to the chutes of the first group of containers, these chutes are heated indirectly simultaneously.

In one embodiment, the frame of the heater can be spring loaded so that, when the tray is in the operation position, the frame is urged against the chutes and the spring increases the contact with the surfaces of the chutes.

Preferably, the heater is switched on when the door is closed only in order to avoid the any injure for the operator.

[0023] Usually the tray is attached to the frame by means of at least one vertical hinge. Accordingly, the movement of the tray is a rotation around the hinge.

Any known alternative ways to attach the movable tray to the frame can be used such as hinge enabling a vertical translation or a diagonal upwards translation.

[0024] In one embodiment, the apparatus can comprise a supply of crushed ice and the frame comprises a chute for guiding doses of crushed ice to the mixing chamber.

With this embodiment, frozen beverage can be prepared. Frozen beverages are prepared by blending a mixture of hot water, at least one soluble beverage ingredient providing a thick texture and crushed ice.

The supply of crushed ice can comprise :

- a hopper for feeding pieces of ice,
- a crusher for reducing the size of the pieces of ice,
- a unit for dosing crushed ice and discharging dose crushed ice to the mixing chamber.

Pieces of ice such as ice cubes or chip ice can be produced from a separate source that is usually already present in restaurants and coffee shops for other beverage preparations. Usually the hopper comprises means to dispense a first dose of the pieces of ice to the ice crusher. This dispensing means can be a volumetric doser like an auger.

The crusher reduces the size of the pieces of ice with two aims. Crushed ice is easier to dose in an accurate manner, meaning a more consistent preparation of the beverage. In addition, the time of mixing in the mixing chamber is reduced : starting from crushed ice enables the mixing device to blend the ingredients rapidly in an efficient manner. The use of a high power motor to rotate the mixing device is not necessary.

The dosing unit can comprise a container, a scale and a discharge unit. The container is directly fed by the crusher. The container is positioned on a scale weighing the crushed ice introduced in the container.

In an alternative embodiment, the dosing unit can be a volumetric dosing means comprising a chamber of predefined volume through which a dose of pieces of ice is introduced and then dispensed downwards to the mixing chamber. This means can be a barrel, a sliding chamber, a rotary pierced disc or any similar dosing unit.

The dosing unit is configured to dispense the crushed ice to the mixing chamber when the desired amount of crushed ice is reached. Usually the dosing unit comprises a shutter and a chute oriented to the top of the mixing chamber.

Preferably the supply of crushed ice is insulated to limit the melting of ice while it is hold, crushed and then dosed

[0025] In the present application the terms "inside", "internal", "outside", "back", "front", "bottom", "top" and "lateral", "depth", "width" are used to describe the relational positioning of features of the invention. These terms should be understood to refer to the dispenser in its normal orientation as shown in the figures 1 to 5.

[0026] The above aspects of the invention may be combined in any suitable combination. Moreover, various features herein may be combined with one or more of the above aspects to provide combinations other than those specifically illustrated and described. Further objects and advantageous features of the invention will be apparent from the claims, from the detailed description, and annexed drawings.

Brief Description of Drawings

[0027] Brief description of the drawings

The characteristics and advantages of the invention will be better understood in relation to the following figures :

- Figure 1 illustrates an apparatus according to the invention,
- Figure 2 illustrates the apparatus of Figure 1, the front door being opened,
- Figure 3 illustrates the apparatus of Figure 2, the tray of the second group of canisters being partially pulled away from the main housing,
- Figure 4 corresponds to Figure 3 the chutes of the second group of canisters having been removed,
- Figure 5 is an isolated perspective view of the first group and the second group of containers and their chutes,
- Figure 6 is a side view of the first group and the second group of containers and their chutes of Figure 5,
- Figure 7 is an isolated side view of one discharge outlet, the chutes and the bottom plate,
- Figure 8 is a front view of the chutes.

Description of Embodiments

[0028] Detailed description of the drawings

Figure 1 illustrates an apparatus 10 for producing beverages according to the invention. The apparatus comprises a main frame 8 and a front door 7. The front door comprises a user interface in order to enable the selection of a beverage. This door is openable to get access to the internal part of the apparatus for maintenance. Maintenance comprises tasks such as refilling of the containers, cleaning, fixing, control.

The apparatus comprises a drawer 6 on which the user can position an empty drinking container 5. The drawer is configured to be pushed inside the apparatus in order to initiate the preparation of a beverage and the filling of the drinking container.

At the end of the filling, the user is authorised to pull back the drawer 6 to get the container filled with the selected beverage.

[0029] Figure 2 shows the apparatus of Figure 1, the front door 7 having been opened. Behind the front door 7 and in front of the main frame 8, the apparatus comprises three powder canisters 321 forming a second group 32 of containers and positioned in a tray 11. The tray 11 positions the second group 32 of containers along the front side of the frame. These containers are oriented inside the tray so that the discharge outlet of each container faces the inside of the main frame (not visible in Figure 2). Each of these containers 321 comprises a tank and a dosing unit inside the tank (rotating auger not visible). The actuating devices 323 of the dosing units appear on the front side.

The front door 7 is not flat but comprises an inside volume 71 to cover the part of the second group 32 of containers rising from the front side of the frame.

Inside the main frame, one single mixing chamber 1 is positioned inside the frame 8 and under the second group 32 of canisters. As a result, bulk beverage ingredients dispensed from said containers 321 can flow through the top of the mixing chamber and received in the mixing chamber. In the particular illustrated embodiment, the chamber comprises a movable upper shutter 14 configured for cooperating with the top edge of the sidewall of the chamber for closing or opening the top of the vessel. During the beverage ingredient dosing, this shutter is moved away from the top of the mixing chamber and after dosing, the shutter moves back to cover the chamber. The chamber can mix the ingredients introduced in the mixing chamber without risk of projection outside the chamber. The chamber comprises a water inlet 16 to introduce water to be mixed with the beverage ingredient. This water inlet is connected to supply of water by means of a flexible tube.

The chamber 1 comprises a movable lower shutter 15 configured for cooperating with a discharge outlet at the bottom of the chamber for closing or opening the discharge outlet. The dispensing of the beverage inside the drinking container 5 is controlled by the movement of this lower shutter.

[0030] Figure 3 shows the apparatus of Figure 2, the tray 11 supporting the second group 32 of canisters having been moved to the maintenance operation that is away from the front side of the main frame. The tray is attached to the main frame 8 by a hinge 112 and the tray is rotatable around this hinge as illustrated by arrow A. The rotation of the tray 11 pulls out the second group 32 of containers away from the main frame 8. In one movement, the operator is able to move the three containers 321 of the second group and, as a result, is able to get access to the internal parts of the frame for maintenance and refill of the first group 31 of containers as described below.

In this figure, the discharge outlets 322 of the second group of containers are apparent as well as their corresponding chutes 42 positioned in the frame 8. Each of

these chutes 42 comprise respective holes 421 at their tops in which the discharge outlets 322 fit with when the tray 11 of the second group of containers is pushed in the operating position. The discharge outlets 322 of the containers slide in the holes 321 at the tops of the chutes 42. The chutes 42 guide beverage ingredients to the mixing chamber 1.

The tray 11 comprises a horizontal bottom plate 111 to receive ingredients that may fall from the discharge outlets 322 when the tray is moved away from the chutes 42. Beverage ingredient falling from the discharge outlets 322 is stopped by said plate. The fall of beverage ingredient on the floor in front of the apparatus 10 is limited.

The tray supports a heater enclosed in a frame 44 and positioned under the discharge outlets 322 of the second group of containers. This heater prevents the presence of steam and the caking of powder in this area and in particular in the chutes 42 as described below.

In the illustrated embodiment the frame 8 of the apparatus holds a supply 2 of crushed ice, a supply 9 of hot water and a first group 31 of containers too. These three types of ingredients are supplied to the single mixing chamber 1 to prepare the beverages with the beverage ingredients of the second group of containers.

On the left part of the apparatus, the supply 2 of crushed ice comprises a hopper 21 for receiving pieces of ice. An auger (not illustrated) at the bottom of the hopper delivers portions of pieces of ice to the ice crusher 22. Crushed ice is received in a dosing unit 23 comprising a container supported by a scale and a shutter to dispense the desired dose of crushed ice to the mixing chamber 1 through the chute 24.

On the top of the apparatus, the supply 9 of hot water consists in a boiler of water. The outlet of the boiler is connected to a flexible tube 91 guiding water to the water inlet 16 of the mixing chamber 1. The illustrated apparatus uses gravity force to dispense water. Alternatively a pump can be used to pump water and feed the mixing chamber.

On the right side of the frame, the apparatus comprises a first group 31 of two containers storing bulk beverage ingredients, they dose and dispense ingredient to the mixing chamber 1 through powder chutes as illustrated in Figure 4.

[0031] Figure 4 is a partial view of the inside of the frame wherein the chutes 42 of the second group having been removed. The first group 31 of containers is made apparent : this group comprises two containers 311 with discharge outlets 312 feeding two chutes 41. The chutes 41 dispense ingredients in the mixing chamber 1 (in the figure, the top of the chamber is closed by the upper shutter).

[0032] Preferably, the illustrated apparatus is configured for preparing frozen beverages by mixing a dose of crushed ice, water, a dose of soluble frappe base powder and at least a dose of a soluble beverage flavour. The soluble frappe base powder can be stored in the first group 31 of containers whereas the soluble beverage flavour can be stored in

the second group 32 of containers.

[0033] Figures 5 and 6 are views isolating the first group 31 and the second group 32 of containers, in its tray 11, and their chutes 41, 42 from the rest of the apparatus. The tray 11 is in the operating position.

Figure 5 shows clearly the two ranks of containers facing each other above the mixing chamber (not represented). It can be noticed that the five chutes 41, 42 of bulk beverage ingredients are closely positioned side by side (for chutes of the same group of containers) and in front of each other (for chutes of different groups of containers). With this configuration, all the chutes present an angle with horizontal comprised between 60° and 90° as detailed later which guarantees an efficient fall of all dosed beverage ingredient inside the below mixing chamber 1. At the end, including the dispensing of crushed ice, it is six different ingredients that can be dosed and dispensed in the single mixing chamber 1.

It can be noticed that the heater frame 44 is in direct contact with the chutes 42 of the second group of canisters when the tray 11 is in the operation position as illustrated. As result, the heater heats the chute 42.

In the same manner, a heater is provided in heater frame 45 positioned under the first 31 group of containers. This frame 45 is in direct contact with the chutes 41 of the first group of canisters. As result, the heater heats the chute 41.

[0034] Figure 7 is an isolated side view of the chutes 41, 42, the bottom plate 111 of the tray and the discharge outlet 322 of one container. The top of the chute 42 has been made transparent to show the cooperation of said discharge outlet and the hole 421 at the top of the chute.

In normal operation, inside the container, some beverage ingredient is pushed by a dosing auger or screw to the end of the discharge outlet, flows downwards inside the chute 42 and is dispensed at the bottom end 422 in the mixing chamber. The chute 42 is oriented along an angle α with horizontal comprised between 60° and 90° which guarantees a good dispensing of the ingredient.

When the tray is moved away from the chute 42, it may happen that some beverage ingredient still present near the end of the discharge outlet 322 flows out just when the discharge outlet is moved out of the hole 421 of the chute : this beverage ingredient falls vertically along the front side of the chute 42 as illustrated by the dotted line. By means of the deflector 43 attached to the front side of the chute 42, beverage ingredient is guided in order to fall in the middle of the bottom plate 111 rather than on its edge 111a. Accordingly, beverage ingredient retained by the bottom plate present less risk to fall from the plate during the movement of the tray from the operation position to the maintenance operation.

[0035] Figure 8 is a front view of the three chutes 42. This figure shows that, when con-

sidering the vertical plane extending between the lateral sides of the apparatus, the chutes can be inclined relatively to vertical in that plane. Whereas the central chute is almost not inclined and enables a vertical fall of the beverage ingredient (that is a chute with an angle β of 90° with horizontal), the two lateral chutes are inclined relatively to vertical. Yet, their inclinations are sufficient to guarantee a good dispensing. Precisely, the illustrated angle β between their most inclined lateral wall and the horizontal is of about 60° , meaning that beverage ingredients fall in the left and right chute following an angle superior to 60° with horizontal which is a guarantee of good dispensing.

[0036] The apparatus presents the advantage of enabling the presence of a high number of beverage ingredient containers, all feeding the same single mixing chamber, with the guarantee that all the ingredients are well discharged.

[0037] Although the apparatus has been illustrated with a second group of containers comprising three containers, the number of containers in this second group can be increased by reducing the width of these containers in the rank. Since these containers preferably store soluble beverage flavours, the dose required for preparing one beverage (3 or 4 g) is smaller than the dose of soluble frappe base to be discharged from the containers of the first group for preparing said beverage. Accordingly, a higher number of smaller containers can be used in the second group. In addition, the depth of these containers can be reduced too with the result that the front door becomes thinner.

[0038] Although the invention has been described with reference to the above illustrated embodiments, it will be appreciated that the invention as claimed is not limited in any way by these illustrated embodiments.

Variations and modifications may be made without departing from the scope of the invention as defined in the claims. Furthermore, where known equivalents exist to specific features, such equivalents are incorporated as if specifically referred in this specification.

As used in this specification, the words "comprises", "comprising", and similar words, are not to be interpreted in an exclusive or exhaustive sense. In other words, they are intended to mean "including, but not limited to".

Reference Signs List

[0039] List of references in the drawings :

- mixing chamber 1
- upper shutter 14
- lower shutter 15
- water inlet 16
- supply of crushed ice 2

ice hopper 21
ice crusher 22
crushed ice dosing unit 23
crushed ice chute 24
first group of containers 31
containers 311
discharge outlets 312
actuating devices 313
second group of containers 32
containers 321
discharge outlets 322
actuating devices 323
chutes of first group 41
chutes of second group 42
holes 421
bottom end 422
top end 423
deflector 43
heater frame 44, 45
drinking container 5
drawer 6
front door 7
inside volume 71
frame 8
supply of water 9
water tube 91
apparatus 10
tray 11
bottom plate 111
edge 111a
hinge 112

Claims

- [Claim 1] A beverage preparation apparatus (10) comprising :
- a main frame (8), and
 - a front door (7), and
 - a supply (9) of water, and
 - several containers (311, 321) configured for storing and dosing bulk beverage ingredients, each container comprising an ingredient discharge outlet (312, 322), the containers being divided in a first group (31) and a second group (32),
 - one mixing chamber (1) configured for mixing at least one dose of bulk beverage ingredient and water, said chamber being positioned below the first group and the second group of containers, and
 - several chutes (41, 42) for guiding doses of bulk beverage ingredient from the discharge outlets of the containers to the mixing chamber, wherein in each group of containers, the containers are aligned side by side and form a rank,
- wherein the mixing chamber, the first group of containers and the chutes are positioned inside the internal volume of the main frame, and wherein the second group (32) of containers is hold on a tray (11), said tray being movable between :
- an operating position where the tray (11) holds the second group (32) of containers along the front side of the frame so that the discharge outlets (322) of the second group of containers feed corresponding chutes (42), and
 - a maintenance position where the tray (11) holds the second group (32) of containers away from the front side of the frame and liberates the access to the internal volume (71) of the main frame.
- [Claim 2] A beverage preparation apparatus according to Claim 1 wherein the second group of containers (32) feed the mixing chamber (1) through chutes (42) positioned on the front side of the frame and the first group of containers (31) feeds the mixing chamber through chutes (41) positioned on the back side of the frame.
- [Claim 3] A beverage preparation apparatus according to Claim 1 wherein all the chutes (41, 42) are oriented according to an angle comprised between 90° and 60° with horizontal.
- [Claim 4] A beverage preparation apparatus according to any one of the precedent claims , wherein, when the tray (11) is in the operating position, the

discharge outlets (322) of the second group of containers extend inside the internal volume of the frame.

[Claim 5] A beverage preparation apparatus according to any one of the precedent claims, wherein the movable tray (11) comprises a bottom plate (111) extending horizontally under and beyond the discharge outlets (322) of the second group of canisters.

[Claim 6] A beverage preparation apparatus according to the precedent claim, wherein the bottom plate (111) is configured to be tilted upwardly when the tray (11) is moved between the maintenance position and the operating position.

[Claim 7] A beverage preparation apparatus according to Claim 5 or 6, wherein a deflector (43) is attached transversely along the front side of the chutes of the second group of container in order to guide bulk beverage ingredients to the bottom plate (111) and away from the edge (111a) of the bottom plate.

[Claim 8] A beverage preparation apparatus according to any one of the precedent claims, wherein in the chutes (42) for guiding doses of bulk beverage ingredient from the second group of containers to the mixing chamber, the bottom end (422) of the chute is positioned inside the internal volume of the frame at a backwards position compared to the top end (423) of the chute.

[Claim 9] A beverage preparation apparatus according to any one of the precedent claims, wherein for each group of containers, all the chutes of the containers are attached one to the other and form a chute assembly.

[Claim 10] A beverage preparation apparatus according to any one of the precedent claims, wherein the chute assembly of the second group of containers is fixed inside the frame along and in front of the chute assembly of the first group.

[Claim 11] A beverage preparation apparatus according to any one of the precedent claims, wherein the tray (11) comprises a heater.

[Claim 12] A beverage preparation apparatus according to the precedent claim, wherein, in the operating position, the heater is directly or indirectly in contact with the chutes (42) of the second group of containers.

[Claim 13] A beverage preparation apparatus according to any one of the precedent claims, wherein the tray (11) is attached to the frame by means of a hinge (112).

[Claim 14] A beverage preparation apparatus according to any one of the precedent claims, wherein the apparatus comprises a supply (2) of crushed ice and

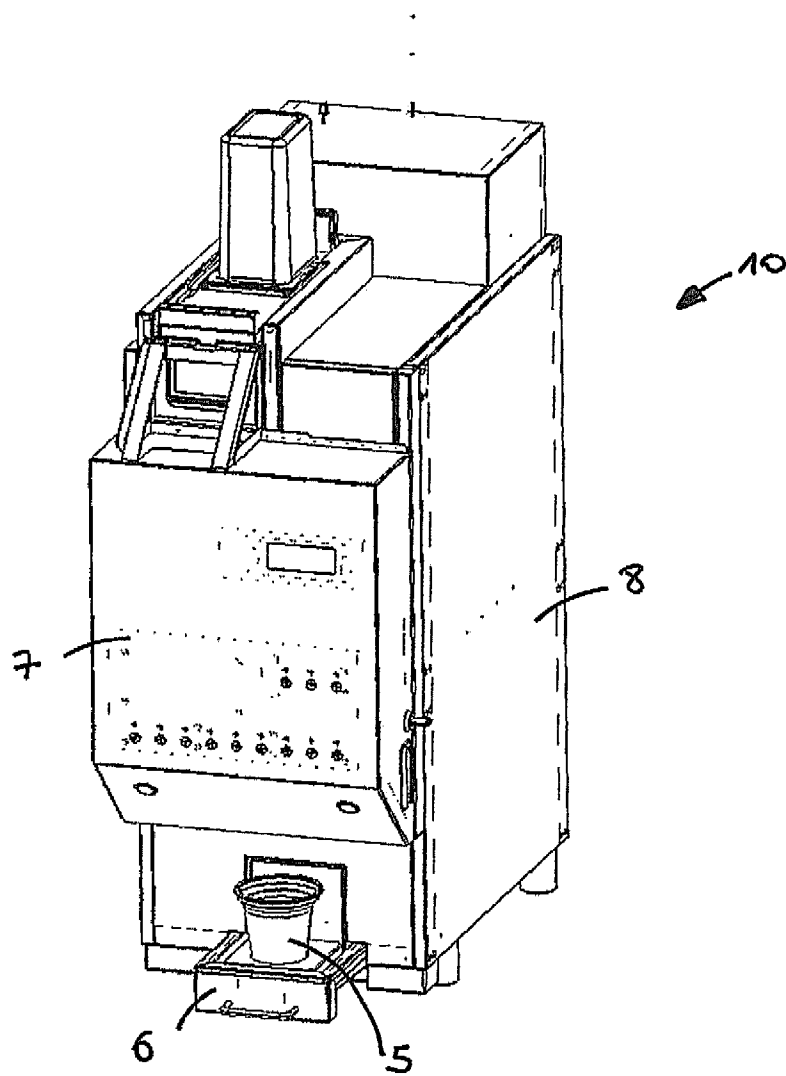
the frame (8) comprises a chute (24) for guiding doses of crushed ice to the mixing chamber (1).

[Claim 15]

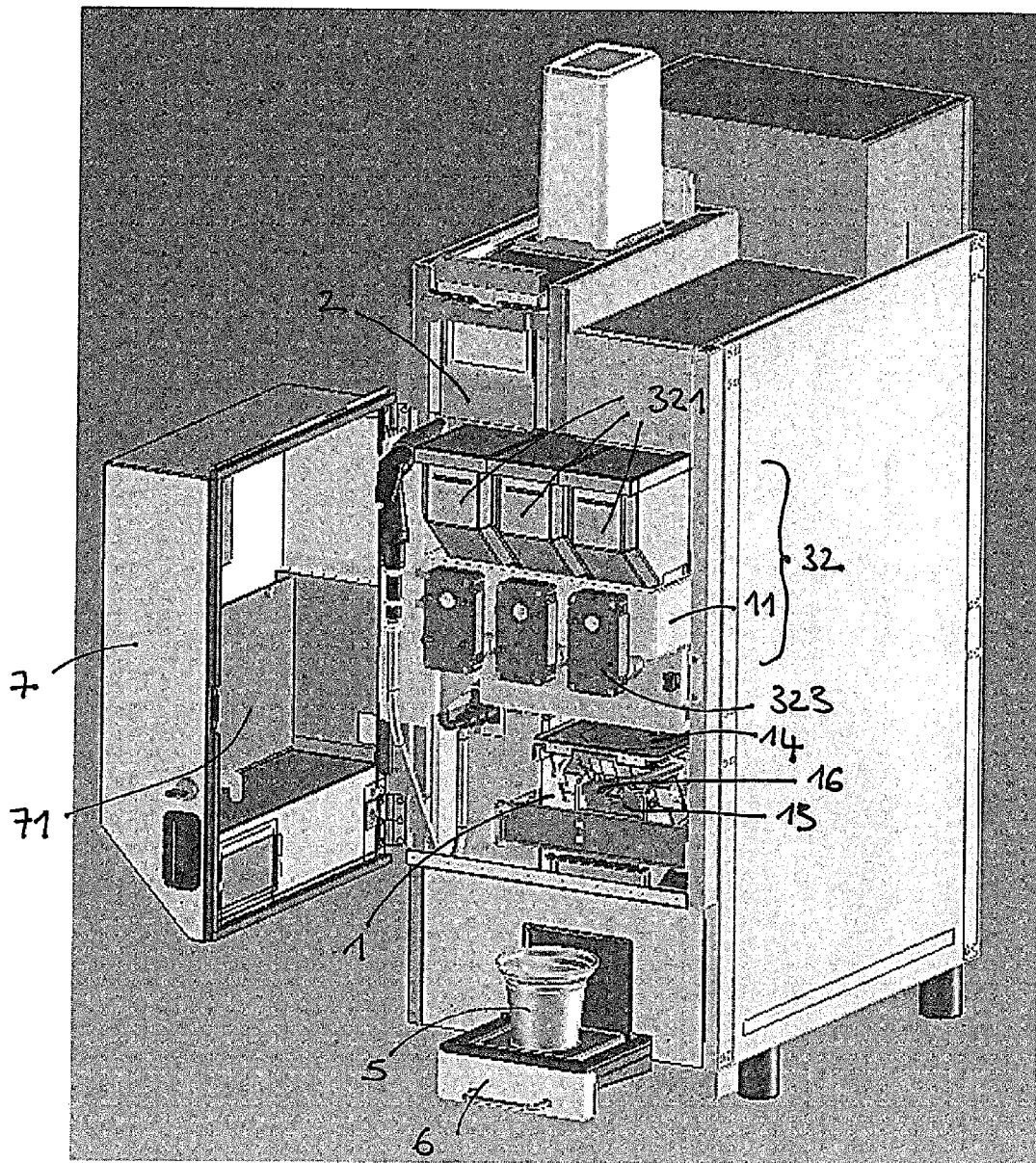
A beverage preparation apparatus according to the precedent claim wherein the supply of crushed ice comprises :

- a hopper (21) for feeding pieces of ice,
- a crusher (22) for reducing the size of the pieces of ice,
- a unit for dosing (23) crushed ice and discharging dose crushed ice to the mixing chamber (1).

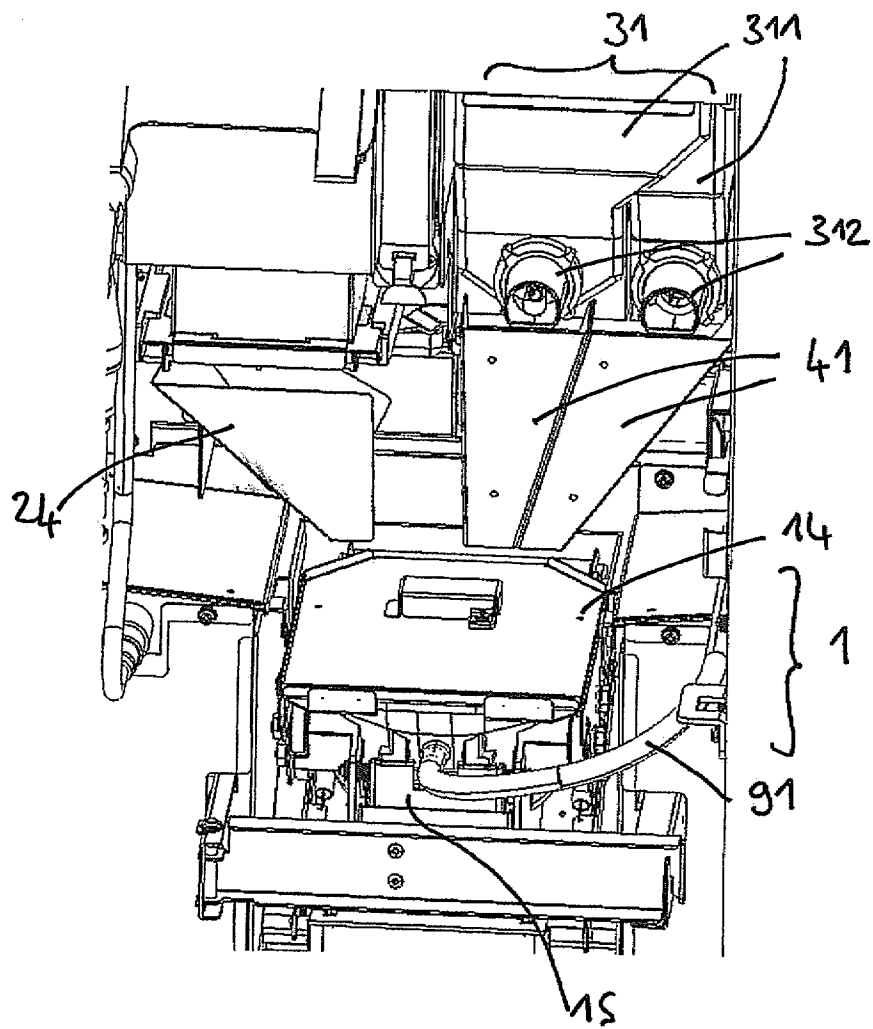
[Fig. 1]



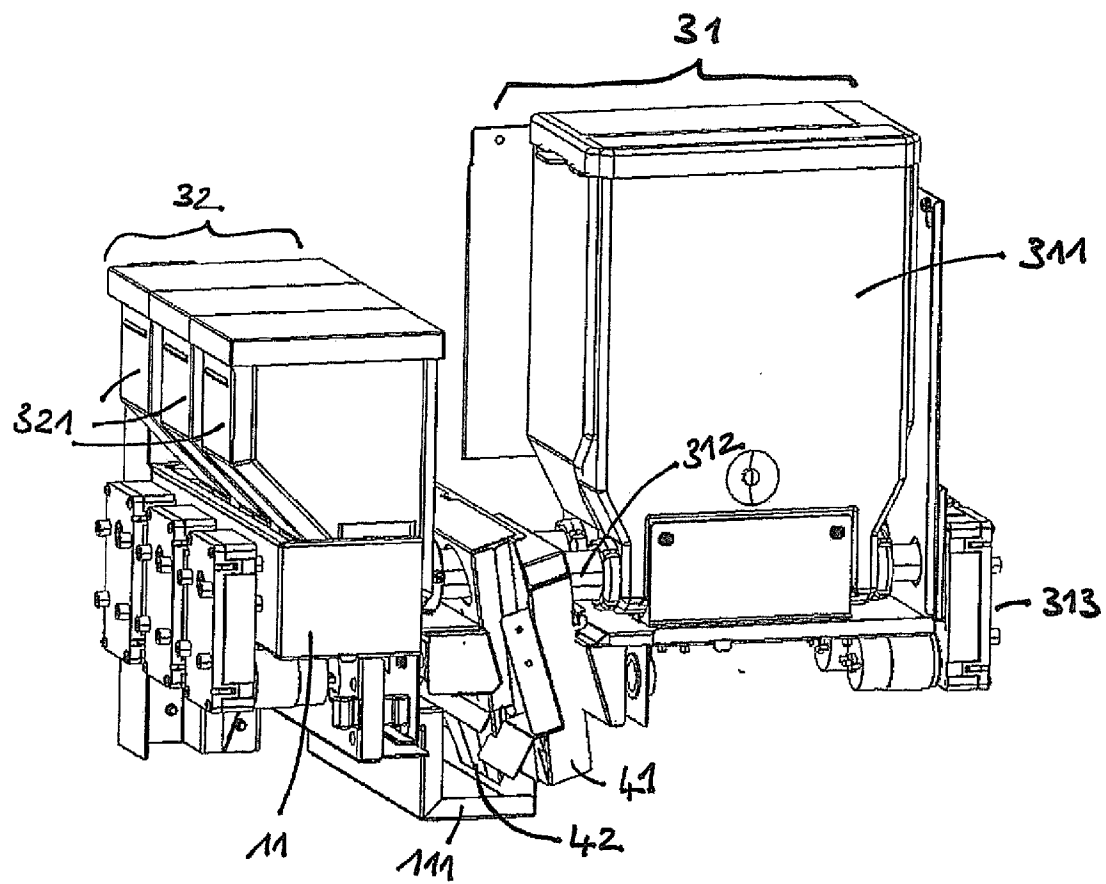
[Fig. 2]



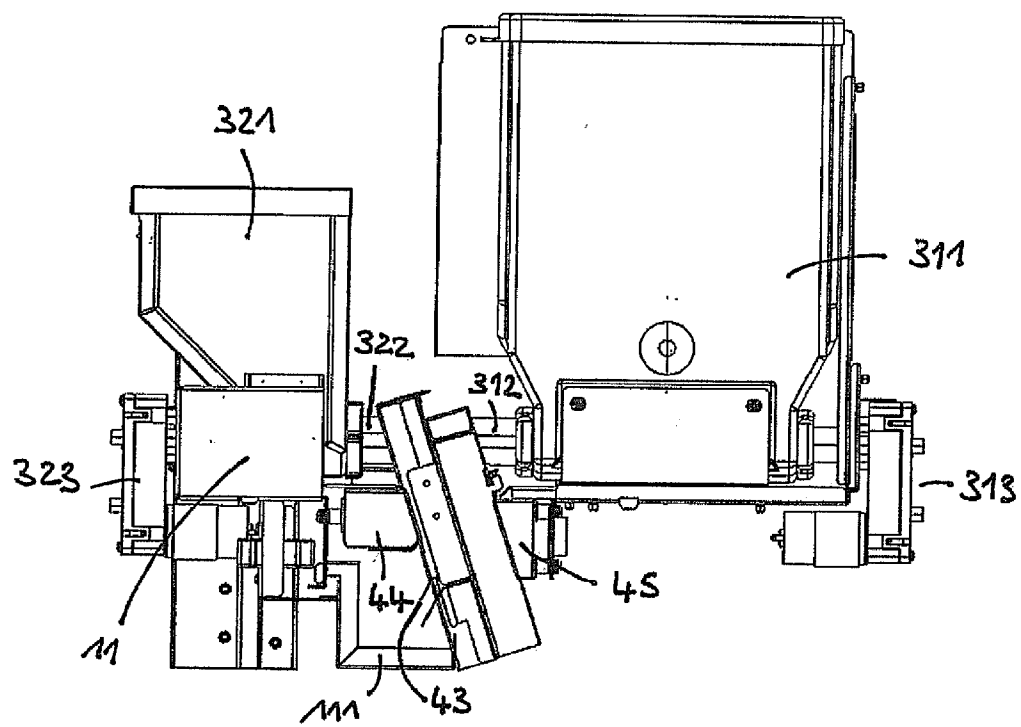
[Fig. 4]



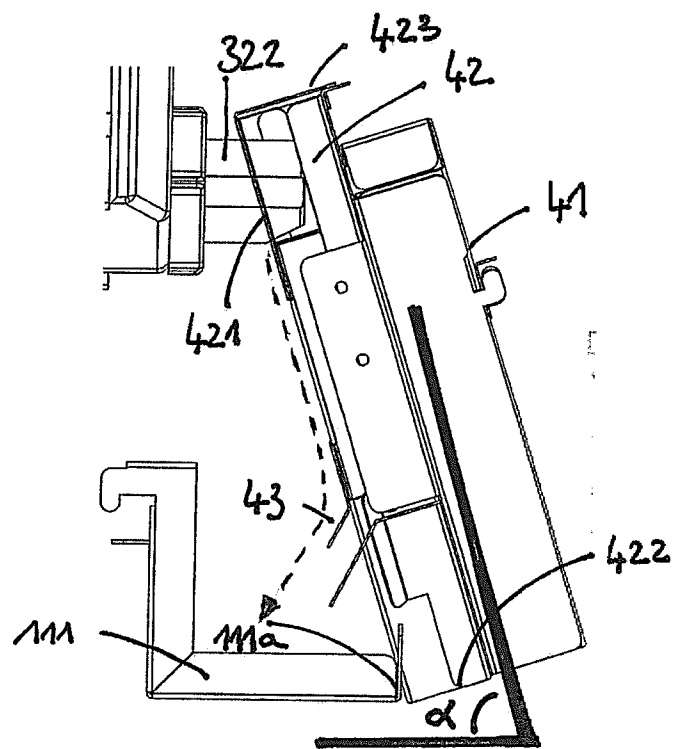
[Fig. 5]



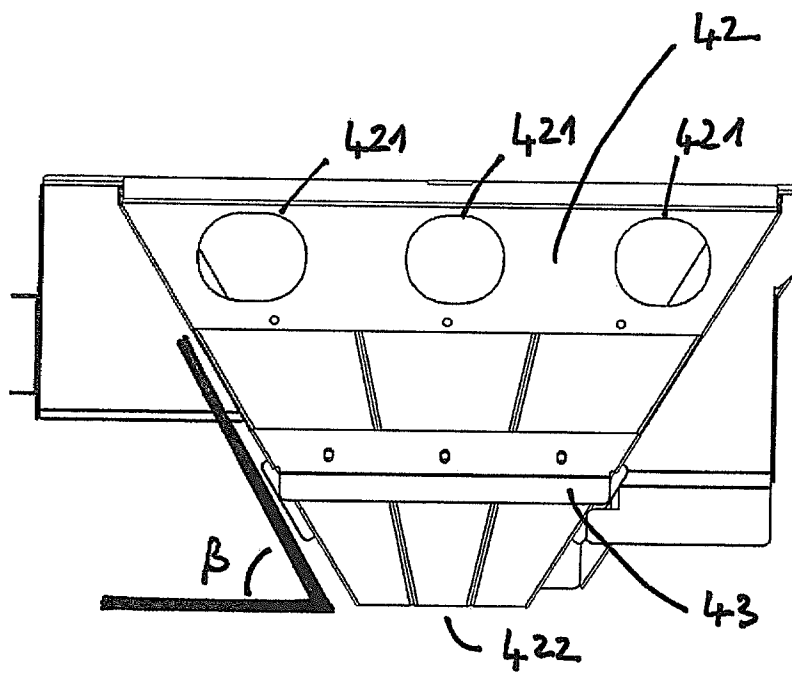
[Fig. 6]



[Fig. 7]



[Fig. 8]



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2018/024715

A. CLASSIFICATION OF SUBJECT MATTER

Int.Cl. A47J31/00 (2006.01) i, A47J31/40 (2006.01) i, G07F13/00 (2006.01) i

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)

Int.Cl. A47J31/00, A47J31/40, G07F13/00, G07F13/06, B67D1/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Published examined utility model applications of Japan 1922-1996
 Published unexamined utility model applications of Japan 1971-2018
 Registered utility model specifications of Japan 1996-2018
 Published registered utility model applications of Japan 1994-2018

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 2009-43134 A (FUJI ELECTRIC RETAIL SYSTEMS CO., LTD.) 2009.02.26, paragraphs [0032] to [0040], [0043] to [0050], Figs.1 to 2, 4 to 6 (Family:none)	1-15
A	JP 9-115053 A (MATSUSHITA REFRIGERATION CO.) 1997.05.02, paragraphs [0003] to [0005], Figs.3 to 4 (Family:none)	1-15



Further documents are listed in the continuation of Box C.



See patent family annex.

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Date of the actual completion of the international search

08.08.2018

Date of mailing of the international search report

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2018/024715

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	Microfilm of the specification and drawings annexed to the written application of Japanese Utility Model Application No.96721/1989(Laid-open No.37588/1991) (HOSHIZAKI ELECTRIC CO.,LTD) 1991.04.11, description page8 line6 to page9 line14, Figs.1 to 2 (Family:none)	1-15
A	US 2010/0151083 A1 (KLIER,Niri) 2010.06.17, paragraphs [0045] to [0054], Figs.1 to 2 & JP 2012-515123 A & WO 2010/082185 A1 & EP 2387323 A1 & CN 102202516 A & KR 10-2011-0116137 A	1-15
A	WO 2015/022692 A2 (YAZAMCO CORP LTD.) 2015.02.19, page20 line28 to page22 line5, page32 line19 to page36 line16, page46 line30 to page47 line32, Figs.1 to 2 (Family:none)	1-15
A	US 2010/0058931 A1 (RIGHETTI,Marco) 2010.03.11, paragraphs [0026] to [0033], [0038] to [0041], Figs.1 to 6 & JP 2010-514022 A & EP 2096607 A1 & KR 10-2009-0088961 A & CN 101589412 A	1-15
A	JP 2003-285900 A (SANYO ELECTRIC CO., LTD.) 2003.10.07, paragraphs [0019] to [0020], [0024], Figs.1 to 4 (Family:none)	1-15
A	GB 2160847 A (COCA-COLA GMBH) 1986.01.02, page2 line114 to line128, Fig.5 & JP 60-240698 A	1-15
A	KR 20-2009-0005134 U (CHA,Seung Ho) 2009.05.27, paragraphs [0003] to [0020], Figs.1 to 4 (Family:none)	1-15