

SET OF BEVERAGE PREPARATION MACHINES DIFFERING BY THEIR SIZES

Field of the invention

The present invention relates to a set of differing beverage production machines, the
5 machines differing by their sizes.

Background of the invention

The manufacturing of beverage preparation machines offering different beverage delivery
capacities is complex and costly. There is a need for rationalizing the manufacture of the
10 beverage machines while still providing a large range of machines with different options for the
operator.

US 5,957,033 describes a coffee machine that can be rapidly assembled. The machine is
composed of several modules that are disposed such that they can be slid in a housing frame.
These modules are a roasted and ground coffee powder extraction device, a water supply and
15 an electronic control. The proposed process of manufacturing is simplified but only one type of
machine is manufactured.

EP 2 070 454 describes the modular manufacturing of beverage production machines. All
the machines present an identical core unit comprising a control circuitry and a beverage
production module that is designed for housing a sealed capsule or a pod comprising a food
20 ingredient and feeding a liquid to the interior of the capsule or pod. The machine also comprises
a platform for mounting the core unit. The modularity consists in manufacturing different
platforms on which different numbers of identical core units can be mounted. This process
enables the production of a set of machines that differ by the number of units for processing the
sealed capsule or the pod. In these machines each core unit mounted on the platform presents
25 its own housing.

Other types of beverage dispensers comprise different modules with different
functionalities (water supply, food ingredient storage, food ingredient dosing, food ingredient
processing, ...) that are all placed and hired in a common housing our frame like e.g. vending
machines. For this type of machines it would be an advantage to propose a range of beverage
30 preparation machines proposing the preparation of several various different beverages (not only
coffee but also tea, milk, chocolate and mixtures thereof), different formats of food ingredient
packaging for feeding the machines, different qualities of beverage preparation and
consequently presenting different level of costs depending of the requirement of the operator for
his customers while simplifying the manufacturing of these different machines. It would then be

possible to propose to the operators a large choice of differing beverage preparation machines adapted to each type of consumption (depending from e.g. the place where the machine is placed, the consumers who will use it) while optimizing manufacturing costs. In particular the operator would be able to choose between different sizes of machines able to store different numbers of food ingredients and consequently to deliver different numbers of beverages.

One aim of the present invention is to propose a solution for optimizing the manufacturing of a set of beverage production machines differing by their sizes.

Summary of the invention

According to a first aspect, the invention concerns a set of differing beverage production machines presenting different sizes, the machines having housings comprising :

- one left, one right and one back side core housing panels,
- one bottom housing, said bottom housing being selected in a plurality of bottom housings differing by their width sizes,
- none or at least one back side extending housing panel for laterally extending the housing,
- none or at least a set of one left, one right and one back side extending housing panel for vertically extending the housing.

According to the invention the machines of the set preferably differ in their width sizes and/or their vertical sizes. This difference of sizes can have different origins. Generally the sizes of the machines are correlated to the quantity and/or the number of different food ingredients stored in the machines. Usually the difference of sizes is related to the size of the food ingredient storing module in the machine. The size of this module can depend on the number of different food ingredients stored in the machine. Actually some machines only store a soluble coffee ingredient and a soluble milk ingredient, whereas others store a soluble tea ingredient and/or a soluble cocoa ingredient too. In this last case the size of the machine has to be doubled. The size of the food ingredient storing module can also depend on the format of containers used to store the food ingredients in the machine that can present different volumes. The sizes of the machines can also be correlated to the beverage processing technology placed in the machine. Actually beverages can be prepared by means of very simple processing technologies like the delivery of at least one jet of diluent in a cup containing a soluble food ingredient or beverages can be prepared by means of more complex processing technologies like the whipping of a diluent and a soluble food ingredient in a whipping chamber in which an impeller rotates. This second technology takes a bigger place in the machine than a simpler nozzle producing diluent jet(s).

According to the invention all the machines of the set present common elements which are one left, one right and one back side core housing panels. Generally a set of one left, one right and one back side extending housing panel vertically extends the housing above the selected bottom housing.

5 According to a first mode the left, right and back side core panels can be separate panels. Each of the three panels is a substantially plane plate.

 According to a second mode the back side core panel can be part of the left core panel and/or the right core panel. In this mode, the left and/or the right core panel presents an L-shape. When assembled these left and right side core panels determine the size of the smallest
10 machine of the set of machines. Different variants can be implemented in which : one part – preferably the half - of the back side core panel is part of the left core panel and the other part of the back side core panel is part of the right core panel, or all part of the back side core panel is part of either the left core panel or the right core panel.

 The machines of the set according to the invention can comprise none or at least one
15 back side extending panel. The presence or not of at least one back side extending housing panel is correlated to the size of the machine. Preferably the back side extending panel is a substantially plane panel.

 Usually the set of one left, one right and one back side extending housing panels for vertically extending the housing comprises three separate plane panels.

20 According to a specific embodiment the housings of the machines can comprise either a small back side core housing panel or a big back side core housing panel. This embodiment enables the production of higher number of different housings for the same set of machines.

 Usually each of the core housing panels and the extending housing panel presents connection means for attaching them together. Preferably these means enable the attachment
25 of the panels together in a simple and rapid manner. Preferably these connection means can be clipping or screwing means. Preferably the panels present openings for enabling the electric or fluid connections of the different devices housed in the machine like a pump, a heater, motors for rotors (dosing, mixing) ... These openings are preferably placed in the back side panel.

 The bottom housings of the different machines of the set according to the invention differ
30 by their width sizes. Their sizes are correlated to the sizes of the machines.

 The machines can present have an external cover above the housing. As for the housing, the cover can consists in panels and in particular comprise :

- one left, one right and one back side core cover panels,
- none or at least one back side extending cover panel for laterally extending the cover,

- none or at least a set of one left, one right and one back side extending cover panels for vertically extending the cover.

The machines usually comprise a front door. As for the front door, it can comprise :

- one core front door,

5 - none or at least one front side extending cover panel.

Preferably the present invention applies to beverage production machines that produce beverages by interaction between a food ingredient and a diluent. The food ingredient can be a soluble food ingredient concentrate like a soluble powder or a liquid concentrate or it can be an infusible food ingredient like a roast and ground coffee powder or tea leaves. The diluent can
10 either dissolve the soluble food ingredient concentrate or extract the infusible food ingredient. It is usually water.

In the housing, diluent supply means, food ingredient processing means, food ingredient dosing means and food ingredient storing means are usually positioned.

15 According to a second aspect, the invention concerns a process for manufacturing a beverage production machine from a set of differing beverage production machines such as described above comprising the steps of :

- pre-assembling bottom housings of different width sizes,

- configuring the machine by selecting a pre-assembled bottom housing,

20 - assembling the left, right and back side core housing panels and eventually at least one back side extending housing panel and/or one set of one left, one right and one back side extending housing panels for vertically extending the housing on the selected pre-assembled bottom housing necessary for the configured machine.

Preferably the pre-assembled bottom housing and the panels are assembled together by
25 clipping or screwing.

Once the housings are assembled, the different functional modules of the beverage dispenser (like diluent supply, food ingredient storage, food ingredient dosing, food ingredient processing, ...) can be fixed inside the housings for continuing the machines manufacturing.

30 In the present application, the terms "left", "right", "back", are used to describe the relational positioning of the panels of the machines of the invention. These terms should be understood to refer to the machines in their normal sense of use as shown in the figures.

Brief description of the drawings

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

- Figures 1 and 2 illustrate a set of two differing beverage production machines housings according to the first mode of the present invention,
- Figure 3 illustrates a set of two differing beverage production machines housings according to the second mode of the present invention.
- Figure 4 illustrates a set of cover panels for differing beverage production machines according to the present invention.

Detailed description of the drawings

Figures 1 and 2 illustrate the way to build the housings 10a, 10b, 10c of three differing beverage production machines from the same set of machines. The housings are produced starting from the same common core elements that are the left, the right and the back side core housing panels.

According to the first mode of Figure 1, the left side core housing panel 1, the right side core housing panel 2 and the back side core housing panel 3 are three independent panels. These panels are essentially plane. Depending on the desired size of the dispenser, these three core panels can be connected either on a small bottom housing 5a or a large bottom housing 5b. These two bottom housings 5a, 5b differ by the size of their width, the small bottom housing 5a presenting a width W and the large bottom housing 5b presenting a width W^+ bigger than W . The core housing panels 1, 2, 3 are configured so that the left and right side core panels present the same depth dimension D as the bottom housings 5a, 5b and the back side core panels present the same width dimension W as the smallest bottom housing 5a. Consequently the connection of the three core side housing panels 1, 2, 3 on the small bottom housing 5a produces a housing 10a. This housing is the smallest of the housings of the set of machines. For manufacturing the larger housing 10b, the three core side housing panels 1, 2, 3 and a complementary back side laterally extending housing panel 4 are connected on the large bottom housing 5b. The back side extending housing panel 4 presents a width w such that $W+w$ equals W^+ . In the same manner larger housings can be produced by using larger bottom housings and additional laterally extending housing panels 4.

According to the first mode of Figure 2, the same machine housing 10a can be produced from the three panels 1, 2 and 3. This housing is the smallest of the housings of the set of machines. These three panels can also be used to produce a machine presenting a bigger

height. For manufacturing the higher housing 10c, the three core side housing panels 1, 2, 3 and one left extending panel 6, one right extending panel 8 and one back side extending panel 7 for extending the housing vertically are connected on the bottom housing 5a. These extending panels 6, 7, 8 present the same height h . In the same manner larger housings can be produced by using larger bottom housings and additional laterally extending housing panels 4.

According to the second mode of Figure 3, the back side core panel is part of the left core panel 2 and of the right core panel 1. These two last panels present an L shape, one part of the L corresponding to a side panel and the other part to a half part of the back panel. Depending on the desired size of the dispenser, these two core panels can be connected either on a small bottom housing 5a or a large bottom housing 5b as in first mode. The core housing panels 1, 2 are configured so that the left and right side core panels present the same depth dimension D as the smallest bottom housing 5a and a width dimension w_1, w_2 such that $w_1 + w_2$ equals the width W of the smallest bottom housing 5a. Consequently the connection of the two core side housing panels 1, 2 on the small bottom housing 5a produces a housing 10a. This housing is the smallest of the housings of the set of machines. For manufacturing the larger housing 10b, the two core side housing panels 1, 2 and a complementary back side laterally extending housing panel 4 are connected on the large bottom housing 5b. The back side laterally extending housing panel 4 presents a width w such that $W+w$ equals W^+ . In the same manner larger housings can be produced by using larger bottom housings and additional laterally extending housing panels 4. Taller housings can also be produced by using additional vertically extending housing panels 6, 7, 8.

Generally the left and right housing panels, either core or additional panels, of the set present means for attaching decorative cover panels thereon. Usually the back side core or extending housing panel presents holes to enable the electric connection of the electronic control unit with the other elements of the dispenser and the fluid connection of the boiler with the other elements of the machine.

Starting from the housings different food ingredient processing modules, food ingredient dosing module, food ingredient storing modules can be selected and placed in the housing to build a beverage preparation machine.

Generally covers are positioned on the beverage machine housings for aesthetic reasons. The covers can be conceived according to the same principle as the housings that is by assembling core cover panels optionally with additional laterally and/or vertically extending housing panels. Figure 4 illustrates how different cover panels can be used to cover either one small machine housing or one big machine housing. In the first case the small cover 100a is

conceived from three basic panels 101, 102 and 103a. Usually these panels are not assembled together but each of them is attached on the corresponding right, left or back side of the machine. In the second case the big cover 103b is conceived from three basic panels 101, 102 and 103b and two additional vertically extending panels 106, 108. The use of several basic back
5 side panels of different side can also be implemented for manufacturing different housings.

Generally a front cover is also placed in front of the housing and comprises means for making a beverage selection like a touch screen or buttons. The general principle developed for the housing can be applied to the front cover that can be built from a core front cover and optionally at least one extending front cover panel. In the same manner the top of the machine
10 can be built from a core top cover and optionally at least one extending top cover panel.

The present invention presents the advantage of enabling the production of a very large set of machines that present different sizes without having to produce specific numerous pieces for manufacturing their housings. Only a limited optimized number of housing pieces can be produced for assembling all the different machines.

15 Another advantage of the present invention is that the costs for manufacturing the set of machines are reduced, particularly for machines produced in a plastic material. The presence of core elements enables the reduction of the number of moulds for producing the different elements of the housings.

CLAIMS

1. Set of differing beverage production machines (10a, 10b) presenting different sizes, the machines having housings comprising :
- 5 - one left, one right and one back side core housing panels (1, 2, 3),
- one bottom housing, said bottom housing being selected in a plurality of bottom housings (5a, 5b) differing by their width sizes,
- none or at least one back side extending housing panel (4) for laterally extending the housing,
- none or at least a set of one left, one right and one back side extending housing panels (6, 7,
10 8) for vertically extending the housing.
2. Set of differing beverage production machines according to Claim 1 wherein the machines are susceptible to differ in their width sizes and/or their vertical sizes.
- 15 3. Set of differing beverage production machines according to Claim 1 or 2, wherein the sizes of the machines are correlated to the quantity and/or the number of different food ingredients stored in the machines and/or the beverage processing technology placed in the machine.
4. Set of differing beverage production machines according to any of the precedent claims,
20 wherein the left, right and back side core panels (1, 2, 3) are separate plane panels.
5. Set of differing beverage production machines according to any of the claims 1 to 3, wherein the back side core panel for laterally extending the housing is part of the left and/or the right core panel (1, 2).
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6. Set of differing beverage production machines according to any of the precedent claims, wherein the back side extending panel for laterally extending the housing (4) is a plane panel.
7. Set of differing beverage production machines according to any of the precedent claims,
30 wherein the set of one left, one right and one back side extending housing panels (6, 7, 8) for vertically extending the housing comprise three separate plane panels.

8. Set of differing beverage production machines according to any of the precedent claims, wherein the housings of the machines comprise either a small back side core housing panel (3) or a big back side core housing panel (31).

5 9. Set of differing beverage production machines according to any of the precedent claims, wherein each of the core housing panels and the extending housing panel presents connection means for attaching them together.

10 10. Set of differing beverage production machines according to any of the precedent claims, wherein the machines have an external cover comprising :
- one left, one right and one back side core cover panels,
- none or at least one back side extending cover panel for laterally extending the cover,
- none or at least a set of one left, one right and one back side extending cover panels for vertically extending the cover.

15 11. Process for manufacturing a beverage production machine from a set of differing beverage production machines according to Claims 1 to 10 comprising the steps of :
- pre-assembling bottom housings of different width sizes,
- configuring the machine by selecting a pre-assembled bottom housing,
20 - assembling the left, right and back side core housing panels and eventually at least one back side extending housing panel and/or one set of one left, one right and one back side extending housing panels for vertically extending the housing on the selected pre-assembled bottom housing necessary for the configured machine.

25 12. Process according to Claim 11 wherein the pre-assembled bottom housing and the panels are assembled together by clipping and/or screwing.