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(54) Ice cream machine

(57) An ice cream machine for domestic use comprises a mixing chamber 4 which includes a removable mixing vessel 7. A space between the vessel 7 and the chamber 4 may contain an anti-freeze solution.

The ice cream machine may be provided with a removable blender unit 3 for processing the ingredients of the ice cream before their introduction to the mixing vessel.

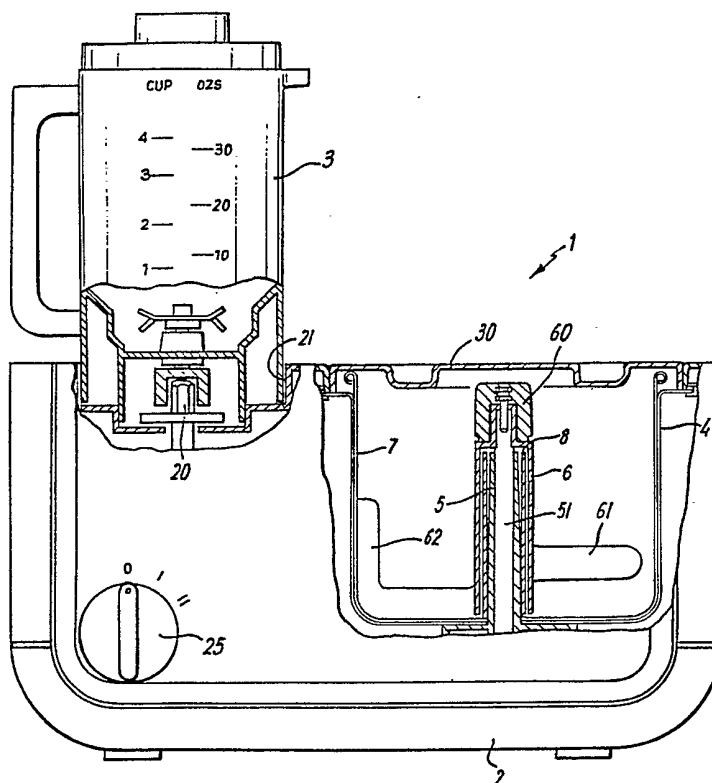
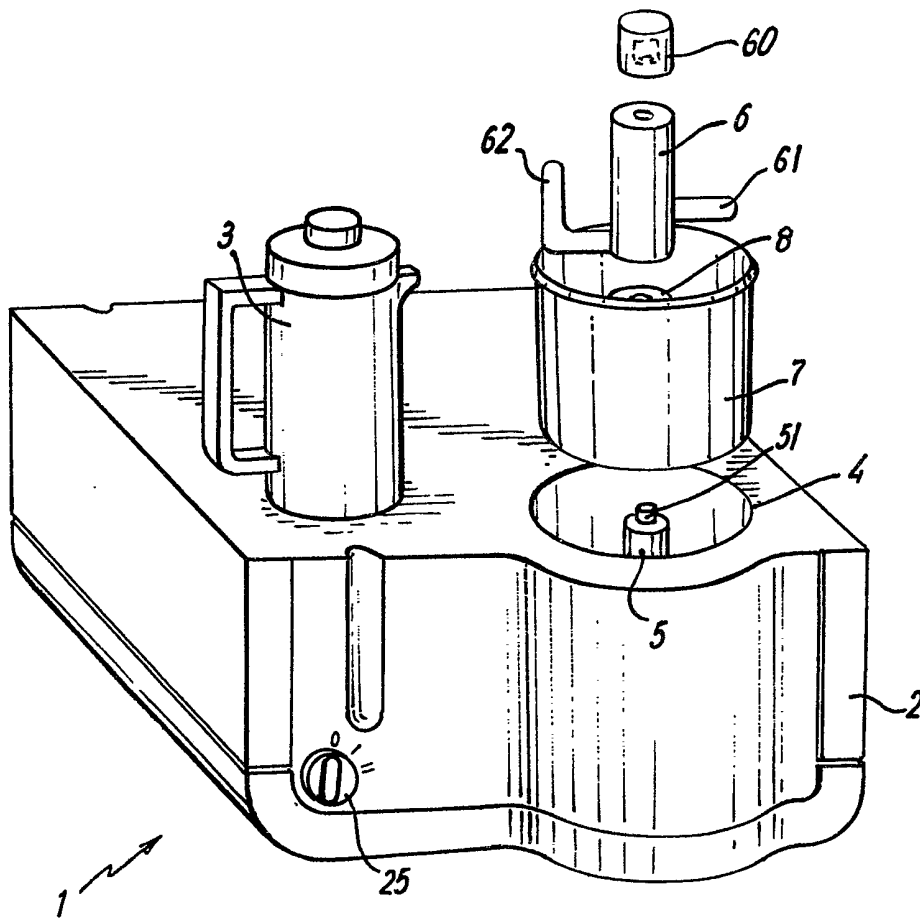
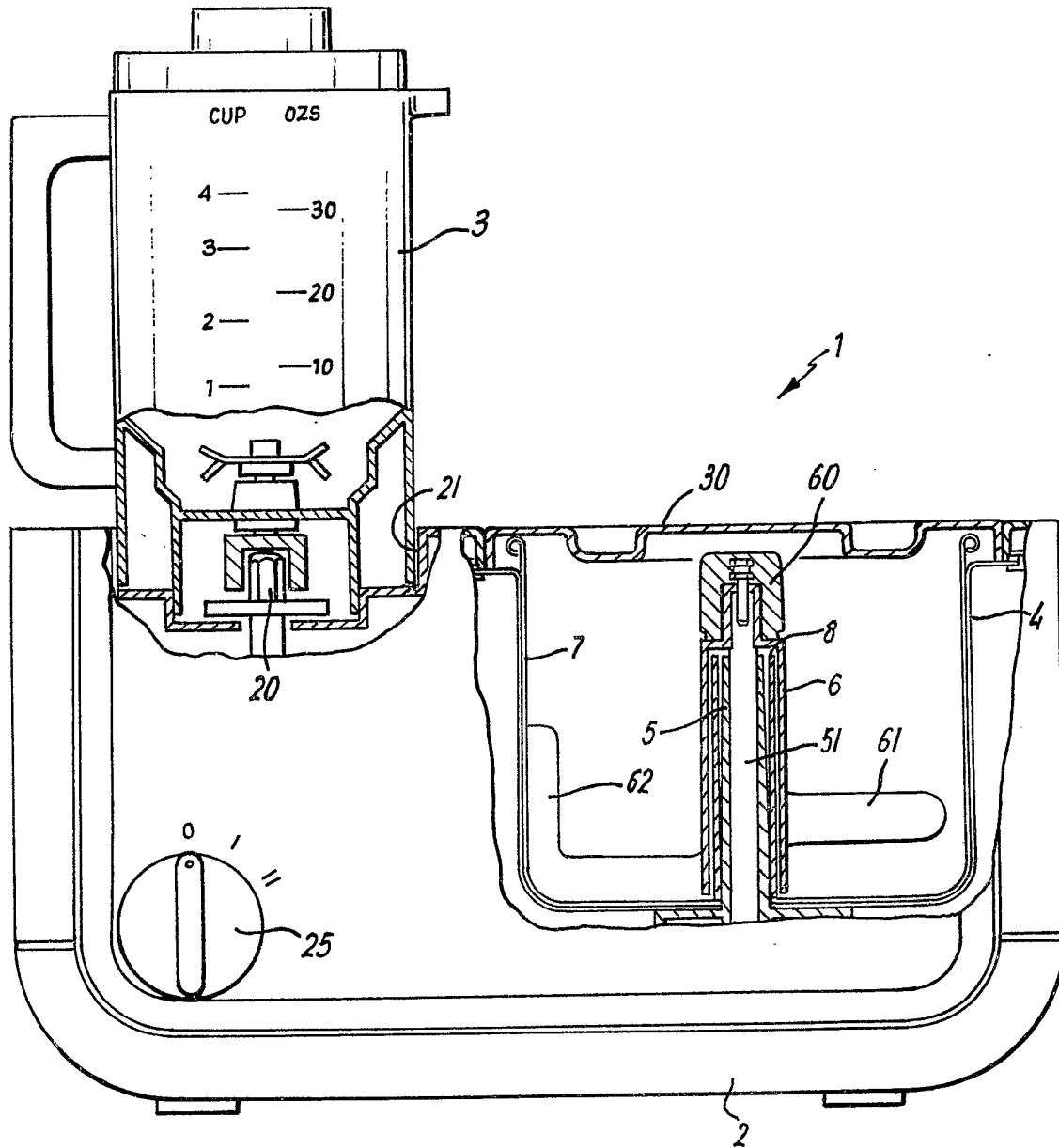


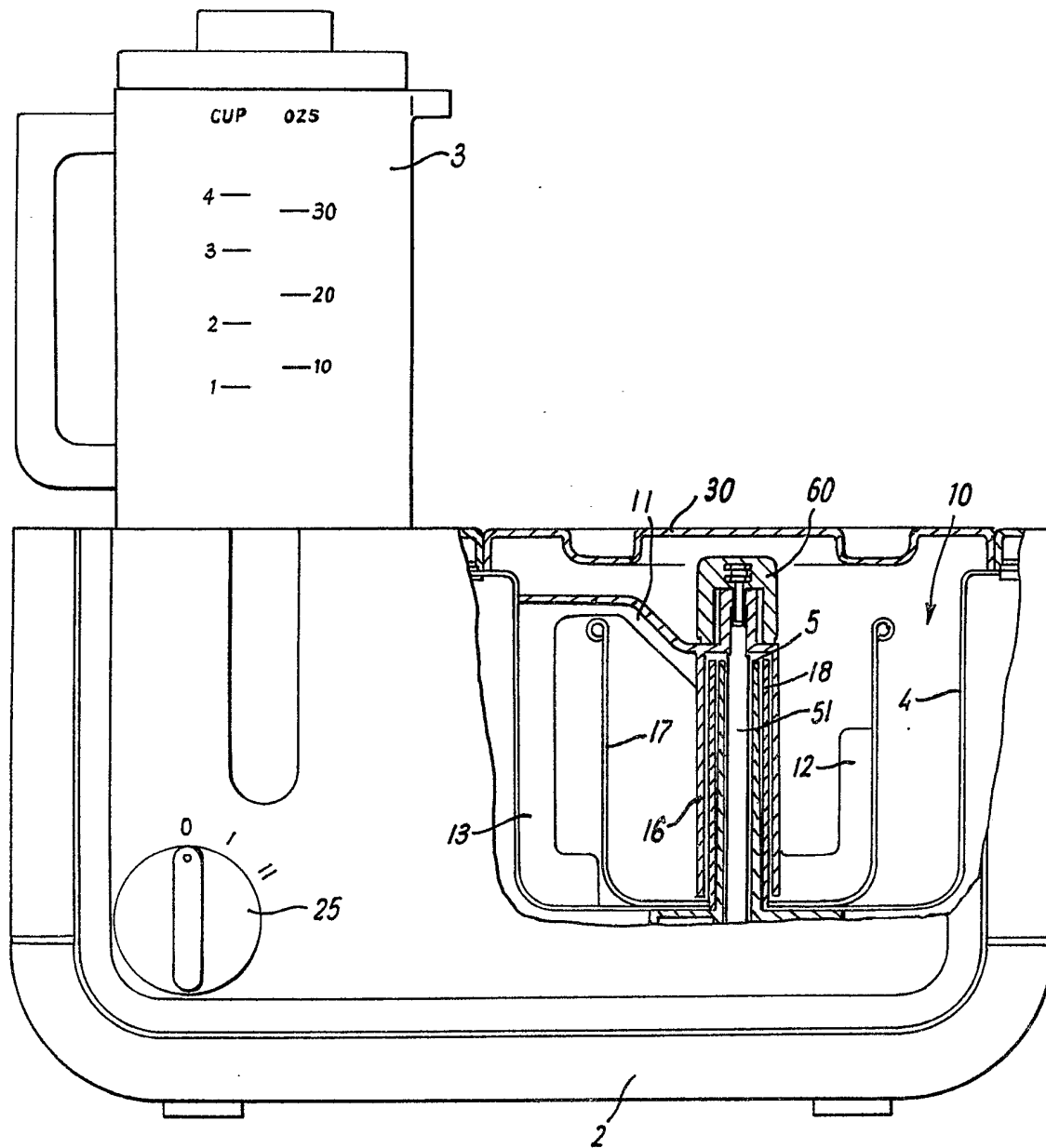
FIG. 2

The drawings originally filed were informal and the print here reproduced is taken from a later filed formal copy.

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$\frac{1}{3}$ **FIG. 1**

$\frac{2}{3}$ **FIG. 2**

$\frac{3}{3}$ FIG. 3

SPECIFICATION

Ice cream machine for domestic use

This invention relates to an ice cream machine for domestic use.

There are known ice cream machines for domestic use, which include a refrigerating circuit and an electric motor connected through motion transmission means to a drive shaft for rotation of a blade arranged within a mixing chamber in heat exchange relationship with an evaporator of the refrigerating circuit.

Such known ice cream machines have a considerable practical inconvenience due to the fact that, as it is not possible to remove the mixing chamber from the body of the ice cream machine, the operations of removal of the ice cream from the chamber, as well as cleaning of the chamber itself are not particularly easy. Known ice cream machines for domestic use generally have the mixing chamber made of a stainless steel sheet which also forms the upper surface of the ice cream machine itself. Although the mixing blades may be easily removable from the drive shaft of the machine, the cleaning of the mixing chamber, is, notwithstanding this, extremely inconvenient and complex to carry out, especially as it is not possible to use a jet of running water, which may pass through the aeration vents of the condenser of the refrigerating circuit and thus could reach and damage the electrical units of the ice cream machine. Further, the weight and the considerable mass of such ice cream machines result in these operations being somewhat wearisome and difficult. The only way of carrying out cleaning of the mixing chamber of such ice cream machines remains, therefore, to use a wet cloth which is unsatisfactory from the hygienic point of view.

An object of the present invention is therefore to provide an ice cream machine for domestic use which obviates or mitigates the above-mentioned inconvenience common to ice cream machines known till now, allowing easy and complete cleaning of the mixing chamber.

According to the present invention there is provided an ice cream machine for domestic use, in which there is provided a mixing chamber constituted by a fixed part and a removable part, said removable part forming the mixing vessel itself, and between said mixing vessel and the fixed part there is provided a cavity for anti-freeze liquid.

Another object of the present invention is to provide an ice cream machine for domestic use which allows preparation of the ice cream ingredients without the necessity of using other electro-domestic apparatus, and which thus allows better use of the mechanical elements of the machine.

Thus according to another aspect of the present invention there is provided an ice cream machine for domestic use, wherein there is included a removable blending unit for mixing the ice cream ingredients, the unit being operated through a power take-off of the motor of the ice cream

machine.

The ice cream machine according to the present invention allows extremely easy and complete cleaning of the mixing vessel, allows the preparation of the ice cream without the necessity of using other electro-domestic apparatus, and allows the use of the ice cream machine also as a blender and mixer for foodstuff products in general.

Embodiments of the present invention will now be described by way of example, with reference to the accompanying drawings, in which:—

Fig. 1 is a perspective view of one embodiment of an ice cream machine according to the invention showing the parts of the machine in their respective positions before assembly;

Fig. 2 is a side view, in part section, of the ice cream machine of Fig. 1 ready for use; and

Fig. 3 is a side view in part section, of a modified ice cream machine adapted for the simultaneous preparation of two types of ice cream.

With reference to Figs. 1 and 2 of the drawings, an ice cream machine 1 has a shaped housing 2, in which there is located a refrigerating circuit and an electric motor controlled by switch 25. On the housing 2 there is provided a detachable blender unit 3 and a mixing chamber 4. Located in the mixing chamber 4 there is a vertical shaft housing 5 within which rotates a drive shaft 51 for driving in rotation a mixing blade 6. The blade 6 has a pair of arms 61, 62 and is connected to the drive shaft 51 by a locking cap 60 which engages a threaded opening in the end of the drive shaft 51. The drive shaft 51 is connected through motion transmission means to the electric motor of the ice cream machine whilst the blender unit 3 is operated directly by the electric motor of the ice cream machine through a power take-off 20 located in a seat 21 formed in the upper surface of the housing 2.

The mixing chamber 4 is in heat exchange relationship with the evaporator of the refrigerating circuit of the ice cream machine and the chamber 4 may be closed by means of a cover 30.

The blender unit 3 is removable from the seat 21 in the housing within which it is fixed by means of a known type of coupling, for example, by means of screw connection. Also, the blender unit 3 may be a push fit within the seat 21.

Within the mixing chamber 4 there is provided a removable mixing vessel 7 having a central tubular bush 8 extending upwardly from the bottom of the mixing vessel 7 and adapted to be inserted over the shaft housing 5 so that the mixing vessel 7 is fixed within the mixing chamber 4 in a non-rotational manner by means of an interference fit between the bush 8 and the shaft housing 5. To this end the shaft housing 5 is of trunco-conical section, tapering upwardly.

When the removable mixing vessel 7 is positioned within the mixing chamber 4, between the outer surface of the mixing vessel 7 and the inner walls of the chamber 4 there is defined a

tubular cavity adapted to receive an anti-freeze liquid solution which can, for example, be most simply constituted by water and salt. This anti-freeze solution serves to avoid formation of a layer of ice between the walls of the mixing chamber 4 and the mixing vessel 7 which would prevent transfer of cold from the refrigerating circuit and considerably increase the time necessary for the preparation of the ice cream.

Referring now Fig. 3, the ice cream machine is fitted with a removable mixing vessel 17 of smaller diameter such that the cavity between the side walls of the mixing vessels 17 and the mixing chamber 4 is increased in volume to constitute a second mixing zone 10. In this embodiment there is provided a blade 16 of particular shape, having two mixing arms one of which 12 rotates within the vessel 17 and the other of which 13 rotates in the cavity 10 between the mixing vessel 17 and the chamber 4 thus to allow the preparation of two types of ice cream simultaneously. The diameter of the mixing vessel 17 is approximately half of the diameter of the mixing chamber 4 in which it is inserted such that the cavity 10 is of sufficient volume for preparation of ice cream. As in the embodiment of Figs. 1 and 2, the blade 16 is inserted over the bush 18 of the removable mixing vessel 17 and is connected to the drive shaft 51.

Alternatively, the second mixing zone 10 can be created by inserting in the mixing chamber 4 two removable mixing vessels which are co-axial with each other and of which vessel having the greater diameter forms a cavity with the lateral walls of the chamber 4 adapted to contain antifreeze liquid.

CLAIMS

1. An ice cream machine for domestic use, in which there is provided a mixing chamber constituted by a fixed part and a removable part, said removable part forming the mixing vessel itself, and between said mixing vessel and the fixed part there is provided a cavity for anti-freeze liquid.

2. An ice cream machine as claimed in claim 1, wherein said removable mixing vessel includes a central bush extending upwardly for engagement on a shaft housing in the mixing chamber.

3. A machine according to claim 2, wherein the shaft housing the mixing chamber is of a truncated conical or cylindrical shape.

4. A machine as claimed in any preceding claim, wherein, between removable vessel and the fixed part of the mixing chamber there is formed a second mixing zone.

5. A machine as claimed in claim 4, wherein the machine is provided a two-arm blade shaped to operate respectively in the first mixing zone and in the second mixing zone.

6. An ice cream machine for domestic use, wherein there is included a removable blending unit for mixing the ice cream ingredients, the unit being operated through a power take-off of the motor of the ice cream machine.

7. An ice cream machine for domestic use substantially as hereinbefore described with reference to Figs. 1 and 2 of the accompanying drawings.

8. An ice cream machine for domestic use substantially as hereinbefore described with reference to Fig. 3 of the accompanying drawings.