

Therefore, the present invention generally aims at proposing a machine able to produce a variety of freshly made cooled, aerated or whipped food products, conveniently and in an automated and controlled manner, while reducing the preparation time.

Object and summary of the invention

It is an object of the present invention to overcome or ameliorate at least one of the disadvantages of the prior art, or to provide a useful alternative.

Preferred embodiments of the present invention seeks to address the above-described problems. Preferred embodiments of the invention also aims at other objects and particularly the solution of other problems as will appear in the rest of the present description.

According to a first aspect, the invention proposes a machine for preparing a cooled food product, comprising:

- a receiving seat, for accommodating a container, comprising a heat exchange element having a heat exchange contact surface arranged to be in contact with an outer surface of a side wall of the container when the container is placed in the machine,
- a cooling unit arranged for cooling the heat exchange element and,
- a stirring unit connectable to a stirring member and arranged for driving the stirring member in at least one rotational movement;

comprising

- means for measuring the temperature of the product while being prepared,

- torque sensing means for sensing the viscosity of the product during preparation, wherein it comprises
 - a control unit for controlling output parameters according to a phase-by-phase regulation during the preparation of the cooled food product, such that the control unit sets threshold values of input parameters according to different phases, which are specific to the type of cooled food product to be prepared the output parameters being set at different values;
 - wherein the output parameters comprise: at least one rotational velocity of the stirring member and the cooling power of the cooling unit, and
- wherein the threshold parameters comprise any one or a combination of: the measured product temperature, the stirring time and the sensed torque value.

According to a second aspect, the present invention provides a system comprising a food product preparation machine according to the first aspect and further comprising a container comprising ingredients for the preparation of the cooled food product, the container comprising a heat transfer side wall portion having an inner freezing surface.

According to a third aspect, the present invention provides use of the machine according to the first aspect or the system according to the second aspect to make a cooled, aerated or whipped food product.

According to a fourth aspect, the present invention provides a cooled, aerated or whipped food product made by

using the machine according to the first aspect or the system according to the second aspect.

Unless the context clearly requires otherwise, throughout
5 the description and the claims, the words "comprise",
"comprising", and the like are to be construed in an
inclusive sense as opposed to an exclusive or exhaustive
sense; that is to say, in the sense of "including, but not
limited to".

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Provided herein is a machine for preparing a cooled food
product, comprising:

- a receiving seat, for accommodating a container,
comprising a heat exchange element having a heat exchange
15 contact surface arranged to be in contact with an outer
surface of a side wall of the container when the container
is placed in the machine,
- a cooling unit arranged for cooling the heat exchange
element and,
- 20 - a stirring unit connectable to a stirring member and
arranged for driving the stirring member in at least one
rotational movement; wherein it comprises:
means for measuring the temperature of the product while
being prepared,
- 25 a control unit for automatically setting output parameters
according to input parameters received by the control unit
and compared to threshold values stored in the unit;

Claims

1. A machine for preparing a cooled food product,
comprising:
- 5 - a receiving seat (1), for accommodating a container,
 comprising a heat exchange element (1a) having a heat
 exchange contact surface (21) arranged to be in
 contact with an outer surface of a side wall (8d) of
10 the container when the container is placed in the
 machine,
- a cooling unit (4) arranged for cooling the heat
 exchange element (1a) and,
- a stirring unit (5) connectable to a stirring member
 (9) and arranged for driving the stirring member (9)
15 in at least one rotational movement;
 comprising
- means (16) for measuring the temperature of the
 product while being prepared,
- torque sensing means (27a, 27b) for sensing the
20 viscosity of the product during preparation,
 wherein it comprises
- a control unit (6) for controlling output parameters
 according to a phase-by-phase regulation during the
 preparation of the cooled food product, such that the
25 control unit sets threshold values of input parameters
 according to different phases, which are specific to
 the type of cooled food product to be prepared the
 output parameters being set at different values;
- wherein the output parameters comprise: at least one
30 rotational velocity of the stirring member and the
 cooling power of the cooling unit, and
- wherein the threshold parameters comprise any one or a
 combination of: the measured product temperature, the
 stirring time and the sensed torque value.

2. Machine according to claims 1, wherein it further comprises a product volume sensor (17) to determine the increase of volume due to the overrun of the product during preparation, the threshold parameters further comprising the product volume increase sensed by the product volume sensor (17).

3. Machine according to claim 1 or claim 2, wherein it further comprises air transmission means (15) for providing air into the product, and wherein the output parameters further comprise an actuation time for the air transmission means (15).

4. Machine according to any one of the previous claims, wherein it comprises recognition means (11) connected to the control unit for interacting with identification means (14) of the container; and wherein the control unit is further configured to control the preparation of the cooled product according to the type of cooled product identified by the recognition means.

5. Machine according to claim 4, wherein the recognition means (11) are connected to the stirring unit (5).

6. Machine according to claim 5 wherein the recognition means are arranged offset with respect to the longitudinal axis (Z) of the stirring member.

7. Machine according to any one of the previous claims, wherein the stirring unit (5) is arranged for driving the stirring member (9) according to a combination of movements, wherein the combination of movements comprises

a first rotational movement of the stirring member (9) about its longitudinal axis (Z) which is arranged offset to a central longitudinal axis (X) of the receiving seat (1) and a second closed loop movement about the central longitudinal axis (X) of the container (8) or receiving seat (1) and wherein the output parameters comprise the first velocity of the first rotational movement and the second velocity of the second closed loop movement of the stirring member (9).

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8. Machine according to claim 7, wherein the closed loop movement is an orbital rotation of the stirring member (9) about the central axis (X) of the container (8).

15 9. Machine according to any one of the preceding claims, wherein it further comprises a user interface (58) for providing a start input signal (59) to the control unit so as to start control of preparation of the cooled food product.

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10. Machine according to claim 9 wherein the user interface is for providing a start input signal to the control unit for actuation and/or control of the at least stirring unit (5) and cooling unit (4).

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11. Machine according to any one of the preceding claims, wherein it further comprises a display device (60) capable of displaying a visual and/or acoustic signal arranged for receiving a stop output signal (61) from the control unit indicating the end of the preparation of the cooled food product.

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12. A system comprising a food product preparation machine (20) according to any one of claims 1 to 11 and further comprising a container (8) comprising ingredients (8b) for the preparation of the cooled food product, the container
5 (8) comprising a heat transfer side wall portion (12) having an inner freezing surface (12a).

13. A system according to claim 12, wherein the container (8) comprises identification means (14) containing a
10 recipe code related to the type of cooled food product to be prepared.

14. A system according to claim 13, wherein the identification means (14) comprises a barcode.
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