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(54) **Title**: VENDING MACHINE FOR THE DELIVERY OF A FROZEN FOOD DIARY PRODUCT

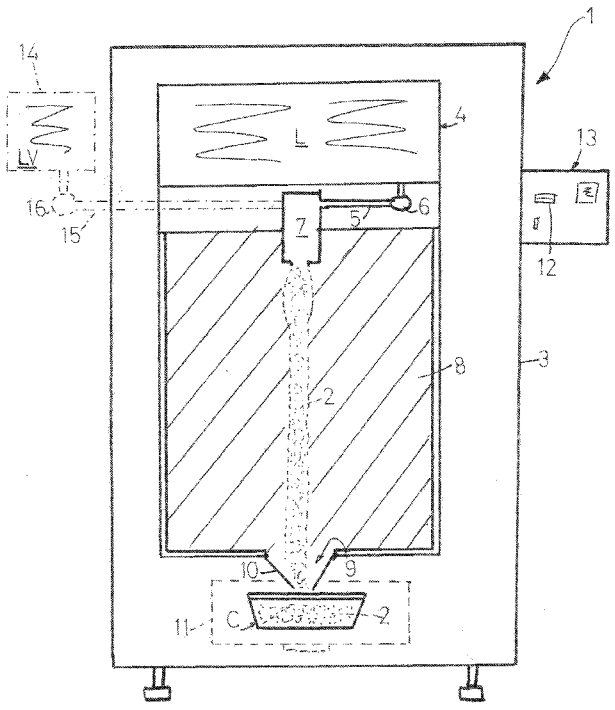


FIGURE 1

(57) **Abstract**: A vending machine (1) for automatic delivery of a frozen food product (2) from which producing a sweet ice cream or similar, comprises tank means (4, 14) for containing at least a substance (L1LV) substantially liquid, and ultrasonic nebulising means (7) for spraying said substance (L, LV) and for forming a quantity of said product (2) in the form of powder or frozen particles adapted to be released into a container (C).

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— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

VENDING MACHINE FOR THE DELIVERY OF A FROZEN FOOD DIARY PRODUCT

TECHNICAL FIELD

The present invention relates to a vending machine for delivering a frozen product.

The invention is advantageously applied on distribution of foodstuff or the like, in particular the supply and consequent sale of a substance or frozen powder made by milk or other liquid substance from which it's easily obtainable and achievable sweet ice cream, to which specification expressly refers without thereby restricting the scope of the invention.

BACKGROUND ART

As well known, currently in distribution and sale of milk and dairy products the spread of automatic fresh milk supply has considerably increased for direct sale to customers in bulk raw milk.

These automatic supply machines, which currently face considerable interest and great support from the public, are normally positioned in the immediate vicinity of the stables and breeding farms, and in general have the great advantage of allowing customers to get fresh milk delivered directly to the place of production, and thus allowing for a sampling of types of milk with flavours and aromas with intensity that modern treatments of industrial processing do not permit to perceive.

SCOPE OF THE INVENTION

The purpose of this invention is to provide further develop existing opportunities for delivery and distribution of food products, for example product based on milk and its derivatives.

In particular, the aim of the present invention is to make a vending machine or apparatus for the distribution and delivery of a frozen diary product or the like, preferably made of milk milked in the nearby of such apparatus.

Especially, the frozen dairy product made for direct sales from vending machine of the subject-invention is in the form of small frozen spherical particles, from which it can get, with high speed and with a natural process and also without need for any mechanical device, a soft ice cream with natural unmistakable flavours and fragrances.

Another purpose of this invention is to allow an immediate availability and easy and safe portability of the frozen product in suitable containers, such as insulated taken from nearby same distributing apparatus and provided with closing lids.

SUMMARY OF THE INVENTION

According to the present invention is realized a vending machine for automatic delivery of a frozen food product from which producing a sweet ice cream or similar, characterized in that it comprises tank means for containing at least a substance substantially liquid, and ultrasonic nebulising means for spraying said substance and for forming a quantity of said product in the form of powder or frozen particles adapted to be released into a container.

The technical characteristics of the invention, in accordance with the cited scopes and aims, are clearly seen from the content of the claims below, and the advantages thereof will be more evident in the detailed description which follows, made with reference to the attached drawing, which represent a preferred form of realization purely illustrative and not limitative of the vending machine for delivering a frozen product of the present invention.

DESCRIPTION OF A PREFFERED FORM OF THE INVENTION

With particular reference to the attached drawing, with the reference number 1 is generally and schematically illustrated a vending machine/distributor for delivering a frozen product 2, made from a substantially liquid substance, preferably raw milk L or its derivatives in general (e.g. yoghurt).

The vending machine 1 comprises an external structure 3, preferably a parallelepiped conformed quite similar to the universally popular vending machines for sale of various products (e.g. food as snacks, or beverages in general), within which it's arranged a tank or reservoir 4 for the raw milk L.

The tank 4, maintained at a temperature suitably cooled using air conditioners known and not illustrated, is placed in communication, through a conduit 5 connected to a pump 6, with a ultrasonic atomisation/nebulisation device 7 adapted to operate into a spraying and freezing/deep-freezing chamber 8.

The ultrasonic device 7 into chamber 8 is, in operation, adapted to realize, according to a known methodology and from a liquid mixture (fresh milk L or its

derivatives), the product 2 substantially in powder form, which comprises spherical frozen sprayed particles.

Specifically, the device 7 is of the type known as described and illustrated in Italian Patent No. 1,311,336 and Italian Patent No. 1,310,501 both on behalf of Saitec Srl, to which this description refers explicitly and whose texts are leads to completeness.

Within the freezing chamber 8, the temperature is maintained preferably by means of known elements and not illustrated, to values around -50 ° C (for example through the use of cryogenic gases).

On the bottom of the chamber 8 it's provided a output mouth 9 for the frozen product 2 (spherical particles), at which two bulkheads 10 are positioned for opening / closing the mouth 9, to be open in order to delivery the product 2 onto a insulated container C.

In operation, the container C is placed on a support plan of the distributor 1 (not shown) by the customer, who has previously taken such a container C from a store (not shown) located outside of the vending machine 1 and has introduced the container C within the same machine 1 through a opening or damper 11 (in dotted line in the attached figure.

The implementation of frozen product 2 and then its disbursement into the container C is realized starting from an introduction, in a slot 12 of a selecting and counting unit 13, of a predetermined amount in coins or bank notes as a function of quantity of product 2 to be released, followed by pushing a starting button to start and control the release.

After the release, the container C is taken from the dispenser 1 through the damper 11 and then immediately closed by a cover.

Therefore, from the frozen product 2 contents inside the container C it can be achieved quickly a tasty ice cream dessert made with raw milk just milked, simply leaving it for a specified time at room temperature without the need having to employ any mixing apparatus, or other similar mechanical instrument.

It has to noted that as simply replacing the milk L with a mixture of water and various flavourings (e.g. lemon juice or orange juice) is also possible to advantageously produce with distributor 1 even ice cream desserts like sorbets.

According to a variant shown in mixed line in the attached drawing, at least one additional tank or reservoir 14 containing a liquid mixture LV (e.g. chocolate, vanilla, fruit smoothies or blended, juices and similar, also variously mixed each other), is simultaneously fed to device 7 together with the same milk L along a primary conduit 15 and further through a pump 16: so it can get a frozen diary product 2 with various flavours, aromas and tastes.

According to an alternate version not shown, the vending machine 1 described above, in particular its structure 3, is advantageously achieved with very small dimensions to be easily mountable and available ready for use in private/domestic spaces (e.g. kitchens, tavern, etc.).

In this configuration for domestic use, of course, it's not contemplated the presence of the selection unit 13, and includes a reservoir 4,14 of small capacity and a small ultrasound atomization device 7.

According to a further variant not shown, the vending machine 1 described above, in particular its structure 3, is advantageously made with certain dimensions for rendering it compatible with industrial production.

This configuration for industrial production does not provide the presence of the selection unit 13, and in particular includes more tanks 4,14 of high capacity connected to more ultrasound devices 7 provided in large chambers 8.

With the invention as described above, in particular, the following additional advantages are obtained:

- production of ice cream with natural process and temperature;
- using the same raw milk taken from bulk milk dispenser preferably prepared alongside or nearby the vending machine just described.

CLAIMS

1. Vending machine (1) for automatic delivery of a frozen food product (2) from which producing a sweet ice cream or similar, characterized in that it comprises tank means (4, 14) for containing at least a substance (L,LV) substantially liquid, and ultrasonic nebulising means (7) for spraying said substance (L, LV) and for forming a quantity of said product (2) in the form of powder or frozen particles adapted to be released into a container (C).
2. Vending machine according to claim 1, characterized in that said tank means (4,14) are connected to conditioning means adapted to cool said substance (L,LV) inside said tank means (4,14).
3. Vending machine according to claim 1 or 2, characterized in that said tank means (4,14) comprise pump means (6) connected to said ultrasonic nebulising means (7).
4. Vending machine according to any claim 1 to 3, characterized in that said ultrasonic nebulising means (7) comprise atomisation chamber (8) at constant temperature of around 50° C below zero.
5. Vending machine according to 4, characterized in that the bottom of said atomisation chamber (8) is provided with an outlet mouth (9) for said frozen product (2); opening means (10) being provided on said outlet mouth (9) for opening said mouth (9) and letting the delivery of said frozen product (2) inside said container (C).
6. Vending machine according to any claim 1 to 5, characterized in that it further comprises accepting means (12,13) for accepting and counting predetermined amount in coins or bank notes, and button means for activating and controlling the delivery of said product (2) inside said container (C).
7. Vending machine according to any claim 1 to 6, characterized in that said substance (L) comprises milk or similar.
8. Vending machine according to any claim 1 to 7, characterized in that said tank means (4,14) comprise at least a reservoir (14) for a liquid mixture (LV) adapted to be mixed with said substance (L).

9. Vending machine according to claim 8, characterized in that said liquid mixture (LV) comprises chocolate, or vanilla, or fruit smoothies or blended, juices and similar, also variously mixed each other, adapted to be fed to said ultrasonic nebulising means (7) through pump means (16).

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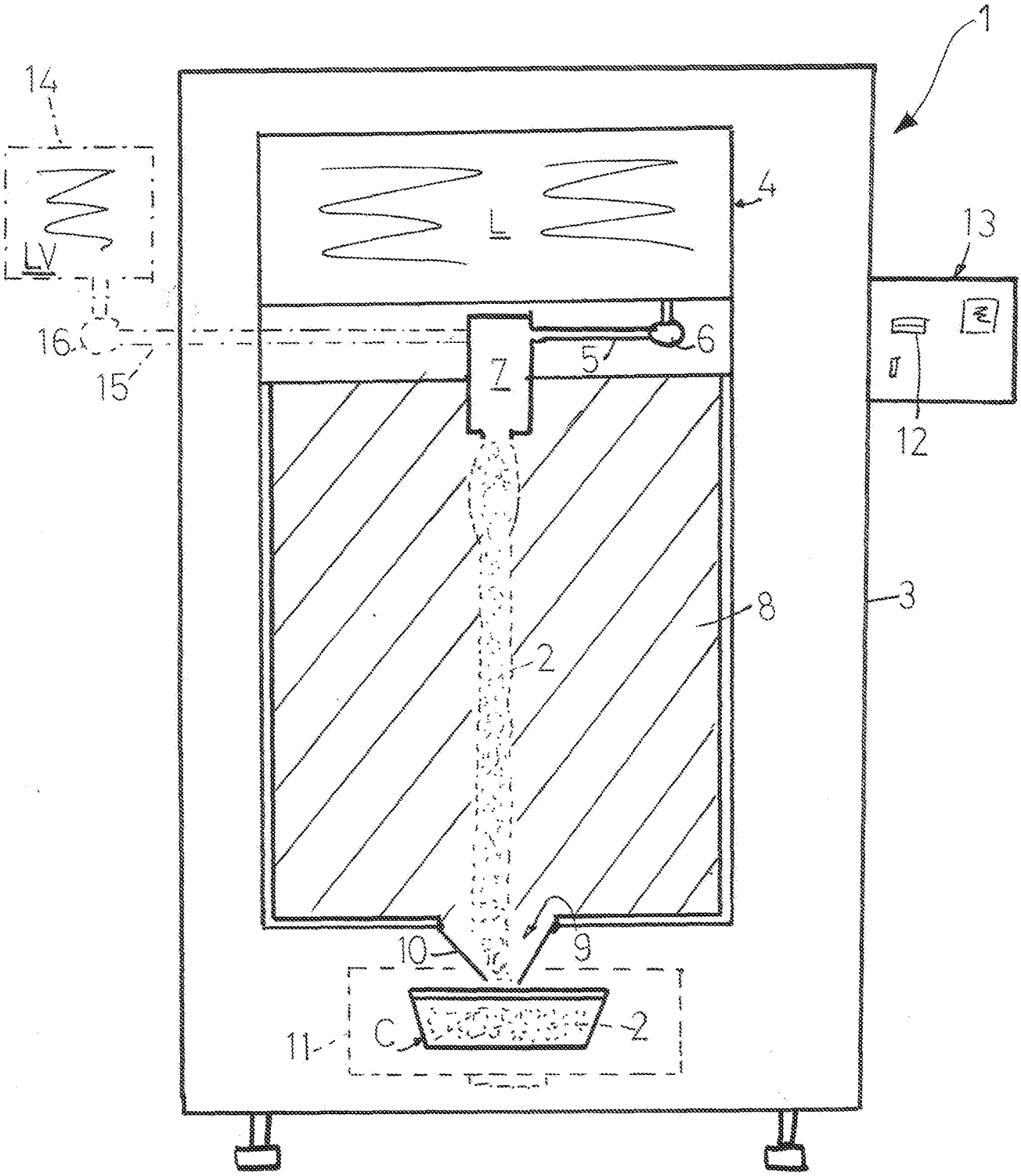


FIGURE 1

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2009/052111

A. CLASSIFICATION OF SUBJECT MATTER
INV. G07F9/10 A23G9/20 F25C1/00

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)
A63G G07F F25C

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

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 92/02146 A (KATEMAN PAUL [US]) 20 February 1992 (1992-02-20) page 9, line 14 - page 17, line 5	1-9
A	JP 63 218273 A (TOA NENRYO KOGYO KK) 12 September 1988 (1988-09-12) abstract	1-9
A	EP 1 238 589 A (BOC GROUP PLC [GB]) 11 September 2002 (2002-09-11) the whole document	1-9
A	WO 01/23814 A (SAITEC SRL [IT]; DIOLAITI LUIGI [IT]) 5 April 2001 (2001-04-05) the whole document	1-9

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
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