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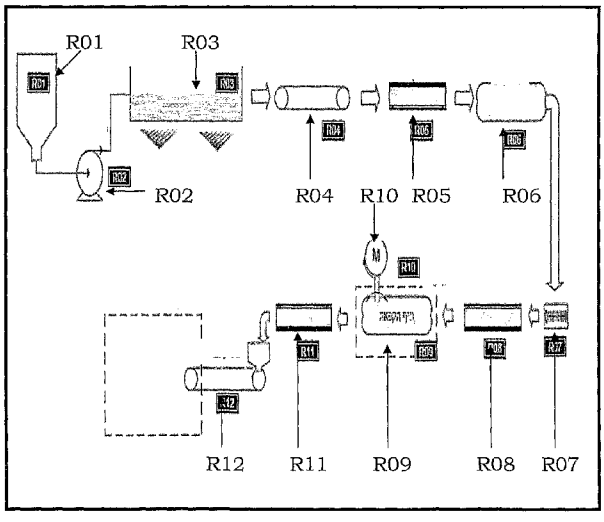
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(54) **Title:** METHOD FOR FREEZING FRIED, COOKED AND SEASONED FOOD SUCH AS RICE, VEGETABLES, ONIONS OR LEGUME AND APPARATUS OF DOING THE SAME

Fig 1



(57) **Abstract:** A method and an apparatus for freezing fried, cooked and seasoned food such as rice, vegetables or legume which comprises of: 1. A frying pan for frying, cooking and seasoned the food such as rice, vegetables or legume to a higher degree then usually fried for producing preserved foods. 2. Two rotary drums having each a plurality of plate blades mounted on an inner circumferential wall of said rotary drums; 3. Driving means for rotating said rotary drums at a substantially low speed; and 4. A discharge port divided in said outlet cover for discharging the fried, cooked and seasoned, frozen food, and the used refrigerant.

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METHOD FOR FREEZING FRIED, COOKED AND SEASONED FOOD SUCH AS RICE, VEGETABLES, ONIONS OR LEGUME AND APPARATUS OF DOING THE SAME

Cross-Reference to Related Applications

This application claims priority to Israel Application No. 185006 filed 2nd August, 2007, incorporated herein by reference in its entirety.

Field of the Invention.

The present invention relates to a method and an apparatus for producing preserved foods, and particularly for the freeze preservation of fried rice, fried vegetables or fried legume.

Background

Up till now, for obtaining frozen rice, cooked rice was placed on a tray or the like and arranged in a predetermined form, and then frozen as it was, to be packed as a commercial product. US patent 4,022,600 describes an apparatus for freezing boiled rice that has an internally conveyor running at low speed. A hopper feeds boiled rice in through the inlet cover to an inner bottom face of the conveyor. US patent 5,543,167 describes an apparatus that continuously feeds cooked rice on a conveyor system, where the rice is cooled to a given temperature using cool air jets from above and below the conveyor. The cooled rice is then transferred to another mesh conveyor The surface-frozen rice is then transferred onto a third mesh conveyor where two sets of counter-rotating comb rollers break up the surface-frozen rice grains into separate grains of surface-frozen rice. However, these methods have many disadvantages. These disadvantages cause the end products to be lumpy. Accordingly, in order to eliminate the

above disadvantages, it is known to have the fried rice grains scattered manually or by an apparatus (such as described in US patent 4,607,495) before being frozen, or else fried rice is thinly leveled manually and frozen. The frozen rice is then subjected to impact so as to be crushed into a scattered state. However, this has another set of disadvantages. The manual pretreatment of scattering fried rice or leveling it into a proper thickness is costly ; it is very difficult to perform the above pretreatment in a uniform manner, and therefore to obtain uniform products; and the application of impact for crushing of the rice deforms and pulverizes the fried rice grains, impairing the yield and commercial value considerably.

It is an object of the present invention to provide a method and an apparatus which can freeze fried cooked and seasoned rice in a scattered state.

It is another object of the present invention to provide a method and an apparatus which can freeze fried cooked and seasoned rice in an optimum state without finely crushing or pulverizing the fried rice, fried vegetables or fried legume.

It is yet another object of the present invention to provide a method and an apparatus for freezing fried cooked and seasoned rice, chooped vegetables or legume which allows easy weighing, packing and thawing.

It is yet another object of the present invention to provide a method and an apparatus which can continuously and efficiently freeze fried cooked and seasoned rice, fried cooked and seasoned vegetables or fried cooked and seasoned legume.

It is yet another object of the present invention to provide a method and an apparatus which saves cost of the manual labor in the

process of freezing fried cooked and seasoned rice, fried cooked and seasoned vegetables or fried cooked and seasoned legume.

Summary of the Invention

A method and an apparatus for freezing fried cooked and seasoned food such as rice, vegetables, onions or legume which comprises of:

a. A frying pan for frying cooking and seasoned rice, vegetables or legume to a higher degree then usually fried for producing preserved foods.
b. Two rotary drums having each a plurality of plate blades mounted on an inner circumferential wall of said rotary drums;
c. Driving means for rotating said rotary drums at a substantially low speed; and
d. A discharge port divided in said outlet cover for discharging the fried, cooked and seasoned, frozen rice, and the used refrigerant

Brief Description of the Drawing

Fig 1 – Schema of the apparatus according to the method.

Detail of a preferred embodiment of invention

The accompanying drawings (Fig. 1) show a preferred embodiment of the present invention.

The product (Rice, chopped vegetables, onions or legume) is fried, cooked and seasoned in a large frying pan. After completing the cooking process, the product which comes out in large lumps, is being poured on a conveyer that throws it into a six layer vibrator. While

falling through the vibrator layers, the large lumps break into smaller ones and cools up. The product is then inserted into a rotating drum equipped with blades. The product is being moved through the drum by the blades. During this movement it is continuously elevated by the rotating blades to the upper end of the drum, and drops down again, A blower, blows cool air in the opposite direction, thus cooling the product as it drops through the drum.

From the first drum, the product is poured onto a second vibrator which breaks it into single grains. The grains are then frozen by being conveyed through a second drum, similar to the first one, which is kept in a freezing chamber, with freezing air blowing through it. The food then can be freezed to a temperature between 4°C and up to -18°C. The frozen product is dropped through a hopper into the packaging machine, to be packaged in boxes, cartons or bags.

In order to keeps the system operating continuously, the hopper acts as a reservoir. It is cooled and is large enough to contain up to two hours of production.

Claims

1. A method and an apparatus for freezing fried, cooked and seasoned food such as rice, vegetables or legume which comprises of:
   a. a frying pan for frying, cooking and seasoned the food such as rice, vegetables or legume to a higher degree then usually fried for producing preserved foods.
   b. two rotary drums having each a plurality of plate blades mounted on an inner circumferential wall of said rotary drums;
   c. driving means for rotating said rotary drums at a substantially low speed; and
   d. a discharge port divided in said outlet cover for discharging the fried, cooked and seasoned, frozen food, and the used refrigerant.
2. The apparatus for freezing fried cooked and seasoned food according to claim 1, in which said rotary drum is surrounded by an insulating material.
3. The apparatus for freezing fried cooked and seasoned food according to claim 1, in which said plate blades are each provided with clearance between a base portion thereof and the rotary drum.
4. The apparatus for freezing fried, cooked and seasoned food according to claim 1, in which said rotary blades are each provided with clearance between a base portion thereof and an outer face of said rotary shaft.
5. The apparatus for freezing fried, cooked and seasoned food according to claim 1, in which said rotary blades are positioned in a plurality of groups and are attached to the rotary shaft with the respective phases different among the groups.

6. The apparatus for freezing fried, cooked and seasoned food according to claim 1, in which said rotary shaft comprises of a shaft pipe and a pair of rod members fitted in end openings of said shaft pipe and integrally joined thereto.
7. The apparatus for freezing fried cooked and seasoned food according to claim 1, further comprising a plurality of support rollers mounted on a mount member thereof for supporting said rotary drum.
8. The apparatus for freezing fried cooked and seasoned food according to claim 7, in which said rotary drum comprises of a plurality of annular rails circumferentially mounted on the outer wall thereof and arranged in contact with said support rollers.
9. The apparatus for freezing fried, cooked and seasoned food according to claim 7, in which said mounting member includes a plurality of bolting means fixed between said mounting member and the base for adjusting the tilt angle of the mounting member.
10. The apparatus for freezing fried, cooked and seasoned food according to claim 7, in which said supply pipe for the refrigerant has a body of a hollow configuration with a skirt opened divergently.
11. The apparatus for freezing fried, cooked and seasoned food according to claim 7, in which said supply pipe for refrigerant includes a jet nozzle provided therein for jetting the refrigerant through an axial hole thereof.
12. The apparatus for freezing fried, cooked and seasoned food according to claim 11, in which the jet nozzle has at least one fine through hole opening on a side wall thereof tangentially of said axial hole for jetting the refrigerant in a whirlwind manner.
13. The apparatus for freezing fried, cooked and seasoned food according to claim 7, further comprising of a drum cover

secured to the mount member for accommodating said rotary drum, where drum has the inlet and outlet covers secured to the drum cover.

14. The apparatus for freezing fried cooked and seasoned food according to claim 7, in which said discharge port is provided with an exhaust duct for discharging used refrigerant.

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Fig 1

