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ICE TRAY

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3 Claims. (Cl. 62-105)

1

The object of my invention is to provide a method and mechanism for producing frozen products and particularly ice cubes in a domestic refrigerator.

It is the object of my invention to provide means of freezing ice cubes, of automatically replenishing the water in the freezing tray and means of delivering the frozen product by ejecting it from the ice trays as they pass to a new position to be refilled.

It is a further object of the invention to provide means of actuating the ice trays to move them from the freezing compartments to the point of ejection and to refill the incoming ice trays into the freezing compartment all under the control of a container being placed in position for receiving the ice cubes to be ejected into it.

The further object of the invention is to provide a compressor compartment, a freezing compartment and an ejecting compartment so as to have in a single combination an automatic means of providing a continuous supply of frozen ice cubes which may be delivered to the user at will and in such quantities as may be necessary to satisfy the demands of a domestic household user.

In particular it is my object to provide a freezing compartment through which passes a flexible belt comprising an ice tray mechanism which is adapted upon passing out of the freezing compartment to be so expanded as to discharge the ice cube. This belt then returns to a position before entering the freezing chamber for an automatic refill.

It is an object of the invention to provide means by which the placing of a container on the exterior of the compartment in position to receive the ice cubes closes the circuits that actuate the ice tray belt through the freezing compartment in order to remove the tray from the freezing compartment and eject the cubes and at the same time opens up the valve for refilling the incoming ice cube trays before entering into the freezing compartment. In this manner the ice cube trays are filled in the exact proportion to the number of frozen cubes that are discharged from the trays after they leave the freezing compartment.

It is an additional object to provide means of deforming the flexible ice cube belt so as to eject the cubes from the belt after the water in the compartment in the belt has been frozen into ice cubes.

Referring to the drawings:

2

Figure I is a side elevation of the apparatus of this invention with the enclosures in sections.

Figure II is a top plan view of the apparatus with the enclosure illustrated in section.

Figure III is an enlarged detailed view showing the sheaves in elevation and the belt in section.

Referring to the drawings in detail, 1 is the bottom of a container forming a refrigerator compartment. 2 indicates a compressor in the lower compartment 3 which is enclosed by the partition or top 4. The compressor is connected to a heat transfer coil 5 over which air is blown by the fan 6. This coil is connected at one end as at 7 to the compressor 2 and the other end as at 8 through the pipe 9 to the freezing unit 10 the other side of which is connected by the pipe 11 to the compressor 2. The freezing compartment 10 has a passageway 12 therethrough to receive the flexible ice cube belt 13 which passes horizontally through the freezing chamber and remains therein at intervals long enough to have the contents of the trays frozen into the ice cubes 14. This belt is composed of elastic material such as rubber or the like and has one or more series of compartments 15 formed by the side walls 16 and cross walls 17, bottoms 18 as shown particularly in Figure III. In the form shown in the drawings two series of compartments 15 are arranged in parallel in a single elastic body. Any number of such compartments may be so embodied. This belt is mounted upon oppositely disposed sheaves 19 at least one of which is provided with beads or ridges 20 that engage the bottom of the ice cube belt as at 18 causing a deformation of the bottom to assist in the ejecting of the cubes 14. As the belt stretches in passing over the pulley or drum 19 it opens up so that the compartment 15 expands thereby permitting the ice cubes to fall out by gravity into the discharge chute 21. An intermediate rib 22 is provided on the sheaves 19 for assisting in the driving of the ice cube tray belt. These sheaves 19 are supported at either end upon axle 23 on brackets 24. These brackets are mounted upon the partition 4. One of the sheaves is driven through worm gearing 25 and 26 by an electric motor 27.

The filling of the ice trays is effected through the water pipe 28 controlled by the valve 29 which in turn is actuated by the solenoid actuator 30. Upon opening the valve the water is discharged into the ice cube compartment 15. The actuation of the motor and the opening of this valve are concurrent due to the closing of the circuit as indicated by the placing of the container 31

3 in position between the light source 32 and the electronic cell 33.

The container 31 controls the operation of the system. When 31 is placed in position it cuts off the light source 32 from the electronic cell 33 thereby causing a closing of the circuit which is connected to the motor 27 and to the valve 30. The motor starts up and moves the belt 13 through the cooling compartment 10 so as to discharge the ice cubes 14 in the chute 21 and then into the container 31 and at the same time the solenoid 30 opens the valve 29 and water is delivered into the vacant ice tray 17 for refilling them before they pass into the cooling chamber 10. In the event that this operation is performed to exhaust all of the ice cubes 14 from the trays 13 and water is carried around on the belt 13, it is dumped into the receiving tray 34 and no damage is done. The tray is removable in the usual manner.

It will be understood that I desire to comprehend within the scope of my invention such modification and changes that may be fairly comprehended within the scope of the hereinafter appended claims.

Having thus fully described my invention what I claim as new and desire to secure by Letters Patent is:

1. In combination, a cooling compartment having a freezing means therein, an elastic deformable pocketed belt adapted to pass through said cooling compartment and said freezing means, means for actuating said belt and for deforming it to cause it to expand and discharge frozen products therein, chute means for receiving said frozen products and discharging them outside of said cooling compartment, means for actuating said actuating means and intermittently driving said actuating means for said belt comprising an electrical circuit associated with the exit of said chute, means associated therewith whereby when a container is placed at the bottom of said chute said actuating means for said belt will be put into operation and retained in operation until said container is removed.

2. In combination, a cooling compartment having a freezing means therein, an elastic deformable pocketed belt adapted to pass through said cooling compartment and said freezing means, means for actuating said belt and for

4 deforming it to cause it to expand and discharge frozen products therein, chute means for receiving said frozen products and discharging them outside of said cooling compartment, means for actuating said actuating means and intermittently driving said actuating means for said belt comprising an electrical circuit associated with the exit of said chute, means associated therewith whereby when a container is placed at the bottom of said chute said actuating means for said belt will be put into operation and retained in operation until said container is removed, means of depositing fluid in the empty compartments in said belt before it passes through the freezing means, and means associated with the actuation of the belt for opening said fluid depositing means at the time that the belt is moving and closing it when the belt is at rest.

3. In combination, a cooling compartment, a freezing unit therein, an elastic deformable pocketed belt adapted to pass therethrough, means for actuating said belt and adapted to expand and deform the belt as it passes thereover, means for driving said actuating means, means for depositing fluid in the said belt before it passes through the freezing unit comprising a valve, an electrically actuated means for operating said valve interconnected with the driving means for actuating said belt, means for receiving the discharged frozen products from said belt, means for supporting a container at the end thereof, and means actuated upon association of a container with said supporting means to cause an actuation of the means for driving the belt and opening the valve for supplying fluid to the belt during the period that the frozen products are being discharged into said container.

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