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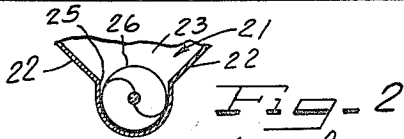
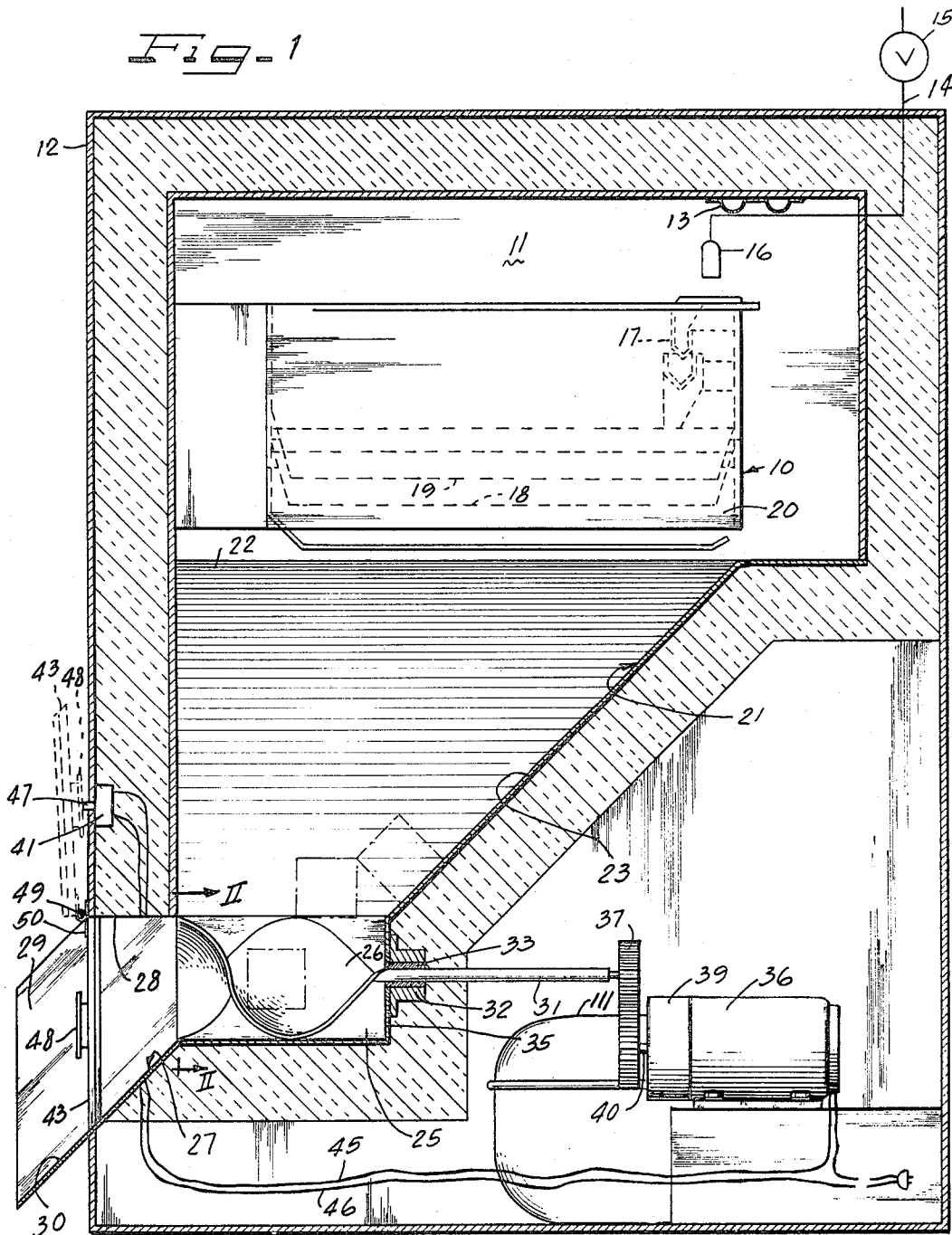
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3,387,743

ICE CUBE DISPENSER WITH SCREW FEED

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Fig-1



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ICE CUBE DISPENSER WITH SCREW FEED
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ABSTRACT OF THE DISCLOSURE

A dispenser for the ice cubes frozen in ice cube molds in the freezing compartment of a refrigerator cabinet, and arranged to collect and retain water to be frozen and to eject the frozen ice cubes from the machine for use. Freezing is attained by a conventional compressor condenser unit in the cabinet and an evaporator unit in the freezing compartment of the cabinet. The molds are operated to eject ice into a hopper having sloping side walls converging to a restricted trough-like bottom, having a conveyor extending therealong. The conveyor is operable to feed selected quantities of ice cubes into a container and thereby prevent contaminating the ice stored in the hopper, by the hands or conventional scoops.

It is, therefore, an object of the present invention to provide an improved means for storing and dispensing ice cubes from a hopper, so arranged as to avoid contaminating ice cubes by touching the cubes by the hand.

Another object of the invention is to provide an automatic ice maker particularly adapted for hotels, motels and the like in which the ice maker is contained within a cabinet and ejects the ice cubes into a hopper having side walls converging toward the bottom of the hopper, and in which the hopper has a trough-like bottom portion having a conveyor extending therealong and supplying ice cubes to be dropped into a glass and the like.

Another object of the present invention is to provide an ice making apparatus employing molds for forming water deposited therein into ice cubes, and discharging the frozen ice cubes into a converging hopper having a trough-like bottom, and in which a screw conveyor operable at the selection of the person requiring ice cubes, extends along the trough-like bottom, for dispensing ice cubes through the door of the cabinet.

Still another object of the invention is to provide a screw-type conveyor in the bottom of the storage hopper of an automatic ice cube maker, for dispensing ice cubes from the hopper, in which the screw type conveyor is intermittently driven by an electric motor and a door is provided for the discharge spout of the hopper, which has connection with the energizing circuit to the motor for energizing the motor to effect the discharge of ice cubes as long as the door is held in a predetermined open position.

These and other objects of the invention will appear from time to time as the following specification proceeds and with reference to the accompanying drawing wherein:

FIGURE 1 is a cross-sectional view taken through an ice cube maker cabinet and illustrating one form in which the present invention may be embodied;

FIGURE 2 is a detail fragmentary sectional view drawn to a reduced scale and taken substantially along line II-II of FIGURE 1.

While the principles of the present invention are applicable to any ice making apparatus, a particular useful application is for an automatic ice cube maker of a type making large quantities of ice cubes and used in hotels, motels and like places, where ice cubes are to be delivered to a glass or other container. In the embodiment of the invention shown in FIGURE 1 of the drawings, an automatic ice cube maker 10 is diagrammatically

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shown as contained in a freezing compartment 11 of an insulated cabinet 12, containing a compressor condenser unit 111 and evaporator coils 13, in the freezing compartment of the cabinet. A water line 14 having a valve 15 therein, on the outside of the cabinet, enters the cabinet through the insulation thereof and has communication with a nozzle 16 shown as directing water to a stationary trough 17, positioned above a series of trays 18 and 19, and adapted to successively fill said trays with water as moved into water receiving relation with respect thereto, under the control of the valve 15. The valve 15 may be a conventional form of solenoid operated valve.

The ice cube maker 10 may be of any conventional form and is herein shown for illustrative purposes only, as an ice cube maker of the type having at least a pair of ice cube molds or trays 18 and 19 contained within a frame or casing 20. Each of the trays is supported at its opposite ends for rotation about its longitudinal axis and is made from a flexible material, such as a plastic material, or other like material which is twistable to eject the ice cubes from the tray by twisting movement thereof. A form of automatic ice maker of the type generally described above is shown and described in application Ser. No. 527,189 filed by William R. Donahue, Jr. on Feb. 14, 1966, and no part of the present invention so not herein shown or described further.

While I have shown an ice cube maker in which the water is frozen to the form of ice cubes and ejected from the trays when frozen by twisting of the trays, it should be understood that any conventional ice maker may be contained in the freezing compartment 11, to maintain a supply of ice cubes in a storage hopper 12 disposed beneath the freezing compartment for the ice cubes. The storage compartment 21 is shown in FIGURES 1 and 2 as being in the form of a hopper having inclined side walls 22 and an inclined back wall 23, converging toward the bottom of the hopper and terminating in a trough 25, at the bottom of the hopper. The trough 25 generally conforms to the form of the scroll of a screw conveyor 26, mounted therein, for impelling the ice cubes in the hopper through an inclined discharge chute 27 inclined downwardly from the discharge end of the trough 25, and directing ice cubes beyond the front end of the cabinet into an ice cube container of any suitable form (not shown). The discharge trough 27 extends through an opening 28 in the front wall of the cabinet 12 and has parallel side walls 29 and an inclined bottom wall 30 extending beyond the front end of the cabinet a distance sufficient to accommodate the placing of a container (not shown) in ice cube receiving relation with respect to the discharge end of said trough.

The scroll of the screw conveyor 26 is shown as having a shaft 31 formed integrally therewith journaled in a bearing support 32 on a sleeve bearing 33. The bearing support 32 is shown as being mounted on the rear side of a rear wall 35 of the trough 25 in the insulation for the storage compartment. The shaft 31 extends behind the insulation for the trough 25 and the back wall of the hopper and is shown as driven from a motor 36 through a geared reduction train 37. The motor 36 may be a speed reducer type of motor having a speed reducer housing 39 on the end thereof, containing conventional speed reducer gearing, and having an output shaft 40 having driving connection with the reduction gearing 37. It should be understood that the screw conveyor 26 may be driven in various other manners, as by a hand crank (not shown) on the outside of the cabinet, through a chain and sprocket drive (not shown), a leverage arrangement on the outside of the compartment (not shown) and having drive connection with the screw conveyor through gearing or any other suitable drive train,

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and that the drive from the motor 36 to the screw conveyor may also be of any conventional form.

The motor 36 is shown as being energized by a switch 41 operated by a door 43 closing the opening 28 through the front wall of the cabinet, and through which the chute 27 extends. The switch 41 is connected with the motor 36 through conductors 45 and 46 in a conventional manner. The switch 41 may be a form of micro-switch closing the circuit to the motor 36 upon the depression of a button 47 of the switch, either by the finger or by engagement by a knob 48 for the door 43. The door 43 is shown as being mounted on the outside of the front wall of the cabinet 12 on a horizontal hinge pin 49. A torsion spring 50 may bias the door to a tightly closed position, although the door may drop by gravity if desired.

When it is desired to dispense a quantity of ice cubes, a container for the cubes may be placed beneath the discharge end of the chute or spout 30. The door 43 may then be hinged upwardly by grasping the knob 48 and then placing the finger beneath the panel of the door and raising the door, to engage the knob 48 with the button 47 for the limit switch 41. This will energize the motor 36 and drive the conveyor 26 to convey ice cubes to the chute 27, as long as the button of the switch is depressed. As soon as the door 43 is released, the energizing circuit to the motor 36 will be broken. The door 43 may be held in an open position when the circuit to the motor is deenergized, to accommodate the ice cubes remaining in the delivery chute 27 to clear the chute. The door may then be closed.

It may be seen from the foregoing that a simple and improved dispensing means for ice cubes has been provided, particularly adapted for commercial ice makers in use in motels and hotels, and dispensing ice cubes as required without touching the cubes by the hand or with the usual scoop provided for this purpose and usually contained in the storage compartment for the ice cubes.

While I have herein shown and described one form in which the invention may be attained, it should be understood that various modifications and variations in the invention may be effected without departing from the spirit and scope of the novel concepts thereof.

I claim as my invention:

1. A dispenser for ice cubes including a cabinet having a freezing compartment at the upper end thereof and a storage compartment at the lower end thereof, ice mold means within said cabinet in said freezing compartment for collecting and retaining water to be frozen and for ejecting the frozen water in the form of ice cubes, said storage compartment being beneath said mold means and being of a hopper-like formation having a front wall oppositely sloping side walls and a

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sloping back wall converging toward a discharge opening having a restricted trough-like bottom disposed therebeneath and extending transversely of said side walls from said bottom through said front wall,

said restricted trough-like bottom being semi-cylindrical in cross-section and terminating at said front wall,

a downwardly inclined delivery chute having an inclined bottom and opposite side walls extending therealong beyond the front of said cabinet, a distance sufficient to enable a container to be placed therebeneath,

a screw conveyor extending along said trough-like bottom and generally conforming to a form thereof and terminating adjacent said front wall rearwardly of said delivery chute, and retaining ice cubes to said hopper when not in operation, and

means for driving said screw conveyor to effect the delivery of a pre-selected number of ice cubes along said delivery chute.

2. The structure of claim 1,

wherein a motor is provided in said cabinet rearwardly of said restricted delivery chute and has driving connection with said screw conveyor,

wherein a door is provided to close said delivery chute, wherein a hinge pin hinges said door to said cabinet, wherein spring means bias said door downwardly into said delivery chute, and

wherein energization of said motor and operation of said screw conveyor is controlled by opening of said door.

3. The structure of claim 2,

wherein the door has a knob on the outer side thereof, wherein a switch is provided to energize said motor to drive said screw conveyor, and

wherein said switch is spaced on the opposite side of the hinge pin for said door from said knob in position to be engaged by said knob, upon movement of said door into an extreme upward open position, to effect a dispensing operation of ice cubes, as long as said knob is held into engagement with said switch.

References Cited

UNITED STATES PATENTS

1,934,646	11/1933	Slemmer	222-413	X
2,969,650	1/1961	Eschenburg et al.	222-2	
2,986,897	6/1961	Howard	194-13	X
3,192,734	7/1965	Swanson	222-64	X
3,207,366	9/1965	Feistel	194-10	X
3,211,338	10/1965	Well et al.	222-413	X
3,225,968	12/1965	Winkler et al.	222-413	X

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