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Crider

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[54] **ICE DISPENSING MACHINE**

[76] Inventor: **Ernest L. Crider,** 3949 Hedgerow Cove, Memphis, Tenn. 38116

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[52] **U.S. Cl.** **222/143,** 222/185, 222/239

[51] **Int. Cl.** **B67d 5/60**

[58] **Field of Search** .....62/320, 379; 198/53, 54, 56, 198/57, 58; 220/4, 4 E, 20.5, 41, 97 B; 214/303, 307, 143; 222/238, 239, 185, 371, 415, 559

[56] **References Cited**

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Primary Examiner—Robert B. Reeves
Assistant Examiner—Larry Martin
Attorney—John R. Walker, III

[57] **ABSTRACT**

A dispensing machine for dispensing crushed ice, cubed ice, or the like. The dispensing machine includes a base portion and a plurality of removable stacked hoppers supported on the base portion for containing the ice and supplying it to the base portion. The base portion contains an exit opening for the ice and a conveyor belt for receiving the ice from the hoppers and moving it into said exit opening for the dispensing thereof.

5 Claims, 4 Drawing Figures

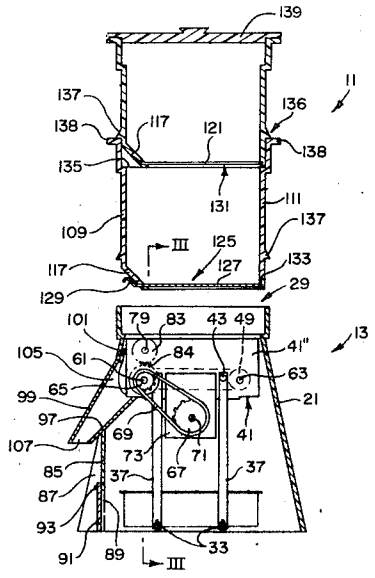


FIG. 1

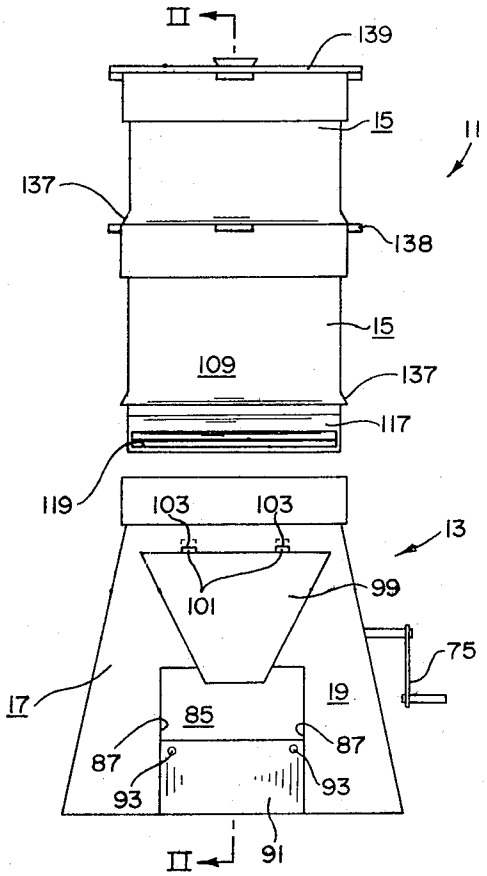


FIG. 2

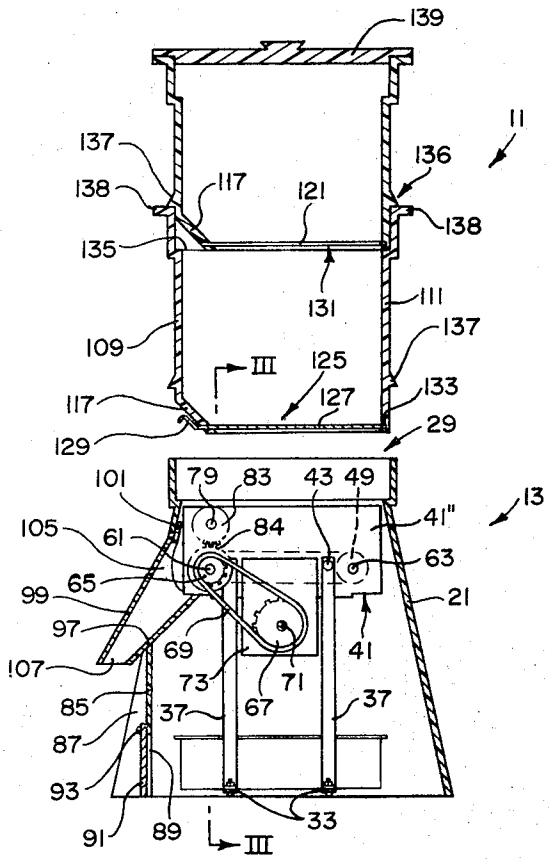


FIG. 3

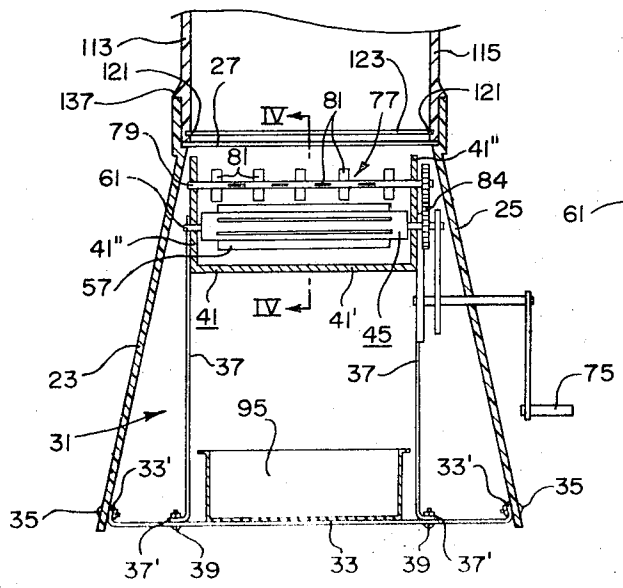
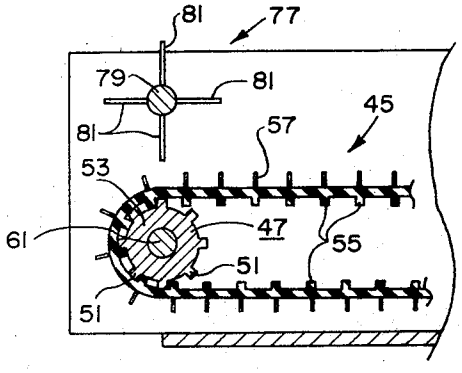


FIG. 4



INVENTOR.
ERNEST L. CRIDER

BY John L. Walker, III
Attorney

ICE DISPENSING MACHINE

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to machines for dispensing ice.

2. Description of the Prior Art

A preliminary patentability search revealed the following U. S. Pat. Nos. 219,911; 2,222,024; 2,584,750; 2,913,150; and 3,062,413.

The typical machines for dispensing ice which is crushed, cubed or in other shapes for use to cool water, drinks or the like are in general in two categories, namely: (1) automatic icemakers and dispensers wherein the ice is automatically made in a hopper as needed and is automatically dispensed by placing a glass or other container under the spout leading from the bin and actuating a switch to cause the ice to be dispensed. (2) Large chests which hold the ice, that is either automatically made in the chest or placed in the chest from another source of supply. The user then utilizes a scoop to reach down into the chest and scoop up the required amount of ice to fill a container for the ice. With the above-mentioned second type, it will be apparent that it is unsanitary when a number of different persons reach down into the ice and contaminate the ice with their dirty hands, etc. Although the first-mentioned general type is more sanitary, it is generally of smaller capacity and greater comparative expense when a number of the machines are needed to give the same capacity as the larger chest. Also, since generally only one spout is available per machine for the filling of glasses and the like, only one use of the machine can be made at a time, as opposed to the chest wherein a number of users, such as waitresses and the like, may fill glasses or the like at the same time therefrom.

Summary of the Invention

The present invention is directed towards overcoming the heretofore-mentioned and other disadvantages in previous ice dispensing machines. Thus, the present invention provides an ice dispensing machine which is economical to manufacture, and which is sanitary.

It is an object of the present invention to provide unique hoppers that can be filled with ice at a point remote from the dispensing or base portion of the machine and brought to the base portion of the machine where they are stacked on the top thereof.

It is a further object to provide such hoppers that have gate means which close the open bottom portion of the hopper and which are operable from a closed position for preventing passage of ice therethrough to an open position, thereby allowing the gravitational passage of ice therethrough into the base portion of the machine.

A further object is to provide means for increasing ice capacity during rush hours.

A further object of the present invention is to provide such hoppers which are constructed so that said gate means may be easily and conveniently removed as the hoppers are stacked.

A further object is to provide such hoppers that can be quickly and easily removed from the base portion and from each other without removing any bolts or screws.

A further object is to provide such a base portion which includes an endless conveyor belt for horizontally moving the ice which is deposited thereon from the hoppers, exit means for dispensing the ice, and drive means for driving the upper flight of the conveyor belt horizontally so that the ice received thereon is moved horizontally and discharged through the exit means.

A further object is to provide a rotatable picket disposed above the conveyor belt for breaking up the ice.

A further object is to provide a base portion of such a machine which can easily be broken down into its component parts for easy cleaning or repair.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a front elevational view of the ice dispensing machine of the present in invention.

FIG. 2 is a sectional view taken as on the line II—II of FIG. 1.

FIG. 3 is a sectional view taken as on the line III—III of FIG. 2.

FIG. 4 is a sectional view taken as on the line IV—IV of FIG. 3.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The ice dispensing machine 11 of the present invention comprises in general a filling mechanism or base portion 13 and a single hopper 15 or a plurality of hoppers 15 stacked on top of one another and supported on base portion 13.

Base portion 13 includes a housing 17 preferably integrally formed of plastic or the like having spaced front and back panels 19, 21 and spaced side panels 23, 25. Panels 19 and 21 and panels 23 and 25 respectively slope inwardly and upwardly towards one another for the greater portion of their lengths, and then adjacent the upper end of housing 17 the panels 19, 21, 23 and 25 extend vertically upwardly. At the juncture of the sloping portions of the panels and the vertically extending portions there is provided a shoulder 27 around the inside of the housing 17. In other words, the vertically extending portion is somewhat offset outwardly from the upper ends of the sloping portions to provide the shoulder 27 and to provide the upwardly directed and upwardly opening socket 29, for a purpose later to be described.

A frame assembly 31 is provided in the interior of housing 17 and is preferably constructed as follows: A pair of parallel spaced apart transverse members 33 extends across the lower part of housing 17. At the opposite ends the transverse members 33 are upturned as at 33' and are respectively removably attached to side panels 23, 25 as by the bolt-nut assemblies 35 which extend through aligned apertures in the upturned portions 33' and the panels 23, 25. A pair of vertical support members 37 are provided in spaced relationship along each of transverse members 33 and are respectively removably attached thereto as by the bolt-nut assemblies 39 extending through aligned apertures in the laterally extending lower end portions 37' of members 37 and in the transverse members 33. Frame assembly 31 includes a channel-like frame 41 that includes a horizontal bottom portion 41' and spaced upstanding side portions 41'' integrally attached to and upstanding from the side edges of bottom 41'. Frame 41 is sup-

ported from vertical support members 37 and removably fixedly attached thereto as by means of bolt-nut assemblies 43 respectively extending through aligned apertures in the upper ends of support members 37 and sides 41''.

An endless conveyor belt 45 which is flexible and formed from a suitable material, as rubber, flexible plastic or the like, extends over a pair of horizontally disposed spaced rollers 47, 49. Rollers 47, 49 are substantially identical in construction and include a plurality of radially extending and circumferentially spaced lugs 51 that extend outwardly from the main body portion 53 of the rollers. The lugs 51 preferably extend the length of the rollers and are adapted to engage corresponding lugs 55 which extend inwardly from belt 45 in spaced relationship along the interior of the belt. It will be understood that lugs 51 and 55 may be omitted without departing from the spirit and scope of the present invention, in which case there will be a frictional drive. On the exterior of belt 45 are a plurality of outwardly projecting ribs 57 that extend transversely of the belt and in spaced relationship along the length of the belt. It will be understood that ribs 57 may be omitted without departing from the spirit and scope of the present invention. Rollers 47, 49 are respectively fixedly mounted on shafts 61, 63 that are in turn rotatably supported from frame 41 as by extending the ends of the shafts through apertures in side portions 41'' and are held therein by suitable means. A gear 65 is keyed to shaft 61 and is driven by a larger gear 67 by means of an endless chain 69 extending over gears 65, 67. Gear 67 is keyed to a shaft 71 that in turn is rotatably mounted from a vertical plate 73 fixedly attached to frame 41 as by welding or the like with the shaft 71 extending through an aperture in plate 73 and outwardly through an aperture in side panel 25. A hand crank 75 is fixedly attached to shaft 71 so that by turning the hand crank, roller 47 can be turned counterclockwise as viewed in FIG. 4 to cause the upper flight of belt 45 to move forwardly or to the left as viewed in FIGS. 2 and 4. It will be understood that if desired, handle 75 may be replaced by an electric motor geared to accomplish the desired motion, and a suitable switch may be mounted so as to be engaged by the container being filled with ice, in a manner known to those skilled in the art. A picket 77 is provided in base portion 13 above belt 45 adjacent roller 47. Picket 77 includes a shaft 79 that rotatably extends through apertures in frame 41 and is provided along the length thereof with paddle-like fingers 81 which are disposed at 90° intervals, as viewed in FIG. 4, and are staggered along the length of the shaft 79 as viewed in FIG. 3. A gear 83 is keyed to shaft 79 and engages a gear 84 keyed to shaft 61 so that when the hand crank 75 is turned as heretofore-described, picket 77 will turn clockwise as viewed in FIG. 4 for a purpose later to be described.

An intermediate portion of front panel 19 is depressed or set inwardly to provide a vertical part 85 of front panel 19 with the triangular-shaped portions 87 connecting vertical part 85 with the remaining portion of front panel 19. The lower part of vertical part 85 is cut away to provide an opening 89 which is removably closed by a metal grille 91 removably held in place as by screws 93 or the like so that access can be gained into the interior of housing 17. A drip pan 95 is provided in base portion 13 and supported on transverse members 33 beneath frame 41.

An opening 97 is provided in front panel 19 above vertical part 85 and into which fits a funnel-like exit member 99. Exit member 99 is provided with a pair of tabs 101 along the upper edge thereof which respectively extend through notches 103 in front panel 19 adjacent opening 97 with the tabs 101 extending upwardly on the back side of front panel 19 to removably hold the exit member 99 in place. The upper mouth opening 105 of exit member 99, when in place, is disposed adjacent roller 47 and the lower mouth opening 107 extends outwardly beyond front panel 19 as best seen in FIG. 2.

Hoppers 15 are substantially identical in construction and the following description of a hopper 15 will suffice for all. Hopper 15 includes spaced apart parallel and vertical front and back panels 109, 111 and spaced apart vertical side panels 113, 115 integrally attached along the opposite edges thereof to the edges of front and back panels 109, 111. At the lower part of hopper 15 front panel 109 slopes inwardly and downwardly for a portion as at 117. sloping portion 117 is provided with a transverse slot 119 and side panels 113, 115 are provided with grooves 121 at the same horizontal level as slot 119. Additionally, back panel 111 is provided with a groove 123 thereacross at this same level. A gate member 125 is provided which includes a horizontally disposed plate portions 127 and a sloping handle portion 129 across one end thereof and sloping upwardly and outwardly from plate portions 127. Gate member 125 is adapted to close the open bottom 131 of hopper 15 by extending gate member 125 through slot 119 and sliding the side edges of the gate member in the grooves 121 until the rearward edge 133 is housed in groove 123, at best seen in FIG. 2, wherein it will be seen the sloping handle portion 129 is adjacent sloping portion 117 and is inwardly of the main body portion of front panel 109. The upper ends of panels 109, 111, 113, and 115 are offset outwardly to provide an upwardly facing shoulder 135 and an enlarged upwardly extending mouth portion 136 adapted to receive the lower end of another hopper 15, as best seen in FIGS. 1 and 2. Around the outside periphery of hopper 15 and spaced upwardly from the lower edge thereof, the hopper is thickened to provide a downwardly facing shoulder 137 adapted to engage the upper edge of another hopper therebelow on which it is stacked to act as a stop and as a shield to prevent dirt, dust and the like from getting into the interior of hoppers 15. Outwardly extending flanges 138 are provided adjacent the upper end of hopper 15 to serve as handles. Preferably substantially the entire hopper 15 is integrally formed of an insulating material, such as styrofoam plastic. A top 139, also preferably formed of the same material, is provided to fit on the uppermost one of hoppers 15.

In utilizing the ice dispensing machine 11 of the present invention, one or more hoppers 15 are filled with ice, as by the attendant, who then brings the hoppers to the location of the base portion 13. In placing the lowermost one of hoppers 15 into base portion 13, the lower edge of back panel 111 is placed into socket 29 and the hopper is tilted slightly backwardly so that handle portion 129 of gate member 125 is exposed. The attendant then pulls outwardly on the handle por-

tion 129 to remove gate member 125 and then allows the hopper to move to a vertical position with the shoulder 137 of the hopper being seated against the top edge of housing 17. With the removal of the gate member 125, the ice will fall downwardly onto the belt 45. If desired, another hopper 15 may be placed on the lowermost hopper, in the same manner that the lowermost hopper 15 was placed in socket 29 and the gate member 125 is removed in the same manner. The top 139 is then placed on the uppermost hopper 15. When it is desired to dispense the ice, a container, not shown, is placed beneath mouth opening 107 and the hand crank 75 turned to cause the upper flight of the conveyor belt 45 to move the ice horizontally and forwardly and into the upper mouth opening 105 where it slides down through the exit member 99 into the container. It will be understood that the picket 77 will break the ice up into smaller pieces, as with crushed ice, or will pull the ice out one cube at a time, as with cubed ice. Thus, clogging of the exit member 99 is eliminated. It will be understood that for cubed ice, the picket 77 should be disposed at a greater distance from the belt 45 than with crushed ice. For this purpose, different diameters of gears 83 may be utilized with corresponding apertures in frame 41 to accommodate the difference in heights of the shaft 79 with different sizes of gears 83.

Although the present invention has been described with reference to a preferred embodiment thereof, it will be understood that it is not to be so limited since changes and modifications may be made therein which are within the full intended scope of this invention.

I claim:

1. An ice dispensing machine comprising an endless conveyor belt for moving the ice horizontally, a roller-frame assembly supporting said conveyor belt, housing means for encasing said roller-frame assembly and said conveyor belt, at least one removable hopper means for containing a supply of ice and having an open bottom portion thereof so as to allow a gravitational passage of ice therethrough, said hopper means being provided with an upwardly directed opening for receiving the ice, gate means closing said open bottom portion of said hopper means, said gate means being operable from a closed position for preventing passage of ice therethrough to an open position thereby allowing the gravitational passage of ice therethrough, said housing means being provided with an upwardly directed socket means for removably receiving the lower end of said hopper means so that the ice passing through said open bottom of said hopper means is deposited on said conveyor means, exit means for dispensing said ice, said exit means having one end thereof adjacent the discharge end of said conveyor means, and drive means for driving the upper flight of said conveyor belt horizontally so that the ice received thereon is moved horizontally and discharged therefrom into said exit means; said hopper means including straight vertical back, front and side panels, and a downwardly and an inwardly sloped portion on the front of said hopper means and adjacent the lower edge thereof, and means defining opposing grooves adjacent the lower end thereof; and said gate means including a plate portion having the opposite side edges thereof received in said grooves and includes a sloping handle portion disposed adjacent said sloped portion of said hopper means.

2. An ice dispensing machine comprising an endless conveyor belt for horizontally moving the ice, a roller-frame assembly supporting said conveyor belt, housing means for encasing said roller-frame assembly and said conveyor belt, a plurality of stacked hopper means for containing a supply of ice, each of said hopper means having an upwardly opening mouth-like upper end and a downwardly opening lower end adapted to fit into the upper end of the subjacent one of said hopper means for allowing gravitational passage of ice therethrough, a plurality of removable gate means respectively closing the openings in said lower ends of said hopper means, each of said gate means being operable from a closed position for preventing passage of ice therethrough to an open position thereby allowing the gravitational passage of ice therethrough, said housing means being provided with an upwardly directed socket means for removably receiving the lower end of the lowermost one of said hopper means so that the ice passing through the open bottom of the lowermost one of said hopper means is deposited on the conveyor means, exit means for dispensing the ice, said exit means having one end thereof adjacent the discharge end of said conveyor means, and drive means for driving the upper flight of said conveyor belt horizontally so that the ice received thereon is moved horizontally and discharged therefrom into said exit means.

3. The machine of claim 5 wherein each of said hopper means includes straight vertical front, back and side panels, and a downwardly and inwardly sloped portion on one of said panels adjacent the lower end thereof, and means defining opposing grooves adjacent the lower end of said hopper; and wherein each of said gate means includes a plate portion having the opposite side edges thereof received in said grooves and includes a sloping handle portion disposed adjacent said sloped portion of said hopper means.

4. The machine of claim 6 in which is included picket means disposed above said conveyor belt adjacent said exit means for breaking up the ice.

5. The machine of claim 7 in which is included top means removably closing the uppermost one of said hopper means.

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