April 12, 1960 W. P. MANNHARDT 2,932,429

ICE DISPENSING MACHINE

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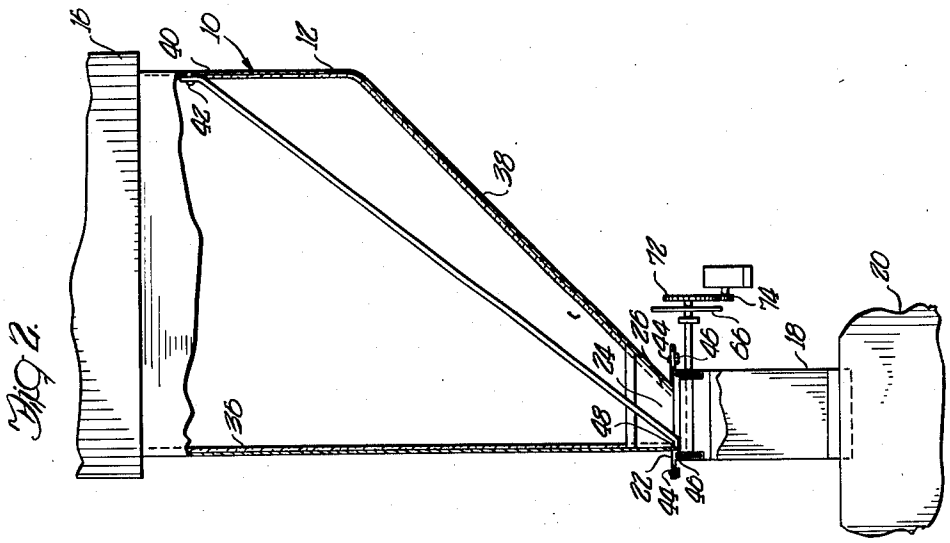


Fig. 2.

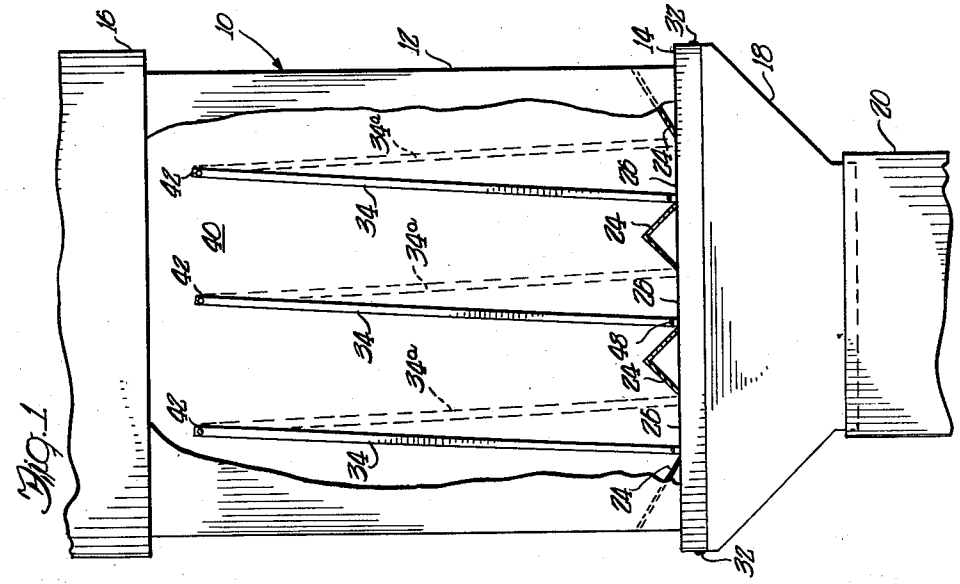


Fig. 1.

Inventor
Wilbert P. Mannhardt
George E. Frost
Attorney

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Fig. 3.

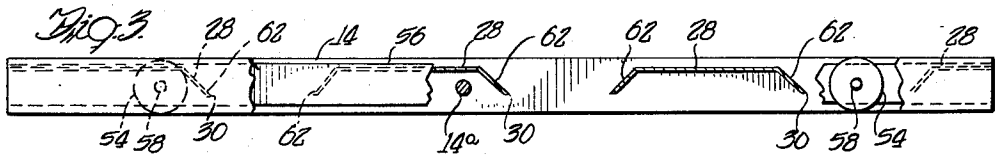


Fig. 4.

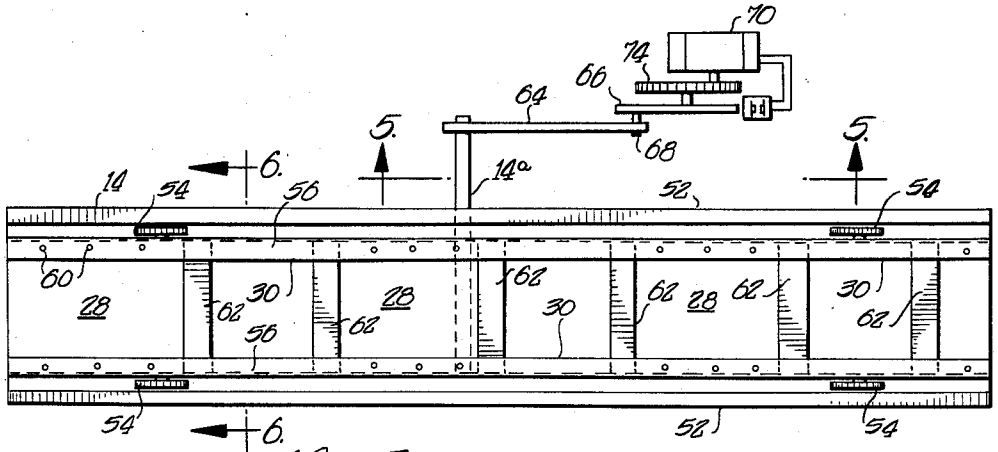


Fig. 5.

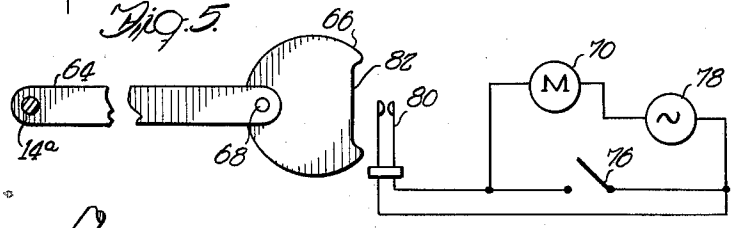
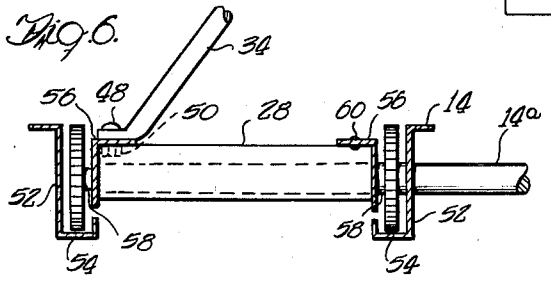


Fig. 6.



Inventor
Wilbert P. Mannhardt
George E. Frost
Attorney

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ICE DISPENSING MACHINE

Wilbert P. Mannhardt, Park Ridge, Ill.

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6 Claims. (Cl. 222—2)

My invention relates to an ice dispensing machine in which a movable carriage provided with ice dispensing windows coacts with a plurality of carriage operated agitators to dispense ice cubes or shaved ice.

In accordance with the present invention there is provided an insulated container, which stores ice cubes or shaved ice, with a base plate having a plurality of aligned ice dispensing openings. A movable carriage underlies the base plate and these openings and defines webs underlying the base openings when the carriage is in ice-holding position and ice dispensing windows underlying the base openings when the carriage is in ice-dispensing position. A plurality of agitators each have one end swingably mounted on the side of the container and the other end swingably mounted on the movable carriage rock in pendulum-like fashion when the carriage is moving between the ice-dispensing and ice-holding positions to agitate and loosen the ice cubes or shaved ice to assure discharge through the openings. These agitators move or rock in accord with the carriage movement and at a rate which does not cause the ice cubes to fracture or powder but will prod the ice gently.

The movable carriage is reciprocated by a motor through a crank mechanism. In a coin operated unit the motor is operated for a predetermined period upon insertion of a coin. At the end of this time the motor remains energized until the carriage reaches the ice-holding position.

It is, therefore, a general object of the present invention to provide an ice dispensing machine with a movable carriage having ice dispensing windows that coacts with a plurality of agitators to dispense ice cubes or the like.

It is a further object of the present invention to provide an ice dispensing machine having a plurality of agitators that coact with a movable carriage and which move in unison with the carriage and at a rate to gently prod ice cubes or the like to facilitate discharge of the same without fracture or powdering.

It is yet a further object of the present invention to provide a coin operated ice dispensing machine with an insulated container having base openings and a movable carriage with windows and webs of the same extent as the openings underlying the same whereby the carriage will reciprocate for a predetermined period of time after insertion of a coin, together with agitators connected to the carriage and operable in unison therewith to prod the ice free and assure discharge of a predetermined quantity of ice.

It is another object of the present invention to provide an ice dispensing machine having a movable carriage with ice dispensing windows defined by transverse webs underlying an insulated container having a base with ice dispensing openings, and a plurality of agitating rods swingably mounted at one end to the movable carriage and swingably mounted at the other end to one side of the container so that they are upstanding and span the width of the container and rock in unison with

the movable carriage to prod the ice free and assure discharge of the same.

It is still a further object of the present invention to provide an ice dispensing machine that is low in cost, reliable in operation and adapted for use with an ice making machine.

The novel features which I believe to be characteristic of my invention are set forth with particularity in the appended claims. My invention itself, however, together with further objects and advantages thereof will best be understood by reference to the following description taken in conjunction with the accompanying drawings in which:

Figure 1 is a front elevational view with parts broken away showing an ice-dispensing machine made in accordance with the present invention;

Figure 2 is a side elevational view with parts broken away of the ice-dispensing machine shown in Figure 1;

Figure 3 is an enlarged side elevational view of the movable carriage of the machine of Figures 1 and 2, with parts broken away;

Figure 4 is a top plan view of the movable carriage shown in Figure 3;

Figure 5 is a fragmentary, cross-sectional view taken through 5—5, Figure 4, together with a diagram of a coin operating circuit for the ice-dispensing machine of Figures 1–4; and

Figure 6 is an enlarged cross-sectional view taken through axis 6—6, Figure 4, showing one of the agitators of the machine of Figures 1–5.

An ice-dispensing machine made in accordance with the present invention is shown generally at 10, Figures 1 and 2. An insulated container 12 is mounted on a movable carriage 14. Ice cubes or shaved ice manufactured by a suitable unit 16 mounted on insulated container 12 by suitable means (not shown) supplies the container 12 with ice. The entire ice-dispensing unit in turn is mounted on a hopper 18 by means of sheet metal screws 32 and directs the ice cubes or shaved ice into a pail or bucket 20 sitting therebeneath. The base 22 of the insulated container 12 is provided with baffles 24 which may be welded to the base or may be attached thereto by any other suitable means (not shown). These baffles 24 define ice dispensing openings 26 in the base plate 22 through which the ice cubes or shaved ice are discharged. It will be noted that the baffles 24 are of triangular shape in cross-section to direct the passage of the ice cubes or shaved ice into the openings 26.

The movable carriage 14 is provided with transverse webs 28 which define ice dispensing windows 30, both being of the same extent as openings 26 in base plate 22. When the movable carriage is in ice-dispensing position, the windows 30 underlie the openings 26 in base plate 22. When the movable carriage is in ice-holding position, the webs 28 underlie the openings 26 in base plate 22. In this manner flow of the ice products can be effectively controlled by the movable carriage.

It is well known that ice is very brittle and easily damaged. It is also well known that adjacent ice cubes or shaved ice in a container have a tendency to join which makes it very difficult to pass through the rather restricted openings in an ice-dispensing machine. In order to assure passage of ice through the openings 26 there is provided a plurality of agitators 34 which are shown in Figures 1, 2, and 6 in the form of elongated rods. It is to be understood, however, that I do not limit my invention merely to the use of rods but that the agitators may take any feasible form dependent upon the design preferences of the user. Many alternative forms will provide the agitating service that the rods 34 do.

The rods 34 are swingably mounted at one end on the insulated container 12 and are swingably mounted on the movable carriage 14 at the other end. When the carriage reciprocates the rods 34 rock in unison with the carriage 14. The agitators 34 move at a rate that will not cause the ice to fracture or powder and be reduced to a volume smaller than that manufactured in the ice making machine 16. The agitators 34 perform the function of separating ice cubes which have become attached to one another and therefore allows the individual cubes to pass through the openings 26 and 30 into the hopper 18. The container 12 is insulated by means of any commercially suitable insulation 36 for the container acts as a storage device while the ice-dispensing unit is not in operation.

It will be noted that the container 12 has one sloping side 38 which is in a plane generally parallel to the plane in which the agitators 34 operate. The purpose of having at least one side of the container 12 in a sloping relationship with the other sides is twofold. First, it defines a rather narrow mouth as shown in Figure 2 and secondly acts as a slide for the ice cubes or shaved ice which is stored by the container 12. The agitators 34 are swingably mounted on vertical side plate 40 by rivets 42. The other end of agitators 34 are swingably mounted on movable carriage 14 by bolts 48 and nuts 50, as shown in Figures 1, 2, and 6. The agitators 34, therefore, are upstanding in relation to base plate 22 and span the width of the container 12.

The movable carriage 14 is shown in detail in Figures 3, 4, and 6. It consists of two fixed guideways 52 in the form of U-shaped channels in spaced co-extensive relation to one another. Channels 52 underlie container 12 and are attached thereto by bolts 44 and nuts 46 as shown in Figures 1 and 2. The channels 52 act as guideways for rollers 54 which are rotatably mounted on angle plates 56 by means of shafts 58. Angle plates 56 serve as the mounting unit for agitators 34 (by means of nuts 48 and bolts 50) and for webs 28 by means of rivets 50 as shown in Figures 4 and 6. The webs 28 have a truncated pyramidal cross-sectional shape as shown in Figure 3 and thereby define beveled edges 62. As has been discussed hereinbefore these webs 28 are so spaced that they define ice-dispensing windows 30 between each other of at least the same extent as the base openings 26 in base plate 22. In the construction thus far described it is apparent that angle plates 56 are movable with respect to channels 52. This motion is accomplished by means of a motor operating through a crank mechanism as is best seen in Figures 4 and 5.

Carriage link 14*a* is fixedly supported and mounted in angle plates 56 at one end and is rotatably mounted in crank arm 64 at its other end. Crank arm 64, in turn, is rotatably mounted on cam 66 by means of pin 68. The cam 66 derives its motion from motor 70 through pinion 72 and reduction gear 74 as best seen in Figures 2 and 4. It will be noted that the reciprocating path defined by the displacement of carriage link 14*a* is of sufficient extent to shift the carriage 14 between an ice-holding position where webs 28 underlie openings 26 in base plate 22 and an ice-dispensing position where windows 30 underlie openings 26. The agitators 34 which are mounted on angle plates 56 move in unison with and will rock at a rate proportional to the linear displacement of carriage link 14*a*.

As shown in Figure 1 the solid lines designating agitators 34 define the ice-disposing position of carriage 14, and the dotted lines 34*a* define the ice-holding position of carriage 14*a*. Because the motion imparted to carriage 14 by means of carriage length 14*a* is of a reciprocating nature the agitators 34 will rock back and forth between the solid lines and the dotted lines as shown in Figure 1. This motion gently prods and separates the ice cubes or shaved ice which are joined while resting in the container 12. The rate of displacement of agitators 34 is of a value insufficient to fracture or powder the ice cubes. Consequently reduction gear 72 is of such a size that will produce this critical rate of angular displacement of agitators 34.

The ice-dispensing machine 10 is coin operated so that insertion of a suitable coin will operate the machine for a predetermined time. As best seen in Figure 5, switch 76 will close upon deposit of a coin and supplies current to the motor 70 from the source 78 which may be any commercial outlet situated in the place which houses the ice-dispensing machine 10. The rotating motion of motor 70 is transmitted from pinion 74 to reduction gear 72 to cam 66 which in turn operates crank 64 which creates the reciprocating motion of carriage link 14*a*. When the predetermined time has expired switch 76 will open. However, motor 70 will be supplied current by means of spring switch 80 until the cam 66 is in the position shown in Figure 5. The purpose of this construction is to insure that the webs 28 underlie the base opening 26 in base plate 22 (the ice-holding position of carriage 14) at the time the machine is not in operation. If the switch 76 is opened at a time when the carriage 14 is not in the ice holding position, the spring switch 80 will be closed because it will be riding on the circular periphery of cam 66. As the cam continues to rotate, cutout portion 82 will be approaching the position of the spring switch 80. When the cutout is in the position as shown in Figure 5 the contacts of the switch 80 spring open, deenergizing motor 70. Consequently, carriage 14 is always in ice-holding position when the ice dispensing machine 10 is deenergized.

While I have described and shown a specific embodiment of the present invention it will, of course, be understood that various modifications and alternative constructions may be made without departing from the true spirit and scope thereof. I therefore intend by the appended claims to cover all such modifications and alternative constructions falling within their true spirit and scope.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. An ice dispensing machine for use with a machine for making ice cubes or the like comprising in combination: an insulated container adapted to house ice cubes or the like and having a base plate with an ice dispensing opening; a chute spaced immediately below said opening to receive said cubes or the like from said opening when the space therebetween is unobstructed; a movable carriage immediately underlying said base plate and having an ice dispensnig window and a closure web of at least the extent of said ice dispensing opening, said window and said web being positioned on said carriage for alternative movement into said space; means to impart reciprocating motion to said movable carriage to shift the same between an ice-holding position with the web in said space underlying said ice dispensing opening and an ice-dispensing position with the ice dispensing window in said space underlying said ice dispensing opening; and an agitating rod swingably attached at one end to said container at a point elevated in relation to said base plate and swingably attached at the other end to said movable carriage whereby the agitating rod is rocked in unison with the reciprocation of said movable carriage to prod the ice gently to discharge the same at uniform rate without fracture or powdering.

2. An ice dispensing machine for use with a machine for making ice cubes or the like comprising in combination: an insulated container adapted to house ice cubes or the like and having a base plate with a plurality of ice dispensing openings; a chute spaced immediately below said openings to receive said cubes or the like from said openings when the space therebetween is unobstructed; a movable carriage immediately underlying said base plate and having a plurality of ice dispensing windows and closure webs of at least the extent of said ice dispensing openings, said windows and said webs being positioned on said carriage for alternative movement into

said space; means to impart reciprocating motion to said movable carriage to shift the same between an ice-holding position with the webs in said space underlying said ice dispensing openings and an ice-dispensing position with the ice dispensing windows in said space underlying said ice dispensing openings; and agitating rods swingably attached at one end to said container at a point elevated in relation to said base plate and swingably attached at the other end to said movable carriage whereby the agitating rods are rocked in unison with the reciprocation of said movable carriage to prod the ice gently to discharge the same at uniform rate without fracture or powdering.

3. An ice dispensing machine for use with a machine for making ice cubes or the like comprising in combination: an insulated container adapted to house ice cubes or the like having a base plate with ice dispensing openings and having at least one sloping side in relation to the other sides; a chute spaced immediately below said openings to receive said cubes or the like from said openings when the space therebetween is unobstructed; a movable carriage immediately underlying said base plate and having ice dispensing windows and closure webs of at least the extent of said ice dispensing openings, said windows and said webs being positioned on said carriage for alternative movement into said space; means to impart reciprocating motion to said movable carriage to shift the same between an ice-holding position with the webs in said space underlying said ice dispensing openings and an ice-dispensing position with the ice dispensing windows in said space underlying said ice dispensing openings; agitating rods each swingably attached at one end to one side of the container and swingably attached at the other end to said movable carriage whereby the agitating rods are rocked in unison with the reciprocation of said movable carriage in a plane spanning said container and generally parallel to said sloping side to prod the ice gently to discharge the same at a uniform rate without fracture or powdering.

4. A coin operated ice dispensing machine for use with a machine for making ice cubes or the like comprising in combination: an insulated container adapted to house ice cubes or the like and having a base plate with ice dispensing openings; a chute spaced immediately below said openings to receive said cubes or the like from said openings when the space therebetween is unobstructed; a movable carriage immediately underlying said base plate and having ice dispensing windows and webs of at least the extent of said ice dispensing openings, said windows and said webs being positioned on said carriage for alternative movement into said space; coin operated means to impart reciprocating motion for a predetermined time to said movable carriage to shift the same between an ice-holding position with the webs in said space underlying said ice dispensing openings and an ice-dispensing position with the ice dispensing windows in said space underlying said ice dispensing openings; agitating means rocking in unison with the reciprocation of said movable carriage to prod gently the ice to discharge the same at a uniform rate without fracture or powdering; and means to continue the reciprocations of the carriage after said time until it is restored to the ice-holding position.

5. A machine for dispensing a particulate material such as ice cubes or the like, said device comprising: a frame; a container mounted on said frame and adapted to house said material, said container having a base plate with a material dispensing opening; means spaced immediately below said opening to receive said material from said opening when the space therebetween is unobstructed; a movable carriage mounted on said frame and having a closure web of at least the extent of said ice dispensing opening, said web being movable on said carriage with respect to said container to move into and out of said space to obstruct and permit, respectively, the flow of said material from said container to said means; an agitating rod swingably attached at one end to said container at a point elevated in relation to said base plate and swingably attached at the other end to said carriage whereby the rod is moved in unison with the movement of said carriage to prod the material gently to discharge the same at uniform rate without fracture or powdering; and power means operatively connected to said carriage to move said web into and out of said space.

6. A machine for dispensing a particulate material such as ice cubes or the like, said device comprising: a frame; a container mounted on said frame and adapted to house said material, said container having a base plate with a material dispensing opening; means spaced immediately below said opening to receive said material from said opening when the space therebetween is unobstructed; a movable carriage mounted on said frame and having a web of at least the extent of said ice dispensing opening, said web being movable on said carriage with respect to said container to move into and out of said space to obstruct and permit, respectively, the flow of said material from said container to said means; an agitating rod swingably attached at one end to said container at a point elevated in relation to said base plate and swingably attached at the other end to said carriage whereby the rod is moved in unison with the movement of said carriage to prod the material gently to discharge the same at uniform rate without fracture or powdering; and power means operatively connected to said carriage to move said web into and out of said space when said power means is energized, said power means including a control means effective to deenergize said control means only when said web is in said space.

References Cited in the file of this patent

UNITED STATES PATENTS

908,700	Rush	Jan. 5, 1909
1,413,428	Riley	Apr. 18, 1922
1,974,988	Hillstrom	Sept. 25, 1934
2,237,189	McCormack et al.	Apr. 1, 1941
2,668,636	Martin	Feb. 9, 1954