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MANUFACTURE OF SNOW ICE

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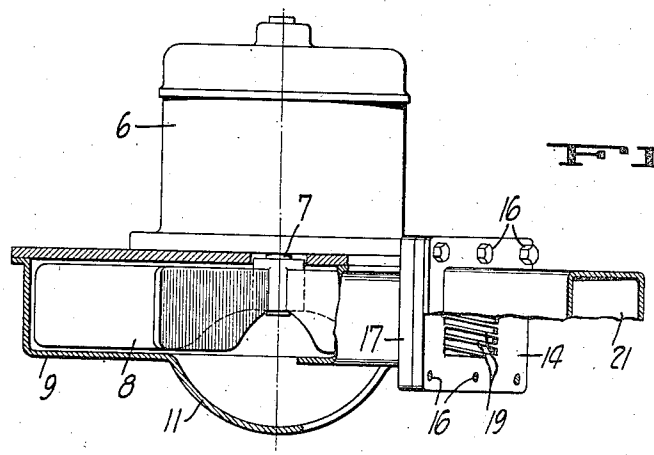


FIG. 1

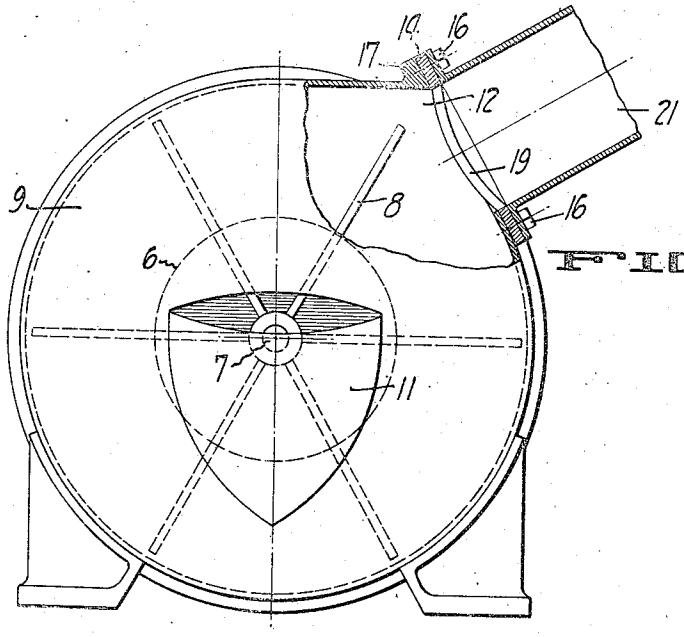


FIG. 2

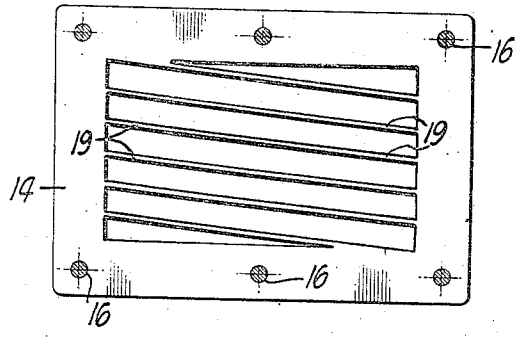


FIG. 3

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MANUFACTURE OF SNOW ICE

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3 Claims. (Cl. 83—63)

This invention relates to a machine for producing snow ice from crushed ice.

In the packing of lettuce for shipment it is usual to place several layers of lettuce in a crate with a layer of ice interposed between each layer of lettuce, and with a top layer of ice on the uppermost layer of lettuce. The crate top is then placed in position and nailed down. The crate lid placing and nailing is usually conducted in a machine which forces the lid down positively, compressing the contents of the crate with considerable force. It has been found that with ordinary crushed ice, that delivered from the usual ice crusher, considerable bruising of the lettuce results. The bruised areas decay in the course of a few days and impart a very objectionable appearance to the lettuce. Usually upon arrival the bruised leaves must be removed. This necessitates rehandling the lettuce as well as stripping of many of the outer leaves off the lettuce. The trade therefore has turned to the utilization of snow ice because with the ice in more finely divided form, upon the lid being placed in position upon the crate bruising of the lettuce is greatly reduced, if not entirely eliminated. The claim is made by some that snow ice lasts longer in the crate than crushed ice. While the packing of lettuce has been specifically discussed, the problem presented is common to many other products.

Ice is reduced in size only with difficulty and the production of snow ice from either block ice or previously crushed ice presents a problem which has long troubled the trade. Thus, it is not economically possible to produce snow ice from ordinary ice crushers or from the usual mills employed for comminuting material. It is in general the broad object of the present invention to provide a simple but very efficient machine for the production of snow ice from crushed ice.

This invention includes other objects and features of advantage, some of which, together with the foregoing broadly stated object, will appear in the following wherein the present preferred form of snow ice machine of this invention is disclosed.

In the drawing accompanying and forming a part hereof

Figure 1 is a plan view partly in section of the machine of my invention.

Figure 2 is a side elevation.

Figure 3 is a plan view of the screen grill or grid employed.

In accordance with this invention I provide a suitable power unit such as the electric motor which I have indicated generally at 6. In place of this motor any other suitable prime mover can be employed. The motor usually includes a drive shaft indicated at 7, upon which is mounted a suitable rotor 8. The rotor includes a plurality of flat blades, usually six, cooperating with a concentrically placed outer casing 9. A suitable inlet is provided by a hopper 11 which directs the crushed ice delivered from a suitable source as an ice crusher or a conveyor therefrom into the casing to the center of the rotor. Upon rotation of the rotor at about 1800 R. P. M. the ice is thrown out by centrifugal force to discharge through tangential outlet 12.

In accordance with this invention I mount across the discharge opening 12 a suitable plate 14, bolts 16 retaining this plate in place upon a suitable flange 17 on the casing 9. The plate 14 includes an opening therein, and across this opening is provided a plurality of spaced members 19 providing a grill, grid, or screen. The ice is discharged off the face of any one of the vanes on the rotor with very considerable kinetic energy so that it is thown forcefully against the grill, grid, or screen and thereupon is cut, broken, or shattered and, as it passes through the grill, grid or screen, is reduced in size to what is known in the trade as snow ice.

The plate 14 is placed at an angle across the discharge 12 so that its outer edge, that adjacent the retreating rotor edge, is close to, or wipes this edge of the rotor. The spaced members 19 are usually about ⅜ inch apart. I have made them of ⅛ inch by ⅜ inch bars placed on edge with a ⅜ inch apart, the bars being welded in place with a slight rake and curved inwardly slightly toward the rotor. This placement gives a cutting action on ice between the rotor and the grill.

For the purposes of this invention snow ice is defined as ice in which each particle is of a size such that it will pass through a screen having an opening not over ⅜ inch along each side.

After discharge of snow ice through the grill 19 into pipe 21 it is led away to a point of use or to a suitable screw conveyor or otherwise discharged as desired. The snow ice has sufficient energy so it can be discharged at some distance from the machine without further power input.

I claim:

1. A machine for producing snow ice from crushed ice comprising a substantially flat bladed multivaned rotor, a casing about the rotor, an inlet to said casing and to said rotor, an outlet on the periphery of said casing, and a grill over said outlet for receiving and comminuting ice thrown off the rotor, said grill including a plu-

rality of spaced members extending generally parallel to the plane of rotation of said rotor but at a slight angle thereto, said spaced members having their ends at one end of the grill spaced from said rotor to permit ice to enter between the rotor and the members, said members extending from said end in toward the rotor in the direction of rotor rotation and at least over a portion of their length substantially to engage the rotor whereby the rotor is effective to force ice, initially between the members and the rotor, finally between the members.

2. A machine for producing snow ice from crushed ice comprising a substantially flat bladed multivaned rotor, a casing about the rotor, an inlet to said casing and to said rotor, an outlet on the periphery of said casing, and a grill over said outlet for receiving and comminuting ice thrown off the rotor, said grill including a plurality of spaced members extending generally parallel to the plane of rotation of said rotor but at a slight angle thereto and with one end of said members closely adjacent to the retreating edge of said rotor and with the other end of said members spaced from said rotor edge.

3. A method of reducing crushed ice to snow ice by impact shattering and comminution on a stationary member having a plurality of openings therein of restricted size to pass only snow ice, said method comprising discharging crushed ice, after imparting substantial kinetic energy thereto, against said stationary member on which the ice impinges and shatters while simultaneously moving the ice positively across said openings to force the ice through said discharge openings and thereby effect further comminution of the ice.

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