June 9, 1964 H. O. KEMPTON 3,136,454

FLAKED ICE DISPENSER

Filed Aug. 4, 1961 3 Sheets-Sheet 1

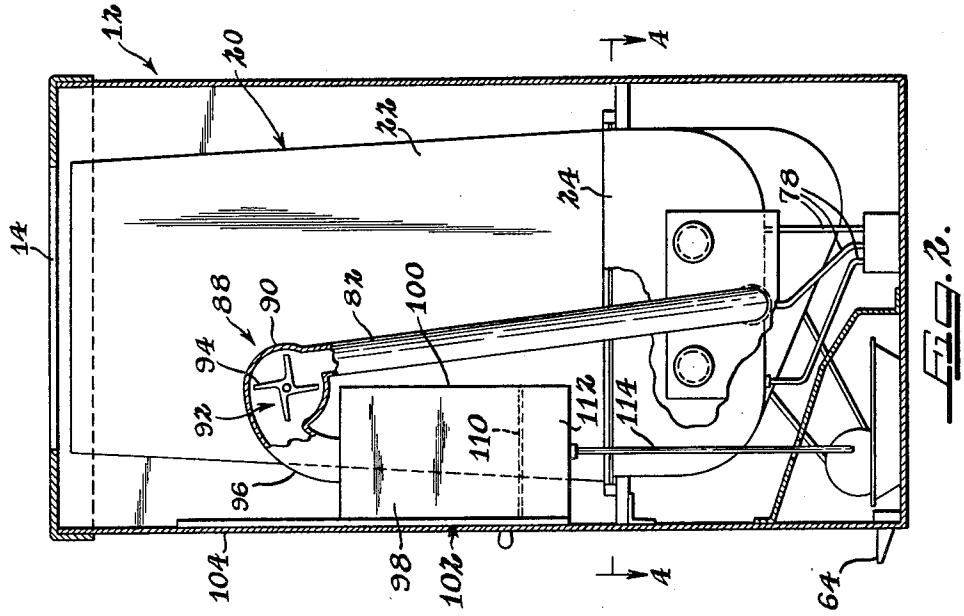



Fig. 2.

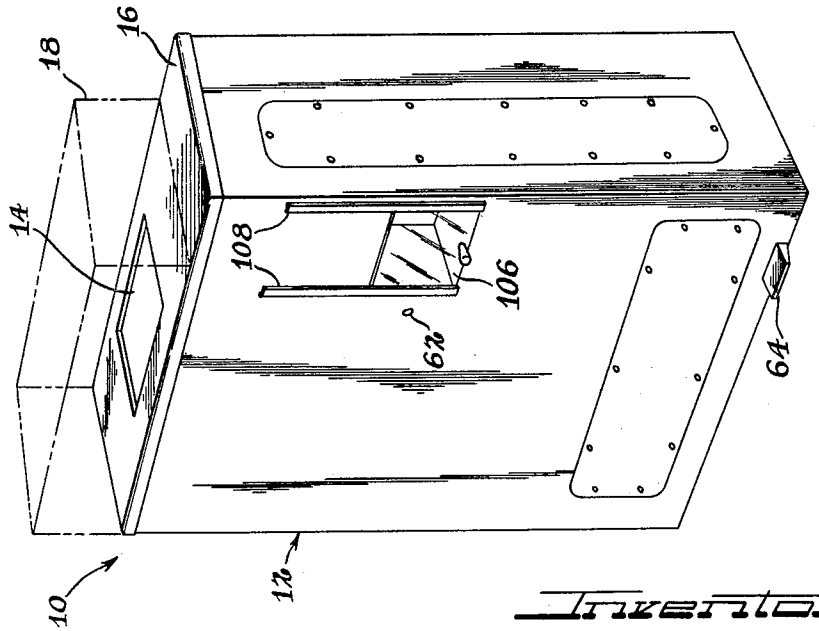



Fig. 1.

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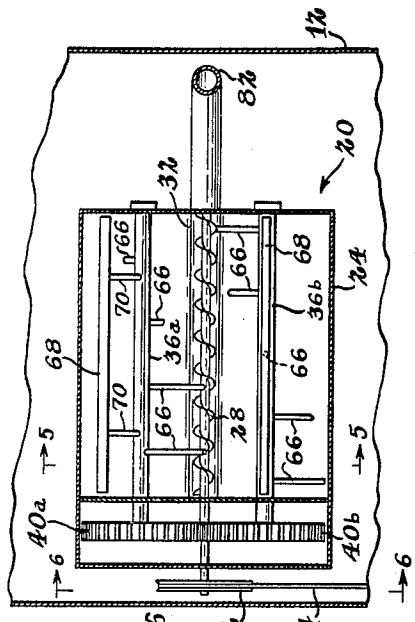



FIG. 4.

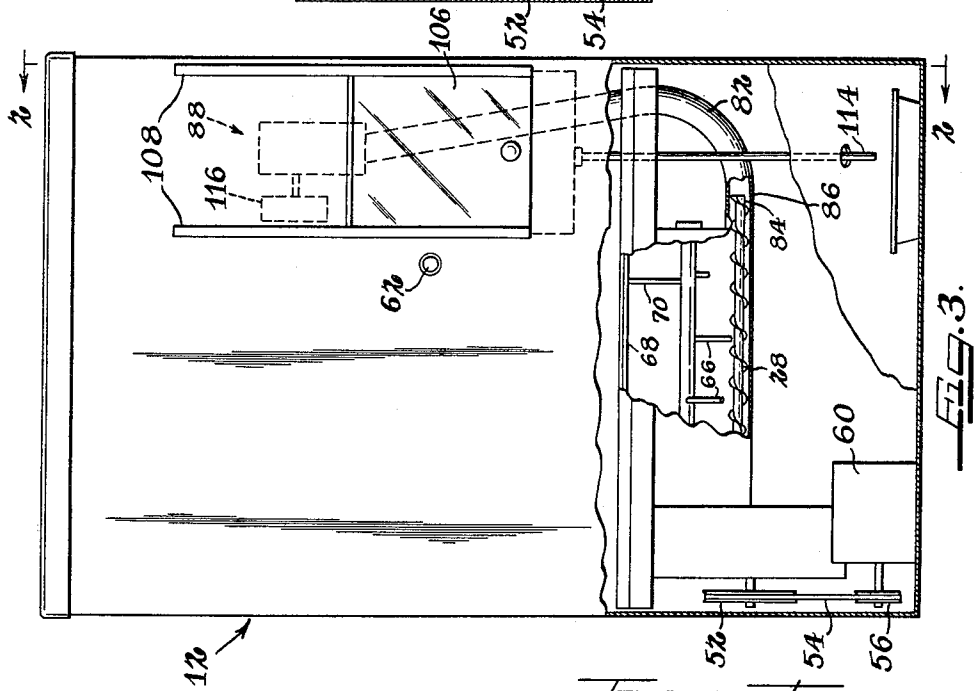



FIG. 3.

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Fig. 5.

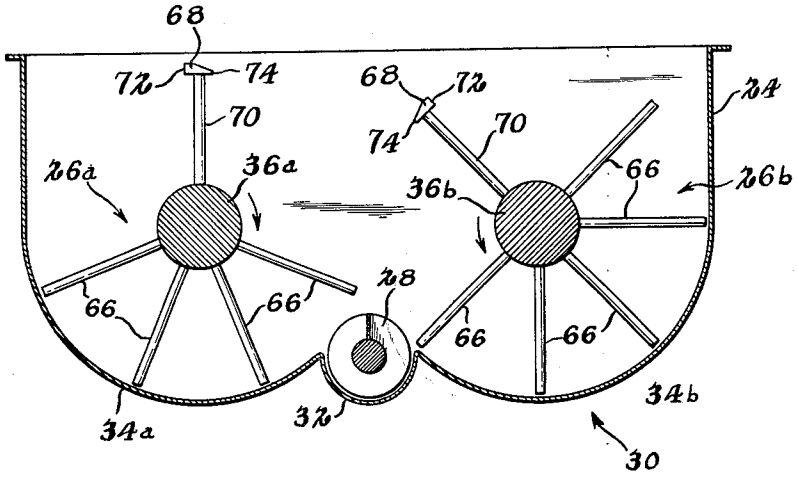
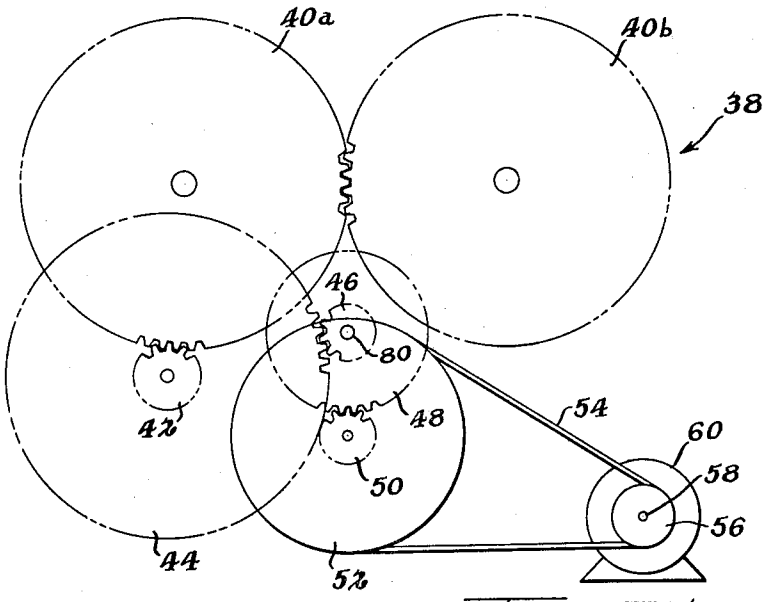



Fig. 6.




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3,136,454

# FLAKED ICE DISPENSER

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6 Claims. (Cl. 222—227)

This invention relates to a new and improved machine adapted to dispense ice supplied to the machine in the form of flakes.

One object of the present invention is to provide a new and improved dispensing machine adapted to receive a relatively large quantity of ice in the form of flakes from existing equipment of the type which produces ice flakes on a continuous basis, the dispensing machine being adapted to deliver the flaked ice as needed into a pitcher, bucket or the like.

A further object is to provide a new and improved dispensing machine of the foregoing character in which the ice flakes are stored in a hopper or bin and are raised from the lower end of the hopper to an elevated discharge spout by a conveyor system which may be operated as needed to deliver the desired quantity of flaked ice.

Another object is to provide a dispensing machine of the foregoing character in which the conveyor system includes a tube leading from the lower end of the hopper, a feed screw for pushing the flaked ice into the tube and upwardly through the tube, an agitator in the hopper to provide a steady flow of the ice flakes to the screw, and a device at the upper end of the tube for reflaking the ice and delivering it to the discharge spout.

A further object of the present invention is to provide a new and improved dispensing machine of the foregoing character in which the agitator includes means for stirring the flaked ice in the hopper, and also means for chopping up any balls of ice which may tend to form in the hopper.

A further object is to provide such a new and improved dispensing machine in which the feed screw extends into the tube leading from the hopper so that the ice will be pushed into the tube in a positive manner.

Further objects and advantages of the present invention will appear from the following description, taken with the accompanying drawings, in which:

FIG. 1 is a general perspective view of flaked ice dispenser to be described as an illustrative embodiment of the present invention.

FIG. 2 is an elevational section, taken generally along a line 2—2 in FIG. 3.

FIG. 3 is a front view of the dispenser with various parts broken away and shown in section.

FIG. 4 is a fragmentary horizontal section, taken generally along a line 4—4 in FIG. 2.

FIG. 5 is a fragmentary elevational section, taken generally along a line 5—5 in FIG. 4.

FIG. 6 is a fragmentary diagrammatical elevational view showing details of the drive for the dispensing machine, the view being taken generally as indiacted by the line 6—6 in FIG. 4.

As already indicated, the drawings illustrate a machine 10 for dispensing ice in the form of flakes. As shown in FIG. 1, the machine 10 has an outer housing or cabinet 12, which is generally rectangular in form. The ice flakes may be delivered to the machine 10 by an ice-making machine of the well-known type adapted to supply ice in the form of flakes or chips. The ice flakes are dropped into the machine 10 through an opening 14 in the upper wall 16 of the cabinet 12. The ice-making machine may be placed on top of the cabinet 12 over the opening 14, as indicated by the outline 18*b* in broken lines in FIG. 1.

The flaked ice, which enters the machine 10 through



the opening 14, drops into a bin or hopper 20, which is mounted within the cabinet 12. To retard the melting of the ice, the bin 20 may be insulated with a suitable heat insulating material, disposed between the bin and the walls of the cabinet 12.

The illustrated bin 20 has an upper section 22 which flares downwardly so that the lower end of the upper section is wider than the upper end, as shown to advantage in FIG. 2. This construction facilitates the movement of the flaked ice downwardly through the bin 20 and tends to prevent the flaked ice from caking up and forming bridges across the walls of the bin.

The bin 20 has a lower section 24 which contains a pair of agitators 26*a* and 26*b*, and a feed screw 28. The lower section 24 has a bottom wall 30 which includes a central trough-shaped portion 32, in which the feed screw 28 is mounted, as shown to advantage in FIG. 5. The trough portion 32 is substantially semi-cylindrical in shape. It will be seen that the feed screw 28 fits closely within the trough portion 32.

The bottom wall also includes larger cylindrically curved trough portions 34*a* and 34*b*, in which the agitators 26*a* and 26*b* are mounted. The trough portions 34*a* and 34*b* are disposed on the opposite sides of the central trough portion 32.

It will be seen that the agitators 26*a* and 26*b* comprise shafts 36*a* and 36*b*, which are on the same horizontal level but are disposed over the trough portions 34*a* and 34*b*. The shaft portions 36*a* and 36*b* are adapted to be driven in opposite directions by a drive train 38, shown to best advantage in FIG. 6. In this case, the shaft 36*a* is driven clockwise, while the shaft 36*b* is driven counterclockwise.

The illustrated drive 38 comprises meshing gears 40*a* and 40*b* which are mounted on the shafts 36*a* and 36*b*. A pinion 42 meshes with a gear 40*a* and is secured to a gear 44. It will be seen that a pinion 46 meshes with the gear 44 and is secured to a gear 48. A pinion 50 drives the gear 48 and is connected to a pulley 52. A belt 54 connects the pulley 52 to a smaller pulley 56, mounted on the shaft 58 of an electric motor 60.

A push button switch 62 may be mounted on the front of the cabinet 12 to operate the motor 60. The operator actuates the switch 62 when flaked ice is to be disposed into a pitcher, bucket or the like. A foot pedal switch 64 may also be provided so that the operator may operate the machine when his hands are not free to operate the push button.

The agitator shafts 36*a* and 36*b* are formed with a plurality of stirring rods or spokes 66, which radiate from the shafts and are arranged in spiral patterns, as will be evident from FIGS. 4 and 5. The spokes 66 on the two shafts 36*a* and 36*b* mesh with each other so that the spokes on one shaft pass between the spokes on the other shaft. Any bridges or cakes that may tend to form in the flaked ice are immediately broken up so that the ice flows freely to the feed screw 28. It will be seen that the outer ends of the spokes 66 pass closely along the cylindrically curved trough portions 34*a* and 34*b*. The outer ends of the spokes also move closely past the screw 28. In this way, the spokes assist in breaking up any cakes of ice that may tend to form on the screw 28 and the inner walls of the trough portions 34*a* and 34*b*.

In addition, each of the agitator shafts 36*a* and 36*b* is provided with a cutting or chopping blade 68, which is mounted on the outer ends of a pair of spokes 70, extending radially from the shaft. The blades 68 extend parallel to the shafts 36*a* and 36*b*. As shown, each blade 68 has a relatively thick trailing edge 72 but tapers to a relatively thin leading edge 74. When the shafts 36*a* and 36*b* are rotated, the blades 68 swing around through the flaked ice and chop up any balls that may tend to

form in the ice. The blades 68 move closely past the screw 28 and the inner walls of the trough portions 34*a* and 34*b* and thus are effective to prevent ice from accumulating on the screw and the trough portions. The circular paths of the blades 68 overlap, but the blades are oriented so that they do not strike each other. Moreover, the blades are located so that they do not strike the spokes 66 on the opposite agitator. It will be seen that the spokes 66 are confined to approximately ½ of the radial space around each of the shafts 36*a* and 36*b*, and that the blades 68 are located in the other half of the space.

The combined stirring action of the rods 66 and cutting action of the blades 68 is much more effective in assuring a continuous flow of flaked ice to the screw 28, than would be expected from a consideration of the individual actions of these components. Neither the stirring rods alone nor the chopping blades alone are normally sufficient to assure a smooth and continuous flow of ice flakes to the screw 28, but the combined action of these components is effective to break up all bridges, balls and cakes in the ice and to maintain the ice in a flaked condition so that it may be fed freely by the screw 28.

Any water that may be formed in the bin 20 due to thawing of the ice is carried away by drain pipes 78, three of which are illustrated. It will be seen from FIG. 2 that the drain pipes are connected to the lower extremities of the trough portions 32, 34*a* and 34*b*.

The pinion 46 and the gear 48 are mounted on a shaft portion 80 of the screw 28, so that the screw is driven by the motor 60. The shaft portion 80 extends out of one end of the ice bin 20. The rotation of the screw is effective to feed the flaked ice toward the other end of the bin and into a tube or conduit 82. It will be seen from FIG. 3 that the screw 28 has an end portion 84 which extends a substantial distance into the entrance portion 86 of the conduit 82. In this way, the flaked ice is positively fed into the conduit 82.

The entrance portion 86 of the conduit 82 is straight, but the conduit then curves upwardly so as to carry the flaked ice to an elevated discharge position. At its upper end, the conduit 82 is connected to a reflaker 88 which comprises a generally cylindrical housing 90, in which a rotatable star wheel 92 is mounted. The illustrated star wheel 92 is formed with four vanes or blades 94. A discharge spout 96 extends downwardly from the reflaker 88. It will be seen that the conduit 82 and the discharge spout 96 are connected tangentially to the housing 90. The rotating star wheel 92 cuts and loosens up the flaked ice as it emerges from the conduit 82. The star wheel throws the flaked ice downwardly through the spout 96 Thus, the ice is dispensed in the form of loose flakes, even though the ice may tend to cake, to some extent, in the conduit 82.

The spout 96 discharges into a chamber 98 formed in the front portion of the cabinet 12. A housing 100 may be mounted inside the cabinet 12 to form the chamber 98. An opening 102 is provided in the front wall 104 of the cabinet 12 so that a pitcher, bucket or other receptacle may be inserted into the chamber 98 to receive the ice from the spout 96. In this case, a sliding door 106 is provided to close the opening 102. The door is slidable upwardly and downwardly along tracks 108. The door 106 is normally kept closed to minimize the entrance of heat into the cabinet 12. As shown, the door 106 is made of transparent plastic or other suitable material. A grill or perforated lower wall 110 is provided in the chamber 98 to permit any water or stray ice flakes to drop downwardly into a compartment 112. A drain pipe 114 is connected to the compartment 112 to carry away water from the compartment.

The star wheel 92 of the reflaker 88 is rotated by an electric motor 116, which is also operated under the control of the push button switch 62, or the foot pedal 64. When either the push button 62 or the foot pedal 64 is operated, the motors 60 and 116 are energized. The motor 60 drives the feed screw 28 and the agitators 26*a* and 26*b*, while the motor 116 drives the star wheel 92 of the reflaker 88. A control arrangement may be provided to start the motor 116 slightly before the motor 60 and to run the motor 116 for a short interval after the motor 60 has been stopped, so that the reflaker cannot become jammed with ice flakes.



The spokes 66 on the agitators 26*a* and 26*b* stir up the ice flakes in the bin 20, while the blades 68 chop up any balls or bridges that may tend to form. Thus, the flaked ice flows freely to the screw 28, which pushes the ice flakes into the conduit 82. At the upper end of the conduit, the star wheel 92 reflakes the ice and throws the flakes downwardly through the discharge spout 96. A pitcher, bucket or other receptacle may be inserted into the chamber 98 to receive the ice flakes dispensed by the machine.

It will be evident that the flaked ice dispenser eliminates any need for handling the flaked ice manually. Thus, the machine insures that the flaked ice will be dispensed in an entirely sanitary manner. A bucket or pitcher of ice may be dispensed from the bin without any possibility of contaminating the flakes which remain in the bin.

The dispensing machine is capable of delivering a large quantity of flaked ice in a short time, if necessary. The supply of flaked ice in the dispensing machine may then be replenished over a longer period of time by the continuous action of the ice-making machine which delivers its output to the dispensing machine.

The ice dispensing machine eliminates any tendency for the ice to cake up or form bridges in the machine. Thus, the dispensing machine is dependable and efficient in operation.

Various modifications, alternative constructions and equivalents may be provided without departing from the true spirit and scope of the present invention, as exemplified in the foregoing description and defined in the following claims.

I claim:

1. In a machine for dispensing flaked ice or the like, the combination comprising a bin for receiving and holding a supply of the flaked ice, a cylindrical outlet tube connected to the lower portion of said bin at one end thereof, said bin having a lower wall formed with a central substantially semicylindrical trough-shaped portion, said tube having a straight initial portion aligned with said trough-shaped portion, a feed screw closely received in said trough-shaped portion and having an end portion extending into said straight initial portion of said tube for positively feeding the flaked ice into said tube, said bottom wall on said bin having a pair of cylindrically curved trough portions on the opposite sides of the central trough-shaped portion, a pair of rotatable agitator shafts disposed in said bin over the said cylindrically curved trough portions, a plurality of radial stirring rods mounted on each of said shafts and arranged in a spiral pattern thereon, said rods extending into close proximity to said cylindrically curved trough portions, said rods on one of said shafts meshing with said rods on the other of said shafts, each of said shafts having a plurality of spokes extending radially therefrom and a chopping blade mounted on the outer ends of said spokes, said chopping blades being parallel to the respective shafts and being movable in close proximity to the respective trough portions, and means for rotating said shafts in opposite directions while maintaining said shafts in synchronized relation to each other.

2. In a machine for dispensing flaked ice or the like, the combination comprising a receptacle for receiving and holding a supply of the flaked ice, a conduit leading from the lower end portion of said receptacle, a feed screw disposed in the lower portion of said receptacle for feeding the flaked ice into said conduit, and agitator

means in said receptacle for causing the flaked ice to flow downwardly to said feed screw, said agitator means comprising a pair of agitator shafts spaced upwardly in said receptacle from said feed screw and on opposite sides thereof, a cutting bar mounted on each of said shafts in spaced relation thereto, each of said shafts having a plurality of spokes extending between the shaft and the corresponding cutting bar, said cutting bars being movable along overlapping circular paths, means synchronizing said shafts for rotation in opposite directions but with said cutting bars orientated differently so that said cutting bars will not strike each other, and a plurality of stirring rods extending radially from each of said shafts and meshing with the stirring rods on the other of said shafts, said stirring rods being separate and spaced angularly from said cutting bars.

3. In a machine for dispensing flaked ice or the like, the combination comprising a receptacle for receiving a supply of the flaked ice, a conduit connection to the lower portion of said receptacle, a feed screw for feeding the flaked ice into the conduit, a pair of agitator shafts disposed in said receptacle and spaced upwardly from said feed screw, means for rotating said feed screw and said agitator shafts, a plurality of stirring rods mounted on each of said shafts, a cutting bar mounted on each of said agitator shafts and spaced outwardly therefrom, each cutting bar being generally parallel to the corresponding shaft, and a plurality of spokes extending between each cutting bar and the corresponding shaft, said stirring rods being separate and spaced angularly from said cutting bars.

4. In a machine for dispensing flaked ice or the like, the combination comprising a bin for receiving and holding a supply of the flaked ice, an outlet tube connected to the lower portion of said bin at one end thereof, said bin having a lower wall formed with a central substantially semicylindrical trough-shaped portion, a feed screw closely received in said trough-shaped portion for feeding the flaked ice into said tube, said bottom wall on said bin having a pair of cylindrically curved trough portions on the opposite sides of the central trough-shaped portion, a pair of rotatable agitator shafts disposed in said bin over the said cylindrically curved trough portions, a plurality of radial stirring rods mounted on each of said shafts and arranged in a spiral pattern thereon, said rods extending into close proximity to said cylindrically curved trough portions, said rods on one of said shafts meshing with said rods on the other of said shafts, each of said shafts having a plurality of spokes extending radially therefrom and a chopping blade mounted on the outer ends of said spokes, said chopping blades being parallel to the respective shafts and being movable in close proximity to the respective trough portions, and means for rotating said shafts in opposite directions while maintaining said shafts in synchronized relation to each other.

5. In a machine for dispensing finely divided solid material, the combination comprising a bin for receiving and holding a supply of the material, a cylindrical outlet tube connected to the lower portion of said bin at one end thereof, said bin having a lower wall formed



with a central substantially semicylindrical trough-shaped portion, said tube having a straight initial portion aligned with said trough-shaped portion, a feed screw closely received in said trough-shaped portion and having an end portion extending into said straight initial portion of said tube for positively feeding the material into said tube, said bottom wall on said bin having a pair of cylindrically curved trough portions on the opposite sides of the central trough-shaped portion, a pair of rotatable agitator shafts disposed in said bin over the said cylindrically curved trough portions, a plurality of radial stirring rods mounted on each of said shafts and arranged in a spiral pattern thereon, said rods extending into close proximity to said cylindrically curved trough portions, said rods on one of said shafts meshing with said rods on the other of said shafts, each of said shafts having a plurality of spokes extending radially therefrom and a chopping blade mounted on the outer ends of said spokes, said chopping blades being parallel to the respective shafts and being movable in close proximity to the respective trough portions, and means for rotating said shafts in opposite directions while maintaining said shafts in synchronized relation to each other.

6. In a machine for dispensing finely divided solid material, the combination comprising a bin for receiving and holding a supply of the material, an outlet tube connected to the lower portion of said bin at one end thereof, said bin having a lower wall formed with a central substantially semicylindrical trough-shaped portion, a feed screw closely received in said trough-shaped portion for feeding the material into said tube, said bottom wall on said bin having a pair of cylindrically curved trough portions on the opposite sides of the central trough-shaped portion, a pair of rotatable agitator shafts disposed in said bin over the said cylindrically curved trough portions, a plurality of radial stirring rods mounted on each of said shafts and arranged in a spiral pattern thereon, said rods extending into close proximity to said cylindrically curved trough portions, said rods on one of said shafts meshing with said rods on the other of said shafts, each of said shafts having a plurality of spokes extending radially therefrom and a chopping blade mounted on the outer ends of said spokes, said chopping blades being parallel to the respective shafts and being movable in close proximity to the respective trough portions, and means for rotating said shafts in opposite directions while maintaining said shafts in synchronized relation to each other.

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