

Aug. 9, 1949.

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PACKAGE FREEZING MACHINE

2,478,465

Filed Feb. 3, 1947

2 Sheets-Sheet 1

Fig. 1.

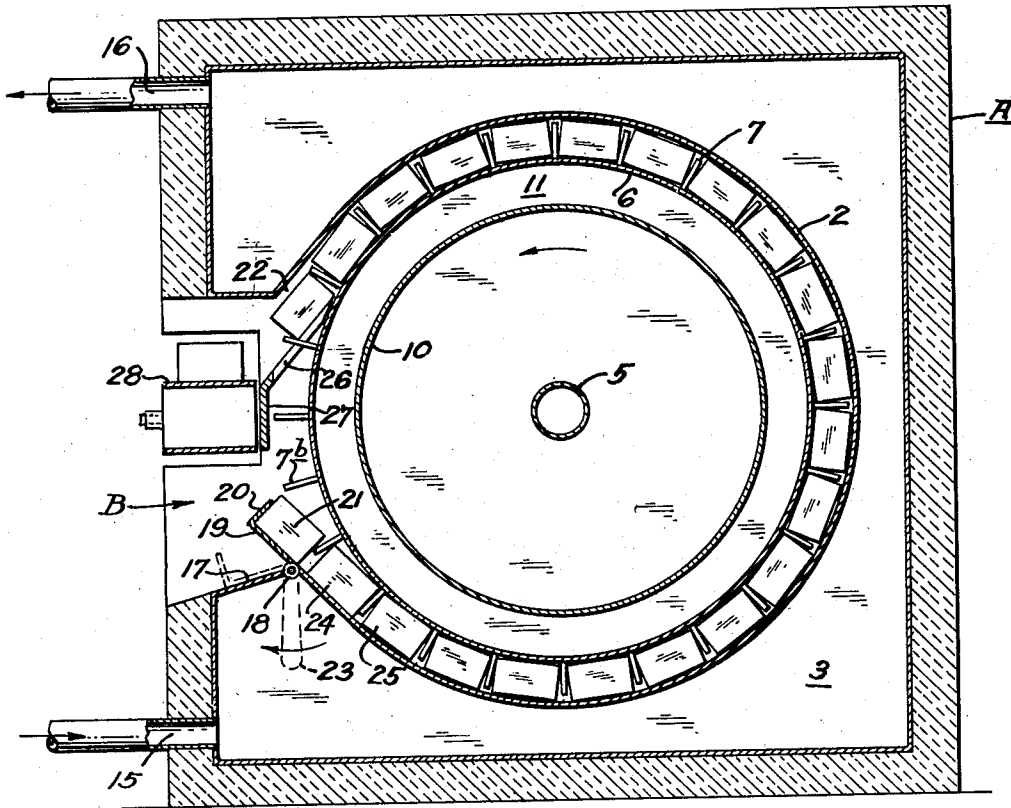
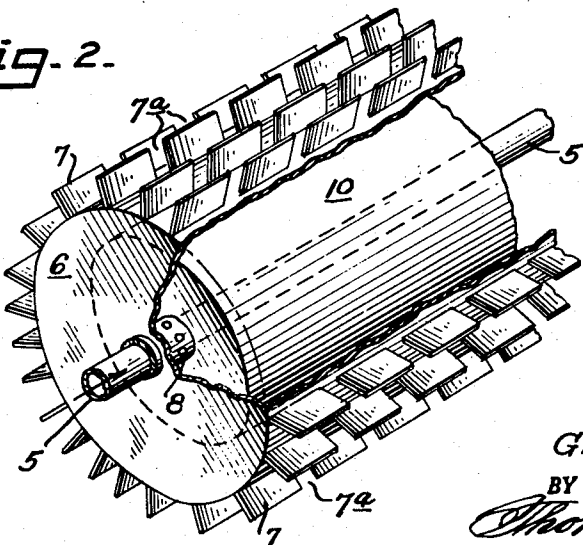


Fig. 2.



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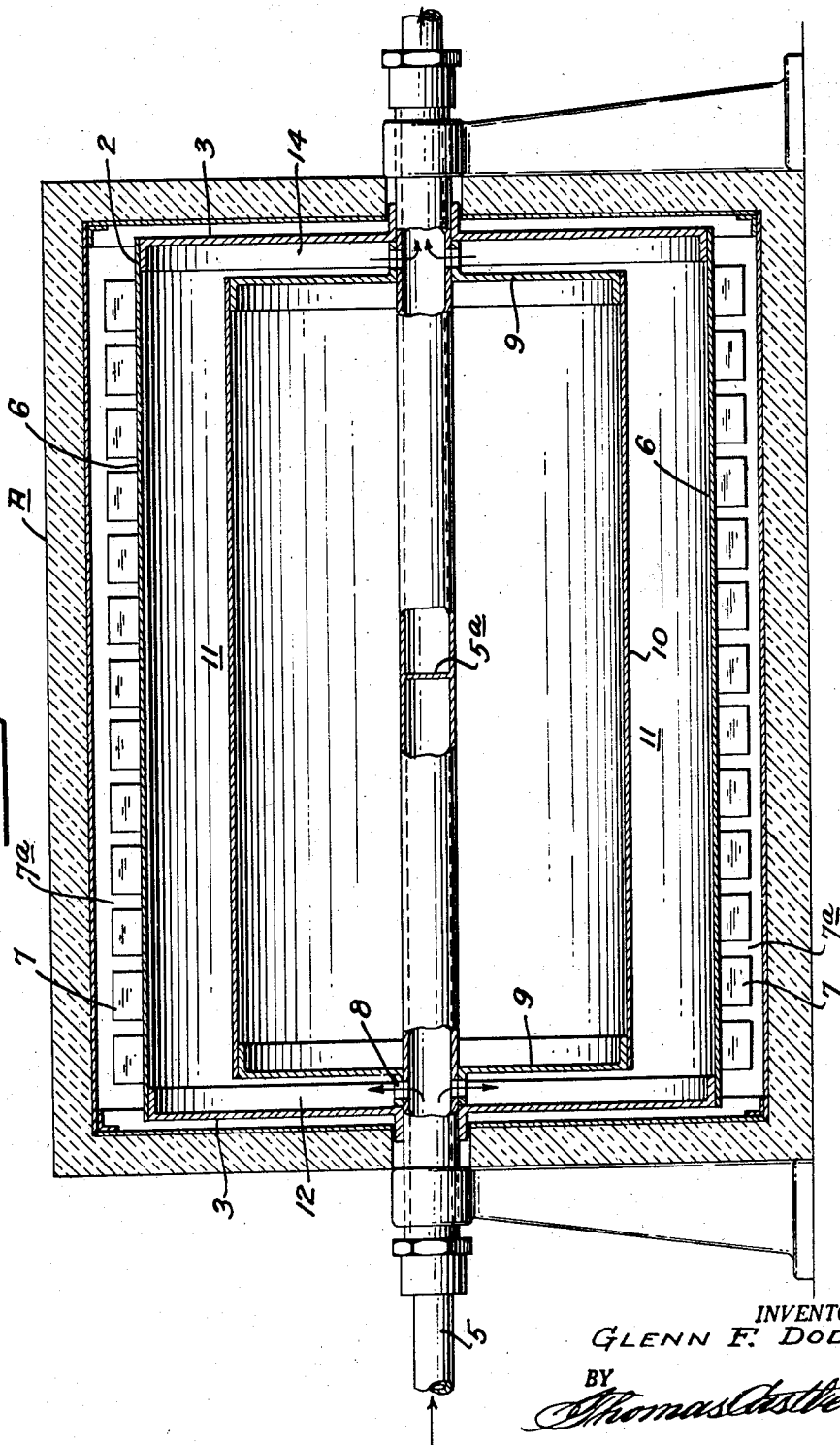
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Fig. 3-



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2,478,465

PACKAGE FREEZING MACHINE

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Application February 3, 1947, Serial No. 725,992

5 Claims. (Cl. 62—114)

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This invention relates to a machine for freezing packaged food products such as meat, fish, fruits, vegetables and the like, and especially to a rotary type of machine which is capable of commercial quantity output.

The object of the present invention is generally to improve and simplify the construction and operation of package freezing machines; to provide a machine of the rotary type which is continuous in operation and capable of quantity output; to provide a machine in which a plurality of packages are delivered intermittently at one end, then passed through the machine and frozen, and finally intermittently discharged in the frozen condition at another point; to provide a machine in which the packages are held under pressure and in contact with two heat abstracting surfaces while being frozen; and further, to provide a package freezing machine in which a brine or like refrigerating medium may be efficiently applied and circulated to insure rapid removal of heat.

The invention is shown by way of illustration in the accompanying drawings, in which:

Fig. 1 is a vertical cross section of the machine;

Fig. 2 is a perspective view of the revolving drum, said view being partially broken away; and

Fig. 3 is a longitudinal vertical section of the machine.

Referring to the drawings in detail, and particularly Fig. 1, A indicates a housing, interiorly of which is mounted a cylinder 2. The cylinder and the housing A enclosing the same may be of any suitable length, and both ends are closed by heads or end members 3—3. Extending through the heads 3 and the cylinder 2 is a tubular shaft, and supported by the shaft is a drum 6 on the outer face of which is mounted a plurality of pusher plates 7.

In order to efficiently abstract heat from the packaged goods to be frozen, it is essential that the exterior surface of the cylinder 2 be cooled and similarly the surface of the drum. To cool the drum a brine solution or the like is delivered to the pipe 5 in any suitable manner. The pipe is blanked off at the point 5a and as it is perforated as shown at 8, the brine will discharge radially and outwardly in the direction of the arrows. A pair of head members 9—9 are carried by the pipe and these support an inner drum 10, hence there is an annular space 11 between the main drum 6 and the inner drum 10, and there is a space 12 and a space 14 at opposite ends of the drum 10. Thus the refrigerating medium or the brine flows in the direction of the arrows

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though the end space 12, then through the annular space 11, and finally through the end space 14 and out through the shaft 5 to be circulated over and over. The cylinder on the other hand is cooled by delivering the refrigerating medium at the point 15 and discharging it at the point 16. It thus circulates completely around the cylinder and efficiently cools the same.

Formed in the housing A at one side thereof and extending substantially from end to end of the housing is an opening generally indicated at B, this opening being utilized for the purpose of delivering the packages to be frozen and for removing them when frozen. Formed at the lower side of the opening is a shelf 17. Pivotaly mounted as at 18 at the inner end of the shelf is a loader platform 19 at the outer end of which are placed a series of fingers 20. These fingers are so disposed as to clear the spaces shown at 1a between the pusher plates 7 (see Fig. 2).

In actual operation the drum 6 is rotated by means of shaft 5 at a suitable speed, for instance at a speed which may require ten or fifteen minutes to each revolution. That is, a package such as shown at 21 when delivered to the drum will be engaged by a pusher plate and will be slowly carried around with the drum until the point of discharge 22 is reached. This time period may be any period required whether it be five minutes, half an hour, or more, and the speed of the drum and pusher plates must accordingly be varied. If the drum 6 is four feet long and the packages to be frozen are six inches long, then it is obvious that eight packages may be placed end to end on the loader platform 19 in the position shown at 21. They may be placed on the loader platform by hand operation or otherwise and when in place are transferred to the drum 6 by a handle 23. This is grasped by the operator and pulled in the direction of the arrow. The several packages 21 are thus brought into engagement with the surface of the drum behind the pusher plates shown at 7b. The loader platform is held in this position until the pusher plates 7b engage the packages 21 and force them downwardly into the space indicated at 24. This space is wedge shaped or tapered so that the packages will enter freely between the drum and the cylinder, but as the packages advance pressure is gradually applied and is fully applied at the point 25. From that point it remains constant until the point of discharge indicated at 22 is reached. The pressure may not be great, but it should be sufficient to maintain good contact or a path of conduction for extraction of

heat, and heat is obviously rapidly removed as the package is in contact not only with the cooled surface of the drum 6, but also with the cooled surface of the cylinder 2. The packages are cooled or frozen when they reach the discharge point 22, and they are here automatically discharged by a series of scraper blades 26 supported by a side bar 27. The scraper blades 26 are like the fingers 28 on the loading platform, that is they are so positioned as to align with the spaces 1a formed between the pusher plates 7 and as such may be in constant contact with the surface of the drum 6. Below the scraper blades and at one side thereof is a continuously moving conveyor belt 28 and this removes the packaged frozen product to any point desired.

The machine constructed as here shown is capable of handling great quantities of goods of the character described as any suitable number of packages may be entered at one time and once entered will be moved automatically to the point of discharge and will there be automatically discharged. The number of packages delivered by the platform 19 between each row of pusher blades depends entirely upon the dimensions of the packages and the length of the drum, and as this may be increased or decreased to suit varying conditions, practically any output desired may be obtained.

The manner in which the brine solution or other cooling medium is supplied and circulated insures efficient and rapid heat removal and as pressure is applied to the packages being frozen and to the opposite faces thereof, ideal freezing conditions are obviously maintained, and while this and other features of the invention have been more or less specifically described and illustrated, it should be understood that changes may be resorted to within the scope of the appended claims and that the materials and finish of the several parts employed may be such as the experience or judgment of the manufacturer may dictate or varying conditions or uses may demand.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. A machine for freezing packaged goods comprising a continuously movable member and a stationary member, said members being spaced apart to form a passage between them, a housing having an entrance and a discharge opening in communication with the passage, means on the movable member for engaging and feeding packaged goods delivered to the entrance from said entrance through the passage to the discharge opening, and means for applying refrigeration to the movable and stationary members.

2. A machine for freezing packaged goods comprising a rotatable drum, a cylindrical shaped housing enclosing the drum and spaced therefrom to form an annular passage, said passage having an inlet and an outlet, means for simultaneously delivering a plurality of packages to

the inlet, means on the drum for engaging said packages and for moving them from the inlet through the annular passage to the outlet, means for discharging the packages at the outlet, and means for circulating a cooling medium around the housing and through the drum to cool the packages to a predetermined temperature during transit through the annular passage.

3. In a machine of the character described, a cylindrical housing, a drum disposed within the housing and extending substantially from end to end thereof, said drum being of smaller diameter than the housing to form an annular passage between the drum and housing, a plurality of rows of pusher blades projecting from the face of the drum, said rows of blades extending longitudinally of the drum, means for delivering a plurality of packages between each row of blades, means for rotating the drum to move said packages through said passage to a point of discharge, means for cooling the housing and drum to cool the packages during transit through said passage, and means for removing the packages from between each row of pusher blades adjacent the point of discharge.

4. A machine for freezing packages having flat opposite walls a predetermined distance apart comprising a pair of curved plates spaced apart approximately said predetermined distance to provide an arcuate passage, means for moving one of said plates with respect to the other, means for impelling said packages through said passage, and means for refrigerating said plates.

5. In a machine of the character described, a cylindrical housing, a drum disposed within the housing, said drum being of smaller diameter than the housing and said drum and housing defining an annular passage therebetween, a plurality of peripherally spaced pusher blades projecting substantially radially from the face of said drum and dividing said passage into compartments of a size to relatively snugly receive packages of predetermined dimensions and maintain said packages in pressure contact with said drum and housing simultaneously, means for rotating said drum to move packages in said compartments through said passage, and means for cooling the cylinder and drum to cool the packages during transit through said passage.

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