July 7, 1925. 1,544,862

C. E. ROGERS

ICE CREAM PACKAGING MACHINE

Filed Aug. 15, 1921 8 Sheets-Sheet 1

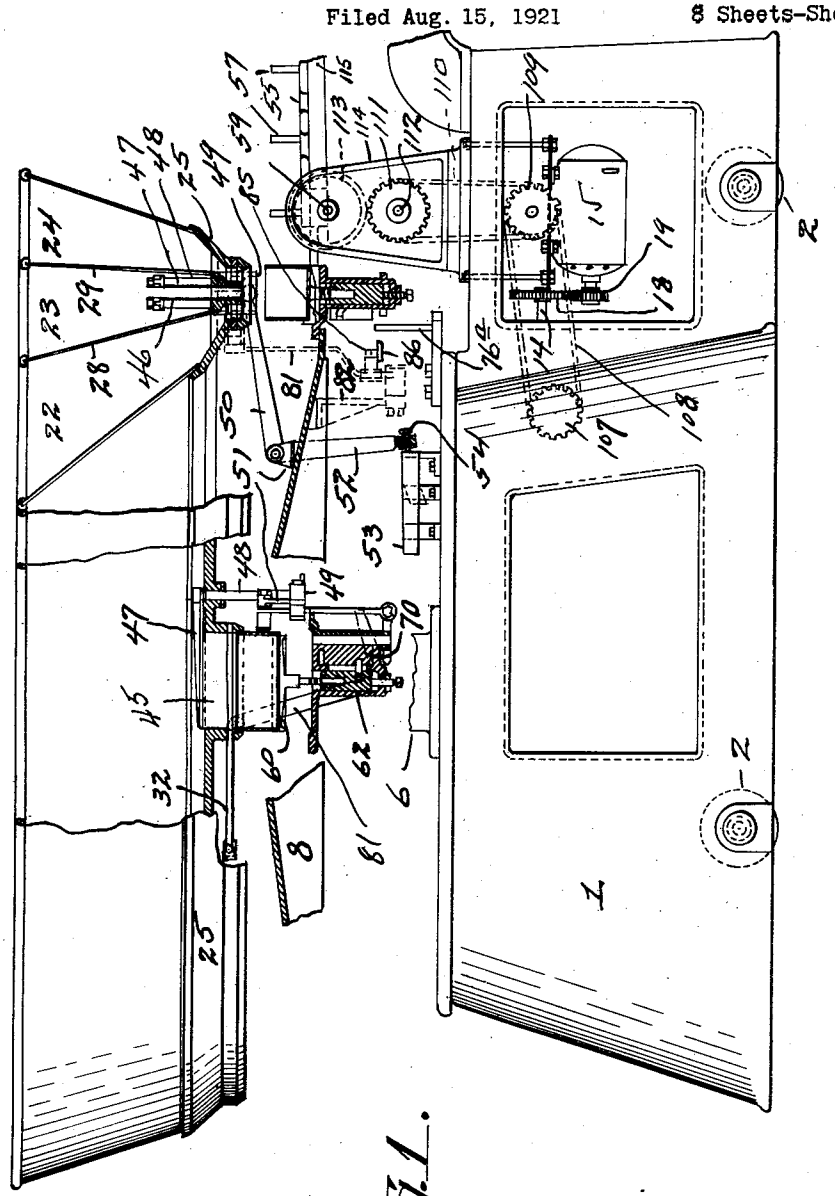


Fig. 1.

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July 7, 1925. 1,544,862

C. E. ROGERS

ICE CREAM PACKAGING MACHINE

Filed Aug. 15, 1921 8 Sheets-Sheet 2

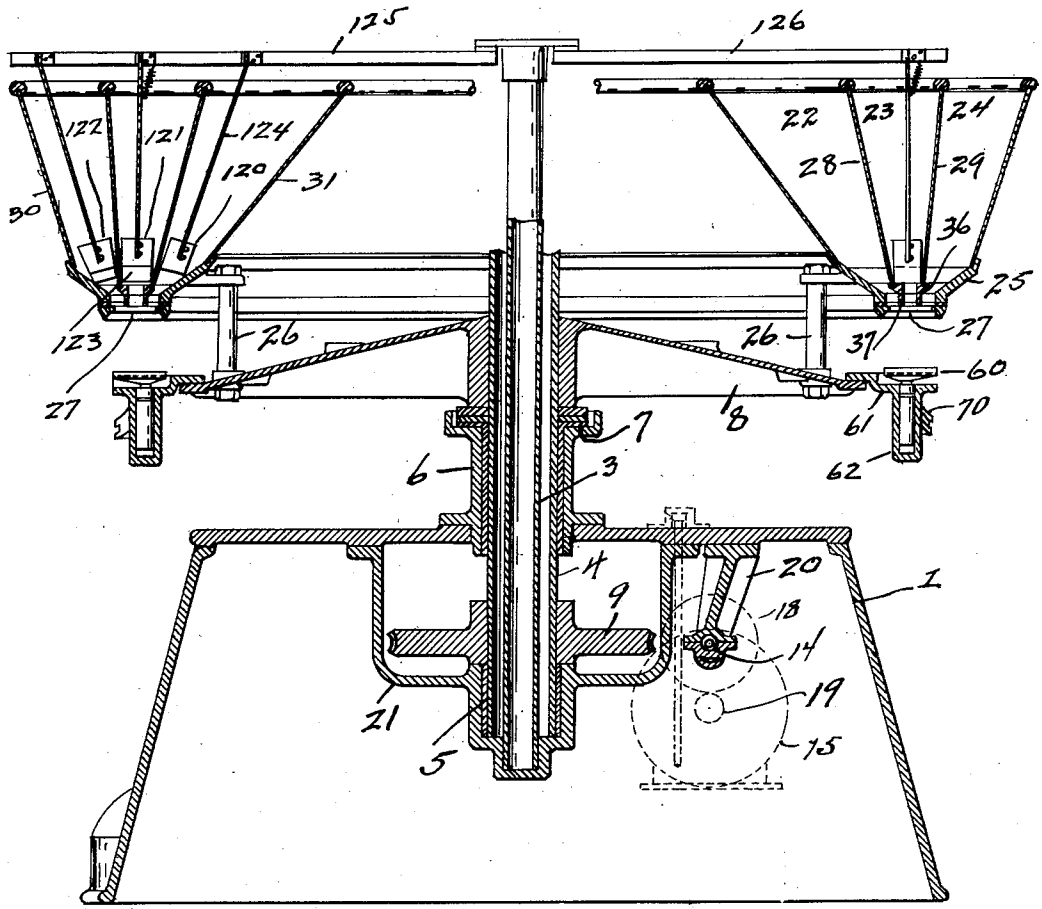


Fig. 2.

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ICE CREAM PACKAGING MACHINE

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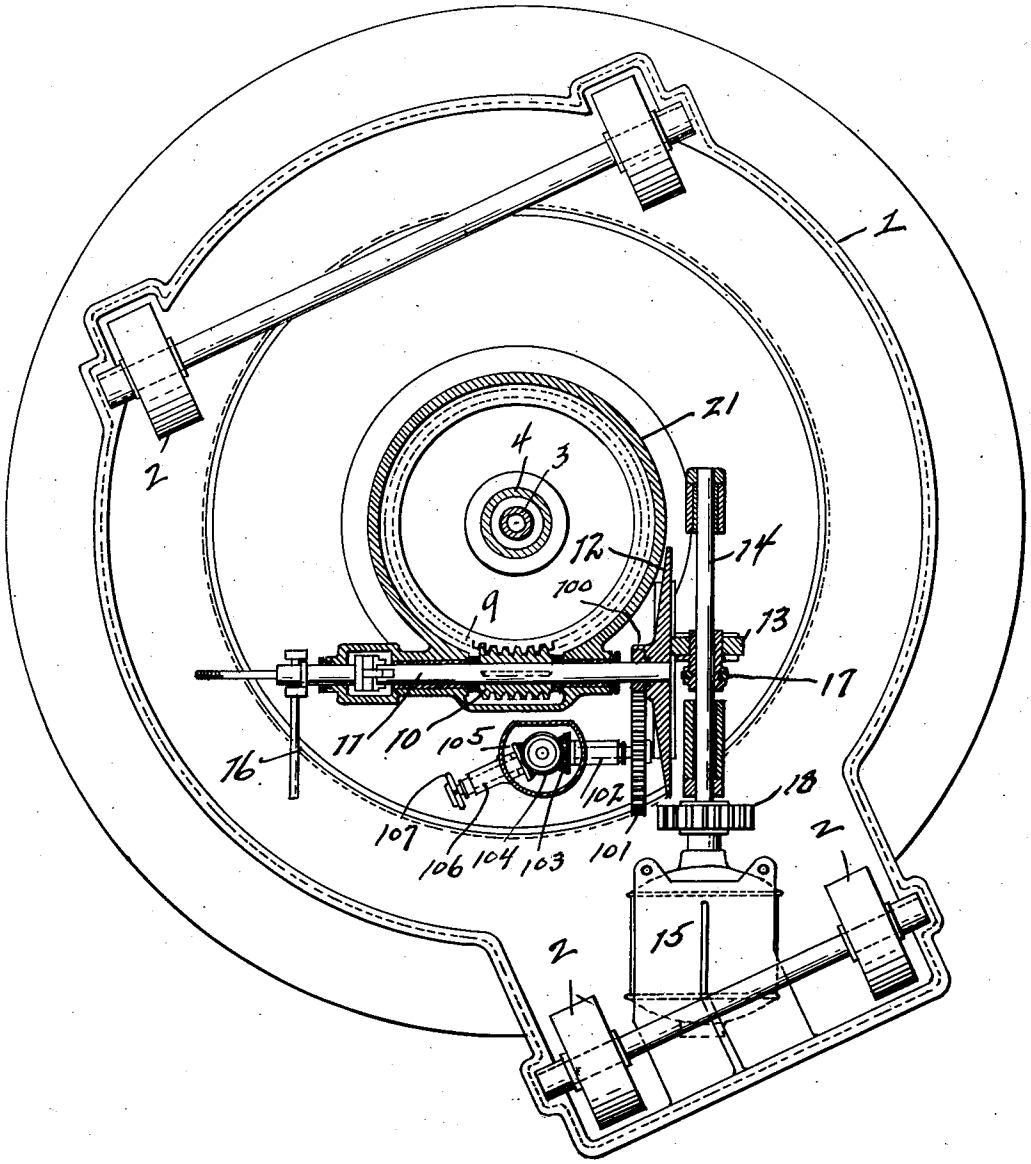


Fig. 3.

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ICE CREAM PACKAGING MACHINE

Filed Aug. 15, 1921 8 Sheets-Sheet 4

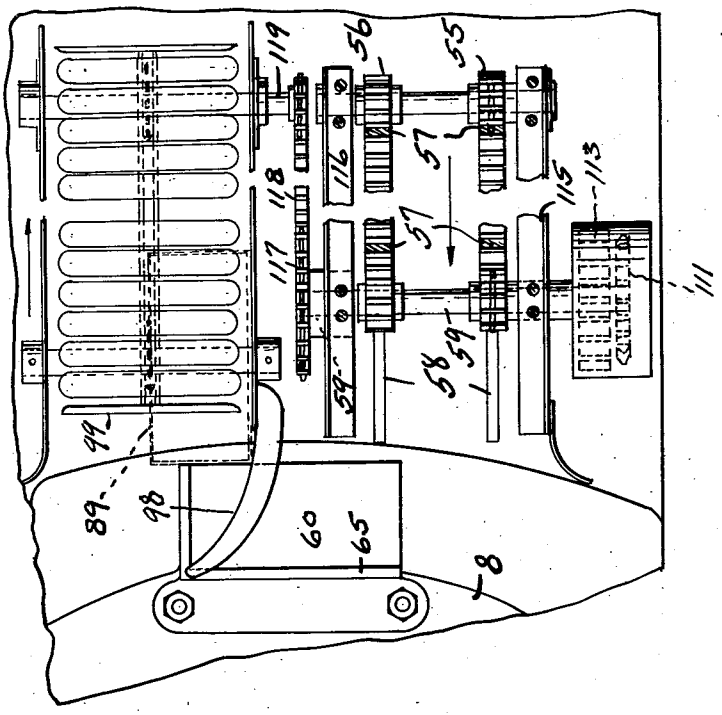


Fig. 4.

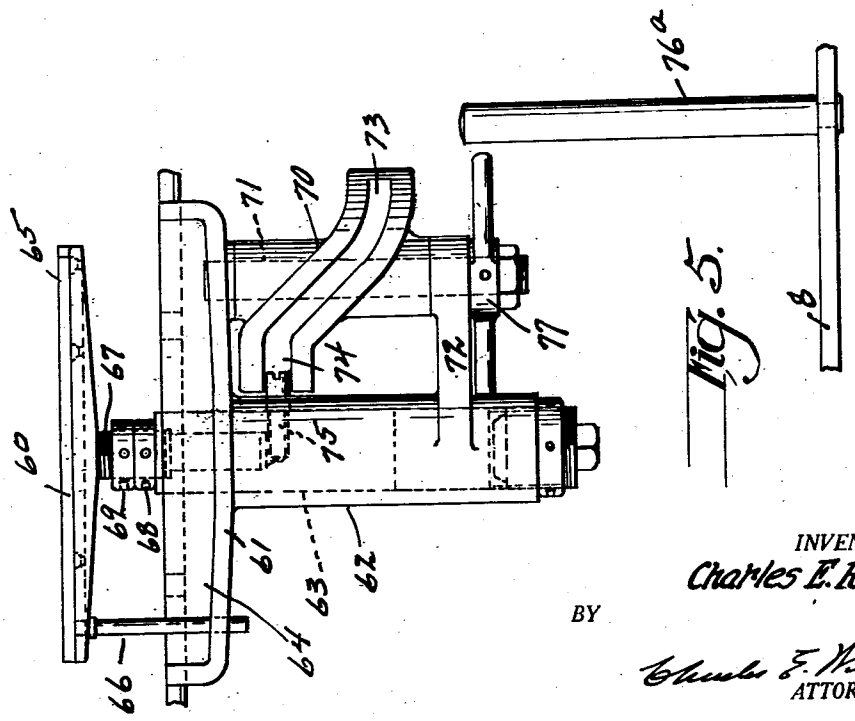


Fig. 5.

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C. E. ROGERS

ICE CREAM PACKAGING MACHINE

Filed Aug. 15, 1921 8 Sheets-Sheet 5

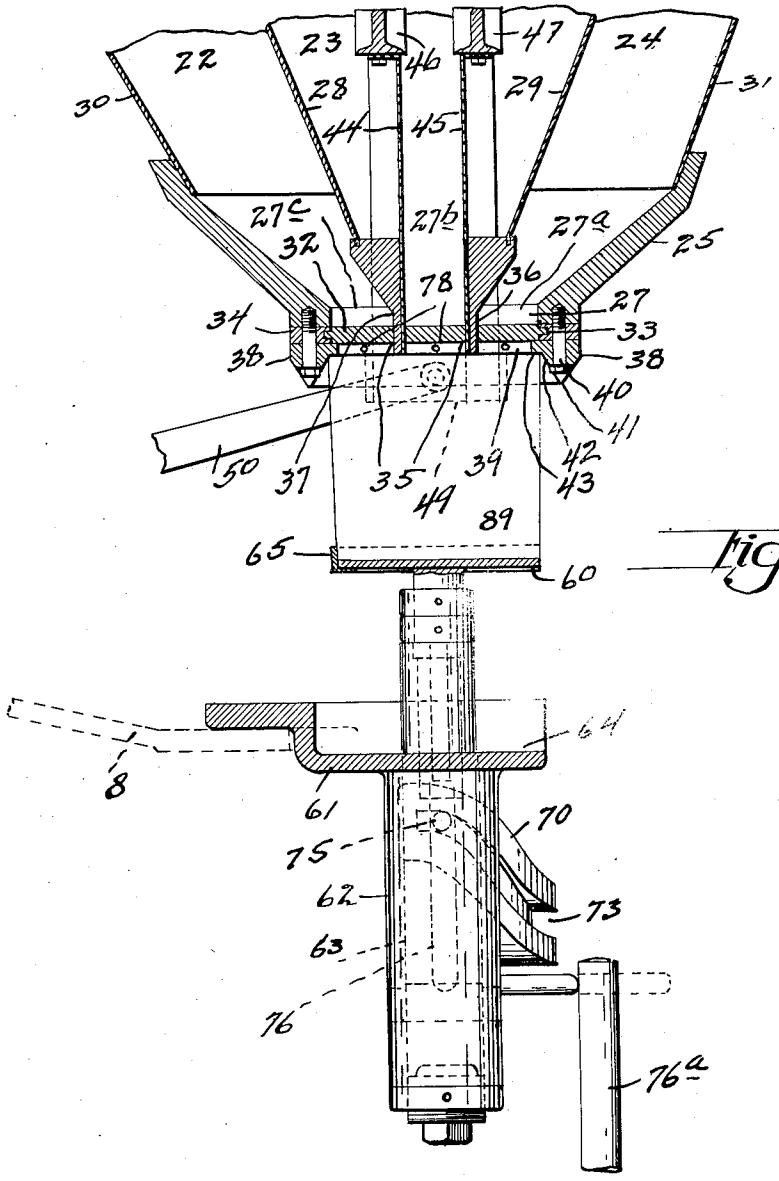


Fig. 6.

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July 7, 1925. 1,544,862

C. E. ROGERS

ICE CREAM PACKAGING MACHINE

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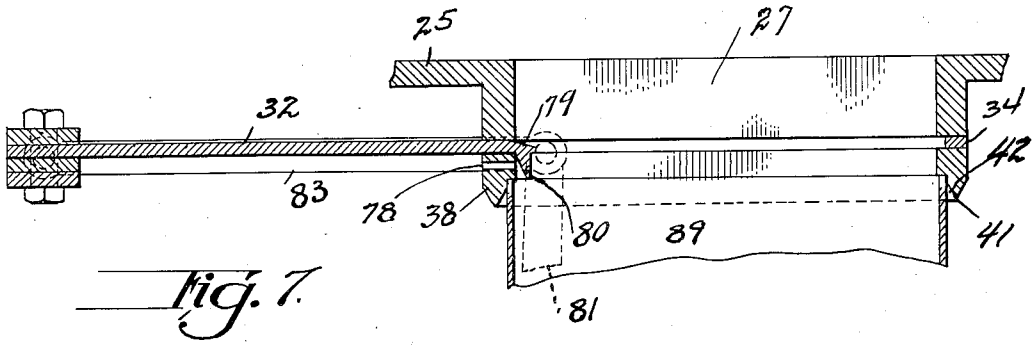


Fig. 7.

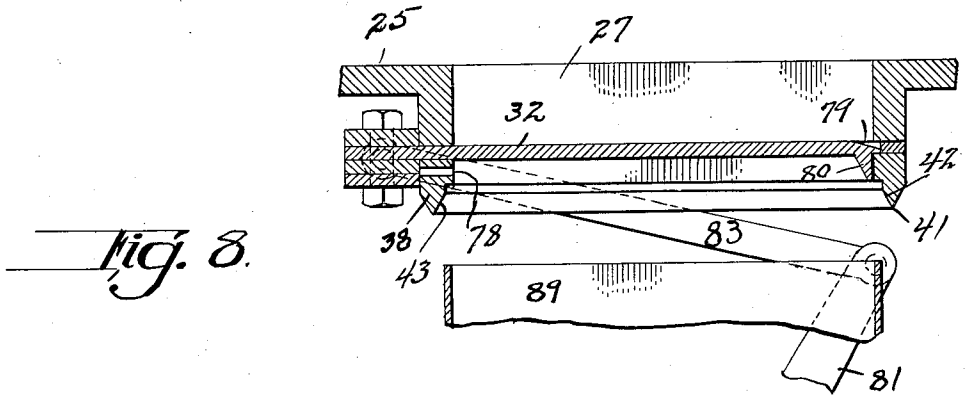


Fig. 8.

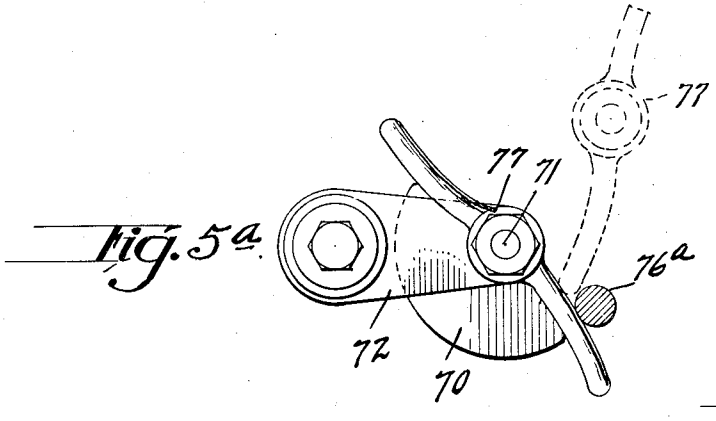


Fig. 5a.

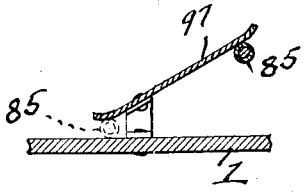


Fig. 12.

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July 7, 1925.

1,544,862

C. E. ROGERS

ICE CREAM PACKAGING MACHINE

Filed Aug. 15, 1921

8 Sheets-Sheet 7

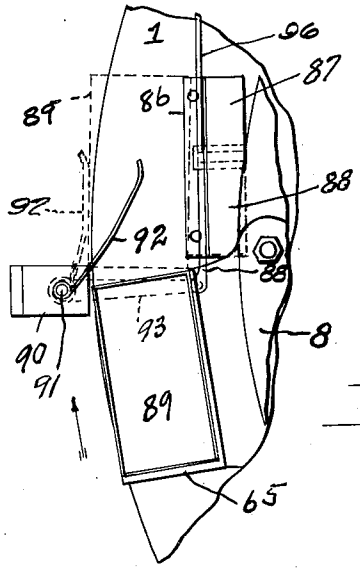


Fig. 11.

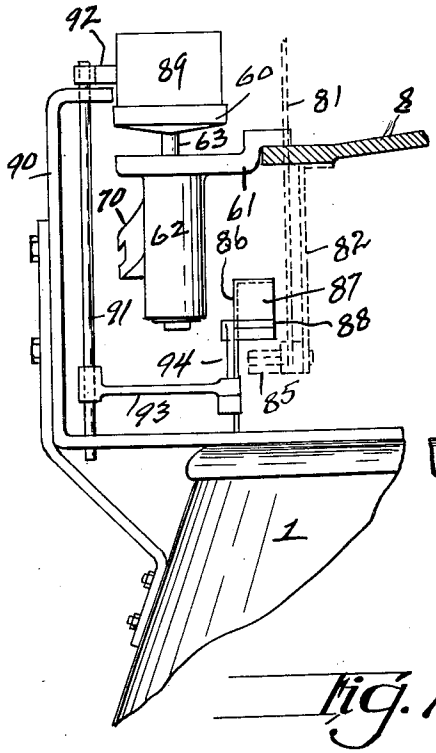
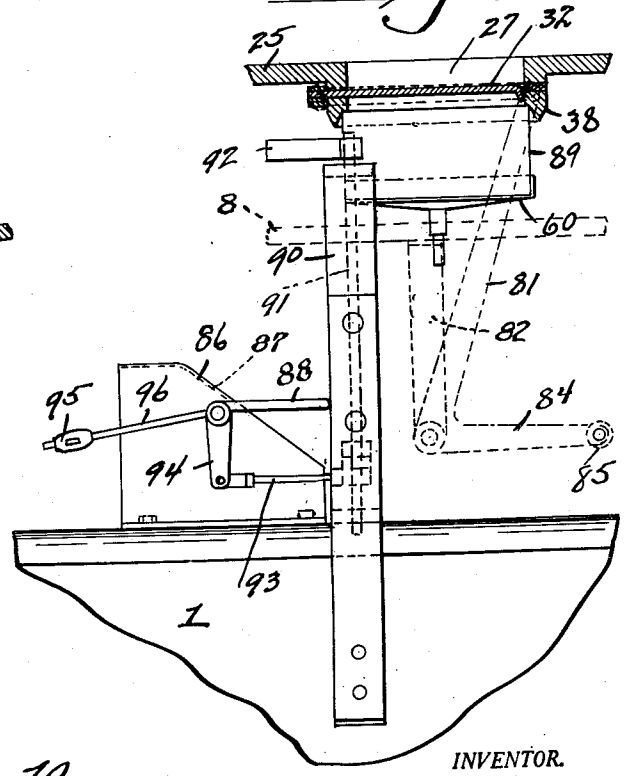


Fig. 10.

Fig. 9.



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July 7, 1925. 1,544,862

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ICE CREAM PACKAGING MACHINE

Filed Aug. 15, 1921 8 Sheets-Sheet 8

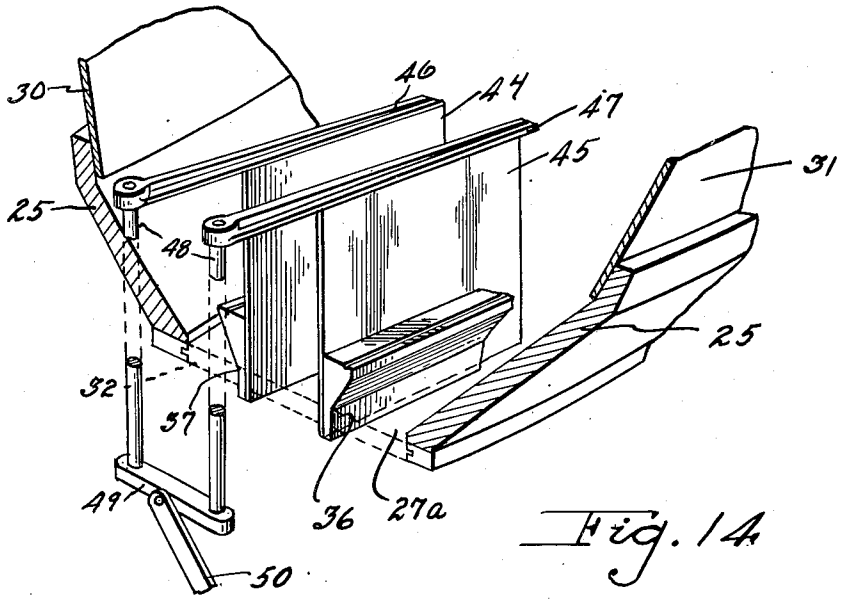


Fig. 14

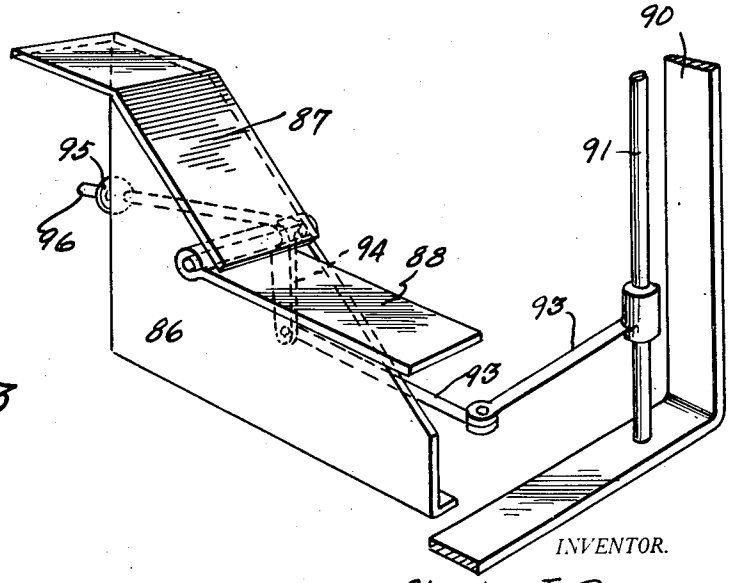


Fig. 13

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Patented July 7, 1925. 1,544,862

UNITED STATES PATENT OFFICE.

CHARLES E. ROGERS, OF DETROIT, MICHIGAN.

ICE-CREAM-PACKAGING MACHINE.

Application filed August 15, 1921. Serial No. 492,618.

To all whom it may concern:

Be it known that I, CHARLES E. ROGERS, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Ice-Cream-Packaging Machines, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to machines for packaging ice cream, the object being to provide a device for placing the ice cream in the package in which it is sold to the consumer and preferably in the form of a brick or the like and of one, two or three colors, layers or flavors as may be desired. The present practice with ice cream manufacturers is to form layers of ice cream when in a semi-frozen condition and thereafter harden the same and finally cut it by hand into bricks. An object of this invention is to provide an automatically operated machine to package the semi-frozen ice cream, the packages or cartons being brought to the machine, filled and discharged subsequent to which the packaged cream is hardened in the usual way and sold to the consumer in the original package avoiding hand operations and further avoiding contamination arising from such handling.

In the accomplishing of this general object as is hereinafter more fully described the cream in semi-frozen condition is placed in a container of one, two or three or the desired number of chambers and a feature of this invention consists in the mounting of the containers for revolution about an axis and the provision of a series of valved openings in the bottom of the containers and further consists in the provision of mechanism for automatically bringing the cartons or containers in which the cream is to be packaged to position beneath the discharge openings in succession, automatically opening and closing the valve for each opening and automatically discharging the filled cartons or packages from the machine. An additional feature of this invention is in the manner and means of discharging the fluid into the containers. Ice cream when in the proper semi-fluid condition is greater in volume than the volume of the material forming the frozen cream. In other words there is what is termed in the trade an "overrun" when the cream is at a certain temperature. This is occasioned by reason of the multitude of air cells in the body of the cream and if the cream can be maintained in this condition it is more desirable to the trade in that the cream is smoother in texture and is not grainy. Cream in such desired condition may not have pressure applied thereto whereby it may become compacted because the finished article becomes too hard and is not of the smoothness and texture desired by the trade, and due to the loss of the effect of the overrun, is not desirable to the manufacturer. A feature of this invention therefore resides in the manner and means of discharging the semi-frozen cream into the package by gravity, the arrangement providing for a comparatively long filling period and rapid receipt and discharge of the packages. A further object is to provide a valve mechanism controlling the discharge into the package of such construction and mode of operation as to prevent cream in the package from adhering to the valve plate and in the provision of means for leveling or scraping the top of the package. A further object of this invention is to provide a mechanism for delivering ice cream in semi-frozen condition in one or more layers as may be desired without the use of a form or mechanism other than the package to shape the cream which, being in a semi-frozen condition and discharged by gravity into the package, readily conforms to the shape of the package. A further object is to provide mechanism operating automatically to bring each carton to the machine to filling position relative to the discharge aperture and of the provision of mechanism to introduce dividing plates into the package to divide the same into separate compartments, the construction permitting the use or nonuse of dividing plates according to whether the brick is to be of one layer, color or flavor or of several layers, colors or flavors. A further object of

the invention is to provide a rotatable container having a series of valved discharge apertures, means for bringing the package to be filled to filling position beneath the apertures and the provision of means actuated by the package to be filled controlling the operation of the valve device for the respective aperture so that, in the event no package is positioned for filling, the respective valve mechanism is not operated. Another object is to provide a machine in which a number of packages at a time may be in filling position and the provision in conjunction with a machine of this character of mechanism delivering the empty cartons in succession to the machine positioning the package for the filling position and mechanism discharging the filled packages successively therefrom. These and other objects and various novel features of the invention are hereinafter more fully described and claimed, and the perferred form of construction of an ice cream packaging machine embodying my invention is shown in the accompanying drawings, in which—

Fig. 1 is a side elevation partly in section showing a part of the containers for the semi-frozen cream and mechanism for handling and filling the package.

Fig. 2 is a vertical section showing particularly the manner of mounting the containers and mechanism for revolving the same.

Fig. 3 is a bottom view partly in section showing the preferred means employed for operating the machine.

Fig. 4 is an enlarged detail showing the mechanism for bringing the boxes or packages to and discharging the same from the machine.

Fig. 5 is a detail showing the base or support onto which the packages are delivered and the mechanism for operating the table to raise and lower the package to and from filling position.

Fig. 5ª is a diagram showing the manner of operation of the package table.

Fig. 6 is a detail showing the valve and dividing plates for the discharge aperture of the containers and relationship of the package and its control apparatus therewith.

Fig. 7 is a longitudinal section of the discharge aperture showing the valve plate open.

Fig. 8 is a similar view showing the valve plate closed.

Fig. 9 is a detail in side elevation showing the means employed to control operation of the valve plate.

Fig. 10 is a view taken from the left side of Fig. 9.

Fig. 11 is a plan view showing means actuated by the package to set the valve plate operating mechanism.

Fig. 12 is a detail showing the means employed to close the valve plate.

Fig. 13 is a detail showing the device controlling operation of the slide for the discharge opening.

Fig. 14 is a perspective view of mechanism utilized in operating the dividing plates.

The machine consists of a base 1 that is preferably supported on rollers 2, 2 etc., shown particularly in Figs. 1 and 3 to permit the device to be readily moved. Within the base, which is of hollow form as shown, is mounted a vertical shaft 3 about which is a tube 4 and this tube is mounted in a roller bearing 5 supported from beneath the top of the base and on the top is mounted another vertical bearing 6, which vertical bearings may be provided with the usual anti-friction device and this vertical bearing member 6 has at the head thereof a horizontal preferably anti-friction bearing 7 supporting the weight of a table 8 secured to the tube 4. This tube 4 is rotatable by means of the worm gear 9 shown clearly in Fig. 3 meshing with which is a worm 10 on the horizontal shaft 11. This shaft is preferably provided with a friction disc 12 engaged by a friction wheel 13 on the cross shaft 14 connected with the motor 15. The shaft 11 is longitudinally movable by a control lever 16 to release the friction disc from the friction wheel 13, the worm 10 being splined on the shaft 11 to permit the movement of the shaft therethrough. The friction wheel 13 is movable longitudinally of the shaft 14 to position the same toward or from the center of the disc 12 and thus control the speed of rotation of the tube 4 and table 8 for a purpose hereinafter given. This wheel 13 may be positioned in any approved manner as by means of a lever connected with the hub of the wheel, a portion of which is shown at 17 in Fig. 3. The shaft 14 has a gear 18 thereon which, as will be understood from Fig. 2, meshes with a smaller gear 19 on the motor shaft. The shaft 14 is supported in suitable bearings formed at the lower end of the brackets 20, one of which is shown in Fig. 2 and the bearing for the shaft 11 is formed in the housing 21 for the gear 9, which housing also carries the bearing 5 for the vertical shaft.

The ice cream to be packaged is delivered in semi-frozen condition to what I have termed the containers 22, 23 and 24. These containers are annular in form and preferably have converging walls as shown and the ice cream may be discharged into these containers in any approved way all of one color or separate colors or flavors as may be desired. The containers are preferably of sheet metal having a cast base member 25 and are supported at a series of points by standards 26 supporting the base on the

plate 8. At a series of equidistant points on the lower side of the base 25 is provided a series of apertures 27 shown in detail in Fig. 6. This aperture 27 is in fact triple in form there being an aperture 27^a for the compartment 24, the aperture 27^b for the container 23 and the aperture 27^c for the container 22. Walls 28 and 29 separating the container 23 from the adjacent containers 22 and 24 may each fit in a groove formed in the central part of the cast base 25, as shown in Fig. 6, and the sides of the member 25 are shaped to receive the walls, the outside wall 30 of the container 22 and the outside wall 31 of the container 24 and material in these containers tends to fall or flow by gravity through the apertures which are normally closed by a valve plate 32. The valve plate has a tongue 33 at each edge riding in a groove formed in a rectangular frame 34 supported at the bottom of the member 25 at each aperture 27. The valve plate 32 has two central slots 35 into which the depending portion 36 and 37 of the central part of the casting 25 extends. This single plate therefore may close or open the apertures 27^a, 27^b and 27^c and when the valve plate is open, material may flow from the several containers through the apertures. It is to be understood that the group of apertures 27^a, 27^b, 27^c, are referred to hereinafter as "aperture 27".

Beneath the frame 34 supporting the valve plate is a second frame 38 preferably of rectangular form having a central aperture 39 providing a ledge or shoulder on which the valve plate 32 rides as may be seen in Fig. 6. Preferably, the bolts 40 of which there are several about the frame, secure both the frames 34 and 38 to the bottom of the casting 25 at the several apertures provided therein. This frame 38 has a depending portion 41 with an inwardly sloping inner side wall 42 terminating short of the aperture 39 of the frame providing a shoulder 43 on the under side of the frame below the valve plate 32.

The parts 36 and 37 of the casting 25, heretofore mentioned as extending through slots of the valve plate, receive the lower edges of the dividing walls 28 and 29 forming the central container. The inner and adjacent walls of the two parts 36 and 37 at the aperture are straight and dividing plates 44 and 45 ride against these straight sides of the parts 36 and 37. There is a pair of dividing plates at each aperture 27 provided in the bottom casting 25 of the container and the dividing plates are movable vertically along these side walls of the parts 36 and 37 and extend into the slots in the valve plate 32. These dividing plates 44 and 45 are attached at the upper end to arms 46 and 47 respectively as will be understood from Fig. 6 and Fig. 1. These arms are connected to a vertically reciprocable rod 48 which is supported on the head 49 below the casting 25 forming the bottom of the container, the rods extending through vertical bearings provided in the said casting as will be seen in Fig. 1. It is to be understood, and as hereinafter described, means is provided to move the plates downward into the package positioned below the aperture after the manner shown in Fig. 6 and this consists of a bell crank lever 50 pivotally supported on a bracket 51 which is mounted on the supporting table 8 of the device. The lower end 52 of the bell crank extends through the member 8 and comes into contact with a bent strip 53 mounted on the top of the base 1. This strip 53 is in the nature of a cam and is positioned so that the adjusting bolt 54 may ride in contact therewith to raise the plates to position shown at the right side of Fig. 1. There are two plates 53 on the base 1 of the machine, one of which is shown in Fig. 1, of a character adapted to cause the dividing plates 44 and 45 to be raised out of the package, the other of which acts upon the opposite side of the screw 54 to cause the plates to move downward into the package to form several compartments therein.

As heretofore stated the packages are brought to the machine, filled, and discharged therefrom. The mechanism for bringing the packages to and carrying them from the machine is shown principally in Fig. 4. The mechanism for positioning the packages on the machine consists of a pair of chains 55 and 56 having upwardly extending fingers 57 on the upper side between which the packages may be positioned and carried toward the machine. These chains terminate close to the revolving table 8 and the box is delivered onto a pair of bars 58 extending toward the table and the fingers, as they turn about the sprockets of the shaft 59 at the inner end of the chains, force the empty box or package onto the supporting table. This is a timed operation, the fingers being a certain distance apart and the chain operating at a certain speed so as to bring the empty box to the table and move the same thereonto and onto the package table or support 60 shown in Fig. 2 and in detail in Fig. 5. There are a series of these package tables carried by the main table 8, there being a package table directly beneath each aperture 27 provided in the bottom of the container. These package tables may be raised and lowered to bring the receptacle to the filling position as shown in Fig. 6 and withdraw it from such position after the package has been filled. This package table or supporting device consists of a casting 61 supported on the edge of the table 8 shown in Fig. 2 and has a tubular portion 62 in which the shaft or stem 63

of the table 60 may move vertically. The casting 61 at the top is provided with the recess 64 into which the table 60 may drop to a point preferably just slightly below the upper surface of the bars 58 onto which the package is delivered from the chains 55 and 56 and thus in position so that the fingers may slide the box or package off from these bars onto the package table 60. As will be understood from Fig. 6, this table 60 is provided with a flange 65 on the inner side and at the rear end which are made adjustable for reasons hereinafter given. Thus the package can be moved onto the table from the forward side before the package table is directly opposite the box and the box is moved backward and positioned against the rear flange as the package table moves from the receiving position hereinafter described. This table 60 is also provided with a depending rod 66 riding in an aperture provided in the upper part of the casting 61 and this acts as a guide to prevent rotation of the table and its shaft in the support 62.

This package table 60 is vertically adjustable on the shaft 63 by a threaded stem 67 having an unthreaded portion thereof extending down into the shaft 63. By means of the nut 68 and lock nut 69 the table 60 may be raised or lowered relative to the end of the shaft 63 by which it is supported. As before stated, the shaft 63 is reciprocable in the cylindrical portion 62 of the member 61 and this is accomplished by means of a spiral cam device 70 rotatably mounted on the shaft 71 carried in bearings provided in the casting 61 at the upper and lower ends, the lower bearing being in an arm 72 extending outward from the part 62 as shown in Fig. 5. This spiral cam 70 is in the form of a grooved member, the groove 73 terminating in a horizontal portion 74 at the upper end and in this groove rides the head of a screw 75 that is threaded into the side of the shaft 63 and extends outward through a slot 76 in the part 62 as shown by dotted lines in Fig. 6. Instead of the screw head shown a roller may be provided if desired to ride in the cam groove. From this description it will be noted that by operation of the member 70 and the shaft 71 the vertical shaft 63 supporting the package table 60 may be raised and lowered. When raised, due to the fact that the head of the screw rides into the horizontal portion 74 of the groove, the table will stand in its uppermost position. The shaft is operated by means of the pin or stationary stub shaft 76^a mounted in the top of the base 1. There are two such stub shafts and on the lower end of the shaft 71 of the cam is a two armed operator 77. When the empty package has been delivered onto the table 60 and is in position thereon, one arm of this member 77 strikes the stationary pin 76^a which turns the arm, due to the fact that the arm is carried with the table 8, and this turns the shaft 71 raising the package table 60. After the filling operation, the opposite arm of the operator 77 engages a similar pin on the base 1 which reverses the direction of oscillation of the shaft 71 and lowers the table. The package table is raised shortly after the package or box is positioned thereon which brings the box to position shown in Fig. 6 against the shoulder 43 of its respective plate or frame 38 which tends to center the box at the upper end and the table 60 is so adjusted in position that a slight pressure of the package edge is caused against the frame sealing the upper end of the box. When the box has been brought to position the dividing plates heretofore described are moved by the respective lever 50 downward into the package or box forming three compartments of substantially equal size and the box or package is then ready for the filling operation.

As heretofore stated the ice cream is in a semi-solid or semi-frozen condition, it being in a condition full of air cells and really is greater in volume than the volume of material required to make the same. This is a greatly to be desired condition both from the point of view of economy in manufacture and sale and also in the production of a superior article for consumers and as it is desired to maintain this texture or quality of the semi-frozen cream, I have therefore provided that the cream in this semi-solid condition shall flow by gravity into the package or box. The containers are therefore provided with the sloping side walls as shown and the throat of each container heretofore noted 27^a, 27^b, and 27^c is of such size as to permit the ice cream in the semi-solid condition mentioned to flow therethrough when the valve plate 32 has been opened as is hereinafter described. I am able to thus discharge the semi-solid cream by gravity due to the considerable period of time that the valve plate for each package or box is open. As will be noted the empty package is first positioned on its table and the valve plate is opened very shortly thereafter and remains open until the containers with the box in position have made nearly a complete revolution whereupon the valve plate is closed and the box or package discharged as hereinafter described. The containers revolve comparatively slowly and due to the considerable number of boxes being filled at any one interval the output of the machine is very high certainly higher than any machine within my knowledge heretofore devised. In practice I have filled packages and formed perfect bricks of several layers and

discharged the same from the machine at the rate of twenty-four hundred per hour. By means of the friction drive wheels 12 and 13 heretofore described, the speed of the machine may be varied to conform to the rapidity of manufacture of the supply therefor as will be readily understood. The valve plate 32 is shown in cross section in Fig. 6 and in longitudinal section in Figs. 7 and 8. There is a valve plate 32 for each of the several openings 27 in the bottom casting 25 of the containers and this plate is slotted to receive the dividing plates and the lower extensions or parts 36 and 37 of the walls of the central container. The valve plate is adapted for horizontal movement as will be understood from Figs. 7 and 8. It is to be noted that the package or box as shown in Fig. 6 does not come to engagement at the top edge with the valve plate but with a shoulder 43 on the member 38 which is provided at the rear edge, with a series of apertures 78 leading from the atmosphere into the space between the valve plate and the top of the package. The front edge of the valve plate 32 is beveled as shown at 79 and also has a depending part 80 extending downward from the said edge practically to a level with the top of the package. When this valve plate is fully opened the semi-solid ice cream may flow from the containers into the package, the apertures providing for an egress of air from the package. By provision of the depending lip 80 at the forward edge of the valve plate and the inclined edge thereabove, the ice cream upon closing the valve is scraped from the top of the box or package and pushed forward of the valve plate and upward into the material in the containers above the valve plate. A difficulty in filling a package and the sliding of the valve plate thereover is that the ice cream tends to adhere to the lower surface of the plate so that when the box or package is removed from the aperture part of the ice cream is withdrawn therefrom due to its adherence to the plate. I have overcome this difficulty by spacing the valve plate from the top of the package and provision of the depending rib 80 and series of apertures 78 which may also be formed in the side of the frame 30 if so desired. The purpose of these apertures is to permit air to flow out of the package while being filled and to flow into the space between the valve plate and top of the ice cream in the package as the plate is moved forward to close the aperture 27. By the structure described the package is leveled, the excess cream being driven back up into the container above the valve plate and by reason of air flowing into the space between the plate and top of the leveled package no ice cream may adhere to the valve plate being kept out of contact therewith. The valve plate 32 is operated by mechanism shown in Figs. 9, 10 and 11 and this consists of a bell crank lever 81 pivotally supported by a bracket 82 attached to the under side of the revolving table 8 as may be understood from Fig. 1. The upper end of this lever 81 is attached by means of a pitman 83 to the rear end of the valve plate as will be understood from Fig. 9. This lever by oscillation on its pivot may be made to open and close the valve and to so operate it I have provided the short end 84 of the lever with a roller 85. On the top of the base 1 is provided a stationary plate 86 having a flange 87 thereon lying at an angle to the vertical and, this roller 85, as will be understood from Fig. 9, by reason of its being carried with the containers contacts this angular face 87 raising the lever 84 from position shown in Fig. 9 and opening the valve plate.

It sometimes happens that all the package tables have not been supplied with an empty package due to the feed chain being not properly provided with empty packages or for other reason. In an automatic machine it is necessary that the valve plate be not opened unless a package or box is in position to receive the ice cream which would flow through the aperture. For this reason I have provided means actuatable by the package to set a mechanism to lead the roller 85 onto the inclined way 87 and thus open the valve plate. If no package is on the table the mechanism will not be set and the valve plate will not be opened. This mechanism consists of a plate 88 pivotally supported on the side of the member 86 to permit it being turned to occupy the same plane as the flange of the way 87 which way 87 is of itself higher than the normal position of the roller 85, which as will be understood from Fig. 10, will pass beneath the way 87. If on the other hand this plate 88 is in actuating position forming an extension of the way 87 the roller will contact this plate 88 and ride up on the way 87 and open the valve plate.

The position of the valve plate is controlled by the package or box which is shown at 89 in Figs. 9, 10 and 11 and the control mechanism consists of a standard 90 positioned on the fixed base 1 and extending upward to a point adjacent the package table. This bracket 90 supports a vertical rod 91, on the upper end of which is provided a curved finger 92 normally lying in the path of movement of the package 89 as will be seen in Fig. 11. The direction of movement of the package is shown by the arrow in Fig. 11 and it will be seen that on movement from position shown in full lines to the position shown in dotted lines the finger 92 will be turned outward turning the

shaft 91 on its longitudinal axis. At the lower end the shaft 91 is provided with an arm 93 which is pivotally connected with an arm 94 attached to the plate 88 and the turning of the finger 92 by the box will thus turn the lever 94 and position the part 88 to be engaged by the roller 85 of the operating lever for the valve 32. This pivoted plate 88 is preferably provided with a counter-balancing weight 95 on an arm 96 connected with the lever 94 and plate 88. This weight is sufficient to turn the plate 88 to the position shown in Fig. 9 and will at all times hold the plate 88 in position unless the finger 94 be turned by the box. This mechanism, due to its being counter-balanced, is very easily turned and therefore does not tend to deform the package which is preferably of a cardboard or paper type. Also the finger coming in contact with the box as it is moved tends to force the box into its correct position on the package table 60 being held from displacement by the finger due to the flanges 65 provided on the said package table. This mechanism for opening the valve plate, as will be readily understood, is positioned near the point of delivery of the box onto the package table and after delivery thereonto the package table is raised to bring the box to filling position and the dividing plates inserted therein and then the valve plate is opened by the mechanism described above. This valve plate remains open during nearly the complete rotation of the container and table 8 and, as it approaches the discharge point reverse action of the valve plate and dividing plates takes place, the dividing plates being raised by the described mechanism and the valve plate closed by an angularly positioned metal strip 97 shown in Fig. 12. The roller 85 being in its highest position when the valve plate is open rides under this plate 97 and is depressed from the position shown by full lines in Fig. 12 to practically the position shown by dotted lines in the said figure. After the valve plate is closed as described, the cam 70 is turned by reason of an arm of the member 77 coming into contact with stationary pin which turns the cam and lowers the package table. Just after this table is lowered it comes to delivery position, shown by dotted lines in Fig. 4, and the package or box comes into contact with the stationary finger 98, supported from a convenient stationary part of the device, which scrapes the box from its table onto the traveling platform 99 which preferably consists of a series of slats supported on chains, the upper surface of which is traveling in the direction of the arrow shown at the top of Fig. 4 opposite to the direction of travel of the chain members 55 and 57. The filled packages are taken from this traveling platform device to the hardening room where the cream is hardened in the package and is ready for delivery to consumers in the original package.

Any approved mechanism may be employed to operate these chain devices 55 and 56 and traveling platform 99. This mechanism is shown somewhat diagrammatically in Figs. 1, 3 and 4. In Fig. 3 it will be noted that the motor drives the shaft 11 on which shaft is a gear 100 meshing with the gear 101 on a shaft 102. On this shaft 102 is a beveled gear 103 meshing with a beveled gear 104 which in turn meshes with another beveled gear 105 on a horizontal shaft 106. On this shaft is a sprocket wheel 107 which, as shown in Fig. 1, is connected by a chain 108 to a sprocket 109. This sprocket 109 is connected by a vertical chain 110 to a sprocket 111 on the shaft 112. On this shaft 112 is a gear (not here shown being directly back of the sprocket 111 in Fig. 1) which meshes with a gear 113 thereabove on a shaft 59. On this shaft are sprockets for the chains 55 and 56 and, due to the gear connection the shaft 59 runs in a direction opposite to the shaft 112 and this shaft 59 drives the upper side of the chains 55 and 56 toward the machine. These shafts 112 and 59 are supported by a standard 114 on one end and extend through frame members 115 and 116 and the shaft 112 on the outside of the frame 116 is provided with a sprocket 117. This sprocket 117 is connected by means of a chain 118 with a sprocket on the shaft 119 which shaft drives the traveling slatted platform 99 in the direction shown by the arrow at the top of Fig. 4. Thus the chains 55 and 56 run in one direction and the slatted platform 99 in the other direction.

The semi-solid ice cream is delivered into the several containers in any approved way and this machine may be made to operate continuously by providing a continuous supply or it may be operated as a batch machine, the quantity to be packaged being discharged into the containers and then the machine operated. In either case I prefer to provide scrapers indicated in Fig. 2 at 120, 121 and 122. These scrapers ride at the bottom of the containers and are particularly useful when the containers become partly empty. As heretofore stated there are several apertures in the bottom of the containers which are spaced a distance apart and it is necessary to provide some means of carrying the ice cream to the aperture through which it falls into the box or package. This prevents the accumulation of the cream between the apertures at the bottom of the containers. These scrapers are preferably provided with flexible terminal portions indicated at 123 and the arms 124 which connect the scrapers to the upper supporting arm 125 may be fixed arms or may be pivoted as shown in the central con-

tainer in Fig. 2. In case the arm is pivoted a spring is employed tending to draw the arm downward to the bottom of the receptacle. This pivoting of the central arm is for the purpose of allowing the scraper 121 to raise over the brackets 46 and 47 carrying the dividing plates 44 and 45. These brackets are sometimes some distance above the bottom of the central container and sometimes quite close to the bottom. In either case it is necessary for the central scraper to be free to rise over these brackets. All the arms may be pivoted, however, if desired and provided with a spring and this spring should be of sufficient tension to hold the scraper down in the material to insure the carrying of the material to the apertures when the containers become partly empty. Preferably there is only one scraper in each container but additional scrapers may be provided if desired as shown at the left of Fig. 2, carried by the arm 126. These arms 125 and 126 are attached to the stationary central standard 3 and the containers 22, 23 and 24 and the supporting table 8 carrying the package table 60 revolve about the shaft 3. This table 8 and bottom 25 of the container carry the operating mechanism for the dividing plates and for the valve plate 32 and the two arm device 77 for operating the cam 70 which controls the raising and lowering of the package table 60. The several levers are actuated by stationary devices on the top of the stationary table or base 1 to which the levers are brought successively by the revolution of the table 8 and containers.

The packages or boxes into which the ice cream is discharged are preferably ordinary paraffined carboard or like material in common use in various industries and the ice cream is not otherwise wrapped. Heretofore, attempts have been made to package ice cream with a waxed paper about the brick which is enclosed in another package. Such paraffined paper wrapping is dispensed with in this device and the ice cream is discharged directly into the paraffined package of the desired shape and in multiple layers if desired. It is to be noted that the word "layers" or words "multiple layers" as herein used refers to a straticulate brick of ice cream in which the strata of different colors or flavors lie in parallel vertical planes rather than in superimposed relation. While there shown as being rectangular in form it may be of any desired shape, the apertures in the container closed by the valve plate 32 being somewhat smaller than the open end of the container.

It is believed from the foregoing description that the operation of the machine will be fully understood and that the various objects of the invention are secured by the structure herein described including automatic filling of the packages, that the machine is very rapid in operation and that ample time is provided for each package to completely fill by the action of gravity and without any material pressure being employed upon the mass discharged into each package to pack the same therein, and that the package may be formed in one or several layers. If only one layer is desired or one color or flavor the actuating member 53 or the dividing plates may be detached so that are not operated.

Having thus fully described my invention, what I claim is—

1. In a machine for packaging ice cream in a semi-solid condition, a plurality of containers of annular form and concentric relation, there being a series of apertures in spaced relation in the bottom of each container, the apertures of the several containers being in alignment, means for rotating the containers, means for positioning a package at each group of aligned apertures in succession, means permitting the ice cream in the containers to discharge simultaneously through a group of apertures into the package, and means for discharging the filled packages successively from the machine.

2. In a machine for packaging ice cream in a semi-solid condition, the combination of a plurality of containers of annular form and concentric relation, there being a series of apertures in spaced relation in each container, the apertures of the several containers being arranged in alignment, a valve plate for each group of aligned apertures, means for rotating the containers, means for positioning a package at each group of aligned apertures in succession, automatic means for actuating the valve plate to open the same subsequent to the positioning of the package, the parts being arranged to permit the semi-solid ice cream to flow by gravity simultaneously through the several apertures of a group into the package, means for closing the valve plate, and means for discharging the filled packages successively from the machine.

3. A machine for packaging ice cream in semi-solid condition, a container having an aperture in the bottom thereof, a valve plate for opening and closing the aperture, a frame outlining the aperture and provided with inwardly sloping walls at the bottom terminating in a shoulder just below the valve plate, means for positioning a package beneath the aperture, the sloping walls tending to center the upper open end of the package with the edges engaging the said shoulder providing a seal for the package, said valve plate having a depending lip at the forward edge extending to approximately the face of the shoulder engaged by the box or package, the shoulder having an

aperture opening the space between the valve plate and package to atmosphere, the said depending lip as the valve plate is closed providing means for leveling the material and forcing the same upward into the container.

4. In a machine for packaging ice cream in semi-solid condition in multiple layer form, the combination with a plurality of containers of annular form and concentric relation provided with apertures in the bottom, the apertures of the several containers being in groups in radial alignment, means for rotating the containers, stationarily positioned mechanism for delivering packages successively to the several groups of apertures, means permitting a flow of ice cream simultaneously through a group of apertures to packages in succession, and a discharge device adjacent to the delivery mechanism for removing the filled packages from the machine.

5. In a machine for packaging ice cream in semi-solid condition and in multiple layer form, a plurality of ice cream containers of annular form and concentric relation having a series of apertures in the bottom, the apertures of one container being in alignment with those of the other containers, means for rotating the containers, means for bringing an empty package to each of the series of apertures in succession, means for separating the interior of the packages into compartments corresponding to the number of containers, a valve plate for each of the series of apertures opened and closed at predetermined points in the path of travel of the containers to allow semi-solid ice cream to flow into the package by gravity, and means for discharging the filled containers successively from the machine.

6. In a machine for packaging ice cream in semi-solid condition and multiple layer form, the combination with a plurality of ice cream containers of annular form and concentric relation, of a series of apertures in the bottom of each container, the apertures of one container being in radial alignment with the apertures of the other containers, a valve plate for controlling the flow of ice cream through the apertures, means for bringing a package to registration with the said apertures, means for maintaining the ice cream from the several containers separate as it flows into the packages into which the ice cream may flow by gravity, automatic means for opening and closing the valve plate, and means for discharging the filled package from the machine.

7. In a machine for packaging ice cream in semi-solid condition and in multiple layer form, in combination, a plurality of ice cream containers of annular form and concentric relation having a series of apertures in the bottom, the apertures of one container being in radial alignment with those of the other containers, a valve plate for each of the series of aligned apertures, means for rotating the containers, a delivery device for placing a package at each of the series of apertures in succession, means for opening the valve plate after the placing of each package, means for closing the valve plate in each aperture as it approaches completion of its path of travel, and means for withdrawing the filled package from the machine.

8. In a machine for packaging ice cream in semi-solid condition, a plurality of containers of annular form and in concentric relation rotatable about a vertical axis, the containers having a series of apertures in spaced relation in the bottom thereof, the apertures being divided by the walls of the several containers, a series of dividing plates movable to form extensions of the walls intermediate the outside wall of the innermost and outermost container, means for positioning a package at each aperture in succession as the containers are rotated, the dividing plates separating the interior of the package into compartments corresponding to the divisions of the aperture, a valve plate for normally closing the aperture, means actuated by movement of the container for opening the valve plate subsequent to the projection of the dividing plates into the package permitting a flow of semi-frozen ice cream from each container into the respective compartment in the package, means for closing the valve plate, means for withdrawing the dividing plates from the package subsequent to the closing of the valve plate, and means for removing the filled package from the apertures in succession.

9. In a machine for packaging ice cream in semi-solid condition, a series of containers of annular form and in concentric relation rotatable about a vertical axis having a series of apertures in the bottom, each aperture opening into the several containers, a frame about each aperture, a valve plate at each aperture, a series of dividing plates adapted to be raised or lowered to provide extensions of the walls of the containers intermediate the innermost and outermost wall of the assembled containers, said frame being provided on the inside with an inwardly sloping wall, a package table beneath each aperture moving with the containers adapted to be raised or lowered, means for positioning a package on each package table in succession, a base member beneath the containers, stationary means on the base for actuating the raising and lowering means of the table, a stationary means on the base by means of which the dividing plates may be raised or lowered and stationary means on the base for actuating the valve opening

and closing means, the arrangement of the stationary devices being such that the package table and package thereon is first raised, the upper open end of the package being centered beneath the aperture by the inclined wall of the frame, the dividing plates then moved to the lowermost position separating the package into compartments corresponding to the divisions of the aperture, the valve plate then opened to permit a flow of the semi-solid ice cream into the package, the construction providing that the several parts remain in this position during nearly a complete revolution of the container providing a comparatively long period of time for the filling of the package, stationary devices for closing the valve plate, raising the dividing plates and lowering the table in the order named, means whereby the filled packages are delivered from the package table by movement of the container, and means for receiving the removed package carrying the same from the machine.

10. In a machine for packaging ice cream in semi-solid condition, a container having an aperture in the bottom thereof through which the semi-solid cream flows to the package, a valve plate for opening and closing the aperture, means for placing a package in position to receive the ice cream from the aperture, means on the valve plate adapted upon the closing of the plate to provide a space between the plate and the ice cream in the package, and a vent provided for the said space opening to atmosphere.

11. In a machine for packaging ice cream in semi-solid condition, a container having an aperture in the bottom thereof, a valve plate adapted to open and close the aperture, means for placing a package in filling position beneath the aperture, the valve plate being spaced from the upper edge of the package when positioned, a depending lip at the forward edge of the valve plate extending approximately to the upper edge of the package and shaped to remove excess ice cream from the package and force it upward into the container and to level that remaining in the package, and means whereby air is introduced into the space between the body of the valve plate and the leveled ice cream in the package.

12. In a machine for packaging ice cream in semi-solid condition, a container having an aperture in the bottom thereof through which the ice cream may flow by gravity, a valve plate for opening and closing the aperture, means for positioning a package beneath the aperture for the filling operation, the upper edge of the package being sealed relative to the aperture, a valve plate having a depending lip at the forward edge adapted to level the ice cream and remove excess cream from the package upward into the container, and means for maintaining atmospheric pressure in the space between the valve plate and surface of the package to the rear of the said lip.

13. In a machine for packaging ice cream in a semi-solid condition, a container having an aperture through which the semi-solid ice cream may flow by gravity, a valve plate movable across the aperture to open the same, means for positioning an open ended package with the rim thereof in sealed relation with the wall about the aperture, means on the valve plate adapted by movement of the valve to close the aperture to displace the ice cream and provide a space between the plate and the ice cream in the package, the said space being provided with a vent to atmosphere.

14. In a machine for packaging ice cream in semi-solid condition, a container having an aperture through which the semi-solid ice cream may flow by gravity, a valve plate movable across the aperture to open the same to permit flow of ice cream therethrough, and means whereby on closing of the valve plate a space is provided between the valve plate and the ice cream in the package.

In testimony whereof, I sign this specification.

CHARLES E. ROGERS.