July 17, 1951 J. L. SAMMY 2,560,664

CUSTARD DISPENSER

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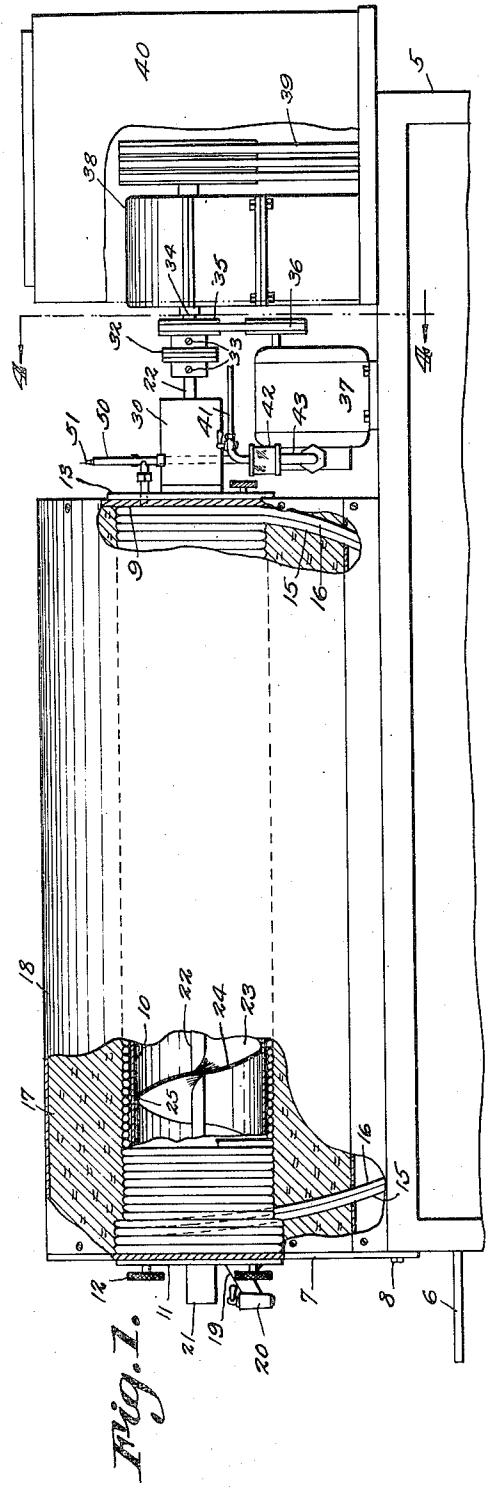


Fig. 1.

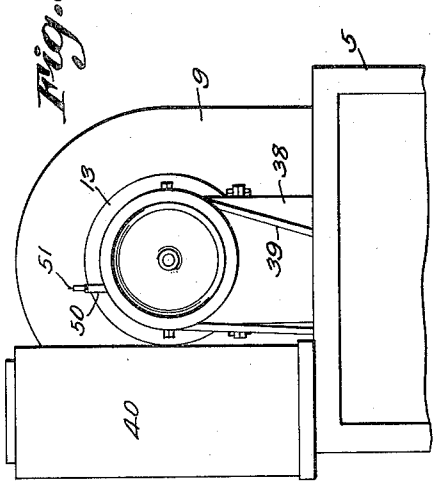


Fig. 3.

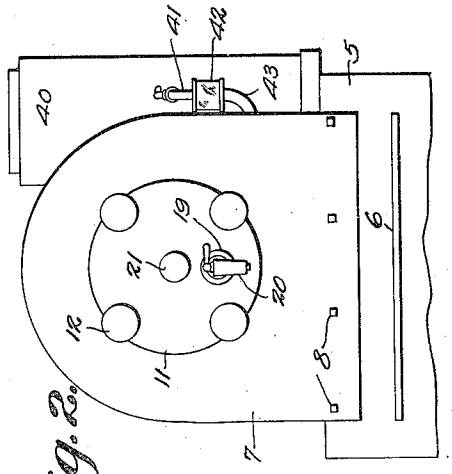


Fig. 2.

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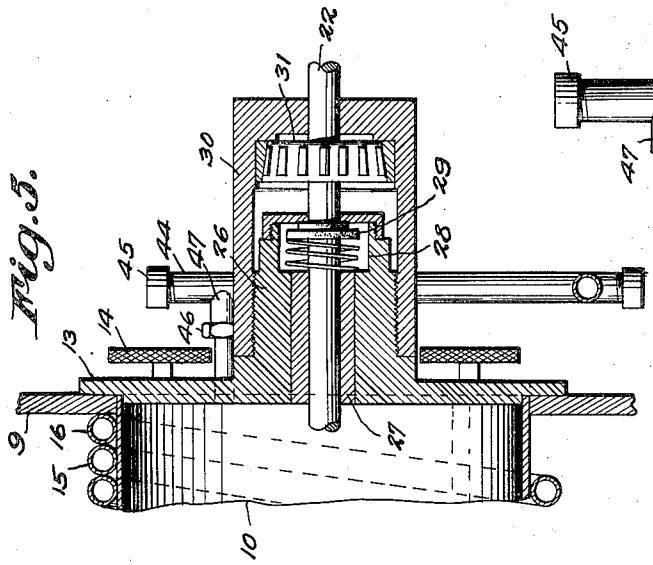


Fig. 3.

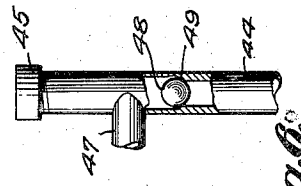


Fig. 6.

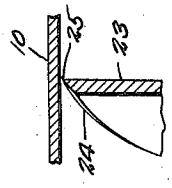


Fig. 7.

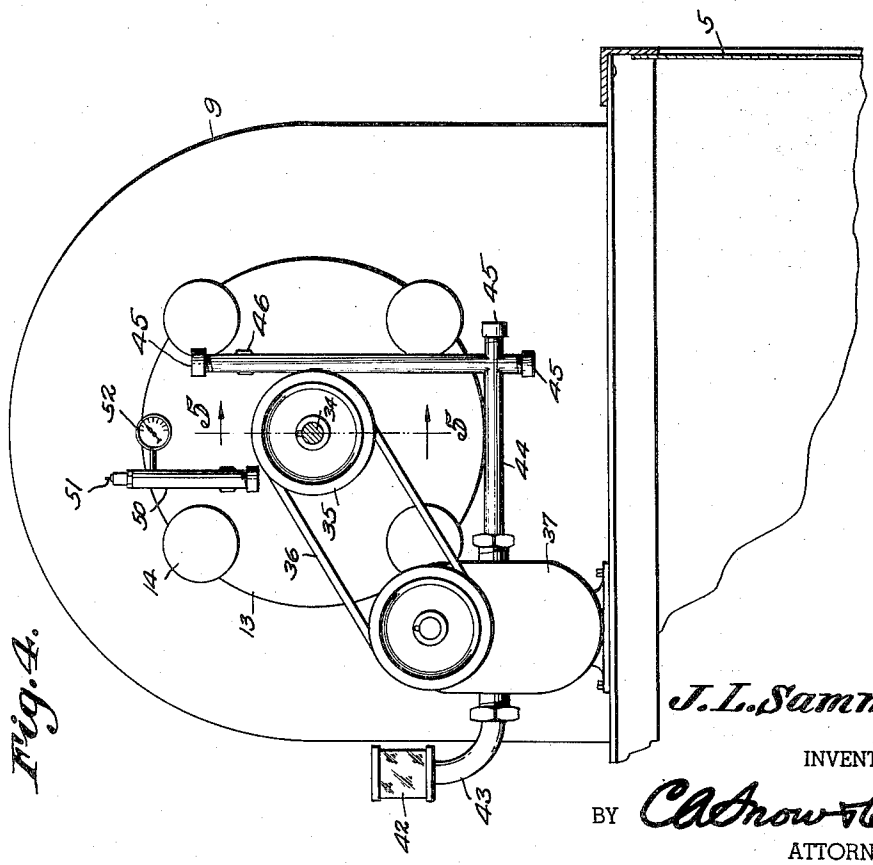


Fig. 4.

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CUSTARD DISPENSER

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Application March 8, 1948, Serial No. 13,572

1 Claim. (Cl. 62—114)

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This invention relates to a custard dispenser, and more particularly, has reference to a machine for freezing and dispensing frozen custard.

It is well known in the art to which the invention relates that machines of the character described must be capable of ready disassembly and assembly, for the purpose of permitting proper cleaning of all parts that come in contact with the cream from which the frozen custard is made. The laws of most states, in fact, are exacting in their requirements that such parts be cleaned thoroughly and often.

It is also well known that a machine of the type stated should be capable of freezing the custard efficiently, rapidly, and uniformly.

The primary object of the present invention is to provide an improved construction throughout of a freezing and dispensing machine of this type; and in keeping with this broad purpose, the invention has among its objects the provision of a machine in which the food-engaging portions will be retained unusually sanitary, and may be disassembled or assembled with ease and rapidity; in which said disassembly is permitted without disturbance or movement whatsoever of other portions of the machine, such as the drive mechanism; in which an improved dispensing valve permits dispensing direct to a cone or container, so that the product never touches human hands and is not exposed to the atmosphere until delivered to the customer; and in which a creamier and always uniform product is obtained, with minimum attention from the operator.

With the foregoing and other objects in view which will appear as the description proceeds, the invention consists of certain novel details of construction and combinations of parts, hereinafter more fully described and pointed out in the claims, it being understood that changes may be made in the construction and arrangement of parts without departing from the spirit of the invention as claimed.

Referring to the drawings

Figure 1 is a side elevational view of the machine, portions being broken away and other portions being shown in longitudinal vertical section.

Figure 2 is a front elevation.

Figure 3 is a rear elevation.

Figure 4 is an enlarged section on line 4—4 of Figure 1.

Figure 5 is an enlarged section taken substantially on line 5—5 of Figure 4.

Figure 6 is a detail view, partly in elevation

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and partly in section, of a gravity lock feed line embodied in the invention.

Figure 7 is a fragmentary sectional view through a portion of the beater.

Referring to the drawings in detail, a supporting frame 5 is of any suitable construction that will serve to support the machine and its associated parts. On the front of the frame there may be fixed a ledge or shelf 6 on which may be kept cones or other containers used in dispensing the product.

An upstanding front end plate 7 is rigidly secured to the frame by bolts 8, and a rear end plate 9 is mounted in the same manner. Fitted into large central openings formed in the respective plates are the opposite ends of a freezing cylinder 10. The freezing cylinder, and all other portions of the machine which are food-engaging, should be of stainless steel or similar material.

A front cylinder plate 11 is annularly flanged, and closes the front end of the freezing chamber provided by cylinder 10. This is removably secured to the front end plate 7 by the provision of a plurality of studs extending from the end plate, and received in openings formed in the flange of the cylinder plate 11, knurled nuts 12 being threaded on the studs to hold the cylinder plate tightly but removably to the end plate.

The rear cylinder plate 13 is removably secured to the rear end plate 9 in the same manner, knurled nuts 14 permitting ready mounting or removal of the rear cylinder plate.

Spirally wrapped around the freezing cylinder 10, from end to end thereof, are coils 15 and 16. By the provision of the two lines 15 and 16, disposed in an alternating arrangement from end to end of the freezing cylinder, far better cooling efficiency results and emergency operation of the machine is permitted despite the breakdown of one of these freezing coils, since the other coil will still be in operation for the purpose of refrigerating the cylinder 10.

The cylinder-engaging portions of the refrigeration lines 15 and 16 are soldered to the cylinder from end to end of the machine, thereby eliminating air spaces between said coils and the cylinder surface. At the front end of the machine, the coils are wrapped in a double course for a suitable distance, since it is desirable that the freezing cylinder be kept colder at its front or dispensing end.

Surrounding the cylinder and coils is insulation 17, preferably cork, and over this is mounted a cover 18, which like the end plates, may

be of stainless steel for convenience in exterior cleaning and for a sanitary appearance.

Extending outwardly from the lower portion of the front cylinder plate 11 is a downwardly inclined and tapering nozzle 19, on the outer end of which is disposed a dispensing faucet 20. It has been found that a nozzle and faucet so formed and arranged permits dispensing of the product directly to a cone or similar container, for delivery to a customer, and it is thus seen that the product is untouched by the hands of the person charged with the dispensing. Conventional machines of this type generally require that the product be dispensed from the freezing cylinder to some other container, in which it is kept until sold to a customer.

Integral with the front cylinder plate 11, and extended outwardly therefrom, is a centrally disposed bearing 21, in which is journaled for rotation the front end of a beater shaft 22. This beater shaft is extended from end to end and axially of the freezing cylinder 10, and the portion of the shaft inside the cylinder is integral with a helical beater 23.

In the invention, the beater 23 is so formed as to dispense with the necessity of a knife and beater combination, as has been required in prior machines of this type. The beater 23 in the present instance is both knife and beater, the several flights of the beater each having an obliquely angled knife edge 24, which is continuous from end to end of the beater, and which at all points is closely spaced, as shown at 25, from the wall of the freezing cylinder. It has been found that a beater so formed produces a creamy product, in which the continuous knife edge 24 continuously and cleanly cuts the cream during the freezing process, and during the movement thereof from the rear to the front end of the freezing cylinder.

Referring particularly to Figure 5, an outstanding exteriorly threaded neck 26 is integral with the rear cylinder plate 13, and is formed with an axial bore in which is a bushing 27, the rear end of shaft 22 being journaled for rotation therein.

The outer end of the neck 26 has a recess 28, for a sanitary seal 29 of resilient packing material, that prevents the infiltration of oil or other foreign matter through the shaft journal and into the freezing cylinder.

Threaded on the neck 26 is a cup-like bearing housing 30, and this is formed to receive a conical roller bearing 31.

The end of shaft 22 projects through an opening in the closed end of the housing 30, and terminates within a flexible coupling 32, in which it is removably secured by a set screw 33.

Secured to the coupling shaft 34 is pulley 35 around which passes belt 36 adapted to drive a force pump 37. Pump 37 is removably bolted to the frame 5.

The coupling shaft 34 extends into and is driven from a gear reducer 38, driven by pulleys and belts 39 extending from a suitable motor, not shown, that may be mounted in the frame 5.

At 40 is shown a cream tank having a removable lid, and which will be thoroughly insulated, as by cork or the like. Cream is drawn from the cream tank through provision of a valved cream supply line 41. The discharge end of this line is extended downwardly, into a glass cup 42 which, as will be understood, has an opening in its upper end for this purpose. The opening is made large enough to permit air to be drawn into the cup as well as cream.

Fixedly secured to the bottom of cup 42 is an air and cream line 43 the other end of which is detachably secured by a suitable union to one side of the pump 37. Referring to Figure 4, a similar union permits detachable connection to the other side of the pump of one end of a pressure feed line 44. This is L-shaped, and caps 45 threaded on the respective projections of the pressure feed line permit cleaning of all portions thereof with facility.

As shown in Figure 5, the outlet end of the pressure feed line 44 is detachably connected to a pipe extending from the rear cylinder plate 13, there being a union 46 for effecting said connection with a lateral branch 47 of the pressure feed line. This branch is disposed at a distance below the upper end of the feed line. A ball 48 is normally disposed (Figure 6) on an annular seat 49 interiorly formed in the pressure feed line, and just below the opening into the branch 47. By reason of this construction, it is seen that during operation of the pump, the ball 48 will rise in the pressure feed line, and will move above the branch 47, so that mixed cream and air will be forced under pressure into the branch 47, and thence into the freezing cylinder 10. When the pump is not operating, however, the ball drops to its seat, thus to seal the mixture of cream and air in the freezing cylinder.

The invention embodies a pressure indicator and release unit 50 detachably connected to the plate 13 for communication with the freezing cylinder. At its upper end, this is provided with a pressure release valve 51, and the unit is also provided with a pressure gauge 52. Valve 51 is normally closed. However, when the pressure inside the freezing cylinder rises above the desired amount, the valve opens, and remains open until the pressure returns to its proper level.

In operation, the motor is started, and this drives both the beater and the pump. Cream is fed by gravity to the pump from the cream tank, and the pump forces a mixture of cream and air into the pressure feed line 44. Ball 48 rises, and the mixture is fed to the freezing cylinder. The valve 51 is set so as to hold the air pressure within the freezing cylinder at a uniform rate at all times, the pressure being preferably between 5 and 10 pounds. At any point during the operation, should the pressure rise above this amount, it is immediately brought back to its proper level in the manner previously described. In this way, a continuously uniform product is obtained, and it has been found that the maintenance of a proper air pressure at all times, in combination with the beater arrangement and formation, and also with the simultaneous and uniform operation of the beater and the pump, brings about these results. As previously mentioned, when the motor is cut off, ball 48 drops and seals the mixture in the cylinder without loss of pressure.

Another important characteristic of the machine should be noted, and this is the ease and speed of cleaning permitted by the construction illustrated and described. It is an absolute essential, in machines of this type, that they be capable of thorough and speedy cleaning. By removing simply the nuts 12 at the front of the machine, the front cylinder plate 13 is lifted off. This exposes the beater shaft 22 integral with beater-conveyor 23. Simply by loosening set screw 33 where the rear end of the shaft is secured to the flexible coupling 32, the entire

shaft and beater may be drawn out the front of the machine.

To remove the rear cylinder plate 13, nuts 14 are removed, and pressure feed line 44 disconnected from the plate by unthreading of union 46. The rear cylinder plate and the parts carried by the neck 26 thereof is now free to be moved rearwardly and lifted away from the machine. In doing so, it need be moved rearwardly no more than approximately one-half inch, to free it from the rear end plate 9.

In this way, the cylinder plates, cylinder, and beater, are all fully accessible for thorough cleaning. An important characteristic of the disassembly operation described, in this regard, is the fact that it is permitted without disturbance or movement of any part of the drive mechanism.

The pump, additionally, is easily removed in its entirety from the machine, to facilitate cleaning and sterilizing thereof, and this characteristic applies as well to the pressure feed line and the pressure indicator and release unit.

Other important characteristics of the machine are the fact that the product is untouched by hands from beginning to end of the operation, and is dispensed directly to the consumer; the machine is capable of continuous operation even though one refrigeration line may go out of order; and both pump and beater are driven from one motor, this being permitted by reason of a construction including a pressure feed line having a gravity lock as at 48, and also by the pressure indicator and release unit 50.

What is claimed is:

In a custard dispenser the combination, with a freezing cylinder and a pump for forcing mix into said cylinder, of a feed line communicating between the pump and freezing cylinder, said

feed line including a vertical supply pipe opening at its lower end from the pump and closed at its upper end, and a lateral branch communicating at one end with the supply pipe at a short distance below the closed upper end portion of said supply pipe, and opening at its other end into the cylinder, said pipe being of one-piece formation and the upper end portion thereof having a counterbore extending from a location above the intersection of the pipe with said lateral branch to a location below said intersection to define an annular ball seat integrally formed in the supply pipe immediately below the location at which the supply pipe communicates with the lateral branch; a ball disposed in and formed to the diameter of the counterbore and normally seating by gravity upon the ball seat to prevent backward movement of mix through the lateral branch and downwardly into the supply pipe; and said ball adapted to be moved upwardly into the closed upper end portion of the supply pipe to clear the supply pipe and branch for movement of mix therethrough, when said pump forces mix upwardly through the supply pipe.

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