Feb. 16, 1943. C. A. THOMAS 2,311,602

MILK COOLING AND DISPENSING DEVICE

Filed June 26, 1939

FIG. 1.

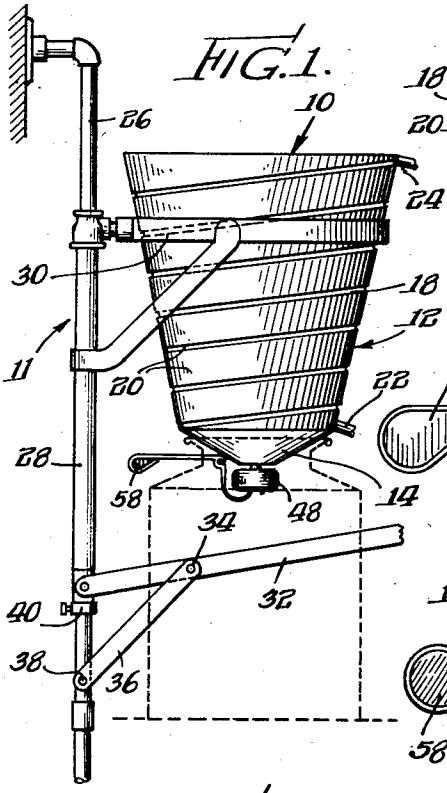


FIG. 2.

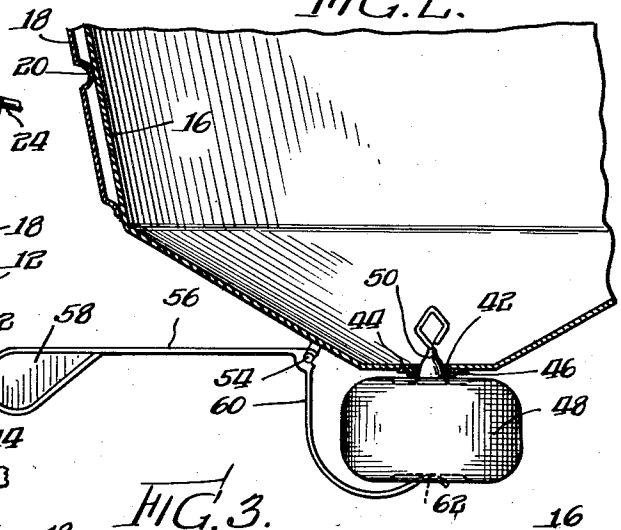


FIG. 3.

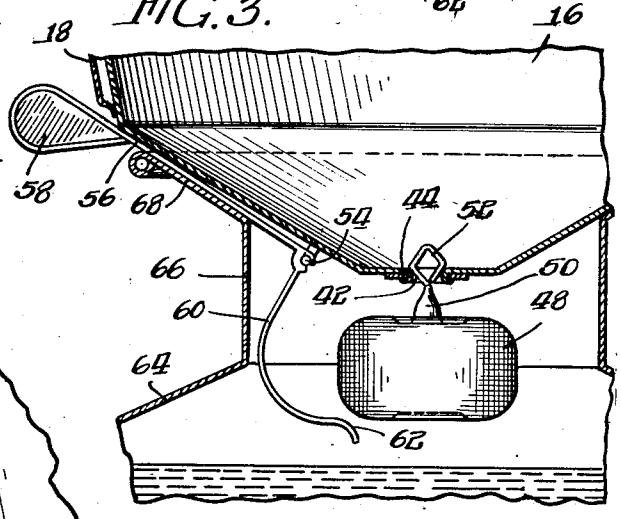


FIG. 4.

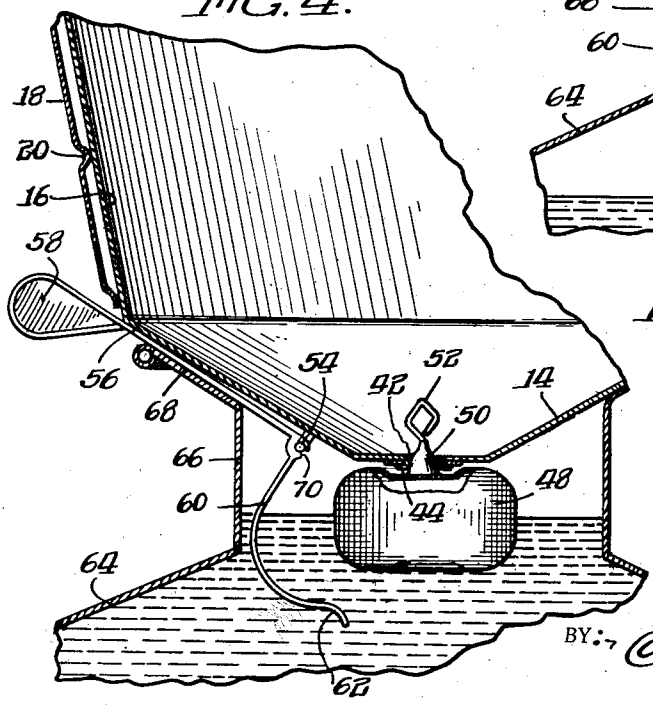
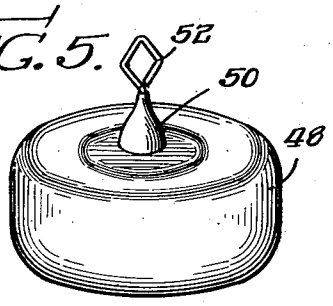


FIG. 5.



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MILK COOLING AND DISPENSING DEVICE

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4 Claims. (Cl. 226—37)

The present invention relates to a device for cooling and filtering milk and similar fluids.

It has heretofore been the general practice to supply milk to cooling and filtering devices and to collect the treated or cooled effluent in a suitable receiving container. Operating in this manner, it has been necessary to gauge the quantity of liquid supplied to the treating instrumentality to prevent overflow of the receiving container.

It is an object of the present invention to obviate the special attention necessary in the operation of such devices by so arranging the milk treating or cooling instrumentality as to provide a reservoir for excess liquid adapted to retain any superfluous liquid remaining after the receiving container has become fully supplied, which device automatically ceases supply to the receiving container at this point and positively seals the outlet of the reservoir until such time as the container is replaced.

It will be apparent that the present invention provides a milk cooling or filtering unit to which the liquid may be supplied relatively indiscriminately while filling individual receptacles with the treated product thereof, and this is, accordingly, of great practical value in the handling and supply of milk where the product of the diary is normally and preferably dispensed in individual milk cans or containers of convenient size.

It is an important object of the present invention to provide a valve control for a milk cooler adapted to close when the receiving container is full and to be positively held in closed position until an empty container is placed in receiving position, as above, and particularly wherein the valve mechanism is relatively simple and mounted adjacent the exterior of the cooling member in convenient position for disassembly and cleaning. In this respect the present invention provides a construction which is well adapted to the handling of products which are preferably maintained in sterile condition.

The present invention yet further contemplates the provision of a valve construction for a liquid treating and dispensing device, as above, wherein a float acts directly to press the valve into closed position for the purpose of obviating the use of a relatively complex valve actuating mechanism and providing a simplified construction.

In this connection it is a further important object of the present invention to provide in a construction such as the foregoing a unitary valve and float construction retained resiliently in position with respect to the outlet orifice of the device by means of a yieldable attaching member and freely removable from the orifice by a moderate force.

Yet an additional object of the present invention is to provide a construction such as the foregoing wherein the dispensing valve is held positively closed by an exteriorly applied force when the unit is removed from operative position with respect to a receiving container in order to positively prevent leakage, the valve being automatically freed from said positive closing force by mere arrangement in operative position adjacent an empty receiving container. To this end the valve member when released normally resides in valve opening position, whereby it is closable positively by the action of the float in accordance with the rise in level of liquid in the receiving container and/or the influence of the positive mechanical closing means which comes into action upon relative separation from the receiving container. The present invention, accordingly, provides a construction wherein the valves are positively closed by external means for assuring continued reliability of operation.

Yet other and further objects and advantages of the present invention will be apparent throughout the course of the following specification, wherein:

Figure 1 is an elevational side view of a milk cooler constructed in accordance with the present invention;

Figure 2 is a detail sectional view taken centrally through the lower part of the milk cooler shown in Figure 1;

Figure 3 is a view the same as Figure 1 but showing the relation of the parts when the milk cooler is in operative position above an empty milk can;

Figure 4 is a view identical with Figures 2 and 3 and illustrating the action of the valve when the liquid in the receiving container reaches a predetermined level; and

Figure 5 is a perspective view of the combined float and valve element.

Referring to the figures of the drawing, wherein the present invention is represented more in detail, Figures 1 and 2 show a milk cooler 10 supported upon an adjustable bracket 11. The cooler body has a frustoconical side wall 12 and is closed at the bottom by a wall 14 having a much more sharply inclined frustoconical configuration. The cooler 10 may be provided with an open top for admission of liquid to be cooled, or may be provided with a reservoir and filter for straining solid material from the liquid, as is well known in dairy practice.

Attention is directed to the fact that the side wall 12 of the present cooler body is provided with an inner wall 16 surrounded by a coolant jacket 18, Figure 2. The jacket 18 is provided with a continuous groove or depression 20 which progresses spirally upwardly, the apex or crest of this laterally depressed portion 20 being welded to the inner wall 16, as clearly shown in Figure 2, to space the remainder of the wall 18 away from the wall 16. As a result, the coolant jacket provides a continuous spiral path about the entire outer surface of the filter cooler 10, wherefore a cooling liquid introduced at inlet 22 progresses upwardly and outwardly at outlets 24 to abstract heat from liquid within the wall 16. As will be understood by those skilled in the art, it is preferable during operation to pass the milk or the liquid to be cooled in a film downwardly along the wall 16 in heat-exchanging relationship.

The cooler supporting bracket or mounting 11 comprises a fixed vertical bar 26 slidably carrying a tube or sleeve 28 in coaxial relationship. The sleeve 28 carries an embracing hoop or collar 30 in which resides the cooler and strainer unit 10. A treadle or pedal 32, fulcrumed at 34 upon link 36, has its opposite end engaging the sleeve 28 so that as the foot lever or treadle 32 is pressed downwardly at its outer end the sleeve 28, and, accordingly, the cooling and filtering unit 10, are lifted upwardly. The lower end of link 36 is pivoted to the fixed bar 26 as at 38, while a collar 40 adjustably fixed upon the bar 26 supports the sleeve 28 in lower position. In accordance with the present construction, therefore, the milk cooler may be readily elevated to permit the arrangement therebeneath of a conventional milk can, as indicated by the dotted lines in Figure 1 and may be readily swung to any of a plurality of positions about the bar 26 suitable for delivery of the treated product.

In accordance with the present invention, the liquid reaching the lower confines of the filter-cooler unit 10 is permitted egress only when an unfilled or incompletely filled receiving container is arranged in proper predetermined receiving relationship. To this end the lower wall 14 of the cooling unit is provided centrally with an aperture 42, which aperture, as will be hereinafter seen, provides an operative valve seat cooperating with a movable valve member. As shown more clearly in Figures 2 to 4, inclusive, a preferred valve seat is provided by flanging or forming over the edge of the aperture as at 44 about an annular collar or washer 46. The movable part of the valve comprises a float 48 having an upwardly extending tapered projection 50. As clearly shown in Figures 2 and 4, the tapered part 50 may enter the aperture 42 in valve closing relationship, the adjacent surfaces at the aperture preferably being lapped together to assure a fluid-tight seal in closed position.

Permanent association of the float unit with the aperture 42 is conveniently maintained by means of a yieldable elongated member 52 extending upwardly from the end of the projection 50 and bent reversely, as clearly shown in Figures 2 to 5. While the configuration of the yieldable wire 52 is such as to prevent free passage through the aperture 42, nevertheless it will be evident that the application of a moderately increased force will cause the part 52 to yield for ready disassembly. It will be understood that this construction is of great practical significance in view of the conditions of sanitation and sterility which must be necessarily maintained in handling products of the instant class.

In order to positively hold the valve in closed position the present invention provides a bell crank lever construction fulcrumed upon a fixed pivot or pintle 54 mounted upon the wall 14 and having an outwardly projecting arm 56 weighted as at 58. A second arm 60 of the bell crank lever projects downwardly, as shown in Figure 2, and terminates in an inwardly extending contact or pressing portion 62. As is clearly shown in Figures 1 and 2, the contact extremity 62 of the lever is directed by the action of the counterweight 58, upwardly against the bottom of the float 48 to seal the aperture 42. Thus at all times when the cooling unit is suspended freely as shown in Figure 2, the outlet orifice is closed.

For the purpose of illustrating the operation of the present device, however, reference is had to Figures 3 and 4 illustrating in detail the relative position of the parts with the cooling unit arranged in operative relationship above a suitable receiving container. The receiving container in this illustration and designated by the reference numeral 64 possesses a conventional form having an upstanding neck portion 66 and an outwardly inclined annular flange portion 68 adapted to supportingly receive the complementary inclined bottom wall 14 of the cooler.

Attention is particularly directed to the fact that during arrangement of the cooling unit in operative position upon the receptacle 64, the weighted arm 56 of the bell crank lever is rotated in a clockwise direction about its pivot, carrying with it the pressing finger 62 and, accordingly, releasing the float valve 48, which drops downwardly, as shown in Figure 2, until the yieldable part 52 enters the aperture 42. From the foregoing it will be obvious that at this point the aperture 42 is open, whereupon liquid introduced into the cooler 10 will gravitate to the bottom and into the receptacle 64.

Let it be assumed that the liquid level in the container 64 reaches a predetermined maximum as indicated in Figure 4. At this time the float 48 is elevated, causing the valve projection 50 to enter the aperture 42, effecting positive cessation of flow through the aperture. It is quite important to note that should an excess of liquid have accumulated within the vessel 10 there will be no danger of loss or spillage in substituting an empty or substitute receptacle 64, since elevation of the cooler 10 permits the counterweighted lever to positively hold the float 48 in its upper position through the action of the pressing finger 62. That is to say, elevation of the sealed vessel 10 from the position of repose shown in Figure 4 permits the counterweighted arm 56 to drop downwardly to the original position shown in Figure 2 to apply a predetermined force, retaining the valve in orifice sealing position.

It is further important to note that the bell crank holding lever is, in accordance with the present invention, freely removable from its pivot 54 for sterilization and cleansing. To this end the portion of the lever journaled upon the pivot 54 is cut away or relieved upon one side, as at 70, the cut-away portion being of sufficient extent to permit passage of the pivot. Accordingly, the lever may be freely removed from its supporting pintle 54 by lifting it upwardly and laterally, and equally as readily replaced or assembled. The present invention provides a liquid treating instrumentality which is of convenience in sup-

plying and filling a plurality of containers in successive order, each of the receiving containers being separately and individually filled and the cooling device, meanwhile, being elevated or swung to new positions adjacent successive receptacles without loss or contamination of any of the liquid. In accordance with the present invention, the liquid supplied to the receiving vessel is controlled by automatic means of great simplicity, capable of being maintained in a sterile condition, and relatively freely removable for periodic sterilization.

The present invention additionally provides a cooler body construction of substantially increased strength and rigidity. Heretofore it has been the practice to provide cooling jackets formed by spaced, co-extensive walls. In accordance with the present invention, however, it should be noted that the construction of the outer wall 18 is such as to provide a reinforcement for the inner wall 16. That is to say, the spirally depressed groove or laterally offset portion 20 serves as a reinforcement not only for the outer wall 18 but for the inner wall 16 and, when combined with the inner wall, as by welding, is analogous in effect to conventional bridge truss constructions. It is thought that a careful consideration of Fig. 1 will illustrate the structural manner in which the inner and outer walls cooperate to mutually reinforce and rigidify the final assembly.

Changes may be made in the form, construction and arrangement of the various parts without departing from the spirit or scope of the invention or sacrificing any of its advantages, and the right is hereby reserved to make all such changes as fairly fall within the scope of the following claims.

The invention is hereby claimed as follows:

1. For use in combination with a milk cooling device of the class described having a liquid receiving vessel, an outlet and a valve and float means for sealing said outlet; a lever construction for normally retaining said valve in orifice sealing position, said lever having a discontinuous pivot embracing journal peripherally relieved to permit free separation from the pivot for cleaning, an arm extending from said pivot portion and adapted in one pivotal position to reside adjacent the lower surface of the vessel, a second arm extending laterally from said first-named arm, said second arm terminating in a portion disposed longitudinally and oppositely with respect to said first-named arm and being adapted to engage beneath a portion of the float for holding the valve in sealing position in another pivotal position of the lever.

2. In a device of the class described in combination with a liquid receiving vessel having bottom walls converging inwardly, an outlet in a wall portion of the vessel intermediate the juncture of said converging walls, a float having a valve on its upper portion, said upper portion having means for depending the float and the valve through the discharge outlet whereby to maintain said float and valve below the bottom portion of said vessel at the outlet while permitting the free upward movement of said float and valve to permit the valve to close the discharge outlet by such upward movement, means on one of the converging walls of said vessel providing a pivot, and a lever pivotally mounted between its ends thereon and shaped to provide a relatively straight arm on one side of the pivot and a laterally extending arm on the other side of the pivot, said lever arms being formed so that when said vessel and float and lever are inserted in the mouth of a milk can, said lever is shifted on its pivot and assumes a position such that the straight arm lies parallel to the converging wall of the receiving vessel, and such that the laterally extending arm of the lever is shiftable clear of the float when the first mentioned arm is parallel to the wall of the vessel whereby to permit said float to depend and the valve to shift to open position with respect to said orifice, said straight arm of the lever having sufficient weight whereby when said vessel and valve and lever are removed from said milk can, said straight arm will shift downwardly to cause the laterally disposed arm of the lever to engage the bottom of the float and lift it upwardly to cause the valve to close said discharge opening in the bottom of the vessel and for holding the valve in such position to seal the discharge opening of said vessel.

3. In a device of the class described in combination with a liquid receiving vessel having inwardly converging walls connected with an intermediate bottom wall of the vessel, a centrally disposed aperture therein, a float having a valve on its upper portion adapted in an upper position of said float to project into said opening to seal the same, said valve having means thereabove adapted to permit said valve and float to depend from said vessel with the valve in open position with respect to said aperture while permitting the free upward movement of the float valve, means disposed on the vessel at a point above the closed position of the valve constituting a pivot, and a lever pivotally mounted intermediate its ends on said pivot, said lever having an angularly disposed portion bent so that in one position it engages the underside of the float to push said float upwardly to closed position, and in another position to shift clear of said float to permit said float freely to depend from said aperture, said lever having an actuator for causing it to be shifted to said two positions.

4. In a device of the class described in combination with a liquid receiving vessel having an outlet in its bottom portion, a float carrying a valve adapted on upward movement to seal said outlet, means for maintaining said float and valve in shiftable relation to said aperture of said vessel whereby said valve normally remains in downward open position with respect to said aperture but is freely shiftable upwardly to close said opening, means permanently connected to the outer wall of the vessel forming a pivotal portion and a lever provided intermediate its ends with a peripherally relieved embracing journal adapted to form a quick detachable connection with the pivotal portion on said vessel, said lever including an arm extending from said pivot and adapted in one pivotal position to reside substantially away from the lower surface of the vessel and a second arm extending laterally from the first arm and terminating in a portion adapted to engage beneath the central portion of the float for holding the float and valve in upward position to cause said valve to seal the aperture in said vessel, said second mentioned arm of the lever in a shifting position permitting the free downward movement of said valve to open the aperture in said vessel.

CHESTER A. THOMAS.