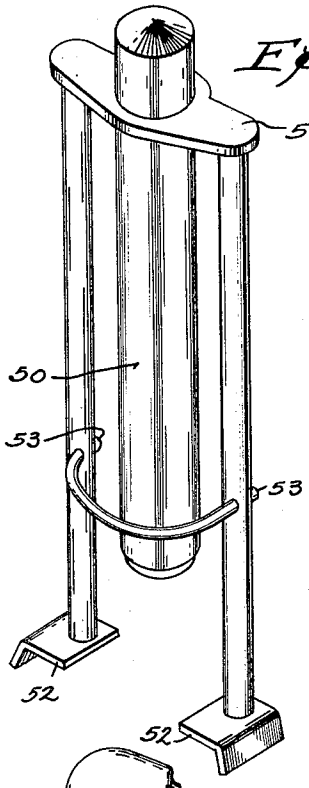
March 9, 1965 L. E. KOCH 3,172,422

DISPENSING FREEZER

Filed Dec. 21, 1962

Fig. 2



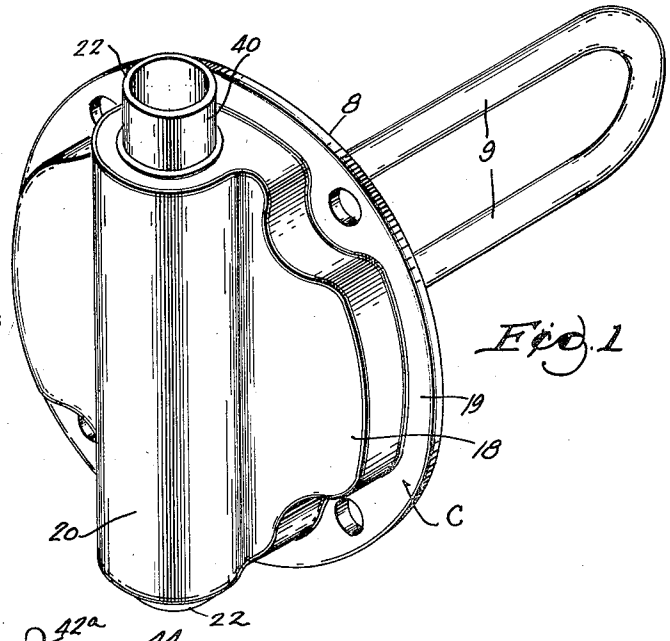


Fig. 1

Fig. 3

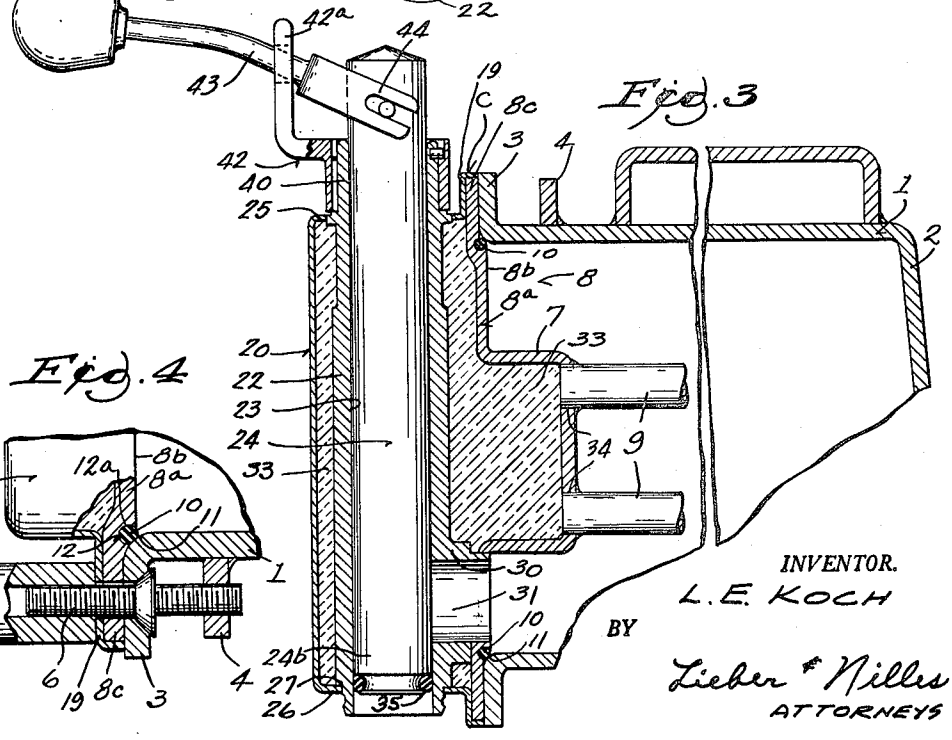


Fig. 4

INVENTOR.
L. E. KOCH
BY
Lieber & Nilles
ATTORNEYS

United States Patent Office

3,172,422

Patented Mar. 9, 1965

3,172,422

DISPENSING FREEZER

Lawrence E. Koch, Rockton, Ill., assignor to Louis A. M. Phelan

Filed Dec. 21, 1962, Ser. No. 246,406
3 Claims. (Cl. 137—375)

The present invention relates generally to continuous freezers for soft ice cream, malteds, custards or the like, of the type in which the product is drawn off through a serving valve located at one end of the freezing cylinder. More specifically, the invention relates to an improved, insulated front cover and serving outlet for such a freezer.

In devices of this general type, the temperature of the product about to be served should be maintained within one-half of a degree of a predetermined temperature in order for the product, when served, to have the necessary consistency to "stand up" and be formed into an appealing top. This temperature is also critical to prevent "leaking" or a general messy condition at the draw off valve; or to prevent "sweating" or condensation on the outside surface of the cover or on the serving valve itself. Generally, these covers must also be efficient in preventing heat exchange therethrough and consequent loss of refrigeration, and some of these problems are referred to in U.S. Patent 2,916,044 over which the present invention is an improvement, which patent issued on December 8, 1959, to L. A. M. Phelan, who is the assignee of the present invention.

Accordingly, the present invention provides an improved insulated cover which has the above desirable characteristics and eliminates the mentioned shortcomings of prior art devices.

The cover provided by the present invention is also versatile in being able to accommodate various types of serving valves, such as may be required for malteds as opposed to custards or other types of soft ice cream.

In addition, the improved cover provided by the present invention reduces leakage to a minimum, notwithstanding high pressures within the cylinder or fluidity of the product.

Another aspect of the present invention relates to an improved O-ring seal between the removable cover and the front end of the freezer cylinder, and an improved mounting groove for such an O-ring.

These and other objects and advantages of the present invention will appear hereinafter as this disclosure progresses, reference being had to the following drawings, in which:

FIGURE 1 is a perspective view of a cover made in accordance with the present invention and having its shiftable valve element removed;

FIGURE 2 is a perspective view of one type of shiftable valve element useable with the FIGURE 1 cover;

FIGURE 3 is a vertical sectional view taken centrally through the cover shown in FIGURE 1, on a slightly enlarged scale, and showing it attached to a portion of the freezer cylinder; the view also showing another type of shiftable valve element in the closed position in the cover; and

FIGURE 4 is an enlarged, fragmentary view of a portion of the cover as shown in FIGURE 3, the view being a sectional one taken through one of the means for securing the cover to the freezer cylinder and also showing the O-ring seal and mounting groove therefor on the cover.

Referring in greater detail to the drawings, the refrigerated freezer cylinder 1 is of the horizontally disposed type having a rear end 2, a front radial flange 3, a cover mounting ring 4 welded adjacent the front end, and a plurality of large thumb nuts 5 threadably removable on the threaded studs 6 secured to the ring 4, for securing

the cover C to the cylinder. The above general arrangement is shown and described in the said Patent Number 2,916,044, as are a large central hub 7 formed integrally on the inside of the inner plate 8 of the cover and a retarder 9 extending from the hub.

It should be noted that an O-ring 10 is located in sealing engagement between the inside wall 8*a* of plate 8 and the corner 11 at the front end of the cylinder 1. This ring is mounted in a groove 12 which is formed between the main or central portion 8*b* of the wall 8*a* and an axially forward offset portion 8*c*. In other words, the groove is axially offset in respect to the horizontal axis of the cylinder 1, so that it has a portion 12*a* which faces radially in respect to the radius of the cylinder 1. The groove 12 is axially offset from wall 8*a* so as to provide a means to prevent loss of the O-ring 10. The groove 12 also extends axially into the axially offset portion 8*c*. As a result, when the O-ring is in the groove 12, it extends therefrom radially outwardly of inner wall 8*a* and also axially from the outer wall portion 8*c*. This groove construction is therefore capable of presenting the O-ring to the inside corner 11 of the front end of the cylinder and insures good sealing regardless of the pressure within the cylinder and even though the thumb nuts 5 may not be drawn up absolutely tight.

This groove construction also has the advantage of being able to hold the O-ring in place on the cover when removing or installing the cover. This prevents O-ring loss or omission, and also insures proper assembly of the joint and sealing thereof, even by an inexperienced operator.

In addition to the inner plate 8, the cover C has an outer wall 18 formed of sheet steel by a stamping operation. This outer wall has an axially extending peripheral flange 19 which is welded at its outer extremity to the outer edge of plate 8. This welded joint is subsequently ground to a smooth finish and the cover plated to present a unitary appearing cover.

It will be noted that the outer wall has a vertically arranged tubular portion 20 pressed outwardly and forwardly from its front side, so as to form an enclosure around a steel tube 22. Tube 22 is vertically arranged and has a bore 23 which forms a seat for and sealing fit with the shiftable valve plunger 24, to be referred to later.

The outer wall 18 has an upper enclosing portion 25 which encloses and is welded to the upper portion of tube 22. A similar enclosing portion 26 is provided for the lower end of tube 22, and a flange 27 on the latter rests on portion 26. This lower joint is also subsequently welded to completely close the space between the inner plate 8 and the outer wall 18.

Tube 22 has a laterally extending portion 30 which extends through and is welded to plate 8. A discharge opening 31 in portion 30 places the interior of cylinder 1 in product communication with the vertical bore 23.

To assemble the various parts of the cover, the tube 22 is first located in the outer wall by being inserted in the opening in portion 25 and is then lowered into the opening in portion 26 until the flange 27 rests on portion 26. Tube 22 is then welded adjacent each of its ends to outer wall 18. The inner plate 8 is then welded to the outer wall 18.

If an insulating material 33 is to be used within the cover, instead of using air as the insulating medium, the material is then inserted therein through the two holes 34 in the end of the hub. This insulation 33 may be of the self foaming type which completely fills all the space in the cover. The retarder 9 is then welded in place in the hub.

In any event, the space between the inner plate and outer wall is a completely closed and insulated space.

The tube 22 and its enclosing portion 20 extend to a considerable height above the horizontal discharge opening 31, being generally co-extensive with the height of the cover proper. If a product of low viscosity is being used, it may be desirable to use an O-ring 35 on the lower end of the plunger. In this case leakage cannot occur upwardly in bore 23 because of its height and even though considerable product pressure may be exerted on the serving valve.

The tube 22 has a portion 40 which extends above the outer wall portion 25 for the purpose of rotatably mounting the bracket 42 of the serving valve. Bracket 42 has an upstanding portion 42*a* in which a handle 43 is pivoted in a vertical direction to operate the plunger 24 which is engaged in the bifurcated end 44 of the handle. If a more complete description of the handle is deemed desirable, reference may be had to the co-pending U.S. application Serial Number 98,474, filed March 27, 1961, by Gorychka et al., and assigned to a common assignee with the present application, and issued as Patent Number 3,081,920, on March 19, 1963. It is sufficient to say for purposes of this disclosure, that the lower end 24*b* of the plunger can be raised to expose at least a portion of opening 31 for drawing the product off. It should be noted that the lower end 24*b* of the plunger is located within the insulated portion of the cover. In fact, enough of the plunger is within the insulated cover to prevent it from becoming warm enough to seriously affect the temperature of the product in discharge opening 31. Maximum control of the temperature of the product about to be served is thereby assured.

The tube 22 is located comparatively close to the inner plate 8 and the opening 31 is relatively short which contributes to a compact and efficient design.

The construction of the present cover is such that the type valve shown in FIGURE 2 can also be used with it, and this results in decided manufacturing and inventory advantages. The FIGURE 2 type of shiftable valve is of the general "cup lift" type shown in my co-pending U.S. application Serial Number 95,142, filed March 13, 1961, issued as Patent Number 3,081,804 on March 19, 1963. The operation of the plunger 50 of that valve within bore 23 is the same as previously described and it is deemed further necessary to say only that the cup (not shown) which is about to be filled is placed against the portions 52 of the valve and then raised to lift the plunger. Projections 53 on the shiftable valve assembly slidingly bear against the cover and thereby guide and stabilize the assembly in its vertical movement. In the closed position, the upper cross plate 56 rests on the top of tube 22.

The present invention provides full insulation for the cover, product discharge openings and shiftable plunger. Temperature control of the product about to be served is definitely controlled and leakage and mess at the draw off valve is substantially eliminated.

The cover is effectively sealed against the cylinder and can be readily removed or attached thereto.

Various modes of carrying out the invention are contemplated as being within the scope of the following claims particularly pointing out and distinctly claiming the subject matter which is regarded as the invention.

I claim:

1. An insulated front cover for a freezer cylinder comprising, an inner plate adapted to abut in sealing engagement with said cylinder, an outer wall spaced from said plate and mounted thereto, said outer wall being of substantially the same diameter as said inner plate, the space between said plate and wall being a completely closed and insulated space, a vertical tube in said space and at each end passing through said outer wall whereby the bore in said tube extends through said cover, and a horizontal discharge opening in communication with said bore adjacent its lower end and passing through said inner plate.

2. In combination, a horizontal freezer cylinder having a discharge end, an outwardly turned radial flange on said end and forming an inner corner therewith, a cover for said end and having an inner plate abuttable against said flange, means for removably securing said inner plate against said flange, one side of said plate having a central portion and a radially outer portion adjoining but axially spaced from said central portion, a groove formed in said one side at the juncture of said portions and facing partially in a radial direction, an O-ring in said groove for sealing engagement with said corner, said cover also having an outer wall spaced from the other side of said plate and welded to said plate, said outer wall being of substantially the same diameter as said inner plate, the space between said inner plate and outer wall being a completely closed and insulated space, a vertical tube in said space and at each end passing through said outer wall whereby the bore of said tube extends through said cover, and a horizontal discharge opening in said cover and passing through said inner plate and placing said tube bore in communication with said cylinder.

3. In combination, a horizontal freezer cylinder having a dischrage end, a cover for said end and having an inner plate abuttable against said cylinder end, means for removably securing said inner plate against said end, said plate having an annular groove in one of its sides, an O-ring in said groove for sealing engagement with said cylinder end, said cover also having an outer wall spaced from said plate and mounted thereto, said outer wall being of substantially the same diameter as said inner plate, the space between said plate and wall being a completely closed and insulated space, a vertical tube in said space and at each end passing through said outer wall whereby the bore in said tube extends through said cover, and a horizontal discharge opening in communication with said bore adjacent its lower end and passing through said inner plate and communicating with said cylinder discharge end.

References Cited by the Examiner

UNITED STATES PATENTS

2,745,261	5/56	Merrill	62—342
2,916,044	12/59	Phelan et al.	137—375
3,040,540	6/62	Brown	62—343 X
3,050,960	8/62	Clifford	62—342
3,052,381	9/62	Carpigiani	222—132
3,062,021	11/62	Grose	62—342
3,081,920	3/63	Gorychka et al.	222—509

FOREIGN PATENTS

764,713	1/57	Great Britain.

M. CARY NELSON, *Primary Examiner.*

MARTIN P. SCHWADRON, *Examiner.*