

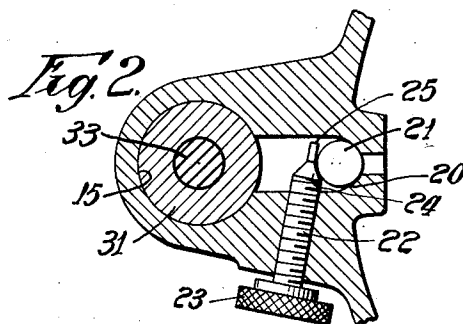
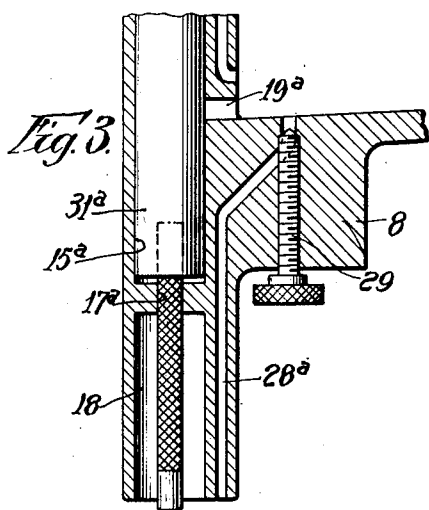
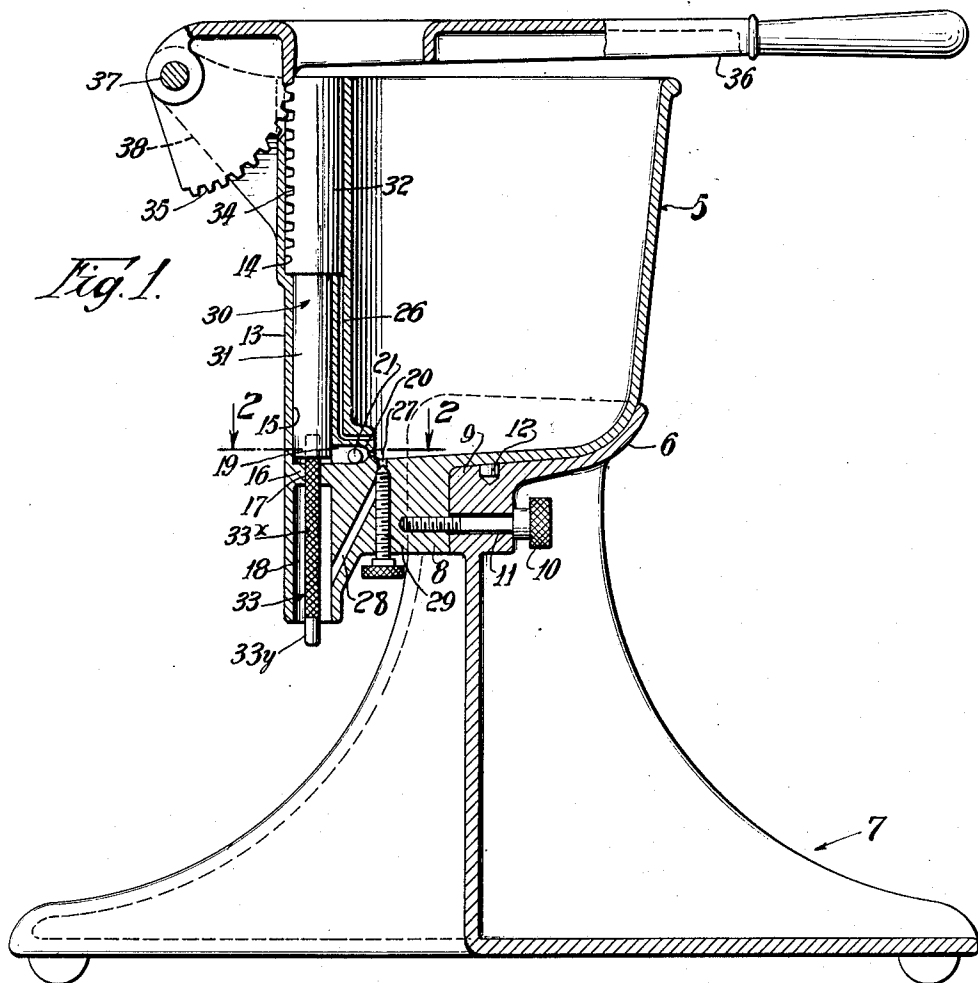
Jan. 7, 1936.

T. H. ALFREDS

2,026,604

EMULSIFYING APPARATUS

Filed Oct. 6, 1934



Inventor:
 Torris H. Alfreds,
 By: *Arthur W. Nelson* Att'y.

UNITED STATES PATENT OFFICE

2,026,604

EMULSIFYING APPARATUS

Torris H. Alfreds, Park Ridge, Ill., assignor to
Herbert J. Taylor, Park Ridge, Ill.

Application October 6, 1934, Serial No. 747,155

7 Claims. (Cl. 99—2)

This invention relates to improvements in an emulsifying apparatus and it consists of the matters hereinafter described and more particularly pointed out in the appended claims.

One of the objects of the present invention is to provide an improved and simplified apparatus for the purpose mentioned.

It is also an object to provide an apparatus of this kind which shall require no springs of any kind.

Another object of the invention is to provide an apparatus of this kind embodying a cylinder having a discharge aperture, a plunger reciprocable in said cylinder and a member movable with respect to said aperture but cooperating therewith in providing an annular emulsifying passage through which material is discharged or extruded in the movement of the plunger in one direction.

A further object of the invention is to provide an apparatus of this kind including simple means for decanting or draining a fluid from the container when so desired and also for positively closing the passage between the container and cylinder, previous to decanting.

Still another object of the invention is to provide a structure of this kind having an improved operative connection between the operating lever and plunger, wherein the leverage is constant and is continuously applied in a direction parallel to the axis of the plunger.

Still a further object of the invention is to provide an apparatus of this kind including an improved means for agitating the material to be emulsified.

The above mentioned objects of the invention, as well as others, together with the several advantages thereof, will more fully appear as I proceed with my specification.

In the drawing:

Fig. 1 is a vertical sectional view through one embodiment of my improved emulsifying apparatus.

Fig. 2 is a horizontal detail sectional view through a part of the improved apparatus on an enlarged scale as taken on the line 2—2 of Fig. 1.

Fig. 3 is a detail sectional view showing a modified structure more closely associated with the means whereby material to be emulsified is introduced into the emulsifying cylinder.

Referring now in detail to that embodiment of the invention, illustrated in the accompanying drawing, and especially to Figs. 1 and 2 thereof:

5 indicates the open top, bowl-like container for the material to be emulsified. As shown herein, the bottom of the container seats in a saddle 6 on

the top end of a base or standard 7 having a considerable bottom area to provide for the stability of the apparatus, as a whole. The container has a block-like bottom extension 8 for engagement in a recess 9 in the top end of the standard. A clamp screw 10 passes through an opening 11 in the said top end of the standard and has a threaded engagement in said block-like extension 8. By manipulating said screw, the container may be locked to or released from the standard. The bottom of the container carries a pilot pin 12 for engagement in a suitable opening in the saddle properly to position the bowl-like container on the base or standard. By the construction described, it is apparent that the bowl-like container is removably secured to the base or standard.

At one side of the bowl-like container is a vertically disposed cylinder 13 having top and bottom bore portions 14 and 15 of different diameters. The bore portion 14 is open at the top while the bore portion 15 is closed at its bottom by a wall 16 in which is an axial opening 17. Below said wall is a discharge passage 18 for the emulsified material.

19 indicates a horizontal passageway connecting the interior of the container with the bore portion 15 near the wall 16. This passageway is enlarged at its outer end which opens into the said bore portion and a seat 20 is formed at the inner end of said enlargement for a check valve member 21. This valve member is in the form of a ball. If desired, said valve member may be positively held against the seat by a valve member control in the form of a horizontally disposed screw 22. This screw opens through one side of the container to there be provided with a head 23. The other or inner end of this screw is tapered as at 24 and is formed with an extension 25 of reduced diameter. When said screw is turned in one direction, its tapered part 24 will engage the ball and force it into engagement upon the seat. When said screw is turned in the other direction, this will withdraw the tapered portion from the ball and present the extension 25 thereto so that the ball can move off its seat but is still confined against undesired movement in the enlarged portion of the passageway.

In the container wall separating the bore portions of the cylinder from the interior of the container, is a passage 26, the top end of which opens into the bottom of the bore portion 14 and the bottom portion of which opens laterally into the interior of the container above the passage 19.

In the block-like extension 8 of the container

is provided a decanting or drainage port 27 arranged at the lowest point of the bottom of the interior of the container which is sloped to drain toward this point. This port connects by a passage 28 with the discharge passage 18. A valve stem 29 is threaded into the block-like extension 8 in line with the port 27 and the top end is formed as a point to engage against a valve seat provided at substantially the junction of the port and passage 27-28. The bottom end of the stem is provided at a point below the block-like extension 8 with a head whereby it may be turned in the desired direction to open or close communication between the said port and passage.

Reciprocable in the cylinder 13 is a member 30 having plunger-like bottom and top portions 31 and 32 respectively. The bottom portion 31 is of such diameter as to have a snug fit in the bottom bore portion 15 of the cylinder and the top portion 32 is of such a diameter as to have a snug fit in the top bore portion 14 of the cylinder. Suitably secured to the bottom end of the bottom plunger portion and axially thereof is an emulsifying pin or stem 33 which has a relatively snug sliding fit in the opening 17 in the wall 16. This pin and opening coact to provide an annular emulsifying passage with inner and outer surfaces, one of which is roughened. Preferably to provide such a surface, the greater portion of the length of said pin is knurled as at 33x, only the bottom portion 33y being smooth or unknurled. The pin 33 is of such length that when the member 30 is in its uppermost position, the smooth bottom end portion of the pin still occupies the opening 17. This fit is so snug that such material as may be in the cylinder cannot leak out through the opening 17 under head pressure.

As before stated, the plunger member 30 is reciprocable in the cylinder. To reciprocate the same on its compression or extruding stroke as well as on its suction stroke, without a change in leverage due to angularity of associated parts such as links or the like, I provide the following:

The plunger portion 32 is provided on its outer side with rack teeth 34 with which the teeth of a segmental pinion 35 mesh. This pinion is made as a part of a lever 36 that is pivoted as at 37 between a pair of ears 38 on the cylinder. The lever 36 normally extends back over the container. When the lever is swung upwardly and downwardly, the pinion 35 will cause an upward and downward movement of the plunger member 30. It is apparent that due to the rack and pinion structure, the plunger member 30 as a whole, is held against turning in the cylinder.

The apparatus is especially adapted for making reconstructed cream from milk and either salted or unsalted butter. When salted butter is used, it is first melted in hot water and the mixture is placed in the bowl-like container. Before placing the mixture in the container, the port 27 is closed by means of the screw 29 and the ball valve is held against its seat 20 by turning the screw 22 in the proper direction. The mixture is permitted to stand in the container for a short while so that the water absorbs the salt from the butter and this salty water will settle out to the bottom of the container.

The screw 29 is then manipulated to open the port 27. The salted water being at the bottom of the container, will drain out through said port 27 into the passage 28 for discharge out through the passage 18 into a bowl or the like, placed to catch the same. When the salty

water has been withdrawn, the screw 29 is turned to close the port 27. The desired quantity of milk is then added to the melted butter in the container, which is at this time sweet or unsalted. By moving the lever 36 up and down a few strokes at this time, a part of the butter and milk material is drawn up into the passage 26 and then discharged back into the material in the container to bubble up therethrough and thus produce a preliminary agitation of the same. The screw 22 is next turned so that the ball 21 is released and has a limited movement off the seat 20. This opens the passage between the interior of the container and the cylinder bore portion 15.

It is assumed that during this time the lever 36 and the plunger member 30 are in the lowermost position. When the lever is lifted upwardly, a suction stroke is created in both the cylinder bore portions 14 and 15 with the result that a part of the material (butter and milk) in the container is drawn into the bore portion 15 and another part of said material is drawn up into the passage 26.

When the lever 36 is swung downwardly the plunger member 30 moves downward in the cylinder and this imposes a pressure on the material in the bore portion 15 and which pressure operates upon the ball valve 21 to engage the same on its seat and close off the passage 19. The material in the cylinder bore is then extruded or forced out through the annular emulsifying passage as provided by the pin 33 and opening 17. Said passage is of a relatively fine dimension in width and this in connection with the roughened surface of the pin so acts upon the material as to break up the butter globules and disperse them in the milk to reconstruct the material into an emulsion constituting a cream. This cream is discharged out through the passage 18 to be caught in a suitable vessel placed beneath the same for this purpose.

In the down or pressure stroke of the plunger member 30, its top portion 31 operating in the cylinder portion 14, forces the material in the passage 26 back into the material in the bowl. The material from the passage 26 thus forced into the material in the container, during the emulsifying operation, will bubble up therethrough and keep the same thoroughly agitated.

The lever 36 is swung up and down to provide successive suction and pressure strokes of the plunger and this is maintained until all of the material in the container has been operated upon. It is apparent that other substances such as ice cream, pudding and salad dressing mixes may be emulsified in the same manner as that described.

In Fig. 3, I have shown a slightly modified form of the invention, wherein the valve ball 21 and its associated screw 22 may be omitted. Under such conditions the distance between the port 19a and the opening 17a is considerably increased over that shown in Fig. 1 and the decanting passage 28a has a discharge independent of the passage 18. With such a structure, no suction stroke is had in the upward movement of the plunger portion 31a and said plunger portion must be elevated to a point wherein its bottom clears or uncovers the passage 19a. When said passage is thus uncovered, the material in the container, runs by gravity through the passage 19a into the cylinder bore 15a. On the down or pressure stroke of the plunger portion 31a, it first closes off the passage 19a and then forces

the material in said bore portion out through the annular emulsifying passage 17a as provided by the pin and opening previously mentioned. Such a structure operates as efficiently but not as fast as the structure shown in Fig. 1, because of the absence of a suction stroke to charge the cylinder bore portion 15. The structure shown in Fig. 3 is valveless and therefore, may be made at an extremely low cost.

While in describing the invention, I have referred in detail to the form, arrangement and construction of certain of the parts thereof, the same is to be considered only in an illustrative sense and therefore, I do not wish to be limited thereto except as may be specifically set forth in the appended claims.

I claim as my invention:

1. In an emulsifying apparatus, the combination of a cylinder for receiving the material to be emulsified, means providing an aperture in communication with said cylinder, a plunger relatively movable with respect to said aperture and having a projecting end part of a different diameter extending into said aperture and coacting therewith in forming an annular emulsifying passage, and means for causing a relative movement between said means and said plunger to extrude the material in said cylinder through said passage.

2. In an emulsifying apparatus, the combination of a cylinder for receiving the material to be emulsified, a member in said cylinder providing an opening, a second member in said cylinder comprising a plunger with a projecting end portion extending into said opening to coact therewith in providing an annular emulsifying passage and means providing a relative movement between said two members so that the material in said cylinder is extruded through said passage.

3. In an emulsifying apparatus, the combination of a cylinder for receiving the material to be emulsified, means providing an aperture in communication with said cylinder, a plunger relatively movable with respect to said aperture and having a projecting end part extending thereto and coacting therewith in forming an annular emulsifying passage having inner and outer surfaces, at least one of which is roughened, and means for causing a relative movement between

said first two mentioned means to extrude the material in said cylinder through said passage.

4. In an emulsifying apparatus, the combination of a cylinder for receiving the material to be emulsified, means providing an aperture at one end of said cylinder, a plunger in said cylinder movable toward and away from said aperture, and a member on one end of said plunger and extending into said aperture for movement therethrough, said member coacting with said aperture in forming an annular emulsifying passage through which said material is extruded when the plunger is moved toward said aperture.

5. In an emulsifying apparatus, the combination of a cylinder for receiving the material to be emulsified, means providing an aperture at one end of said cylinder, a plunger in said cylinder movable toward and away from said aperture, and a member movable with said plunger and engaged in said aperture to coact therewith in forming an annular emulsifying passage through which said material is extruded when the plunger is moved toward said aperture, said passage being defined by inner and outer surfaces, one of which is roughened.

6. In an emulsifying apparatus, the combination of a cylinder for receiving the material to be emulsified, means providing an aperture at one end of said cylinder, a plunger in said cylinder movable toward and away from said aperture, and a member having a roughened surface projecting from one end of the plunger and extending into said aperture to coact therewith in providing an annular emulsifying passage through which said material is extruded, when said plunger is moved toward said aperture.

7. In an emulsifying apparatus, the combination of a container, a cylinder, means providing an aperture at one end of the cylinder, a plunger movable in said cylinder toward and away from said aperture to provide a pressure and suction stroke, and a member on one end of said plunger and extending into said aperture and coacting therewith in providing an annular emulsifying passage, said plunger on its suction stroke, drawing material from said container into the cylinder and on its pressure stroke, extruding said material through said passage.

TORRIS H. ALFREDS.