June 27, 1950 I. L. LOPATA 2,513,035

EMULSIFIER DEVICE

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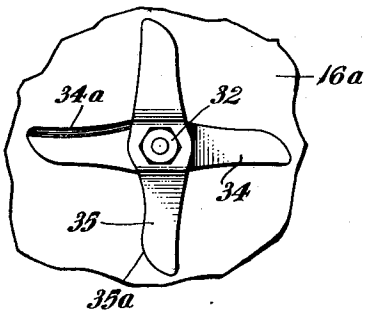


Fig. 3

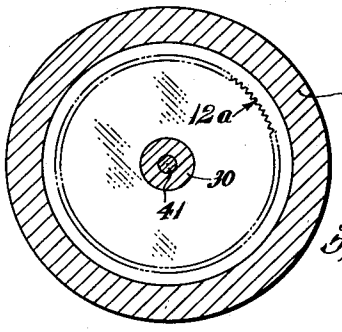


Fig. 2

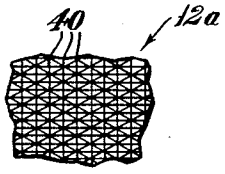


Fig. 5

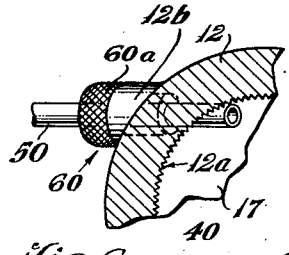


Fig. 6

Fig. 1

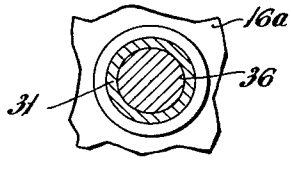


Fig. 4

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EMULSIFIER DEVICE

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4 Claims. (Cl. 259—8)

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This invention relates to mixing and emulsifying devices.

One of the objects of my invention is to provide an emulsifier device of the character described whereby a continuous supply of suitable liquid mixture may be emulsified and substantially simultaneously taken off or dispensed.

Another object of my invention is to provide in an emulsifying device of the character described the combination of agitator propellers in a chamber, the walls of which are provided with a plurality of sharp pointed projections designed to rupture the fat globules in the mixture whereby the process of emulsifying is greatly speeded up.

Still another object of my invention is to provide an emulsifier device which shall comprise relatively few and simple parts, which shall be relatively inexpensive to manufacture, which shall be easy to assemble and operate and which at the same time shall represent a general improvement in the art.

Other objects of my invention will become apparent as the description of the operation thereof proceeds or will hereafter be more fully pointed out.

In the accompanying drawings,

Fig. 1 is a vertical sectional view, partly in elevation of an emulsifier device constructed and arranged in accordance with my invention;

Fig. 2 is a cross-sectional view taken substantially along the line 2—2 of Fig. 1;

Fig. 3 is an enlarged top plan view illustrating the propeller agitators as viewed along the line 3—3 of Fig. 1;

Fig. 4 is an enlarged cross-sectional view taken substantially along the line 4—4 of Fig. 1;

Fig. 5 is an enlarged fragmentary view of a portion of the wall surrounding the mixing chamber shown in Fig. 1, to illustrate the means employed to facilitate emulsification; and

Fig. 6 is an enlarged cross-sectional view taken substantially along the line 6—6 of Fig. 1.

Referring now in detail to the drawings I have shown an emulsifier device constructed and arranged in accordance with my invention and comprising a hollow main body member 10 having a top wall 11, a surrounding side wall 12, and open at the bottom. The side wall 12 at its lower end is provided with a reduced diameter portion 14 which may be externally threaded and which is threaded to a base member 15 having an upwardly extending internally threaded wall portion 16. The base member 15 is provided with an impervious transverse upper wall 16a. It is thus seen that there is provided

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an enclosed chamber 17 adapted to receive therein a supply of liquid mixture to be emulsified, may comprise milk and butter, which is heated, and then placed in a suitable feeding receptacle 20 of any shape and size and of any suitable material such as for example glass, as shown. The bottom of the receptacle 20 may be provided with an externally threaded open neck portion 21 which is received in a correspondingly threaded inner wall 22 of an opening 23 in the upper portion of the main body member 10, above the wall 11. A through aperture 25 in the wall 11 communicates directly with the interior of the receptacle 20 and with the mixing chamber 17.

It is thus seen that when the receptacle 20 is supplied with the mixture to be emulsified, the mixing chamber 17 will be filled through the opening 25.

The following means are employed for mixing and emulsifying the contents of the mixing chamber 17.

The base member 15 is provided with an upwardly extending central hub 30 terminating in a reduced externally threaded portion 31. A driving shaft 41 is journaled in the said hub 30, the lower end thereof projecting into a suitable hollow area of the base portion 15 (not shown). Fixed to the upper end of the shaft 41 by any suitable means such as for example a nut 32, threadedly received on a reduced diameter portion of the shaft 41, are a pair of propeller or agitator blades 34 and 35, the said blades being held in fixed position as best shown in Fig. 3 so that they will be disposed substantially at right angles to each other. This may be accomplished in any suitable manner such as for example by having a portion of the shaft 31 adjacent its top end of non-circular cross-sectional contour projecting through correspondingly shaped openings in the hub portion of the propeller blades 34 and 35. In order to prevent leakage of the mixture in the chamber 17 through the opening in the hub 30 for the shaft 41, I provide the following means:

The shaft 41 is provided with an enlarged diameter area 36 fitted into a correspondingly enlarged opening in the upper end of the hub 30. A suitable packing member 37 surrounding the shaft 41 is seated on the shoulder formed by the openings for the shaft portion 36. A cap member 38 may be threadedly received on the portion 31 and another packing 39 similar to the packing 37 surrounds that portion of the shaft adjacent the top of the shaft portion 36.

Any suitable well known means may be employed for causing rotation of the shaft 41 to

actuate the blades 34 and 35, such as for example, any standard type of electric motor which may be contained in the base (not shown).

As shown in Fig. 3 the leading edges 34*a* and 35*a* of the propellers 34 and 35 respectively are sharpened to present a knife edge so that when the said blades are rotated at a desired speed in a clockwise direction as viewed from Fig. 3 the fat globules in the mixture will be cut more readily and thus facilitate the emulsifying action.

To further facilitate and speed up the emulsifying action of the mixture in the chamber 17, I have provided the inner wall 12*a* surrounding the chamber 17 with a plurality of sharp pointed projections 40. These projections as best shown in Fig. 5 may be made in any suitable way and serve to cut and break up the fat globules by the action of the propeller blades 34 and 35 rotating at great speed so as to throw the liquid mixture up against the walls rupturing the fat globules thereby. The said projections 40 may be made in any suitable well known manner. One way in which I have found that satisfactory results are obtained is to provide the said inner wall 12*a* of the chamber 17 with an internal thread of any suitable pitch and then to cut circumferentially disposed transverse parallel ridges through the threads thereby providing sharp pointed projections. The combination of the action of the propeller blades in cutting the globules of fat of the mixture and at the same time the action of said blades in throwing forcibly the said mixture against the surrounding wall 12*a* of the chamber where the said globules are again broken up, greatly speeds up the process of emulsification.

In accordance with my invention I have provided means whereby the emulsified liquid made in the mixing chamber 17 as above described is automatically taken off, or dispensed. As shown in Figs. 1 and 6 I provide a tubular take off spout 50 of any desired length which is mounted tangentially of the chamber 17 in an opening 51 in the side wall 12 of the main body member 10. The said opening 51 is preferably inclined downwardly as shown in Fig. 1 so that the emulsified liquid may flow through the spout 50 into a suitable container. It is noted that the inner end of the spout 50 projects slightly inside of the chamber 17 and is disposed adjacent the top wall 11 of the said chamber.

To facilitate the mounting and removal of the spout 50 for cleaning or other purposes, I provide a sleeve member 60 through the bore of which the said spout 50 frictionally passes. The sleeve 60 comprises an enlarged portion 60*a* which is externally knurled and a reduced portion 60*b*, the latter portion 60*b* being externally threaded and received in a correspondingly threaded portion in an enlarged portion of the wall opening 51.

It is thus seen that from the above described action that when the shaft 31 is caused to rotate by any suitable driving means the propellers 34 and 35 will be caused to rotate and the liquid in the chamber 17 will quickly become emulsified. Due to the fact that the spout 50 is disposed tangent to the circumference of the inner wall 12*a* the emulsified liquid therein will be flung into the spout 50 through the open inner end thereof when the blades 34 and 35 rotate in a counter-clockwise direction as viewed from Figs. 1 and 3 of the drawings, and thus be dispensed. It is also noted that as soon as emulsified liquid is taken from the chamber 17 additional mixture from the container 20 will flow into the said chamber to become immediately emulsified thereby providing a continuous supply of emulsified liquid through the spout 50 whenever the shaft 31 is caused to rotate.

Having described my invention, what I claim and desire to secure by U. S. Letters Patent is:

1. An emulsifying device of the character described comprising a base member having a top wall, a main body member comprising a top and side walls and open at the bottom to form a hollow chamber therebetween, means for removably mounting said main body member on said base member in such manner whereby said top wall of said base member will close off the bottom opening of said main body member to form an enclosed chamber adapted to hold a supply of suitable mixture to be emulsified, a rotatably mounted agitator in said chamber, means comprising a shaft projecting upwardly from said base member for driving said agitator, the said side wall of chamber being provided with a plurality of sharp pointed projections designed to rupture the fat globules in the mixture as it is thrown thereagainst by said agitator, a spout member mounted on said main body member and communicating directly with said chamber, said spout member being downwardly inclined and having a portion thereof extending slightly into said chamber whereby the emulsified mixture will be caught thereby while being agitated and automatically caused to flow from said chamber, and an inlet opening in the top wall of said main body member to supply said chamber with the mixture to be emulsified.

2. An emulsifying device of the character described according to claim 1 in which there is provided an independent receptacle member adapted to serve as a source of supply of said mixture, said receptacle member having an outlet opening communicating with the inlet opening in said main body member.

3. An emulsifying device of the character described according to claim 1 in which there is provided an independent receptacle member adapted to serve as a source of supply of said mixture, said receptacle member having an outlet opening communicating with the inlet opening in said main body member and means for removably mounting said receptacle on said main body member.

4. An emulsifier device of the character described comprising a hollow main body member having a top wall and a surrounding side wall, and open at the bottom, a base member having a top wall, means for attaching said base member to said main body member whereby said top wall of said base member closes off said open bottom of said main body member to form a mixing chamber adapted to receive a liquid mixture to be emulsified, a feeding receptacle for holding a supply of said liquid mixture, an inlet aperture in said top wall of said main body member communicating directly with the interior of said receptacle to permit said fluid mixture to enter said mixing chamber, a hub portion integral with said base member and projecting upwardly therefrom into said mixing chamber, a shaft journaled in said hub portion, agitator blades fixed to said shaft for rotation therewith, the leading edges of said agitator blades being sharpened to present a knife edge to cut the fat globules in said liquid mixture to facilitate the emulsifying action, the surface of said surrounding wall of said mixing chamber being provided with a plurality of sharp pointed projections to further facilitate the emulsifying action by breaking up the fat globules

when the said liquid mixture is thrown against said sharp pointed projections by the force of said agitator blades when rotated, means for causing the rotation of said shaft, a tangential, downwardly inclined opening in said surrounding side wall of said main body member, disposed relatively near the area of rotation of said agitator blades and communicating directly with said mixing chamber, a tubular take-off spout mounted in said last named inclined opening.

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