June 3, 1930. O. E. HARRIS 1,761,298

COMBINATION CREAM AND MILK STIRRER AND SAMPLER

Filed April 28, 1928

Fig. 1

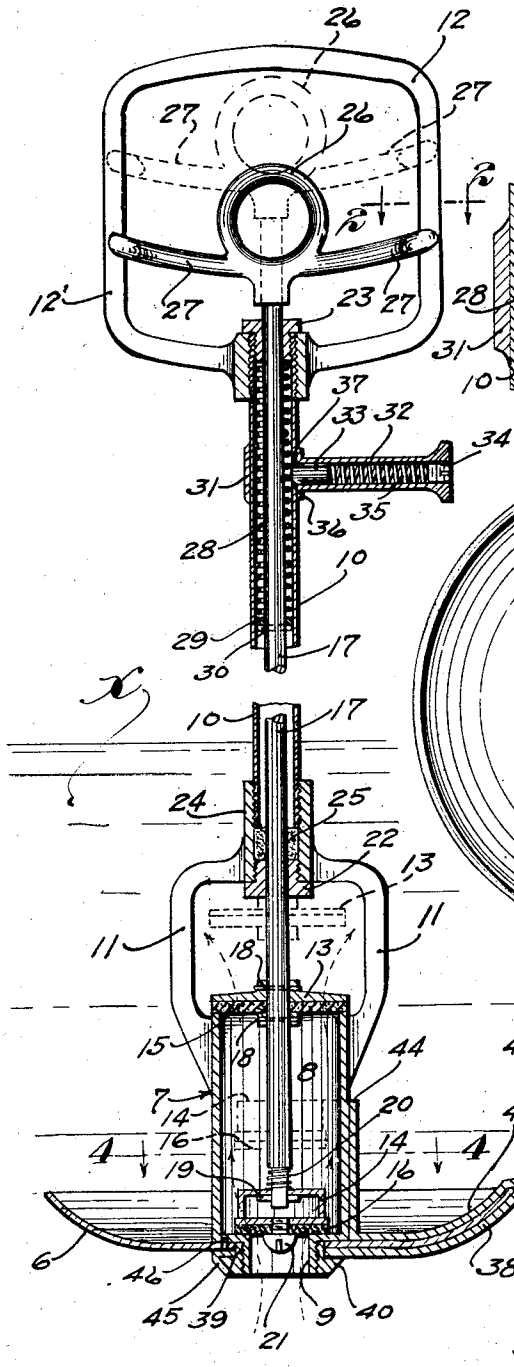


Fig. 2

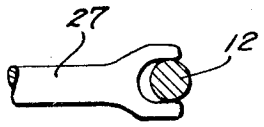


Fig. 3

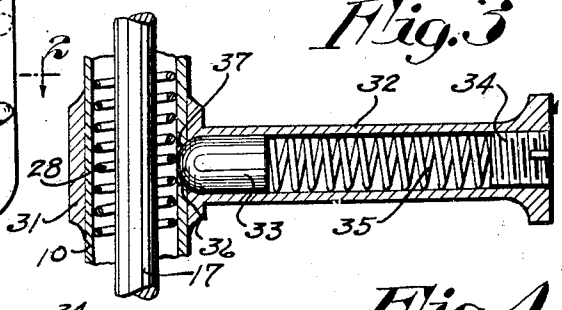


Fig. 4

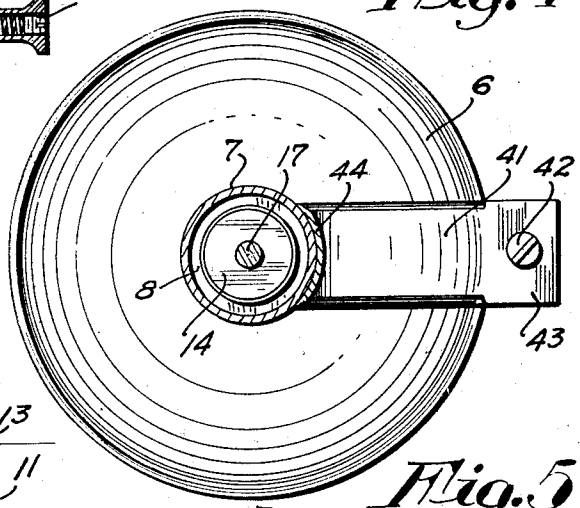
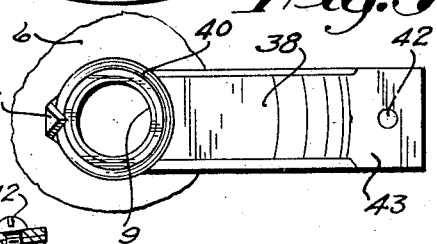


Fig. 5



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UNITED STATES PATENT OFFICE

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COMBINATION CREAM AND MILK STIRRER AND SAMPLER

Application filed April 28, 1928. Serial No. 273,528.

My invention has for its object to provide a simple and highly efficient combined stirrer and sampler intended for general use in stirring liquids to an even consistency and taking samples thereof. The invention is especially designed to give to the cream or milk-sampling operator at creameries, cheese factories and local buying stations, both stirrer and sampler in one instrument, thereby eliminating much work in taking samples and at the same time take the sample with much more dependable accuracy than with the present day method of sampling these commodities for the purpose of determining the percentage of butter fat contained therein.

As will hereinafter appear, this instrument is designed to take a sample while the cream and milk is being stirred to produce a homogeneous body, whereas before, such sampling has been done by pouring cream and milk from an ordinary ladle stirrer into sample jars or receptacles which has proven unsatisfactory because of the large discrepancy in the percentage of butter fat estimated by the sellers and the buyers.

In cold weather, most all cream is of too heavy consistency to make the proper transfer from a sample jar to a test bottle, and hence it is necessary to warm the sample in the sample jar by placing said jar in a hot water bath for a period of several minutes in order that the proper consistency of the sample may be had, thus causing considerable loss of time and extra work. My invention provides for the sealing of a sample in a sampler before the same is lifted from the body of cream and milk from which the sample is being taken and which sampler may be very quickly warmed to give the sample therein the proper consistency by pouring a small amount of hot water on the outside thereof or by submerging the sampler in hot water for a few seconds. The placing of the sampler in hot water also serves another purpose in that it washes the sampler so that the same is cleansed before taking the next sample.

To the above end, generally stated, the invention consists of the novel devices and combinations of devices hereinafter described and defined in the claims.

In the accompanying drawings, which illustrate the invention, like characters indicate like parts throughout the several views.

Referring to the drawings:

Fig. 1 is a fragmentary view of the instrument partly in side elevation and partly in central longitudinal section and also showing a body of liquid into which the instrument is inserted;

Fig. 2 is a fragmentary detail view with a part thereof sectioned on the line 2—2 of Fig. 1;

Fig. 3 is an enlarged fragmentary view of the hollow stem and cleaning slide;

Fig. 4 is a view partly in plan and partly in section taken on the line 4—4 of Fig. 1; and

Fig. 5 is a fragmentary bottom plan view.

The numeral 6 indicates a ladle-like agitator of symmetrical concavo-convex formation and having an axial passageway. An open top cylindrical casing 7 which affords a sample chamber 8 is seated on the concave side of the agitator 6 and has in its bottom a nozzle 9 which projects through the passageway in said agitator. It is important to note that the interior diameter of the nozzle 9 is materially less than that of the sample chamber 8, for a purpose that will presently appear.

Axially aligned with the casing 7 is a long tubular stirring stem 10, the inner end of which is axially spaced from the casing 7 and rigidly secured thereto by a pair of diametrically opposite arms 11. An upper relatively fixed handle section 12 is rigidly secured by a fork 12′ to the outer end of the stirring stem 10. The side members of the fork 12′ are in parallel arrangement, for a purpose that will presently appear. An upper valve 13 and a lower valve 14 are provided for closing the chamber 8. Said valve 13 is provided with a pliable facing 15 arranged to seat on the upper end of the casing 7 and form a tight joint therewith. A pliable facing 16 on the valve 14 is arranged to seat on the bottom of the casing 7 and close the nozzle 9.

The valves 13 and 14 are carried by a valve rod 17 which extends axially through the casing 7 and stirring stem 10. This valve rod 17 extends axially through the valve 13 and its

facing 15 and applied thereto is a pair of opposing nuts 18 which rigidly secure said valve and its facing to the valve rod 17. The valve 14 is yieldingly mounted on the valve rod 17 for an axial movement thereon in respect to the valve 13, whereby the valve 14 will seat slightly in advance of the valve 13. Said valve 14 is hollow and has an axial passage in its back through which the reduced inner end of the valve rod 17 loosely extends. A pin 19 extends through a hole in the reduced end of the valve rod 17 within the valve 14 and holds said valve and valve rod assembled.

A coiled spring 20 encircling the reduced end of the valve rod 17 is compressed between a shoulder on said rod formed by its reduced end and the back of the casing 14 and yieldingly holds the valve 14 pressed against the pin 19 and away from the valve 13. The distance between the seats on the casing 7 for the valves 13 and 14 is slightly greater than the distance between the valve facing 15 and 16 when said valves are open so that the valve 13 will seat slightly in advance of the valve 14, as previously stated. A screw 21 detachably secures the valve facing 16 to the valve 14.

A valve rod 17 is slidably mounted for endwise movement in bushings 22 and 23, the former of which is screwed into the lower end of a sleeve-like coupling 24 between the stirring stem 10 and arms 11, and the latter of which is screwed into the upper end of said stirring stem. A pliable packing 25 is interposed between the lower end of the stirring stem 10 and bushing 22 to form a tight joint between the valve rod 17 and coupling sleeve 24 to close the lower end of the stirring stem 10.

A finger-piece 26 in the form of a ring is rigidly secured to the outer or upper end of the valve rod 17 and by which ring, said rod may be operated to open the valves 13 and 14. Integrally formed with the finger-piece 26 for co-operation with the handle section 12 to form a complete handle for the device is a relatively movable handle section 27, the ends of which are bifurcated to receive the parallel side members of the fork 12′ and hold said handle section for sliding movement toward and from the handle section 12. The interlocking engagement with the handle section 27 with the fork 12′ also holds the valve rod 17 from turning and with the finger-piece 26 in the plane of said fork so that the same is always in a proper position to be engaged by one of the fingers of the operator's hand. The engagement of the valve 13 with the bushing 22 limits the lifting movement of the valves 13 and 14 by either the finger-piece 26 or handle section 27.

The valves 13 and 14 are yieldingly held closed by a long coiled spring 28 encircling the valve rod 17 within the stirring stem and compressed between the bushing 23 and washer 29 on said rod supported by a pin 30.

A cleaning slide 31 in the form of a collar is applied to the stirring stem 10 for stripping any cream or milk which may adhere thereto at the time the device is lifted from a body of liquid x that has been stirred to form a homogeneous body and a sample taken therefrom. This slide 31 has a fixed tubular handle 32 which projects radially therefrom and within said handle is a friction block 33 having a spherical end which impinges against the stirring stem 17.

The outer end of the handle 32 is normally closed by a screw plug 34 and a coiled spring 35 within said handle is compressed between the friction block 33 and the plug 34 and yieldingly holds said plug in contact with the stirring stem 10 for yieldingly holding the cleaning slide 31 where set. The inner end of the handle 32 where the same passes through the cleaning slide 31 is slightly contracted at 36 to form a stop to limit the projecting movement of the friction block 33 by the spring 35.

Formed in the stirring stem 10 near the handle 12 is a bore-like seat 37 into which the friction block 33 is projected when aligned therewith to hold the cleaning slide 31 in its normal or raised position. The purpose of the stop 36 is to prevent the friction block 33 from being projected too far into the seat 37 in case the same should be of a larger bore than the diameter of said block.

A rotatable cleaner is provided for removing any cream or milk which may adhere to the inner and outer surfaces of the agitator 6 and to the exterior of the casing 7.

This rotatable cleaner includes a rotary blade 38 mounted to turn about the axis of the nozzle 9, extends radially therefrom and its upper face is shaped to closely engage the contour of the under side of the agitator 6. The blade 38 has a passageway through which the nozzle 9 projects and is mounted to turn on a nut 39 applied to said nozzle. Said nut 39 has an external annular shoulder 40 with a conical outer face and which nut holds the agitator 6 against the bottom of the cylinder 7 and the blade 38 against the bottom of said agitator.

The rotatable cleaner further includes an upper blade 41 which overlies the lower blade 38 and its under side is shaped to closely follow the contour of the upper face of the agitator 6. The outer end portions of the blades 38 and 41 are projected outward of the rim of the agitator 6, mounted the one upon the other and rigidly connected by a screw 42. These projecting end portions of the blades 38 and 41 form an extension 43, for a purpose that will presently appear.

Said rotatable cleaner still further includes an upstanding blade 44 rigidly secured on the blade 41 and closely engages the outer

face of the casing 7. On the hub of the blade 48 is a short V-shaped blade 45 that engages the conical face on the shoulder 40. Any suitable means may be provided for holding the agitator from turning in respect to the cylinder 7, such as a pin 46, as shown in Fig. 1.

The operation of the combined stirrer and sampler may be briefly described as follows: The device is adapted to be held by the operator in one of his hands by means of the handle 12—27 and said device operated to produce a stirring action in the liquid x. Normally, the spring 28 holds the valves 13 and 14 closed with the handle section 27 moved away from the handle section 12 and the distance between said two handle sections is such that it is necessary that the lower handle section 27 be lifted in order that a proper and convenient sized handle may be formed by the two handle sections 12 and 27. In gripping the handle, the operator places the palm of his hand over the top handle section 12, reaches his fingers around and under the lower handle section 27 and then closes his hand to lift said lower handle section and thereby form the proper sized and convenient handle grip. This lifting of the handle section 27 incidentally lifts the valve rod 17 and thereby automatically opens the valves 13 and 14 which remain open during the stirring operation or until the lower handle section 27 is released by the opening of the operator's hand. After the device has been operated a sufficient length of time in the body of the liquid x, to thoroughly stir the same to make it homogeneous, the operator releases the lower handle section 27 and thereby permits the spring 28 to close the valves 13 and 14 to cage a sample of the liquid in the chamber 8.

As the device is being lifted from the body of liquid x the operator moves the cleaning slide 31 on the stirring stem 10 by means of the handle 32 to strip any of the liquid x from the stirring stem 10 which may have adhered thereto. Before the device is lifted completely out of the container in which the liquid x is held, it is positioned to cause the extension 43 to engage the side of the container above the level of the liquid as a base of resistance and then turn said device about its longitudinal axis to cause the agitator 6 to turn between the blades 38 and 41 and thereby remove any liquid which may have adhered thereto. It is, of course, understood that the device must be held in such a position as to cause the liquid x to freely run or be drained from the ladle-like agitator 6. This same movement causes the cylinder 7 to turn in respect to the blade 44 which removed any of the liquid x which may have adhered to said casing and at the same time the blade 45 removes any of the liquid x from the conical face of the shoulder 40 on the nut 39. The device may be further cleaned, if desired, by dipping the same into a water bath.

To remove the sample from the chamber 8, the device is positioned with the nozzle 9 over a sample jar and the valves 13 and 14 opened by means of the finger-piece 26 to release the sample in the chamber 8 and allow the same to flow through the nozzle 9 and into said jar. As previously stated, if the liquid is cold, the casing 7 may be dipped in hot water or hot water poured thereover to bring the liquid to the proper consistency before releasing the same from the sample chamber 8.

The proper way to take a sample from the body of liquid x is to move the device downward through said body with the valves 13 and 14 open so as to cause a flow of liquid through the chamber 8. As the conducting capacity of the nozzle 9 is considerably less than that of the sampling chamber 8 that portion of the first liquid entering the chamber 8 which is next to the wall of said chamber and outward of the nozzle 9 will remain in the chamber 8 and other liquid of said body will be forced into the cylindrical body of liquid thus caged so that an average sample of the liquid is collected during the projecting movement of the chamber 7 into the body of liquid x.

What I claim is:

1. A device of the class described comprising a stirring stem, a casing having a sample chamber and upper and lower openings for the movement of liquid through the chamber, valves for closing said openings, and a ladle-like agitator on the casing.

2. The structure defined in claim 1 in which the ladle-like agitator is on the bottom of the casing and surrounds the same.

3. A device of the class described comprising a handle-equipped tubular stirring stem, a casing rigidly secured to the lower end of the stem and having a sample chamber and upper and lower openings for the movement of liquid through the chamber, valves for closing said openings, and operating means for the valves including a rod extending through the stirring stem and having a handle closely associated with the handle on the stirring stem.

4. A device of the class described comprising a tubular stirring stem, a casing having a sample chamber with an open top and bottom, valves for closing the open top and bottom of the sample chamber and having a valve rod extending through the stem, a two-part handle comprising a relatively fixed section on the stem and a relatively movable section on the rod, and a spring for closing the valves.

5. The structure defined in claim 4 in further combination with a fork connecting the relatively fixed handle section to the stem,

and a finger-piece on the relatively movable handle section and in which the relatively movable handle section has sliding interlocking engagement with the fork to hold the same together with the finger-piece from turning about the axis of the stem.

6. A device of the class described comprising a tubular stirring stem having at one end a casing axially aligned therewith and spaced therefrom, said casing having a sample chamber having an open top and bottom for the movement of liquid through said chamber, valves for closing the open top and bottom of the sample chamber and having a valve rod extending through the stirring stem, a two-part handle comprising a relatively movable section on the stem and a relatively movable section on the valve rod, and an agitator on the casing.

7. A device of the class described having a stirring stem, a cleaning slide on the stem, a tubular handle for the slide, and a spring-pressed friction block in the handle of the cleaning device, impinging against the stem and yieldingly holdng the slide where set.

8. The structure defined in claim 7 in which the friction block has a spherical surface impinging against the stem and in which the stem is provided with a seat for said spherical surface and hold the slide in a predetermined set position, said slide being arranged to limit the projecting movement of the friction slide into the seat.

9. A device of the class described comprising a stirring stem, a casing having a sample chamber and upper and lower openings for the movement of liquid through the chamber, valves for closing said openings, and a rotatable cleaner for the casing.

10. A device of the class described comprising a stirring stem, a casing having a sample chamber and upper and lower openings for the movement of liquid through the chamber, valves for closing said openings, a ladle-like agitator on the casing, and a rotatable cleaner for the casing and agitator.

11. A a device of the classs described comprising a cylindrical casing having an open top and at its other end a nozzle, a ladle-like agitator on the lower end of the casing and having an opening through which the nozzle projects, a cleaner mounted on the nozzle to turn about the axis thereof and arranged to engage both sides of the agitator and the outer side of the casing, a nut applied to the nozzle for holding the agitator and cleaner thereon, a handle-equipped hollow stirring stem attached to the upper end of the casing and spaced therefrom, valves for closing the upper end of the casing and the nozzle and having a valve rod extending through said stem, and a two-part handle comprising a relatively fixed section on the stem and a relatively movable handle section on the valve rod.

12. The structure defined in claim 11 in which the cleaner is also arranged to clean the nut and provided with a holding extension which projects outward of the agitator.

13. A cream and milk stirring and sampling device comprising a stem having on one end a sampling chamber, and a slide on the stem for cleaning the same.

14. The structure defined in claim 13 in which the slide is provided with a radially projecting operating handle.

In testimony whereof I affix my signature.

ORA E. HARRIS.