

Oct. 20, 1931.

F. C. SANDSTROM

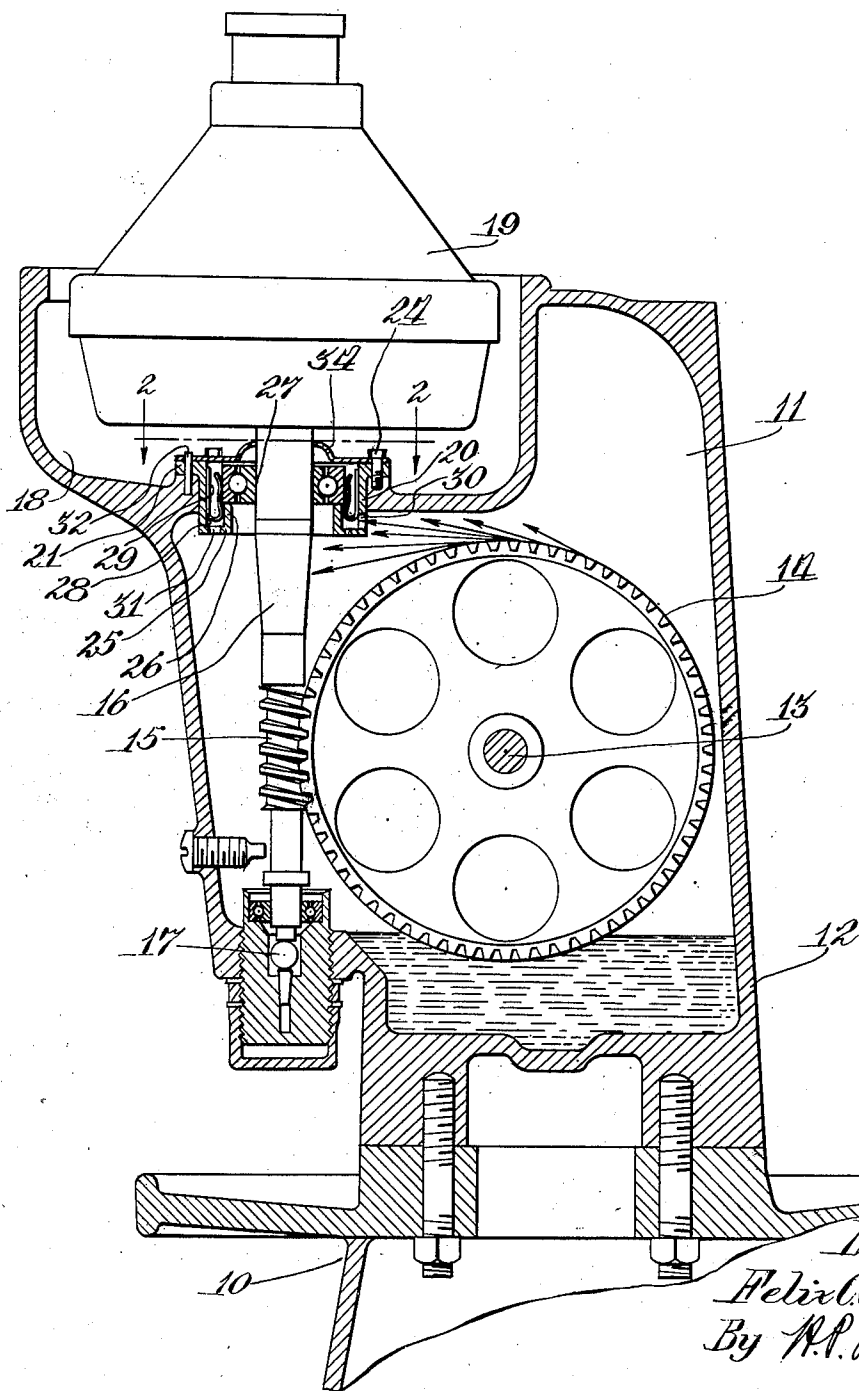
1,828,546

CREAM SEPARATOR

Filed Nov. 24, 1928

2 Sheets-Sheet 1

Fig. 1.



Oct. 20, 1931.

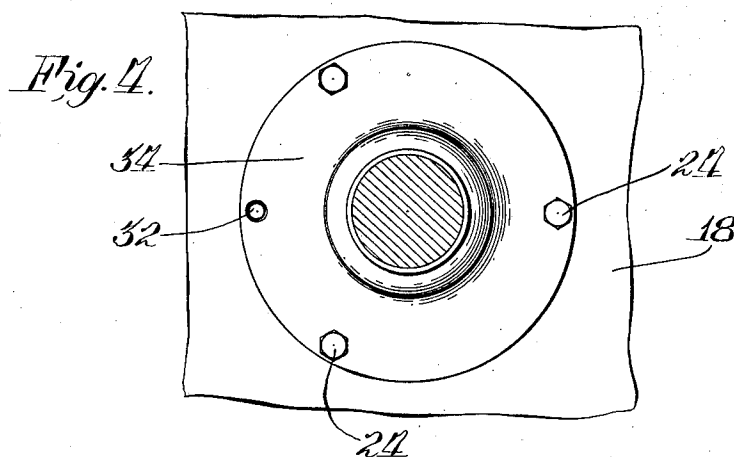
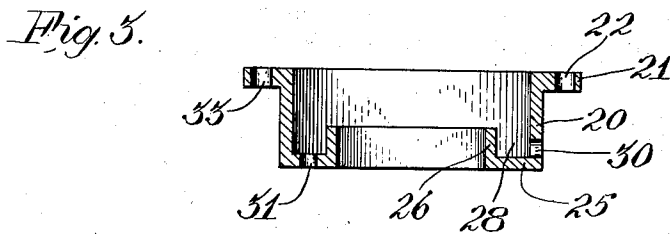
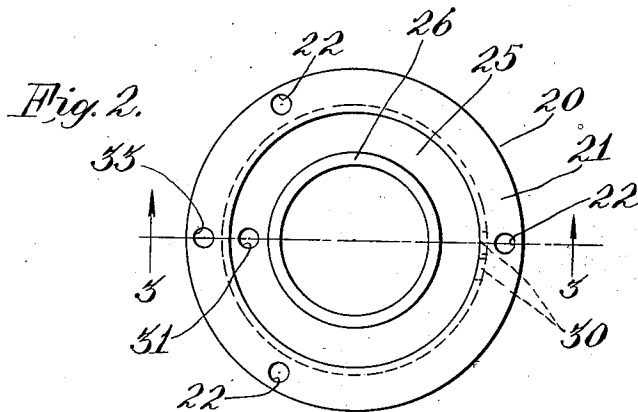
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CREAM SEPARATOR

Filed Nov. 24, 1928

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UNITED STATES PATENT OFFICE

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CREAM SEPARATOR

Application filed November 24, 1928. Serial No. 321,555.

The invention appertains to cream separators.

Cream separators of the centrifugal type include a rotatable bowl structure which is mounted on and driven from a vertical spindle. This spindle must be mounted in a manner that will cause it to rotate rapidly with the least amount of frictional resistance. For this reason, the spindle is usually carried on a ball bearing disposed at the lower end thereof and at its upper end, which is usually called the neck portion, it is provided with another bearing support which includes a flexible neck bearing. This bearing structure must be lubricated to insure efficient operation of the spindle.

Accordingly, it is, therefore, an object of this invention to provide an improved neck bearing structure.

Another object is to provide such structure in the form of a housing or collar which includes openings to receive oil or lubricant by the splash method, said openings directing the oil onto the bearing in the housing.

Another object is to provide a neck bearing housing which includes means for insuring that at all times it will be properly assembled so that the openings heretofore mentioned will always be presented to receive the splash of oil coming thereto.

Other objects will be apparent to those skilled in this art as the disclosure continues.

Briefly, these desirable objects are achieved in a cream separator having a housing provided with an oil sump in which rotates the usual ring gear that drives the vertical spindle, which spindle in turn carries and rotates the cream separator bowl. The neck portion of the spindle is carried in a bearing, which bearing in turn is mounted on a supporting ring formed as a part of a neck bearing housing, which housing is mounted in a novel manner in the frame of the separator. The housing is provided with openings faced in the direction of the oil being thrown by the large ring gear, so that the oil will be received inside of the housing to reach the bearing and the spindle. The housing includes an overflow to return the oil to the sump. The housing also includes a telltale structure, so

that it can only be assembled in one way in the frame, and that one way, of course, being the right way, so that the oil receiving opening thereof will always face in the direction of the oil being splashed by the gear aforementioned.

Reference is now to be made to the accompanying sheets of drawings in which the improved neck bearing housing structure is illustrated. In these drawings:

Figure 1 is a general, vertical, sectional view through the body of the cream separator;

Figure 2 is a top plan view of the neck bearing housing with a cover plate removed, as shown when viewed along the line 2—2 of Figure 1, looking downwardly;

Figure 3 is a cross sectional view taken along the line 3—3, looking in the direction of the arrows in Figure 2; and,

Figure 4 is a view similar to Figure 2, but showing the cover plate on the bearing housing.

The cream separator comprises the usual base 10 and body casing 11 having therein the usual oil sump 12. The body 11 carries a transverse shaft 13 on which is mounted a large ring gear 14, which plays into the oil in the sump to carry or splash the same upwardly, as clearly shown in Figure 1. The gear 14 is in mesh with a gear part 15 formed on a vertical spindle 16, that is mounted for substantially frictionless rotation in the usual manner on a ball bearing 17. The housing 11 above the spindle 16 is provided with the usual bowl housing extension 18 that forms a pocket for the cream separator bowl 19 which is carried on the upper end of the vertical spindle 16.

As has already been indicated, it is important to provide a neck bearing for this spindle, which preferably and usually is made flexible. Accordingly, an opening is provided to afford communication between the main casing 11 and the extension 18, and in this opening is mounted the housing collar 20 of this invention, said housing comprising a lateral, outwardly extending flange 21 that includes three spaced openings 22 to receive

set screws 24 that are secured in the casing, as best shown in Figure 1. The housing sleeve or collar 20 is preferably circular and includes at its bottom end an inwardly extending flange 25 that terminates in an upwardly extending ring 26 and on this ring, as best shown in Figure 1, is mounted, loosely, a standard form of roller or ball bearing 27, into which the neck portion of the vertical spindle 16 is fitted. It will be clear from the showing in Figure 1 that the outer race piece of the bearing 27 rests loosely on the ring 26. The space between the ring 26 and side of the sleeve or collar 20 forms an annular pocket 28 which receives a flexible neck bearing 29 to provide the necessary flexibility of movement for the bearing 27 caused by the rotation of the spindle 16. Thus the bearing 27 is yieldingly held to its rest on the ring 26.

It is essential to provide lubrication for this bearing 27 and the spindle 16, and accordingly two openings 30 are arranged side by side in the sleeve member 20, which openings are faced in a direction to receive the oil being splashed up or centrifugally thrown by the gear 14, as shown best in Figure 1. A drain opening 31 is provided in the bottom of the member 20 or inward extension 25, which causes the oil to drain out and back into the sump 12, as will be clear. Thus, a continuous circulation of fresh oil is being supplied to the neck bearing. Because of these openings 30, it is very essential that the sleeve member 20 be always properly assembled in the cream separator casing 11. To insure this, a telltale structure has been provided which makes it possible only to assemble this member in the proper manner. This telltale means comprises a dowel pin 32 mounted in the body of the separator adjacent the neck bearing structure. The extension 21 of the sleeve 20 is provided with an opening 33 which is designed to fit over the dowel pin 32. The user then knows that, when he has the opening 33 placed over the dowel pin 32, the assembly is correct and that the oil receiving openings 30 are faced in the proper direction.

To keep spilled milk and condensation water out of the neck bearing, a closely fitting cap 34 is provided which is fastened in place, as shown, by means of the set screws 24.

In operation, it will be understood that the gear 14 carries up oil from the sump 12, which is splashed into the openings 30 in the neck bearing housing sleeve 20, and, which oil is received by the neck bearing 27 to lubricate the same and also the spindle 16. The oil is drained back to the sump through the drain hole 31. In assembling the neck bearing structure, the sleeve 20 can only be mounted in place in one way, which calls for registration of the opening 33 with the dowel pin 32.

From this detailed description it must now

be clear that an improved structure has been provided for supporting the neck of a cream separator spindle and that this structure achieves all of the desirable objects heretofore recited.

It is the intention to cover all such changes as do not materially depart from this invention as is indicated by the scope of the appended claims.

What is claimed is:

1. The combination with a cream separator having a body casing provided with an oil sump, a gear ring for driving a vertical bowl carrying spindle, of a collar secured in the casing, said collar having an inward extension terminating in an up-turned ring, and a ball bearing yieldingly positioned on said up-turned ring, the vertical spindle passing through said bearing, said collar being provided with an opening to receive oil splashed thereto from the ring gear to lubricate the bearing, said collar also being provided with a drain opening to return oil to the sump.
2. The combination with a cream separator housing having a vertical opening through which is passed a bowl carrying spindle, of a collar having an outwardly turned lateral extension provided with securing means to fasten the same to the housing and in the opening thereof, said collar including an in-turned extension terminating in a ring, and a resiliently centered neck bearing for the spindle carried loosely on said ring, there being openings in the collar for receiving and circulating oil to the bearing and spindle.
3. The combination with a cream separator housing having a vertical opening through which is passed a bowl carrying spindle, of a collar provided with means for securing the same to the housing within the opening, a vertically arranged ring included in the collar and spaced inwardly from the side thereof to form an annular pocket, a neck bearing for the spindle carried on the ring, and a spring cushioned support for the neck bearing arranged in said pocket to position the said neck bearing yieldingly on the ring, there being openings in the collar to receive and cause oil to be circulated to the bearing and the spindle.
4. The combination with a cream separator having a body casing provided with an oil sump, a gear ring playing in the sump and driving a vertical bowl carrying spindle, of a collar fitted into an opening in the casing, said collar having at its bottom an inwardly extended flange terminating in an upstanding ring, the parts of the collar forming an annular pocket provided with a drain opening, a ball bearing having its outer race resting loosely on the ring, a flexible spring element arranged in the annular pocket to yieldingly hold the ball bearing on the ring, the spindle being passed through the ball bearing, a pin in the casing adjacent its opening,

said pin adapted to fit a hole in the collar for properly locating the collar in the opening, the collar having an oil receiving opening to receive oil splashed from the gear ring, and a seal cap for closing the top of the neck bearing assembly.

In testimony whereof I affix my signature.

FELIX C. SANDSTROM.

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