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PATENTED FEB. 12, 1907.

E. W. BROOMALL.
CENTRIFUGAL CREAM SEPARATOR.
APPLICATION FILED SEPT. 5, 1905.

FIG. 1.

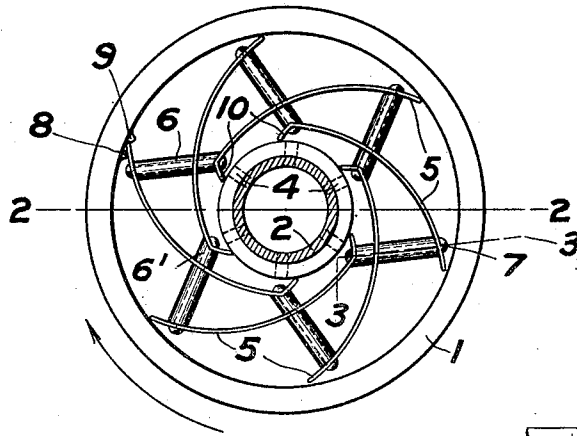


FIG. 2.

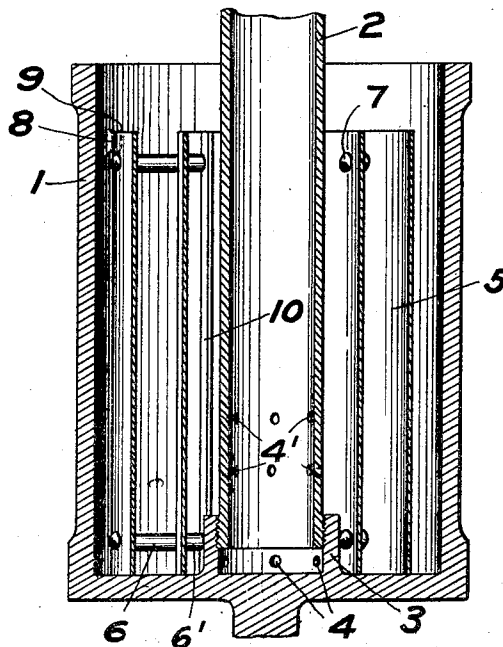
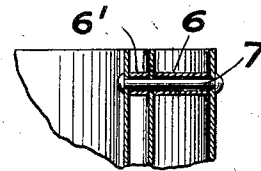


FIG. 3.



Witnesses
Clarence W. Carroll.
H. Gurnee.

By

Edgar W. Broomall
Agent & Counsel

His Attorneys

UNITED STATES PATENT OFFICE.

EDGAR W. BROOMALL, OF ROCHESTER, NEW YORK.

CENTRIFUGAL CREAM-SEPARATOR.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, EDGAR W. BROOMALL, a citizen of the United States, and resident of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Centrifugal Cream-Separators, of which the following is a specification.

This invention relates to centrifugal cream-separators, and has for its object to provide means whereby separation is enhanced by causing the fluid to separate into two distinct streams under centrifugal force, one stream consisting of the fresh milk as it passes outwardly over the front of the separator-blades and the other stream comprising the cream flowing inwardly over the backs of the blades to the cream-wall.

Other advantages will be pointed out in the specification.

In the drawings, Figure 1 is a top view of a separator-bowl and its blades. Fig. 2 is a vertical section of the same on the line 2 2 of Fig. 1, and Fig. 3 is a cross-section on the line 3 3 of Fig. 1.

1 represents the separating-bowl of a centrifugal separator. A feed-pipe 2 is secured within the bowl, as by the flange 3, and fresh milk is introduced into the lower part of it through vertical rows of ducts or passages 4 in the flange and 4' in the feed-pipe. The number of blades 5 should correspond with the number of vertical rows of passages through which the milk enters the bowl from the feed-pipe, so that the incoming fresh milk from each row of passages will be received on one of the blades and conducted by it to the wall of the bowl. It is important that the blades should be removable in order that they may be cleaned, and at the same time they must be braced strongly in their respective positions in the bowl, because the large quantity of fluid between the blades will subject them to great strain under centrifugal action. The blades are locked together both at their upper and lower edges by bolts 7 and are retained at their proper distances apart by the sleeves 6 and 6', that surround the bolts and abut against the blades. The outer edges of the blades are adapted to lie against the wall of the bowl when the blades are in place, and their inner edges are bent inwardly into flanges 10, which lie against the cream-wall of the feed-pipe 2.

In the drawings each bolt is represented as passing through three blades, and accordingly each blade is braced against movement in either direction at three points (both near its upper and its lower edge)—that is to say, both sleeves 6 and 6' hold the blades against movement at its center, the sleeve 6 and the wall of the bowl brace it at its outer end, and the sleeve 6' and the feed-pipe 2 brace it at its inner end. It is obvious that the number and location of the bolts that can be used will depend upon the number and curvature of the blades and their distance apart. This affords a simple yet strong construction and has the additional advantage of giving easy access to the blades, so that they can readily be cleaned when removed from the bowl.

The blades are caused to rotate with the bowl and retained in position therein by stops 8 and 9, one on each side of the blade 5, or by other suitable means. The bowl rotates in the direction of the arrow in Fig. 1. Perforations 4 and 4', through which the fresh milk is admitted to the bowl, lie just in front of each of the inwardly-turned edges or flanges 10 of the blades 5. The milk as it enters the bowl is thrown against the blades by the centrifugal force developed by the rotation of the bowl and is directed outwardly by them and is spread over them in such a way that the cream separates readily from the milk.

One defect that is common in separators is for the unskimmed milk as it enters the separator to meet and mix with the separated cream, and so to retard separation and prevent the best results; but in this separator that is obviated, for the mass of skimmed milk contained in the spaces between the blades effectively separates the incoming milk that is thrown upon the inside of the blades, as aforesaid, from the cream that is flowing inwardly toward the cream-wall of the feed-pipe 2 on the outside of the opposite blades, respectively, so that the separated cream cannot become mixed with the incoming milk.

Two separate and distinct streams of fluid are set up within this separator when in operation. One stream consists of the fresh milk as it takes its course outwardly from the inner edge of the blades over their front surfaces and then onto and over the adjacent surface of the bowl, and the other stream con-

sists of the separated cream as it returns over the back of the blades to the cream-wall, which is the outer surface of the feed-pipe 2. The intermediate spaces are filled with the skimmed milk, which is discharged therefrom in the usual way.

What I claim is—

1. In a centrifugal separator, the combination with a bowl, of a feed-pipe centrally located therein, and having a plurality of circumferential perforations leading into said bowl; and a corresponding number of outwardly-diverging separator-blades whose inner ends lie, respectively, adjacent to and directly in front of their individual perforations, cutting, respectively, radii through said perforations, substantially as shown and described.

2. In a centrifugal separator, the combination with a bowl, of a feed-pipe centrally located therein, and having a plurality of circumferential perforations leading into said bowl; and a corresponding number of outwardly-diverging separator-blades whose inner ends lie, respectively, directly in front of their individual perforations, cutting, respectively, radii through said perforations,

and are then bent inwardly around said perforations and extended behind them, respectively, to said feed-pipe; substantially as shown and described.

3. In a centrifugal separator, the combination with the bowl 1, of the feed-pipe 2, centrally located therein, and having a plurality of circumferential perforations 4' therein; and the corresponding number of outwardly-diverging separator-blades 5, whose inner ends 10 lie, respectively, directly in front of said perforations in the feed-pipe, and then are bent inwardly around said perforations, respectively, to the feed-pipe; substantially as shown and described.

4. A system of separator-blades for a centrifugal separator, comprising a plurality of separated blades held rigidly in proper relation to each other by bolts 7 that pass through said blades, and sleeves 6 and 6' upon said bolts that lie between and abut against said blades, substantially as shown and described.

EDGAR W. BROOMALL.

Witnesses:

G. C. BLACKALL,
D. GURNEE.