No. 621,619. Patented Mar. 21, 1899.

E. G. N. SALENIUS.

CENTRIFUGAL CREAM SEPARATOR.

(Application filed Jan. 11, 1899.)

(No Model.)

Fig. 1.

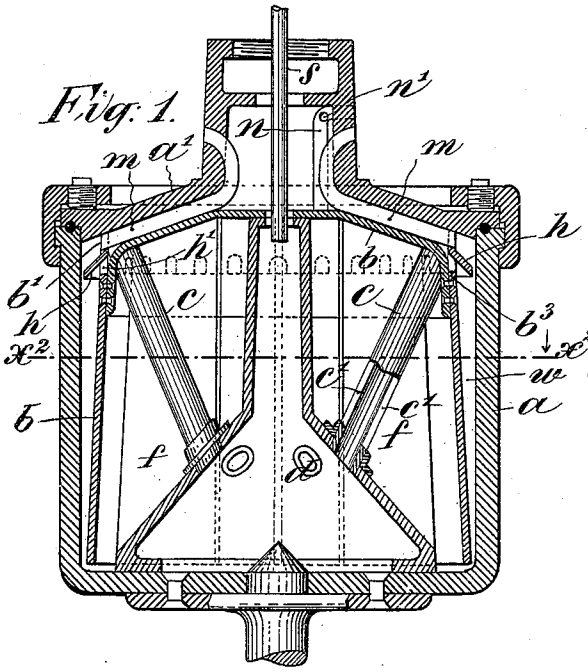


Fig. 3.

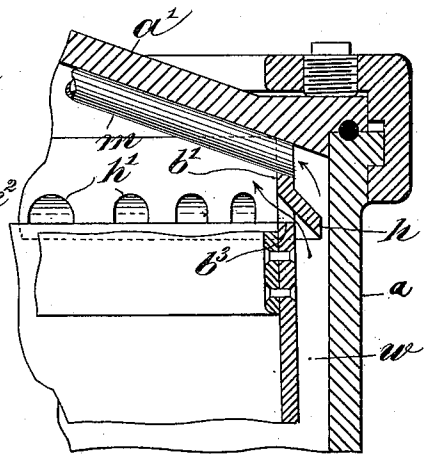


Fig. 2.

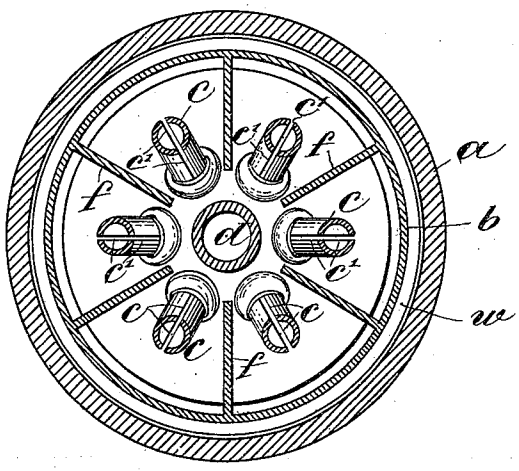
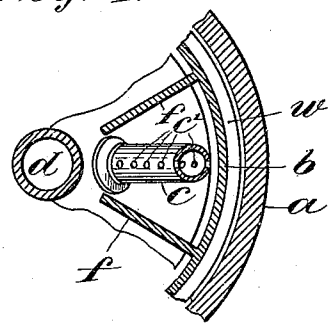


Fig. 4.



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CENTRIFUGAL CREAM-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 621,619, dated March 21, 1899.

Application filed January 11, 1899. Serial No. 701,843. (No model.)

To all whom it may concern:

Be it known that I, ERIK GUSTAF NICOLAUS SALENIUS, a subject of the King of Sweden and Norway, and a resident of Radiator, Albano, in the Kingdom of Sweden, have invented certain new and useful Improvements in Drums for Centrifugal Apparatus, of which the following is a specification.

This invention relates to centrifugal milk-separators, the object being to allow of the centrifugal process taking place in different phases or stages—that is to say, in such a manner that the milk on being introduced into the drum is subjected first to the centrifugal action while divided up into small portions, then while in a mass, and finally while spread out in a thin sheet. This action, which is accompanied by great efficiency, is brought about by mounting in the drum a number of tubes or conduits extending radially and obliquely upward and outward from an axial milk-inlet tube which flares or widens at the bottom, the said radial tubes being slotted or perforated on opposite sides, the one facing and the other turned away from the axis of the drum. In the drum there is, moreover, placed a bell or hook like partition, the wall of which is at only a little distance from the wall of the drum, and this bell incloses the aforesaid axial and radial tubes.

In the accompanying drawings, which illustrate an embodiment of the invention, Figure 1 is a vertical axial section of the drum, and Fig. 2 is a horizontal section of the same at line x^2 in Fig. 1. Fig. 3 is a fragmentary sectional view, on a larger scale, showing the construction of the cream-inlets. Fig. 4 is a fragmentary view illustrating one of the radial tubes perforated instead of slotted.

The drum is designated by a, and its cover by a'. The flared inlet-tube d for the milk is set in the axis of the drum, and the bell b incloses it. The crown-sheet of the bell rests on the top of the tube d, and its outer wall, which is slightly flared toward its lower edge, extends nearly to the bottom and wall of the drum, but is not in contact therewith, so that there is room for the milk to flow out under its edge and up between it and the drum in a thin sheet.

From the flared lower part of the inlet-tube d a plurality of upwardly and outwardly radiating tubes or conduits c extend up to the crown of the bell b, which closes their upper ends. Each tube c has oppositely-arranged slots c', one along the side of the tube facing the axis of the drum and the other along its opposite or outer side. Preferably these apertures c' will be in the form of longitudinally-extending slots, as seen in Fig. 2; but they may be rows of perforations, as seen in Fig. 4.

The bell b has upright radially-arranged plates or vanes f, (seen best in Fig. 2,) preferably as many in number as the tubes c and alternating with said tubes. These vanes extend from the crown of the bell down to the flared lower end of the milk-inlet tube d.

A ring flange or plate b' extends from the crown of the drum down to the top of the side wall of the bell b at b^3, this flange having the same diameter as the upper end of the drum, and through this flange extend the tubes or pipes m, which carry off the blue milk from the drum. In the ring-flange are apertures h' just above the top or crown of the bell, and on the outer face of said flange, just above the apertures h', is a ring-like sloping hood h, which extends out nearly to the drum-wall.

The milk, entering the rotating drum through the axial tube d, (being supplied through a pipe s,) is thrown outward by the centrifugal action, and finding no escape at the bottom of said tube (which is closed) it is driven outward through the radial tubes c, in which it is subjected to the centrifugal force. The cream escapes from the tubes c through the inner slots therein and the skimmed or blue milk through the outer slots. The milk flows from the tubes c into the hollow or space within the bell b and there undergoes centrifugal treatment in mass. From the hollow of the bell the partially-skimmed milk flows outwardly under the lower edge of the bell and into the narrow annular space w between the sloping wall of the bell and the upright wall of the drum, while the cream, separated within the bell, rises and flows out through a cream-outlet pipe n, which taps the crown of the bell b. While flowing upward through the relatively narrow space w the partially-skimmed milk is

subjected to powerful centrifugal force while in a thin sheet. On reaching the annular hood *h* in its upward flow the blue or skimmed milk next to the drum-wall is separated from the inner cream-wall and passes up to and out at the tubes *m*, while the cream therefrom flows inwardly through the apertures *h'* to the space over the convex crown of the bell and rises thence to an aperture *n'* in the side of the tube *n* at the point where the latter discharges. Owing to the main portion of the cream having been primarily separated within the bell *b*, the subsequent treatment of the milk in the narrow annular chamber *w* is enabled to remove substantially all of the butter-fat still remaining in the milk, and thus the loss of fat carried off in the blue milk will be reduced to a minimum.

Having thus described my invention, I claim—

1. In a centrifugal separator for milk, the combination with the drum, of an upright milk-inlet tube *d*, in the axis of the drum and having a flared and closed lower end, a plurality of radially-arranged, upwardly and outwardly inclined tubes *c*, open to the interior of the flared portion of the tube *d* at their lower ends, closed at their upper ends, and furnished with apertures *c'*, a bell *b*, inclosing the pipes *c* and *d*, said bell being of such size and so placed as to form a narrow annular space *w* about it between its wall and the wall of the drum, a discharging-tube *m*, to lead the blue milk from the space *w*, a discharging-tube *n*, adapted to lead the cream from within the bell, and means for skimming the cream from the blue milk rising in the chamber *w*, substantially as set forth.

2. In a centrifugal separator for milk, the combination with the drum, the axial milk-inlet tube, the radial, apertured, separating-tubes *c*, and the inclosing bell *b*, of the ring-flange *b'*, extending from the drum-cover down to the top of the wall of the bell and provided with apertures *h'*, the hood *h*, above said apertures and extending out nearly to the drum-wall, and the tubes *m* for the blue milk extending through the pendent flange *b'*, substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

ERIK GUSTAF NICOLAUS SALENIUS.

Witnesses:

ERNST SVANQVIST,

H. B. OHLSSON.