

1,046,906.

2 SHEETS—SHEET 1.

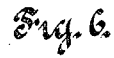


Fig. 1.



Benedict's Office
J. L. Mauliffe

INVENTOR

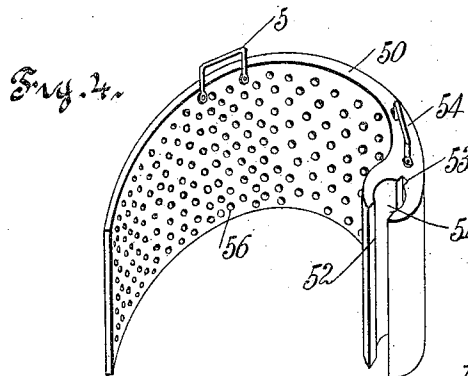
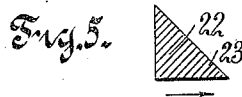
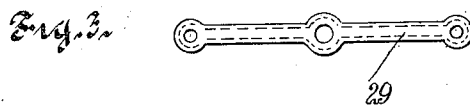
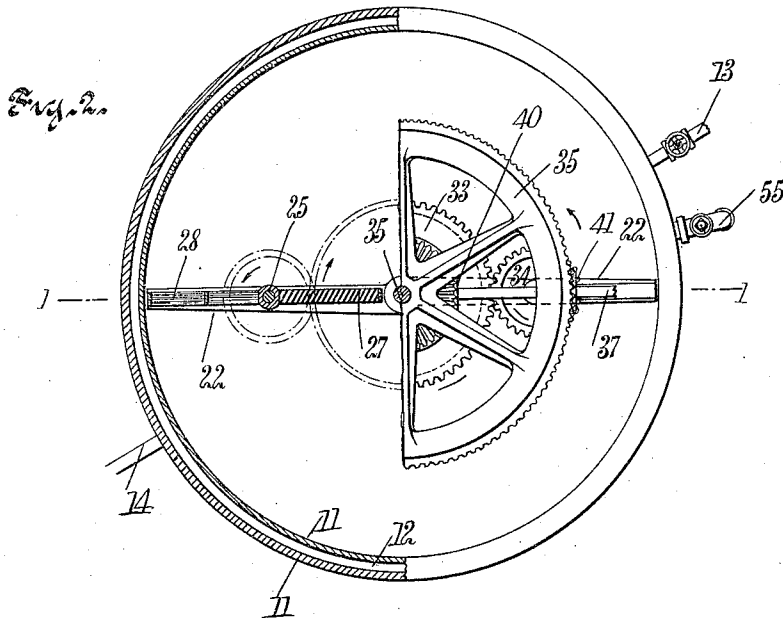
Belke Veemans
BY *Munro*
ATTORNEYS

E. VEEMAN.
CHEESE MAKING MACHINE.
APPLICATION FILED MAR. 13, 1912.

1,046,906.

Patented Dec. 10, 1912.

2 SHEETS—SHEET 2.



WITNESSES

Bureau of Patents
J. L. Lusk

INVENTOR

Eelke Veeman
BY *Munn & Co*
ATTORNEYS

UNITED STATES PATENT OFFICE.

EELKE VEEMAN, OF SNEEK, NETHERLANDS.

CHEESE-MAKING MACHINE.

1,046,906.

Specification of Letters Patent.

Patented Dec. 10, 1912.

Application filed March 13, 1912. Serial No. 683,410.

To all whom it may concern:

Be it known that I, EELKE VEEMAN, a subject of the Queen of the Netherlands, and a resident of Sneek, Netherlands, have invented a new and Improved Cheese-Making Machine, of which the following is a full, clear, and exact description.

An object of my invention is to provide a machine for use in the manufacture of cheese, and adapted for performing operations now generally performed by hand with the aid of various tools, by the use of which machine the curd will be effectively broken up and thoroughly worked to a uniform and superior condition, the mechanism having provision for effectively extracting the whey and effecting its discharge while collecting the curd in an annular layer in the containing vessel against the inside surface of the side wall of said vessel.

In general terms the illustrated example of my improved machine presents an exterior tub, a vessel removably fitted in the tub and spaced therefrom to form an intervening space for receiving steam, hot water, or other heating medium, a shaft mounted to revolve centrally in the said vessel, radial arms carried by the shaft, shafts stepped in the radial arms and carrying curd breakers of novel construction, and overhead driving gearing for revolving the several shafts on their own axes. The mentioned curd breakers during the final operations of the machine are removed and the radial arms raised out of the vessel, after which the central shaft receives a special form of blade for collecting the curd and separating the whey therefrom.

In the illustrated example of my machine I have shown a particular arrangement of driving gears for actuating various shafts forming part of the machine, and while this arrangement is advantageous and preferable, it may be varied in practice.

The various novel features of my machine, as well as the important structural forms will appear from the more specific description hereinafter to be given.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional elevation of a machine embodying my invention; Fig. 2 is a partly sectional plan view thereof, on line

2—2 Fig. 1; Fig. 3 is a plan view of a tie connection between shafts constituting part of my invention; Fig. 4 is a perspective view of a curd-collecting and whey-extracting blade of novel form; Fig. 5 represents a cross section of one of the radial arms to be hereinafter referred to; and Fig. 6 is a fragmentary detail showing one of the blades of the curd breaker removably fitted in the frame thereof.

In constructing a machine in accordance with the illustrated example, the tub 10, which may be of wood suitably bound, receives a removable vessel 11, which is spaced at all sides and at the bottom from the said tub to provide a chamber 12 adapted to receive steam, hot water, or other heating medium which may enter through a pipe 13, and be drained off through any suitable outlet as 14, the said vessel 11 being formed with a horizontal top flange 15 bridging the space 12 at the top, and extending to the side wall of the tub 10. The bottom 16 of the vessel 11 inclines or dips downward and inward from the periphery toward the center, as clearly shown in Fig. 1, and in said vessel there is mounted to revolve a central shaft 17. The shaft 17 may be stepped at its lower end in any suitable manner; preferably there is a central base member 18, constituting a bearing and located beneath the tub 10, which bearing receives a journal stud 19 screwed to the lower end of the shaft 17, said journal member 19 having a steel pin 20 driven therein and resting on the bearing 18. Surrounding the attached journal member 19 is a flanged collar 21, fitted in the bottom of the tub 10 and on which the bottom of the vessel 11 rests. Any suitable frame bearing 18^a is provided for the upper end of the shaft 17.

On the shaft 17 are carried radial arms 22, each of which as shown in Fig. 5, presents a front face 23 that inclines upwardly and rearwardly from the bottom edge of the arms so as to constitute a scraper for the curds, and in said radial arms are stepped vertical shafts 24, to which curd breakers 25 are secured, as by pins 26, the several shafts being actuated in the manner hereinafter described. Each curd breaker 25 comprises two series of blades 27, 28, one series at each side of the shaft 24; one series of the blades, as 27, are disposed vertically or approximately so, while the other series 28 are disposed horizontally, the blades of

the latter series being in practice slanted rearwardly and upwardly so as to have a lifting action on the milk and on the curds. Thus the milk and curds are acted upon by the scraping radial arms 22 at the bottom of the vessel, and by the vertical and horizontal blades of the curd breaker to effectively agitate the milk and break up the curds.

Between the several shafts extend tie bars 29, 30, supported as by a collar 31, at the under side, and held above as by collars 32 on the shafts 24. In the tie bars 29, 30, the shafts 24 rotate as the said bars and shafts are carried around with the revolution of the central shaft 17. The preferred arrangement of the driving devices for the shafts and their appurtenances is as follows: A gear wheel 33 is loose on the shaft 17, being supported on the upper tie rod 30 and meshing with said loose gear wheel are spur pinions 34, which are keyed on the shafts 24. Above the gear wheel 33 and spaced therefrom, there is keyed to the shaft 17 a second gear wheel 35, provided with bevel teeth 36 on the under side of the periphery so that the gear is generally in the form of a crown gear. A drive shaft 37 is supported in suitable bearings 38 and provided with a suitable arrangement of driving device, illustrated in this instance as a conventional pulley 39, and on said drive shaft bevel spur pinions 40, 41 are keyed to mesh respectively with the gear wheels 33, 35. The gear 35 serves to drive the shaft 17, and thus the radial arms 22, the tie rods 29, 30, and the shafts 24 with their spur pinions 34 are carried around with the said shaft 17. In the meantime the shafts 24 are rotated on their own axes through the action of the driving pinion 40, the gear wheel 33 and the spur pinions 34.

It will be observed from Fig. 1, that the shafts 24 are formed in coupled sections, the lower sections 24^a that carry the curd breakers 25 being suitably coupled to the upper sections as by a sliding sleeve 42, which is adapted to fit over the overlapped or rabbeted meeting ends 43, 44 of the shaft sections, the said coupling sleeves resting on collars or flanges 45 on the lower sections 24^a. By raising the sleeves 42 slightly, the lower sections 24^a and the curd breakers may be lifted out of the vessel, after which the radial arms 22 are raised to the position shown in dotted lines Fig. 1, where they may be temporarily supported in any suitable manner, as by hooks 46 on the tie rod 29. The shaft 17 is now ready to receive the curved blade 50 (Fig. 4), said blade being formed at one end and along the edge thereof with an eye 51, said eye being open at a side as at 52. This shaft 17 is flattened at opposite sides, as at 17^a, whereby to be received in the eye 51 through the open side

52 thereof, after which the blade is given a partial turn and the key inserted in the seat 53, to hold the blade fixedly on the shaft. The blade is provided also with suitable handles 54 for convenience in manipulating it.

In practice, the milk in condition for the making of cheese is placed in the vessel 11 and steam or hot water being directed into the chamber 12, the machine is started to actuate the shafts and agitate the milk until it is heated equally and to the desired degree. When the tub has been filled and the temperature has reached the proper degree, the rennet is put in, the machine being at this time stopped and the tub covered until the milk is sufficiently coagulated. The shafts are now again rotated to agitate the milk with the rennet therein for about fifteen minutes, after which some of the whey is drawn off, there being an outlet 55 in the form of a drain pipe which communicates with the interior of the vessel 11 and extends from about the center thereof at the lowest portion of the vessel. The speed of the machine is now increased, and after operating for from thirty to forty-five minutes more whey is drawn off, after which the speed may be increased. When the curd has been sufficiently broken up by the curd breakers 25 and the radial scraper arms 22, the said curd breakers are removed by uncoupling the lower shaft sections 24^a, and the radial arms 22 are raised on the shaft 17 to the upper position. The curved blade 50 is now secured to the shaft 17 in such a manner that in the rotation of the shaft, the outward convex surface of the blade 50 will be presented to the curd, the effect of which will be to press the curd in advance of the blade so that the curd will be collected in the form of a vertical layer against the upright side wall of the vessel 11, the whey in the meantime escaping rearwardly through the perforations 56 of the blade as the latter advances, to finally pass out through the outlet 55.

The blades 27, 28 are received in slots 25^a in the frames of the curd breakers so as to be removable for cleaning.

By my improved machine the operation of working the curd and removing the whey is performed with a minimum of labor, and the curd is brought to a uniform and superior quality, after which it is packed in the usual manner.

Having thus described my invention, I claim as new, and desire to secure by Letters Patent,—

1. A machine for use in working curd in cheese making, comprising a receptacle for the milk, said receptacle consisting of an outer tub and a removable vessel spaced from the tub to form a chamber for a heating agent, and curd breakers mounted to

travel around the interior of the inner vessel and to rotate on their own axes.

2. In a machine for use in working curd in cheese making, a curd breaker, comprising a frame, and vertical series of blades disposed in said frame, one vertical series being approximately radial and the other set approximately vertical.

3. In a machine for use in working curd in cheese making, a curd breaker comprising a frame, and sets of blades disposed in said frame, one set being approximately radial and the other set approximately vertical, the radial blades being slightly slanting from the front portion toward the rear.

4. A machine for use in working curd in cheese making, comprising a tub, a vessel within said tub, a heating chamber between the tub and vessel, the said vessel having a bottom inclined downward from the exterior toward the center and having a whey outlet leading from about the center, a central shaft, radial arms carried on said shaft to be carried around thereby, shafts stepped in said arms, curd breakers mounted on the last mentioned shafts, tie connections between all of said shafts above the vessel and in which tie connections the second mentioned shafts may turn, and means for turning each of said shafts on its own axis.

5. In a machine for use in working curd in cheese making, a vessel, a central shaft mounted in said vessel, radial arms carried by said shaft, to be carried around thereby, a shaft supported in each of said radial arms and carrying curd breakers, tie bars connecting said shafts above the vessel and in which the second mentioned shafts may rotate on their own axes, a gear wheel loose on the central shaft, spur pinions keyed on the other shafts and meshing with the said gear wheel, a second gear wheel keyed on the central shaft, a driving shaft, and driving pinions on said drive shaft and meshing respectively with the gear wheels on the central shaft.

6. In a machine for use in working curd in cheese making, a vessel, a central shaft mounted in said vessel, radial arms on said shaft to be carried around thereby, a shaft stepped in each of said arms, a curd breaker on said last mentioned shafts, tie bars connecting all of said shafts above the vessel and in which the shafts stepped in the radial arms may turn, a gear wheel loose on the

central shaft, spur pinions keyed on the other shafts and meshing with the said gear wheel, a second gear wheel keyed on the central shaft above the first mentioned gear wheel, a drive shaft, and driving pinions on said drive shaft and meshing respectively with the gear wheels on the central shaft, the drive shaft and its pinions being disposed above the loose wheel and below the fast gear wheel.

7. In a machine for use in working curd in cheese making, a vessel having means for heating it exteriorly, a central shaft having actuating means, radial arms carried by said shaft, and shafts stepped in said arms and having driving means, said last-mentioned shafts comprising coupled sections to permit the lower sections to be removed without disturbing the driving connections, the mentioned radial arms being movable vertically on said central shaft.

8. An agitating dasher for use as a curd breaker and for other purposes, comprising two series of blades, the blades of one series being disposed at pronounced angles to the blades of the other series, the blades constituting one series being at one side of the axis of the curd-breaker, and the other series at the opposite side of the axis.

9. In a machine for use in working curd in cheese making, a vessel for receiving the milk, a central shaft mounted to revolve in said vessel, radial arms carried by said shaft and formed with front faces slanted upwardly and rearwardly, shafts stepped in said radial arms, curd breakers carried by said second mentioned shafts, and means for actuating the central shaft.

10. The combination with a vessel, of a central shaft therein, radial arms on the shaft, shafts stepped in said radial arms, portions of said shafts being removable, and curd breakers carried by the removable portions of the shafts, the radial arms being movable upward on the central shaft above the vessel when the curd breakers and the shaft portions are removed.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EELKE VEEMAN.

Witnesses:

J. ONEDEW,
A. C. NELSON.