(No Model.)

H. SARTORIUS.

MACHINE FOR MIXING AND COOLING LARD.

No. 490,505. Patented Jan. 24, 1893.

Fig. 1

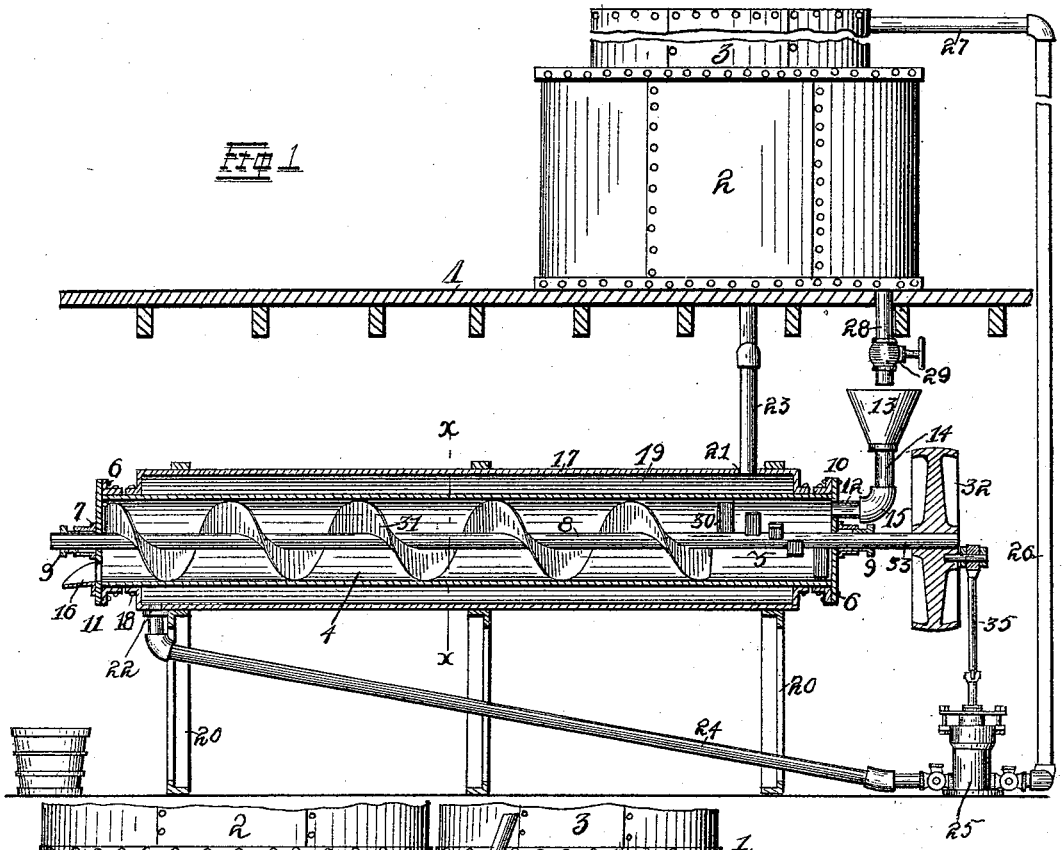


Fig. 2

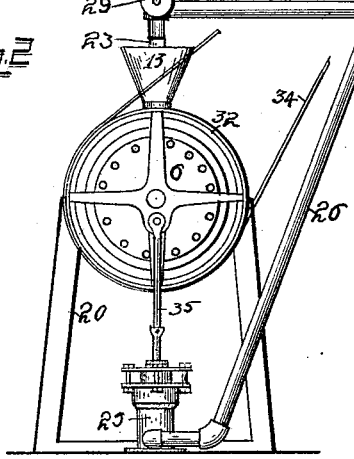
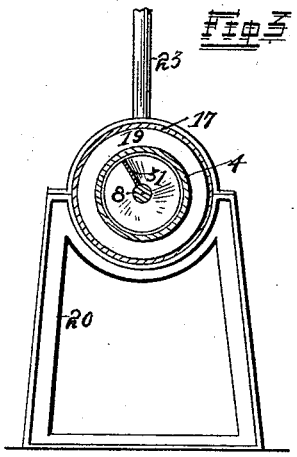


Fig. 3



Witnesses
Alfred A. Eicks
Herbert S. Robinson

Inventor
Henry Sartorius
By his Attorneys
Higdon & Higdon & Langan

UNITED STATES PATENT OFFICE.

HENRY SARTORIUS, OF ST. LOUIS, MISSOURI.

MACHINE FOR MIXING AND COOLING LARD.

SPECIFICATION forming part of Letters Patent No. 490,505, dated January 24, 1893.

Application filed June 9, 1892. Serial No. 436,154. (No model.)

To all whom it may concern:

Be it known that I, HENRY SARTORIUS, of the city of St. Louis and State of Missouri, have invented certain new and useful Improvements in Machines for Mixing and Cooling Lard, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to improvements in "machines for mixing and cooling lard" and consists in the novel arrangement and combination of parts as will be more fully hereinafter described and designated in the claim.

In the drawings: Figure 1 is a view of my complete invention, showing the cooling and conveying apparatus in detail vertical section. Fig. 2 is an end plan view of the conveyer and showing the pumping attachment forming a part of the cooling process. Fig. 3 is a section view taken on the line *x x* of Fig. 1.

The object of my invention is to improve upon the present method of cooling and mixing lard.

The main feature of my improved machine is to prepare lard for the general market which will not be affected by any climatic changes.

Heretofore in the manufacture of lard there has been a difficulty which has not to any extent been overcome. By the former processes of preparing lard for shipment it has always been in a grainy state and therefore this peculiar condition would not allow of its being handled in hot climates on account of its tendency to return to its original state. To overcome this deficiency in the manufacture of lard, I have designed an improved machine which combines the mixing and gradual cooling of lard thus rendering it dense and hard and free from any grain.

The advantages gained by the use of my invention are apparent and will be more readily understood from the following description.

Referring to the drawings: Before proceeding any farther, I wish to state that the conveyer and parts necessary thereto are preferably located on one floor of a building and the supply tanks upon an upper floor. Thus 1 represents a floor supporting a supply tank or reservoir 2 which contains the rendered lard in its semi-molten state. 3 indicates another supply tank or reservoir adapted to contain the liquid used for cooling. 4 indicates the conveyer cylinder, in the receiving end of which is provided a mixing device, to be hereinafter described. Suitable heads 6 upon both ends of the cylinder 4 are provided with apertures 7 through which is a shaft 8 running longitudinally through the cylinder 4 and journaled in bearings 9 secured to both heads 6. The bearings 9 are in the form of stuffing-boxes and operate as such.

I will distinguish the ends of the cylinder 4 by calling one the receiving end 10 and the other the discharging end 11. The receiving end 10 is provided with a pipe 12 secured in the head 6 and ultimately leading to a funnel shaped receptacle 13, the connections being made by said pipe 12 and a pipe 14 connected by a coupling 15. The discharging end is provided with a mouth piece or guiding trough 16 through which the lard after it has passed through the conveyer, passes.

The cylinder 4 is provided with a jacket covering 17 secured a relative distance from the outer wall of said cylinder 4, and the end of the jacket cover fitting on to said cylinder and secured thereto by means of bolts 18. The space formed by this construction between the outer wall of the cylinder 4 and the jacket 17, I term a cooling chamber 19. In this connection I will state that the conveyer, cylinder 4 and its intermediate parts are supported by suitable posts or columns 20 a desirable distance above the floor.

The jacket covering 17 is provided with an inlet opening 21 and an outlet opening 22 into which are fitted pipes 23 and 24 respectively. The pipe 23 leads to said cooling chamber 19 from the tank 3 located above, and the pipe 24 leads from the opposite end of said cooling chamber 19 to an ordinary valve pump 25. Pipes 26 and 27 with their suitable coupling attachments lead from the pump 25 upward to the tank 3. Thus it will be seen that a continuous circuit is formed through which the cooling liquid passes and leads from the tank 3 downward through the pipe 23, thence into the cooling chamber and out into the pipe 24 and into the pump 25 which forces the said liquid upward and back into the tank 3 again.

The lard supply tank 2 is provided with a depending pipe 28 leading into the funnel shaped receptacle 13. The flow of the liquid lard through this pipe 28 is controlled by a valve 29.

Upon that part of the shaft included in the mixing chamber 5 are secured spirally arranged blades or paddles 30 which agitate the liquid lard.

Secured on the balance of the shaft located within the conveying chamber 4 is a spiral shaped piece of metal or some other suitable material which is adapted to act as a conveyer for the lard which is forced against said spiral 31 by the motion of the paddles 30 in the mixing chamber 5. These different parts are located upon the shaft 8 and said shaft is revolved by pulley 32 located upon the projecting end 33 of the shaft 8 at the receiving end 10. The power for operating the pulley is transmitted by a belt 34 leading to some outside source of power. Eccentrically adjusted to the pulley 32 is a connecting rod 35 upon the free end of which is secured the valve within the pump 25.

It will readily be seen that the conveyer shaft and the pump are operated from the same source of power and are directly connected with each other, this arrangement forming one of the features of my invention.

Having fully described the parts in detail and stated the object of my invention, I will now proceed to describe its operation. The cooling liquid that I use may be any of the materials or chemicals now used in refrigerating process, such as ice water, salt and ice, ammonia &c. In case ammonia or other strictly refrigerating materials are used it is of course necessary to force the said cooling liquid through the cooling chambers by means of a compressor especially designed for that purpose and the connections to said compressor will practically be the same as they are now except that the compressor will be connected between the tank 3 and the cooling chambers 19.

I will first describe the manner in which the lard is mixed and conveyed. The supposition being that the cooling apparatus is in use and the cooling process being carried on. By opening the valve 29 in the pipe 28 the desired flow of the liquid lard is allowed to pass into the funnel shaped receptacle 13 and from thence through pipes 12 and 14 into the mixing end of the cylinder 4. The effect of the cooling liquid in the cooling chamber 19 adjacent to the mixing chamber 5 stiffens the liquid lard to such an extent that it can be worked in the mixing end of the cylinder before passing through the conveyer. The spirally arranged paddles 30, arranged on the shaft 8 and inside of the cylinder agitate the lard and thoroughly mix it up and stiffen it thus relieving the lard of any tendency to be grainy which it may have. The spiral arrangement of the blades or paddles 30 has a special function in itself, namely, it serves to very slowly push the lard after it has arrived at a thoroughly mixed state against the spiral shaped conveyer 31. This conveyer gradually carries the lard along through the chamber 4 and forces it out through the mouth piece 16 from which it is taken off into buckets or tubs, which are usually used for this purpose. During the mixing and conveying of the lard it is continually under the influence of the cooling liquid in the chamber 19. This process makes the lard perfectly hard and the combination of the mixing, conveying and cooling processes relieves the lard of any grain. The absence of this grain in the lard and the shape in which it is when packed, allows of its being shipped and stored in any hot climate without materially affecting the lard. The passage of the cooling liquid has been heretofore described, but I will reiterate my former statement. The refrigerating material passes from the tank 3 through the pipe 23 into the chamber 19 at a point near the receiving end and in the upper periphery of said chamber. It passes through the chamber and out through the pipe 24 secured in the outlet 22 in the lower periphery of the cooling chamber 19 at the discharging end. It passes through this pipe into the pump 25 operated from the pulley 32 and is forced upward through pipes 26 and 27 back into the tank 3, thus forming a continuous circuit.

The advantage gained by the re-use and continuous flow of the cooling material, is that a great expense is saved and the continuous current remains unbroken.

The use of the stuffing boxes 9 located upon the heads 6 and in which the shaft 8 is journaled is apparent. They prohibit any lard from escaping or leaking out of the chambers.

Having fully described my invention, what I claim is,

In a machine for mixing and cooling lard, the combination, with a cylinder provided at opposite ends with an inlet and an outlet, respectively, a cooling chamber surrounding said cylinder, a reservoir for the cooling medium, and inlet and outlet pipes affording communication between the cooling chamber and the reservoir, of a shaft journaled in the cylinder and provided with mixing arms at the receiving end thereof and a conveyer in rear of said arms, a pump interrupting one of said pipes, and a band wheel mounted on said shaft and adapted to operate the same and the pump; substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY SARTORIUS.

Witnesses:
C. K. JONES,
ALFRED A. EICKS.