March 29, 1932. A. RÖLZ 1,851,113

PROCESS AND APPARATUS FOR INCREASING THE EFFICIENCY OF MASH TUBS FOR MASSECUITE AND THE LIKE

Filed Sept. 12, 1928

Fig. 1.

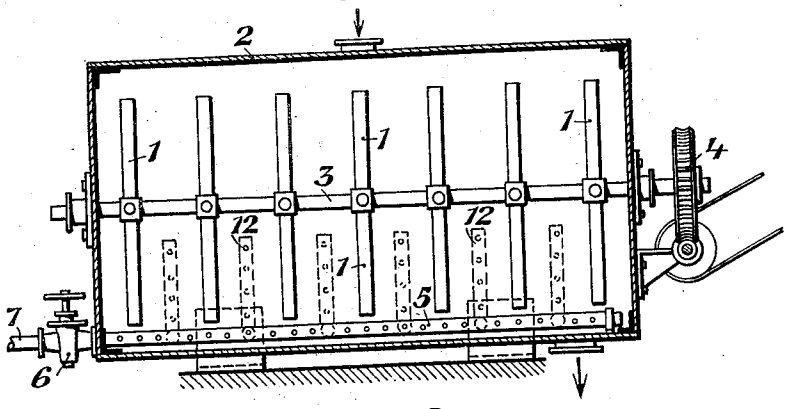


Fig. 2.

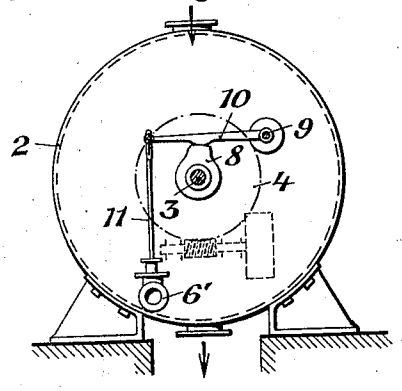
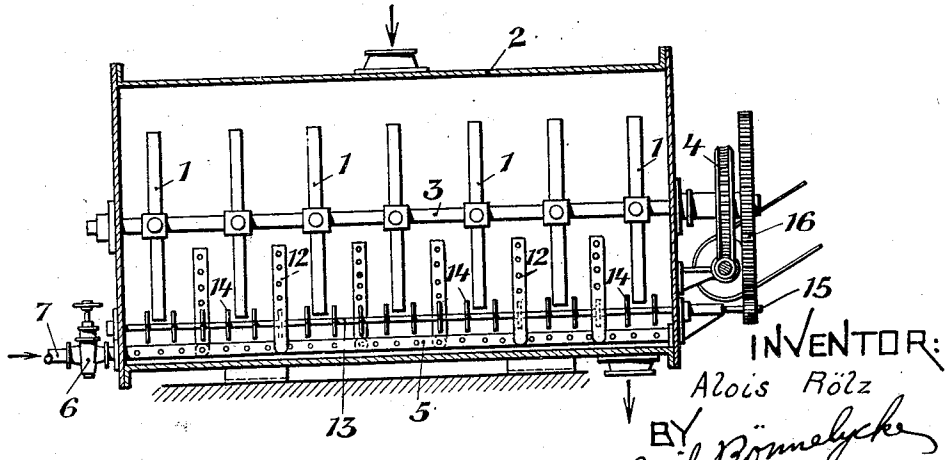


Fig. 3.



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UNITED STATES PATENT OFFICE

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PROCESS AND APPARATUS FOR INCREASING THE EFFICIENCY OF MASH TUBS FOR MASSECUITE AND THE LIKE

Application filed September 12, 1928, Serial No. 305,600, and in Germany September 13, 1927.

The efficiency of mash tubs for massecuite and the like is in known manner increased if a liquid is mixed with the charge. This liquid was previously simply applied to the surface of the contents in greater or less quantities and at certain intervals of time. This method, however, does not effect a rapid and intimate mixture of the liquid with the charge, so that these known processes have considerable drawbacks.

The object of the invention is to obviate these drawbacks by the arrangement in which the liquid is led to the mash tubs under pressure in fine jets. The liquid is, preferably, supplied intermittently.

An important improvement is also effected if a bladed shaft is arranged above the tube supplying the liquid, in order to break up the jets of liquid flowing from the tube and to mix it with the surrounding charge.

Examples of apparatus for carrying out the process according to the invention are shown in the accompanying drawings.

Fig. 1 is a longitudinal section through a mash tub according to the invention.

Fig. 2 is a front view of a modified construction of the mash tub.

Fig. 3 is a longitudinal section through a further modified construction of the mash tub.

A stirring shaft 3 provided with arms 1 disposed in the tub 2 is set in rotation in known manner by a worm and worm wheel 4. According to the invention, a tube 5 is placed in the mash tub or receptacle 2 and is provided over its whole length with perforations for the passage of the liquid. A valve 6 is arranged outside the tub in a tube 7 leading from a vessel containing liquid under pressure and forming a prolongation of the tube 5. The valve can as shown in Figs. 1 and 2 be provided with a hand wheel in order to manually control the supply of the liquid. The valve 6 is, however, preferably controlled mechanically so that the liquid is led intermittently to the tub 2 as shown in Fig. 2 as valve 6′.

For this purpose a cam disc 8 is secured externally to the mash tub 2 on the arm of the stirring shaft 3, while at the front wall of the mash tub 2 or at any other suitable fixed point a lever 10 is pivoted about a pin 9; the lever rests on the cam and is connected by a rod 11 with the slide or valve 6′. In this arrangement as the shaft 3 and with it the cam rotates, the valve 6 is opened and closed by the lever 10 and the rod 11 at each rotation of the shaft. Several cams can be arranged on the disc, so that the liquid can be delivered several times during one revolution of the shaft 3.

The cam of the disc 8 may be adjustable in order to vary the stroke of the valve and in this way to control the quantity of liquid supplied at any time.

Obviously, instead of the single tube 5, several such tubes can be applied at different places in the tube. Also, as shown in broken lines in Figs. 1 and 2, the tube 5 can be provided with branch tubes 12 disposed between the arms 1 of the stirrer in order to obtain a better distribution of the liquid.

The syrup, water or other suitable liquid is preferably supplied under a pressure such that the liquid penetrates as deeply as possible into the charge.

As shown in Fig. 3 a beating shaft 13 is rotatably mounted above the tube 5 and carries short arms 14. One end of the shaft 13 projecting out of the tub 2 carries a small gear wheel 15 which engages with larger gear wheels 16 secured to the driven shaft 3.

The tubes 12 branched from the tube 5 are arranged in this case parallel to the end walls of the tub 2, so that they are not in the way of the arms 14.

By using the device shown in Fig. 3, the shaft 13, owing to the high gear ratio of the wheels 16 and 15, is driven by the worm gear 4 at considerably higher speed than the shaft 3, so that the liquid jets streaming from the perforations of the tube 5 are met and broken up by the arms 14, that is the liquid is thoroughly mixed with the charge in the tub 2.

Instead of driving the shaft 13 in the manner shown, other suitable driving means can be employed. For example, the shaft 13 may advantageously be rotated by the worm shaft instead of by the worm wheel shaft, whereby the drive is essentially simplified, since this

shaft has a high velocity and reduction gear is unnecessary.

Having thus described the nature of my said invention and the best means I know of carrying the same into practical effect, I claim:—

1. A sugar mashing apparatus comprising a receptacle for the mash, a perforated tube arranged in the receptacle, a pipe supplying a liquid under pressure connected to said tube, a beating shaft arranged above said perforated tube, short arms on said beating shaft for breaking up the liquid issuing from said tube, and means for controlling the supply of said liquid.

2. A sugar mashing apparatus comprising a receptacle for the mash, a perforated tube arranged in the receptacle, a pipe supplying a liquid under pressure connected to said tube, a beating shaft arranged above said perforated tube, short arms on said beating shaft for breaking up the liquid issuing from said tube, and a valve for controlling the supply of liquid under pressure arranged on the outside of the receptacle.

3. A sugar mashing apparatus comprising a receptacle for the mash, a perforated tube arranged in the receptacle, a pipe supplying a liquid under pressure connected to said tube, a stirring shaft, a beating shaft arranged above said perforated tube, short arms on said beating shaft for breaking up the liquid issuing from said tube, means for controlling the supply of said liquid, and toothed gears arranged on the outside of the receptacle for driving both shafts, the beating shaft being driven at a higher speed than the stirring shaft.

4. A sugar mashing apparatus comprising a receptacle for the mash, a perforated tube arranged in the receptacle, a pipe supplying a liquid under pressure connected to said tube, a stirring shaft, a beating shaft arranged above said perforated tube, short arms on said beating shaft for breaking up the liquid issuing from said tube, and means for controlling the supply of said liquid worm gearing arranged on the outside of the receptacle for driving both shafts, the beating shaft being driven at a higher speed than the stirring shaft.

5. A sugar mashing apparatus comprising a receptacle for the mash, a stirring shaft in the receptacle, a perforated tube arranged in the receptacle, a pipe supplying a liquid under pressure connected to said tube, a valve for controlling the supply of said tube, and a rotatable cam on the stirring shaft for intermittently and automatically opening and closing said valve.

In testimony whereof I have affixed my signature.

ALOIS RÖLZ.