No. 881,128. PATENTED MAR. 10, 1908.

A. JENSEN.

LIQUID RIPENER.

APPLICATION FILED SEPT. 16, 1907.

2 SHEETS—SHEET 1.

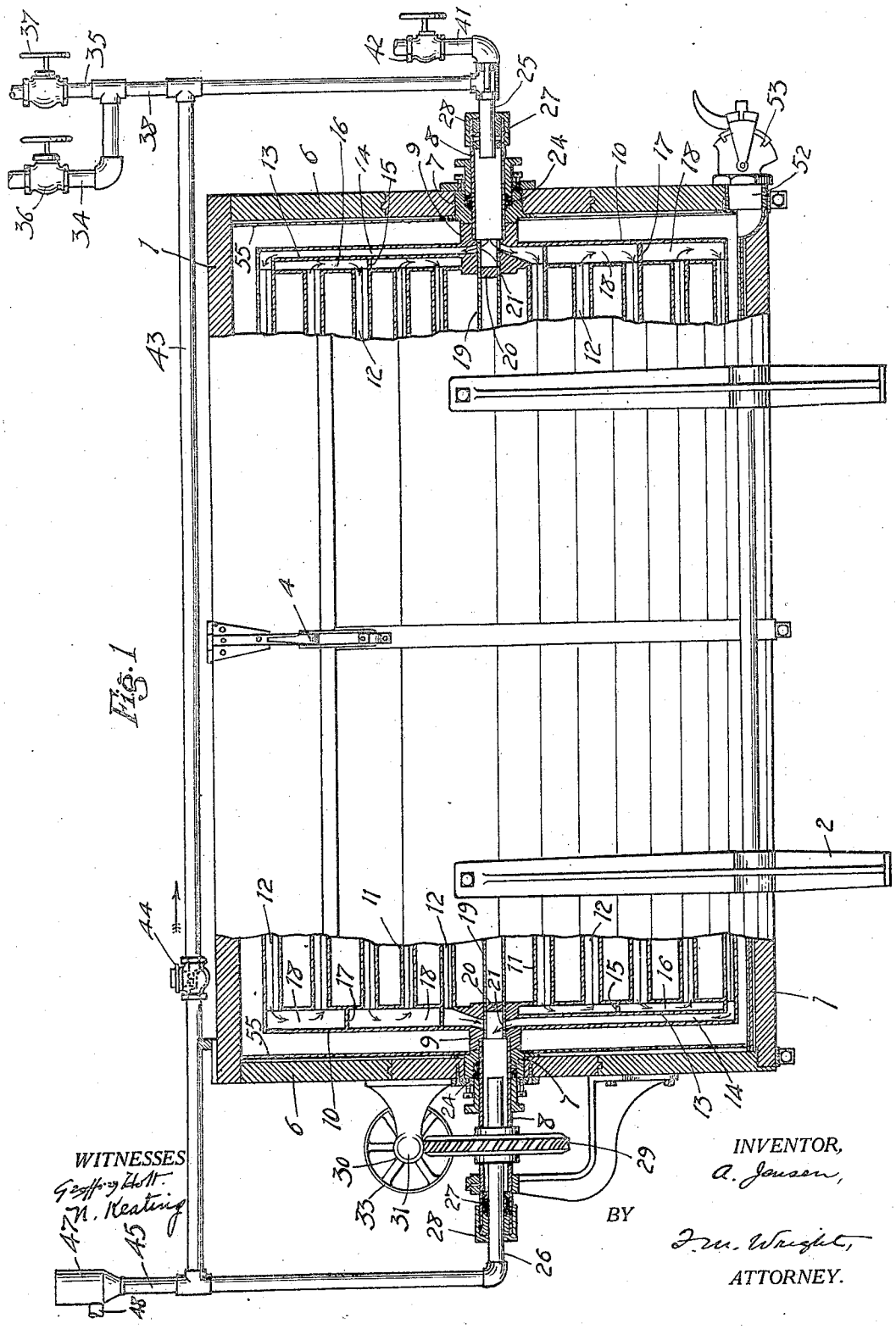


Fig. 1

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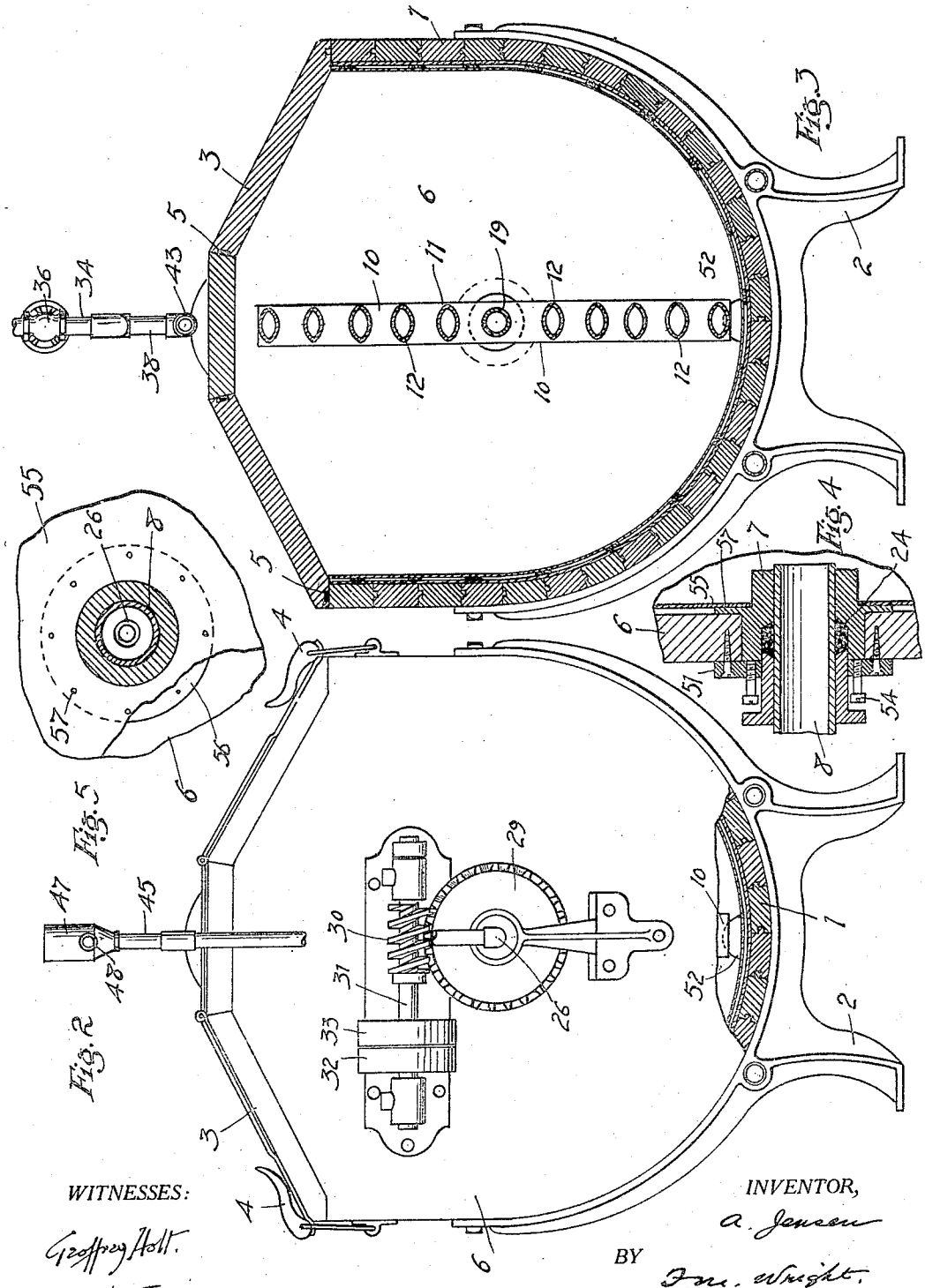
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AAGE JENSEN, OF EUREKA, CALIFORNIA.

LIQUID-RIPENER.

No. 881,128. Specification of Letters Patent. Patented March 10, 1908.

Application filed September 16, 1907. Serial No. 393,044.

To all whom it may concern:

Be it known that I, AAGE JENSEN, a citizen of the United States, residing at Eureka, in the county of Humboldt and State of California, have invented new and useful Improvements in Liquid-Ripeners, of which the following is a specification.

The object of the present invention is to provide an improved form of liquid ripener, especially adapted for ripening cream, by means of which the cream may be heated to the desired temperature and maintained at such temperature as long as may be necessary with great uniformity throughout the entire body of the liquid; or by which a liquid may be uniformly cooled if desired.

In the accompanying drawing, Figure 1 is a broken side elevation of the machine; Fig. 2 is an end view thereof; Fig. 3 is a cross sectional view thereof; Fig. 4 is an enlarged broken vertical sectional view, and Fig. 5 is a broken inside view, showing the connection of the bearing to the metallic lining.

Referring to the drawing, 1 indicates the casing of the machine mounted upon suitable legs 2. Said casing is semi-cylindrical in its lower portion having the upper portions of the sides flat, and downwardly sloping lids 3, one on each side, which lids are secured by cam fastenings 4, and make an air-tight joint with the sides by means of cork strips 5. Each end 6 of the casing is centrally apertured, and within each aperture is a close fitting bearing 7 for a hollow shaft 8, there being secured upon the inner end of each shaft a hub 9 formed upon the corresponding head 10 of a revoluble hollow agitator 11. Each such head 10 is in the form of two hollow radial arms extending in opposite directions from the hub, and the agitator comprises, in addition to the two hollow heads 10, the longitudinal tubes 12 connecting said heads. Said tubes are preferably in cross section of the form of an ellipse having sharp ends, as more clearly shown in Fig. 3. It is found that such construction of tubes furnishes a maximum amount of heating or cooling surface while at the same time the friction of the agitator in moving through the liquid, and therefore the power necessary to give it a given speed, is reduced to a minimum. One-half of the head or radial arm at one end of the machine, and the other half at the other end thereof extending in the opposite direction from the first half, are formed in the interior with longitudinal partitions 13, leading from the hub to the outer ends of said heads. Each such one-half of the head is thereby divided longitudinally into compartments, of which the outer compartment constitutes a channel 14 leading to the outermost tube 12, while the inner compartment is again divided by transverse partitions 15 extending from one side of the longitudinal partition 13, into conduits 16, each connecting the ends of two adjacent longitudinal tubes 12. The other halves of the heads or radial arms have no longitudinal partition, but have, each of them, transverse partitions 17, dividing the interior of said arms into conduits 18, each also connected with the ends of two longitudinal tubes 12. The transverse partitions at the opposite ends of the machine are so arranged that the longitudinal tubes, and the conduits connecting them in pairs, form a zig-zag or tortuous conduits for the heating or cooling medium.

The two hubs 9 are both secured to a central tube 19 which serves merely to strengthen the apparatus, there being placed in each end thereof a block 20 which arrests the passage of the heating or cooling fluid along said tube, and compels said fluid into or out of the above described tortuous conduits, which it does by passage 21 in the walls of said tube.

It will be understood that, by the above arrangement, the heating or cooling fluid admitted to the hollow shaft at one end of the machine flows therefrom by said openings 21 in two opposite directions. One part enters that half of the head which is divided by the longitudinal partition 13, and consequently flows to the outermost longitudinal tube 12. It then flows in a tortuous path through said tubes finding its way gradually inwards and flows from the innermost longitudinal tube by a similar opening 21 and the hollow shaft at the other end. This part of the fluid therefore gives up its heat or cold first at the outermost part of the interior of the casing, and by degrees to the central part thereof. The other part of the fluid flows first to the innermost longitudinal tube, and then in a circuitous path through said tubes in succession to the outermost tube 12, then flowing along the longitudinally divided hollow arm at the other end of the machine. It thus gives up its heat or cold first to the surrounding liquid in the central part of the chamber of the machine, and then in succession to parts thereof farther outwards. Each of said shafts 8 passing through the bearing 7 is

provided with a stuffing box 24, and connects at its outer end with a pipe for conducting the heating or cooling fluid. At one end said hollow shaft 8 connects with a pipe 25, and at the other end the hollow shaft connects with a pipe 26, the connection with each pipe being made liquid tight by means of a stuffing box 27 having a screw collar 28. One of said shafts has secured thereon a worm wheel 29 which is driven by a worm 30 on a shaft 31 carrying tight and loose pulleys 32, 33, by which the shaft may be driven from any source of power. By this means a slow movement of rotation is imparted to the hollow agitator.

In order to supply the heating or cooling liquid, there are provided two or more pipes 34, 35, respectively controlled by valves 36, 37, and connected with a common pipe 38. By one of these pipes cold water may be supplied and by the other brine for cooling. The pipe 38 extends downwards and connects with a pipe 25, into which leads a nozzle 40 from a steam pipe 41 controlled by a valve 42. If it is desired to use cold water or brine the valve 42 is closed so that no steam can enter. The pipe 38 is also connected with a pipe 43 leading from the other end of the machine and having therein a check valve 44 the other end of said pipe 43 being connected with a pipe 45 which is connected with the pipe 26 leading from the other hollow shaft. The pipes 26, 45, 43, 38, and 25 thus form with the hollow agitator a complete fluid circuit, the check valve 44 allowing the fluid to flow only in the direction indicated by the arrow. The pipe 45 is extended upwards and carries an overflow vessel 47 open at the top and having a discharge pipe 48 at the side. The object of providing this overflow vessel is to insure that the pressure in the agitator is uniform and of any desired magnitude, depending upon the height of the overflow. The liquid from the casing is drained by an outlet 52 being closed by a gate valve 53. With an apparatus of this character, when it is desired to supply a heated liquid to the agitator, the valve 42 is opened to admit steam to the nozzle 40, thereby creating a suction in the direction of the arrow and at the same time heating the liquid, causing the heated liquid to flow in the direction of the arrows through the agitator and when discharged therefrom to return by the pipes 45, 43, 38, the operation of the apparatus being noiseless.

It will now be understood why it is desirable to divide the heating or cooling current into two streams which flow respectively to the inner and outer portions of the chamber of the machine. Since the agitator is continuously rotating, the effect of supplying these two streams, the one flowing to the middle part of the chamber and thence outwards, and the other flowing to the outer part of the chamber and thence inwards, is to cause the abstraction of heat or cold from the agitator to be uniform at all points of the chamber. This is of great importance in any ripening process where a slight variation of temperature is of importance in affecting the success of the process or the character of the product.

In using this machine, the receptacle for the liquid is filled to any desired height, but inasmuch as in any case there is a considerable space intervening between the level of the top of the liquid and the top of the casing, the liquid cannot be rotated bodily with the agitator. The result is that no rotation can be imparted to the liquid as a whole, and in consequence fresh surfaces of the liquid are continuously exposed to the heating and cooling effect of the agitator. Moreover, since at all times a portion of the agitator is rising out of contact with the liquid, said agitator more readily carries with it from the liquid gases or products of fermentation which might be detrimental to the product.

In order to insure a sanitary joint between the revolving and stationary portions of the apparatus there is secured upon the outside of each head of the casing a plate 51 through which are screwed adjusting screws 54 the inner ends of which bear against the outer end of the bearing 7, and press the inner end of said bearing against the adjacent surface of the corresponding hub, thereby making a perfectly tight joint between said surfaces.

The above construction provides a bearing which is of a sanitary character, since the adjustment of the bearing can be made from the outside by means of said screws. Also the stuffing boxes at the outer ends of the bearings are entirely disconnected with the interior of the receptacle. The stuffing boxes are all readily accessible and can always be made perfectly tight to prevent the passage therethrough of any fluid.

The interior of the casing is lined with a lining 55 of copper or other metal which does not injuriously affect the liquid being treated. The bearing is formed with a circular flange 56 which is secured by rivets 57 or otherwise to the metallic inner lining 55 of the end of the receptacle in such a way that no liquid can pass therebetween. When the bearing is adjusted, in the manner already described, by this action not only the bearing itself but the metallic lining is moved. Since by this adjustment the end of the bearing is moved into close contact with the end of the hub, it will readily be seen that this arrangement provides an absolutely tight joint to prevent the passage of liquid either between the bearing and the hub or between the bearing and the wall of the receptacle.

I claim:—

1. In an apparatus of the character described, the combination of a suitable receptacle for containing the liquid to be treated,

said receptacle having apertured heads, an agitator having horizontal shafts passing through said apertures, bearings for said shafts, the agitator having hubs with which said bearings contact, and means for adjusting said bearings to maintain them in close contact with said hubs, substantially as described.

2. In an apparatus of the character described, the combination of a suitable receptacle for containing the liquid to be treated, said receptacle having apertured heads, an agitator having horizontal shafts passing through said apertures, bearings for said shafts, the agitator having hubs with which said bearings contact, and means for adjusting said bearings to maintain them in close contact with said hubs, comprising plates secured upon said heads and screws through said plates abutting against said bearing, substantially as described.

3. In an apparatus of the character described, the combination of a receptacle adapted to contain the liquid to be treated, an agitator revoluble therein, means for rotating said agitator, a shaft for said agitator extending through the wall of the casing, a metallic lining for said casing, and a bearing for said shaft secured to said lining to prevent the passage of fluid therebetween, substantially as described.

4. In an apparatus of the character described, the combination of a receptacle adapted to contain the liquid to be treated, an agitator revoluble therein, means for rotating said agitator, a shaft for said agitator extending through the wall of the casing, a metallic lining for said casing, a bearing for said shaft secured to said lining to prevent the passage of fluid, therebetween, said agitator having a hub, against which said bearing can abut, and means for adjusting said bearing to make a tight joint between the abutting surfaces of said bearing and hub, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

AAGE JENSEN.

Witnesses:
FRANCIS M. WRIGHT,
D. B. RICHARDS.