P. SOMERVILLE.

PULP HEATING AND AGITATING APPARATUS.

APPLICATION FILED DEC. 16, 1918.

1,341,287. **Patented May 25, 1920.**

2 SHEETS—SHEET 1.

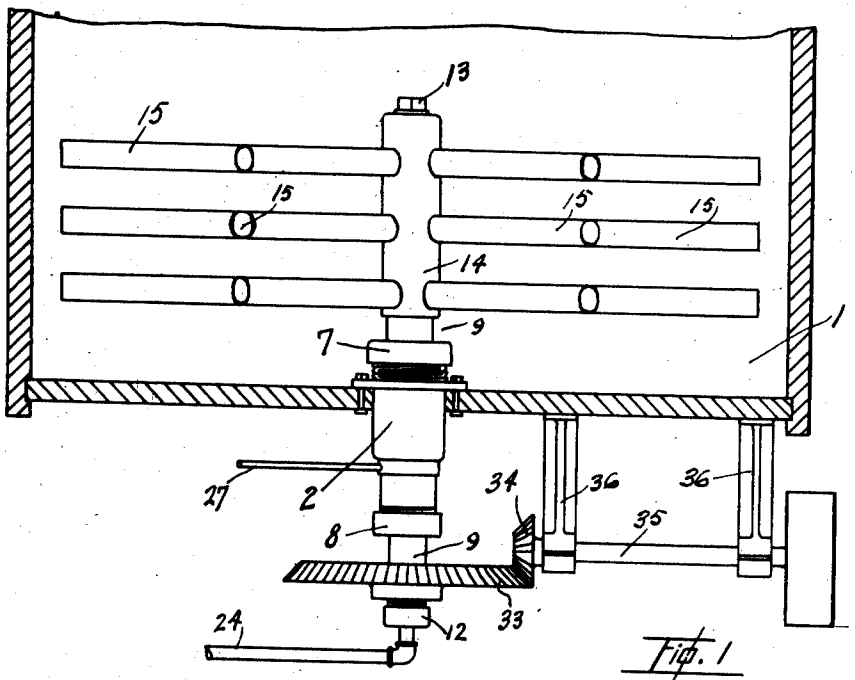


Fig. 1

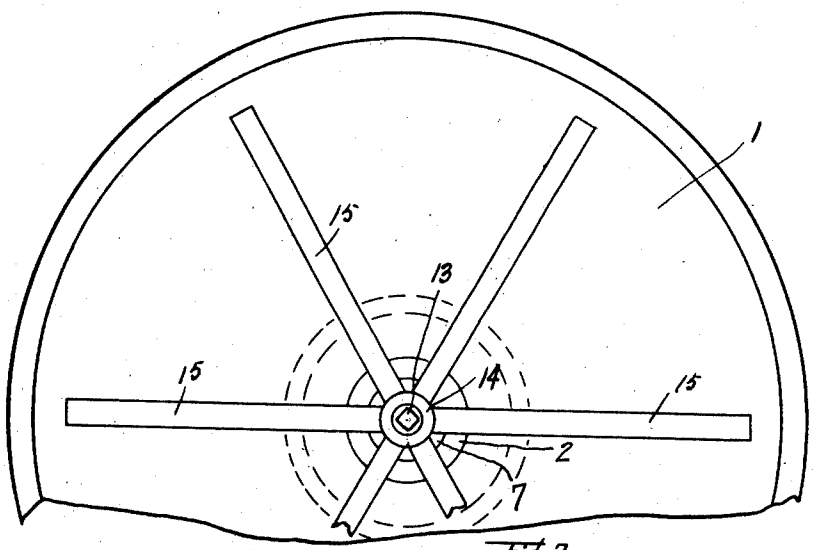


Fig. 2

INVENTOR

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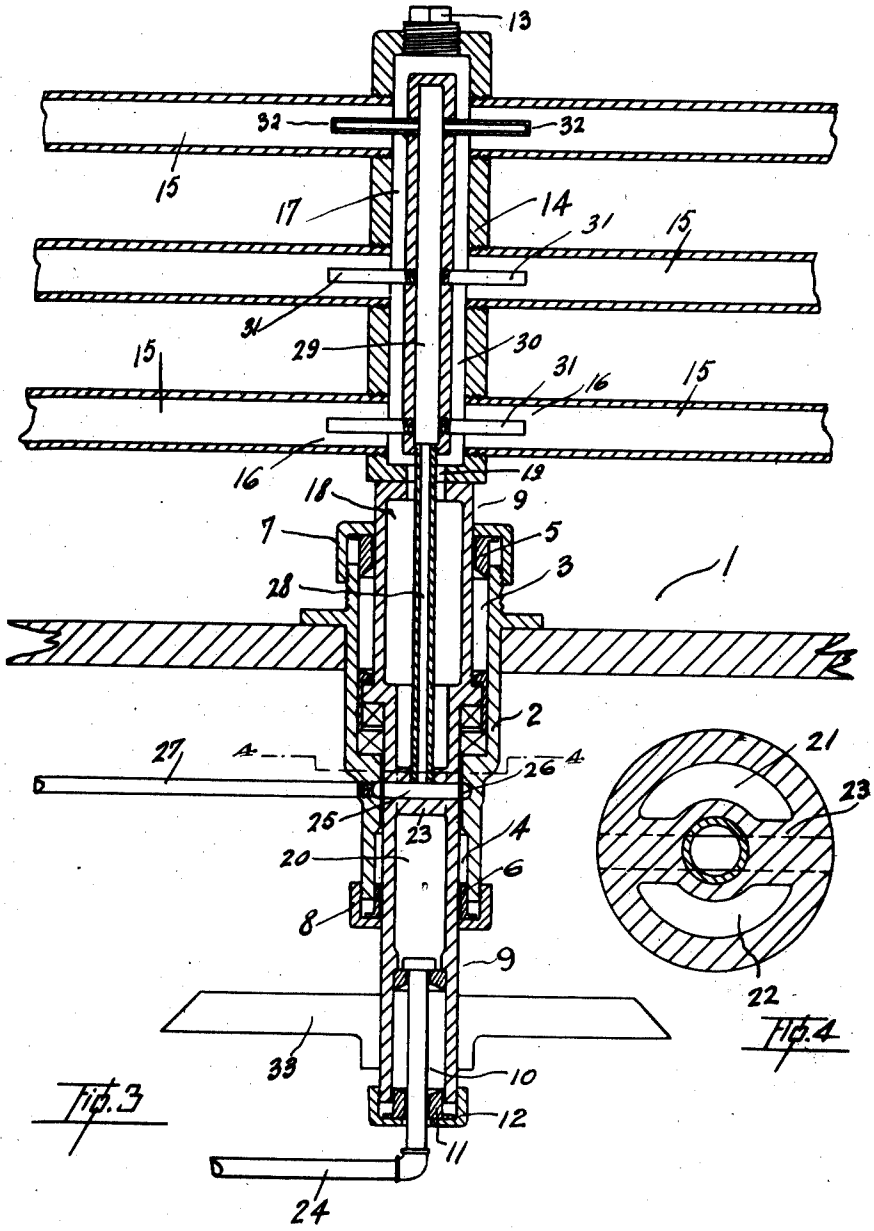


Fig. 3

Fig. 4

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UNITED STATES PATENT OFFICE.

PHILIP SOMERVILLE, OF VANCOUVER, BRITISH COLUMBIA, CANADA.

PULP HEATING AND AGITATING APPARATUS.

1,341,287. Specification of Letters Patent. Patented May 25, 1920.

Application filed December 16, 1918. Serial No. 266,940.

To all whom it may concern:

Be it known that I, PHILIP SOMERVILLE, a subject of the King of Great Britain, and a resident of the city of Vancouver, in the Province of British Columbia, Canada, have invented certain new and useful Improvements in Pulp Heating and Agitating Apparatus, of which the following is a specification.

My invention relates to apparatus for heating pulp, such as tomato pulp used in the manufacture of catsup, and the object of my invention is to provide such an apparatus in which the heat is capable of being readily controlled and regulated and which not only acts as a heater for the pulp but as an agitator therefor as well so as to keep it continually stirred during the heating process, thereby eliminating entirely the danger of burning the pulp and rendering it useless for marketable purposes, a frequent occurrence at the present time due to the excess heating of a passive body of pulp.

I attain this object by the construction illustrated in the accompanying drawings in which—

Figure 1 is an outside elevation of the apparatus, assembled in a pulp tank.

Fig. 2 is a partial plan view of Fig. 1.

Fig. 3 is a vertical sectional elevation of the apparatus.

Fig. 4 is a cross section taken on the line 4—4 of Fig. 3.

Similar figures of reference indicate similar parts throughout the several views.

1 indicates the lower portion of a tank in which pulp is mixed, to the bottom of which is secured centrally a cylindrical member 2, each end of which is formed as a stuffing box, 3 and 4 respectively, provided with the usual glands 5 and 6 and nuts 7 and 8, the ends of the cylinder being exteriorly threaded, to receive the nuts 7 and 8. Rotatably mounted in the member 2 is a tubular member indicated generally by the numeral 9 the lower end of which extends through and beyond the stuffing box 4 of member 2, being formed as a stuffing box 10 provided with gland 11 and nut 12, while its upper end is closed by a plug 13 and extends through the stuffing box 3, as shown, to form a tube 14 extending upwardly into the tank 1, from which tube extend radially pipes 15, which pipes are closed at their outer ends but the bores 16 of which communicate with the bore of the tube 14. The bore of the member 9 is divided vertically into three compartments, the upper one 17 of which communicates with the intermediate one 18 through a restricted passage 19, while the intermediate one 18 communicates with the lower one 20 through ports 21 and 22 formed by the disposition of a rib 23 across the lower end of the intermediate compartment. 24 indicates a drain pipe from the lower compartment extending to any suitable receptacle, while 25 indicates a passage extending transversely through the rib 23 and in normal communication with an annular steam groove 26 formed in the body of the member 2, as shown in Fig. 3, which groove is adapted to be supplied with steam or compressed air through a pipe 27 led from any suitable source of supply. Extending from the passage 25 and passing centrally upward through the compartment 18 and passage 19 is a pipe 28, to the upper end of which and within compartment 17 is secured a tubular member 29, which member is of less length and less diameter than the bore of compartment 17 so that a space 30 is formed all around it, and from the bore of member 29 small short tubes 31 extend into the pipes 15, as shown in Fig. 3, these tubes being closed at their outer ends and provided with a restricted aperture 32 in the closure so as to form nozzles.

A bevel gear 33 is secured to the lower end of the member 9, with which gear meshes a bevel gear 34 mounted on a shaft 35 rotatably supported in suitably secured bearings 36, which shaft may be driven from any suitable source so as to effect the rotation of the gears and the member 9.

The manner in which the apparatus operates and its utility will be apparent and may be described briefly as follows: Steam admitted to pipe 27 fills the groove 26 and the passage 25, passing therefrom through pipe 28 into the bore of the member 29 and through the restricted apertures 32 in the closed ends of the small tubes 31 into the larger pipes 15. The intensity of the heat radiating from the pipes 15 into the mass of pulp surrounding them may be readily and effectively controlled by the amount of steam admitted into pipe 27 and, as the steam emerges from the apertures 32 into the wide bore of the pipes 15, condensation takes place, so that the pulp is subjected to a more even and moderate heat instead of the fierce heat present where such condensation is not

provided for, the condensation water and exhaust passing from the pipes 15 through the passage 19 into compartment 18 and therefrom through ports 21 and 22 into compartment 20, from which it is drawn off through pipe 24. At the same time the pulp is continually stirred and agitated by the circumferentially traveling pipes, these being actuated by the rotation of the member 9 by means of the shaft 35 and gears 33 and 34, as already mentioned, and forming in effect steam heated agitators, the use of which in a mass of pulp prevents the burning and destruction of the same.

What I claim as my invention is:—

1. In a device of the class described, the combination with a tank, of an outer rotatable vertical tubular member extending through the bottom of said tank and provided with radially extending tubular members the bores of which communicate with the bore of the vertical member, their outer ends being closed, the said vertical member being closed at its upper end and having a condensate drain orifice in its lower end, an inner tubular member mounted concentrically in the bore of the outer tubular member of less diameter than the same and provided with nozzles extending into the bores of the radial members, means for rotating the rotatable member, and means for supplying heated gases to the radial members by way of the said inner tubular member and nozzles during such rotation.

2. In a device of the class described, the combination with a tank, of an outer rotatable vertical tubular member extending through the bottom of the tank and provided with radially extending tubular members the bores of which communicate with the bore of the vertical member, their outer ends being closed, the said vertical member being closed at its upper end and divided into upper, intermediate, and lower compartments the upper one of which communicates with the intermediate one through a restricted passage and the intermediate one being partially closed at its lower end by a transverse rib so that outlet ports are formed through which communication is established with the lower compartment, the said lower compartment being provided with a drain outlet, an inner tubular member mounted within said upper compartment of less diameter and length than the bore of the same and provided with nozzles extending into the said radial members, means for rotating the rotatable member to cause the radial members to sweep through the tank, and means for supplying heated gases to the radial members by way of said inner tubular member and nozzles during rotation.

3. In a device of the class described, the combination with a tank, of a stationary tubular bearing secured centrally to the tank bottom, its upper and lower ends extending respectively within and without the tank and provided with stuffing boxes and its lower end bore being recessed so that an annular groove is formed therein adapted for connection to a heated gases supply, an outer tubular member rotatably mounted in said bearing having its upper and lower ends projecting through and beyond the respective stuffing boxes and provided on its upper end with radially extending tubular members the bores of which communicate with the bore of the outer member, their outer ends being closed, the said outer member being closed at its upper end and divided into upper, intermediate, and lower compartments the upper one of which communicates with the intermediate one through a restricted passage and the intermediate one being partially closed at its lower end by a transverse rib so that outlet ports are formed through which communication is established with the lower compartment, said transverse rib being provided with a passage normally communicating with the said annular groove and said lower compartment having a drain outlet, an inner tubular member mounted within said upper compartment of less diameter and length than the bore of the same and provided with nozzles extending into the said radial members, a tubular connection between the rib passage and the bore of the inner tubular member, and means for rotating the rotatable member to cause the radial members to sweep through the tank.

Dated at Vancouver, B. C., this 28th day of November, 1918.

PHILIP SOMERVILLE.