CIRCULATION SYSTEM FOR PULP DIGESTERS
Filed July 2, 1924
To all whom it may concern:

Be it known that I, KNUT KRISTOFFER MORTERUD, a subject of the King of Norway, residing at Torderod, near Moss, Norway, have invented certain new and useful Improvements in Circulation Systems for Pulp Digesters; and I do hereby declare the following to be full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to Letters and Figures of Reference marked thereon, which form a part of this specification.

In the digesting of vegetable materials for the manufacture of pulp it is customary to use artificial circulation of the digesting liquid, preferably heating the latter in a calorisator. The direction of flow inside the digester is usually vertical upwards or downwards.

It has, however, been found when materials are treated, the individual parts of which have great length in comparison to breadth, such as for instance straw, that the material is liable to pack in lumps whereby there are created zones with deficient circulation of liquid.

The explanation of this fact lies therein that these materials during the filling operation are liable to pack in such a manner that the liquid flows easier near the circumference of the digester than in the middle thereof.

The present invention has for its object an arrangement by which it is made possible to direct the flow of liquid inside the digester at will in planes, vertically and horizontally as well as at angles, and towards as well as away from the digester.

In the drawing are diagrammatically illustrated two forms of the invention in Figs. 1 and 2.

Referring to Fig. 1 there is located inside the digester a number of annular perforated tubes 9, which all communicate with the external tube 7 through valves or cocks 8.

Near the bottom of the digester a sieve or screening surface 5 may be substituted for the perforated annular tube 9 in order to facilitate the blowing out of the digester.

Centrally in the digester there is located a perforated tube 6 which is divided into separate sections by means of transverse walls 7. Each section of tube 6 is connected through a valve or cock 8 with a common tube 7.

Tubes 7 and 6 both communicate with the pressure tank 5 as well as with the intake 6 of a pump 4, cocks or valves 1, 2, 4, 6, 10, and 11 being provided in the outlet from the calorisator 3 and the intake to the pump 4, so as to connect the same either with 7 or 6 and cut off the connection with the other tube.

By means of the several cocks or valves 1, 2, 4, 6, 10, and 11 it is possible to control the direction of flow of the liquid inside the digester in a number of different ways, and it is also possible to reverse the direction of flow by means of cocks 1 and 2.

The form of the invention illustrated on Fig. 2 differs from the form illustrated on Fig. 1 principally therein that valves 1 and 2 are mounted inside the digester, all valves 1 and 2 and all valves 1 and 2 being combined in separate casings. As the valves in this case will not necessarily have to be absolutely pressure tight, this form of the invention will be somewhat cheaper than the one illustrated on Fig. 1.

Claims:

1. In a pulp digester, a digesting vessel, a calorisator outside the digesting vessel and a pump for circulating liquid through said digesting vessel and calorisator, a perforated tube mounted centrally in said digesting vessel, one or more annular perforated tubes surrounding said centrally disposed tube and spaced from one another in the digesting vessel, and suction and pressure tubes connecting said centrally disposed and annular perforated tubes with the pump and calorisator.

2. In a pulp digester, a digesting vessel, a calorisator outside the digesting vessel and a pump for circulating liquid through said digesting vessel and calorisator, a perforated tube divided longitudinally in two or more independent parts mounted centrally in said digesting vessel, one or more annular perforated tubes surrounding said centrally disposed tube and spaced from one another in the digesting vessel and suction and pressure tubes provided with valves for connecting one or more of said independent parts of the central tube and one or more of the annular tubes with the pump intake or calorisator outlet.

3. In a pulp digester, a digesting vessel, a perforated tube centrally disposed in said digesting vessel and a pump for circulating liquid through said digesting vessel and said perforated tube, said perforated tube divided longitudinally in two or more independent parts and connected with suction and pressure valves for connecting said perforated tube with said pump intake and outlet.
calorisator associated therewith, a pump for circulating liquid between the digesting vessel and the calorisator and laterally spaced liquid distributing and collecting means for said circulating liquid, at least one of said means comprising a plurality of elements spaced longitudinally of the digesting vessel to deliver or collect said liquid in spaced zones so as to thereby produce an inclined flow of liquid within the digesting vessel between said liquid distributing and collecting means.

In testimony that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

KNUT KRISTOFFER MORTERUD.

Witnesses:

MANGUS BÜGGE,

GULBORG GULBRANDSEN.