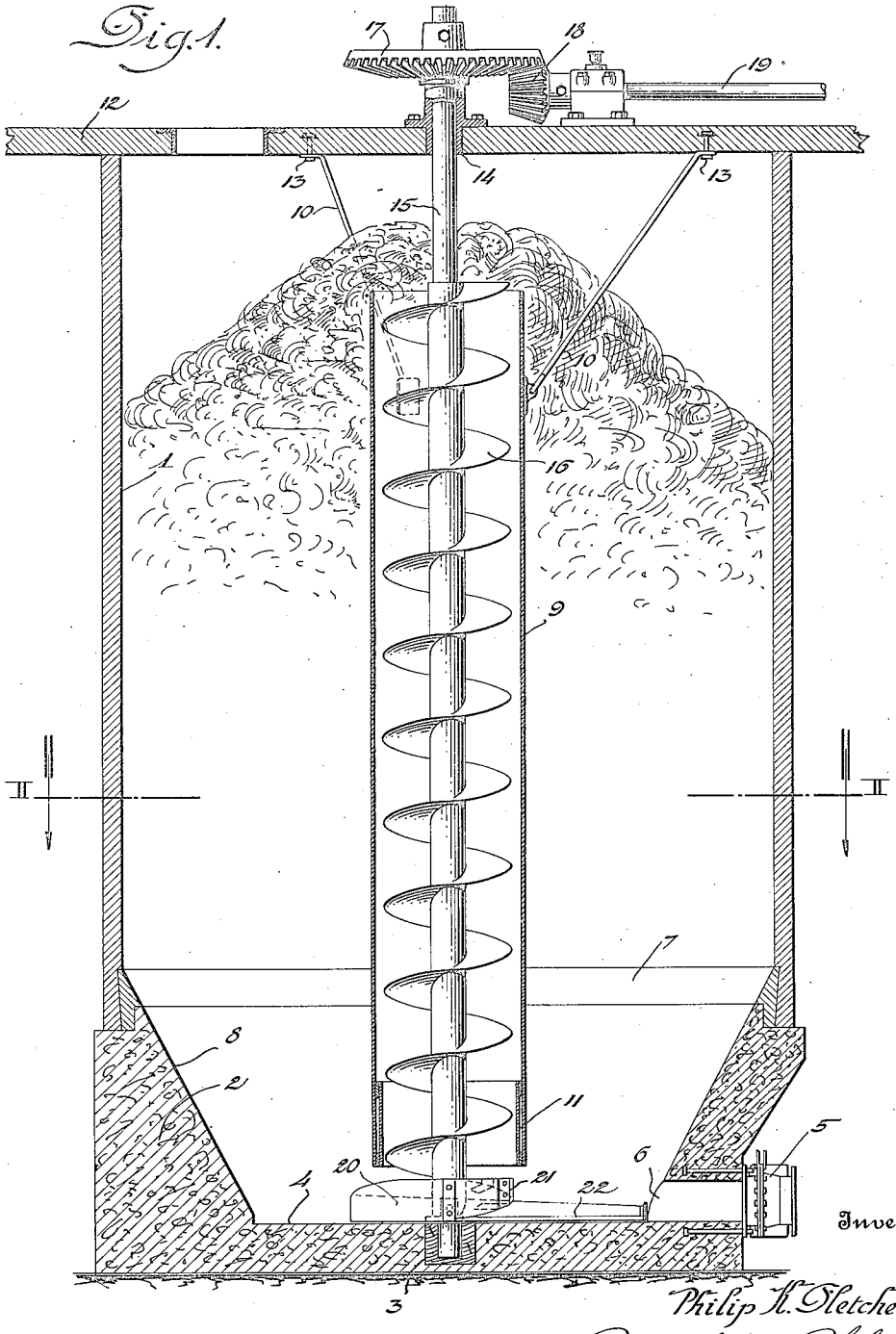
Aug. 28, 1923. 1,466,499

P. K. FLETCHER

PULP BLEACHER

Filed June 17, 1922 2 Sheets-Sheet 1

Fig. 1.



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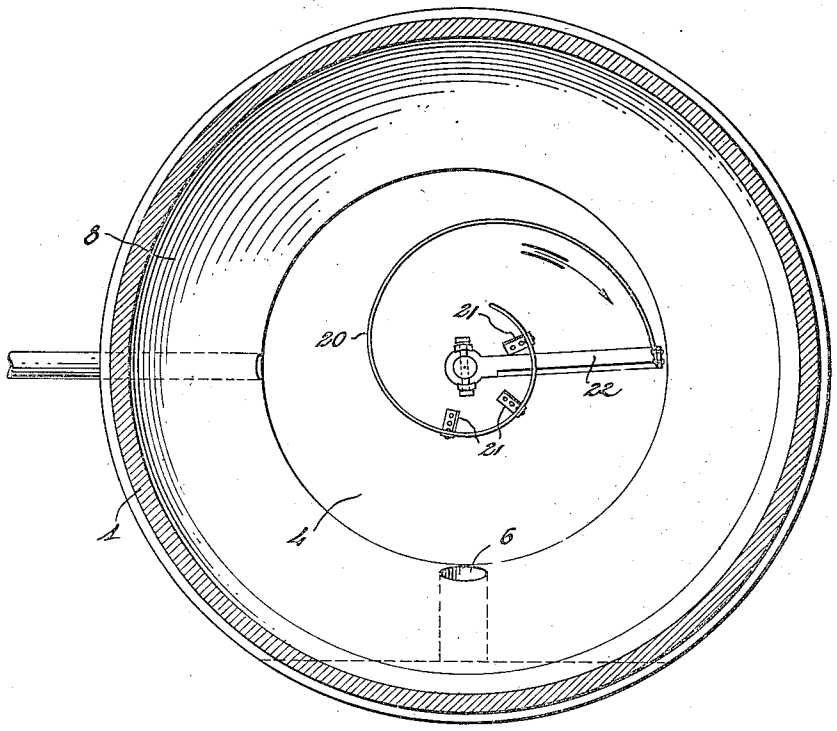


Fig. 2.

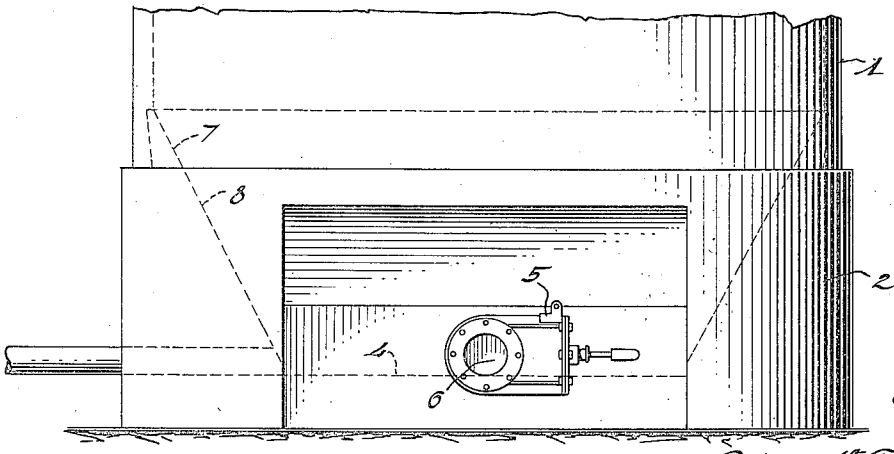


Fig. 3.

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Patented Aug. 28, 1923.

1,466,499

UNITED STATES PATENT OFFICE.

PHILIP K. FLETCHER, OF ALPENA, MICHIGAN.

PULP BLEACHER.

Application filed June 17, 1922. Serial No. 569,177.

To all whom it may concern:

Be it known that I, PHILIP K. FLETCHER, a citizen of the United States of America, residing at Alpena, in the county of Alpena and State of Michigan, have invented certain new and useful Improvements in Pulp Bleachers, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to a device for causing thorough agitation of pulp within a tank containing stock of high consistency and is primarily intended for the bleaching of pulp used in the manufacture of paper.

The principal object of the invention is to avoid the clogging commonly causing difficulty in the operation of machines of this type.

A further object of the invention is to insure the agitation of all portions of the pulp so that no part of the pulp within the tank will be left outside of the range of operation of the agitating means.

Additional objects of the invention will appear in connection with the description of the embodiment illustrated in the accompanying drawings, in which—

Figure 1 is a central vertical section;

Fig. 2 is a horizontal section on the line II—II of Fig. 1, and

Fig. 3 is an elevation of the lower portion of the device, the upper portion being broken away.

A wooden tank 1 is provided with a base 2 preferably of concrete, with a bearing socket 3 set in the center of its floor 4 and with a suitable valve 5 in position to close an outlet 6. After the tank 1 is placed in position upon the base 2 the joint between the two members may be made liquid-tight by a cement seal 7. The floor 4 is made circular as illustrated in Fig. 2, the diameter of the floor being somewhat less than the diameter of the tank 1. The side 8 of the base 2 is formed with an upward slope and the seal portion 7 is given a similar slope so that the inner wall of the tank will be free from obstructions through its entire extent. A cylinder 9 is suspended within the tank by suspension rods 10 with its lower end at a slight elevation above the floor 4 of the base and within the lower end of the cylinder 9 is mounted a tube 11 to form a contracted opening for the lower end of the cylinder. This tube 11 will preferably be made removable for ready replacement when worn. The cylinder 9 is suspended from a floor 12 to which the suspension rods 10 are secured by flanged brackets 13 and in the floor 12 at a point vertically above the socket 3 is mounted a bushing 14 which forms a bearing for the shaft 15 of a screw 16. The shaft 15 is driven by any suitable gearing such for example as the bevel gears 17 and 18, the gear 17 being secured to the shaft 15 and the gear 18 being secured to a shaft 19.

At the lower end of the screw 16 is mounted a collector member consisting of a spirally curved sheet of metal 20 secured to the screw 16 by suitable brackets 21. The outer end of the spiral 20 lies closely adjacent to the lower end of the tapering portion 8 of the base and this outer end is connected with the inner end by a scraping blade 22 which preferably lies closely adjacent to the floor 4.

As the shaft 15 is rotated clockwise as indicated by the arrow in Fig. 2, any material resting upon the floor 4 is collected by the spiral member 20 and drawn inward toward the shaft 15 and the screw 16. Rotation of the screw 16 within the cylinder 9 causes an upward movement of the stock within the cylinder, additional stock being drawn in at the bottom as the stock in the cylinder is forced out at the top. Pulp placed within the tank falls to the bottom where it is drawn in by the action of the rotating collector 20 and the pulp is carried upward through the tube 11 and the cylinder 9.

Difficulty has been hitherto experienced in the operation of a screw conveyor in a mass of wet pulp because of a tendency of the pulp to become clogged in the space within which the screw operates. To obviate this difficulty the lower end of the cylinder 9 is given an opening smaller than its average diameter by the use of the tube 11 which has an inside diameter only a little greater than the diameter of the screw 16.

Pulp gathered by the collector 20 is forced by the screw 16 through the narrow tube 11 beyond which the conveyor tube 9 is larger to allow the pulp to expand. By this means clogging of the tube is avoided since only as much pulp can be drawn into the cylinder 9 as will pass through the narrow tube 11.

The scraper 22 insures the removal from the floor 4 of any pulp which may reach the bottom and the collector member 20, by

reason of its spiral shape carries into the center any pulp which may slide down the sloping side 8.

As the pulp is forced out at the top of the tube by the screw 16, it will be carried in all directions by the whirling movement produced by the screw 16 and the pulp will gradually settle downward into the base 2 until it comes again within the range of action of the collector member 20.

It will be seen that there has been provided a mechanism having the particular features of advantage before enumerated but which obviously is susceptible of modification in its form, proportion, details of construction and arrangement of parts without departure from the principle involved or the sacrifice of any of its advantages. The invention is therefore claimed in any of its forms or modifications within the legitimate and valid scope of the appended claims.

I claim:

1. A machine of the type described comprising a tank, a centrally arranged vertical cylinder suspended within the tank with its lower end spaced from the floor of the tank, a screw mounted for rotation co-axially with said cylinder, and a spiral collector member adjacent to the floor of said tank adapted by its rotation to collect material upon the floor of the tank and force it toward the lower end of the screw.

2. A structure as in claim 1 in which the lower end of the cylinder is formed with an opening of smaller diameter than the diameter of the portion above said opening.

3. A pulp bleaching machine comprising a tank having a circular bottom, a shaft having its lower end mounted at the center of the circular bottom of the tank, said shaft having a spiral collector member secured thereto with its outer end adjacent to the periphery of the circular bottom, a screw mounted upon said shaft with its lower end extending substantially to the bottom of the tank, and a cylinder surrounding said screw, said cylinder having an entrance portion spaced from the floor of said tank, said entrance portion being of smaller diameter than the body of said cylinder.

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

PHILIP K. FLETCHER.

Witnesses:

M. A. WELLINGTON,

WOOLSEY W. HUNT.