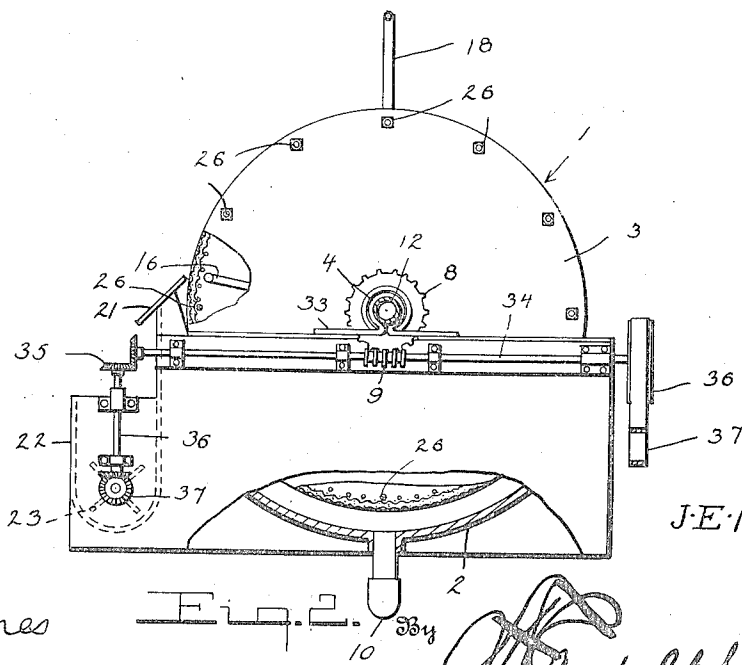
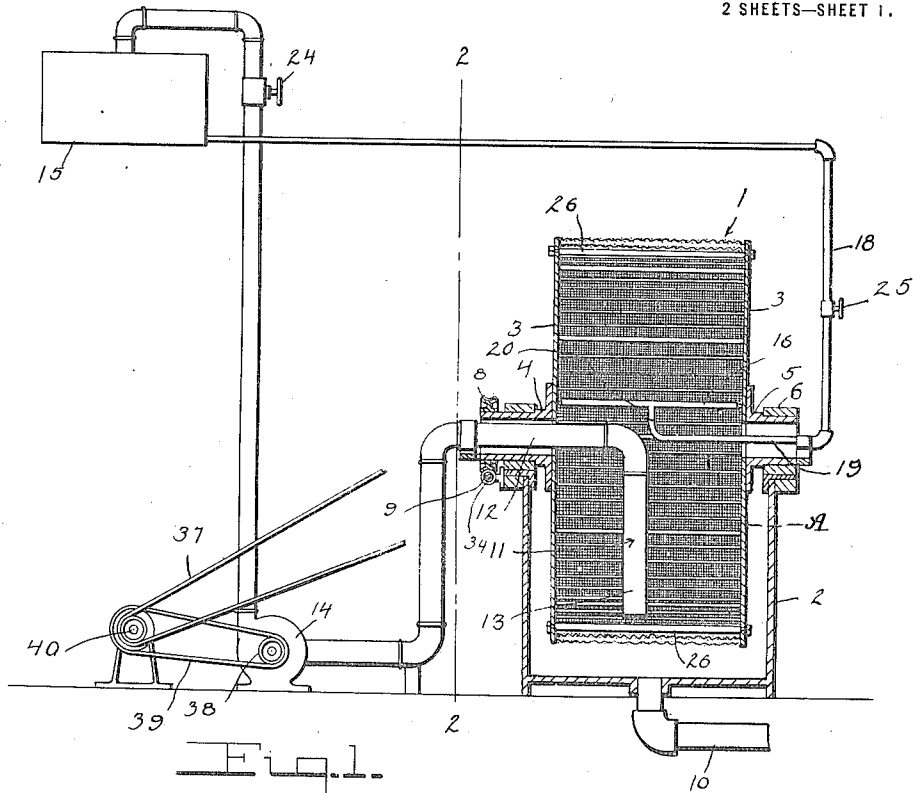


J. E. MALONE.
PULP SAVING AND WASHING MACHINE.
APPLICATION FILED SEPT. 30, 1916.

1,212,978.

Patented Jan. 16, 1917.

2 SHEETS—SHEET 1.



Inventor
J. E. Malone

Witness

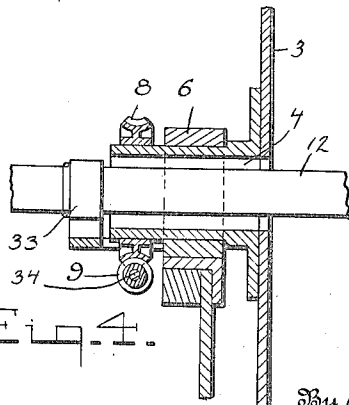
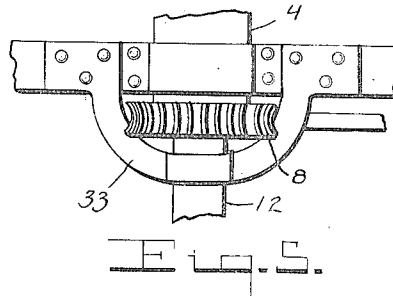
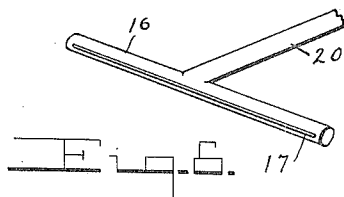
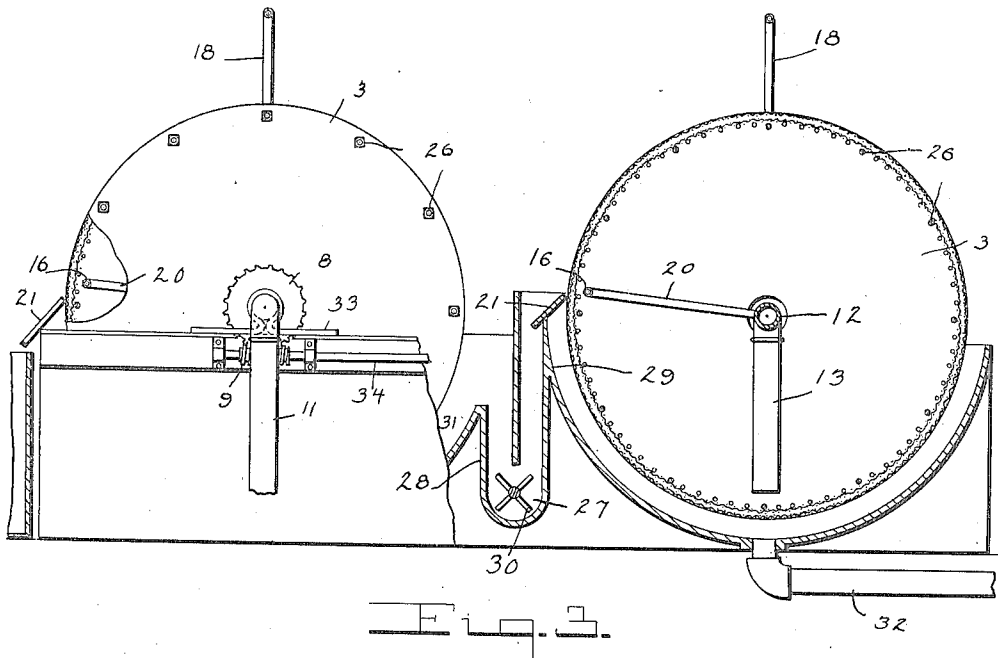
R. M. Jones

[Signature]
Attorney

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Witness

R. M. Jones

Fig. 4.

J. E. Malone Inventor

By *A. H. Murphy, Jr.* Attorney

UNITED STATES PATENT OFFICE.

JOSEPH E. MALONE, OF BRISTOL, VIRGINIA.

PULP SAVING AND WASHING MACHINE.

1,212,978.

Specification of Letters Patent.

Patented Jan. 16, 1917.

Application filed September 30, 1916. Serial No. 123,037.

To all whom it may concern:

Be it known that I, JOSEPH E. MALONE, a citizen of the United States, residing at Bristol, in the county of Washington and State of Virginia, have invented certain new and useful Improvements in Pulp Saving and Washing Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to a pulp saving and washing machine.

The object of the present invention is to improve the construction of pulp saving and washing machines and to provide a simple, practical and efficient machine of this character adapted to treat spent caustic liquor after it has been drawn from the pulp, and capable of saving the fiber which is usually lost and of also preventing such fiber from clogging the evaporator of a pulp mill and of thereby obviating the necessity of frequent overhauling and cleaning of the same.

A further object of this invention is to provide a machine of this character which may also be advantageously employed for washing the brown pulp preparatory to bleaching the same.

With these and other objects in view, the invention consists in the construction and novel combination of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended; it being understood that various changes in the form, proportion, size and minor details of construction, within the scope of the claims, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings Figure 1 is a transverse sectional view of the pulp saving machine constructed in accordance with this invention. Fig. 2 is a vertical sectional view on the line 2—2 of Fig. 1. Fig. 3 is a side elevation partly in section showing a plurality of the machines arranged for washing pulp. Fig. 4 is a detail sectional view through one of the hollow journals. Fig. 5 is a plan view of the same illustrating the arrange-

ment of the worm gear with relation to the bearing bracket. Fig. 6 is a detail perspective view of the nozzle of the spray or jet.

Like numerals of reference designate corresponding parts in the several figures of the drawings.

In the accompanying drawings in which is illustrated the preferred embodiment of the invention the pulp saving machine comprises in its construction, a rotary cylinder 1 operating within a tank or receptacle 2 and comprising a foraminous periphery and solid heads 3 provided with hollow journals 4 and 5 mounted in suitable bearings 6 of opposite ports 7. The rotary cylinder may be mounted in any suitable manner and the foraminous periphery of the cylinder while being shown of screen material may be of any other desired construction as will be readily understood. The hollow journal 4 is extended beyond the adjacent support 6 and the cylinder is rotated by suitable gearing preferably consisting of a worm wheel 8 and a worm meshing with the worm wheel and adapted to rotate the cylinder at a relatively slow speed but any other form of gearing or actuating mechanism may be employed. Connected with the bottom of the receptacle 2 is a feed pipe 10 adapted to deliver the spent caustic liquor and the fiber contained in the same to the receptacle 2, a suitable pump (not shown) being employed for this purpose.

The liquor is designed to stand in the receptacle to about the dotted line A. The receptacle 2 is shown semi-cylindrical so as to conform closely to the configuration of the rotary cylinder within which operates a suction pipe 11 having an axial portion 12 extending through the hollow journal 4 and carrying a radial arm or portion 13 which extends downwardly within the cylinder to a point adjacent to the bottom thereof. The suction pipe which is equipped with a centrifugal or other pump 14 is connected with a storage tank 15 and the lower end of the depending radially arranged arm 13 is open and is adapted to suck the water into it from the bottom of the cylinder creating a vacuum or suc-

tion exteriorly of the periphery of the cylinder and causing the fiber of the spent liquor to adhere to the cylinder and to be carried upward by the same. By this operation of the suction pipe within the cylinder the fiber is separated from the spent liquor and is saved and as the fiber is separated from the spent liquor prior to conducting the same to the evaporator the latter will be prevented from becoming clogged with the fiber and it will be unnecessary to overhaul and clean the evaporator at frequent intervals as is necessary at the present time in pulp mills where the spent liquor is delivered to the evaporator with the fiber unseparated therefrom. The fiber carried upward by the foraminous cylinder is removed therefrom by means of a jet or spray from a nozzle 16 consisting of a transversely disposed pipe 16 provided with a narrow slit 17 adapted to discharge the liquid interiorly of the cylinder at one end of the receptacle as clearly illustrated in Fig. 2 of the drawings. The nozzle of the spray or jet is connected with a pipe 18 having an axial portion 19 and a radial portion 20. The axial portion extends through the hollow journal 5 and the radial portion supports the nozzle 16 and is arranged at a slight inclination so that the fiber removed from the rotary cylinder will fall upon an inclined dock board or plate 21 and will be delivered to a trough or receptacle 22 equipped with an agitator 23. The separated fiber and the liquor will be conveyed to any suitable point for further treatment to clean the fiber and save the liquor. The pipe 18 is connected with the storage tank 15 which is located at a suitable elevation to secure the necessary pressure. The pipes 11 and 18 are provided with suitable valves 24 and 25 and when the cylinder is provided with a periphery of screen material as illustrated in the accompanying drawings, the said material is preferably supported by a transverse rod 26. The material is removed from the cylinder by the liquor but when the device is used as a washing machine, water is employed. In Fig. 3 of the drawings is illustrated a pulp washer comprising a pair of washing machines constructed similar to the pulp saver or saving machine heretofore described and while but two machines are illustrated any number of such machines may of course be employed for washing the brown pulp preparatory to bleaching the same. A trough 27 having one of its walls 28 of less height and the other wall 29 is interposed between the two machines so that the pulp removed from one machine will fall into the trough and the trough 27 is equipped with an agitator 30 adapted to keep the water and the pulp agitated

so that the pulp and the water will flow readily into the receptacle 31 of the other washing machine. The washing machine at the side 29 of the trough is fed with the pulp by a pipe 32 and it may be connected with the machine at the side 28 of the trough or with another machine when a greater number of washers is employed so that the pulp may be continuously washed until it is sufficiently clean to introduce into the bleaching machine.

The pulp may be washed and the water changed as often as desired or required and it will be clear that owing to the particular arrangement of the suction pipe in both the washing machine and the pulp saver that it is unnecessary to provide tight connections between the cylinders and the receptacle and employ gaskets and other packing for rendering such connections water tight.

The suction pipe 12 of the pulp saving machine is preferably supported by a bracket 33 mounted on and extending from the adjacent side of the receptacle and the shaft 34 upon which the worm 9 is mounted is journaled in suitable bearings and is connected by beveled gears 35 with a vertical shaft 36 which is also connected by bevel gears with the agitator 23.

The gearing 35 is located at one end of the shaft 34 and the other end of the shaft is provided with a pulley 36 receiving a belt 37 which may be driven by any suitable means, also the centrifugal pump 14 is shown equipped with a pulley 38 which is driven by a belt 39. The belts 37 and 39 may extend to a line shaft 40 or be operated by any other suitable means.

In practice the rotary cylinder will be equipped with a hand hole and a suitable closure to afford ready access to the interior when desired.

What is claimed is:—

1. A machine of the class described including a receptacle, a rotary cylinder operating in the receptacle and having imperforate sides and the foraminous periphery, a suction pipe extending through the cylinder at one side thereof and having a depending arm terminating adjacent to the bottom of the cylinder, and a pipe extending through the opposite side of the cylinder and provided with a nozzle having a slit and arranged to direct the liquid against the interior of the cylinder for removing material from the exterior of the same.

2. A machine of the class described including a receptacle, a rotary cylinder having solid sides and a foraminous periphery operating in the receptacle, said cylinder being provided with hollow journals, a suction pipe extending through one of the hollow journals and operating within the cylinder and a spray or jet pipe extending through

the other hollow journal and having a nozzle arranged to discharge against the inner face of the periphery of the cylinder.

3. A machine of the class described including a receptacle, a supply pipe connected with the receptacle at the bottom thereof, a cylinder having a foraminous periphery and operating in the receptacle, an elevated storage tank, a suction pipe operating within the cylinder and connected

with the storage tank, and a spray or jet pipe also connected with the storage tank and having a nozzle operating within the cylinder.

In testimony whereof I affix my signature 15
in presence of two witnesses.

JOSEPH E. MALONE.

Witnesses:

M. I. LEWIS,

BENNETT S. JONES.