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E. A. PETERSON

WASHER CYLINDER FOR PAPER PULP MACHINES

Filed Aug. 16, 1922

2 Sheets-Sheet 1

Fig. 1

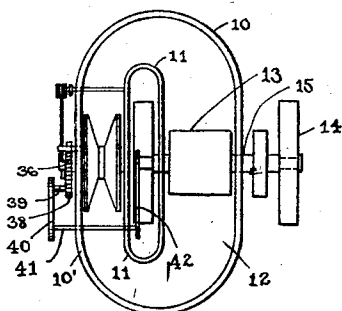


Fig. 2

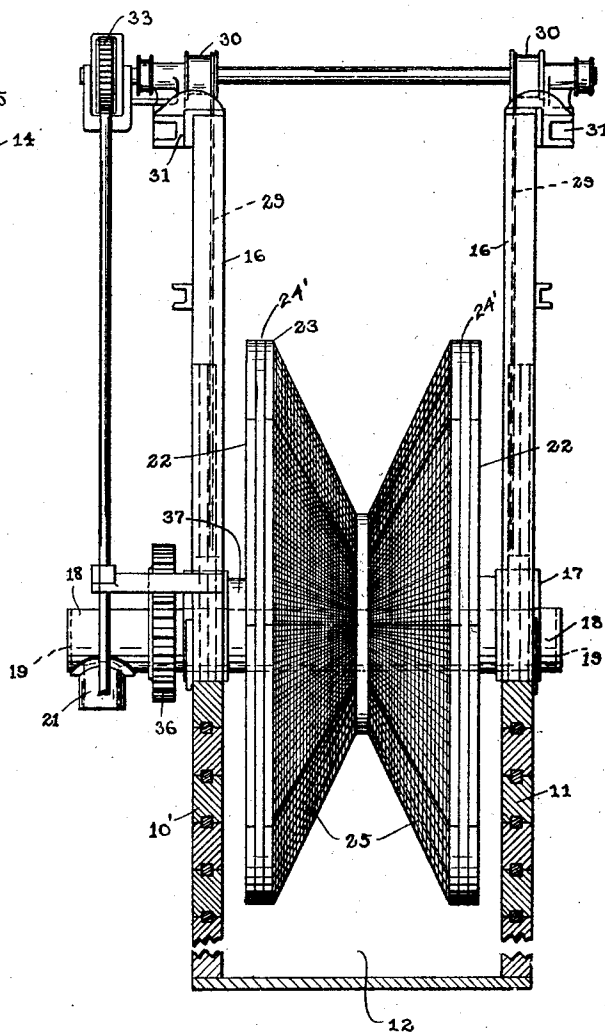
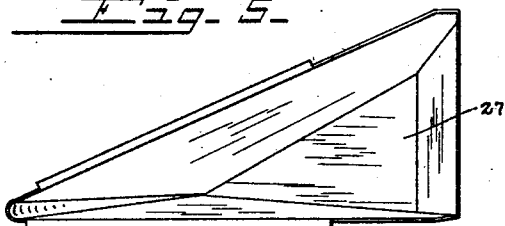


Fig. 5



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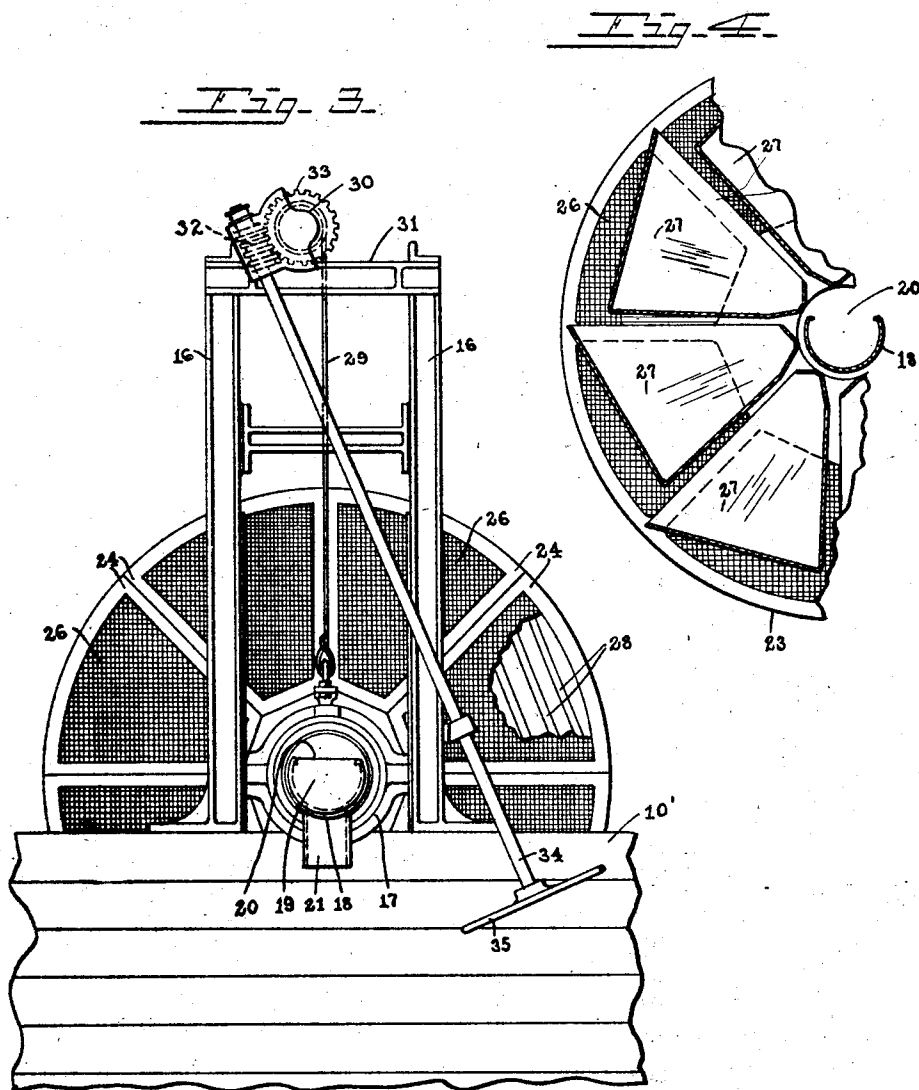
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UNITED STATES PATENT OFFICE.

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WASHER CYLINDER FOR PAPER-PULP MACHINES.

Application filed August 16, 1922. Serial No. 582,236.

To all whom it may concern:

Be it known that I, EMIL A. PETERSON, a citizen of the United States, and resident of Appleton, in the county of Outagamie and State of Wisconsin, have invented new and useful Improvements in Washer Cylinders for Paper-Pulp Machines, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

This invention relates to washer cylinders or drums for paper pulp and similar machines and has for one of its objects to provide a cylinder which will rapidly and efficiently segregate the water from large quantities of pulp.

A further object of the invention is to provide a device of the class described wherein means are provided for the rapid and efficient discharge of the water so segregated.

A still further object of the invention is to provide a washer cylinder which may be mounted in the trough or tub of the usual and well-known beating engines and which may be efficiently employed either as a washer or as a thickener for the pulp as it is acted upon in the said beater.

A still further object of the invention is to provide a cylinder of the class described which will be simple in construction, comparatively inexpensive to manufacture, and more efficient in operation than those which have been heretofore proposed.

With the above and other objects in view which will appear as the description proceeds the invention consists in the novel details of construction and combinations of parts more fully hereinafter disclosed and particularly pointed out in the accompanying claims.

Referring to the accompanying drawings in which like numerals designate like parts in all the views;

Figure 1 is a diagrammatic plan view of one form of beater illustrating the present invention in place in the trough thereof and in operative relation to the beater roll;

Fig. 2 is a central, transverse, vertical, sectional view of the cylinder construction constituting the present invention;

Fig. 3 is a side elevational view of the parts shown in Fig. 2 as seen from the left of the said figure;

Fig. 4 is a fragmentary, detail, sectional view of a portion of the cylinder illustrating the interior construction thereof; and,

Fig. 5 is a detail plan view of one of the water receiving buckets or pans which are mounted within the cylinder for receiving the water extracted from the pulp and discharging it through the hollow central shaft.

In the said drawings the numeral 10 indicates the tub or trough of a well-known type of beating engine which is provided with the interior partition or wall 11 forming a substantially elliptical chamber 12. Mounted within one side of this said chamber 12 is a usual beater roll 13 adapted to be rotated in any suitable manner, as by the pulley or gear 14 driven from any suitable source of power, not shown. The said roll 13 and driving means 14 are rigidly connected to a shaft 15 which serves to supply power to the washer drum or cylinder constituting the present invention, all as will appear more fully below.

The present invention comprises a suitable framework 16 which is adapted to be mounted in any suitable manner upon the walls 10' and 11 of the beater 10, preferably on the side thereof opposite to the beater roll 13, as will be clear from Fig. 1. The said frame preferably comprises two pair of spaced upright members which serve as guides for the slidable bearing blocks 17 in which is rigidly mounted the hollow shaft 18.

The ends of the said shaft 18 are closed, as indicated at 19, and the top portion of the same is cut away at suitable points, as indicated at 20, so that water which passes through the wire mesh of the drum or cylinder, as will presently appear, may be deposited therein and find its way through the interior thereof to the discharge pipe 21 with which one end of the said hollow shaft is provided.

The said hollow shaft is provided at suitable points with bearing surfaces upon which are mounted the side frames or members 22 of the washer cylinder 23. These frames may be of any suitable construction, but they are preferably made up of a plurality of segments 24, as indicated in Fig. 3, suitably secured together as by the circumferential bands 24' to form a complete drum.

Each of the said segments is substantially right triangular in cross-section and the companion members are placed with the hypotenuses of the triangles facing one another, thereby providing a cylinder having a substantially V-shaped groove in its circumference, as is clearly shown in Fig. 2.

The hypotenuse sides of the triangles, which form the sides of the V, are covered with wire mesh or cloth 25, while the altitude sides of the triangle, which form the outside walls of the complete cylinder, are likewise covered with wire cloth or mesh 26. The bases of the said triangles are adjacent and parallel to the hollow shaft 18 and are left open whereby the water which passes through the interstices of the said wire cloth and into the buckets or pans to be presently described, may be discharged from the interior of the drum or cylinder.

The interior of the said cylinder 23 is provided with a plurality of sheet metal buckets or pans 27 which are shaped substantially as shown in Figs. 4 and 5, and which are adapted to receive the water as it passes through the said wire cloth on the side walls of the cylinder and to carry the same upwardly to a point above the hollow shaft 18 in which it is discharged. From the said shaft 18 the water may escape through the discharge pipe 21, as will be readily understood.

The wire screening 26 upon the vertical side walls of the cylinder may be reinforced by means of suitable slats or bars 28, see Fig. 5, and if desired, similar reinforcing members may be employed upon the inclined sides of the V-shaped groove to support the wire cloth members 25.

The bearing blocks 17, as above stated, are slidably mounted in the upright frame members 16 and they are connected by means of a suitable rope or cable 29 to a revolving drum or windlass 30 carried by the upper horizontal member 31 of the frame 16. The said drum or windlass 30 may be actuated by a worm 32 engaging a worm wheel 33, which worm gearing may be controlled by means of the shaft 34 and hand wheel 35 for a hand adjustment, although it is obvious that, if desired, the mechanism just described may be connected to the power shaft of the beater for power actuation.

The cylinder 23 may be driven in any suitable manner, as for example by the gear 36 which is rigid with a sleeve 37 connected to the said cylinder 23, and the gear 36 may be rotated by means of a pinion gear 38 carried by a stub shaft 39 driven by means of a belt connection 40 from a counter-shaft 41 which in turn is driven by a belt or gear connection 42 from the shaft 15, which carries the beater roll 13.

In operation the cylinder 23 is lowered by means of the windlass 30 to occupy its lowermost position within the trough or chamber 12 of the beater 10, and upon operation of the said beater in the usual manner, pulp, as it is discharged from the beater roll, will pass around the said chamber to the said washer roll 23. This said roll is so positioned within the trough or chamber 12 that

its V-shaped surface compresses and squeezes the pulp thereby causing the water carrying the same to pass through the holes of the wire cloth and into the interior of the said cylinder, where it is caught in the buckets 27, carried downwardly, and discharged into the hollow shaft 18, from whence it finds its way to the discharge pipe 21.

The pulp, which has thus had a good portion of the water segregated, may be either returned to the beater roll for further disintegration or it may be withdrawn from the chamber 12 for the next step in the paper making process.

The water necessary for carrying on the operation of the machine is supplied to the pulp at any suitable point as is customary in operating this class of machine.

It will thus be seen that this invention provides a washer roll which rapidly and effectively segregates the water from the pulp and discharges it through the hollow shaft 18 into the discharge pipe 21. Furthermore, due to the peculiar construction of the washer roll or cylinder, it provides a relatively large surface so that larger quantities of pulp may be acted upon at a given time and at a given speed than with the previous devices of this character.

Should it, for any reason, be desired to render the washer roll inoperative, it may be lifted entirely out of the beater trough by manipulating the windlass 30 through the hand wheel 35, shaft 34 and worm gearing 32 and 33.

It is obvious that those skilled in the art may vary the details of construction, as well as the arrangement of parts without departing from the spirit of the invention, and therefore it is not wished to be limited to the above disclosure except as may be required by the claims.

What is claimed is:

1. A pulp working apparatus comprising a support, a hollow shaft mounted in said support, a foraminous cylinder formed from a plurality of segments, triangular in cross section rotatably mounted on said shaft and provided with a circumferential groove about its periphery, means for rotating said cylinder, and means for transferring water passing to the interior of said cylinder to said hollow shaft.

2. A pulp working apparatus comprising a support, a hollow shaft slidably mounted in said support, a foraminous cylinder rotatably mounted on said shaft, said cylinder comprising a plurality of segments, triangular in cross section, and arranged to form a relatively deep V-shaped groove about the periphery of the cylinder, means for rotating the cylinder, and means comprising a plurality of receptacles, for transferring water passing to the interior of said cylinder to said hollow shaft.

3. In a pulp working apparatus the combination with a beater having a beating chamber and a beater roll rotatably mounted in said chamber, of a foraminous washer cylinder also rotatably mounted in said chamber; the said washer cylinder being formed of a plurality of segments, triangular in cross section to provide a circumferential groove about its periphery; and connections between said beater roll and said washer cylinder for rotating the latter.

4. A pulp working apparatus comprising a support, a hollow shaft slidably mounted in said support, a washer cylinder rotatably mounted on said shaft, said cylinder comprising a plurality of segments, each of the said segments being triangular in cross sec-

tion and so arranged that their bases are adjacent and parallel to the said hollow shaft, and their hypotenuses face each other whereby a V-shaped groove is formed circumferentially of the cylinder, foraminous material arranged as a covering on the hypotenuse and altitude sides of the said triangular segments, whereby water may be admitted to the interior thereof, means for rotating the cylinder, and means comprising a plurality of receptacles for transferring water passing to the interior of said cylinder to said hollow shaft.

In testimony whereof, I affix my signature.

EMIL A. PETERSON.