Aug. 25, 1931. J. A. WHITE 1,820,854

SAVE-ALL, PAPER MAKING MACHINE, ETC

Filed Oct. 13, 1930 2 Sheets-Sheet 1

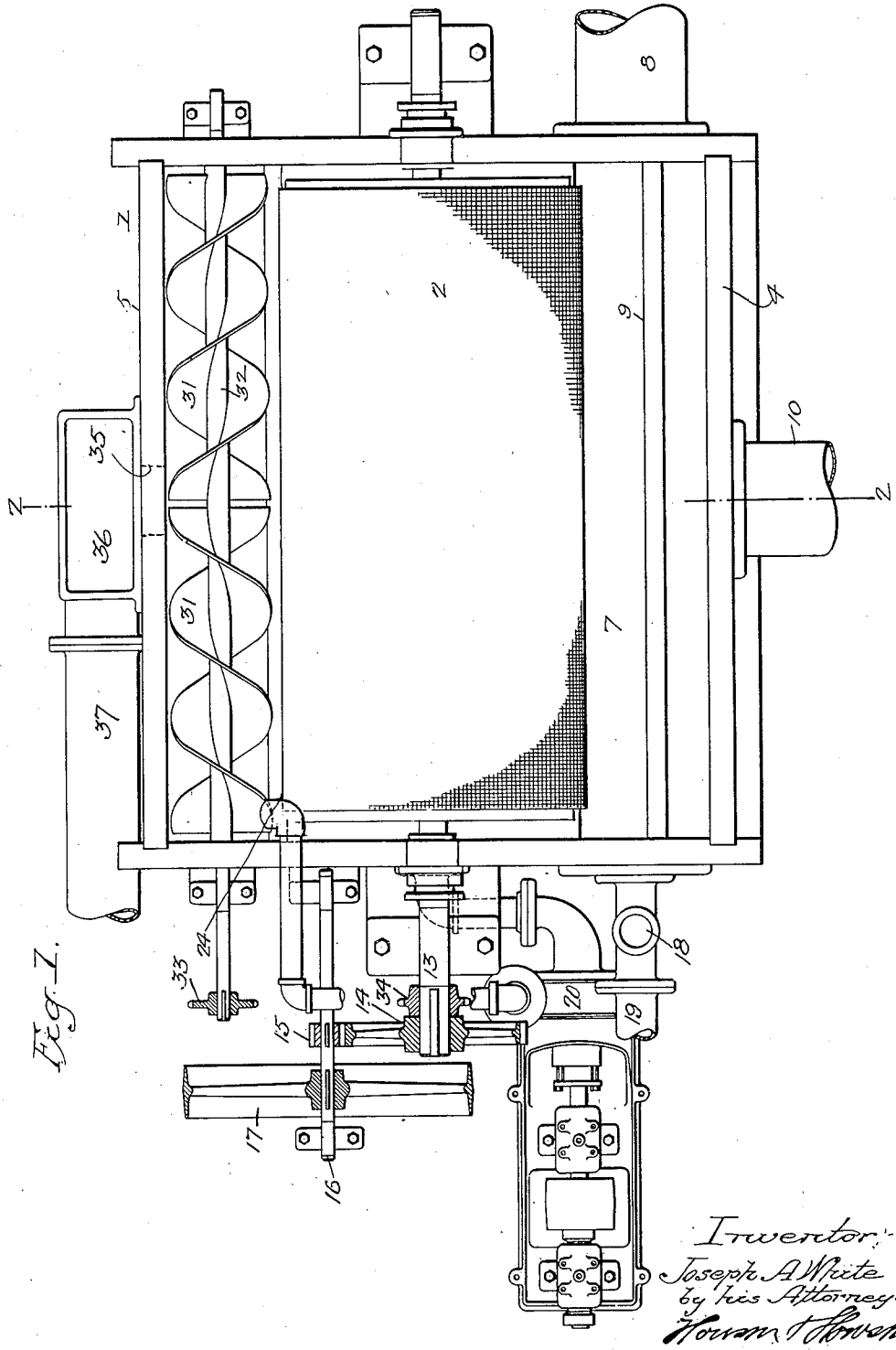


Fig. 1.

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Fig. 2.

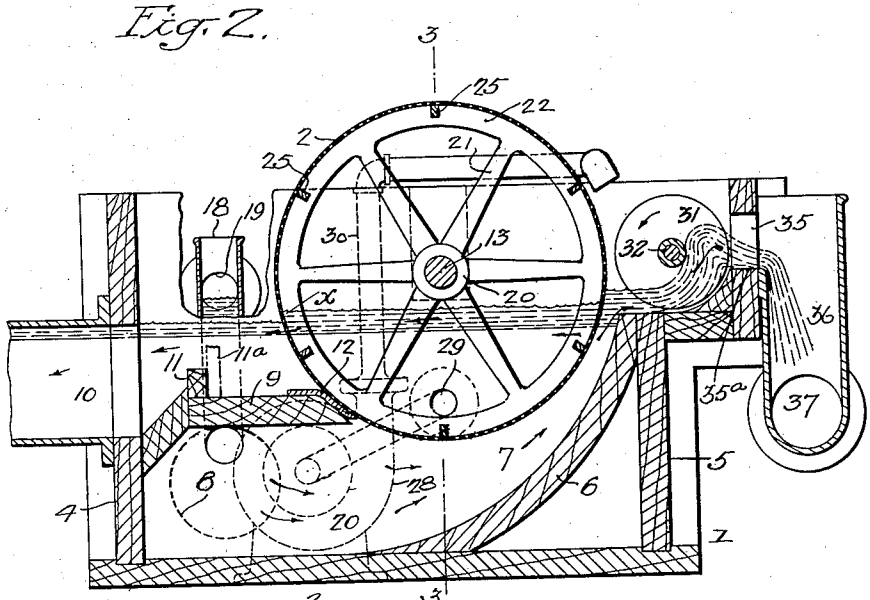


Fig. 3.

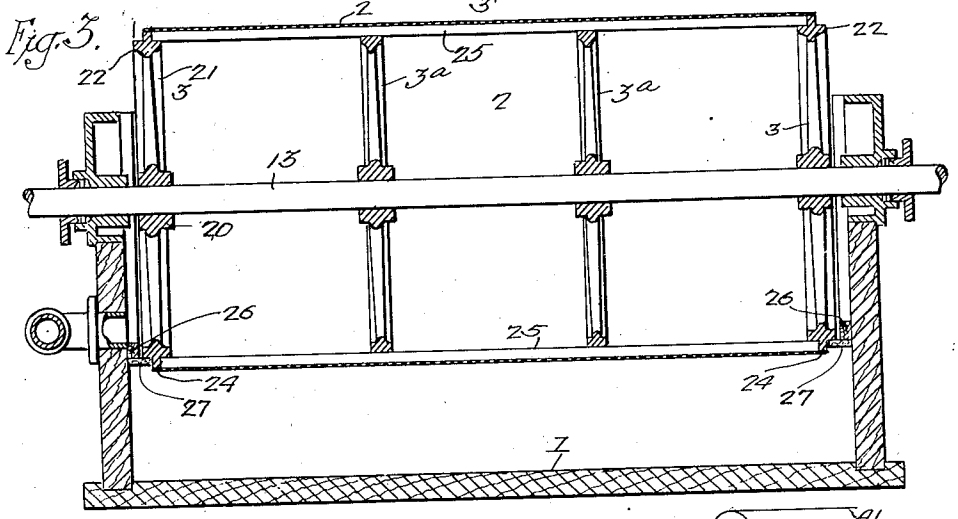


Fig. 4.

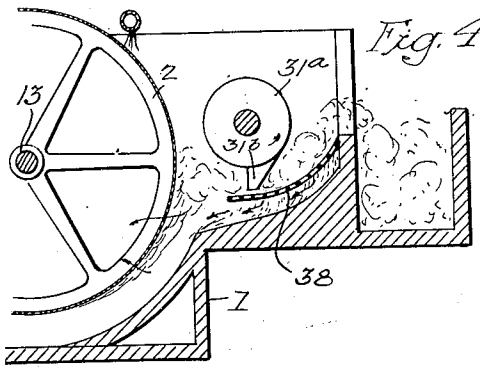
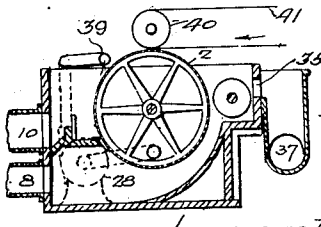


Fig. 5.



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UNITED STATES PATENT OFFICE

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SAVE-ALL, PAPER MAKING MACHINE, ETC.

Application filed October 13, 1930. Serial No. 488,415.

This invention relates to certain improvements in cylinder machines, in which pulp carried by liquid adheres to the surface of a perforated cylinder, the water passing through the cylinder with some fine stock, and the water being discharged from the cylinder.

The invention can be used as a save-all, which collects the water from different paper making machines, the pulp being discharged at one end of the machine, or it may be taken off with a couch roll, as in a wet paper making machine, or a decker, the water passing from the cylinder through an outlet.

The object of my invention is to improve the construction of this type of machine by causing the liquid to pass through the perforated cylinder twice, first inwardly, causing the paper stock to adhere to the outer surface of the cylinder; then through the cylinder face from the inside to an outlet.

A further object of the invention is to so construct a machine of this type that the perforations of the cylinder will be comparatively clear of obstructions at all times.

The invention relates also to details of construction described hereinafter.

In the accompanying drawings:

Figure 1 is a plan view of a save-all, illustrating my invention;

Fig. 2 is a transverse sectional view on the line 2—2, Fig. 1;

Fig. 3 is a longitudinal sectional view on the line 3—3, Fig. 1;

Fig. 4 is a sectional view illustrating a modification of the invention; and

Fig. 5 is a view illustrating my improvement as applied to a cylinder paper making machine.

Referring now to Figs. 1, 2 and 3 of the drawings; 1 is a vat. Located in the vat is a cylinder 2, made as shown in Fig. 3 having a perforated periphery, preferably in the form of a screen of a given mesh supported by a series of spiders 3—3*a*, the end spiders forming the open ends of the cylinder. The end walls 4 and side walls of the vat extend the full height thereof, while the end wall 5 terminates a short distance below a longitudinal center line taken through the cylinder. Extending from the bottom of the vat at about the center of the vat, to the top of the end wall 5, is an inclined bottom section 6, curved in the present instance and forming with the cylinder, a channel 7, through which the water and stock flow. The channel in this instance is tapered as shown in Fig. 2 but may be made of the same area throughout as shown in Fig. 4.

An inlet pipe 8, opens into the vat under a horizontal partition 9, an outlet 10 communicates with the vat above the partition as shown in Fig. 2. The partition has a wier 11, and this wier may be adjustable or may have an adjustable section, as shown by dotted lines 11a, Fig. 2. The water passes over the wier the full width of the vat and keeps the water level inside of the cylinder exactly the same from end to end, which is a decided advantage when making paper or paper board. Secured to the edge of the partition is a flexible strip 12, which prevents the water passing from the inlet to the outlet between the edge and the cylinder 2. This strip may be made of any flexible material.

The cylinder 2 is mounted on a shaft 13 having suitable bearings on or near the vat. On the end of this shaft is a gear wheel 14, which meshes with the pinion 15 on the power shaft 16, on which is a belt pulley 17, but it will be understood that other methods of driving the cylinder may be used without departing from the essential feature of the invention.

Communicating with the inlet is an overflow pipe 18, having an outlet 19. Each end spider 3 of the cylinder 2 has a hub 20, arms 21 and a ring 22. On the ring is an annular rib 24, and the supports 25 for the screen extends from one end spider to the other end spider, as shown in Fig. 3. The intermediate spiders 3*a* are made in substantially the same manner as the end spiders and form the intermediate supports for the screen.

On the side wall of the vat are segmental ribs 26. Secured to the ribs are strips of

felt 27, which rest upon the end rings of the cylinders as shown in Fig. 3, and prevent water and stock entering the cylinder without first passing through the screen.

The inlet of a rotary pump 28 communicates through a pipe 29 with the interior of the cylinder 2 and the outlet of the pump is connected to a pipe 30, which discharges into the vat at the back of the cylinder 2, as shown in Fig. 2, so as to draw any stock that may collect in the interior of the cylinder away from the cylinder and discharge it into the vat. The pipe 30 may be attached to a spray pipe if desired, as shown in Fig. 4.

At the discharge end of the vat is a screw conveyor 31, mounted on a power driven shaft 32, having a sprocket wheel 33, which is driven through a chain from a sprocket wheel 34 on the shaft 13 of the cylinder. This screw conveyor is made in two sections, one section being a right hand screw and the other a left hand screw, so as to feed the stock as it flows from the tapered channel 5 to a central discharge opening 35, and into a receptacle 36, which is connected to a discharge pipe 37. The bottom 35*a* of the discharge opening 35 acts as a wier over which the stock flows. The screw conveyor not only acts to convey the material to a central point in the machine, but also acts to squeeze the stock as it is conveyed, so as to remove as much water as possible from the stock before it is discharged, the stock passing over the wier in a comparatively thick condition.

The water, after passing through the perforations in the cylinder from the channel 7, again flows through the perforations in the cylinder at the point X, but in the opposite direction, so that the water is re-filtered, reclaiming fiber or clay which may have passed through the cylinder the first time. This is returned to the vat by the pump and its connection, and this operation keeps the cylinder absolutely clean both on the inside and the outside.

The machine above described, requires no special washing when changing colors, etc., as it is self-cleaning.

Fig. 4 illustrates a modification, in which a ribbed roll 31*a* is substituted for the screw conveyor, the rib 31*b* of this roll passing over a curved screen plate 38 squeezing a certain amount of water from the stock, the water passing through the openings in the plate 38, returning to the interior of the vat.

In Fig. 2 I have shown the invention as applied to a save-all, while in Fig. 5 I have shown the invention as applied to a cylinder paper making machine. The vat, screen, and the partitions in the vat are the same as in Fig. 2. The spray pipe is located on the opposite side of the cylinder, as at 39, and has a roll 40, which is located above the cylinder and passing around the roll is an endless apron 41 of the usual type.

I claim:—

1. The combination in a cylinder machine for paper making, of a vat; a cylinder in the vat having a perforated periphery; means for rotating the cylinder in the vat; an inlet communicating with a portion of the cylinder to allow stock to adhere thereto and to allow water to pass into the cylinder through the perforations; and an outlet separated from the inlet and communicating with a portion of the perforated periphery, so that water will pass a second time through the perforations in the cylinder to the outlet.

2. The combination in a cylinder machine for paper making, of a vat; a rotating cylinder in the vat having peripheral perforations; and an inlet and an outlet for the vat, a portion of the bottom section of the inlet being so related to the cylinder that a tapered channel is formed where the water is allowed to pass through the perforations into the cylinder, the outlet communicating with another portion of the perforated periphery of the cylinder, so that the water in the cylinder will pass out of the cylinder through perforations to the outlet.

3. The combination in a cylinder machine for paper making, of a vat; a rotating cylinder in the vat having peripheral perforations; an inlet and an outlet for the vat, a portion of the bottom section of the inlet being so related to the cylinder that a tapered channel is formed where the water is allowed to pass through the perforations into the cylinder, the outlet communicating with another portion of the perforated periphery of the cylinder, so that the water in the cylinder will pass out of the cylinder through perforations to the outlet; a pipe communicating with the interior of the cylinder; a pump connected to the pipe; and a pipe connected to the discharge end of the pump and opening into the vat outside of the cylinder.

4. The combination in a cylinder machine for paper making, of a vat having a horizontal partition; an inlet pipe communicating with the space under the partition; an outlet pipe communicating with the space above the partition; a rotating cylinder having peripheral perforations and mounted in the vat and communicating with both the outlet and the inlet, so that water separated from the stock will pass through the perforations into the cylinder and the water within the cylinder will pass again through a section of the perforated cylinder in the opposite direction to the outlet; and means for conveying the stock away from the vat.

5. The combination in a cylinder machine for paper making, of a vat; a cylinder in the vat having a perforated periphery; means

for rotating the cylinder in the vat; an inlet communicating with a portion of the cylinder to allow stock to adhere thereto and to allow water to pass into the cylinder through the perforations; an outlet separated from the inlet and communicating with a portion of the perforated periphery, so that water will pass a second time through the perforations in the cylinder to the outlet; a right and left hand screw-conveyor extending the full length of the cylinder at the discharge end thereof; and a central outlet for the stock.

6. The combination in a cylinder machine for paper making, of a vat; a cylinder rotated in the vat, said cylinder having a perforated periphery and open at each end; means for closing the space between the ends of the cylinder and the sides of the vat; a substantially horizontal partition; an inlet pipe communicating with the space under the partition; an outlet pipe communicating with the space above the partition; means between the partition and the cylinder to prevent water flowing from the inlet to the outlet without passing through the cylinder; and a pump, the inlet pipe of the pump communicating with the interior of the cylinder, and the discharge pipe of the pump discharging into the vat.

7. The combination in a cylinder machine for paper making, of a vat; a rotating cylinder mounted in the vat and having a perforated periphery extending substantially the full width of the vat; a partition in the vat separating the inlet from the outlet; an inclined bottom section forming with the cylinder a channel of reduced area so that the water will pass through the perforations in the vat while the pump will remain on the periphery of the vat, the outlet communicating with a portion of the periphery of the vat so that the water will again pass through the perforations from the interior of the cylinder to the outlet; and means for conveying the pulp away from the machine.

JOSEPH A. WHITE.