Jan. 7, 1930. A. D. WOOD 1,742,294

PULP OR FIBER THICKENER

Filed Dec. 18, 1926

FIG. 1.

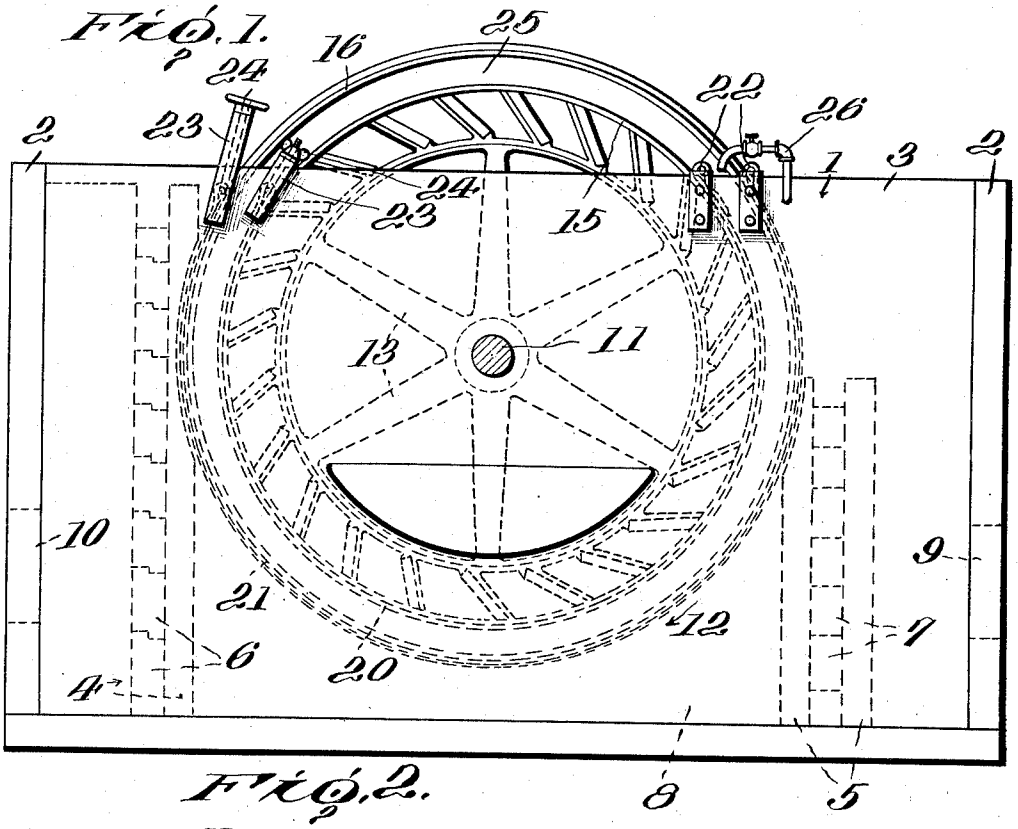


FIG. 2.

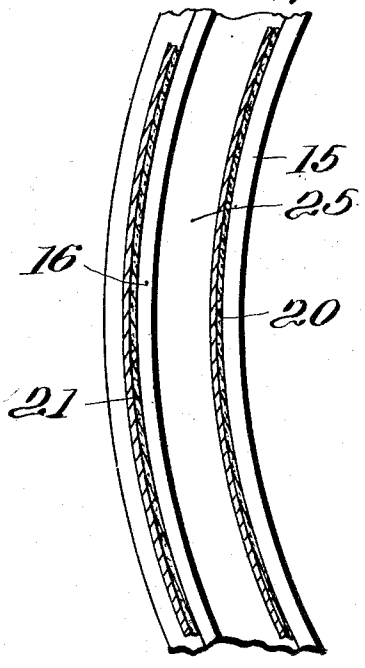
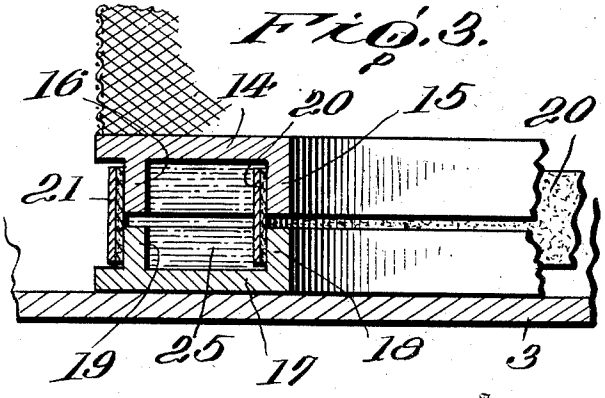


FIG. 3.



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1,742,294

UNITED STATES PATENT OFFICE

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PULP OR FIBER THICKENER

Application filed December 18, 1926. Serial No. 155,710.

This invention relates to the manufacture of paper pulp, or any particular pulp, or any sort of fibrous material whether made by a mechanical process or any of the so-called "chemical processes" used in the manufacture of any fibrous boards, or sheets, or material.

Its primary object is to provide improvements in the apparatus for thickening the pulp or fibrous material, such apparatus being serviceable also in the treatment of waste water, from pulp and paper mills, for the recovery of pulp fiber.

In my United States Patent No. 1,103,725, dated July 14, 1914, I have disclosed a wood pulp thickener comprising a tank containing a foraminous cylinder, and packing strips between the ends of the cylinder and the ends of the tank, to prevent the flow of water and pulp between the ends of the cylinder and tank. The present invention is directed specifically to improving the sealing between the ends of the cylinder and the ends of the tank.

Another object of the invention is to provide a double sealing collar on one or both ends of the cylinder, and a companion stationary double segment on the end of the tank or vat. With this double sealing collar and segment, I employ two sealing straps with their requisite hooks and adjusting screws, instead of one sealing strap as in my patent above mentioned. With these two sealing straps, the tension need not be so great as when but one is employed, and I thus lessen the friction and horse-power, and insure fewer replacements of the straps. Between the double collar on the drum and the double segment on the vat, I have a substantially U-shaped or segmental chamber which is filled with liquid, to maintain a static head in this compartment, sufficient to equal or overcome the pressure of the stock and water in the vat, on the outside of the cylinder. With such a construction, if the sealing straps are but moderately tensioned, and any leakage occurs, it will be that of the liquid passing out from the compartment, and either mixing with the stock and water in the vat, or waste water inside the cylinder, which can do no harm, but positively prevents the loss of good fiber at this point.

With the foregoing objects outlined, and with other objects in view which will appear as the description proceeds, the invention consists in the novel features hereinafter described in detail, illustrated in the accompanying drawing, and more particularly pointed out in the appended claims.

Referring to the drawing:

Fig. 1 is an end view of a pulp thickener provided with my improvements.

Fig. 2 is a fragmentary side view of one of the double sealing rings, and a vertical sectional view of a portion of the two sealing straps.

Fig. 3 is a horizontal sectional view of a portion of one end of the vat and cylinder, and illustrating my improved sealing means.

In the drawing, 1 designates an ordinary vat of box-shape having side walls 2 and end walls 3, only one of the latter being illustrated. The ends of the vat are provided on the inner surfaces with the usual vertical cleats 4 and 5 to provide vertical grooves to receive the partition boards 6 and 7, which form, with the bottom of the vat, a chamber 8 in which the pulp or fiber is strained. 9 designates the inlet and 10 the outlet of the vat, it being understood that the water and pulp enter the vat through the inlet 9, flow over the partition 7 and into the chamber 8, and after being strained in the manner hereinafter described, the thickened pulp passes over the partition 6 and flows out through the outlet 10.

11 indicates a shaft adapted to be rotated in the direction of the arrow 12 and carrying wheels 13 forming part of the usual foraminous drum, one type of which is clearly illustrated and described in said patent.

To prevent the loss of good fiber at the ends of the cylinder, I preferably provide each end of the cylinder with a double sealing ring consisting of a metal annulus 14 having parallel circular flanges 15 and 16 which extend outwardly from the end of the cylinder. This double sealing ring cooperates with a double sealing segment consisting of a substantially U-shaped member 17,

having parallel segmental flanges 18 and 19 which extend toward the flanges 15 and 16. The double sealing segment 17 is fixed to the end of the vat. The flanges 15, 16, 18 and 19 cooperate with a pair of sealing straps 20 and 21 which engage the peripheries of said flanges. These sealing straps may be formed of rubber, canvas, ducking or other fabric belt, lined with dryer felt or other suitable fabric or webbing. Each strap has one of its ends connected to the end of the vat by a hinge joint 22, the opposite end of each strap being connected to an adjusting device 23 mounted on the end of the vat and including an adjusting nut 24 to permit the operator to vary the tension of the strap.

The substantially U-shaped chamber 25 which is bounded by the rings 14 and 17, flanges 15, 16, 18 and 19, and the sealing straps 20 and 21, is filled with water to provide a hydraulic seal between the end of the cylinder and the adjacent end of the vat, and as before stated, a sufficient head of water is maintained in this compartment, together with proper tension on hand wheel 24, to press the strap 20 against the flanges 15 and 18, and sufficient tension is maintained thru hand wheel 24, on straps 21, to keep it snugly in contact with flanges 16 and 19, thereby regulating leakage, if any, of liquid from the U-shaped compartment.

As set forth above, in the usual apparatus of this character, one sealing collar and one sealing strap is usually employed at each end of the foraminous cylinder, and must be operated under very strong tension, thereby producing frictional resistance and increasing the horse-power necessary to drive the machine, and must be kept in constant repair and adjustment to prevent the passage of good fiber contained in the vat, through this point into the waste water or screened water inside the cylinder. With the double sealing device of the present invention, the pressure of the stock and water in the vat against the outer sealing strap 21 is equalized or made even less by the pressure of the fresh water contained in the compartment 25, even though the sealing straps are but moderately tensioned. Consequently, an effective seal is provided with a minimum of friction.

While the invention is primarily considered for use in connection with the machine described in my previous patent and is in effect an improvement on that machine, I do not desire to limit its use to this machine only, but it may be used with equal effectiveness on any type of machine employing a foraminous cylinder operating in a vat, where it is desired to prevent leakage at the ends of the cylinder.

It is to be noted that the double sealing collar which is a part of the cylinder, must, of necessity, be a continuous circle, whereas its companion segment attached to the end of the vat, is cut off along the line of the top of the vat, which offers the necessary opening for the water supply pipe 26 and the strap adjusting devices 23 and 24.

From the foregoing, it is believed that the construction, operation and advantages of the invention may be clearly understood, and I am aware that changes may be made in the details disclosed without departing from the spirit of the invention as expressed in the claim.

What I claim and desire to secure by Letters Patent is:

In a strainer of the class described, a vat, intake and outlet ducts arranged in opposite walls of the vat, a foraminous drum rotatably mounted in the vat, a partition at each side of said drum arranged in the vat between the drum and the intake and outlet ducts, a sealing ring on one end of the drum provided with a plurality of circular flanges extending toward one end of the vat, a stationary segment mounted on that end of the vat and having a plurality of flanges projecting toward the flanges of the ring, a plurality of sealing straps engaging the flanges and bridging the spaces between the flanges of the ring and the flanges of the segment to provide a compartment, a hydraulic sealing agent arranged in said compartment, means connecting one end of each strap to the end of the vat, and threaded means connecting the other end of each strap to the end of the vat to permit manual adjustment of the straps.

In testimony whereof I hereunto affix my signature.

ALBERT D. WOOD.