No. 756,342. PATENTED APR. 5, 1904.

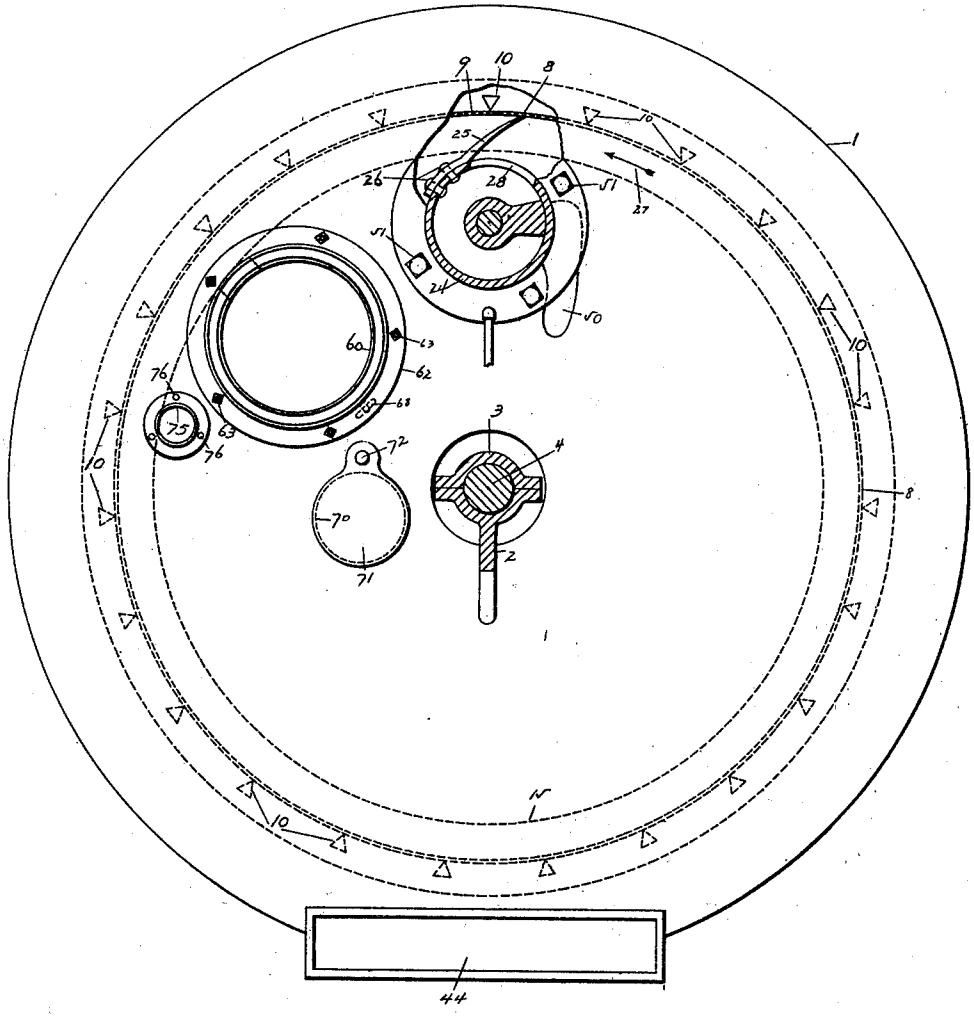
C. E. DULIN.

CENTRIFUGAL SCREEN.

APPLICATION FILED JUNE 19, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

FIG. 1.

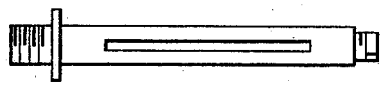


WITNESSES.

S. C. Booth.

E. M. O'Reilly.

FIG 5



INVENTOR.

Charles E. Dulin,

By Mosher & Curtis

attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 756,342. PATENTED APR. 5, 1904.

C. E. DULIN.

CENTRIFUGAL SCREEN.

APPLICATION FILED JUNE 19, 1903.

NO MODEL. 2 SHEETS—SHEET 2.

Fig. 2.

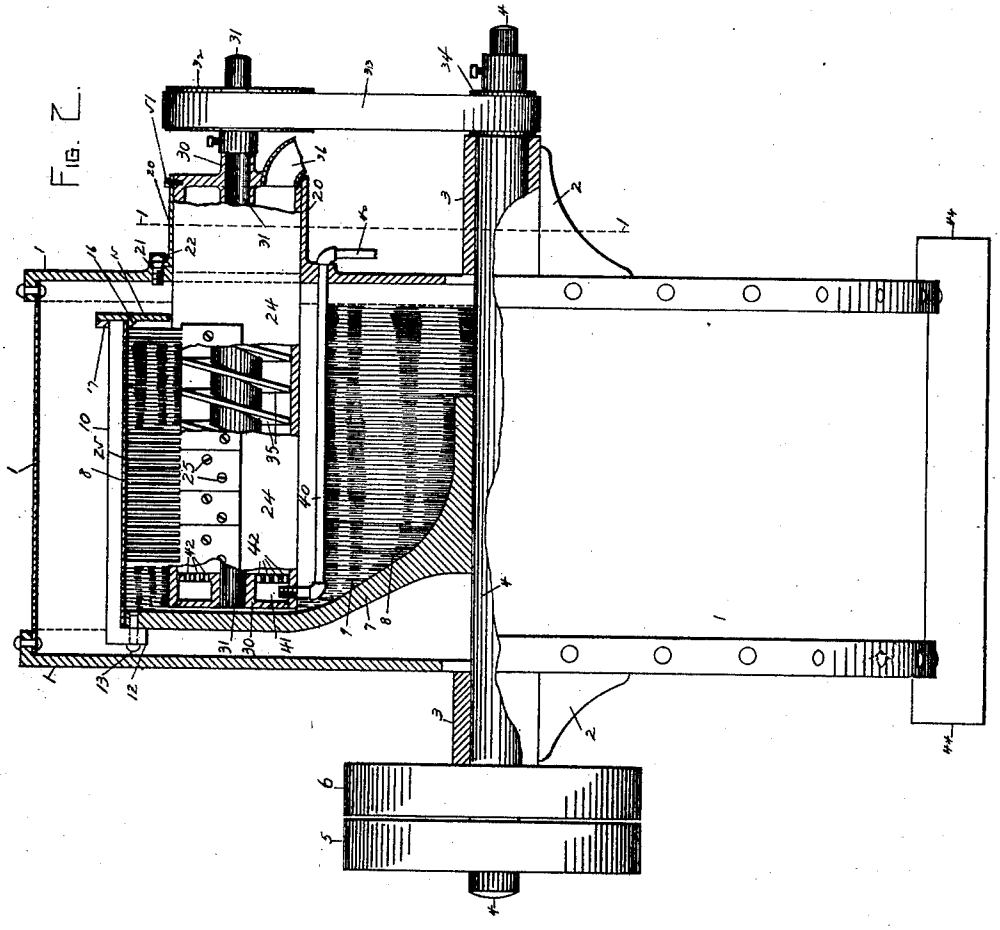


Fig. 3.

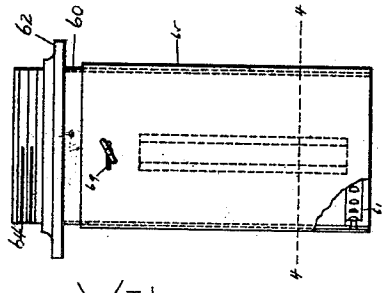
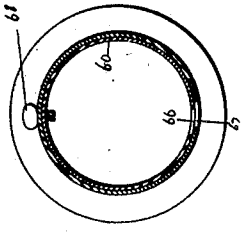


Fig. 4.



WITNESSES

S. C. Barth

E. M. O'Reilly

INVENTOR: Charles E. Dulin,

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 756,342. Patented April 5, 1904.

UNITED STATES PATENT OFFICE.

CHARLES E. DULIN, OF GLENS FALLS, NEW YORK, ASSIGNOR TO THE UNION BAG & PAPER COMPANY, OF SANDY HILL, NEW YORK, A CORPORATION.

CENTRIFUGAL SCREEN.

SPECIFICATION forming part of Letters Patent No. 756,342, dated April 5, 1904.

Application filed June 19, 1903. Serial No. 162,156. (No model.)

To all whom it may concern:

Be it known that I, CHARLES EDWIN DULIN, a citizen of the United States, residing at Glens Falls, county of Warren, and State of New York, have invented certain new and useful Improvements in Centrifugal Screens, of which the following is a specification.

The invention relates to such improvements; and it consists of the novel construction and combination of parts hereinafter described and subsequently claimed.

Reference may be had to the accompanying drawings, and the reference characters marked thereon, which form a part of this specification.

Similar characters refer to similar parts in the several figures.

Figure 1 of the drawings is an end view in elevation and partly in section along the broken line 1 1 in Fig. 2 of my improved centrifugal screen with a portion of the end wall of the case broken away to show a portion of the interior mechanism. Fig. 2 is a central vertical section of the upper portion of the same, the lower half being shown in side elevation. Fig. 3 is a plan view of the slotted supply-tube detached and removed from the case with a portion of the end wall broken away to show the interior construction. Fig. 4 is a vertical cross-section taken on the broken line 4 4 in Fig. 3. Fig. 5 is a plan view of the water-supply tube detached and removed from the case.

My invention is well adapted for screening wood-pulp to remove therefrom sticks, slivers of wood, and other foreign substances.

The principal objects of my invention are to facilitate the removal of the screenings from the perforated cylindrical screen while the same is in use, to provide a convenient means for regulating the supply of material to be screened to the screen, and to provide a convenient means for diluting with water the material to be screened.

The invention consists of a cylindrical screen or drum having perforate walls and means for rotating the same about a horizontal axis coincident with the axis of the drum, a trough exteriorly supported and projected through one end of the drum interiorly and provided with teeth for removing the screenings from the inner surface of the drum, and means for forcing the screenings along the trough and out of the drum, a supply-tube exteriorly supported and projected into the drum and provided with ports which allow the material to be screened to be projected against the perforate wall of the drum in a radial direction, and a water-supply tube projected interiorly of the drum on one side of the material-supply tube and provided with ports for forcing the water radially against the perforate side of the drum, as hereinafter more fully described, and set forth in the claims.

The stationary cylindrical case 1 is provided on each of its ends with bearing-supports 2, supporting the bearings 3, containing a rotary shaft 4, on which are mounted the driving-pulley 5 and loose pulley 6, also a concaved disk 7, adapted to close one end of the cylindrical shell or drum 8, containing the slot-perforations 9. The perforate shell is held in position against the periphery of the disk by means of a series of transverse bars 10, each provided with an angle offset 12, secured at one end to the peripheral part of the disk 7 by means of a series of rivets 13. The other end of each bar is held in position by means of the annular ring plate 15, having a rib 16 engaging with the inner surface of the edge of the screen and a ring 17 inclosing the ends of the bars. The inner edge of the ring plate constitutes a flange which partially closes the otherwise open end of the screen.

A sleeve 20, provided with an annular flange 21, is secured to the end wall of the case by means of screw-threaded bolts 22, inserted in screw-threaded apertures in the case, as shown. The sleeve 20 serves to support a tubular trough 24, projected through the open end of the cylindrical screen approximately to its closed end, the outer end of the trough resting in the supporting-sleeve 20. A series of scraper-teeth 25 are fastened upon the outer surface of the trough, as by means of rivets 26. These teeth are so located as to engage the inner surface of the perforated shell and

remove therefrom screenings which may adhere thereto. The perforate shell is adapted to travel in a direction indicated by the arrow 27 in Fig. 1 past the teeth 25, so that when the screenings are removed from the perforate shell by the teeth they will fall beneath the teeth through the opening 28 into the trough 24. Each end of the tubular trough is provided with bearings 30, adapted to receive shaft 31 rotary therein. Fixed upon this shaft is a drive-pulley 32, connected by belt 33 with pulley 34, fixed upon shaft 4, by means of which rotary movements are communicated to the shaft. The shaft is also provided with a screw 35, rotary in the trough and adapted to practically fill the same, whereby a rotary movement of the shaft and its screw-thread will force the screenings deposited in the trough outwardly until they are projected through the opening 36 exteriorly of the case. The operation of conveying the screenings along the trough may be facilitated by means of water injected at the inner end of the trough, as through the supply-pipe 40, leading from a source of supply (not shown) into the trough itself. In some cases a jet of water so forced into the trough will be sufficient to convey the screenings along the trough and out of the case without the aid of the screw.

This improved screen is especially adapted for use in screening wood-pulp, the chips and slivers of wood being retained on the inner surface of the screen and removed therefrom by the teeth into the trough, and thus carried out of the case, as above described, while the screened pulp passes through the apertures in the shell and into the case 1, which incloses the shell, falling by gravity to the lower side and passing out of the take-offs 44 to a suitable receptacle. (Not shown.)

By providing the end wall of the case with a lateral opening 50 the teeth 25 may be riveted onto the tubular trough 24 before the trough is inserted within the drum, the teeth being passed through the opening 50 and the trough afterward rotated to bring the teeth in the proper position, as shown in Fig. 1. When so inserted, the supporting-sleeve 20 is not secured to the case-wall until after the insertion of the trough. After the trough is inserted and before the pulley 32 is secured to the shaft 31 the sleeve 20 is slipped onto the outer end of the trough and bolted to the case, as shown. The trough is held in the proper position in the sleeve by means of screws 51.

60 is the supply-tube, closed at its inner end by means of the head 61, (shown in Fig. 3,) and is provided on its outer end with an attaching-flange 62, which is secured to the outer case-wall by means of screw-bolts 63. The outer end may also be screw-threaded, as shown at 64 in Fig. 3, for the purpose of attaching other lengths of pipe thereto. The inner end of the supply-tube is also provided with a sleeve 65, rotatable upon the tube. The tube is provided with a longitudinal slot 66 and the sleeve with a similar slot 67. By rotating the sleeve upon the tube the two slots can be made to exactly register or adjusted relatively to each other, so as to vary the capacity of the slots for discharging the material to be screened from the tube. The sleeve can be held in the proper adjusted position upon the tube by means of the thumb-screw 68 passing through slot 69 in the sleeve and inserted in the screw-threaded aperture in the tube. The tube is so located interiorly of the drum that the material will be discharged through the slots 66 and 67 radially to the drum against the perforate wall of the drum. The centrifugal force exerted by the rapidly-rotating drum forces the material to be screened through the perforations, except the sticks, slivers, and other foreign substances, which are deposited on the inner face of the drum. The material is preferably supplied in such quantities that most of the liquid material will pass through the perforations before any given part of the perforated shell has made a complete revolution. By locating the supply-tube just in the rear of the screenings-trough, as shown in Fig. 1, the pulp will mostly pass through the perforations of the drum before reaching the screenings-trough, leaving nothing but the foreign matter on the perforate shell, which is removed by the scraper-teeth and deposited in the open trough. A hand-hole in the case-wall, indicated by dotted lines 70 and covered by plate 71, oscillatory on pivot 72, permits of access to the thumb-screw 68 to adjust the sleeve on the tube and regulate the flow of the material to be screened through the slots.

The water-supply tube 75, having a longitudinal slot similar to that in tube 60, is inserted just in the rear of the material-supply tube, as shown in Fig. 1, and secured therein by screw-bolts 76. By means of this tube the material to be screened can be diluted as desired. By projecting a radial sheet of water from this tube against the perforated wall of the drum the material to be screened already deposited therein by the supply-tube 60 is still further agitated and its passage through the perforations in the drum or screen facilitated. The supply of water in this tube 75 can be regulated by a stop-cock in the supply-tube connected therewith. (Not shown.) The inner end of the water-supply tube is closed by means of a screw-threaded plug 79, screwed into the end of the tube.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a centrifugal screen, the combination with a side perforated drum rotatable upon a horizontal axis; and means for supporting and rotating the same; of means for projecting the material to be screened against one side of the drum and upon its inner surface;

a stationary stripper within the drum just in advance of the projected material for removing the screenings from the perforated wall of the drum; a horizontally-disposed trough beneath the stripper extending without the drum; means for conveying the screenings along the trough without the drum; and a receiver for the screened material, substantially as described.

2. In a centrifugal screen, the combination with a side perforated drum rotatable upon a horizontal axis; and means for supporting and rotating the same; of means for projecting the material to be screened against one side of the drum and upon its inner surface; a stationary trough exteriorly supported in a horizontal position and projecting into the drum just beneath its upper side; means for stripping the screenings from the inner surface of the drum just above the trough whereby they drop into the trough; and means for injecting water into the inner end of the trough to carry the screenings along the trough out of the drum; and a receiver for the screened material, substantially as described.

3. In a centrifugal screen, the combination with a side perforated rotatable drum; and means projecting interiorly of the drum for supporting and rotating the same; of means for projecting under pressure the material to be screened against one side of the drum and upon its inner surface; means for projecting water against the inner surface of the drum on one side of the projected material to be screened whereby the material can be diluted; and a receiver for the screened material and water inclosing the drum, substantially as described.

4. In a centrifugal screen, the combination with a side perforated drum rotatable upon a horizontal axis; means projecting interiorly for supporting the drum and means for positively rotating the same; of a stationary supply-tube projecting into the drum with its axial line practically parallel with the axis of the drum, and provided along that side which faces away from the axis of the drum, with a supply port or ports; and a drum-inclosing case extending entirely around the drum, substantially as described.

5. In a centrifugal screen, the combination with a side perforated shell rotatable upon a horizontal axis open at one end; and means for supporting and rotating the same; of an inwardly-projecting flange at its open end; exteriorly-supported stripping and conveying mechanism projected through the open end into the shell whereby the stripping mechanism is adapted to act upon the inner surface of the screen; and a supply-tube exteriorly supported and projected through the open end into the shell, substantially as described.

6. In a centrifugal screen, the combination with a side perforated rotatable drum; and means for supporting and rotating the same; of a supply-tube projected into the drum and containing a slot or opening on one side; a sleeve rotatable on said tube and provided with a similar slot or opening adapted to register with the opening in the supply-tube; and means for securing the sleeve in an adjusted position on said tube whereby the size of the side opening can be varied as desired, substantially as described.

In testimony whereof I have hereunto set my hand this 12th day of June, 1903.

CHAS. E. DULIN.

Witnesses:

W. R. BULLARD,

H. E. WARREN.