H. T. BAKER AND J. D. HASKELL.

PAPER PULP SCREEN MACHINE.

APPLICATION FILED MAY 4, 1921.

1,429,707.

Patented Sept. 19, 1922.

2 SHEETS—SHEET 1.

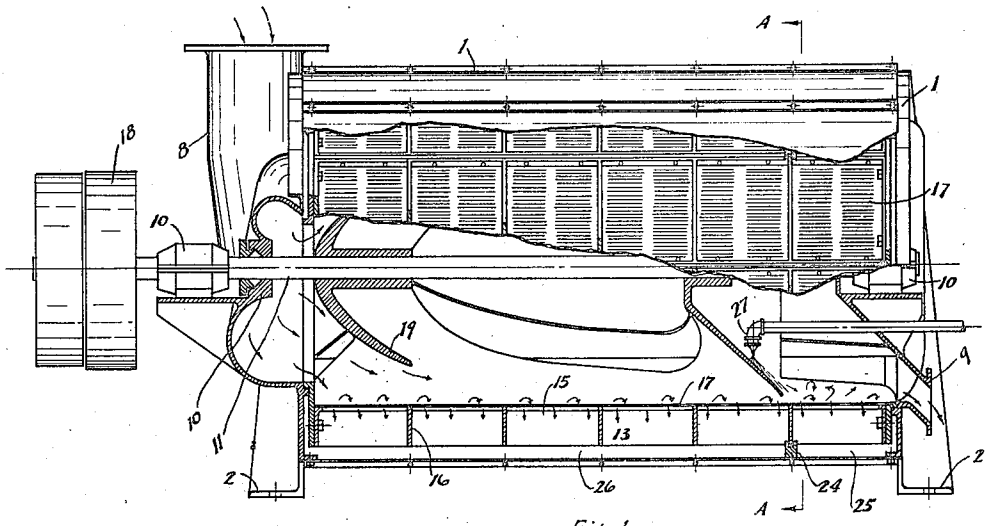

Fig. 1

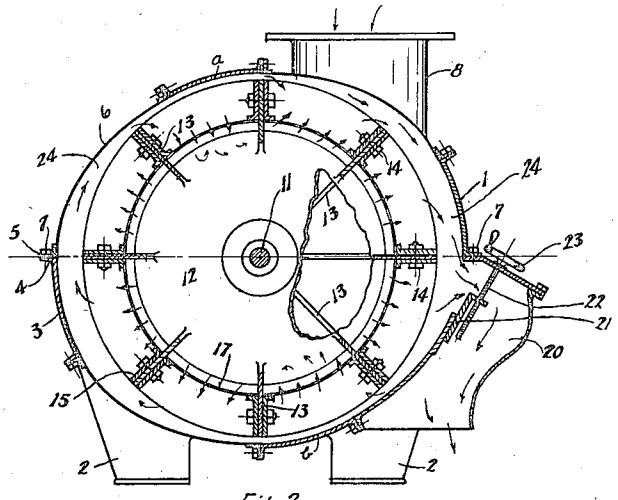

Fig. 2

Section at "AA"

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Harold T. Baker and

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BY

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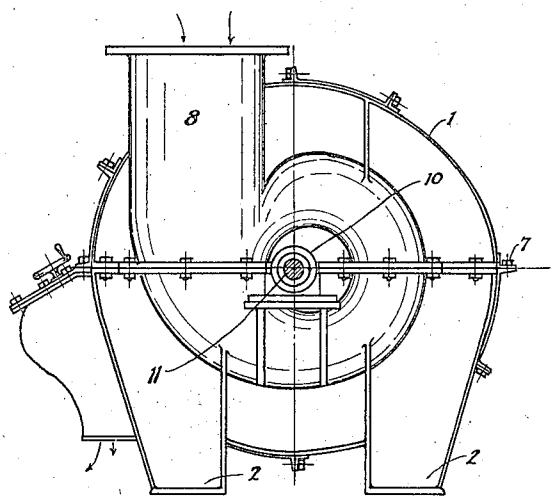

Fig. 3

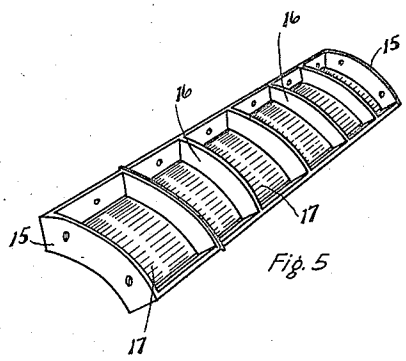

Fig. 5

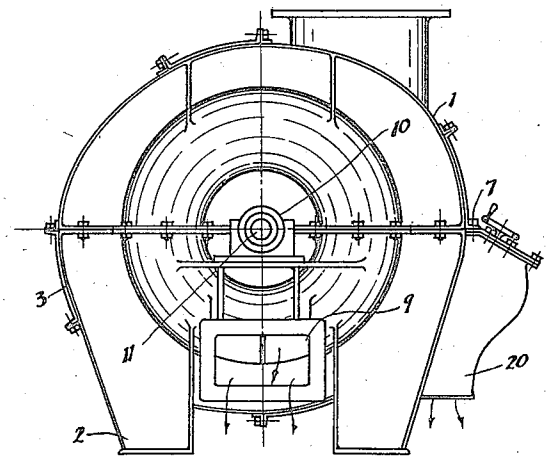

Fig. 4

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UNITED STATES PATENT OFFICE.

HAROLD T. BAKER AND JOHN D. HASKELL, OF DAYTON, OHIO.

PAPER-PULP-SCREEN MACHINE.

Application filed May 4, 1921. Serial No. 466,663.

To all whom it may concern:

Be it known that we, HAROLD T. BAKER and JOHN D. HASKELL, citizens of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Paper-Pulp-Screen Machines, of which the following is a specification.

The principal object of our invention is to provide a machine for so screening fibrous material that fibers of required sizes only will pass through the screen plates as accepted material, while the oversize fibers or bundles of fibers and dirt will be forced back from the screen plates and diverted to an outlet for the rejections or tailings.

Other important and incidental objects will be brought out in the following specification and particularly set forth in the subjoined claims.

In the accompanying drawings illustrating our invention, Figure 1 is a longitudinal view of the outer casing that is broken away to show the screen sections, rotor, stock inlet, rejection outlet and shower. Figure 2 is a cross section taken on the line A—A of Figure 1, showing the elliptical casing, circular rotor, adjustable accepted-stock outlet and screen sections. Figure 3 is an end elevation of the machine looking toward the stock inlet. Figure 4 is an end elevation of the machine looking toward the tailing discharge. And Figure 5 is a perspective view of a single screen section.

Throughout the specification and drawings, similar reference characters denote corresponding parts.

In a detailed description of the preferred form of embodiment of our invention, the numeral 1 designates the outer casing or shell of the machine, which is approximately elliptical in cross section. (See Figures 1 and 2.) This casing is supported by feet 2 that project downwardly from its lower section 3. The latter has a peripheral flange portion 4 that is secured to a similar flange portion 5 on the upper half section 6 of said casing or shell 1, by bolts 7, whereby the two sections are firmly secured together.

At one end the casing 1 has a convolute inlet portion 8 to receive and distribute the entering stock, and at its other end an outlet portion 9 for the rejections or tailings. (See Figures 1, 3 and 4.)

Supported upon bearings 10 at each end of the machine, is a shaft 11 on which is mounted an impeller or rotor 12 having a series of radial blades 13. Between the outer ends of each pair of blades 13 there is secured by bolts 14, a trough-shaped frame 15 having curved ends and divided into sections by curved partition pieces 16. (See Figures 2 and 5.) Fastened in the bottom portion of each section of the frames 15, is a screen plate 17. Fast on the outer end of the shaft 11 is a double pulley 18 which receives a belt (not shown) by which the rotor blades 13 that carry the screen frames 15, are rotated.

Diluted fibers made from fibrous material reduced to fibers by either mechanical or chemical means, are admitted to the interior of the rotor 12 through the inlet 8, and by a curved deflector 19, are directed along the interior surfaces of the screen plates 16. The impeller 12 causes the stock to revolve with it, and due to centrifugal force, the fibers which are of such size as to pass through the screen slots, will be forced through them together with the water. This screened stock fills the space between the screen plates 16 and the interior surface of the outside casing or shell 1, and by the rotor blades which project into this space, said stock is caused to revolve. This produces a further centrifugal force which causes a partial vacuum on the outside of the screen plates.

At two points, designated by the letters "*a*" and "*b*" in Figure 2, the circumference of the outside shell 1 approaches the ends of its minor axis. At these points, therefore, there will be a narrow clearance between the shell and the blades of the rotor. Screened stock will be carried into this space, where it will be compressed to cause a counterflow of stock, or, in other words, an inward flow as indicated by the arrows at the points "*a*" and "*b*." This reversal of flow will have sufficient force to dislodge the large or oversize fibers and dirt that tend to plug or clog the slots in the screen plates 15 and cause them to be carried along by the incoming unscreened stock toward the tailing discharge outlet 9, parallel to the shaft 11. By this counterflow of the screened stock, the slots in the screen plates will be kept clean and open at all times to permit the required sizes of fibers to be freely passed through them. After passing through the screen plates, the desired fibers will be carried through the space between the outer ends of the blades and the outer shell 1, into

an accepted stock outlet 20. The size of the opening in the latter may be adjusted or varied by a gate valve 21 that may be raised or lowered by a screw 22 to which a hand wheel 23 is attached. (See Figure 2.) The oversize fibers and dirt, on the other hand, will be worked along the inner surfaces of the screen plates 15 to the rejection or tailing discharge outlet 9.

In order to keep the screened stock from being forced through the screen plates into the tailings accumulated at the two compression points "*a*" and "*b*" before referred to, a ring 24 is secured to the inner periphery of the outer shell at the tailing discharge end of the rotor to separate the space between it and the screen plates into two compartments 25 and 26. (See Figures 1 and 2.) The accepted stock that does work back through the screen plates is caught in the compartment 25 and discharged through the outlet 20.

A shower pipe 27 is also provided to spray water upon the rejections or tailings at the end of the rotor 12, to give them a final washing for the purpose of removing any fine fibers that may adhere to them. (See Figure 1.)

We do not wish to be limited to the details of construction and arrangement herein shown and described, and any changes or modifications may be made therein within the scope of the subjoined claims.

Having described our invention, we claim:

1. In a paper-pulp screen machine, the combination with an outer casing approximately elliptical in cross section, of fiber screening means rotatable within said casing, a stock inlet to the latter, an accepted stock outlet and a tailing discharge outlet from said casing, the wall of the outer casing approaching the screening means at two points to form compression spaces between the screening means and the casing wall for the purpose specified.

2. In a paper-pulp screen machine, the combination with an outer casing approximately elliptical in cross section, of a circular rotor rotatable within said casing, curved screen plates forming the outer periphery of said rotor, means for admitting stock to said rotor, a chamber between the screen plates and the casing wall to receive the required sizes of fibers that pass through said plates, the wall of the casing converging toward the screen plates at two points to lessen the size of said chamber at those points for the purpose specified, an outlet from said rotor for the oversize fibers and dirt, and an outlet from said chamber for the fibers that pass through the screen plates.

3. In a paper-pulp screen machine, the combination with an outer casing approximately elliptical in cross section, of a shaft rotatable therein, rotor blades mounted on said shaft, screen frames secured between the outer ends of said blades, screen plates mounted in said screen frames, means for admitting stock to said rotor, a chamber between the screen plates and the casing wall to receive the required sizes of fibers that pass through said plates, the wall of the casing converging toward the screen plates at two points to lessen the size of said chamber at those points for the purpose specified, an outlet from said rotor for the oversize fibers and dirt, and an adjustable outlet from said chamber for the fibers that pass through the screen plates.

4. In a paper-pulp screen machine, the combination with an outer casing approximately elliptical in cross section, of a circular screen rotatable within said casing, means for admitting stock to said screen, a chamber between the screen and the casing wall to receive the required sizes of fibers that pass through the screen, the wall of the casing converging toward the screen at two points to lessen the size of said chamber at those points for the purpose specified, an outlet from said screen for the oversize fibers and dirt, an outlet from said chamber for the fibers that pass through the screen, and a partition ring in said chamber near said outlets, for the purpose specified.

5. In a paper-pulp screen machine, the combination with an outer casing approximately elliptical in cross section, of a circular screen rotatable within said casing, means for admitting stock to said screen, a chamber between said screen and the casing wall to receive the required sizes of fibers that pass through the screen, the wall of the casing converging toward the screen at two points to lessen the size of said chamber at those points for the purpose specified, an outlet from said chamber for the fibers that pass through the screen, an outlet from the latter for the oversize fibers and dirt, and a shower pipe near said last named outlet to spray water upon said oversize fibers and dirt prior to their discharge through said outlet, for the purpose specified.

In testimony whereof we have hereunto set our hands this 2nd day of May, 1921.

HAROLD T. BAKER.
JOHN D. HASKELL.

Witness:
HOWARD S. SMITH.