

No. 693,215.

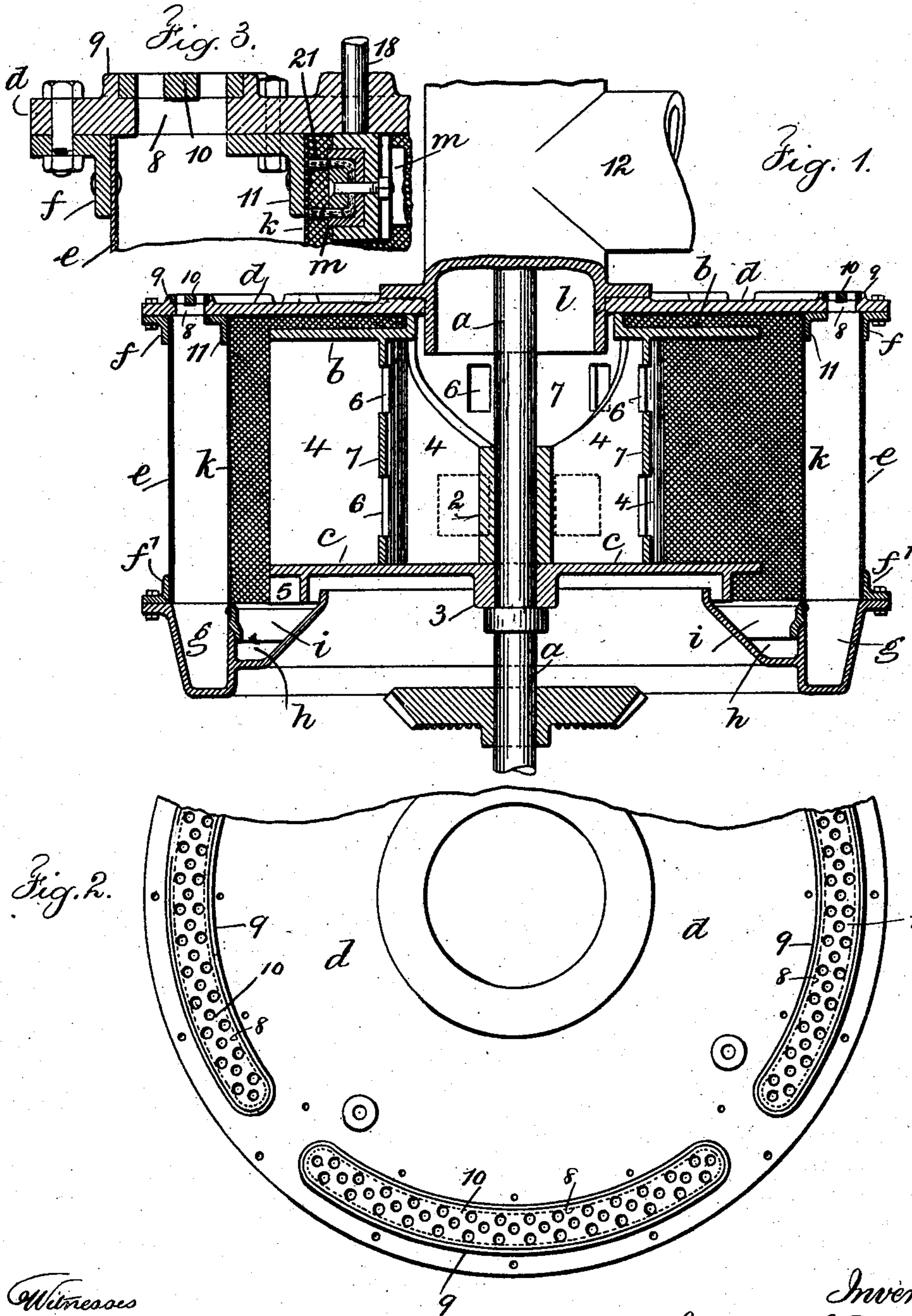
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CENTRIFUGAL PULP SCREEN.

(Application filed Dec. 18, 1901.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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CENTRIFUGAL PULP-SCREEN.

SPECIFICATION forming part of Letters Patent No. 693,215, dated February 11, 1902.

Application filed December 13, 1901. Serial No. 85,794. (No model.)

To all whom it may concern:

Be it known that we, JAMES H. BAKER, GEORGE F. SHEVLIN, and FREDERICK H. BAKER, citizens of the United States, residing at Saratoga Springs, in the county of Saratoga and State of New York, have invented an Improvement in Centrifugal Pulp-Screens, of which the following is a specification.

Our invention relates to improvements in centrifugal mechanism and devices for treating pulp and paper-stock, and the same comprises improvements upon the devices shown and described in Letters Patent granted to us November 19, 1901, No. 686,962.

Heretofore in machines of this class all of the fiber possible was not recovered from the pulp. Hence there was loss of fiber, the same passing off with the slivers; and the object of our present invention is to overcome this difficulty and to be able to reclaim or save all of the fiber pulp.

We have discovered that currents of air passing through the machine facilitate the action thereof and assist the separation of the fibers from the pulp more perfectly than heretofore. It is a fact that the centrifugal devices in themselves are sufficient to create said currents of air when the machine is constructed therefor, and to effect the object sought we form openings in the cover of the pulp-screen between the segmental casing and the screen-plates and provide for covering said openings with perforated metal plates, forming gratings. The pressure of the action of the centrifugal devices draws in the air to the apparatus over the edge of the slivers-trough and beneath the blades of the lower centrifugal device into the pulp-screen, and by the action of the centrifugal device or beater-wheels the air passes through the screen-plates and escapes between the screen-plates and segmental casing and gratings or openings provided in the cover of the device. The action of this air is to segregate and separate the pulp into minute portions and to force the fiber through the screen-plates, where the same is collected in the fiber-troughs on one side of the screen-plates, while the slivers remain on the other side of the

screen-plates, each to be received and gathered in their respective troughs.

In the drawings, Figure 1 represents by a vertical section and partial elevation the principal portion of our improved centrifugal screen. Fig. 2 is a partial plan of the cover, and Fig. 3 is a vertical section in larger size through the cover and adjacent segmental casing and screen-plates.

The vertical revoluble shaft *a* is provided with suitable bearings and the same passes through the machine. The centrifugal devices, or, in other words, the beater-wheels, are made with hubs 2 3, which surround and are secured to the said shaft. The uppermost centrifugal device or beater-wheel comprises a cover-plate *b*, blades 4, which radiate from the hub 2, and an intermediate ring 7, having perforations 6. The lower centrifugal device or beater-wheel is provided with a cover-plate *c*, which forms a bottom for the upper centrifugal device or beater-wheel, and this lower beater-wheel is provided with blades 5. The cover *d* to the pulp-screen device is made with an opening of substantially the same dimensions as the opening in the cover-plate *b* of the upper centrifugal device, and a cylinder *l* extends down into the upper beater-wheel, through the opening in the cover, rises above the cover, and is provided with a flange secured to the cover and with an inlet-pipe 12, the paper-pulp being delivered into the center of the machine through the inlet-pipe 12 and cylinder *l*.

e represents the segmental casing; *ff'*, ring-frames secured thereto and bolted to the cover *d* and to annular concentric cast-metal troughs *g h*. An annular frame *i* fits over the division-wall between the troughs *g* and *h*, and the circular segmental screen-plates *k* are at their lower edges secured to the annular frame *i* and at their upper edges to a ring-frame 11, bolted to the cover.

We provide, as in our aforesaid patent, a screen-cleaner, of which the channel-iron ring *m*, vertical rods 18, and the ring of rubber 21 form the essential features.

The parts hereinbefore described are the same, perform the same operations, and have

the same functions as the same parts in our aforesaid patent.

We form in the cover *d* adjacent to the periphery curved openings 8 of elongated form and whose edges are concentric to the periphery, said openings coming between the vertical planes of the segmental casing and the screen-plates *e k*, and we prefer to make the cover *d* with flanged edges 9, that surround the openings 8 and are spaced at a slight distance from the edges of the openings, and we provide curved open-work metal plates or gratings 10, that fit over said openings and within the flanged edges 9. We do not limit ourselves to the number of the openings or to the shape of the openings or to the shape of the open-work metal plates or openings or to the arrangement of the perforations therein, as these may be varied without departing from the essence of our invention.

In the operation of the machine the centrifugal devices or beater-wheels force the pulp and air within the machine outward and produce a pressure between the segmental casing and the screen-plates and at the same time force the pulp against the screen-plates. This pressure is at once relieved by the open-work metal plates or gratings, providing an outlet or exit for the air and also providing an abundant outlet to relieve any pressure and provide for a constant movement of air through the machine brought about by the action of the centrifugal devices, the larger portion of the air entering the machine over the edge of the trough *h*, beneath the lowermost centrifugal device or beater-wheel, passing up into the machine, through the screen-plates *a*, and away by the gratings. The action of the air is to assist the beater-wheel in subdividing or comminuting the pulp as the same is thrown against the screen-plates and so permitting more fiber to pass through the screen-plates and to be saved by collecting in the fiber-troughs *g*, while the slivers fall within the screen-plates into the sliver-troughs *h*.

Our improvement possesses another advantage in that these pulp-screens require occasionally to be thoroughly washed out and cleansed, and for this purpose the open-work metal plates or gratings 10 are readily lifted from the seats on the cover, a hose introduced through the opening in the cover, and a stream of water therefrom thrown against the outer surface of the screen-plates in the opposite direction to that taken by the fibers in the operation of the machine, so that the screens are washed clean as well as the fiber

and sliver troughs. The screen-cleaner facilitates this operation.

We are enabled with the present improvement to effect a considerable saving in the percentage of the fibers removed from the paper-pulp. Besides, the operation of the machine is increased and its output rendered greater, and the cleansing of the machine is made possible to an extent not heretofore attained.

We claim as our invention—

1. The combination in a centrifugal pulp-screen, of devices for supplying the pulp or paper-stock, devices for acting upon the same, a segmental casing and a cover therefor and screen-plates within the casing acting to separate the fibers from the pulp, and means for permitting the pent-up air or pressure between the screen-plates and casing to escape through the cover whereby currents of air are established upward through the machine, substantially as and for the purposes set forth.

2. In a centrifugal pulp-screen, the combination with a power-shaft and centrifugal devices mounted thereon, and a cylinder and inlet-pipe to the machine, of segmental screen-plates, a segmental casing outside of the screen-plates, a cover to which the screen-plates and casing are connected, said cover having openings therein between the vertical planes of the screen-plates and casing and open-work metal plates or gratings fitting said openings, substantially as set forth.

3. In a centrifugal pulp-screen, the combination with a power-shaft and centrifugal devices mounted thereon and a cylinder and inlet-pipe to the machine, of segmental screen-plates, a segmental casing outside of the screen-plates a cover to which the screen-plates and casing are connected, said cover having curved openings therein between the vertical planes of the screen-plates and casing and flanged edges surrounding said openings spaced at a slight distance from the edges of the openings, and curved open-work metal plates or gratings fitting over said openings and within said edges, substantially as specified.

Signed by us this 11th day of December, 1901.

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Witnesses:

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