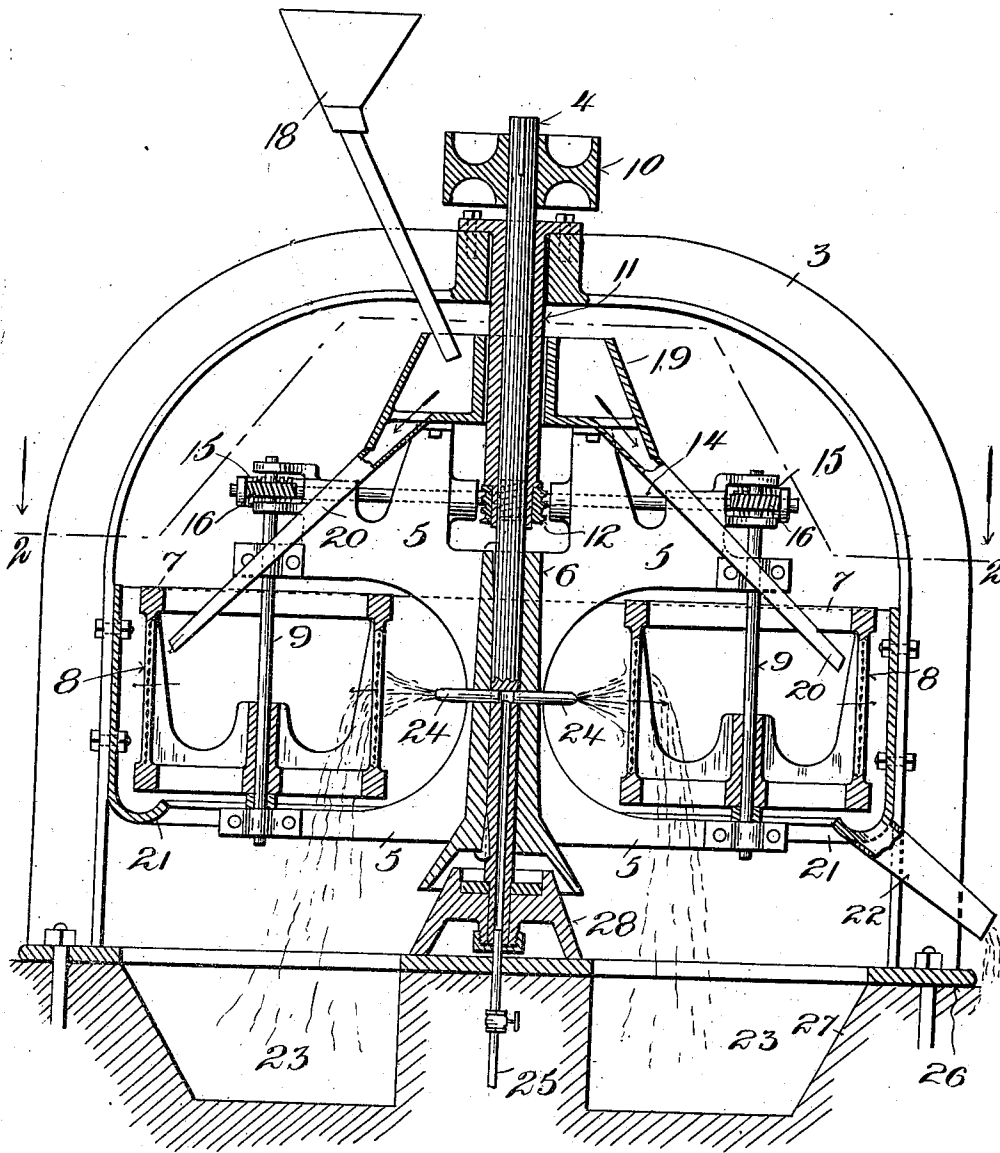


1,012,794.

2 SHEETS--SHEET 1..



Witnesses:
 Lem Benjamin
 Joseph Klein.

William Matthew Barker Inventor
By His Attorney Samuel E. Darby

1,012,794.

2 SHEETS—SHEET 2.

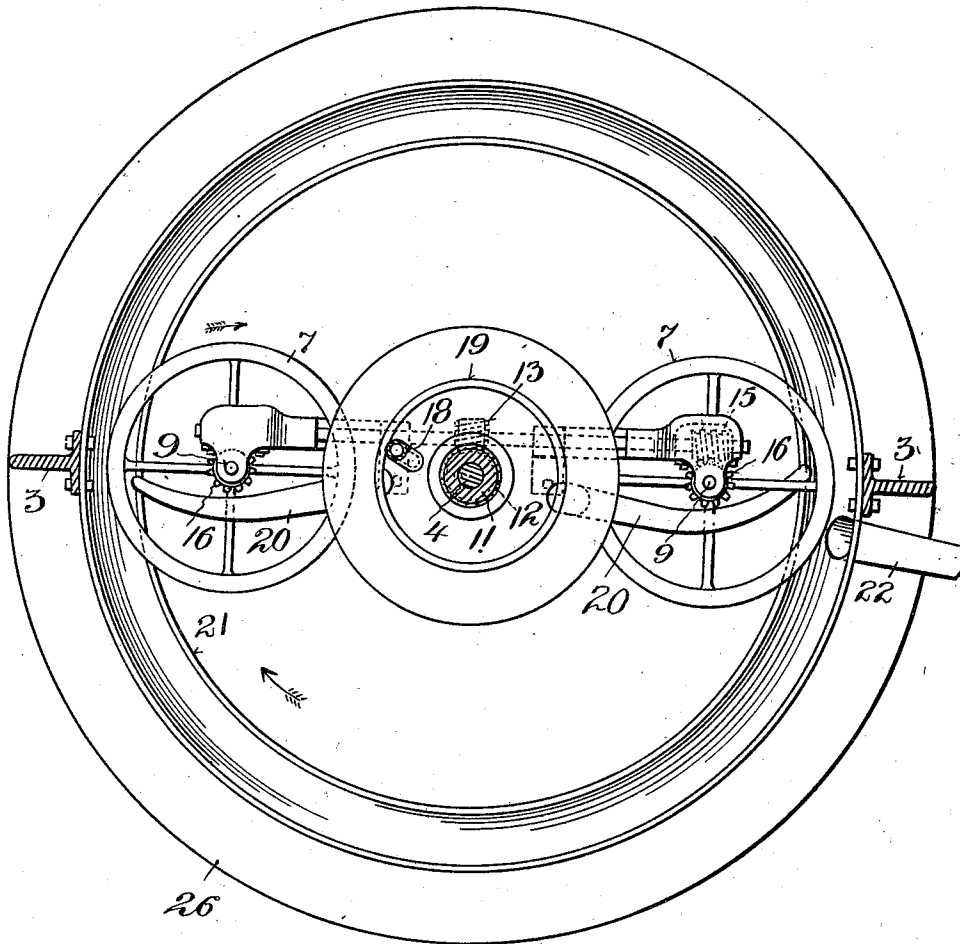


Fig. 2.

Witnesses:
W. Benjamin
Joseph Klein.

William Matthew Barker Inventor
By his Attorney Samuel E. Darby

UNITED STATES PATENT OFFICE.

WILLIAM MATTHEW BARKER, OF MCGILL, NEVADA, ASSIGNOR OF ONE-HALF TO H. A. GUESS, OF FLAT RIVER, MISSOURI.

FILTERING-MACHINE.

1,012,794.

Specification of Letters Patent.

Patented Dec. 26, 1911.

Application filed May 9, 1908. Serial No. 431,945.

To all whom it may concern:

Be it known that I, WILLIAM MATTHEW BARKER, a citizen of the United States, residing at McGill, in the county of White Pine, State of Nevada, have made a certain new and useful Invention in Filtering-Machines, of which the following is a specification.

The invention relates to filtering machines.

The object of the invention is to provide a machine which is simple in construction and efficient in operation for separating the solid portions of pulp from the liquid portion thereof.

A further and special object of the invention is to provide a filtering apparatus in which centrifugal force is employed to effect a separation of the liquid and solid portions of material to be filtered, and also to assist in recovering and collecting the separated solid matter.

Other objects of the invention will appear more fully hereinafter.

The invention consists substantially in the construction, combination, location, and arrangement of parts, all as will more fully hereinafter appear as shown in the accompanying drawings, and finally pointed out in the appended claim.

Figure 1, is a view in central vertical section of a filtering apparatus embodying the principles of my invention. Fig. 2, is a view in section on the line 2, 2, Fig. 1 looking in the direction of the arrows.

Reference sign 3, designates a stationary framework and 4, a vertically arranged shaft journaled centrally in such framework. A frame having the arms 5, and a central hub 6, is mounted upon and suitably secured to the shaft 4, to revolve therewith. Upon each arm 5, is carried a filter screen 7. Each filter screen, in the particular form of embodiment of my invention shown in the drawings, and preferably, is cylindrical in form and provided with a foraminated, perforated or meshed wall 8, and open at both the top and the bottom, as clearly shown. Each filter screen 7, is carried by a centrally arranged vertical shaft 9, suitably journaled in the arms 5, of the revolving frame, so that axial rotation may be imparted to said cylindrical screens in addition to the movement thereof due to the revolutions of the frame 5, with shaft 4.

Rotations may be imparted to shaft 4, in any suitable or convenient manner, as, for instance, through a pulley 10, mounted thereon and driven from any convenient source of power.

The axial rotative movements of the screens 7, may be imparted thereto in any suitable or convenient manner, and by any suitable or convenient arrangement of gearing. I have shown a simple arrangement wherein a sleeve 11, is mounted in the stationary frame 3, and in position for the drive shaft 4, to extend therethrough. Upon this stationary sleeve 11, is carried a worm gear 12, at the lower end thereof, with which meshes a gear 13, carried by a shaft 14, suitably journaled in the revolving frame 5, and extending in transverse direction with reference to drive shaft 4, and carrying gears 15, at the respective ends thereof, arranged to mesh with drive gears 16, carried upon the shafts 9. Thus it will be seen that as frame 5, revolves with shaft 4, the intermeshing worm gears 12, 13, will impart axial rotative movement to shaft 14, through the intermeshing gears 15, 16, thereby imparting axial rotative movement to shafts 9, and the filter screens 7.

The pulp to be filtered may be supplied to the machine in any suitable manner. I have shown a delivery shaft or spout 18, delivering into a receiving receptacle 19, suitably supported upon the revolving frame 5, to revolve therewith. From this receiving receptacle 19, the material to be filtered is distributed and delivered to the filter screens 7, through delivery spouts 20. In practice I prefer to arrange the delivery ends of the spouts 20, to extend into close proximity to that portion of the inside surface of the filter screens 7, which is farthest away from the axis of rotation of drive shaft 4, and hence to the point where the greatest centrifugal force and power is developed. The liquid portion of the material to be filtered in the operation of the machine passes through the walls of the screen 7, and is received in the launder or trough 21, from whence such liquid portion is drawn off through the delivery spout 22. The solid portions of the material to be filtered remain against the inner surface of the walls of the screens until detached therefrom; as will be more fully hereinafter explained when such solid portion will fall into the

space 23, below such screens, or to any desired receptacles to receive the same. If desired and in order to assist the centrifugal action in detaching the adhering particles or portions of solid matter from the walls of the screens when the screens are moved relatively to the revolving frame 5, sufficiently far for centrifugal action to operate thereon, and in order to clear the filter screens, I may arrange a water-jet 24, to play against the filter screens from the outside thereof, as clearly indicated in the drawing Fig. 1, the water sprays being supplied with water through a pipe 25, arranged in any suitable manner.

In the construction and arrangement of the machine the stationary frame 3, may be supported in any convenient manner, as, for instance, by a base plate 26, resting upon a conveniently arranged foundation 27. The main drive shaft 4, as shown and above mentioned, and preferably, is a vertical shaft, and is journaled at its upper end within the sleeve 11, and at its lower end said shaft is journaled in a step bearing 28, in any suitable or convenient manner.

It is obvious that the screens 8, may be of any suitable material, or of any suitable construction, permitting a filter operation and therefore in the use of the term "screen", I do not desire to be limited or restricted.

In the operation of the apparatus the main drive shaft 4, and with it the frame 5, and the parts carried thereby, is rotated at a high speed as, for instance, a speed of two hundred revolutions per minute, while the screens 8, are moved relatively to the frames 5, and independently of the movement thereof due to the revolution of the frame 5, but at a very slow speed, say, for instance, at two revolutions per minute upon their axes, such slow relative movements being imparted through the arrangement of worm gearing above described and as shown in the drawings.

The material to be filtered is delivered from the chute or hopper 18, into the receptacle 19, and from thence is distributed to the filter screens, in the manner above described with the result that the liquid contents of the material pass through the screens and is received in the launder or

trough 21, and thence escapes through the spout 22, while the solid content is deposited through the opened bottom of the screens into the receiving receptacle below.

A filter machine embodying the principles of my invention may be employed for any purpose for which a filtering operation is desired such, for instance, as in the separation of solid and liquid portions of pulp in milling operations, in the preparation and treatment of ores in connection with the cyanid or other processes, or for other milling work. The apparatus is equally well adapted for use for other purposes and in other relations, such, for instance, as separating the water contained from the solid portions of brewers' grains, mashies and pulp in distilleries, and, generally for all purposes where a filtering operation is required, or a separation of liquid or solid portions of masses is required.

It is obvious that many variations and changes in the details of construction and arrangement might readily occur to persons skilled in the art and still fall within the spirit and scope of my invention. I do not desire, therefore, to be limited or restricted to the exact details of construction shown and described. But

Having now set forth the object and nature of my invention and a construction embodying the principles thereof, and having described such construction and its functions and mode of operation, what I claim as new and useful and of my own invention is:

The combination with a revolving frame, of two or more screens carried by said frame, means for revolving said screens each upon its own axis, means for delivering the material to be treated against the inner wall of the screens at a point farthest removed from the axis of revolution of said frame, and means for delivering a spray against the outer wall of the screens at a point nearest the axis of revolution of the frame.

In testimony whereof I have hereunto set my hand in the presence of the subscribing witnesses, on this 25th day of April A. D., 1908.

WILLIAM MATTHEW BARKER.

Witnesses:

ALAN FRAZER McCORMICK,
PRESTON KING HOMER.