

June 16, 1936.

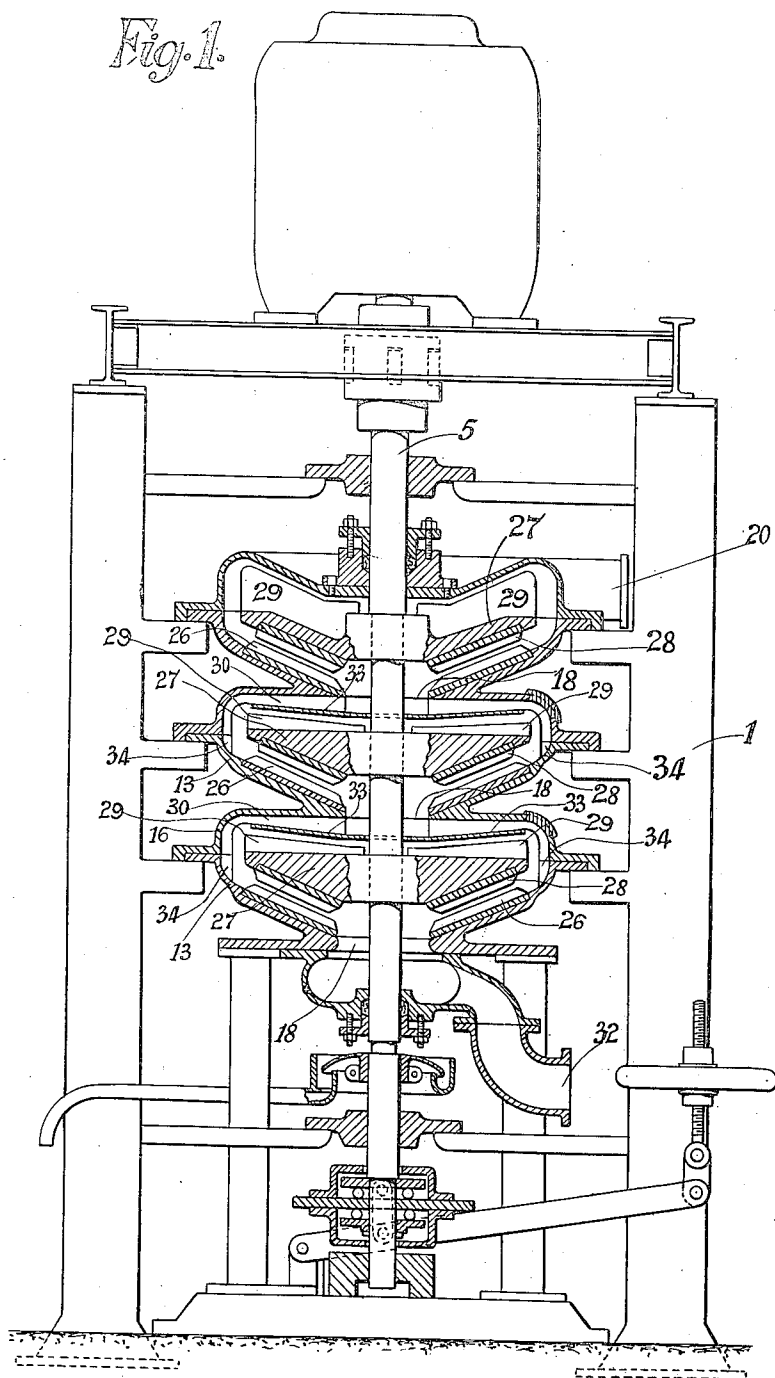
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2,044,480

GRINDING MACHINE FOR PAPER PULP

Filed Sept. 7, 1935

2 Sheets-Sheet 1



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Fig. 2.

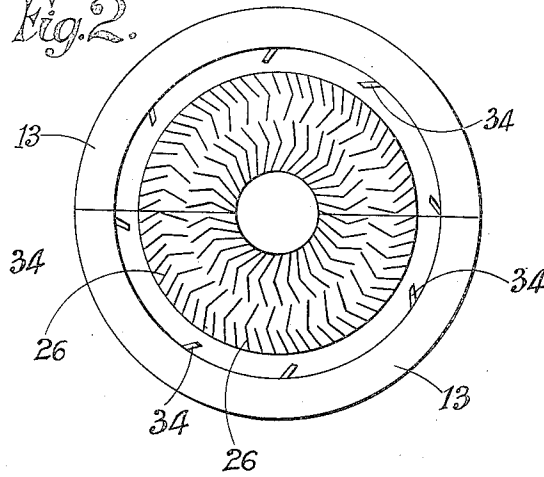


Fig. 3.

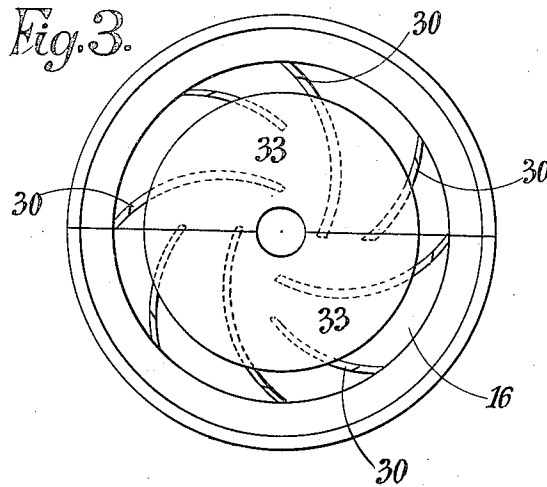
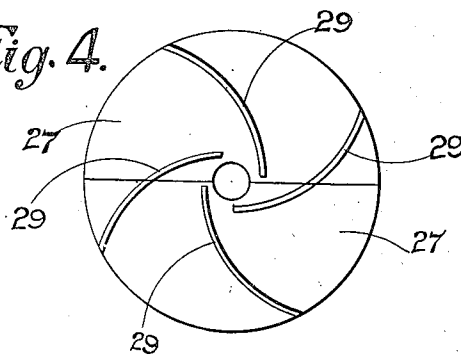


Fig. 4.



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UNITED STATES PATENT OFFICE

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GRINDING MACHINE FOR PAPER PULP

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2 Claims. (Cl. 92—26)

This invention relates to that kind of grinding machines for paper pulp wherein there are superposed rotary grinding discs having grinding blades on the under sides and propeller vanes on the upper sides, the said discs being provided in a stationary casing provided with grinding blades and guide vanes, and the paper pulp being forced upwards under pressure through the casing so as to travel radially outwards between the cooperating grinding blades and then travel radially inwards between upper sides of the rotary discs and the undersides of parts of a stationary casing.

The object of my invention is to avoid the possibility of any pulp lodging and ceasing to travel inwardly to the succeeding higher grinding blades.

In accordance with my invention, a grinding machine for paper pulp has disc-like walls which together with the said guide vanes form inwardly extending passages for the pulp, the said walls also cooperating with outwardly acting propeller vanes provided on the upper sides of the rotary discs to prevent entrance of pulp to and lodgment of pulp on the upper surfaces of the rotary discs.

The said walls are preferably dished to increase the height of the passages towards the centre of the casing means and thereby compensate for the reduction in width of the said passages towards the centre.

I attain the hereinbefore stated object by the means hereinafter described and shown in the annexed drawings wherein—

Figure 1 is a view in vertical section of a grinding machine for paper pulp.

Figure 2 is a detached plan view of the lower part of a stationary grinding disc.

Figure 3 is a detached plan view, regarded from below, of a part of the casing.

Figure 4 is a detached plan view of a rotary grinding disc.

The machine shown in the drawings comprises a frame 1 in which is mounted a vertical shaft 2 provided with three rotary, conically dished grinding discs 27 having grinding blades 28 on their under sides and a flat upper surface provided with scoop-like, radial propeller vanes 29. The grinding blades 28 cooperate with grinding blades 26 provided on the upper surfaces of stationary dished, conical discs 13 having central apertures 18, the two uppermost stationary discs 13 having inverted dished flanges 16 forming part of the said casing, the under sides of which flanges are opposed to the upper sides of the rotary discs 27 and are provided with scoop-like, radial guide vanes 30. The pulp is forced under pressure, for example by means of a pump (not shown),

through the inlet 32, and up through the machine, and leaves the machine at the outlet 20. Whilst passing through the machine, the pulp travels radially outwards between the cooperating grinding blades 26 and 28, and then radially inwards between the upper sides of the flanges 16 and then through one of the central apertures 18 to the next higher blades 26 and 28.

A disc-like wall 33 is joined to the under edges of the guide vanes 30 to form with the said vanes passages extending from the periphery of each inverted dished flange 16 to the central aperture 18 provided in the corresponding stationary dished conical disc. The wall 33 extends beyond the inner ends of the guide vanes 30 to separate the aperture 18 from the upper surface of the corresponding rotary disc 27. The propeller vanes 29 on the rotary disc 27 lie below the wall 33 and are separated thereby from the guide vanes 30 on the inverted dished flange 16. The propeller vanes 29 on the rotary disc 27 act in an outwardly propellant direction and internal ribs 34 are provided on the stationary dished conical disc 13 at the periphery thereof to form continuations or extensions of the guide vanes 30 on the flange 16.

The guide vanes 30 on the flange 16 are of greater depth at the centre, the said wall 33 therefore being of disc-like formation and the passages produced being deeper at the centre.

In operation the pulp forced upwardly under pressure through the lowermost central aperture 18 in each stationary disc is driven outwardly by the said pressure and centrifugal action, and during its outward travel it is ground by the grinding blades 26 and 28.

The pressure and centrifugal action continues to act on the pulp after it has reached the periphery of the rotary disc 27 and forcibly flings the pulp against the ribs 34 which guide the pulp upwards and between the vanes 30 on the flange 16, the following pulp forcing the preceding pulp through the passages formed by the vanes 30 and the wall 33 in an inward direction until it reaches the next higher central aperture 18, up which it is forced to the succeeding grinding blades 26 and 28. The pulp is prevented from leaving the ribs 34 and the entrance ends of the vanes 30 on the flange 16 by the action of the vanes 29 on the upper side of the rotary disc 27, the said action defeating any attempt of the pulp to enter and find lodgment between the upper surface of the rotary disc 27 and the under surface of the wall 33.

Due to the increase in depth towards the centre of the passages formed by the vanes 30 and the

5 wall 33, the restriction in the width of the said passages due to their convergence from the periphery of the flange towards the centre is partially or wholly compensated for and the pulp can therefore flow at a substantially uniform velocity through all parts of the said passages.

Alternate of the guide vanes 38 may be formed shorter than the others to assist in preventing any constriction of the flow of pulp towards the centre.

10 I claim—

1. In a paper pulp grinding machine having superposed rotary grinding discs provided in a stationary casing, disc-like walls which together with the guide vanes provided on the stationary

casing form inwardly extending passages for the pulp the said disc-like walls cooperating with outwardly acting propeller vanes provided on the upper sides of the rotary discs to prevent entrance of the pulp to and lodgment of pulp on the upper surfaces of the rotary discs.

2. In a grinding machine according to claim 1, the dishing of the said disc-like walls to increase the height of the passage towards the centre of the casing means and thereby compensate for the reduction in width of the said passages towards the centre.

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