

Aug. 25, 1942.

J. A. WIENER

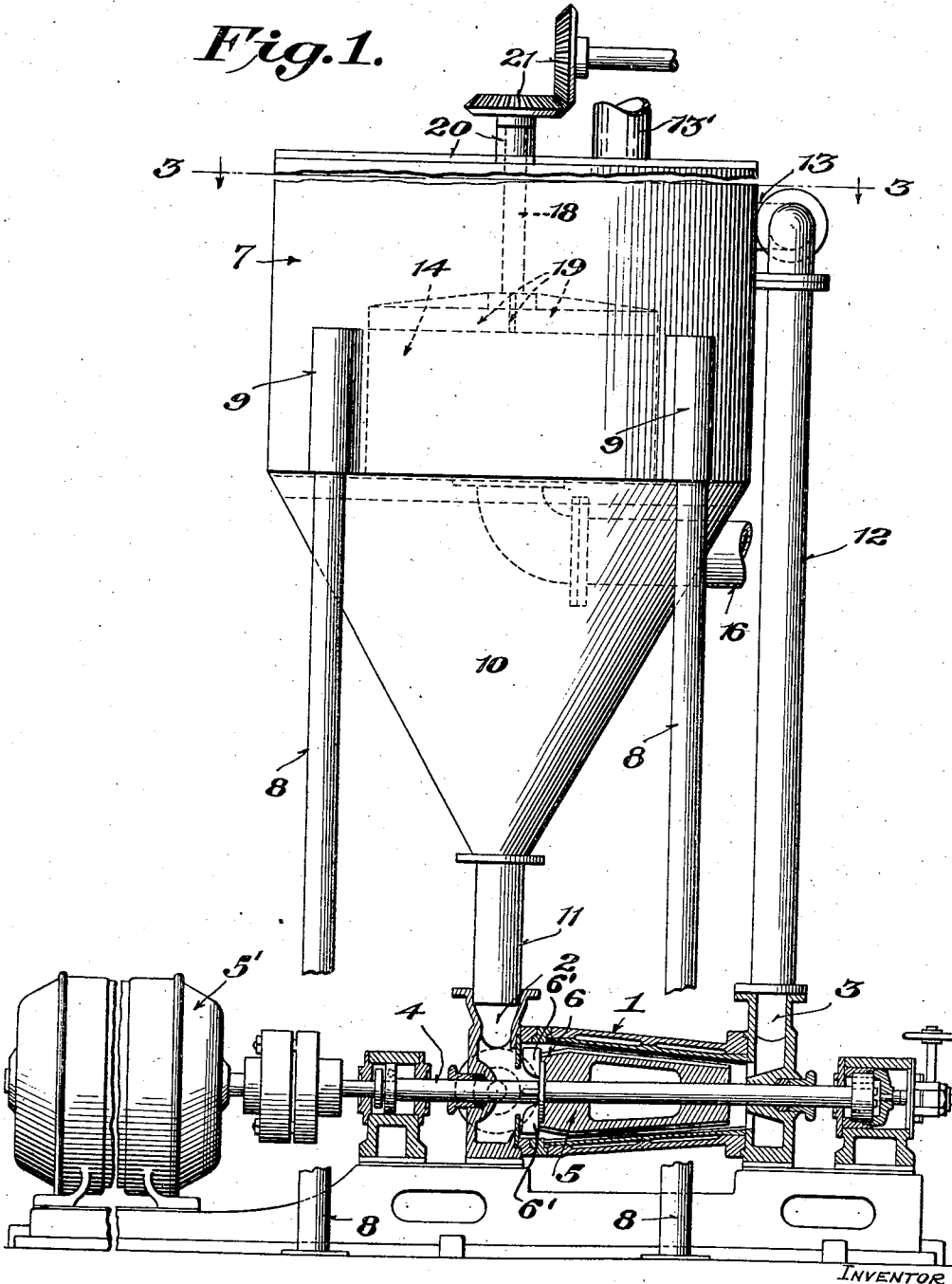
2,294,060

PULP TREATMENT

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Fig. 1.



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Fig. 2.

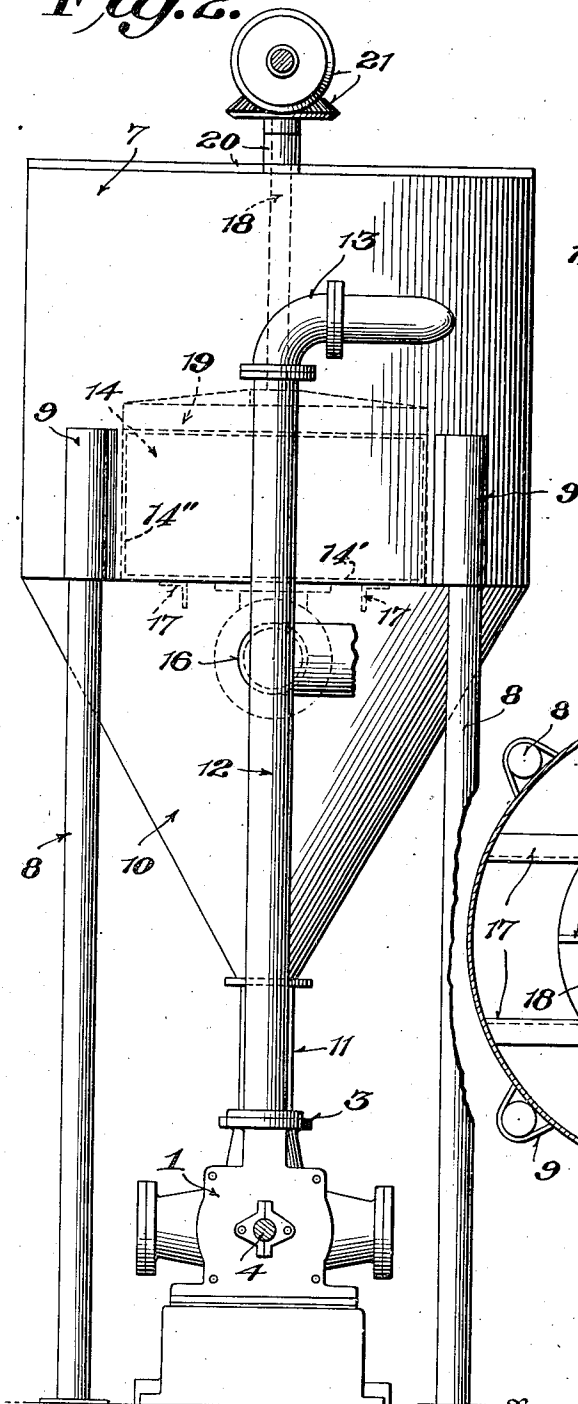


Fig. 4.

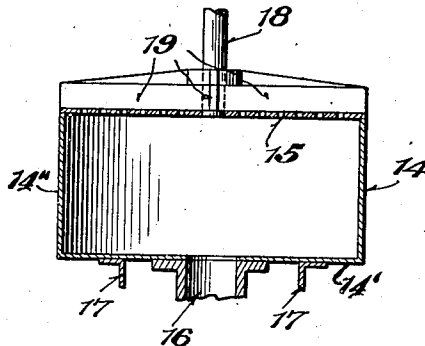
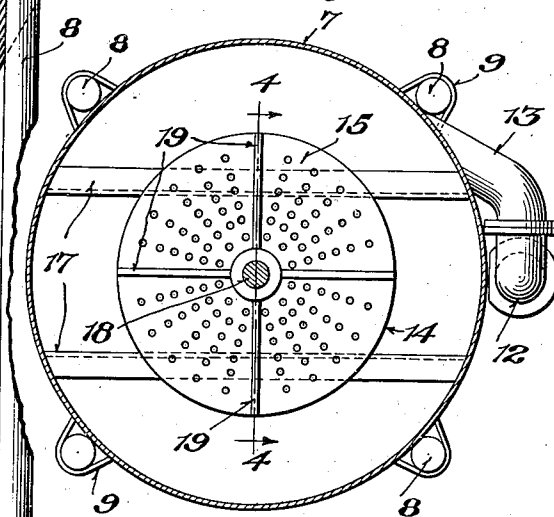


Fig. 3.



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UNITED STATES PATENT OFFICE

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PULP TREATMENT

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2 Claims. (Cl. 92-23)

This invention relates to pulp treatment, more particularly wood pulp, although not so limited.

The primary object of the invention is to provide improved means for expeditiously refining the waste products of paper mills, such as tailings, or other coarse and rejected fibers, to a predetermined degree, more specifically by initially charging a receiver with material to be refined, having screening means therein, and therefrom after screening, passing the mass into a grinder, then after grinding returning the ground mass into the receiver to be screened, and again returning the rejected or unaccepted portion of the mass to the grinder, which process is continuously repeated ad infinitum, until the entire charge is ground to the predetermined extent, or "accepted."

A further object of the invention is to provide an apparatus of this type, wherein the receiver or hopper is separate from the grinder and functions to not only receive and convey the charge to the grinder, but also cooperates with the screening mechanism, thereby serving in a dual capacity.

The invention further aims to increase the capacity of an apparatus of this type, without increasing the size of the grinder.

Still further, the invention aims to provide means for more expeditiously screening the charge by subjecting same to a scraping action during screening.

Still further, the invention aims to provide an apparatus of this character which is attachable to grinders of present-day type, such as generally illustrated in my Patent No. 1,939,747, dated December 19, 1933.

In addition, the invention also is aimed at the simplicity, compactness, and economy in production, and application.

Other objects will be hereinafter referred to, and of themselves manifested in the course of the following.

In the drawings:

Fig. 1 is a front elevation of the invention partly broken away and partly in section;

Fig. 2 is an end elevation partly in section;

Fig. 3 is a plan view, the gearing for rotating the section on line 3-3 of Fig. 1, and

Fig. 4 is a section on line 4-4 of Fig. 3, showing the screening apparatus.

In proceeding in accordance with the present invention, a grinding apparatus is shown, which generally may be of the character disclosed in my said patent, and which briefly involves a casing 1, having an inlet 2, and an outlet 3, 55

with a shaft 4, driven by a motor 5', extending through the casing and having thereon a grinding member 5, provided with axially extending cutting blades 5, and also blades 6', which propel or force the material from the inlet 2, to the outlet 3. It will be understood in this regard that any form of grinder suitable for the purpose, having an inlet and outlet, and propelling means can be used, since same forms no part of the invention.

A receiver or hopper 7, is provided and is spaced from the grinder, preferably located above the grinder and supported in a fixed position in any suitable manner, herein shown as vertically disposed posts 8, the upper ends of which are received within, sockets 9, formed on the periphery of the receiver. The lower end of the hopper is of funnel formation as shown at 10, and has its lower terminal connected by a pipe 11, to the inlet 2, of the grinder. A pipe or conduit 12, is connected to the outlet 3, of the grinder and has an elbow 13, at its upper end, which extends into the upper portion of the hopper substantially tangential thereto, so as to discharge material from the grinder into the hopper.

For the purpose of screening the material within the hopper, a drum-like or cylindrical member 14, is provided, the top 15, of which is foraminated, the foraminations being of predetermined size so as to enable pulp of predetermined size to pass therethrough. As depicted in Fig. 4, the drum 14, has a closed bottom 14' to which is connected a conduit 16, the latter conducting the screened or refined pulp to any selected external point, not shown. Struts 17, are secured to the bottom of the drum and to the interior of the hopper, so as to support the drum with its bottom adjacent the upper end of the funnel-like portion 10, of the hopper. For the purpose of constantly maintaining the top of the screening apparatus free of any fibers of a size which might partially enter the foraminations of the screen and thus clog the latter, as well as to macerate smaller particles, susceptible to easy reduction in size and hence acceptable, a scraping mechanism is provided, which consists of a shaft 18, having a series of radially extending scraping blades 19, secured to its lower end. The blades as clearly shown in Figs. 3 and 4 have a wiping action against the foraminated top of the drum. The shaft 18 may be supported by a journal and strut 20, the latter rigidly secured to the top of the hopper as depicted in Figs. 1 and 2. Likewise the shaft 18

may be driven by any suitable means, such as the miter gears 21, as illustrated, which latter are operated from any suitable source of power, not shown.

By referring to Figs. 1, 2, and 3 it will be noted that the side or bounding walls 14' of the screening drum 14, are spaced from the adjacent walls of the hopper, whereby to provide for free passage of the unrefined material past the drum into the funnel, and through the latter to the grinder.

As shown particularly in Fig. 3 of the drawings, the unrefined mass returned to the hopper by the grinder, through pipe or conduit 12, and its elbow 13, which latter constitutes a nozzle, enters the hopper substantially tangential thereto, the mass being impinged against the hopper walls and thereby given a swirling motion, or vortex, so as to facilitate screening. The mass accordingly is agitated, and thereby opportunity for entry of the screenable fibers into the screen is materially increased, augmented by the nozzle 13 discharging the material above the screening mechanism, so that the swirl is initiated above the latter.

In operation, the charge of a slurry of coarse fibers, which is to be converted into acceptable stock, which consists of waste products of paper mills, such as tallings and other coarse fibers, is introduced into the hopper in any suitable manner, for example through a pipe 13' and initially screened therein, assisted by the scraping blades which act to macerate encountered fibers and hence render same acceptable to the screening apparatus, as well as to sweep off fibers of excessive size. All rejected fibers gravitate through the space between the drum 14, and hopper, and from the latter into the funnel 10, and then enter the inlet to the grinder where the fibers are ground. After grinding the fibers are forced by the grinder upwardly through the outlet 3, and conduit 12-13, and are returned to the hopper 7, where they are again subjected to the screening action, which process is completed until the charge is completely accepted by the screening or refining apparatus.

With the present invention, however, and with the screening apparatus formed and acting independently, and located exteriorly, of the grinding apparatus as distinguished from my aforesaid

patent, it will be apparent that the capacity of refining of the entire apparatus is greatly increased, and consequently refining can be more expeditiously effected.

In addition, in the present invention, by virtue of the scraping and macerating of the fibers simultaneously with screening increases the speed of operation or capacity of the apparatus in refining a charge, or constantly occurring or continuous charges of coarse fibers.

The hereindescribed embodiment of the invention, it is to be understood, is by way of example, and is subject to all changes, alterations and modifications, that fall within the spirit and scope of the invention, as announced by the following claims.

What is claimed is:

1. A fibrous pulp treating apparatus including a receiver, an accepted stock chamber disposed within and spaced from the receiver, screening means disposed between the receiver and chamber, a grinder having an inlet, a conduit connecting the inlet with said receiver to convey material rejected by the screening means to the grinder, a conduit communicating with the chamber and screening means for conducting material screened by the latter to a point externally of the receiver, said grinder having an outlet and a conduit connected to the outlet and to the receiver for conveying the ground material back into the receiver for rescreening; the receiver, the two conduits connected to same and to the grinder, and the latter conjointly forming a continuous circuit for the mass to be screened until accepted by the screening means, and means for operating the grinder so as to grind and also force the material ground thereby into the second conduit and thence back into the receiver.

2. A fibrous pulp treating apparatus in accordance with claim 1, wherein the receiver has curved sides, and wherein the conduit for conveying the ground material into the receiver has an outlet disposed tangential to the receiver and above the screening means for discharging the ground material against the curved sides of the receiver thereby to impart a swirling movement to the ground material, above the screening means.

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