

H. F. STORRER.  
PULP REFINER.

APPLICATION FILED SEPT. 30, 1915. RENEWED MAY 29, 1920.

1,346,277.

Patented July 13, 1920.

2 SHEETS—SHEET 1.

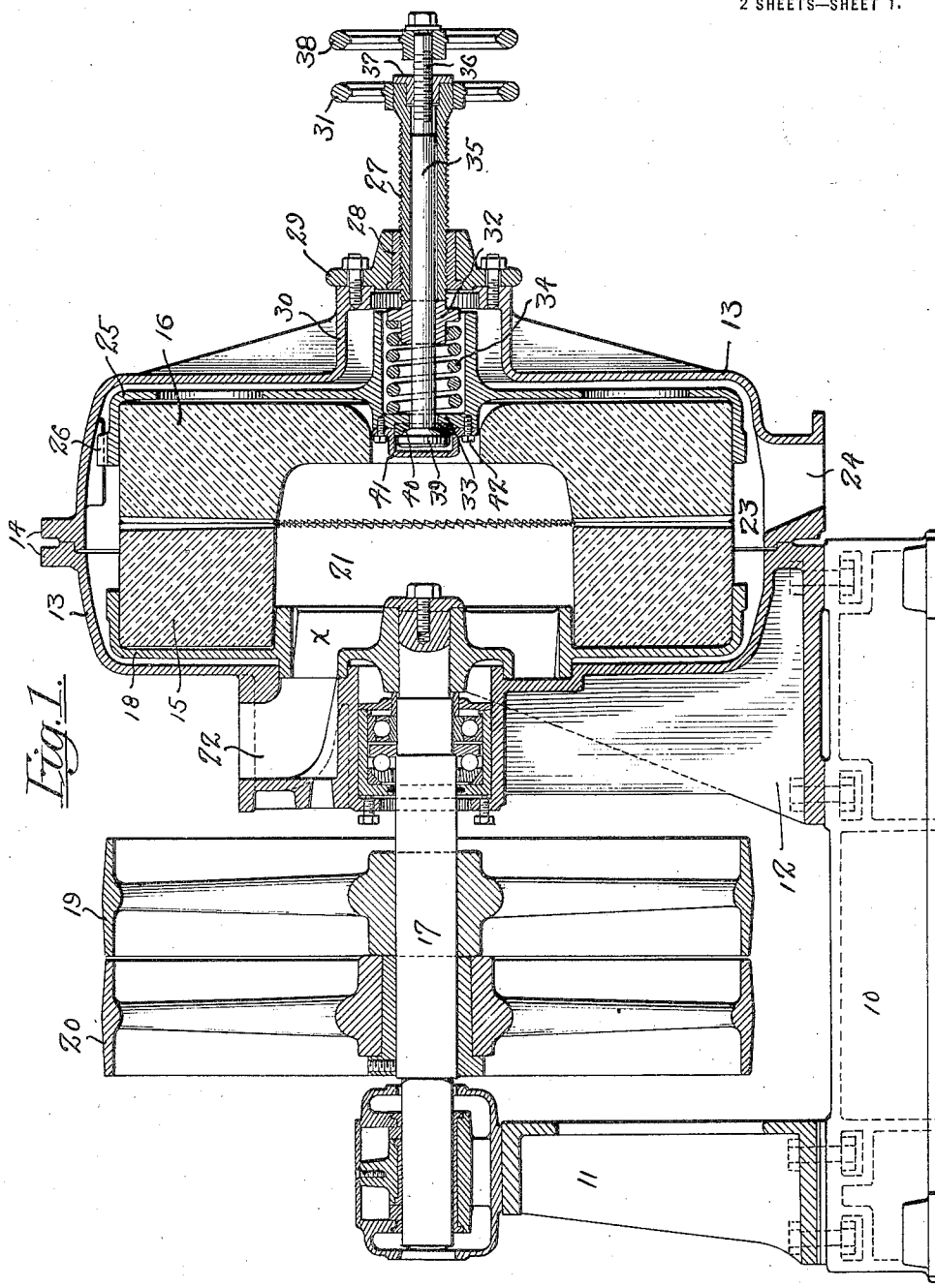


Fig. 1.

Witness

*John H. Stone*

Inventor

By *HERMANN F. STORRER*  
his Attorneys

*Kroon and Kroon*

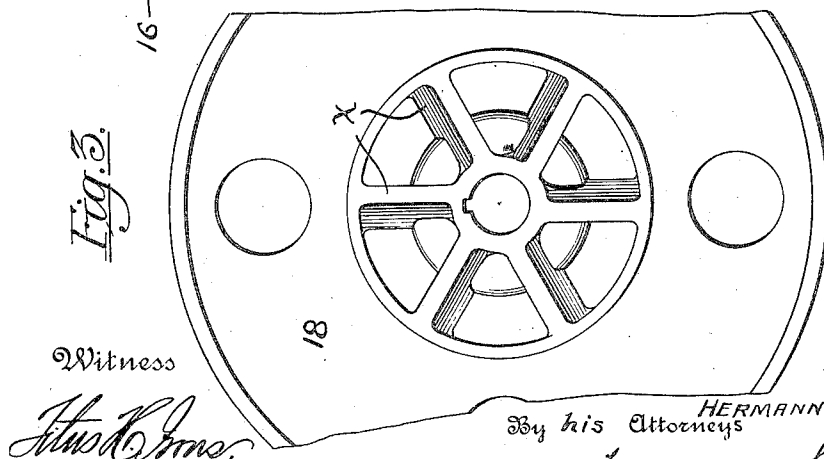
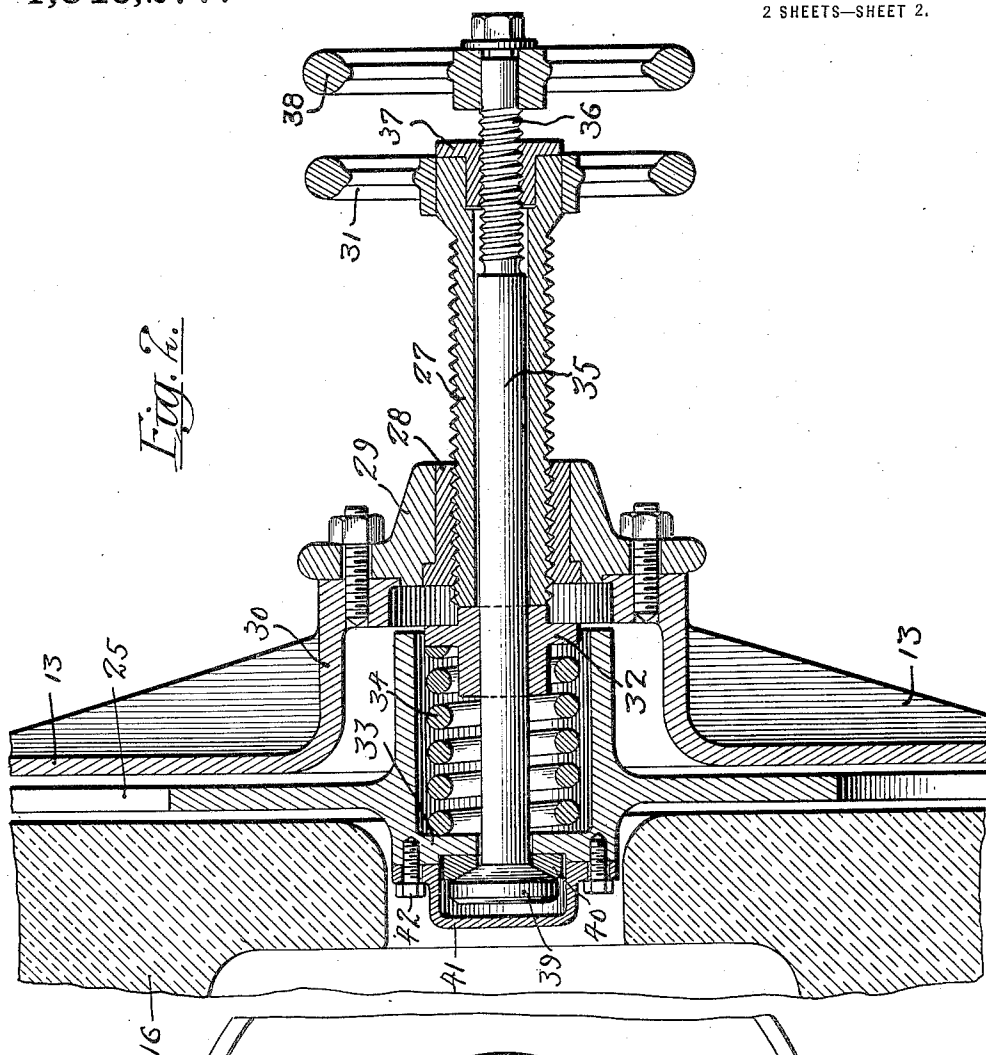
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Witness

*H. F. Storrer*

Inventor

By his Attorneys **HERMANN F. STORRER**

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# UNITED STATES PATENT OFFICE.

HERMANN F. STORRER, OF NEW YORK, N. Y., ASSIGNOR TO J. M. VOITH COMPANY, INC., A CORPORATION OF NEW YORK.

## PULP-REFINER.

1,346,277.

Specification of Letters Patent.

Patented July 13, 1920.

Application filed September 30, 1915, Serial No. 53,299. Renewed May 29, 1920. Serial No. 385,643.

*To all whom it may concern:*

Be it known that I, HERMANN F. STORRER, a citizen of the Republic of Switzerland, and residing in the city, county, and State of New York, have invented a certain new and Improved Pulp-Refiner, of which the following is a specification.

The present invention relates to a pulp refiner for paper mills or the like and particularly to an improved method of adjusting the grind stones with relation to each other, the object of my invention being to provide a simple and efficacious device acting solely upon the stationary stone and by which the approach of the stones can be adjusted as desired without altering the tension of the pressure spring and at the same time permit the tension of the pressure spring to be varied without altering the approach of the stones.

In the accompanying drawings,

Figure 1 is a longitudinal section through an apparatus in which my invention is embodied in one form;

Fig. 2 is an enlarged section of the details of the adjusting mechanism; and

Fig. 3 is a broken elevation of the runner cup.

In the form here shown the present refiner comprises a base 10 from which rise the standards 11 and 12. The stationary casing 13 of the refiner is carried by the standard 12 and is formed in halves bolted together through marginal flanges 14. Within the casing are arranged the grind stones 15 and 16, the latter being stationary, while the former is driven from the shaft 17 to the end of which is bolted the cup 18 in which the runner stone is mounted. The shaft 17 may be driven in any suitable manner, as for instance by an electric motor mounted thereon, but for the sake of simplicity I have here shown merely a pair of pulleys 19 and 20, the latter keyed to a shaft, and the other idle thereon in well understood manner. The pulp stock is led through the inlet 22 into the feed chamber 21 formed in the center of the stones and the refined material is discharged through the discharge passage 24 from the annular chamber 23 surrounding the stones. The cup 25, carrying the stationary stone 16, is provided with studs 26 engaging suitable stops on the casing 13 to prevent the rotation of the stone, while at the same time per-

mitting the latter to be moved forward to approach the stone 15 as the working faces of the stones wear away. The cup carrying the runner 15 has its hub in the form of a spider, the plates  $\alpha$  of which are inclined so as to drive the stock into the feed chamber and force it between the working faces of the stones.

The adjusting mechanism is confined to the stationary stone 16 so that it is unnecessary to disturb or to rearrange the drive connection to the runner stone 15 on each adjustment as has heretofore been customary. In the form shown, the adjusting mechanism comprises a sleeve 27 externally threaded to engage the tapped bushing 28, carried by the cap 29 bolted to the boss 30 on the casing. At its outer end this sleeve carries a hand wheel 31 by which it may be rotated in the bushing, while at its inner end it carries a thrust bushing 32 between which and the flange 33 on the hub of the cup 25 is interposed the thrust spring 34. When the hand wheel 31 is rotated in a direction to force the thrust bearing 32 inward into the casing, the tension of the spring 34 is increased and the pressure upon the pulp between the stones 15 and 16 correspondingly augmented. To adjust the approach of the working faces of the stones toward each other, I provide a rod 35 having a threaded portion 36 which engages the tapped bushing 37 in the outer end of the sleeve 27. This rod carries a hand wheel 38 at its outer end and a head 39 at its inner end against which the hub flange 33 of the cup 25 bears through a suitable bushing 40. When the handle 38 is screwed in a direction to force the head 39 inward into the casing, the cup 25 is simultaneously forced in the same direction by the spring 34 thus approaching the faces of the stones closer together.

In order to protect the adjusting mechanism from the pulp stock within the chamber 21, I provide a cap 41 inclosing the head 39 on the spindle 35 and bolted at 42 to the hub of the cup 25.

If it is desired merely to increase the pressure between the stones without altering the space between the same, the hand wheel 31 is rotated in a direction to compress the spring 34. If it is desired to approach the stones closer together and at the same time lessen the pressure of the spring

34, the hand wheel 38 is rotated in a direction to advance the spindle head 39 into the casing. If it is desired to approach the stones closer without changing the pressure of the spring 34, the hand wheels 31 and 38 are rotated simultaneously in the same direction, thus advancing both the spindle head 39 and the thrust bushing 32 the same distance.

10 Among the advantages of the construction disclosed may be pointed out the fact (1) that the driving spindle 17 is not affected in any way by the adjustment of the stones; (2) the adjustment is confined to the stationary stone; (3) it is possible to conveniently use an electromotor directly connected to the driving shaft 17, a construction not hitherto practicable where the adjustments involve a displacement of the driving spindle; (4) the approach of the stones may be adjusted without changing the adjustment of the pressure spring; (5) the pressure between the stones may be varied without altering the approach of the stones; (6) the feed of the stock to the stones is improved by the drive of the inclined spider plates of the runner cup style which the stock enters.

I claim as my invention:—

30 1. In a pulp refiner, a runner stone, a stationary stone cooperating therewith, a carrier cup for said stationary stone, having an axial sleeve, a pressure spring within said sleeve bearing against one end of the latter, a movable abutment for the other end of said spring within said sleeve, and means for displacing said cup and spring abutment simultaneously or independently of each other to vary the position of said stones with relation to each other or the pressure of the spring on the stationary stone.

45 2. In a pulp refiner, a runner stone, a stationary stone cooperating therewith, a carrier cup for said stationary stone, having an axial sleeve, a pressure spring within said sleeve bearing against one end of the latter, a movable abutment for the other end of said spring within said sleeve, a thrust spindle passing through the sleeve and hav-

ing a thrust head against which said sleeve bears under the action of said pressure spring, a cover cap for said head, and means for moving said spindle and cup simultaneously or either alone to vary the position of the stones with relation to each other or the pressure of the spring on the stationary stone.

3. In a pulp refiner, a runner stone, a stationary stone cooperating therewith, a casing inclosing said stones and having on one side a hub coaxial therewith, a tapped bush in said hub, an abutment sleeve threaded into said bush, a pressure spring interposed between said sleeve and the stationary stone, a tapped bush in the outer end of said sleeve, a threaded rod screwed through said sleeve and bush and having a thrust head engaged by said stationary stone, together with means for rotating said sleeve and rod in unison or separately to adjust the approach of said stones or the thrust of the pressure spring, substantially as described.

4. In a pulp refiner, a runner stone, a stationary stone cooperating therewith, a spring thrusting said stationary stone toward the runner stone, a sleeve carrying an abutment for one end of said spring, a spindle passing through said sleeve, a thrust head on said spindle against which said stationary stone bears under the thrust of said spring, and means for displacing said sleeve and spindle either with relation to each other or together, for the purpose described.

5. In a pulp refiner, a centrally apertured runner stone, a cup carrying the same and having a spider hub comprising inclined plates and means for leading the stock to said spider hub, whereby the stock is forced by the inclined plates of the latter into the feed chamber and between the working faces of the stones.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses.

HERMANN F. STORRER.

Witnesses:

L. H. GROTE,

HUBERT HOWSON.