Oct. 8, 1929. J. A. WIENER 1,730,908

FIBER STOCK REFINING APPARATUS

Filed Dec. 12, 1927 2 Sheets-Sheet 1

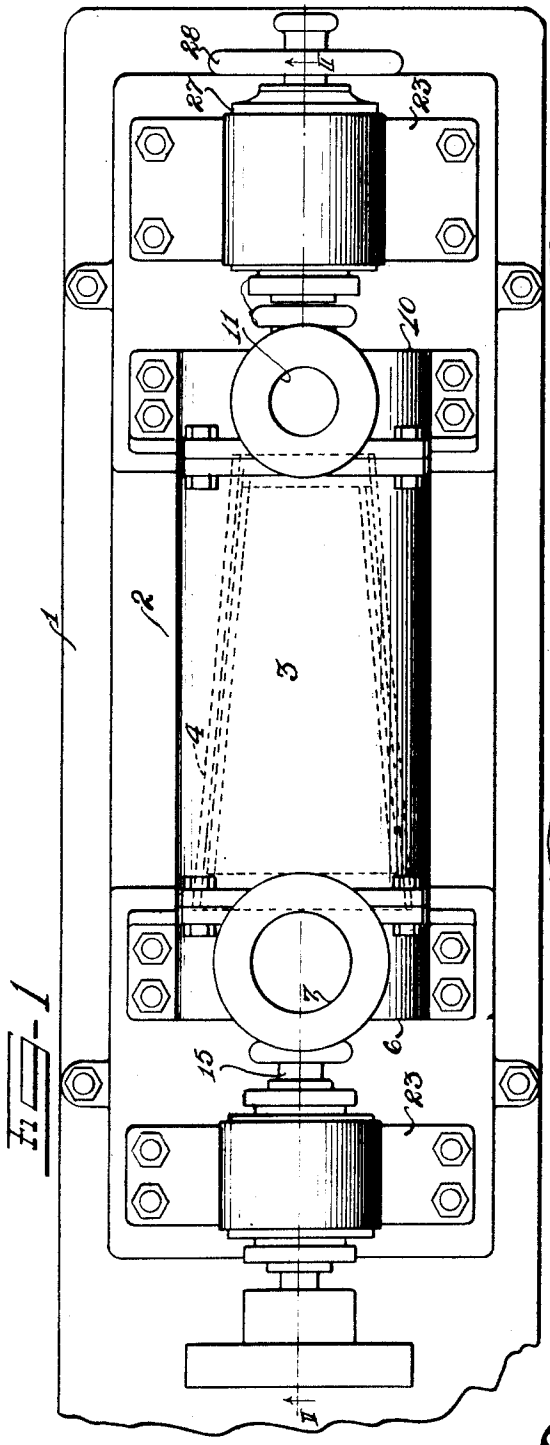

Fig. 1

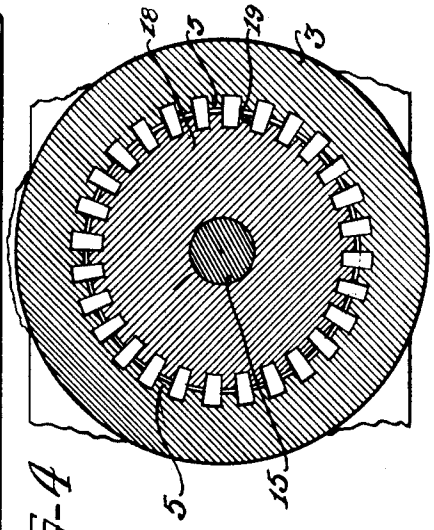

Fig. 4

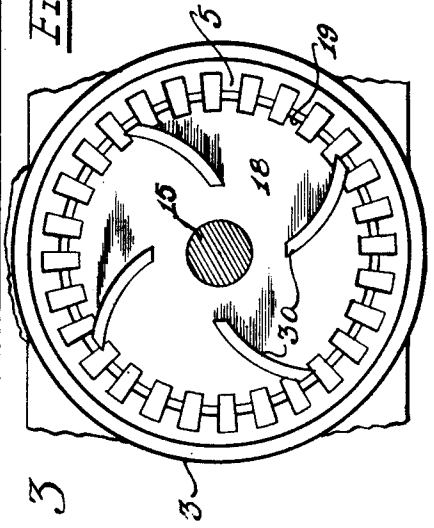

Fig. 3

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FIBER STOCK REFINING APPARATUS

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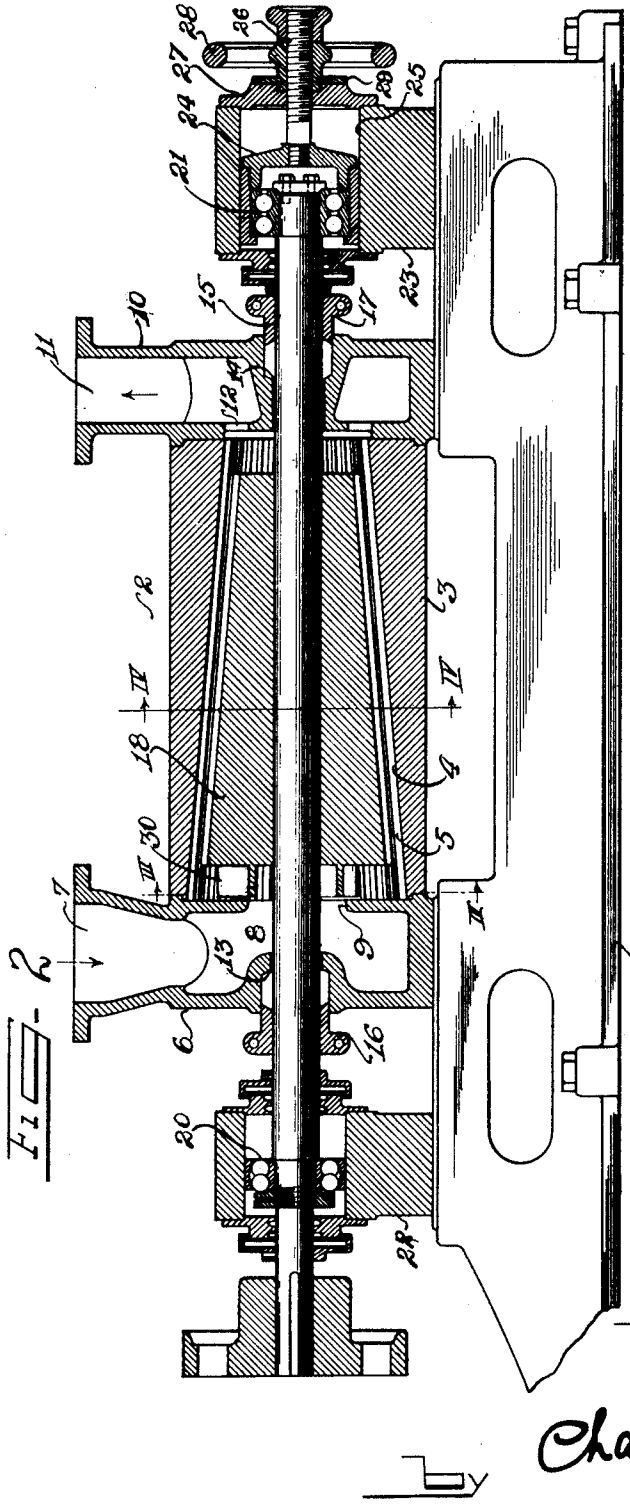

Fig. 2

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Patented Oct. 8, 1929 1,730,908

UNITED STATES PATENT OFFICE

JOHN A. WIENER, OF LAUREL, MISSISSIPPI

FIBER-STOCK-REFINING APPARATUS

Application filed December 12, 1927. Serial No. 239,275.

This invention relates to fiber stock refining apparatus, more particularly of the Jordan type.

In the usual Jordan engine installations, the stock is fed by gravity under a small head into the smaller end of the engine and discharged at the larger end. The Jordan engine itself acts as a pump for the stock and will, if necessary, lift the stock through a small distance.

I have now found, however, that if the direction of flow of stock through the engine is reversed, a more efficient refining of the stock results. In order to cause the stock to flow against the natural flow induced by the pump-like action of the engine, it is necessary to supply positive impelling means for the stock. In accordance with my present invention, impeller blades are formed or secured on the larger end of the Jordan plug in such a manner that the stock is forced from the large end of the Jordan to the small end, with markedly increased refining efficiency.

It is therefore an object of this invention to provide a refining apparatus of the Jordan engine type, wherein means are provided for increasing the refining efficiency thereof by reversing the direction of flow of the stock from that normally taken.

Other and further important objects of this invention will be apparent from the disclosures in the specification and the accompanying drawings.

This invention (in a preferred form) is illustrated in the drawings and hereinafter more fully described.

On the drawings:

Figure 1 is a top plan view of a fiber stock refining apparatus embodying the principles of my invention;

Figure 2 is a sectional view taken on line II—II of Figure 1;

Figure 3 is an enlarged sectional view taken on line III—III of Figure 2;

Figure 4 is an enlarged sectional view taken on line IV—IV of Figure 2.

The reference numeral 1 indicates a base or pedestal adapted to support a fiber stock refining apparatus of the Jordan type, indicated as a whole by the reference numeral 2. Said refining apparatus 2 comprises an outer shell 3 having a frusto-conical bore 4 extending throughout its length. Bed knives 5 of suitable metal are adapted to be formed lengthwise of said bore 4 but may suitably be made separately and secured therein in any desired manner. An end section 6 is secured to said shell 3 at the larger end of the bore 4 and provides an inlet passage 7 and chamber 8 for the introduction of pulp stock through an opening 9 into the bore 4. Another end section 10 having an outlet port 11 communicating by way of an annular passage 12 with the bore 4 is secured at the other end of said casing 3. Both end sections 6 and 10 are bored as at 13 and 14 respectively to receive a shaft 15, packing glands 16 and 17 being provided to prevent leakage around the shaft.

A grinding plug 18 is adapted to be keyed upon the shaft 15 for rotation within the bore 4. Said plug 18 is also of frusto-conical shape but considerably shorter than the bore 4 to provide for longitudinal adjustment, as will later be explained. Said plug 18 carries spaced knives 19 extending in parallel rows throughout the length of the plug. The knives 19 may be either integrally formed with the core 18 or made separately and secured thereto. The blades or knives 19 must of course be accurately ground to correspond in pitch with the bed plate knives 5, so that stock passing between the two sets of knives may be refined to the desired degree.

The shaft 15 is journaled in bearings 20 and 21 slidably mounted in bearing pedestals 22 and 23 respectively. The bearings 21 are rigidly secured in a cage 24 slidable within a slot 25 formed in the pedestal 23. A threaded shaft 26, secured at one end to the cage 24, extends through a head 27 closing the slot 25 and is provided at its outer extended end with a wheel 28. Said wheel 28 is threaded upon the extended end of the shaft 26 and held against longitudinal movement by means of a plate 29 on the head 27. Said wheel 28 thus serves to adjust the position of the plug 18 within the bore 4 to determine the distance between the respective knives 5 and 19.

The present invention consists in providing impeller blades 30 upon the larger end of the plug 18 to serve to force the stock between the respective knives 5 and 19. Each of said impeller blades 30 comprises a curved plate securely mounted upon the larger end of the plug 18 and extending to the periphery of said core. Said impeller blades 30, however, terminate short of the shaft 15 to provide an opening substantially co-extensive with the opening 9 for the admission of stock.

The curvature of the blades 30 throws the stock outwardly in the same manner as a pump runner and thus forces the stock through the space between the core 18 and the surface of the bore 4. The stock is discharged through the ports 12 and the discharge port 11.

The direction which the stock takes in passing through the refining apparatus 2 is thus seen to be opposite to that which the stock takes in the usual refining engines of the Jordan type. It has been found, however, that the efficiency of the refining apparatus is greater in apparatus constructed in accordance with my invention. It has further been found that less power is required to drive a refining engine of the Jordan type when provided with impellers such as described, than is required for the usual Jordan.

I am aware that many changes may be made and numerous details of construction may be varied through a wide range without departing from the principles of this invention, and I, therefore, do not purpose limiting the patent granted hereon otherwise than necessitated by the prior art.

I claim as my invention:

1. Fiber stock refining apparatus, comprising a shell having a frusto-conical shaped bore, a frusto-conical plug rotatably mounted in said bore and impeller blades secured on the larger end of said plug to force stock through to the smaller end between the surface of said rotating plug and the inner surface of said shell.

2. In a fiber stock refining apparatus of the Jordan type, a frusto-conical plug having impeller blades formed on its larger end to force the stock in an opposite direction to that normally taken.

3. In a Jordan engine, a frusto-conical plug and plurality of curved impeller blades projecting from the larger end of said plug and extending to the periphery thereof, said blades terminating short of the axis of said plug.

In testimony whereof I have hereunto subscribed my name at Laurel, Jones County, Mississippi.

JOHN A. WIENER.