(No Model.) 2 Sheets—Sheet 1.

F. A. CLOUDMAN.

KNOTTER.

No. 392,719. Patented Nov. 13, 1888.

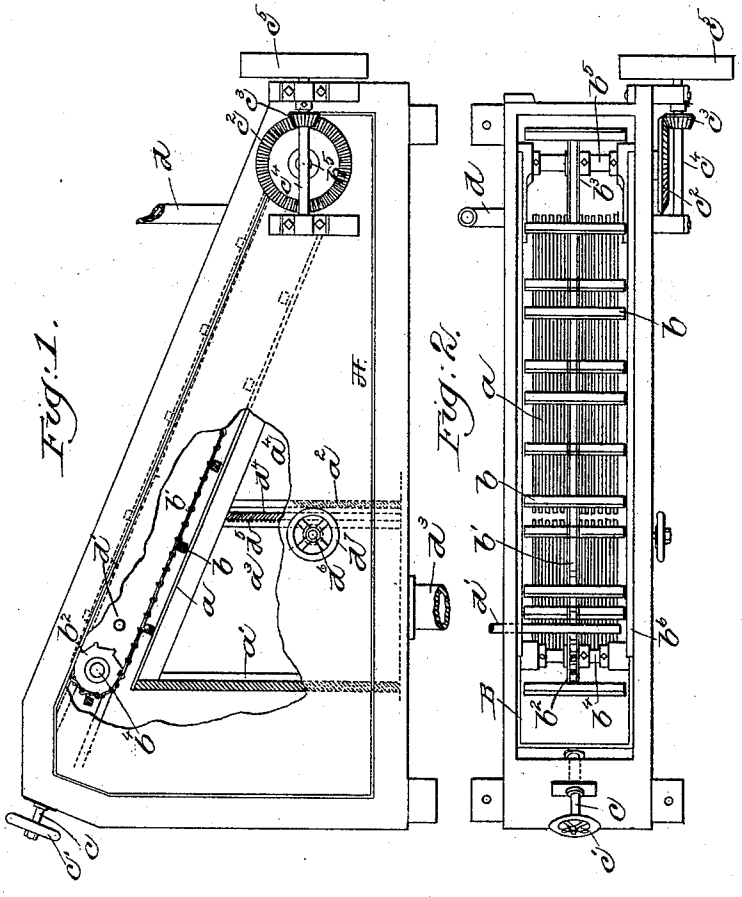


Fig. 1.

Fig. 2.

Witnesses.
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Francis A. Cloudman.
by Crosby & Gregory.
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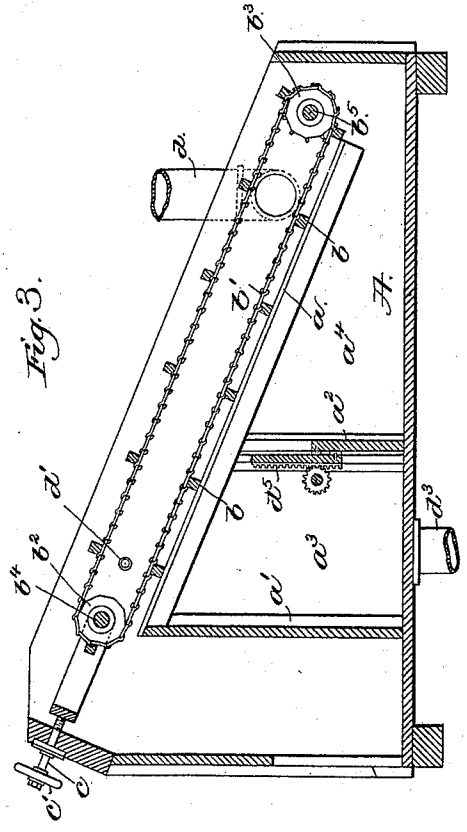
(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.



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UNITED STATES PATENT OFFICE.

FRANCIS A. CLOUDMAN, OF CUMBERLAND MILLS, MAINE, ASSIGNOR TO S. D. WARREN & COMPANY, OF BOSTON, MASSACHUSETTS.

KNOTTER.

SPECIFICATION forming part of Letters Patent No. 392,719, dated November 13, 1888.

Application filed July 28, 1887. Serial No. 245,507. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS A. CLOUDMAN, of Cumberland Mills, county of Cumberland, and State of Maine, have invented an Improvement in Knotters, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention relates to pulp-screens, and has for its object to provide apparatus by which the knots and coarse material may be removed from the screen-plate, the finer fiber of wood or other material passing through the said screen-plate.

My improved apparatus or knotter, as it will be hereinafter designated by me, will preferably be used in connection with a pulp screen or dresser of any ordinary construction, and in practice the knotter will be located, preferably, below the said pulp screen or dresser, so that a surplus of fiber mixed with water may flow from the box in which the screen or dresser is placed into the said knotter.

The fiber mixed with knots, or containing bunches and other coarse material, is conveyed upward over a preferably-inclined coarse screen-plate by a carrier shown as bars or flights attached to an endless chain passed about sprocket-wheels, the latter being revolved, as will be described, to cause the endless chain to travel. The bars or flights lie upon and scrape over the screen-plate, and the knots of fiber and other material too coarse to pass through the screen-plate are carried up by the said bars or flights and discharged into a receptacle, or it may be upon the floor. The mixture of fibers and knots carried up by the bars or flights referred to will preferably be subjected to the action of a stream or spray of water discharged upon the screen-plate near its upper end, the said water washing the fiber through the screen-plate into a chamber below the screen-plate, and from which it may be pumped to the main screen or dresser above the knotter.

The particular features in which my invention consists will be pointed out in the claims at the end of this specification.

Figure 1 is a side elevation, partially broken out, of a knotter constructed in accordance with my invention; Fig. 2, a top or plan view of Fig. 1; and Fig. 3, a longitudinal vertical section of the knotter shown in Fig. 1, to more clearly show the adjustable gate, the pipe *d* being enlarged.

The box or curb A contains within it an inclined coarse screen-plate, *a*, which may be supported in any suitable manner above partitions $a' a^2$, forming chambers a^3 a^4 below said screen-plate. The screen-plate *a* has co-operating with it, as shown, a number of flights or bars, *b*, attached to an endless chain, *b'*, passed about sprocket-wheels b^2 b^3, mounted on shafts b^4 b^5, the shaft b^4 being mounted in a frame, B, movable in guides b^6, the frame B, as shown, being made adjustable in the guides b^6, to regulate the tension of the chain *b'* by means of an adjusting device, shown as the screw *c*, operated by the hand-wheel *c'*. The endless chain *b'* is made to travel, as shown, by means of the bevel gear c^2 in mesh with the pinion c^3 on the shaft c^4, to which rotation is imparted by the band-wheel c^5, driven in any suitable manner.

My improved knotter is designed to be used in connection with the pulp screen or dresser of any suitable construction, and the said knotter is connected with the overflow of the said pulp screen or dresser by a pipe, *d*, which conducts the surplus fiber from the pulp-screen into the chamber a^4.

The fiber in the chamber a^4 is carried up over the inclined screen-plate *a*, having its lower end below the level of the liquid in the chamber a^4, by the flights or bars *b*, and as it is thus carried up the said fiber is subjected to a stream or spray of water issuing, as shown, from a perforated pipe, *d'*, connected with a water-supply, (not shown,) the said pipe being so located as to direct the water downward over the screen-plate. The finer or softer particles or knots of fiber are thus washed through the screen into the chamber a^3, from whence the said fiber may be returned by the pipe d^3, connected with a pump, (not shown,) to the main pulp screen or dresser. The harder knots and coarser particles of fiber not disintegrated by the bars *b*, and which are not washed through the screen *a*, remain upon the said screen, and are carried up and discharged over the end of the screen into a suitable receptacle, (not shown,) or it may be upon the floor.

As herein shown, I have provided an over-

flow or gate, d^4, having a rack, d^5, in mesh with a pinion on a shaft, d^6, supported by the box or curb A, the said shaft having a hand-wheel, d^7, by which the said overflow or gate may be raised or lowered to vary the amount of fiber in the chamber a^4, whereby more or less of the screen-plate is covered with liquid, thus presenting a large or smaller surface of the screen-plate upon which the knots may be deposited—as, for instance, when the pulp contains large quantities of coarse knots not easily disintegrated, the gate d^5 will be raised so as to cover a large part of the screen-plate with liquid, whereby a large quantity of the said knots may be deposited on the screen-plate and separated from the finer pulp. If the pulp is of a softer nature and substantially free from knots, the gate may be lowered to permit the pulp to pass to the chamber a^3, only a small portion of the screen-plate being immersed in the liquid. By regulating the amount of overflow passing through the pipe d and by means of the adjustable gate the amount of liquid in the chamber a^4 may be controlled and the capacity of the said chamber increased, so as to prevent the said liquid, which contains the knots and coarse particles of pulp, from flowing into the chamber a^3 and mixing with the pulp which has been freed from knots, and which is pumped back to the screen (not shown) to be passed therethrough.

I claim—

1. In an apparatus for removing knots and coarser particles from pulp fibers, a box or curb to contain pulp, an inclined screen-plate, and a carrier to convey the pulp up the said screen-plate, combined with a water-discharge located above the screen-plate to wash the fine particles of pulp carried up the screen by the carrier through the said screen, while the coarser particles or knots are carried over the screen, substantially as specified.

2. In an apparatus for removing knots and coarser particles from pulp fibers, a box or curb to contain pulp, an inclined screen-plate, and an endless chain having flights or bars attached to it and normally resting upon the screen-plate, combined with gearing to move the said chain, and with a pipe, d', to discharge water upon the screen-plate, as and for the purpose specified.

3. A box or curb, A, provided with chambers a^3 a^4, a pipe, d^3, communicating with the chamber a^3, and a pipe, d, communicating with the chamber a^4, combined with an overflow or gate, d^4, substantially as described.

4. The box or curb A, an inclined screen-plate, a, located therein, an endless chain having flights or bars b, and sprocket-wheels b^2 b^3, over which the said chain is passed, combined with gearing to rotate said sprocket-wheels, and with an adjusting device to adjust the tension of the endless chain, substantially as specified.

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

FRANCIS A. CLOUDMAN.

Witnesses:
HENRY NUTTER,
M. W. ARMSTRONG.