

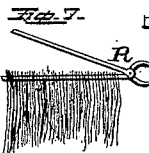
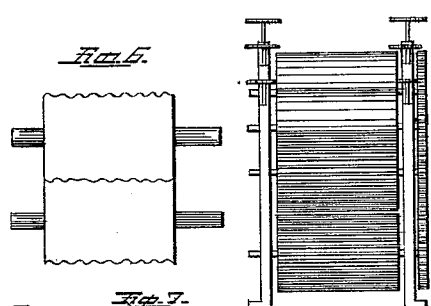
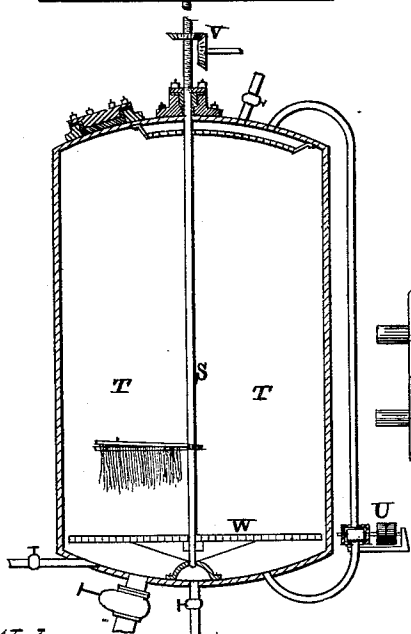
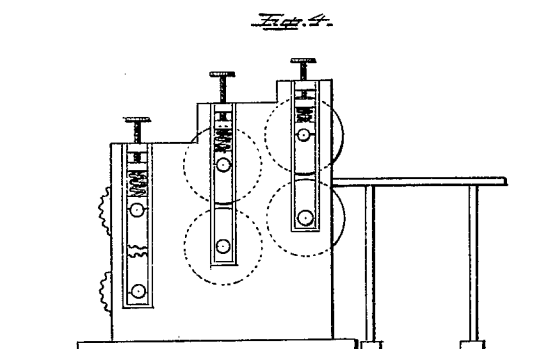
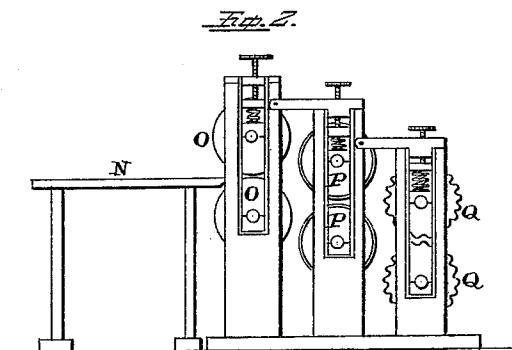
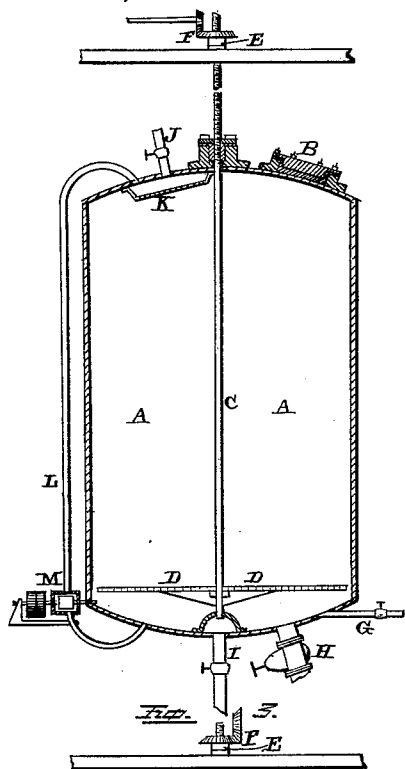
(No Model.)

2 Sheets—Sheet 1.

H. B. MEECH.
Machine for the Reduction of Vegetable Fiber
for Spinning, &c.

No. 241,815.

Patented May 24, 1881.



Witnesses:
W. W. Mortimer.
C. H. Isham

Inventor:
H. B. Meach,
per
F. A. Lehmann, atty.

(No Model.)

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Fig. 8

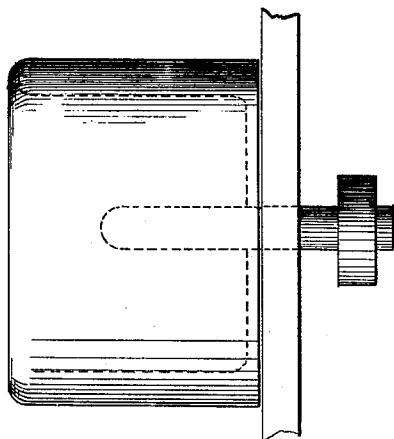
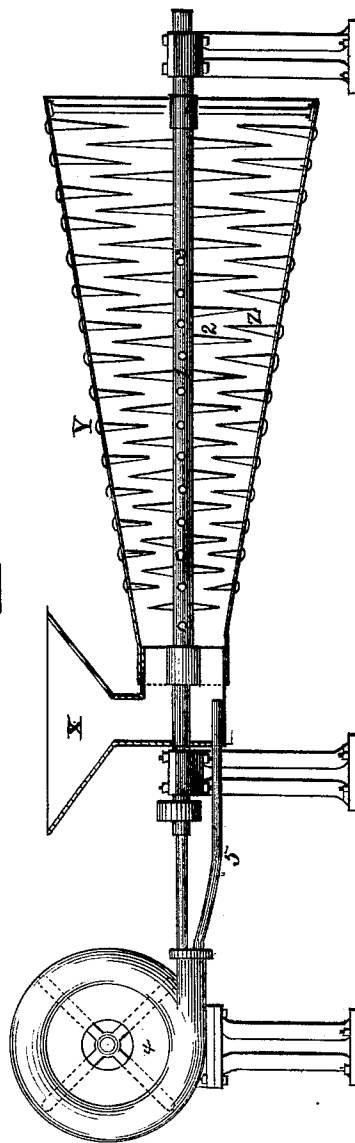


Fig. 9



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UNITED STATES PATENT OFFICE.

HARRISON B. MEECH, OF CHATHAM VILLAGE, NEW YORK.

MACHINE FOR THE REDUCTION OF VEGETABLE FIBER FOR SPINNING, &c.

SPECIFICATION forming part of Letters Patent No. 241,815, dated May 24, 1881.

Application filed October 8, 1880. (No model.)

To all whom it may concern:

Be it known that I, HARRISON B. MEECH, of Chatham Village, in the county of Columbia and State of New York, have invented certain new and useful Improvements in Reduction of Vegetable Fiber for Spinning, &c.; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in the reduction of vegetable fibers for felting and spinning; and it consists in crushing the fiber of jute, ramee-plant, Chinese grasses, and other such plants, and then packing the crushed fiber in a boiler, where it is boiled in a suitable solution, and again passed through suitable crushing-rolls and then bleached and passed through a whipping-cylinder, all of which will be more fully described hereinafter.

Figures 1 and 3 are vertical sections of the boilers in which the fiber is boiled and bleached. Figs. 2, 4, 5, and 6 are different views of the crushing-rolls for rubbing the fiber. Fig. 7 is a view of the tongs for holding the fiber in the boiler while being bleached. Fig. 8 is a side elevation of the centrifugal machine. Fig. 9 is a longitudinal section of the receiving-cylinder, through which the fiber is passed.

A represents a suitable boiler, of any desired shape, size, or construction, and which is provided with a man-hole, B, in its top, through which the crushed fiber is packed into the boiler.

Passing down through the center of the boiler is a shaft, C, which has a screw-thread formed upon its upper end, and which has a perforated bottom, D, secured to it at its lower end. This shaft passes through a suitable stuffing-box in the top of the boiler, which is made steam-tight. This shaft is not intended to revolve, but it has a vertical movement for the purpose of raising the perforated bottom D, so as to elevate the crushed fiber that is packed upon it up to the man-hole B, where it is taken out of the boiler after it has been sufficiently boiled. For the purpose of raising and lowering the shaft C there is placed a nut, E, upon its outer end, and connected with this nut E are the two beveled gears F. When these two gears are made to

revolve the nut causes the shaft to either descend, so as to force the perforated bottom D down to the bottom of the boiler, or raises it upward toward the top.

Leading into the bottom of the boiler is the steam-pipe G, through which steam is conducted, from any suitable source, into the boiler, for the purpose of boiling the fiber that is placed therein, and leading from the bottom of the boiler are the two outlet-pipes H I. Leading into the top of the boiler is an inlet-pipe, J, which discharges just over the top of the sieve K.

The two ends of the boiler are connected together by an outside pipe, L, which has placed in it or connected to it a suitable pump, M.

After the boiler has been filled with fiber, which has preferably been crushed, the man-hole is closed and the boiler is filled with a solution of caustic soda, of about the strength of 30° Baumé, through the pipe J, which solution is sprinkled over the top of the cane through the screen K until the mass of cane is covered over. Steam is then admitted into the boiler through the pipe G at a temperature of about 300°, and the fiber is boiled from about six to ten hours. While this boiling is taking place the pump M is kept constantly in action, so as to keep up a constant circulation of the liquor in the boiler, and thus keep the liquor passing constantly through the fiber. After the fiber has been sufficiently boiled the liquor is drawn off through the pipe I, and then clear water is passed in through the pipe J until the fiber has been thoroughly cleaned. The material is then taken out of the boiler through the man-hole B, and is passed between the crushing and rubbing rolls. (Represented in Fig. 2.) In connection with these rolls is a table, N, upon which the fiber is placed, and from which it is passed between the two upper rolls, O, which have smooth surfaces, and from these two rolls it is passed on through the two rolls P, which are vertically corrugated, and from these rolls P it is passed through the other set, Q, which are corrugated longitudinally. The upper pair of rolls, O, crush the fiber, while the second set, P, split it, and at the same time rub and press it, while the third set, Q, crush and rub the fiber. The top roll may be longitudinally oscillated endwise by suitable cams at the same time that it operates in connection with the

third roll, Q. All these rolls are operated by suitable gears, and are mounted in suitable frame-work and provided with set-screws and springs, in the usual manner, for the purpose of regulating the pressure upon the fiber as it is passed in between them.

After the fiber has been treated by the three sets of rolls, as above described, it is placed upon suitable tongs, R, which are made to clamp upon the shaft S, which passes through the boiler T. Tongs after tongs full of the fiber are applied to the shaft, which has both a vertical and a rotary motion, until the boiler is nearly full. This fiber is bleached white by chlorine gas under pressure, at the same time that the chlorine solution in the boiler is made to constantly circulate back and forth by means of a pump, U. While the fiber is attached to the shaft the two gears F, by means of which the shaft S is raised and lowered, are thrown out of gear with the shaft, and a second set of gears, V, are brought into operation, so as to cause the shaft to revolve and move the fiber, which is attached to it by means of the tongs, constantly around and through the solution in the boiler.

The tongs R are here shown for holding the fiber clamped to the shaft; but, if so preferred, instead of attaching the fiber to the tongs, the fiber may be packed upon the false bottom W. In removing the fiber from this boiler T, whether attached to the shaft or packed upon the false bottom, the shaft is raised upward by means of the gears F and nut E, so as to bring the fiber within easy reach of the man-hole. After the fiber has been taken from this boiler T it is passed through a second set of pressing and rubbing rolls, (shown in Fig. 4;) or the fiber may be put into a centrifugal machine and the water thrown out. After the fiber has thus been treated it is placed in the hopper X of the whipping and drying machine. From this hopper the fiber passes into the revolving cylinder Y, which is provided with a series of teeth, Z, upon its inner side. Passing through the center of this cylinder is the shaft 1, which also has a series of teeth, 2, secured to it, and a series of holes, 3, made through it, so as to allow the air forced into it by the blower 4 to pass freely out into the cylinder. Also, leading from the blower

into the head of the cylinder is an air-pipe, 5, through which a current of air is forced for the purpose of blowing and feeding the fiber forward toward the other end of the cylinder. As the cylinder revolves in one direction and the shaft in the other, it is evident that the fiber will be dried and separated, so that each fiber is separated from another, so as to be ready to be carded and spun or used for felting.

Having thus described my invention, I claim—

1. The combination of the boiler A, a rod, C, having a screw-thread formed upon its upper end, and the bottom D, secured to the rod, whereby the fiber is raised up to the man-hole, substantially as shown.

2. In the treatment of fiber, the combination of a pair of rollers, O, having smooth surfaces, the pair of rollers P, vertically corrugated, and the pair of rollers Q, corrugated endwise, substantially as set forth.

3. The combination of a boiler, a shaft, and the tongs for holding the fiber, substantially as specified.

4. The process described of bleaching the fiber, consisting in taking the fiber, after it has been reduced or broken, and securing it by suitable means to a revolving shaft, and then moving the fiber continuously through the bleaching-solution, substantially as specified.

5. The combination of the hopper X, cylinder Y, provided with teeth, and revolving toothed shaft 1, the shaft being made hollow, and provided with air-holes, through which the air passes into the cylinder, substantially as described.

6. The combination of the hopper, revolving toothed cylinder Y, hollow perforated toothed shaft 1, blower 4, and air-pipe 5, the shaft and pipe being connected to the blower, so as to carry currents of air into the cylinder to dry the fiber and force it out of the cylinder, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 20th day of May, 1880.

HARRISON B. MEECH.

Witnesses:

CHAS. H. ISHAM,
F. A. LEHMANN.