

No. 733,595.

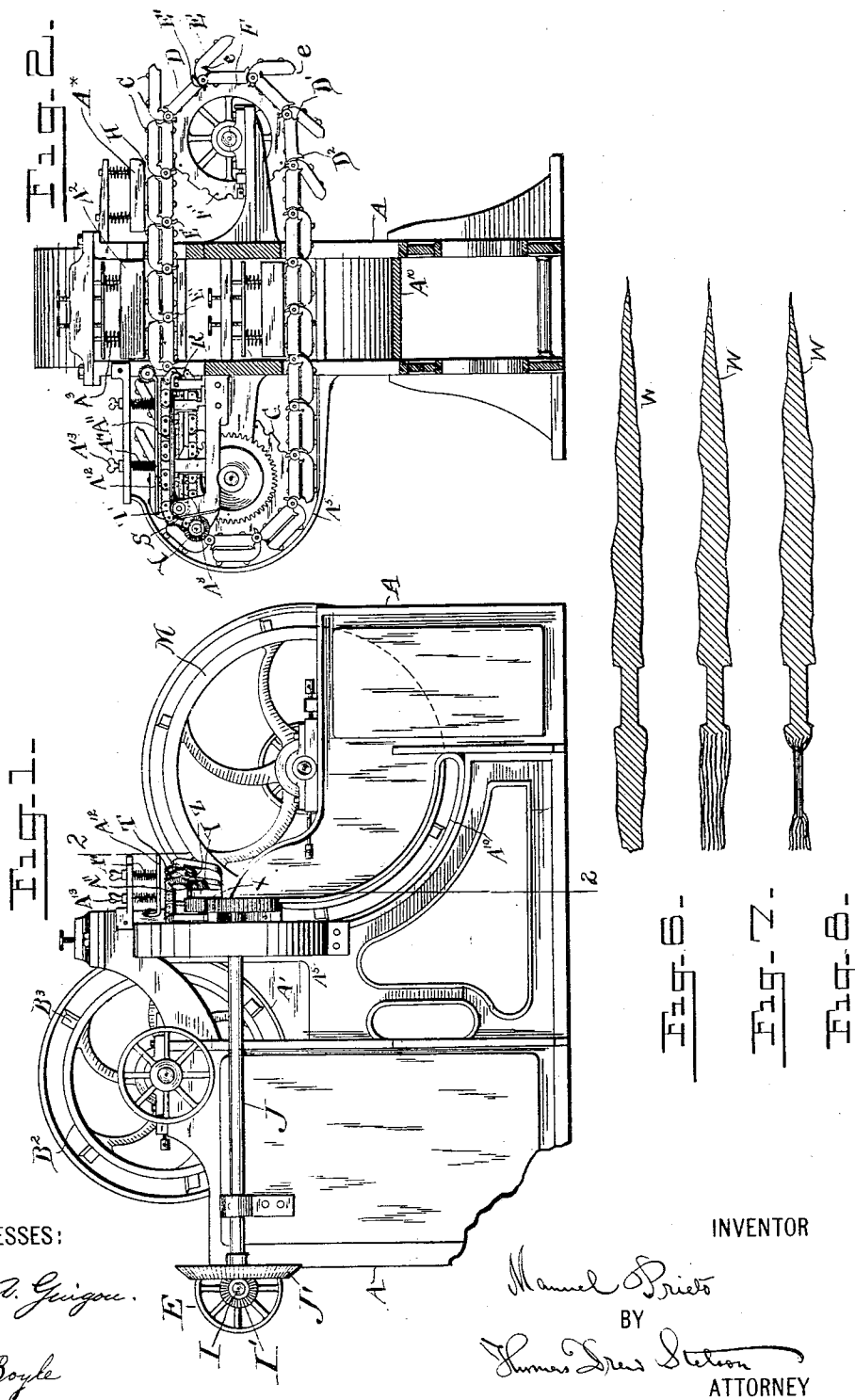
PATENTED JULY 14, 1903.

M. PRIETO.
FIBER PREPARING MACHINE.

APPLICATION FILED MAY 22, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



UNITED STATES PATENT OFFICE.

MANUEL PRIETO, OF MEXICO, MEXICO.

FIBER-PREPARING MACHINE.

SPECIFICATION forming part of Letters Patent No. 733,595, dated July 14, 1903.

Application filed May 22, 1902. Serial No. 108,517. (No model.)

To all whom it may concern:

Be it known that I, MANUEL PRIETO, a citizen of the Republic of Mexico, residing in the city of Mexico, in the Republic of Mexico, have invented a certain new and useful Improvement in Fiber-Preparing Machines, of which the following is a specification.

My machine is adapted for treating many varieties of plants having long leaves in which there is strong fiber extending lengthwise and which require only the removal of the juice, the pulp, and the outer covering to render such fiber available. Many efforts have been previously made by myself and others to thus treat such plants, and the fiber has been utilized with some degree of success for various purposes, eminently the manufacture of cordage.

My present improvement is intended to overcome difficulties heretofore met with and to promote the certainty and economy of operation.

I employ as the feeding and holding means one slowly-traversing chain provided with clamps hinged thereto and provisions for opening and closing them. The portions of the plants are introduced successively each in a transverse position into the several clamps while in the open position and are strongly seized and carried past a beating-drum, and a short projecting portion on one side of the chain is thereby presented to the beaters and cleaned. I will describe the material as leaves of all species of *Agave*, commonly known as "aloes." The leaves are introduced with the butts extending the shortest distance and presented to be first treated. As the chain continues its slow movement the clamps are again opened sufficiently to relax the hold on the leaves, and the long untreated end of each leaf is seized by the aid of another chain worked independently and carried obliquely away, with the effect to pull endwise the partially-treated leaf and thus to move it across the chain. The obliquely-traversing chain has a rough surface adapted to engage the leaf by friction and is of such length and set at such angle to the main chain that it pulls the partly-treated leaf through the clamp to a sufficient extent to expose all the untreated portion of the leaf on the opposite side of the chain. Then the clamp closes tightly and

strongly again and the independent chain releases the leaf, the main chain proceeds and carries the leaf and presents it to another beater, which works on the opposite side of the chain from the first, and beats and thoroughly cleans all the previously-untreated portion. This is a highly important improvement in the mode of operating. Difficulties are experienced which I provide against by projections at both ends of each clamp, at one end defending the joint against being clogged by portions of the leaves and at the other end guarding against the liability of the leaf being squeezed out wedgewise as the clamps are strongly closed.

The following is a description of what I consider the best means of carrying out the invention.

The accompanying drawings form a part of this specification.

Figure 1 is a general side view. Fig. 2 is a vertical section on the line 2 2 in Fig. 1. Fig. 3 is a plan view with certain portions removed to better show important parts of the machine. Fig. 3^a is a corresponding plan view of a portion, showing clearly a supporting and guiding plate which is shown only in dotted lines in Fig. 3. The remaining figures show details on a larger scale. Fig. 4 is a side view of one of the links of the feed-chain with the accompanying hinged part which with the link constitutes a clamp. Fig. 5 is an end view of the same, corresponding to Fig. 4, seen from the right. Figs. 6, 7, and 8 are corresponding views of a leaf at three stages of its treatment. Fig. 6 shows a leaf as it is grasped by the feed-chain preparatory to the first treatment. Fig. 7 shows it after it has been subjected to the first treatment and before its position is shifted in the chain. Fig. 8 shows it after it has been shifted and the clamps in the feed-chain have been strongly closed on the end which has been treated. This is the condition preparatory to the final treatment.

Similar letters of reference indicate corresponding parts in all the figures where they appear.

The framing A, the strongly and rapidly revolving drum B², carrying the first set of scrapers or beaters B³, and the curved casing or bed A', against which the beating action is performed, as also any other portions of the

machinery not herein specifically described may be of any ordinary or suitable construction.

I employ a stout pitch-chain composed of uniform links D, the rivets of which also connect with each a strong clamp E, each provided with a horn E', arranged to make contact with a suitable pin F' in certain portions of their path and compel the opening of the clamp. The movement of the chain drags each link with its accompanying clamp successively between nearly plane surfaces which hold the clamp strongly closed during the period while the first beating is being effected. I equip one of the surfaces A², that pressing on the clamp, with stout springs A³, adjusted to yield when the pressure becomes excessive. The back face of each link, as also of each clamp, is provided with rollers C, arranged to reduce the friction. I promote the efficient holding action of the clamp to resist the strong pull of the leaf W during the beating operation by longitudinal grooves on the adjacent faces of each link and clamp. I provide what I will term "stops" D' D², projecting upward from each link into corresponding recesses e in the clamp, one pair, D' D', being arranged one on each side of the chain near the pivot and serving to prevent the leaf or any considerable portion thereof from working into the joint and clogging the action and the other pair, D² D², being located one on each side at the other end and serving to prevent the leaf from ever sliding out under the oblique compressive strain between the surfaces, notwithstanding the fact that the surfaces are presented very obliquely in the early portion of the closing motion of the clamps. The rivet E² is tightly secured in the clamp E and is engaged by a spring E³, (see Fig. 4,) which exerts an opening force on the clamp about equal to the gravity thereof. This spring holds the clamp open or makes it slow in shutting after it has been opened by its contact with the pins F'.

The chain D is endless, running over a polygonal wheel F at the right and a corresponding wheel G at the left. The clamps, which are successively closed by the wheel H—the opening of which to receive the leaf W was insured by the contact of each horn E' with the pin F' and the closing of which was forcibly effected by the roller H, carried on a yielding spring-platen A[#], and the further closing and retaining of which in the closed position are maintained by the pressure of the more stiffly-depressed platen A²—are released as soon as they are traversed beyond the latter platen and their opening is insured by the contact of the horn E' with the block A⁸. They are held open for a sufficient time to allow the leaves to be shifted transversely of the motion of the chain by my mechanism, which will be described farther on. After the leaves have been shifted the clamps E are again closed by contact with the fixed portion A⁵ of the framing, each in opposition to the gentle force

of its spring E³, and they are held closed by the extension of this casing A⁵ concentric to the axis of the wheel G. They travel horizontally in the return path at a lower level than before. In this return movement the clamps are forcibly closed upon the bare fiber of the treated portion of the leaf W by the chain and its clamp passing between compressing-surfaces corresponding to those between which it passed in its first treatment, but a little closer together to allow for the smaller volume. Thus conditioned it passes the second beating-drum M and the previously - untreated portion is completely cleaned by the action between this second set of beaters or scrapers and the second bed A¹⁰. After having endured this second beating, which completes the cleaning of the entire length of the fiber, the clamps are again opened by gravity and the force of their springs, and the fiber is discharged. Clearing-bars or any suitable means (not shown) may be employed to insure the prompt delivery of the fiber from the clamp, and on passing up half around the wheel F it receives a fresh leaf from the attendant and the operation is repeated.

The first beating-drum B² is much smaller than the second beating-drum M. There need not be much care in putting the leaves in the clamps, but each should always be gripped for the first treatment at about the largest point, which is near the butt-end. The butt-end projecting the least is first treated and because it is short can be treated by a small drum B². When at a later stage the longer part of the leaf is seized between the rough-surfaced chain T and the smooth top bar A¹² and pulled, the change of position of the leaf brings all the untreated material into position for the action of the second drum M, which latter by reason of its greater diameter is well adapted to treat the greater length of the fiber. The fact that the fibers are each thicker at the butts and taper more or less regularly toward the other end aids in allowing the leaf to be strongly held. It is held by the same clamp simply closed tighter for the second treatment.

The driving-gear will be readily understood. Belts from suitable pulleys on the motor (not shown) apply directly to the pulleys represented on the shafts of the two beater-wheels. The driving of the chain D, with its clamps, is effected by a separate belt running on a pulley E, which is set on a shaft I, and through the bevel-wheels I' and J' drives the shaft J, on which is set the polygon G. The chain, composed of the links D, gets its motion from the polygonal wheel G, the corresponding polygonal wheel F being turned by the chain.

The provisions for shifting each leaf W in its hold in the chain is as follows:

R and S are sprocket-wheels carrying a pitch-chain T, which latter has a rough upper face and is kept up to a right line in its traverse between one wheel and the other by

a fixed support A¹¹, interposed. These sprockets are rotated by the aid of the gearing X Y Z, receiving motion from the adjacent feed-shaft, and the chain is run at a rate just sufficiently faster than that of the main chain D to compensate for the obliquity of its traverse. The untreated protruding end of each leaf on reaching the wheel R is seized between the chain T, which engages with the under side of the leaf, and a smooth top bar A¹², the position of which latter is adjustable by screws A¹³ and is slightly yieldable by the action of springs A¹⁴. At the same time that the leaf is thus seized the corresponding clamp E is lifted by the contact of its horn E' with the fixed block A⁸, and its previously strong grip is relaxed and the clamp is positively lifted, so that the leaf is easily movable. Now as the work proceeds the oblique path traversed by the chain T pulls the leaf across the path of the main chain. The parts are so proportioned and adjusted that the small chain T pulls each leaf to an extent something more than sufficient to expose its previously-untreated portion for subsequent treatment on the front side of the chain. Then the clamp E being forced down by contact with the presser A⁵ the small chain T releases its hold and the shifting operation is complete, to be repeated with each of the several leaves in succession.

A¹⁵ is an approximately horizontal shield or guiding-plate, which may be of sheet-steel or other suitable material and contributes to the success of the operation by holding up the untreated portions of the several leaves as they are successively carried over the casing of the second beater M in the act of being treated by the first beater B².

A¹⁶ is a feed-table, (see Figs. 3 and 3^a.) deeply notched to allow the chain, with its open clamps, to rise through it. The leaves in being introduced into the machine may be held in the proper horizontal position by being slid forward on this table.

I attach importance to the use of the oblique chain T and its connected and operating parts as the means for shifting the leaf in the chain, for the reason, among others, that it can take hold of the protruding end of the leaf without bending it and maintains the same angle in its grip during the whole pull. I attach importance to the several adjustments because they allow of adaptation to a wide range of sizes, hardness, &c., of the leaves, and I attach importance to the stops D' D², because they aid to insure the correct position of each leaf even if the oblique chain T and its connections shall through any chance pull at an angle considerably ahead of or behind the proper square position. The fact that the stops D' D' and D² D² and the corresponding recesses *e* are at the edges of the main chain allows them to serve very efficiently in keeping the leaves in position without lessening materially the strong grip afforded by the

longitudinally ridged and grooved main surfaces of the parts D and E.

Modifications may be made without departing from the principle or sacrificing the advantages of the invention.

The obliquity of the chain T and of the accompanying presser-bar A¹² may be varied, taking care to correspondingly vary the rate of its travel and its length. It is not essential that it shall run level, as a downward inclination may for some reasons be preferred for treating specially heavy leaves.

I claim as my invention—

1. In a machine for cleaning fibers of tropical plants, two beating-drums mounted at different levels in the same plane of rotation and revolved in opposite directions, in combination with a feeding-chain having clamps with provisions for holding the leaves firmly thereby in the act of carrying them past the first drum, means for relaxing the pressure of the clamps between the treatments, means for automatically shifting the partially-treated leaf endwise in the clamp during such period and means for again tightening the grip of the clamp and presenting the leaf by the continuous motion of the chain to the action of the second beater-drum, all substantially as herein specified.

2. In a machine for cleaning fibers of tropical plants, two beating-drums mounted at different levels in the same plane of rotation and revolved in opposite directions, in combination with a feeding-chain having clamps with provisions for holding the leaves firmly thereby in the act of carrying them past the first drum, means for not only relaxing the pressure but also positively opening the clamps between the treatments, means for automatically shifting the partially-treated leaf endwise in the clamps during such period and means for again tightening the grip of the clamps and presenting the leaf by the continuous motion of the chain to the action of the second beater-drum, all substantially as herein specified.

3. In a machine for cleaning the fibers of tropical plants, two beating-drums mounted at different levels in the same plane of rotation and revolved in opposite directions, in combination with a feeding-chain having clamps with provisions for holding the leaves firmly thereby in the act of presenting them to the first and second drums to be beaten successively, means for releasing the hold between the treatments, and an obliquely-traversing chain T mounted adjacent to the feed-chain and arranged to act on the leaves between the two treatments so as to move them in a straight condition at right angles to the feeding movement, all substantially as herein specified.

4. In a machine for cleaning fibers of tropical plants, two beating-drums mounted at different levels in the same plane of rotation and revolved in opposite directions, in com-

5 combination with a feeding-chain having clamps
 with provisions for holding the leaves firmly
 in the act of presenting them to the first and
 second drums to be beaten successively, and
 10 means for releasing and positively opening
 the clamps between the successive treatments,
 and with a single obliquely-traversing chain
 T having one surface roughened and a smooth
 holder-bar arranged parallel thereto, allowing
 15 the leaves to slide with little friction there-
 under, all arranged for joint operation sub-
 stantially as herein specified.

5. In a machine for cleaning fibers of trop-
 ical plants, two beating-drums arranged to
 15 act successively in opposite directions, in
 combination with means for feeding, having
 provisions for holding the leaves firmly in
 the act of presenting them to the first and
 second drums to be treated, and provisions
 20 for relaxing the hold on the leaves between
 the successive treatments, and with a single
 obliquely-traversing chain T having one
 surface roughened and a smooth holder-bar
 arranged parallel thereto and the screws A¹³
 25 and springs A¹⁴, arranged to adjust said bar
 substantially as herein specified.

6. In a machine for cleaning fibers of trop-

ical plants two beating-drums arranged to
 act successively in opposite directions, a sin-
 gle feeding-chain having links D, loose rivets 30
 E² and clamping devices E with provisions for
 opening and closing such clamps and having
 also stops D' near the rivet on one part and
 recesses e on the corresponding part of the
 other of a pair of clamps, adapted to serve 35
 substantially as herein specified.

7. In a machine for cleaning fibers of trop-
 ical plants, two beating-drums arranged to
 act successively in opposite directions, a sin-
 gle feeding-chain having links D loose rivets 40
 E² and clamping devices E with provisions for
 opening and closing such clamps and having
 also stops D' D² on each end respectively of
 one part and recesses e on the opposite part of
 the several clamps, adapted to serve substan- 45
 tially as herein specified.

In testimony that I claim the invention
 above set forth I affix my signature in pres-
 ence of two witnesses.

MANUEL PRIETO.

Witnesses:

MARC A. GUIGON,

M. F. BOYLE.