

No. 868,396.

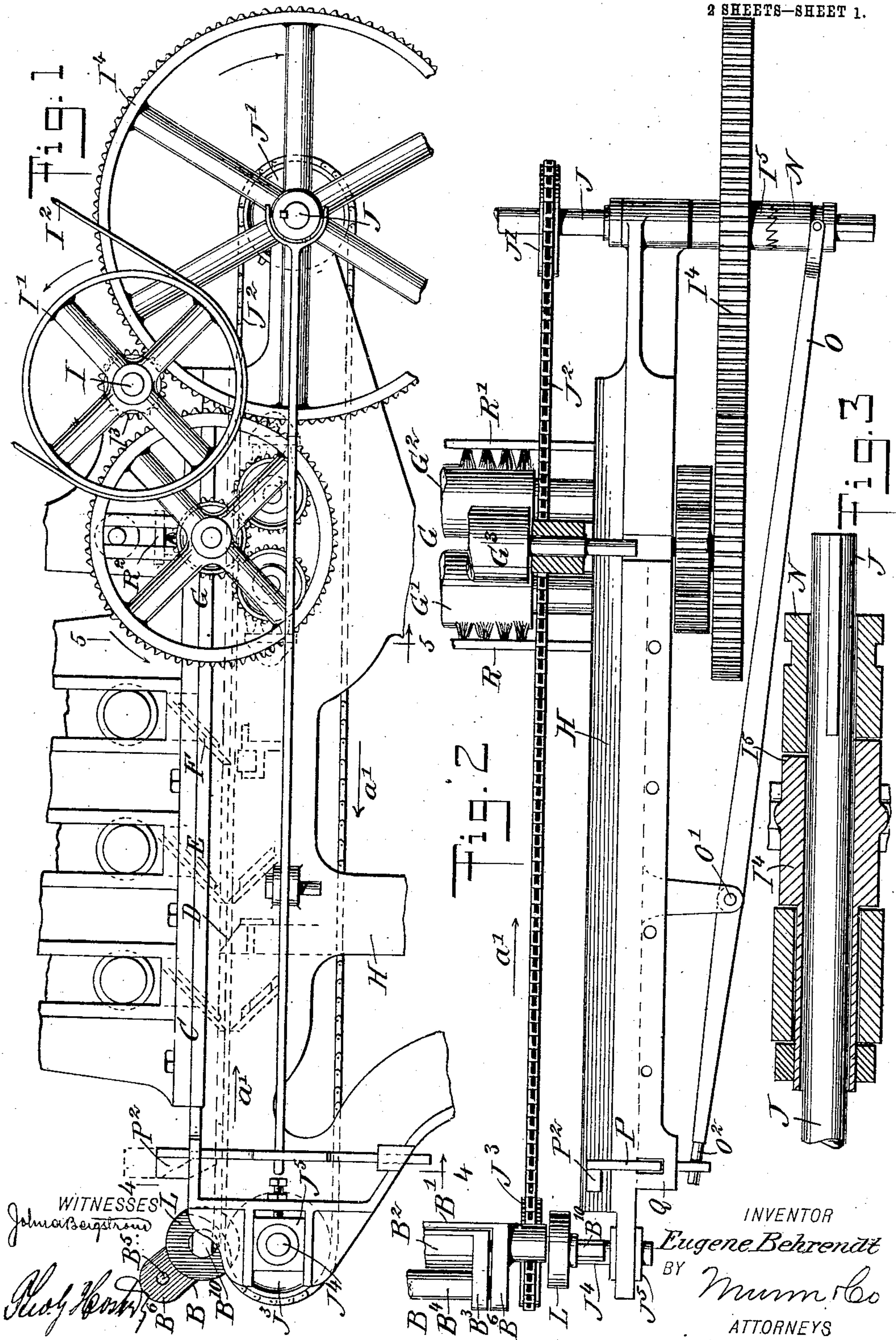
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E. BEHRENDT.

MACHINE FOR SEPARATING FIBERS FROM THE PULP AND OTHER  
EXTRANEIOUS MATTER OF PLANTS AND TREES.

APPLICATION FILED APR. 17, 1908.

2 SHEETS—SHEET 1.







# UNITED STATES PATENT OFFICE.

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## MACHINE FOR SEPARATING FIBERS FROM THE PULP AND OTHER EXTRANEEOUS MATTER OF PLANTS AND TREES.

No. 868,396.

Specification of Letters Patent.

Patented Oct. 15, 1907.

Application filed April 17, 1906. Serial No. 312,169.

*To all whom it may concern:*

Be it known that I, EUGENE BEHRENDT, a citizen of the United States, residing in Manila, Philippine Islands, have invented a new and Improved Machine  
5 for Separating Fibers from the Pulp and other Extraneous Matter of Plants and Trees, of which the following is a full, clear, and exact description.

The invention relates to machines for separating fibers from the pulp and other extraneous matter of  
10 plants and trees, such as shown and described in the application for Letters Patent of the United States, No. 296,498, filed by me January 17, 1906.

The object of the present invention is to provide certain new and useful improvements in the machine  
15 above referred to whereby a single draw head only is required for a continuous operation of the machine, the construction and operation of the draw head and its carrier being exceedingly simplified.

The invention consists of novel features and parts  
20 and combinations of the same which will be more fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings forming a part  
25 of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of the improvement; Fig. 2 is a plan view of one side of the machine, parts being omitted and parts being in section; Fig. 3 is an enlarged  
30 cross section showing the driving shaft for the endless carrier and the clutch mechanism for throwing the driving shaft in or out of gear; Fig. 4 is a cross section of the improvement on the line 4—4 of Fig. 1; Fig. 5 is an enlarged cross section of the drawing mechanism,  
35 the section being on the line 5—5 of Fig. 1; Fig. 6 is a sectional side elevation of the same on the line 6—6 of Fig. 5; Fig. 7 is an enlarged cross section of the draw head in a closed position; Fig. 8 is a sectional side elevation of the same on the line 8—8 of Fig. 7; and Fig.  
40 9 is a like view of the same in an open position.

The reduced end A' of the material A to be treated is clamped between the jaws B', B<sup>2</sup> of a draw head B, adapted to be moved lengthwise of the machine in the direction of the arrows a' for initially drawing the material A successively through a stripping device C, a  
45 combing device D, a second stripping device E, and a cleaning and polishing device F, to finally bring the fibers to a drawing mechanism G for relieving the draw head B of its drawing function and for engaging the  
50 fibers with a view to draw the material through the several devices C, D, E and F.

The several devices mentioned are mounted on a suitably constructed frame H, and are preferably of the construction more fully shown and described in

the application above referred to, so that further description of the same is not deemed necessary.

The drawing mechanism G is actuated from a main driving shaft I extending transversely and journaled in suitable bearings carried by the frame H. On the driving shaft I is secured a pulley I' connected by a  
60 belt I<sup>2</sup> with other machinery for imparting a rotary motion to the said driving shaft I. On the latter is secured a pinion I<sup>3</sup> in mesh with a gear wheel I<sup>4</sup> mounted loosely on a shaft J journaled on the rear portion of the main frame H, and on this shaft J are secured  
65 sprocket wheels J' connected by sprocket chains J<sup>2</sup>, and with sprocket wheels J<sup>3</sup> secured on a transverse shaft J<sup>4</sup> journaled in bearings J<sup>5</sup> held lengthwise adjustable on the front end of the main frame H, so as to give the desired tension to the sprocket chains J<sup>2</sup>. A  
70 pair of oppositely disposed links of the sprocket chains J<sup>2</sup> are pivotally connected at J<sup>6</sup> (see Figs. 7, 8 and 9), with the clamping jaw B' of the draw head B, so that when the machine is in motion and the sprocket chains J<sup>2</sup> travel in the direction of the arrows a', then the  
75 draw head B is bodily carried along by the said chains J<sup>2</sup> in the direction mentioned.

The jaw B' of the draw head B is fixed to the chains J<sup>2</sup>, and the jaw B<sup>2</sup> is movable relative to the fixed jaw B', to allow of opening and closing the jaws, with a view  
80 to close the jaws to clamp the end A' of the material in position and for opening the jaws for removing the end A' after the fibers are cut off, as hereinafter more fully explained. For the purpose mentioned, the movable jaw B<sup>2</sup> is provided at its ends with upwardly extending  
85 lugs B<sup>3</sup> in which is journaled a shaft B<sup>4</sup> provided at its ends with eccentric trunnions B<sup>5</sup> journaled in lugs B<sup>6</sup> secured to or formed on the fixed jaw B'. Now by turning the shaft B<sup>4</sup>, the jaw B<sup>2</sup> is moved toward or from the fixed jaw B' according to the direction in which  
90 the shaft B<sup>4</sup> is turned. In order to properly guide the jaw B<sup>2</sup> toward and from the fixed jaw B', the lugs B<sup>6</sup> are provided with guide lugs B<sup>7</sup> projecting into guideways B<sup>8</sup> formed in the lugs B<sup>3</sup>, see Figs. 7 and 8. The shaft B<sup>4</sup> is provided with an aperture B<sup>9</sup> to permit the  
95 operator to insert a stick or a handle K for conveniently turning the shaft B<sup>4</sup>, with a view to move the jaw B<sup>2</sup> toward or from the fixed jaw B' for the purpose above mentioned.

The fixed jaw B' is provided at its ends with trunnions B<sup>10</sup>, mounted to travel on longitudinally extending guideways H' formed on the main frame H, and on the said trunnions B<sup>10</sup> are journaled friction rollers L for engaging cams L' on the several devices C, E and F, for lifting the cross heads thereof to allow the draw  
105 head B to pass between the members of the said devices.

The hub of the gear wheel I<sup>4</sup> is provided with a clutch



member I<sup>5</sup> adapted to be engaged by a clutch member N, mounted to slide on and to turn with the shaft J, and the said clutch member N is engaged by a shifting lever O, fulcrumed at O' on the main frame H (see Fig. 2), and the forward end of this shifting lever O is in the form of a pin O<sup>2</sup> projecting into an angular slot P' (see Fig. 4), formed in a vertically disposed cam P, mounted to slide up and down in guideways Q and Q' attached to or forming part of the main frame H. On the upper end of the cam P is arranged a wedge-shaped offset P<sup>2</sup>, adapted to be engaged by one of the trunnions B<sup>10</sup>, so that when the draw head B has passed around the sprocket wheels J<sup>3</sup>, it finally acts on the offset P<sup>2</sup> to lift the latter and its cam P, so that the pin O<sup>2</sup> is moved inwardly whereby a swinging motion is given to the shifting lever O to throw the clutch member N out of engagement with the clutch member I<sup>5</sup>. When this takes place, the rotary motion transmitted by the gear wheel I<sup>4</sup> and the engaged clutch members I<sup>5</sup> and N to the shaft J, is stopped, so that the traveling motion of the chains J<sup>2</sup> and that of the draw head B ceases. The draw head B thus comes to a stop at the front of the machine to allow the operator to open the jaws B', B<sup>2</sup> for removal of the reduced end A' of the material previously drawn through the machine, and to allow of inserting the reduced end A' of a batch of material to be treated subsequently. When this has been done and the jaws B', B<sup>2</sup> have been closed, then the operator presses the cam P downward by hand, so that the shifting lever O is actuated to move the clutch member N back into engagement with the clutch member I<sup>5</sup> to rotate the shaft J and thereby start the sprocket chains J<sup>2</sup> for the latter to move the draw head B bodily through the machine. In order to hold the cam P in either of its two positions mentioned, the lower end of the cam is provided with a spring tongue P<sup>3</sup> (see Fig. 4), having spaced teeth P<sup>4</sup>, P<sup>5</sup> adapted to engage a recess in the bearing Q'.

The main drawing device G consists essentially of rubber covered rollers G', G<sup>2</sup> (see Figs. 5 and 6), arranged one alongside the other and operating in conjunction with a pressing roller G<sup>3</sup> adapted to press the fibers in contact with the upper peripheral surfaces of the rollers G', G<sup>2</sup>, all as more fully described in the application above referred to, it being understood that the rollers G', G<sup>2</sup> are driven from the main shaft I, and the roller G<sup>3</sup> is capable of being lifted bodily by the action of the friction rollers L to allow the passage of the draw head B between the rollers G', G<sup>2</sup> and G<sup>3</sup>. In order to keep the rollers G', G<sup>2</sup> and G<sup>3</sup> clean at all times, suitable brushes R, R' and R<sup>2</sup> engage the peripheral faces of the said rollers, the brushes R, R' being fixed to the main frame H and the brush R<sup>2</sup> being fixed to the cam links R<sup>3</sup> in which the roller G<sup>2</sup> is journaled.

The operation is as follows: When the main shaft I is rotated, then the rollers G', G<sup>2</sup> are driven and a traveling motion is given to the carrier chains J<sup>2</sup> as long as the clutch members I<sup>5</sup> and N are in mesh, that is, until the draw head B is between the cam P and the first stripping device C. The shaft J, the sprocket chains J<sup>2</sup> and the draw head B are now at rest to allow the operator to open the jaws B', B<sup>2</sup> of the draw head B to permit the insertion of the reduced end A' of the material A, the operator then closing the jaws B', B<sup>2</sup> to clamp the end A' in place in the draw head. The operator now

presses the cam P downward to start the draw head B on its forward journey and to carry the material A along. The draw head B in its forward travel passes between the members of the cleaning devices C, D, E and F and between the rollers G', G<sup>2</sup> and G<sup>3</sup> of the drawing mechanism G, so that the material is drawn forward through the several devices C, D, E and F for the purpose of completely separating the extraneous material from the fibers and to thoroughly clean and polish the same. After the draw head B has passed the drawing mechanism G, the operator at the rear end of the machine with a knife cuts the fibers adjacent to the jaws B', B<sup>2</sup> to allow the draw head to travel on and return to starting position with the reduced end A' still clamped between the jaws B', B<sup>2</sup>. In the meantime, the main drawing device G draws the fibers onward, the forward ends of the fibers being grasped by the operator at the rear end of the machine for conducting the fibers from the machine. When the draw head B passes up over the sprocket wheels J<sup>3</sup>, one of its trunnions B<sup>10</sup> acts on the cam P to throw the clutch member N out of engagement with the clutch member I<sup>5</sup>, so that the shaft J, the sprocket chains J<sup>2</sup> and the draw head B come to a standstill. The operator at the front of the machine now opens the jaws B', B<sup>2</sup>, removes the reduced end A' and clamps the reduced end A' of a batch of new material in place between the jaws B', B<sup>2</sup>, after which the operator presses the cam P downward and the above described operation is repeated.

By the arrangement described, it is but necessary to employ an unskilled operator at the front end of the machine and an unskilled operator at the rear end of the machine, as the performances required of such operators are exceedingly simple and require no skill.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A machine for separating fibers from the extraneous matter of plant or tree material, comprising means for separating the fibers from the extraneous matter, an endless carrier, and a draw head comprising a fixed member secured to the carrier, and a movable member having vertical sliding movement on the fixed member, and means carried by one member and engaging the other to move the members toward and from each other.

2. A machine for separating the fibers from the extraneous matter of plant or tree material, comprising means for separating the fibers and the extraneous matter, a draw head engaging one end of the material, an endless carrier on which the said draw head is fixed to move the draw head forward and thereby draw the material initially through the said separating means and to return the draw head to a starting position, and a drawing mechanism for engaging the fibers and relieving the said draw head of its function and allowing its return to starting position.

3. A machine for separating the fibers from the extraneous matter of plant or tree material, comprising means for separating the fibers and the extraneous matter, a draw head engaging one end of the material, an endless carrier on which the said draw head is fixed to move the draw head forward and thereby draw the material through the said separating means and to return the draw head to a starting position, and means for automatically throwing the said endless carrier out of gear by the said draw head.

4. A machine for separating the fibers from the extraneous matter of plant or tree material, comprising means for separating the fibers and the extraneous matter, a draw head engaging one end of the material, an endless carrier on which the said draw head is fixed to move the draw head forward and thereby draw the material through the said separating means and to return the draw head to a starting position, and means for automatically throwing



the said endless carrier out of gear by the said draw head at the time the draw head reaches a starting position.

5. A machine for separating the fibers from the extraneous matter of plant or tree material, comprising means for separating the fibers and the extraneous matter, a draw head engaging one end of the material, an endless carrier on which the said draw head is fixed to move the draw head forward and thereby draw the material through the said separating means and to return the draw head to a starting position, means for automatically throwing the said endless carrier out of gear by the said draw head, and a drawing mechanism for engaging the fibers and relieving the said draw head of its function and allowing its return to starting position.

6. A machine for separating the fibers from the extraneous matter of plant or tree material, comprising means for separating the fibers and the extraneous matter, a draw head engaging one end of the material, an endless carrier on which the said draw head is fixed to move the draw head forward and thereby draw the material initially through the said separating means and to return the draw head to a starting position, and a drawing mechanism for engaging the fibers and relieving the said draw head of its function and allowing its return to starting position, the said drawing mechanism comprising a plurality of driven rollers and brushes engaging the peripheral surfaces of the said rollers.

7. A machine for separating fibers from the extraneous matter of plant or tree material, comprising means for separating the fibers and extraneous matter, an endless carrier, and a draw head comprising a fixed member secured to the carrier, a movable member having vertical sliding and guided movement on the fixed member, and means carried by the movable member and engaging the fixed member to move the movable member towards and from the fixed member.

8. A machine for separating the fibers from the extraneous matter of plant or tree material, comprising means for separating the fibers and the extraneous matter, a draw head engaging one end of the material, an endless carrier on which the said draw head is fixed to move the draw head forward and thereby draw the material through the said separating means and to return the draw head to a starting position, means for automatically throwing the said endless carrier out of gear by the said draw head, and comprising a clutch member mounted to slide on and to rotate with the carrier shaft, a driven wheel loose on the said carrier shaft, having a clutch member adapted to be engaged by the said slidable clutch member, a shifting lever for the said slidable clutch member, and a slidable cam engaging the said shifting lever and adapted to be actuated by the said draw head.

9. A machine for separating the fibers from the extraneous matter of plant or tree material, comprising means for separating the fibers and the extraneous matter, a draw head engaging one end of the material, an endless carrier on which the said draw head is fixed to move the draw head forward and thereby draw the material through the said separating means and to return the draw head to a starting position, means for automatically throwing

the said endless carrier out of gear by the said draw head, and comprising a clutch member mounted to slide on and to rotate with the carrier shaft, a driven wheel loose on the said carrier shaft, having a clutch member adapted to be engaged by the said slidable clutch member, a shifting lever for the said slidable clutch member, a slidable cam engaging the said shifting lever and adapted to be actuated by the said draw head, and means for holding the cam in either of two positions.

10. A machine for separating fibers from the woody portion of plants and trees, provided with a draw head comprising a fixed jaw, a movable jaw adapted to move toward and from the said fixed jaw, and a shaft journaled in one of the jaws and having eccentric trunnions journaled in the other jaw.

11. A machine for separating fibers from the woody portions of plants and trees, provided with a draw head comprising a fixed jaw, a movable jaw adapted to move toward and from the said fixed jaw, a shaft journaled in one of the jaws and having eccentric trunnions journaled in the other jaw, and guiding means for guiding the movable jaw toward and from the fixed jaw.

12. In a machine for separating fibers from extraneous matter of plant or tree material, means for separating the fibers and extraneous matter, a draw head for engaging the material, an endless carrier to which the draw head is secured, and means for automatically stopping the carrier when the draw head reaches the front of the machine.

13. In a machine for separating fibers and extraneous matter of plant or tree material, means for separating the fibers and extraneous matter, an endless carrier, a draw head for engaging the material carried by the carrier, means for operating the carrier, a clutch mechanism for controlling the operating means, and means for operating the clutch mechanism from the draw head at the time the draw head is at the front of the machine.

14. In a machine for separating fibers and extraneous matter of plant or tree material, means for separating the fibers and extraneous matter, an endless carrier, a draw head for engaging the material, carried by the carrier, means for operating the carrier, a clutch mechanism for controlling the operating means, and a cam operating the clutch mechanism and operated by the draw head at the time the said draw head is at the front of the machine.

15. In a machine for separating fibers and extraneous matter of plant or tree material, means for separating the fibers and the extraneous matter, an endless carrier, a draw head for engaging the material, carried by the carrier, means for operating the carrier, a clutch for controlling the operating means, a lever for operating the clutch, and a sliding cam operated by the draw head and provided with an angular slot into which one end of the clutch operating lever projects.

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

EUGENE BEHRENDT.

Witnesses:

THEO. G. HOSTER,

EVERARD B. MARSHALL.