(No Model.) 4 Sheets—Sheet 1.

A. L. EVIA.

MACHINE FOR DISINTEGRATING FIBROUS PLANTS.

No. 526,103. Patented Sept. 18, 1894.

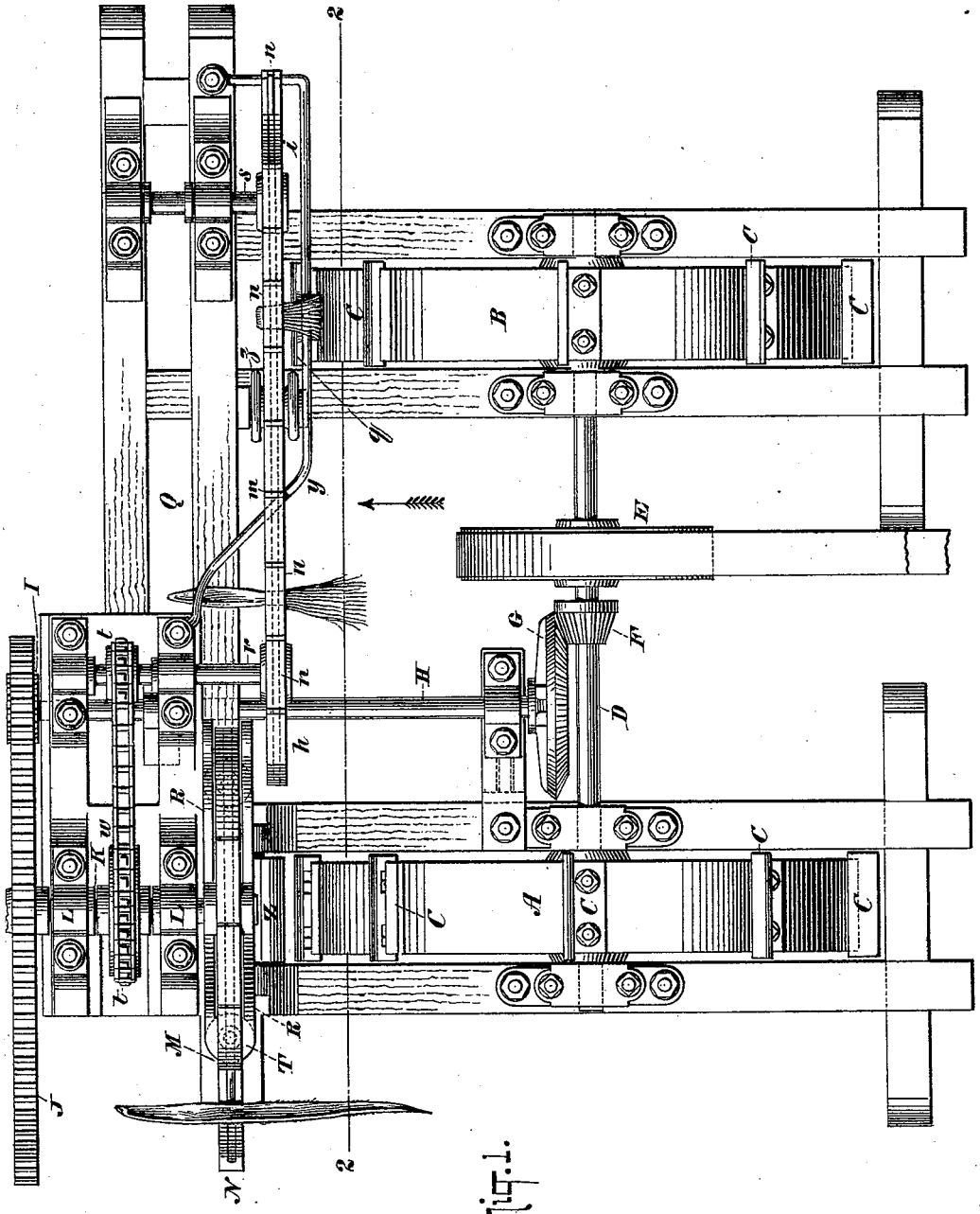


Fig. 1.

WITNESSES:
Gustave Detienchi
Herman Gustow.

INVENTOR
Alfonso Lopez Evia,
BY
Chas. C. Gill
ATTORNEY.

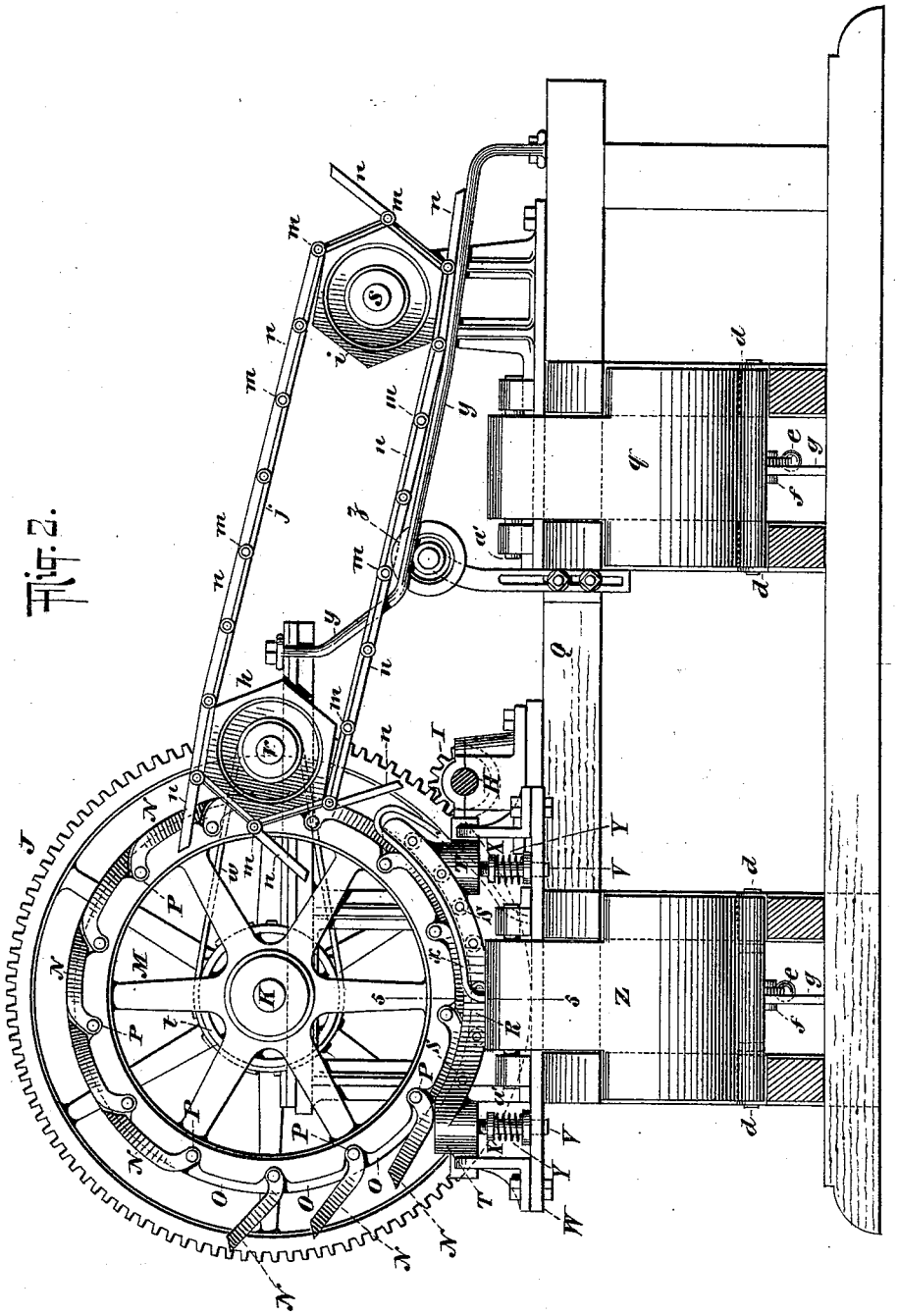
(No Model.) 4 Sheets—Sheet 2.

A. L. EVIA.

MACHINE FOR DISINTEGRATING FIBROUS PLANTS.

No. 526,103. Patented Sept. 18, 1894.

Fig. 2.



WITNESSES:
Gustave Dieterich
Herman Gustow.

INVENTOR
Alfonso Lopez Evia,
BY
Chas. C. Gill
ATTORNEY.

(No Model.) 4 Sheets—Sheet 3.

A. L. EVIA.

MACHINE FOR DISINTEGRATING FIBROUS PLANTS.

No. 526,103. Patented Sept. 18, 1894.

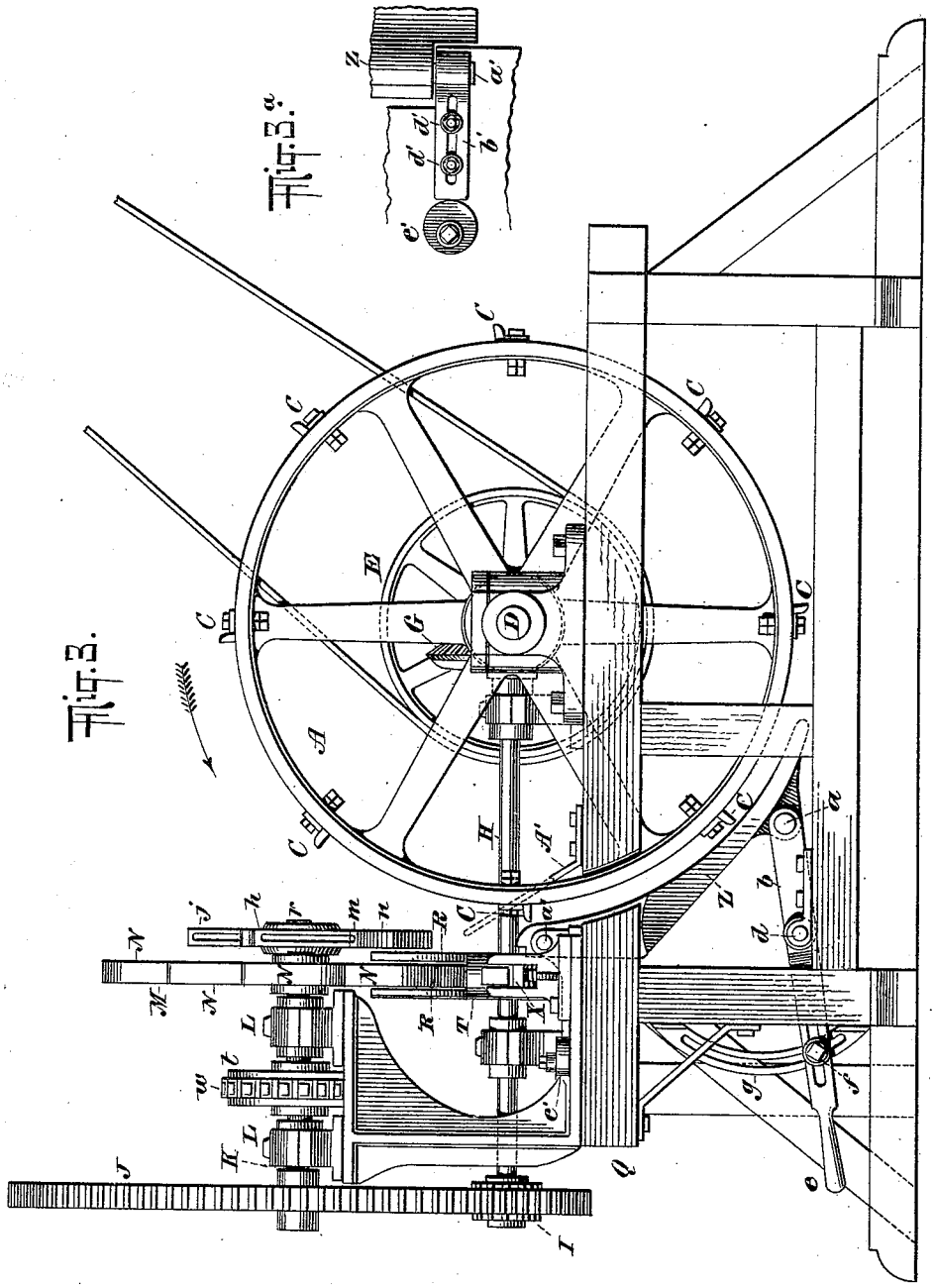


Fig. 3.

Fig. 3a.

WITNESSES:

Gustave Peterich.

Herman Gustow.

INVENTOR

Alfonso Lopez Evia,

BY

Chas. C. Gill

ATTORNEY

(No Model.) 4 Sheets—Sheet 4.

A. L. EVIA.

MACHINE FOR DISINTEGRATING FIBROUS PLANTS.

No. 526,103. Patented Sept. 18, 1894.

Fig. 4.

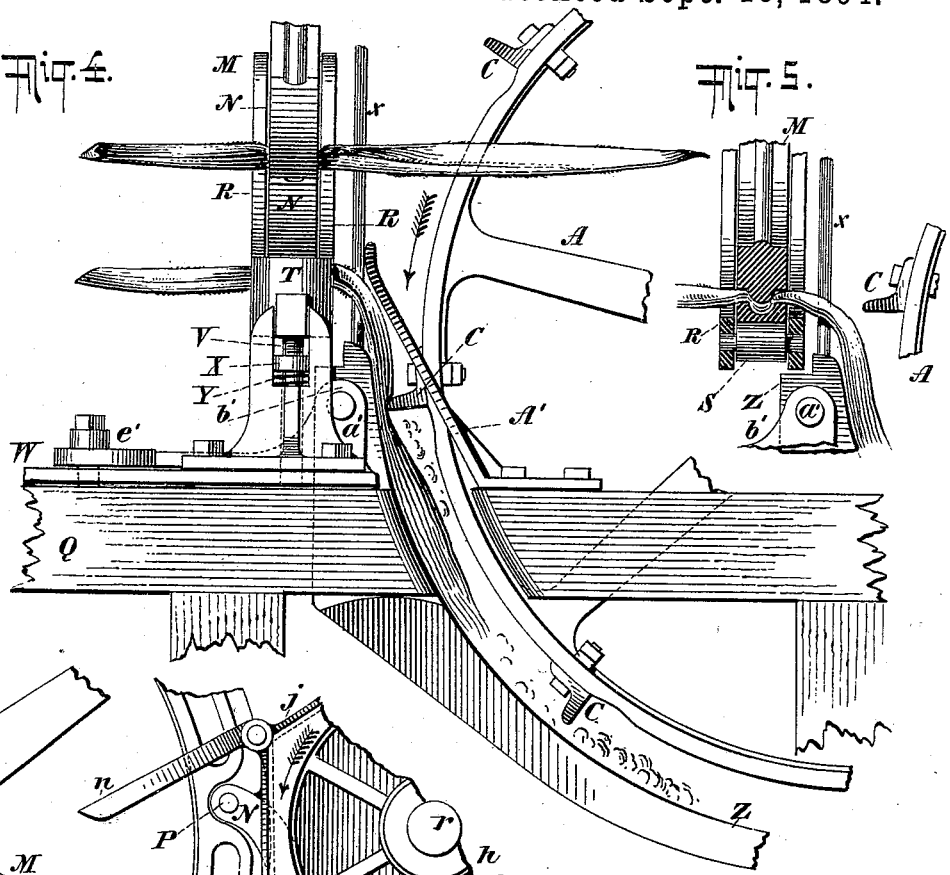


Fig. 5.

Fig. 6.

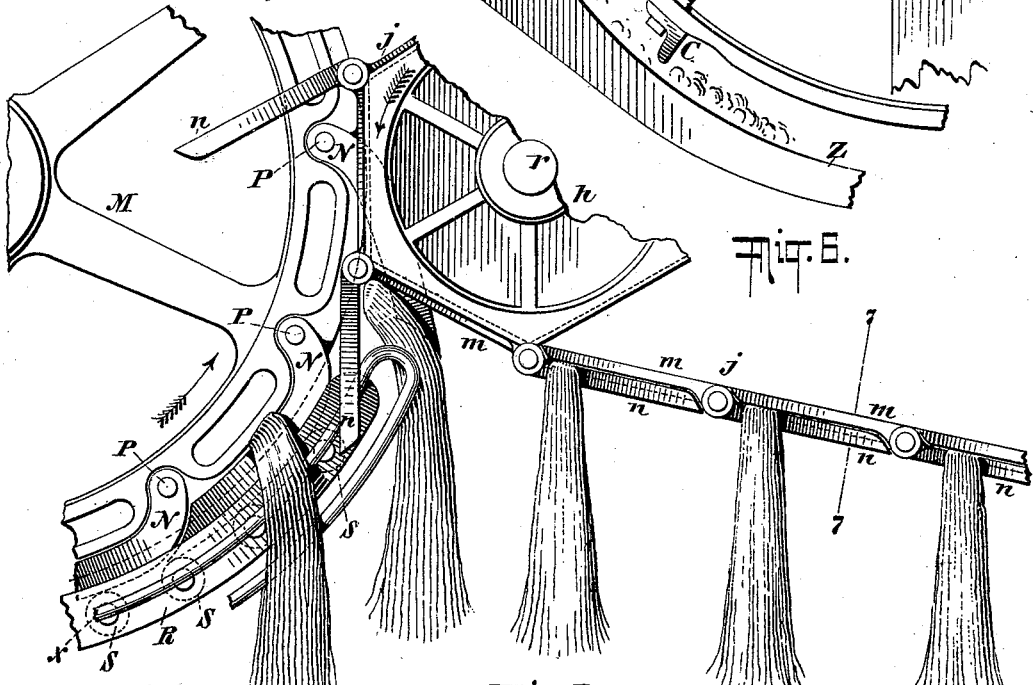


Fig. 7.

WITNESSES:

Gustave Dieterich.

Herman Gustow.

INVENTOR

Alfonso Lopez Evia,

BY

Chas. C. Gill

ATTORNEY.

UNITED STATES PATENT OFFICE.

ALFONSO LOPEZ EVIA, OF MERIDA, MEXICO.

MACHINE FOR DISINTEGRATING FIBROUS PLANTS.

SPECIFICATION forming part of Letters Patent No. 526,103, dated September 18, 1894.

Application filed January 27, 1894. Serial No. 498,171. (No model.)

To all whom it may concern:

Be it known that I, ALFONSO LOPEZ EVIA, a citizen of the Republic of Mexico, and a resident of the city of Merida, Yucatan, in said Republic, have invented a new and useful Improvement in Machines for Disintegrating Fibrous Plants, of which the following is a specification.

The invention relates to improvements in machines for separating the fiber from those leaves or plants which are particularly indigenous to tropical countries and the fibers of which are adapted for commercial purposes; and the said invention consists in the machine, the combinations of parts and the details of construction hereinafter fully described and particularly pointed out in the claims.

Referring to the accompanying drawings: Figure 1 is a top view of a machine for disintegrating fiber constructed in accordance with and embodying the invention. Fig. 2 is a vertical longitudinal section of same on the dotted line 2—2 of Fig. 1 looking in the direction of the arrow the scraper-wheels being omitted. Fig. 3 is an end view of same. Fig. 3ª is a top view of a detail of same. Fig. 4 is an end view of a portion of same shown on an enlarged scale. Fig. 5 is an enlarged vertical section on the dotted line 5—5 of Fig. 2. Fig. 6 is an enlarged detailed view partly broken away showing the operation of transferring the leaf from the main carrying wheel to the endless carrying chain of the machine, and Fig. 7 is a vertical section of the endless carrying chain on the dotted line 7—7 of Fig. 6.

In the accompanying drawings A, B, respectively designate the scraper wheels which are of the usual well known construction and are provided on their periphery with a series of blades C, which, during the revolution of the wheels A, B, come into contact with the leaves or plants and remove the pulpy matter from the fiber thereof, thus separating and cleaning the latter and adapting it for commercial purposes. The scraper wheels A, B, are mounted upon the driving shaft D, carrying the driving wheel E and beveled pinion wheel F which engages the bevel gear wheel G mounted upon one end of the transverse shaft H, whose opposite end is provided with the pinion I which is in engagement with the gear wheel J secured upon the end of the shaft K, the latter being mounted in bearings L and carrying upon its inner end the wheel M, which constitutes an important feature of the present invention. A motion is imparted to the wheel M from the driving shaft D through the bevel gearing F, G, shaft H, gear wheels I, J and shaft K. The wheel M may be of any suitable construction as to its central portion, but along its periphery the said wheel is novel in its construction in that it is provided with the series of independent clamps N having a grooved inner surface adapted to close upon the ribs O provided on the periphery of the wheel intermediate the pivots P by which said clamps N are secured to the wheel.

Below the wheel M there is provided upon the supporting frame Q of the machine the curved open frame R containing between its opposite sides the rollers S and having at its ends the hubs T receiving the upper ends of the threaded standards V which extend downward through the plate W as shown and carry the adjusting nuts X which receive the weight of the frame R and have a bearing upon the confined springs Y. The rollers S during the revolution of the wheel M retain the clamps N passing over them in their closed position so as to effectually hold the leaves or plants being treated. The frame R being open, its opposite sides permit the entrance to the wheels S of the clamps N during the revolution of the said wheel M. The fact that the frame R is supported upon yielding bearings or springs Y enables the automatic adjustment of the relation between the rollers S and clamps N in accordance with the thickness of the plants or leaves being treated. Below and slightly to the front of the wheel M is the concave rest Z for the leaf or plant while being acted upon by the blades C secured upon the periphery of the wheel A and said rest Z is of the usual construction except as to the means provided at its lower end for adjusting the relation of the said rest to the wheel A. As may be seen in Fig. 3 the lower end of the rest Z is provided at opposite sides with the lugs *a* to receive the inner bifurcated end of the lever *b*, pivoted at *d* and having a handle *e* which extends toward the rear side of the machine and carries an adjusting screw

f in position to engage the slotted segmental guide g. Upon loosening the screw f it will appear obvious that the lever b may be turned on its pivot d by elevating or lowering the handle e, and that the effect of such movement of the lever b will be to adjust the rest Z toward or from the wheel A. After the lever b has been adjusted along the guide g to the desired position, it may be there secured by tightening the screw f in a well known manner. The upper end of the concave rest Z may also be made adjustable by any well known means, if desired, and in the accompanying drawings I illustrate the upper end of the rest Z as provided on opposite sides with lugs a' adapted to receive the bearings b', which are adjustable on the frame Q toward the scraper wheel by means of the bolts d' and cams e' in a well known manner. The movement of the upper end of the rest Z and bearings b' in a direction from the scraper wheel will be effected by hand, the cam e' being previously turned and the bolts d' loosened to permit such result.

Upon the supporting frame of the machine and at one side of the carrying wheel M are mounted the polygonal wheels h, i, carrying the chain j, composed of the links m, whose outer ends are provided with extensions or arms n each of which operates as a clamp to hold the leaf or plant and carry the same to the concave rest q where it will be subjected to the action of the scraper wheel B. The concave rest q is identical in construction and operation with the concave rest Z above described. The inner surface of the extension arms n of the links m of the chain j are provided with concave grooves, as shown in Fig. 7, which are adapted to close upon the convex ribs provided upon that portion of the links m which come directly below said extensions n, the purpose of the said grooves and ribs being to more firmly hold the leaves or plants while under the action of the scraper wheel B. It will be observed upon reference to Fig. 2 that the chain j is inclined and that while the chain is passing around the polygonal wheels h, i, the extension arms n are forced to open outward, the arms n at the left hand end of the chain when open pointing downward and closing upward, while the extension arms n at the right hand end of the machine open to the right and then close upward and downward against the body of the chain. The wheels h, i are mounted upon shafts r, s, the shaft r being the driving shaft and receiving its motion from the shaft K through the medium of the sprocket wheels t, t, and connecting chain w. In front of the lower right hand portion of the wheel M there is provided the curved rod x which as the leaves or plants are carried upward from the concave rest Z by means of the clamps N serve to hold the body of the leaf or plant outward from the wheel M and thus guide it to a position at which the extension arms n of the chain j may when passing around the wheel h and closing against the body of the chain grasp the same and clamp it with sufficient firmness to carry it from the then open clamps N to the concave rest q where it will be acted upon again by the scraper wheel B. The rod x is a curved bar of iron secured to the frame of the machine and curving upward on a line with the curvature of the periphery of the wheel M, its sole purpose being to guide the end of the leaf outward from the side of the wheel so as to render it possible and convenient for the arms n to automatically grasp the same and carry it from the clamps N. After the leaves are taken by the extension arms n they are carried by the chain j toward the right and during this movement the leaves are carried against the guide rod y secured to the frame of the machine and by their contact with said rod that portion of the leaf which was to the rear side of the wheel M will be turned downward and outward to the outer or front side of the chain j, in which position it will be carried along the said rod y to the concave rest q in order that during the revolution of the scraper wheel B the scrapers may come into contact with that end of the leaf which was not subjected to the scraping action by the scraper wheel A. The rod y performs no other function than to simply turn the uncleaned end of the leaf from the inner side to the outer side of the chain j so that it may be cleaned by the wheel B. After the leaves or plants have been carried by the chain j beyond the vertical plane of the concave rest q the extension arms n open as illustrated in Fig. 2, thus releasing the leaves or plants and permitting their removal either by hand or by ordinary conveying belts. Below the chain j will preferably be provided a grooved roller z which will receive the edges of the chain and prevent the chain from having any lateral movement or being pulled from its proper position under the force exerted by the scraper wheel B on the leaves.

During the operation of the machine the attendant will place the leaves one after another in the open clamps N at the left hand side of the wheel M while said wheel is revolving and thereupon the said clamps holding the leaves will be carried downward and closed by their contact with the rollers S, whereby the leaves will be securely held and carried over the concave rest Z, where they will be acted upon in the usual manner by the scraper wheel A. The continued revolution of the wheel M will constantly carry fresh supplies of the leaves or plants to the concave rest Z and the partly cleaned leaves or plants will be carried from said rest Z and moved upward over the guide x in position to be taken, one after another from the then open clamps N by the extension arms n of the chain j which during its traveling motion will carry said leaves against the guide y and thence over the concave rest q where they will be again acted upon by the wheel B; after which

the chain *j* will carry the leaves from the rest *q* and release them at the right hand side of the wheel *i*.

At the left of the scraper wheel A will ordinarily be secured an inclined bar A′, which as the leaves are carried inward by the wheel M toward the rest Z, will turn the leaves downward so as to cause them to enter the space between the said rest and wheel A, as shown in Fig. 4.

It is to be noted that the invention is not limited to any special clamping means on the wheel M when said wheel is in a vertical position over the rest Z, since I regard as one part of my invention the vertical leaf carrying wheel, the rest Z below the same and the scraper wheel A. The wheel M when vertical very effectually exposes the leaves or plants flat against the surface of the rest Z whereas, were said wheel horizontal, the leaves would in part at least have to follow the curvature of the periphery of the wheel and thus be withdrawn from close contact at all times with the rest Z.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a machine for disintegrating fiber, the revoluble fiber-carrying wheel, the series of clamps pivoted at one end directly to the rim of said wheel and adapted to close against the periphery thereof, and means for closing said clamps and maintaining pressure against the same during a portion of the revolution of the wheel, combined with the rest for the depending portion of the fiber, and the scraper wheel in line with said wheel and rest; substantially as set forth.

2. In a machine for disintegrating fiber, the revoluble fiber-carrying wheel having along its periphery the series of ribs O, the series of clamps N pivoted at one end directly to the rim of said wheel and having grooved inner surfaces adapted to close upon the said ribs O intermediate the pivots P by which said clamps are secured to the wheel, and means for closing said clamps and maintaining pressure against the same during a portion of the revolution of said wheel, combined with the rest for the depending portion of the fiber, and the scraper wheel in line with said wheel and rest; substantially as set forth.

3. In a machine for disintegrating fiber, the revoluble fiber-carrying wheel, and the series of clamps pivoted at one end directly to the rim of said wheel and adapted to close against the periphery thereof, combined with the curved frame carrying the series of rollers in position to close said clamps against the fiber and maintain them in closed position during a part of the revolution of the wheel, the rest for the depending portion of the fiber, and the scraper wheel in line with said rest and wheel; substantially as set forth.

4. In a machine for disintegrating fiber the carrying wheel having the series of holding clamps along its periphery, and the scraper wheel therefor and in line therewith, combined with the endless chain composed of links in the form of clamps adapted to receive the fiber from the clamps of the carrying wheel, and a second scraper wheel adjacent to said chain; substantially as and for the purposes set forth.

5. In a machine for disintegrating fiber the wheel having the series of holding clamps along its periphery, and the scraper wheel therefor, combined with the endless chain composed of links in the form of clamps, a second scraper wheel adjacent to said chain, and the guide directing the fiber from the said clamps of the wheel to the link clamps of said chain to be taken thereby, substantially as and for the purposes set forth.

6. In a machine for disintegrating fiber, the wheel having the series of holding clamps along its periphery, and the scraper wheel therefor, combined with the endless chain composed of links in the form of clamps, a second scraper wheel adjacent to said chain, and the guide adapted to turn the inner end of the fiber outward to meet said second scraper wheel; substantially as and for the purposes set forth.

7. In a machine for disintegrating fiber, the carrying wheel having the series of holding clamps along its periphery, means for closing said clamps against the fiber, a scraper wheel in line with said wheel, and the guide directing the fiber from the said clamps of the said carrying wheel, combined with the endless chain composed of links in the form of clamps, the guide adapted to turn the inner end of the fiber to the outer side of said chain, and the second scraper wheel adjacent to said chain; substantially as and for the purposes set forth.

Signed at the city of New York, in the county and State of New York, this 19th day of January, A. D. 1894.

ALFONSO LOPEZ EVIA.

Witnesses:
CHAS. C. GILL,
ED. D. MILLER.