

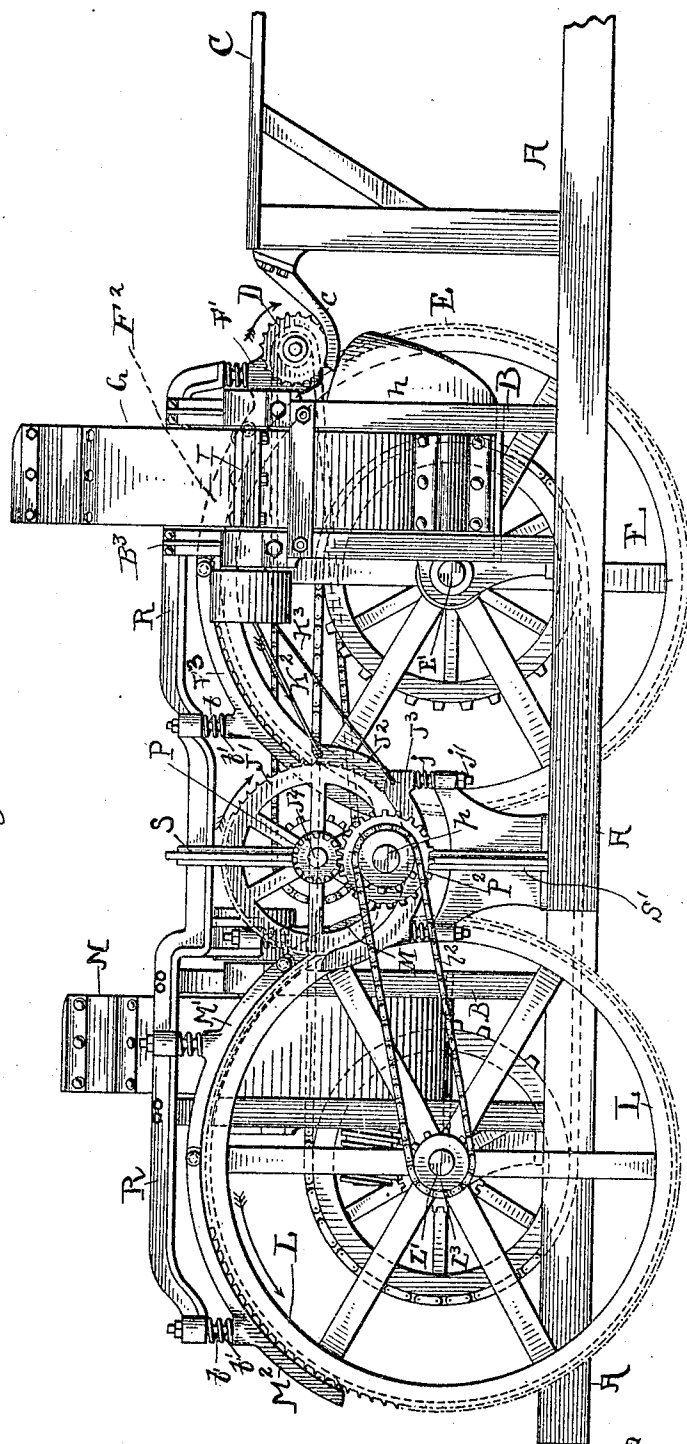
944,106.

A. PONS.
FIBER CLEANING MACHINE.
APPLICATION FILED APR. 25, 1904. RENEWED MAY 17, 1909.

Patented Dec. 21, 1909.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses
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FIBER CLEANING MACHINE.

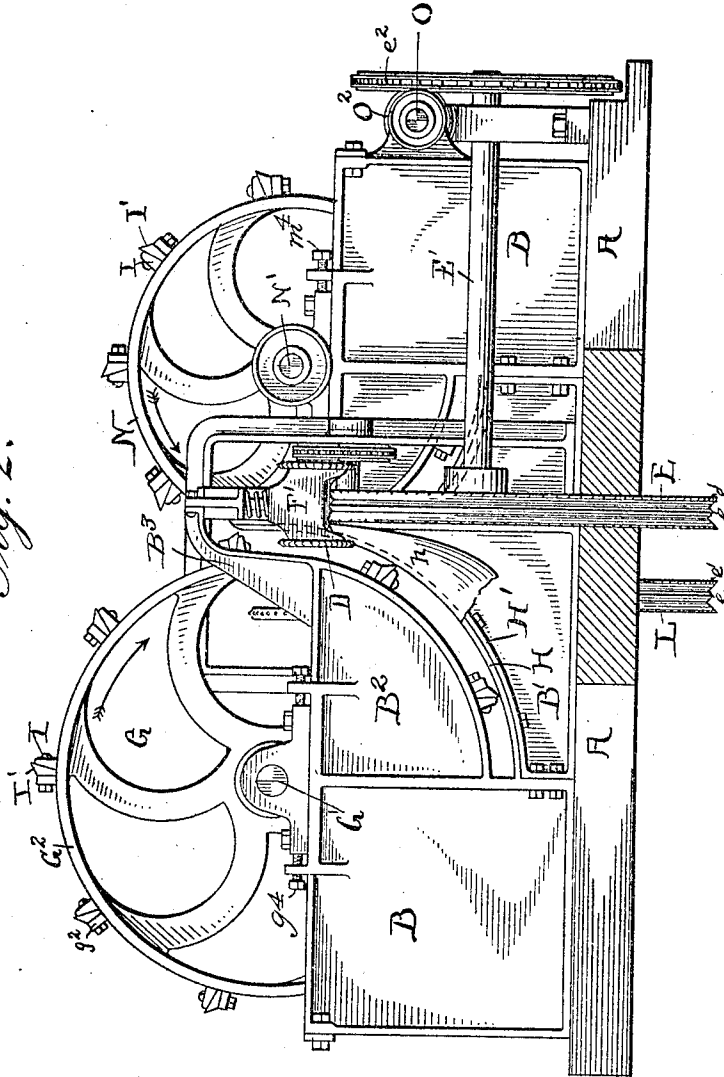
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3 SHEETS—SHEET 2.

Fig. 2.



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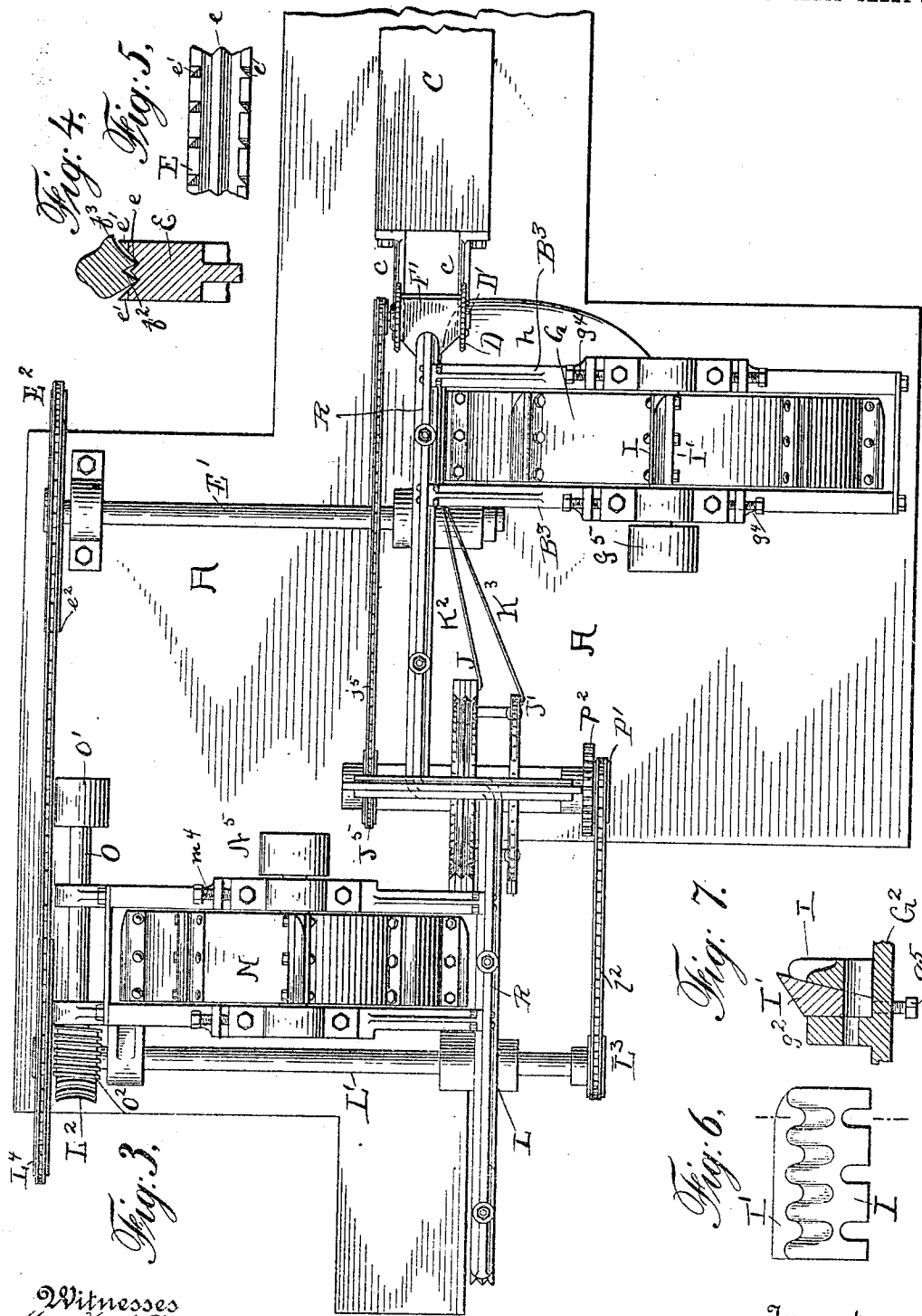
FIBER CLEANING MACHINE.

APPLICATION FILED APR. 35, 1904. RENEWED MAY 17, 1909.

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3 SHEETS—SHEET 3.



Witnesses
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UNITED STATES PATENT OFFICE.

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FIBER-CLEANING MACHINE.

944,106.

Specification of Letters Patent.

Patented Dec. 21, 1909.

Application filed April 25, 1904, Serial No. 204,678. Renewed May 17, 1909. Serial No. 496,648.

To all whom it may concern:

Be it known that I, ANGEL PONS, a subject of the King of Spain, residing in the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Fiber-Cleaning Machines, of which the following is a specification, reference being had therein to the accompanying drawings, in which—

Figure 1 is a side elevation of the machine embodying the principles of my invention; Fig. 2 a front elevation with the feeding table removed; Fig. 3 a plan view; Fig. 4 a detail section of the rim of a carrying wheel and its accompanying platen segment; Fig. 5 a view of the face of a carrying wheel; Fig. 6 a face view of the corrugated stripping blade held in position in front of the scraper; and Fig. 7 a sectional view showing the way in which the stripping blades are attached to the rim of the cleaning wheel.

My invention relates to machines for cleaning fibers of plants, and more particularly to machines for removing the fleshy integument of leaves such as the South American aloe (*Agave Sisalienses*) from the ribs and fibers thereof.

My invention consists of certain arrangements of parts and details of construction which will be hereinafter more definitely pointed out in the claims, and the object thereof is to provide a fiber cleaning apparatus which will completely remove the tissue between the ribs or fibers of these leaves; which may be operated with a minimum of hand-labor; and which is simple in construction and easily adjusted to suit special requirements.

To this end my invention generally, contemplates the use of a series of cleaning blades or beaters, held upon revolving wheels, and carriers for moving the leaves across the path of said blades, in such manner that the entire surface of a leaf will be presented for cleaning.

In the accompanying drawings, wherein like letters bear reference to like parts, A designates any suitable base or platform on which my apparatus is to be mounted, and B the supporting frame of the machine.

Fig. 3 shows most clearly the relative arrangement of the apparatus and of its cleaning wheels and leaf-carrying wheels,

there being two oppositely disposed cleaning wheels and a carrier wheel for each with a transferring carrier wheel between the two main carrier wheels.

Beginning at the front end of the machine, C designates a table or support from which the middle portions of the leaves are fed edgewise to the feeding wheels D D, which are mounted on a shaft D'. These wheels are toothed, spurred or otherwise adapted to engage with a leaf and move it forward to the first of the carriers. The forward end of the table is provided with downwardly curved arms *c c* which project under the feed wheels D. Thus, in the rotation of the wheels D, (whose driving mechanism will be later described) the middle of the leaf to be treated is drawn in between the feed wheels and the arms *c*, the ends of the leaf hanging downwardly on each side and one end being in a position where it may engage a guide-plate *h* and be guided into alinement with the curved opening between the cleaning wheel G and a breast plate in opposition thereto.

E designates one of the main carrier wheels which is designed to move the leaf transversely across the moving face of the cleaning wheel G. This wheel E has a central circumferential rib *e*; parallel circumferential grooves being formed on each side of said rib, and two rows of outer teeth or spurs *e' e'* which extend radially from the periphery of the wheel at the edges thereof, these teeth being preferably inclined in the direction of the wheel movement. The carrier wheel E is mounted on a shaft E' which in turn is connected by a sprocket wheel and chain to the main driving gear, as will be hereinafter described.

The shaft D' which bears the feed wheels D D, is mounted on a platen segment F' which is pivoted at its rear end to one of a pair of spring-pressed segments F² F³ which fit over the upper arc of the wheel E. The segment F' and the other platen segments are supported from a longitudinal skeleton frame R by sliding bolts *f* and are held down toward the carrier wheel, or on the face thereof, according to the adjustment of the bolts *f* by coil springs *f'*. The position of the platen with respect to the face of the carrier wheel is regulated by means of nuts *l* screwed on the upper ends

of the bolts f and bearing against the frame R. Platen segments may be permitted to touch the carrier wheel or they may be adjusted a suitable distance therefrom. The variation in the position of the platen segments will vary the pressure of the springs f' thereon.

The platen segments F^1 F^2 F^3 are arranged upon the carrier wheel and the said wheel moves the leaves under the jointed platen or gripping device thus formed. The carrier wheel and the platen segments thus form a gripping device, one part of which may be rotated, the other part being held against a rotative movement and being permitted to have only a radial or outward movement away from the carrier wheel. The platen segments are in cross section of the form shown in Fig. 4. The inner faces thereof, that is to say, the faces which co-act with the face of the carrier wheel are formed with the two outwardly extending longitudinal ribs f^2 , between which is formed a longitudinal groove to receive the central rib e of the carrier wheel. The outer margin f^3 of the segments projects in a curve beyond the line of the outside row of teeth e' on the carrier wheel. The purpose of the ribs f^2 is to press the middle of a leaf down firmly onto the carrier wheel E and in conjunction with the central rib e of the carrier wheel and its toothed edges e' , to hold said leaf against endwise movement under the action of the cleaning wheels. The overhanging curve of the outside margin of the platen segments is to give a sharper downward bend to that end of the leaf which is to be acted on. There are three platen segments shown, but it will, of course, be understood that I may use any desired number. These platen segments are hinged or pivoted together at their adjoining ends, the ends of the platen overlapping to form the hinge and the overlapped parts being rounded off to permit the platens to have a free pivotal movement and also to permit the leaves to pass readily from under one platen segment to the next segment without any liability of damaging the fiber. By pivoting the platen segments or sections together at their adjoining ends they may yield and may be moved outwardly away from the face of the carrier wheel as the leaves are carried under and past said platen segments by the carrier wheel. It will thus be seen that the holding device is given an undulating movement toward and away from the carrier wheel. This is of great importance as it enables it to work on leaves of varying thicknesses and to pass said leaves through the machine rapidly one after the other. It will be understood that by adjusting the nuts on the bolts the platen segments may be properly placed with respect to the carrier wheel face and the pres-

sure of the springs on the platen segments may be varied by thus varying the position of the platen segments; and the outward movement of the platen segments under the influence of the leaves passing under said sections may be regulated by vertically or outwardly adjusting the bolts carrying said segments. By providing a jointed or sectional platen I am enabled to feed leaves into the carrier, the plurality of sections admitting of play to suit the varying thicknesses of leaves, several of which may be carried through the machine at the same time. Thus the rapidity of the machine and its effectiveness are materially increased.

It will be noted that by means of the adjustable bolts connected to the platen sections, said sections may be so adjusted as to be out of contact with the carrier wheel. By this means there will be no friction between the carrier wheel and the platen when no leaves are held between the said two parts. By overlapping the ends of the platen sections and pivoting said sections together, the platens present a practically continuous gripping surface to the carrier wheel; and by rounding off the lower corners of the overlapped portions of the platen sections, as shown in Fig. 1, the leaf will not be obstructed in its passage under the platen sections and the joints between the connected sections.

It will be noted that the grooved and ribbed surface of the platen sections interlock with the corresponding grooves and ribs on the carrier wheel face and thus grip the leaves in such manner that they are firmly held to withstand the action of the cleaning wheels. The teeth on the outer edges of the carrier wheel assist in moving the leaf under the platen sections.

It will be noted that the platen segments may be held slightly away from the carrier wheels so that there will be an approximate sliding engagement, that is to say, the carrier wheels will move or slide along under the platen segments and said segments will be held against movement except that they will move outwardly or away from the carrier wheel as the leaves pass under them.

It will be noted on reference to Fig. 1 that one of the springs f' is arranged directly in front of each of the cleaning wheels (which will be hereinafter described) so that said spring will serve to firmly hold the leaf while it is being acted upon by the adjoining cleaning wheel.

G is a cleaning wheel mounted on a shaft G' , for scraping, stripping or cleaning one end of a leaf. Its plane of rotation is at right angles to that of the carrier wheel E and it is located forward of the shaft E' . As arranged, the end of the leaf is carried across the face of the scraper wheel G and at the same time in a direction opposite to

the rotation of said wheel. The rim G^2 of the cleaning wheel is provided with outwardly projecting radial ribs g^2 which extend transversely of the rim and to which the stripping blades and scraping blades are bolted. The stripping blades I , which are preferably made of brass, are of the peculiar form shown in Fig. 6. They are corrugated with a rounded edge and act to compress the middle or fleshy part of the leaf so that the scrapers I' may act more easily to clean the leaf. The scraping blades are made wedge shape in cross section and are held between the stripping blades and the ribs g^2 by suitable bolts which pass through slots formed in the stripping and scraping blades and through apertures in said ribs. The scraper blades I' may be adjusted by means of bolts g^3 which pass through the arm g^2 and bear against the inner edge of said blades.

H is a curved bed or breast plate of brass or other material not liable to become rusted or corroded by the moisture from the pulp scraped from the leaves. It is curved to conform to the circumference of wheel G ; and it is supported on a bed H' which forms part of a framing plate B' . On either side of the wheel G are the frame plates B^2 whose edges conform to the curve of the bed plate H' and are separated therefrom by a space of a suitable width.

The operation of the machine so far described is as follows:—The leaf is placed with its middle on the table c ; the two ends of the leaf hanging downwardly from said table with one end on the side toward the wheel G . The leaf is then moved edgewise by hand into engagement with the feed wheels $D D$ which move the leaf inwardly under the platen segments f' until it is caught by the spurs or teeth on the edges of the revolving carrier wheel E . While this is being done one depending portion of the leaf engages the guide plate h and is guided into alinement with the curved opening between the breast plate or cleaning bed H and the frame plate B^2 . As the carrier wheel E rotates it carries one end of the leaf across the face of the rotating wheel G and this wheel in its rotation draws the strippers I and scrapers I' down the half length of the leaf, thus cleaning that half of the leaf of its coating and the fleshy web or matter between the fibers. The peculiar form of stripping blades and scrapers or beaters will be hereinafter described. The leaf has now been cleaned for one half its length and it is necessary that the other part thereof be cleaned. For this purpose I provide the machine with another cleaning wheel N oppositely disposed to the wheel G ; and a carrying wheel L for moving the leaf across the surface of the cleaning wheel. Before moving the leaf to the carrying wheel L , for presentation of its uncleaned

surface to the second cleaning wheel, it must be shifted somewhat and so that the part of the leaf which has before been held by the carrier wheel and its co-acting platen and was, therefore, untouched by the scraping or cleaning wheels, may be acted upon. In order to thus move it to the new carrier and shift the grip on the leaf to the cleaned part, I provide the intermediate spurred or toothed transfer wheels J and J' mounted on a transverse shaft J^4 whose driving gears will be hereinafter described. The transfer wheels are off-set at one side out of alinement with the carrier wheel E so as to take hold of that portion of the leaf previously scraped by the cleaning wheel G . The second carrier wheel is out of line with the first carrier wheel, its vertical plane, however, being parallel with the vertical plane of the said first carrier wheel N . The transfer wheel J is arranged between the carrier wheels E and N , said wheel being out of line with the said carrier wheels, its vertical plane being parallel with the vertical planes of said carrier wheels. The transfer wheels J and J' are spaced apart from each other and are of somewhat different characters, the inner one J being ribbed on its circumference like the carrier wheels, that is to say, it is substantially of the same shape in transverse section as the said carrier wheels. The outer carrier wheel J' is located adjacent the outer side of the second carrier wheel N and is simply provided with radial teeth. These wheels rotate in a direction reverse to that of the rotation of the carrier wheel E ; and are of such size and are so placed as to bridge the space between the two wheels E and N , as shown clearly in Fig. 1. Opposite these wheels are platen segments J^2 and J^3 , these segments being of the same character as those already described with respect to carrier wheel E . These platen segments are supported and pressed toward the transfer wheels by spring j . Bolts j' connect the segments with the rigid frame work of the machine, said bolts being surrounded by the springs; and by adjusting the nuts on the ends of the bolts j' the platen segments may be adjusted toward and from the transfer wheels and the pressure of the springs on the segments be increased or diminished as desired. It will be noted that the segment J^2 extends upwardly on the circumference of the wheel J toward the front end of the machine, that is, toward the carrier wheel E somewhat farther than the segment J^3 . It will also be noted that the rear end of the segment J^3 extends upwardly on the circumference of the rear carrier wheel N substantially as high as the forward end of the segment J^2 . The circumferences of the transfer wheels at the upper ends of the segments J^2 and J^3 are substantially in a transverse line with the circumferences of the carrier

wheels at those points, for a purpose which will clearly appear hereinafter in the description of the general operation of the machine.

5 Two guide rods K^2 and K^3 extend downwardly from the upper end of the breast or cleaning bed H. The rod K^2 is secured at its lower end to the upper end of the platen segment J^2 while the rod K^3 is secured to the
10 forward end of the segment J^3 . By means of these rods the depending cleaned portion of the leaf as it emerges from the cleaning bed is guided to the space between the transfer wheels and their co-acting platens. Be-
15 cause of the location of the transfer wheel J with respect to the carrier wheel E the cleaned portion of the leaf will be delivered to the said wheel and its platen before the leaf is released from the carrier wheel E
20 and its platen; and the transfer wheel J' and its platen J^3 will receive the leaf, or the cleaned portion thereof, when said leaf is near the lower end of the platen of the carrier wheel E. By this means the leaf will be
25 gripped at two points in its length when it is released from the carrier wheel E and the fiber extending between the transfer wheels will be held in a flat or substantially horizontal position, and will be maintained in
30 this position during its presentation to the second carrier wheel and its platen. It will be noted that the transfer wheels are arranged on each side of the second carrier wheel and that the second carrier wheel and
35 its co-acting platen extends into the space between said transfer wheels, the transfer wheels and the said second carrier wheel being arranged in parallel vertical planes.

40 The second carrier wheel L is of the same construction as the carrier wheel E and need not, therefore, be specifically described. This second carrier wheel also rotates in the same direction as wheel E and in a direction opposite to the rotation of the transfer
45 wheels. This wheel is mounted on the shaft L' , which will be hereinafter described as the main driving shaft of the machine. Above the carrier wheel L are arranged the platen segments $M M'$ and M^2 which are of
50 the same construction as the segments $F' F^2$ and F^3 arranged above the carrier wheel E and are hinged together at their adjoining ends in the same manner as the said platen segments F.

55 The cleaning wheel N heretofore referred to is mounted on a shaft N' to rotate at right angles to the carrier wheel N on the opposite side thereof from the cleaning wheel G so
60 that it is adapted to operate on the uncleaned portion of the leaf. This wheel is provided with a cleaning bed and with cleaning blades and stripping blades I and I' of the same construction as those carried by the cleaning wheel G. The second cleaning wheel N
65 is somewhat smaller than the wheel G. The

bearings of the cleaning wheels are provided with screws $g^4 m^4$ which are parallel to the horizontal plane of the journal boxes and serve to take the shearing strains off the
70 bolts which hold the journal boxes to the frame plates. By setting up these bolts the cleaning wheels may be adjusted and thus rigidly held in proper position with respect to the cleaning bed or breast plate against
75 which they work.

It will, of course, be understood that any desired system of gearing for driving the apparatus may be employed, the system shown, however, is very desirable and has
80 given very satisfactory results.

In the apparatus, as shown, the shaft L' , as heretofore stated, is the main driving shaft from which connections are made to the shafts of the other carrier wheel and the transfer wheels. This shaft L' carries the
85 worm wheel L^2 which is engaged by worms O^2 on a shaft O, this latter shaft having a belt wheel O' which is driven from any suitable source of power. On the opposite end of the shaft L' from the worm wheel L^2
90 is secured a sprocket wheel L^3 over which a sprocket chain l^2 runs to a sprocket wheel P' on an intermediate shaft p , this latter shaft being mounted in a vertical frame post S. The shaft p also carries a gear P^2 which
95 engages with a pinion P on the shaft J^4 which carries the intermediate or transfer wheels J and J' . This pinion is so proportioned to its engaging gear P^2 that the circumferences of the transfer wheels will
100 move at the same speed as the circumferences of the main carrier wheels. The object of this is that the leaf will be moved at a uniform speed when it is simultaneously engaged by the carrier wheels and the trans-
105 fer wheel. The shaft J^4 carries a sprocket J^5 on the opposite end thereof from the pinion P; and from this sprocket a chain j^5 runs to a small sprocket on the feed shaft D' thereby driving said shaft in the proper
110 direction to feed the leaf to the carrier wheel E. The shaft E' of the carrier wheel E is provided with a sprocket wheel E^2 from which the sprocket e^2 runs to a sprocket wheel L^4 on the main drive shaft L' . It
115 will, of course, be understood that these sprocket wheels are so proportioned that the two carrier wheels are driven at the same speed; and the drive connection is so arranged that said wheels rotate in the same
120 direction.

The cleaning wheels G and N are preferably driven independently from belt wheels $G^5 N^5$ mounted on the shafts of said wheels. These wheels are intended to revolve at a
125 speed of about four hundred and fifty revolutions a minute, while the carrier wheels make about twelve revolutions a minute.

The frame of my machine I preferably form of plates bolted together solidly as
130

shown and supported by any suitable bed. A skeleton frame R, hereinbefore referred to, is supported by the post S substantially midway between its ends and by posts B³ secured to the main frame of the machine.

The general operation of the machine is as follows:—The leaf to be operated on is laid across the table C and is pushed forward, edgewise, by the operator to the feeding wheels D which deliver it to the carrier wheel E by which it is carried upward under the platen segment F'. As the carrier moves the leaf across the face of the first cleaning wheel the leaf is cleaned from a point near its middle to one end. When the leaf reaches the intermediate carriers, or transfer wheels, the cleaned portion thereof is gripped by said transfer wheels and their platens and carried downward until it is released from the platens of the first carrier wheel. It is then carried upward by said transfer wheels and delivered to the second carrier wheel by which it is carried under the platens co-acting with said second carrier. The portion now hanging down from the second carrier wheel on the opposite side thereof from the cleaning wheel G and on the side adjoining the cleaning wheel N is the remaining uncleaned portion of the leaf. This uncleaned part of the leaf is guided into the opening between the breast plate or cleaning bed and the second cleaning wheel. When it has passed across the face of the second cleaning wheel the leaf fiber has been entirely cleaned and scraped from end to end and is delivered to the rear of the machine completely cleaned of all pulpy matter.

While I have shown carrier wheels for moving the leaves across the face of the cleaners and from one wheel to another and believe such construction to be preferable, I do not wish to be limited thereto as other forms of carriers might be used without departing from the scope of my invention. It is obvious also that many minor changes might be made in the proportions and arrangements of parts, without departing from the scope of the invention.

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

1. A machine for cleaning fibrous plants having a series of beaters or disintegrators acting at one period to commence the treatment of the plant, and another series of disintegrators acting at another period to complete the treatment, a moving carrier for moving the material to be treated to and across the path of movement of the first series of disintegrators, a moving carrier set out of alinement with the first named carrier for moving the material to be treated to and across the path of movement of the second series of disintegrators, an intermediate carrier out of alinement with the first

acting carrier and having a movement of revolution in opposite direction thereto, adapted to engage the plant under treatment before it has been disengaged from the first acting main carrier, to move it with said main carrier until the plant has become disengaged therefrom, then to carry it across to the second acting main carrier until the plant has become engaged thereby, substantially as described.

2. A machine for cleaning fibrous plants, having a series of moving beaters or disintegrators acting at one period to commence the treatment of the plant, and another series of disintegrators oppositely disposed to the first and acting at another period to complete the treatment, carriers for moving the material to be treated to and past the path of movement of each of said disintegrators, and intermediate carrier wheels mounted on the same axis out of alinement with the first named carrier but parallel thereto and acting to present a cleaned portion of the plant to the second carrier, substantially as described.

3. A machine for cleaning fibrous plants, having one series of moving beaters or disintegrators acting at one period to commence the treatment of the plant, a main rotary carrying wheel moving in a plane across the path of movement of said disintegrators, another series of disintegrators acting at a later period to complete the treatment of the plant, another main rotary carrying wheel for said last named disintegrators, and intermediate carrying wheels for transferring the plant from the first to the second named carrying wheel, one of said intermediate carrying wheels being set between the planes of the main carrying wheels and one beyond the plane of the carrying wheel of the finishing disintegrator, substantially as described.

4. A machine for cleaning fibrous plants having one series of moving beaters or disintegrators acting at one period to commence the treatment of the plant, and another series oppositely disposed to the first and acting at a later period to complete said treatment; main carriers entirely separated radially or laterally but parallel and in different vertical planes and moving in the same direction for carrying the material to and past the path of movement of said disintegrators, and an intermediate carrier out of alinement with the first acting main carrier and having a movement of revolution in an opposite direction thereto, the periphery of said intermediate carrier overlapping the peripheries of both of said main carriers, substantially as described.

5. A machine for cleaning fibrous plants having one series of moving beaters or disintegrators acting at one period to commence the treatment of the plant, and another op-

positely disposed series acting at another period to complete said treatment, laterally separated main carriers parallel to but out of alinement with each other and adapted to move in the same direction, for carrying the material to and past the path of movement of each of said disintegrators, intermediate carriers out of alinement with said first acting main carrier and having a movement of revolution in an opposite direction thereto, and located one on each side of said last acting main carrier, the peripheries of the intermediate carriers overlapping the peripheries of the main carriers; and means for holding the material into engagement with the intermediate carriers, substantially as described.

6. A machine for cleaning fibrous plants, having a series of moving beaters or disintegrators acting at one period to commence the treatment of the plant, and another series, oppositely disposed, acting to complete said treatment; main carrying wheels parallel to but out of alinement with each other, adapted to rotate in the same direction, for carrying the material to be treated to and past the path of movement of the disintegrators; and intermediate carrying wheels out of alinement with the first acting main carrying wheel, rotatable in the opposite direction thereto, and located one on each side of the last acting main carrier wheel; the diameter of said intermediate wheels being greater than the radial or lateral distance between said main wheels, and said intermediate wheels being provided with spring pressed platens for holding the material into engagement therewith, substantially as described.

7. In a fiber cleaning machine the combination with a moving carrier for moving the plant, of a series of platens held independently of and cooperating with said carrier to hold the plants to the carrier, the said platens being hinged or joined to each other whereby the carrier will move the plant to be treated under said platens, substantially as described.

8. In a fiber cleaning machine the combination with the moving carrier for moving the plant to be treated, of a series of platens held independently of and cooperating with the said carrier, the said platens being pivoted to each other, and each of said platens being yieldably supported independently of the other, substantially as described.

9. In a fiber cleaning machine the combination with a rotary carrier wheel for moving the plant to be treated, of a series of platens, means for independently supporting each platen segment to hold it against movement with the carrier wheel, each of said platens forming a segment of an arc whose center is the same as that of said wheel and covering the path of movement of said plant

on said wheel carriers, the said platen segments being jointed to each other, substantially as described.

10. In a fiber cleaning machine the combination with a rotary wheel carrier for moving the plant to be treated, of a series of platens, means for independently supporting each platen segment to hold it against movement with the carrier wheel, said platens forming each a segment of an arc whose center is the same as that of said wheel, each of said segments having elastic means for holding it in position to co-act with the wheel carrier to hold the plant to the carrier wheel and permit said wheel to move said plant under the series of platens and means for increasing or decreasing such elastic pressure, substantially as described.

11. In a machine for cleaning fibrous plants, a beater or disintegrator, a carrier for moving said plants across the path of said beater or disintegrator, and a plurality of platens supported above the said carrier for holding the plant to be treated onto the carrier, said platens each having a curved side whose edge projects beyond and over the periphery of the said carrier, substantially as described.

12. In a machine for cleaning fibrous plants, toothed carrier wheels for moving said plants through the machine, said carrier wheels having a longitudinally grooved circumference, and a plurality of pressure platens held against longitudinal movement elastically held in position to co-act with each of the carrier wheels, said platens having a grooved face conforming to the grooved face of the carrier-wheels, substantially as described.

13. A machine for cleaning fibrous plants having a cleaner carrying a series of disintegrating blades or beaters, a carrier for moving the plant to be treated across the path of said disintegrators and a plurality of pressure platens elastically held downward toward the carrier to press the plant into contact with the carrier, the platens of the carrier being jointed to each other, substantially as described.

14. A machine for cleaning fibrous plants having a cleaning wheel carrying a series of disintegrating blades or beaters, a carrying wheel for moving the plant to be treated across the path of said disintegrators, and a plurality of pressure platens pivoted to each other and elastically held downward toward the carrying wheel, substantially as described.

15. In a machine for cleaning fibrous plants, the combination with a blade or beater wheel, of a scraping blade held on said wheel and an auxiliary blade placed forward on said scraper blade and having rounded fingers and reversely rounded grooves between said fingers, said fingers

projecting beyond said groove, substantially as described.

16. In a machine for cleaning fibrous plants, having a cleaning wheel for cleaning one portion of the plant at one period and a cleaning wheel for cleaning another portion of the plant at a later period, the combination with two main carrier wheels for moving the plant across the path of movement of the cleaning wheels, of two transfer wheels on the same axial center intermediate the two main wheels, moving in opposite direction to the first cleaning wheel, and set to one side thereof, and platens supported beneath said transfer wheels, the platen on the side nearest the first main wheel extending upward farther than the platen beyond, substantially as described.

17. In a machine for cleaning fibrous plants, having a cleaning wheel for cleaning one portion of the plant at one period and a cleaning wheel for cleaning another portion of the plant at a later period, the combination with two main carrier wheels for moving the plant across the path of movement of the cleaning wheels, of two transfer wheels on the same axial center intermediate the two main wheels, moving in opposite direction to the first cleaning wheel and set to one side thereof, platens supported beneath said transfer wheels, the platen on the side nearest the first main wheel extending upward farther than the platen beyond, guide rods extending from the first cleaning wheel, one to the entrance of each of said platens, substantially as described.

18. In a fiber cleaning machine, the combination with a main carrier, of a pivoted toothed feed wheel and a leaf support beneath said feed wheel, substantially as described.

19. In a fiber cleaning machine the combination with a main carrier wheel, of a series of platen segments supported above said wheel and pivoted to each other, the forward one of said platen segments bearing a toothed, rotatable feed wheel, substantially as described.

20. A fiber cleaning machine comprising a carrier wheel, a flexible opposed gripping means arranged in the plane of the wheel around a portion of the periphery thereof, means for holding said gripping means against movement with the carrier wheel and means for yieldably forcing said flexible gripping means toward the carrier wheel whereby said gripping means will have an undulating movement toward and away from the wheel as leaves are carried under said gripping means by the carrier wheel.

21. A fiber cleaning machine comprising a carrier wheel, a flexible opposed gripping means above the carrier wheel in the plane thereof and around a portion of its periphery, the working face of said gripping

means being formed on an arc struck from the center of the carrier wheel, said opposed gripping means being capable of a vertical movement toward and away from the carrier wheel, and means for yieldably forcing said flexible gripping means toward the wheel whereby said gripping means will have an undulating movement toward and away from the wheel as leaves are carried under said gripping means by the rotation of the carrier wheel.

22. A fiber cleaning machine consisting of a carrier wheel and a non-rotative flexible opposed gripping means formed of a plurality of sections arranged end to end and in contact with each other above the carrier wheel in the vertical plane thereof and around a portion of its periphery, said sections being vertically movable away from the carrier wheel, means for holding said gripping means against movement with the carrier wheel and means for yieldably forcing said sections toward the wheel whereby the gripping means will have an undulating movement toward and away from the carrier wheel as leaves are carried under said gripping means by the rotation of the carrier wheel.

23. A fiber cleaning machine comprising a carrier wheel having a peripherally grooved gripping surface, a flexible opposed gripping means arranged to coact with the wheel and extending around a portion of the periphery thereof, the working face of said gripping means being grooved and ribbed to fit the corresponding grooves and ribs of the carrier wheel, means for holding said gripping means against movement with the carrier wheel and means for yieldably forcing the flexible gripping means toward the carrier wheel, the gripping means being capable of a movement toward and away from the carrier wheel and presenting a substantially continuous surface to the carrier.

24. A fiber cleaning machine comprising a vertical wheel carrier for moving the plants to be treated, of a series of platens arranged end to end and each forming a segment of an arc whose center is the same as that of said wheel, elastic means for holding each of said segments pressed toward the periphery of the carrier wheel, said means permitting said platens to move vertically away from said carrier wheel as leaves are moved thereunder by the carrier wheel, and means for holding said platens against movement with the carrier wheel whereby leaves of different thicknesses may be moved by the carrier wheel at the same time, said leaves being firmly held by the platens.

25. In a fiber cleaning machine the combination with a carrier wheel for moving leaves to be treated, of a series of platens arranged end to end and adapted to engage

the periphery of the wheel and to be moved toward and away from said wheel, each of said platens forming a segment of an arc whose center is the same as that of said wheel, means for holding said platens against movement with the carrier wheel, an elastic device bearing on each of said platens and forcing it toward the carrier wheel, and means for increasing and decreasing the pressure of said elastic device on said platens, whereby leaves of different thicknesses may be moved by the carrier wheel at the same time, said leaves being firmly held by the platens.

26. In a fiber cleaning machine the combination with a carrier wheel, of a cooperating sectional gripping means located in the plane of the carrier wheel and around a portion of its periphery, means for holding said gripping means against movement with the carrier wheel and elastic means for forcing the gripping means toward the carrier wheel, whereby leaves of different thicknesses may be moved by the carrier wheel under the yieldable gripping means.

27. In a fiber cleaning machine the combination with a gripping device consisting of a wheel and a series of outwardly away from the wheel yieldable devices arranged in the plane of the wheel and around a portion of its periphery, each of said devices being constructed and arranged to yield radially a greater or less degree according to the varying thicknesses of the leaves to be treated and constructed and arranged to co-act with and work in the plane of said wheel, whereby the leaves to be treated will be carried under said series of yieldable devices in succession and said devices will be moved outwardly by the leaves.

28. A fiber cleaning machine consisting of a carrier wheel having annular grooves and ribs on its periphery, a sectional cooperating gripping device arranged above the carrier wheel and extending around a portion of its periphery, the working faces of said sections being formed on an arc whose center is the same as the center of the carrier wheel, the working faces of said sections being ribbed and grooved to interlock with the grooves and ribs on the carrier wheel, and means to hold said gripping device against movement with the carrier wheel and means to yieldably press said sections toward the carrier wheel.

29. A fiber cleaning machine consisting of a carrier wheel having annular grooves and ribs on its periphery, a sectional cooperating gripping device arranged above the carrier wheel and extending around a portion of its periphery, the working faces of said sections being formed on an arc whose center is the same as the center of the carrier wheel, the working faces of said sections being ribbed and grooved to interlock with the grooves

and ribs on the carrier wheel, means to yieldably press said sections toward the carrier wheel, and means for hinging said sections together at their adjoining ends.

30. A fiber cleaning machine consisting of a carrier wheel having annular grooves and ribs on its periphery, a sectional cooperating gripping device arranged above the carrier wheel and extending around a portion of its periphery, the working faces of said sections being formed on an arc whose center is the same as the center of the carrier wheel, the working faces of said sections being ribbed and grooved to interlock with the grooves and ribs on the carrier wheel, means to yieldably press said sections toward the carrier wheel, and means for connecting said sections together at their adjoining ends.

31. A fiber cleaning machine consisting of a carrier wheel having annular grooves and ribs on its periphery, a sectional cooperating gripping device arranged above the carrier wheel and extending around a portion of its periphery, the working faces of said sections being formed on an arc whose center is the same as the center of the carrier wheel, the working faces of said sections being ribbed and grooved to interlock with the grooves and ribs on the carrier wheel, means to yieldably press said sections toward the carrier wheel, the adjoining ends of said sections being overlapped to facilitate the passage of the leaves under the succeeding sections.

32. A fiber cleaning machine comprising a carrier wheel, an outwardly yieldable co-acting gripping means formed in sections and arranged in the plane of the carrier wheel and extending around a portion of its periphery, the adjoining ends of said sections being overlapped to facilitate the passage of the leaves under the succeeding sections.

33. A fiber cleaning machine comprising a carrier wheel, an outwardly yieldable sectional co-acting gripping means arranged in the plane of the carrier wheel and extending around a portion of its periphery, the adjoining ends of the sections being overlapped and rounded off at their lower corners to facilitate the passage of the leaves under the succeeding sections.

34. A fiber cleaning machine having two cleaning wheels, a carrier or conveyer for moving the leaves to be treated opposite each of said cleaning wheels, an intermediate transfer wheel, a plurality of shoes or platens below said transfer wheel and co-acting therewith.

35. A fiber cleaning machine having two cleaning wheels, a carrier or conveyer for moving the leaves to be treated opposite each of said cleaning wheels, an intermediate transfer wheel, a plurality of shoes or platens below said transfer wheel and co-acting therewith, and means for yieldably

pressing the platens or shoes toward the transfer wheels.

36. A fiber cleaning machine comprising two cleaning wheels, a carrier wheel for each cleaning wheel, a gripping device arranged above each carrier wheel and extending around a portion of its periphery, an intermediate transfer wheel, a series of platens or shoes below said transfer wheel and arranged to receive the leaves to be treated from the first carrier wheel and to deliver them to the second carrier wheel, and means for yieldingly pressing the platens or shoes toward the transfer wheel.

37. A fiber cleaning machine comprising two cleaning wheels, two carrier wheels having annular grooves on their peripheries, a co-acting gripping device for each carrier wheel arranged above and extending around a portion of its periphery, the faces of said gripping devices being grooved and ribbed to interlock with the grooves and ribs on the carrier wheels, an intermediate transfer wheel having annular grooves and ribs in its periphery, a co-acting shoe or platen arranged below said transfer wheel and formed with corresponding ribs and grooves to interlock with the grooves and ribs on the transfer wheel.

38. A fiber cleaning machine comprising two cleaning wheels, two carrier wheels having annular grooves on their peripheries, a co-acting gripping device for each carrier wheel extending around a portion of its periphery, the faces of said gripping devices being grooved and ribbed to interlock with the grooves and ribs on the carrier wheels, an intermediate transfer wheel having annular grooves and ribs in its periphery, a co-acting shoe or platen formed with corresponding ribs and grooves to interlock with the grooves and ribs on the transfer wheel.

39. A fiber cleaning machine comprising two cleaning wheels, two carrier wheels having annular grooves on their peripheries, a co-acting gripping device for each carrier wheel extending around a portion of its periphery, the faces of said gripping devices being grooved and ribbed to interlock with the grooves and ribs on the carrier wheels, elastic means for pressing the gripping means toward the carrier wheels, an intermediate transfer wheel having annular grooves and ribs in its periphery, a co-acting shoe or platen formed with the corresponding ribs and grooves to interlock with the grooves and ribs on the transfer wheel, and elastic means for pressing the shoes or platens toward the transfer wheel.

40. A fiber cleaning machine comprising two cleaning wheels, two carrier wheels, an intermediate transfer wheel having a continuous annular gripping surface, and a pres-

sure device co-acting with said transfer wheel.

41. A fiber cleaning machine comprising two cleaning wheels, two carrier wheels having grooved peripheries, a pressure device for each carrier wheel co-acting therewith and having correspondingly grooved working faces, an intermediate transfer wheel having a continuous annular gripping surface, and a pressure device co-acting with said transfer wheel.

42. A fiber cleaning machine comprising two cleaning wheels, two carrier wheels, an intermediate transfer wheel having a continuous annular gripping surface, and a plurality of pressure shoes or platens co-acting with said transfer wheel.

43. A fiber cleaning machine comprising two cleaning wheels, two carrier wheels, an intermediate transfer wheel having a continuous annular gripping surface, a plurality of pressure shoes or platens co-acting with said transfer wheel, and means for yieldably pressing said shoes or platens toward the transfer wheel.

44. A fiber cleaning machine comprising two cleaning wheels, two carrier wheels, an intermediate transfer wheel having a continuous annular gripping surface, a plurality of pressure shoes or platens hinged together, and means for yieldably pressing said shoes or platens toward the transfer wheel.

45. A fiber cleaning machine comprising a cleaning wheel, a carrier wheel and a gripping device arranged above the carrier wheel and extending around a portion of its periphery and formed to present a practically continuous gripping surface to said wheel and consisting of a plurality of sections having a joint between them and each forming a segment of an arc whose center is the same as that of said wheel, the carrier wheel and the gripping device being relatively movable and the gripping device being outwardly movable in a longitudinal direction with respect to the co-acting surfaces.

46. A fiber cleaning machine comprising a cleaning wheel, a carrier and coöperating gripping means constructed and arranged to conform in contour with and to present a practically continuous bearing surface to the carrier and consisting of a plurality of platens or sections, the carrier and the gripping means being relatively movable in a longitudinal direction with respect to the co-acting surfaces, and the gripping means being movable outward or away from the carrier.

47. A fiber cleaning machine comprising a cleaning wheel, a carrier and coöperating gripping means constructed and arranged to conform in contour with and to present a

- practically continuous bearing surface to the carrier and consisting of a plurality of platens or sections, the carrier and the gripping means being relatively movable in a longitudinal direction and the gripping means being movable outward or away from the carrier, and elastic pressure devices for forcing the gripping means toward the carrier.
48. A fiber cleaning machine comprising a cleaning wheel, a carrier, a cooperating gripping means constructed and arranged to conform in contour with and to present a practically continuous bearing surface to the carrier and consisting of a plurality of platens or sections hinged together, the carrier and the gripping means being relatively movable in a longitudinal direction and the gripping means being movable outward or away from the carrier.
49. A fiber cleaning machine comprising a cleaning wheel, a carrier wheel, and a gripping means consisting of a plurality of platens or sections forming each a segment of an arc whose center is the same as that of said wheel, the carrier and the platens being relatively movable in a longitudinal direction and the platens being outwardly movable, the platens being rounded off at the lower part of one corner or edge adjacent to the carrier wheel.
50. A fiber cleaning machine comprising a cleaning wheel, a carrier wheel, and a gripping means consisting of a plurality of platens or sections forming each a segment of an arc whose center is the same as that of said wheel, the carrier and the platens being relatively movable in a longitudinal direction and the platens being outwardly movable, the adjacent ends of the sections of the platens overlapping and the overlapping parts or ends being rounded off adjacent to the carrier wheel.
51. In a fiber cleaning machine a cleaning wheel, a gripping device consisting of a carrier or leaf conveyer adapted to carry leaves on its upper face and a cooperating means arranged above the carrier and yieldingly pressed toward the carrier and consisting of a plurality of sections arranged to co-act with and work in the plane of the said carrier, an elastic means to press the two parts of the gripping device toward each other, said elastic means being located directly in front of or between the vertical planes of the sides of the cleaning wheel, and means to hold the sectional cooperating means against movement with the carrier or leaf conveyer.
52. A fiber cleaning machine comprising a cleaning wheel, a gripping device consisting of a carrier or leaf conveyer adapted to carry leaves on its upper face and cooperating means above the carrier and having an outward movement only with respect to the carrier and arranged to co-act with and work in the plane of the said carrier and consisting of a plurality of sections, and elastic means to press the two parts of the gripping device toward each other located directly in front of or between the vertical planes of the sides of the cleaning wheel.
53. A fiber cleaning machine comprising two cleaning wheels, two carrier wheels, an intermediate transfer wheel arranged between the two carrier wheels, and a shoe or platen arranged to co-act with the transfer wheel and to support the leaf during its transfer from one carrier wheel to the other.
54. A fiber cleaning machine comprising two cleaning wheels, two carrier wheels, an intermediate transfer wheel, a shoe or platen co-acting with said transfer wheel, means for rotating the carrier wheels in the same direction, and means for rotating the transfer wheel in the opposite direction.
55. A fiber cleaning machine comprising two cleaning wheels, two carrier wheels, a pressure means arranged above each carrier wheel and adapted to hold the leaves during their movement with the carrier wheel, said pressure means extending around a portion of the periphery of the carrier wheel, an intermediate transfer wheel arranged between the two carrier wheels, a co-acting pressure means arranged below the transfer wheel and adapted to receive the leaves to be treated from the first carrier and deliver them to the second carrier wheel, means for rotating the carrier wheels in the same direction, and means for rotating the transfer wheel in the opposite direction.
56. A fiber cleaning machine comprising a cleaning wheel, a carrier wheel and a gripping device arranged to extend around a portion of the periphery of the carrier wheel and consisting of a plurality of sections movable outward or away from the carrier, a pressure means to force said sections toward the carrier, means to hold said gripping device against movement with the carrier wheel and means for adjusting said sections toward or from the carrier wheel.
57. A machine for cleaning fibrous plants, carrier wheels for moving said plants through the machine, said carrier wheels each having a longitudinally grooved circumference and a plurality of pressure platens elastically held down toward the carrier wheel and co-acting with said carrier wheels, said platens each having a grooved face conforming to the grooved face of the carrier wheels, and means to hold the platens against longitudinal movement with the carrier wheel.
58. In a fiber cleaning machine the combination with a gripping device consisting of a peripherally grooved wheel, of a correspondingly grooved movable holding device in the plane of the wheel and extending around a portion of its periphery, and ar-

5 ranged to move outwardly away from the wheel a greater or less degree according to the varying thickness of the leaves to be treated, and means for elastically holding said device whereby the wheel may carry 10 leaves of different thicknesses under the holding device, and means to hold the platens against longitudinal movement with the carrier wheel.

10 59. A fiber cleaning machine comprising a cleaning wheel, a carrier wheel, a cooperating gripping means consisting of a plurality of sections arranged over the carrier wheel, means for holding said gripping means 15 against movement with the carrier wheel, means to press the sections toward the carrier wheel, said means bearing on one of said sections directly in front of the cleaning wheel and within the vertical planes of 20 the sides of said cleaning wheel.

25 60. A fiber cleaning machine comprising a cleaning wheel, a carrier wheel, a cooperating gripping means consisting of a plurality of sections arranged over the carrier wheel, means to hold said sections against movement with the carrier wheel, and an elastic device for each section adapted to bear thereon and press the section toward the carrier wheel.

30 61. A fiber cleaning machine comprising a cleaning wheel, a carrier wheel, a cooperating gripping means consisting of a plurality of sections arranged over the carrier wheel, means to hold said sections against movement with the carrier wheel, and an elastic 35 device for each section adapted to bear thereon and press the section toward the carrier wheel, one of said elastic devices being arranged in front of the cleaning wheel and between the vertical planes of the sides 40 of said cleaning wheel.

62. In a fiber cleaning machine, a gripping device comprising two members, one of said members embodying a plurality of adjacent clamping sections, and means to 45 move one of said members longitudinally relative to the other.

63. A fiber cleaning machine comprising a carrier wheel, a flexible opposed gripping means arranged in the plane of the wheel 50 around a portion of the periphery thereof, and means for holding said gripping means against movement with the carrier wheel.

64. In a fiber cleaning machine, a leaf cleaning or beating device, a gripping de- 55 vice comprising a wheel located in front of the former, and a flexible platen superimposed on the said wheel and in sliding engagement therewith, and consisting of a plurality of sections forming each a segment 60 of an arc whose center is the same as that of said wheel, each of said sections having elastic means for pressing it toward the wheel, one of such elastic means being positioned directly in front of, or between the 65 vertical planes of the face or edge of, the cleaning device, and another being located on one side of the cleaning device and adjacent to the vertical plane of one face or edge of the latter. 70

65. In a fiber cleaning machine, two parts comprising a wheel and cooperative sectional gripping means located around a portion of its periphery, means for holding one member against movement by the other, and 75 elastic means for forcing the gripping means toward the wheel.

ANGEL PONS.

Witnesses:

W. H. RUBY,
F. B. WRIGHT.