July 23, 1957 D. RONCIN 2,799,898

EXTRACTION OF FIBRES FROM TEXTILE PLANTS

Filed July 6, 1953 2 Sheets-Sheet 1

Fig. 1

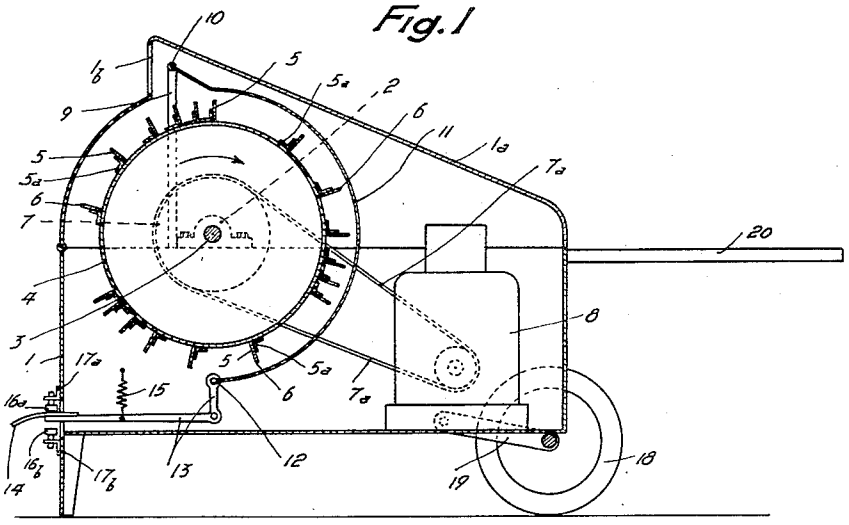


Fig. 2

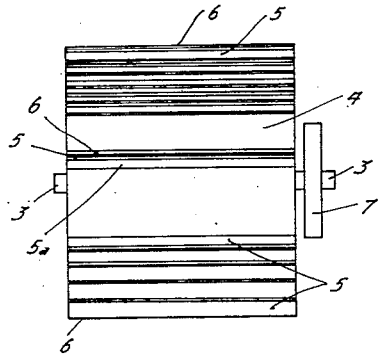


Fig. 3

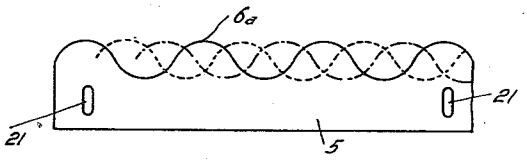


Fig. 4

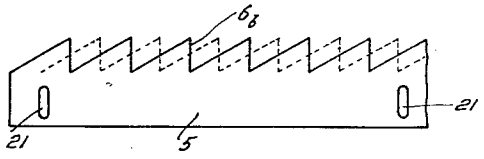
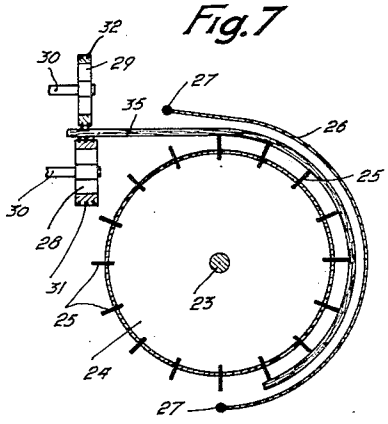


Fig. 7



Inventor:-
Didier Roncin
By Allen & Allen
attys

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Fig. 5

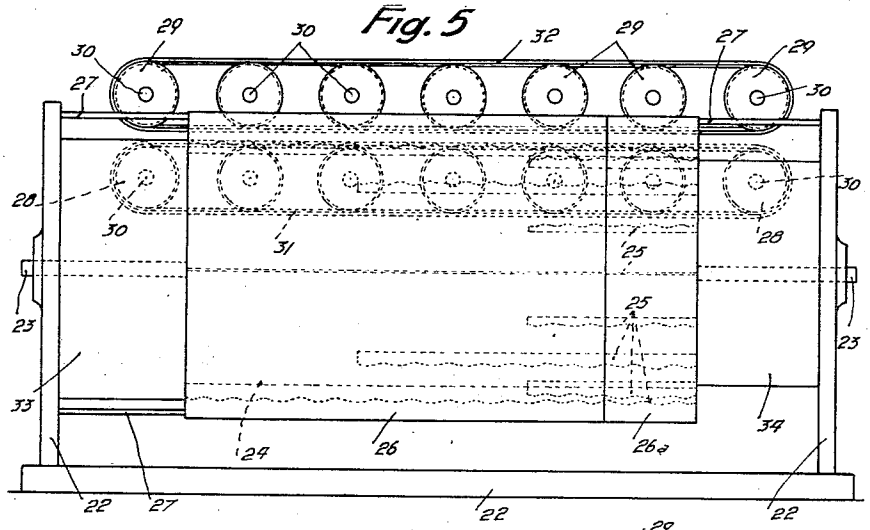


Fig. 6

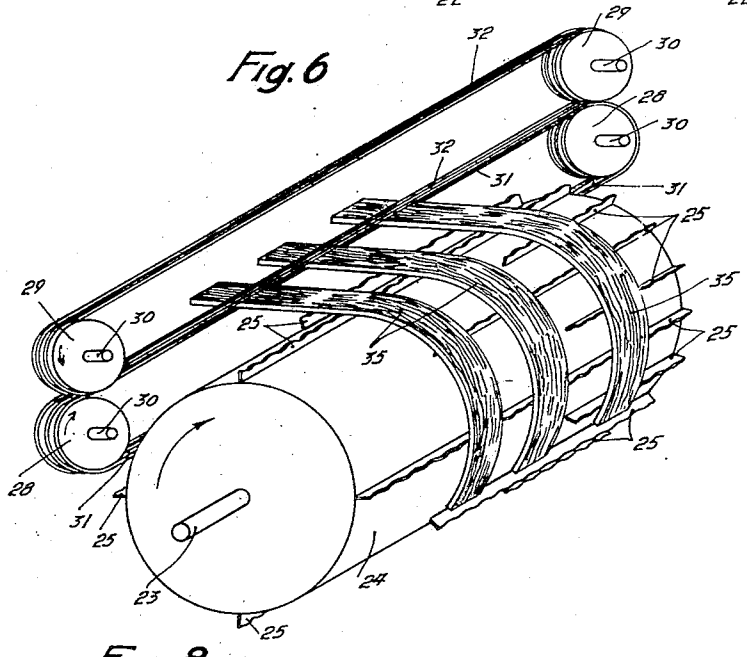
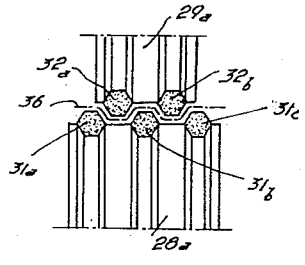


Fig. 8



Inventor
Didier Roncin
By Allen & Allen
attys

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EXTRACTION OF FIBRES FROM TEXTILE PLANTS

Didier Roncin, Neuilly-sur-Seine, France

Application July 6, 1953, Serial No. 366,246

Claims priority, application France July 11, 1952

19 Claims. (Cl. 19—12)

The present invention relates to the extraction of the fibres contained in parts such as stems, leaves, leaf stalks and the like, of textile plants, i. e. the operation which consists in separating the said fibres from the materials which surround them.

The above mentioned parts of textile plants are formed of fibres which are assembled and agglomerated by various materials which, for greater convenience are hereafter generally called a "pulp."

In order to carry out the above mentioned separation, various methods have already been used, consisting chiefly in subjecting the vegetable parts either in their natural condition or after retting, to hackling, swingling, beating or scraping operations.

The main object of my present invention is to provide a method which makes it possible to operate this separation rapidly and completely and which has proved to be particularly advantageous, especially in its application to the extraction of fibres contained in leaf stalks of banana trees.

According to my invention, the vegetable parts are subjected to vibrations, the frequency and/or amplitude of which are varied periodically or not. The frequency may vary between 20 and for instance 10,000 cycles per second and the amplitude between 2 and 100 mm. approximately.

In certain methods already known for separating fibres from textile plant parts, for instance in methods in which the said parts are subjected to a scraping by means of rotating knives, said parts are already subjected to a vibration. This vibration, however, can be efficient only if produced at a given frequency, adapted to the part under treatment. In fact when an adherent assembly of fibers and pulp is subjected to vibrations with a predetermined frequency and amplitude, the result may be, if factors are suitably chosen, that one of the constituents, the pulp for instance, has a tendency to be set in motion while the other constituent, for instance the fibers, has a tendency to remain more or less motionless, this difference in the motions of the constitutive elements leading to a dissociation of the latter.

The vibration conditions should preferably be such that, as indicated above, the fibres have a tendency to remain motionless and the pulp assumes a maximum motion, due to the fact that, in general, the fibres have a much higher continuity and breaking load than pulp. In any case the vibrations should be suited to the constitutive part to which it is desired to impart the motion having a maximum amplitude.

Pulp, however, consists in itself of various constituents, having consequently different inertiae. In addition, the determination of the optimum frequency for a given plant part constitutes a problem which is very difficult to solve, even by experiment, as this frequency may vary from one sample of the same vegetable group to another.

All these drawbacks may be avoided and the fibres may, without any difficulty, be perfectly freed from the pulp adhering thereto when proceeding in accordance with my

invention. The most favourable frequency and amplitude ranges for a given plant group can easily be determined from experience.

The vibrations may be applied to the plant parts either in the longitudinal direction of the fibres only or, preferably, simultaneously or successively in the longitudinal and in the transverse directions. In most cases, longitudinal vibrations give rise to the formation of a more or less wide sheet of fibres practically freed of their pulp on both faces of the sheet but still bound together by pulp and the transverse vibrations make it possible to dissociate this sheet and to separate the fibres completely.

The parts to be treated may be subjected successively to vibrations having a variable frequency and amplitude in a range of low frequencies and relatively high amplitudes, then to a treatment of high frequencies and low amplitudes, the second treatment ensuring a complete cleansing of the fibres. In many cases, however, a low frequency treatment which requires only mechanical vibration generating members is sufficient for ensuring the production of commercial fibres, particularly when taking into account later treatments to which fibres are always subjected before reaching the condition for weaving proper.

In order to impart to the fibres the necessary vibrations, either exclusively mechanical means or electromechanical means may be used.

As an exclusively mechanical means, there may be used a device comprising a cylindrical drum rotatably mounted about its axis, and equipped with driving means, said drum being provided along its periphery with substantially radial blades, extending along generatrices of the drum, and a stator, which covers at least a fraction of the periphery of the drum. In accordance with the invention, the peripheral distance between said blades may or may not decrease periodically. Moreover, said stator is arranged at a minimum distance from said drum so that the interval, preferably adjustable, between the stator and the active edge of a blade carried by the drum is substantially equal to one half of the maximum vibrating amplitude which it is desired to impart to the part to be treated.

The blades may form one or more peripheral groups in each one of which the distance between the successive blades decreases. They may also form several groups arranged side by side on the drum, the blades being equidistant in each group and the distances between the blades decerasing from one group to the next one. The stator may be made of a continuous sheet covering in the above said conditions, at least one part of the periphery of the drum; the stator furthermore can be formed as a screen comprising a latticed upper part and a full or continuous lower part, i. e. from the top of the drum, the stator is provided first with lattices connected together and second with a continuous sheet suitably attached to the lattices.

The textile plant parts to be de-fibred are brought, either transversally or longitudinally on the periphery of the rotating drum, said parts being so directed that the fibres they contain are perpendicular to the axis of the drum. Due to the friction exerted by the blades, these parts have a tendency to wind themselves about the drum and, if they are held at the end opposite to that which is thus wound on the drum, they are subjected to a wave motion, the frequency of which is variable, due to the variable spacing between blades. At the same time, upon the passing of each blade, the ends of the fibres are subjected to a curling effect and tend to hook onto said blade, which gives rise to successive tractions, which cause an irregular, longitudinal vibration which combines with the above mentioned wave motion. The

latter motion is all the more intense as the slope of the blades towards the front in the direction of rotation of the drum is greater.

In case the blades form one or more peripheral groups in each one of which the distance between the successive blades decreases, the parts to be treated may be each held substantially in one and the same transverse plane of the drum. In case the blades form several groups arranged side by side, along the drum, the blades being equidistant in each group and the distances between the blades decreasing from one group to the next, the parts to be treated should be moved sideways, parallel with the axis of the drum so as to be subjected to the successive actions of all blade groups, beginning, preferably, with the group in which the blades are spaced at the widest intervals.

In this second case, the introduction or sideways movement of the parts to be treated may be advantageously operated automatically by mechanical means, such as at least two belts so arranged that the two runs belonging respectively to one and the other belt be driven side by side parallel with the axis of the drum, one end of the parts to be treated being introduced between these runs which nip the said end and move said elements sideways on the drum.

Preferred means for facilitating the introduction of the parts, consist in a set of grooved rollers (for instance two cylinders), provided at the inlet of the set of belts, with their shafts driven by the motor of the machine, fixed on its housing parallel to the plane of belt's motion and perpendicular to the shaft of the drum. The distance between the rollers is preferably adjustable relatively to the thickness of the parts to be treated; said parts thus are introduced between the rollers and submitted to a preliminary tearing, then are pushed through the belts.

The active, or outer, edge of the blades carried by the drum may be rectilinear, or, preferably, irregular, for instance sinusoidal or saw tooth shaped. In the latter case, the blades following one another peripherally are conveniently offset longitudinally with respect to one another, in such a manner that the protruding portions of two consecutive blades be not in a same cross section of the drum, which makes it possible to impart transverse vibrations to the plant parts which are being treated. In view of increasing the vibratory efficiency of the offset blades with irregular shapes, the sharp edges of the blades also may be advantageously provided with saw teeth, with a rounded connection at the respective top and bottom ends of the successive straight portions of the blade. In said embodiment, the lengths of the elementary saw teeth portions and the heights of the straight portions of the blades are preferably decreasing from the inlet to the outlet of the drum. Another possibility consists in providing blades of either one above indicated shape with an increasing height from the inlet to the outlet of the drum.

Two embodiments of a machine according to the invention are described hereinafter with reference to the appended drawings in which:

Fig. 1 is a sectional view, transversally to the drum axis, of a first embodiment.

Fig. 2 is a front elevational view of the drum of this embodiment.

Fig. 3 is a part elevational view at a larger scale, of a first modification of the shape of the active edges of the blades.

Fig. 4 is a similar view of a second modification.

Fig. 5 is a front elevational view of another embodiment of the machine.

Fig. 6 is a partial, diagrammatic, perspective view of the working elements of said machine, the stator being assumed to be removed.

Fig. 7 is a diagrammatic sectional view of this same machine, transversally to the drum axis.

Fig. 8 is a transverse sectional view, of a particularly advantageous embodiment of the driving members for the plant parts to be treated.

Referring now to figures 1 and 2, the machine comprises a frame **1**, shaped as a casing, which is provided with a cover **1***a* having a window **1***b*, and which supports bearings **2** in which rotates a shaft **3** on which is keyed a sheet metal drum **4**. On the periphery of said drum and along generatrices of the latter, are attached steel blades **5** secured on angle irons **5***a*, and the active rectilinear edge **6** of which has a rounded cross section. These blades form three groups, occupying each 120° along the periphery of the drum and in each one of which the distance between two consecutive blades decreases gradually.

On shaft **3** is keyed a pulley **7** connected by a belt **7***a* with the shaft of a driving motor **8**. Supports **9** are secured on the casing frame **1** and carry a rod **10** on which is attached one end of a thin metal sheet **11**, bent so as to follow the shape of the drum **4**, without, however, coming in contact with the blades **5** carried by the said drum. The other end of the metal sheet **11** is secured on a rod **12**, carried by levers **13** oscillatingly supported on the frame of the machine and one of which is connected to a pedal **14** and subjected to the action of a return spring **15**. The pedal **14** cooperates with two adjustable stops formed of bolts **16***a* and **16***b* provided with lock nuts and capable of being screwed backwards or forwards into square irons **17***a* and **17***b*, the stop **16***a*, limiting the run of the pedal **14** upwards and the stop **16***b* limiting the said run downwards.

The casing frame **1** is provided with wheels **18**, mounted at the end of rocking levers **19** oscillatingly supported on the frame and making it possible to place the wheels either in a rest position shown in Figure 1 or in a rolling position in which the whole machine appears as a sort of wheelbarrow which may be driven by means of shafts **20**.

The operation of this machine is as follows:

The drum **4** being driven in rotation in the direction of the arrow by the motor **8**, a fibrous plant part to be treated, for instance a banana tree leafstalk, one end of which, is held by the operator, is introduced through the window **1***b* of the cover **1***a*, its other end engaging between the drum **4** and stator **11**. This end is then beaten by the blades **5**, with a tendency to curl by a sort of whip lash effect around each blade. There results a traction on the leafstalk which has a tendency to be driven in the direction of rotation of the drum, the operator opposing this driving by holding to the leafstalk at the other end, while allowing it to engage about the drum little by little. During this operation, the leafstalk, subjected to the beating and pulls of the blades assumes a complex vibratory motion with a periodically variable frequency due to the variable spacings between the blades. The amplitude of this motion is controlled, on the one hand, by the respective distance and the height of the blades **5**, the leafstalk, the fibres of which are gradually separated from the pulp, tending at all instants to assume the position of a chord between two successive blades and its inertia causing it to beat, in one direction, against the surface of the drum and, on the other hand, by the minimum distance between the active edges of the blades **5** and stator **11**, against which they beat in the other direction. This minimum distance may be adjusted by modifying the position of the stop **16***a* which tends to prevent a moving upwards of the pedal **14**. When the operation is ended, it may be perfected by an actual scraping of the fibres which is obtained by depressing the pedal **14** so as to move the stator **11** closer to the blades **5**, thus pressing the fibres between the said stator and blades. The degree of pressing may be adjusted by acting on the stop **16***b*. By placing the said stop in such a position that

the run of the pedal 14 downwards be limited to a sufficient extent to obtain that the stator 11 gets closer to the blades 5, without causing a pressing of the fibers, it is possible, by periodically stepping on and releasing the pedal 14 to cause a periodical variation of the amplitude of vibration of the leafstalk under treatment.

Once the fibres contained in the portion of the leafstalk engaged into the machine has been brought to the desired degree of cleansing it is removed from the window 1*b* and the operator may proceed with the treatment of the other end by seizing the leafstalk by the previously treated end.

Instead of being rectilinear, the active edges of the blades 5 may be corrugated, as shown at 6*a* in Figure 3, or saw tooth shaped as at 6*b* in Figure 4. In such a case, the corrugations or saw tooths may be longitudinally offset from one blade to the next, as shown in dash and dot lines in Figures 3 and 4. A transverse vibratory motion is thus imparted to the leafstalks also at a variable frequency, particularly advantageous for ensuring a complete separation of the fibres from one another and the elimination of the pulp which may remain between said fibres. Instead of corrugations or saw tooth undulations, other irregular shapes may be contemplated for the active edges of the blades 5, for instance a castellated shape. The distance between the crest points of the corrugations or teeth of the blades may vary along a blade, for instance regularly increase or decrease from one end of a blade to the other.

As may be seen in Figures 3 and 4, the blades 5 may be provided, for ensuring the passage of the bolts which hold them on the angle irons 8*c*, with elongated holes 21 making it possible to adjust the heights of said blades with respect to the drum and, by way of consequence, the amplitude of the vibrations imparted to the leafstalks.

In the machine represented by way of example in Figure 1, the blades are arranged radially with respect to the drum. But they may also be slightly inclined towards the front, the pull exerted on the fibres due to the curling of their ends around the blades, being all the stronger as this inclination is greater.

Instead of being adapted, as the above described machine, for introduction of the leafstalk transversely to the drum axis, the machine according to the invention may be arranged for allowing this introduction parallel with said axis. It is possible, thus, to obtain a machine which operates continuously and in which the leafstalks to be treated are introduced at one end of the drum and the separated fibres are removed at the other end.

A machine of this type is shown in Figures 5–8.

This machine comprises a frame 22 supporting, by means of bearings, a rotary shaft 23, on which is keyed a drum 24, provided, on its periphery, with blades 25, similar to the blades 5 of the preceding example, and which, as shown, have a corrugated active edge like that of the blades in Figure 4. One third of the blades 25 extends over the whole length of the drum; another third extends only over two thirds of said length while the third occupies only one third thereof. The drum is thus divided into three areas in each one of which the blades 25 are regularly spaced, the spacing between two consecutive blades decreasing however, from one area to the next, when moving from one end of the drum to the other. If, instead of being corrugated, the active edges of the blades 25 are saw toothed, the steep sides of the saw teeth are preferably turned towards the end of the drum 24 where the blades are closest to one another. The drum is surrounded on about one half of its periphery, by a stator 26, held on the frame by longitudinal bars 27, the ends of which are bolted to the frame, by engaging into elongated holes which make it possible to adjust the spacing between said stator and

the active edges of the blades 25. A portion 26*a* of said stator, corresponding to a fraction of the end of the drum 24 which carries the closest set blades 25, may be made independent of the rest and may be provided with a tensioning device such as that shown for the stator 11 in the machine of Fig. 1.

On the opposite side of the drum 24 and on both sides of a level which is substantially that of the highest generatrix of said drum, are arranged two parallel lines of coplanar pulleys 28, 29 mounted on horizontal axles 30, perpendicular on the shaft of the drum, trunnioned in bearings, not shown, carried by the frame of the machine. On these two rows of pulleys, pass, respectively, belts 31 and 32 which are arranged so as to allow the nipping, between their respective strands closest to one another, of the end of a banana tree leafstalk to be treated in the machine. The said rows of pulleys extend beyond the ends of the drum 24 and the shafts of the two pulleys 28 and 29, which are located on the side of that end where the blades 25 are closest together, are driven in rotation at the same speed, by the motor of the machine, in the respective directions of the arrows, by means of a mechanical transmission, not shown, the other pulleys being free.

In the extension of the end of the drum 24 which carries the most widely spaced blades 25, is arranged a curved metal sheet 33 co-axial with the drum and the diameter of which is very slightly larger than that of the ideal cylinder surrounding the blades 25, said metal sheet engaging, over a short length, the corresponding end of the drum. This sheet is extended, on the side of the machine where the pulleys 29 and 30 are placed, by a substantially horizontal, apron, not shown, located at the level of the interval between the cooperating strands of the belts 31 and 32.

In line with the other end of the drum 24, is arranged a curved metal sheet 34, similar to metal sheet 33 but the diameter of which is slightly less than that of the drum 24. The corresponding end of the said drum is slightly hollowed out and the sheet 35 engages the cavity thus formed. Said sheet forms a casing in which are housed the motor of the machine and the transmission members connecting the shaft of the said motor with the shaft 23 of the drum and with the shafts 30 of the pulleys 28, 29 which are driven in rotation by said motor.

The above described machine operates as follows:

The motor being started and driving the drum 24 and the belts 31, 32, a banana tree leakstalk such as those shown diagrammatically at 35, previously broken to impart to it a relative flexibility and allow it to bend, is placed on the sheet 33, transversally to the longitudinal axis of the machine, one of its ends going slightly beyond the plane of the belts 31, 32. It is then pushed towards the said belts which seize its end and drive it parallel to the axis of the machine. The leakstalk then leaves the sheet 33 and engages the drum where it is subjected to the above described vibratory action, the frequency of the vibrations increasing from one area of the drum to the next. The speed of the belts, the width of the drum, that of the respective areas and the number of blades are determined by experience in such a manner that when the leafstalk reaches the other end of the drum the fibres have reached the desired degree of cleansing, and this cleansing may be perfected by a periodic pressing, at the passage of each leafstalk, of the portion 26*a* of the stator.

The cleansed fibres finally reach the sheet 34 whence they can be removed or fall naturally, after being abandoned by the belts 31, 32. To clean the untreated end of the leafstalk, it may be engaged anew in the machine in the converse. It will be realized that two similar machines may also be arranged head to tail, offset, in line with each other, the belt conveyor of the second machine being arranged for taking up the fibres delivered by that of the first machine.

With such a machine, it is possible to treat leafstalks, one after another, in a continuous manner and to obtain important outputs of cleansed fibres.

In the machine represented in Figures 5 to 7 the device for the mechanical displacement of the leafstalks has been shown as constituted by two belts **31** and **32**, for simplifying the drawings. However, to ensure a better holding of the leafstalks allowing them to withstand the pulling stress they are subjected to, it is advantageous to use a device such as the one shown in transverse section in Figure 8.

This device comprises a lower set of three double-V belts **31***a*, **31***b*, **31***c*, carried by three-groove pulleys such as pulley **28***a*, and an upper set of two similar belts **32***a* and **32***b*, also carried by two-groove pulleys such as pulley **29***a*. The belts **32***a* and **32***b* engage respectively between the belts **31***a* and **31***b* on the one hand and **31***b* and **31***c* on the other hand, the free interval between the belts being such as to allow the nipping of the end of a leafstalk **36**.

Other modifications of a constructional nature may be made to the above described machines within the scope of the invention. More particularly, in order to avoid having to break the leafstalks previous to their lateral introduction into the machine represented in Figures 5 to 8, the edge of the stator **26** on the side of the entrance sheet **33**, instead of being in a plane perpendicular to the shaft **23**, may be arranged obliquely, said edge forming an arc of a helix, the upper end of which is in the plane of the end of the drum **24**, while its lower end is in the vicinity of approximately the first third of said drum. The leafstalks are thus curved little by little around the drum by the very action of the blades **25**. Similarly, in order to make the initial action of said blades **25** more gentle the latter may be given on the side of the entrance of the leafstalks on the drum, a lesser height than on the remainder of the drum, this height increasing gradually so as to reach the current height, for instance about 20 cms. from the entrance end of the drum.

What I claim is:

1. In a device for separating fibres from the materials coating them in textile plant parts, a housing frame, driving means fixed on said frame, a shaft mounted on said frame, a cylindrical drum rotatably mounted about said shaft and entrained by the driving means, a series of blades extending substantially radially along generatrices of said drum with different distances from one blade of said series to the next one, said blades having an edge in contact with the drum and an outer active edge, the housing frame having a closable aperture in the upper part thereof, and a stator surrounding at least one part of the periphery of the drum at a distance from said periphery which is adjustable and substantially equal to half the maximum amplitude of the vibrations.

2. In a device for separating fibers from the materials coating them in textile plant parts, a housing-frame, driving means fixed on said frame, a shaft mounted on said frame, a cylindrical drum rotatably mounted about said shaft and entrained by said driving means, a series of sets of blades extending substantially radially along generatrices of said drum with different distances from one blade of one set to the next one of the same set, said blades having an edge in contact with the drum and an outer active edge, the housing frame having a closable aperture in the upper part thereof, and a stator surrounding at least one part of the periphery of the drum at a distance from said periphery which is adjustable and substantially equal to half the maximum amplitude of the vibrations.

3. In a device for separating fibers from the materials coating them in textile plant parts, a housing frame, driving means fixed on said frame, a shaft mounted on said frame, a cylindrical drum rotatably mounted about said shaft and entrained by said driving means, a series of blades having an outer edge of non rectilinear shape extending substantially radially along generatrices of the drum with different distances from one blade of said series to the next one, said blades having an edge in contact with the drum and an outer active edge, the housing frame having a closable aperture in the upper part thereof, and a stator surrounding at least one part of the periphery of the drum at a distance from said periphery which is adjustable and substantially equal to half the maximum amplitude of the vibrations.

4. In a device for separating fibres from the materials coating them in textile plant parts, a housing frame, driving means fixed on said frame, a shaft mounted on said frame, a cylindrical drum rotatably mounted about said shaft and entrained by said driving means, a series of blades having an outer edge of approximately sinusoidal shape, extending substantially radially along generatrices of the drum with different distances from one blade of said series to the next one, said blades having an edge in contact with the drum and an outer active edge, the housing frame havng a closable aperture in the upper part thereof, and a stator surrounding at least one part of the periphery of the drum at a distance from said periphery which is adjustable and substantially equal to half the maximum amplitude of the vibrations.

5. In a device for separating fibres from the materials coating them in textile plant parts, a housing frame, driving means fixed on said frame, a shaft mounted on said frrame, a cylindrical drum rotatably mounted about said shaft and entrained by said driving means, a series of blades having an outer edge of saw teeth shape extending substantially radially along generatrices of the drum with different distances from one blade of said series to the next one, said blades having an edge in contact with the drum and an outer active edge, the housing frame having a closable aperture in the upper part thereof, and a stator surrounding at least one part of the periphery of the drum at a distance from said periphery which is adjustable and substantially equal to half the maximum amplitude of the vibrations.

6. In a device for separating fibres from the materials coating them in textile plant parts, a frame, driving means fixed on said frame, a shaft mounted on said frame, a cylindrical drum rotatably mounted about said shaft and entrained by the driving means, a series of sets of blades extending substantially radially along generatrices of the drum within each set different distances from one blade of one set to the next one of the same set, said blades having an edge in contact with the drum and an outer active edge, the housing frame having a closable aperture in the upper part thereof, a stator surrounding at least one part of the periphery of the drum at a distance from said periphery which is adjustable and substantially equal to half the maximum amplitude of the vibrations, and means for introducing the textile plant parts between the drum and the stator.

7. In a device for separating fibres from the materials coating them in textile plant parts, a frame, driving means fixed on said frame, a shaft mounted on said frame, a cylindrical drum rotatably mounted about said shaft and entrained by the driving means, a series of sets of blades extending substantially radially along generatrices of the drum within each set different distances from one blade of one set to the next one of the same set, said blades having an edge in contact with the drum and an outer active edge, the housing frame having a closable aperture in the upper part thereof, a stator surrounding at least one part of the periphery of the drum at a distance from said periphery which is adjustable and substantially equal to half the maximum amplitude of the vibrations, and means for introducing the textile plant parts between the drum and the stator, said means allowing the movement of said textile plant parts in a direction transverse to the axis of the drum, the said plant parts being oriented parallel to said direction.

8. In a device for separating fibres from the materials

coating them in textile plant parts, a frame, driving means fixed on said frame, a shaft mounted on said frame, a cylindrical drum rotatably mounted about said shaft and entrained by the driving means, a series of sets of blades extending substantially radially along generatrices of the drum within each set different distances from one blade of one set to the next one of the same set, said blades having an edge in contact with the drum and an outer active edge, the housing frame having a closable aperture in the upper part thereof, a stator surrounding at least one part of the periphery of the drum at a distance from said periphery which is adjustable and substantially equal to half the maximum amplitude of the vibrations, and means for introducing the textile plant parts between the drum and the stator, said means causing the movement of said plant parts in a direction parallel with the axis of the drum, said plant parts being oriented perpendicular to said axis.

9. In a device for separating fibres from the materials coating them in textile plant parts, a frame driving means fixed on said frame, a cylindrical drum rotatably mounted about said shafts and entrained by the driving means, a series of sets of blades with an edge in contact with at least one part of generatrices of the drum and an outer active edge, one set of blades extending over the whole length of the drum and the other sets extending over decreasing parts of the length of the drum, said blades extending substantially radially on the drum with in each set different distances from one blade of one set to the next one of the same set, the housing frame having a closable aperture in the upper part thereof, a stator surrounding at least one part of the periphery of the drum at a distance from said periphery which is adjustable and substantially equal to half the maximum amplitude of the vibrations, and means for introducing the textile plant parts between the drum and the stator.

10. In a device for separating fibres from the materials coating them in textile plant parts, a frame, driving means fixed on said frame, a shaft mounted on said frame, a cylindrical drum rotatably mounted about said shaft and entrained by the driving means, a series of sets of blades extending substantially radially along generatrices of the drum with in each set different distances from one blade of one set to the next one of the same set, said blades having an edge in contact with the drum and an outer edge, the housing frame having a closable aperture in the upper part thereof, a stator surrounding at least one part of the periphery of the drum at a distance from said periphery which is adjustable and substantially equal to half the maximum amplitude of the vibrations, means for introducing the textile plant parts between the drum and the stator, and means for guiding the cleansed fibres at the outlet of the drum.

11. In a device for separating fibres from the materials coating them in textile plant parts, a housing frame, driving means fixed on said frame, a shaft mounted on said frame, a cylindrical drum rotatably mounted about said shaft and entrained by said driving means, a series of blades having an outer edge of saw teeth shape extending substantially radially along generatrices of the drum with different distances from one blade of said series to the next one, each tooth having a saw toothed inclined edge and a substantially straight bounding edge between two successive teeth, said blades having an edge in contact with the drum and an outer active edge, the housing frame having a closable aperture in the upper part thereof, and a stator surrounding at least one part of the periphery of the drum at a distance from said periphery which is adjustable and substantially equal to half the maximum amplitude of the vibrations.

12. In a device for separating fibres from the materials coating them in textile plant parts, a housing frame, driving means fixed on said frame, a shaft mounted on said

frame, a cylindrical drum rotatably mounted about said shaft and entrained by said driving means, a series of blades having an outer edge of saw teeth shape extending substantially radially along generatrices of the drum with different distances from one blade of said series to the next one, each tooth having a saw toothed inclined edge and a substantially straight bounding edge between two successive teeth, the lengths of the teeth and of the straight bounding edge decreasing for the inlet to the outlet end of each blade, said blades having an edge in contact with the drum and an outer active edge, the housing frame having a closable aperture in the upper part thereof, and a stator surrounding at least one part of the periphery of the drum at a distance from said periphery which is adjustable and substantially equal to half the maximum amplitude of the vibrations.

13. In a device according to claim 5, a set of pulleys shafted on the frame at the level of the closable aperture and moved by the driving means, the shafts of said pulleys being perpendicular to that of the drum.

14. In a device according to claim 5, grooved pulleys shafted on the frame at the level of the closable aperture and moved by the driving means, the shafts of said pulleys being perpendicular to that of the drum.

15. In a device according to claim 5, a set of corresponding pulleys superposed at each end of the drum at the level of the closable aperture and moved by the driving means, the shafts of said pulleys being perpendicular to that of the drum, and a set of endless belts each passing over two corresponding pulleys located one at each end of the drum.

16. In a device as claimed in claim 5, a set of corresponding pulleys superposed at each end of the drum at the level of the closable aperture and moved by the driving means, the shafts of said pulleys being perpendicular to that of the drum, a set of endless belts each passing over two corresponding pulleys located one at each end of the drum, two grooved rollers shafted on the frame and driven by the driving means, their shafts being parallel to those of said pulleys, the contact plane between the surfaces of each roller being at the level of the track of the set of belts.

17. In a device for separating fibres from the materials coating them in textile plant parts according to claim 1, means for adjusting the height of the blades above the periphery of the drum.

18. In a device for separating fibres from the materials coating them in textile plant parts according to claim 1, the outer edge of the blades being rectilinear.

19. In a device for separating fibres from the materials coating them in textile plant parts, a housing frame, driving means fixed on said frame, a shaft mounted on said frame, a cylindrical drum rotatably mounted about said shaft and entrained by the driving means, a series of sets of blades extending substantially radially along generatrices of said drum with in each set constant distances from one blade of said set to the next one, said blades having an edge in contact with the drum and an outer active edge, the housing frame having a closable aperture in the upper part thereof, a stator surrounding at least one part of the periphery of the drum at a distance from said periphery which is adjustable and substantially equal to half the maximum amplitude of the vibrations.

References Cited in the file of this patent

UNITED STATES PATENTS

68,905	Roezl	Sept. 17, 1867
266,038	Luft	Oct. 17, 1882
330,988	Luft	Nov. 24, 1885
2,375,287	Dempsey	May 8, 1945
2,551,129	Hulfish et al.	May 1, 1951