

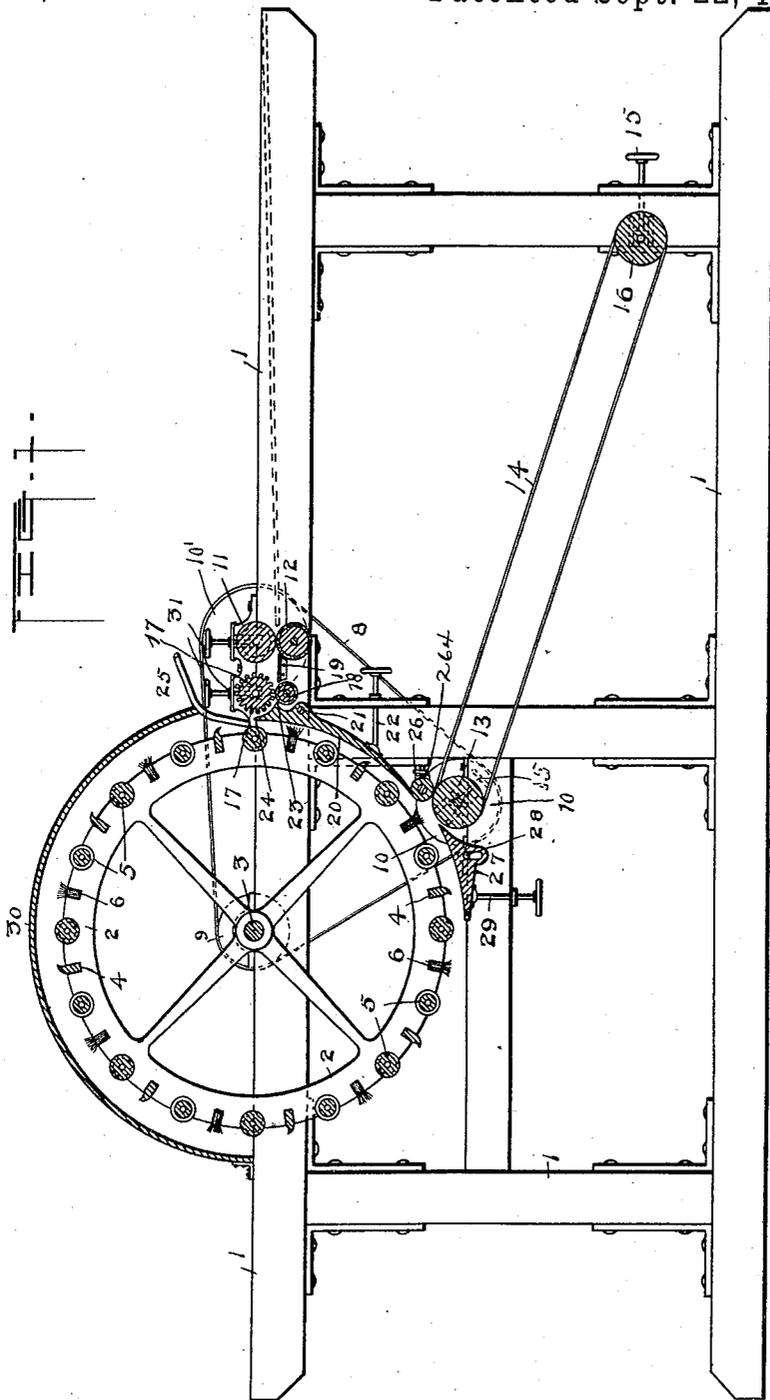
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3 Sheets—Sheet 1.

S. B. ALLISON.
FIBER SEPARATING MACHINE.

No. 568,309.

Patented Sept. 22, 1896.



Witnesses
Arch. M. Cathers.
H. S. Stone

Inventor.
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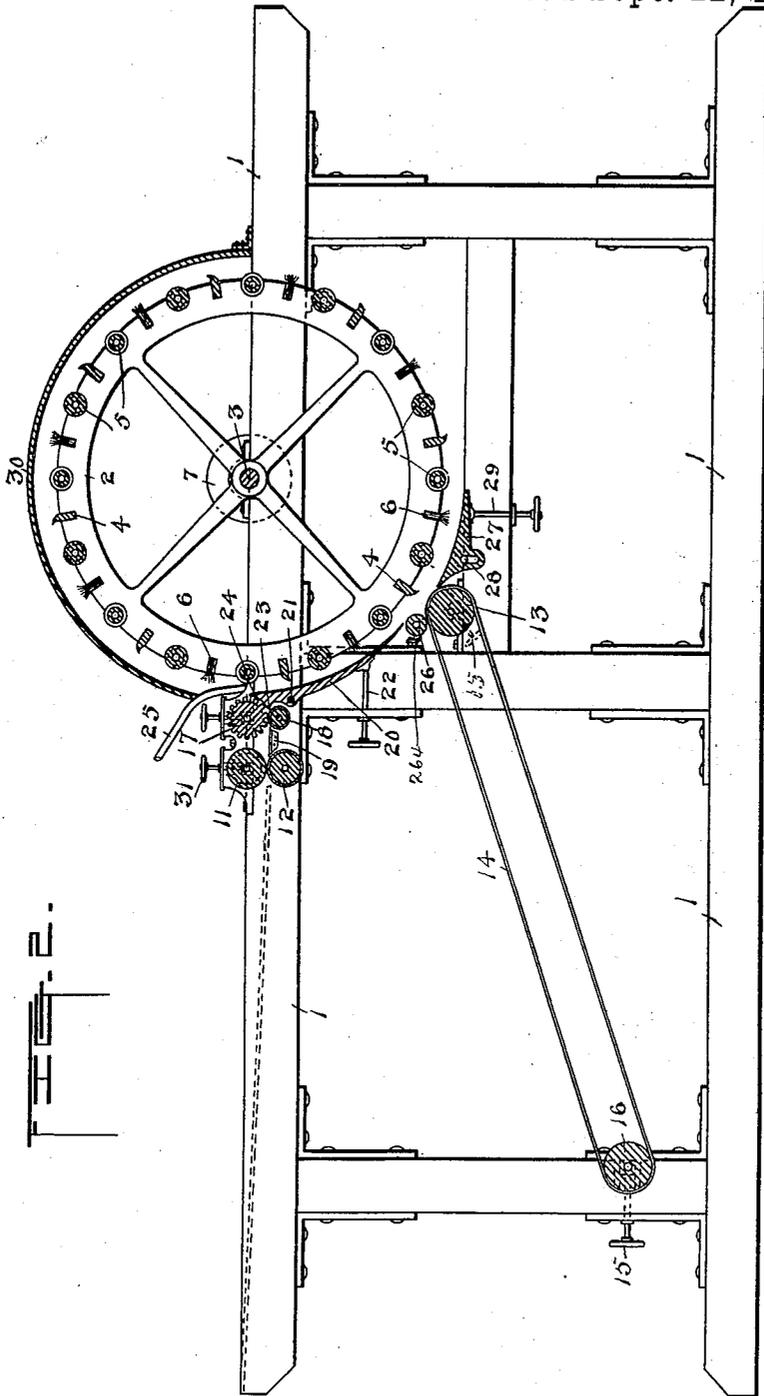
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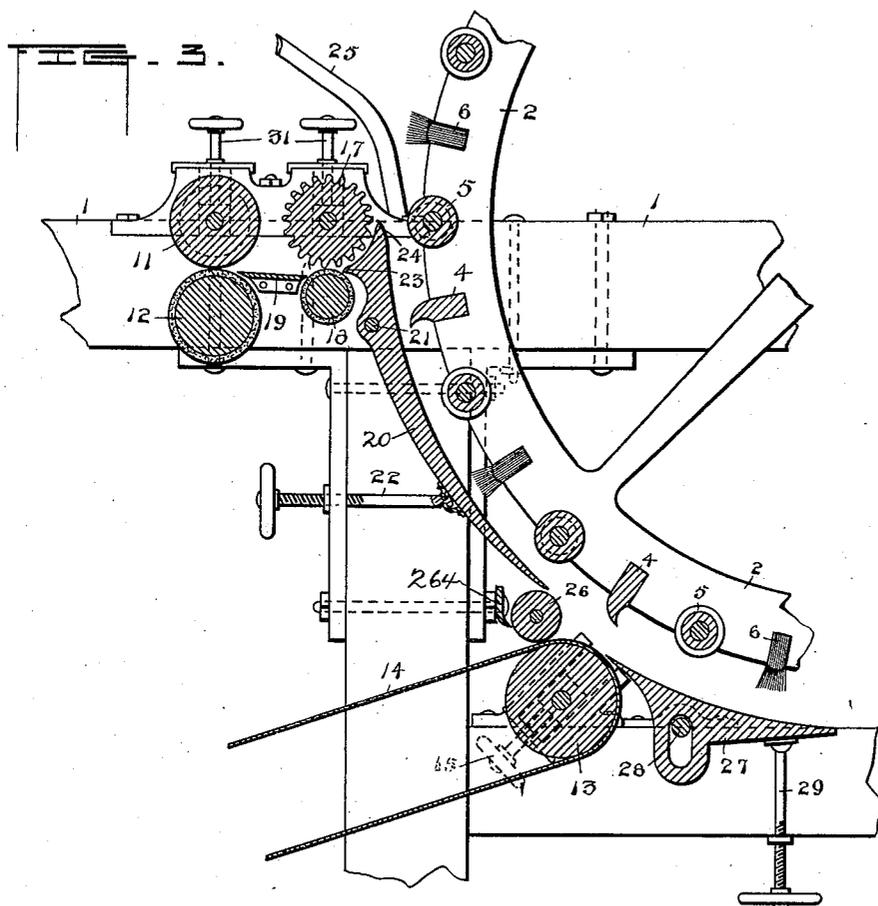
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UNITED STATES PATENT OFFICE.

SAMUEL BENJAMIN ALLISON, OF NEW ORLEANS, LOUISIANA.

FIBER-SEPARATING MACHINE.

SPECIFICATION forming part of Letters Patent No. 568,309, dated September 22, 1896.

Application filed December 3, 1894. Serial No. 530,761. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL BENJAMIN ALLISON, a resident of New Orleans, in the parish of Orleans and State of Louisiana, have invented certain new and useful Improvements in Fiber-Separating Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

The invention relates to the separation and cleaning of the fiber of pineapple, bear-grass, petrea, and other fibrous leaves, many of which have a glazed pellicle and a considerable body of pulp, and which, for this and other reasons, present peculiar difficulties to the separation of the fiber. Fiber-bearing leaves of this character are abundant in some sections and will have great commercial value when suitable means for removing the silicious covering and pulpy envelop from the fiber are provided.

It is the object of the present improvement to separate the fiber from plants such as specified in an economical and efficient manner and without rehandling the leaves after they have been fed to the machine.

The invention consists in the construction hereinafter described and particularly pointed out.

In the accompanying drawings, Figure 1 is a section. Fig. 2 is a similar section, the view being in a direction opposite to that of Fig. 1; and Fig. 3 is a partial section on an enlarged scale.

Numeral 1 denotes the main frame, in which is journaled a skeleton roller or rotating frame consisting of the metal disks 2, secured to shaft 3 and otherwise connected by detachable and interchangeable fiber-cleaning devices, such as scraping-knives 4, cylindrically-grooved bars 5, and wire or bristle brushes 6.

7 denotes a driving-pulley or sprocket-wheel on shaft 3, and 8 is a driving belt or chain which passes about pulleys or wheels 9, 10, and 10', the latter being fast on the shaft of a circumferentially-grooved drawing-in and splitting roller 11, which works opposite a smooth rubber-surfaced roller 12 with the effect to split or break the body of the leaf endwise. The wheel 10 is on a shaft which

is the axis of a roller 13, which drives an off-carrying belt 14.

15 denotes screws for adjusting the bearings of rollers 13 and 16, which rollers operate the belt.

17 denotes a longitudinally-fluted roller, and 18 a small smooth rubber-surfaced roller. The leaves are first acted upon by the corrugations of roller 11 pressing them against the roller 12, and then by the rollers 17 and 18.

19 is a transfer-plate approximately tangential to rollers 12 and 18 and has an edge adjacent to each of them and is adapted to support and guide the leaves.

20 indicates a curved plate having pivots 21, journaled in the frame and provided with adjusting screw or screws 22. This plate has a scraping edge 23, adapted to clean the surface of roller 18. This plate 20 has its upper end on the side next to roller 17 made concave to conform to said roller 17, and said concave portion is situated a short distance therefrom and above the passage between the rollers. It holds the material against the action of said roller 17 and guides it up over the edge 24, said material being drawn down across the edge by the action of the cleaning devices. This construction subjects the stalks for a longer period than would be practicable without it to the breaking action of roller 17, and then, in combination with the fiber-cleaning devices, causes them to be abruptly bent from an upward to a downward direction, whereby the broken woody or pulpy fragments are more effectually exposed to the action of the cleaning devices.

The main body of the plate 20 conforms to the exterior of the skeleton roller and is situated a short distance from it, thereby providing a working bed against which the material is scraped, combed, brushed, or otherwise treated by the devices carried in said roller.

The screw or screws 22 are adapted to turn the plate on its pivots 21 in manner to adjust the edge 23 with reference to roller 18, and to vary the distance of the upper end of the plate from roller 17 and the distance of its main part from the working devices borne by the skeleton roller.

25 indicates a pipe to supply water or a chemical solution to the material under treat-

ment. The delivery end of this pipe is over the main concavity of plate 20, which guides the liquid and the fibrous material down and over a fiber-gripping roller 26, cooperating with roller 13 and with the belt driven thereby. Between the roller 26 and the frame is supported a scraper 264, as indicated.

27 indicates a secondary guide-plate having a scraping edge at its upper end adapted to clean the belt 14. This plate is supported upon a rod or upon studs 28, and may be tilted about said studs by means of the screws 29.

30 indicates a cover so situated as to leave an air-conduit between it and the working devices of the skeleton roller. This aids the production of an induced air-current that will carry dust downwardly. In some cases dry material may be sprinkled after the crushing by the rollers of the fiber envelop to soften gum, increase the flexibility of the fiber, and lay the dust, in which case all the adjacent parts, including the cover, guiding-plates 20 and 27, and the intermediate rollers aid in preventing the escape of dust into the operating-room from the upper part of the machine and direct them away from the operator.

31 are adjusting-screws for the bearing-boxes of rollers 11 and 17.

In operation the leaves are fed in between rollers 11 and 12, which, together with rollers 17 and 18, draw or feed in the leaves and crush and partially divide them longitudinally, breaking their silicious covering and loosening the pulp and fiber, thereby preparing them for the scraping, combing, and brushing action of the various working devices carried by the rotating frame or skeleton roller. The action of these devices draws the material down over the upper edge of the plate 20 and it is beaten, scraped, combed, and brushed between the skeleton roller and the working bed presented by said plate. The fiber thus treated is separated from its silicious and pulpy envelop and the forward end of the material will be drawn in between roller 26 and the belt 14 and carried out of the machine, and at the same time the rear end of the fibrous mass will be whipped over onto the plate 27 and subjected to a final cleaning action. The surface speed of said roller 26 and of the belt is sufficiently greater than that of the skeleton roller to exert a pull on the leaf or sliver produced therefrom, and serves to strip the fiber from the pulp and waste.

I make the roller 26 with a radius about equal to the shortest distance between plate 20 and a working device, such as a brush, or about two inches or less in diameter, and place it substantially as shown, and by this means the unsupported end of each leaf and

of each end of the leaf in turn, when released from the cleaning devices and plate 20, is reduced to a practical minimum of about three inches, which length bears such relation to the distance of the adjacent cleaning devices that the rear end of the material can be moved over upon plate 27 without doubling it back upon itself, thereby avoiding the tangling and breaking of fibers.

The small relative size of the roller 26 and its situation close under the foot of plate 20 diminishes the distance from the grip between plate 20 and the cleaning devices to that between roller 26 and the belt-roller, thereby shortening, substantially as specified, the free end of the material, whether it be the front end, which is first drawn between the gripping and belt-rollers, or the rear end, which is temporarily brushed or beaten past them.

The character of the working devices will be varied to suit the particular plants and their various conditions, and the sprinkling device will be used or not, as circumstances require.

The shape of the main frame, the proportions of the parts, the number and variety of working devices, and other like details may be varied by mechanical skill without departing from the invention, and the use of the machine is not limited to leaves nor to any particular plants, though it is primarily intended for leaves such as above named.

Having thus described my invention, what I claim is—

1. In combination with feeding-rollers comprising rollers 17 and 18, the rotating frame provided with fiber-separating devices and the concave working bed-plate 20 said plate having an edge 23 and an edge 24 the former being in contact with roller 18 and the latter situated above it adjacent to and curved toward roller 17, substantially as set forth.

2. The rotating frame, the cover 30 situated above and adjacent to said frame, the feeding-rollers, the guiding and working plate 20, the pivoted plate 27, the gripping-roller 26, the carrying-off belt and the liquid-supplying pipe, said pipe and feeding-rollers being situated between the cover and plate 20 and said gripping-roller and belt between the plates, all in combination as set forth whereby a substantially continuous conduit for air is produced and whereby liquid may be admitted to the lower part of said conduit.

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

SAMUEL BENJAMIN ALLISON.

Witnesses:

CHARLES CUMMINGS,
U. R. RICHARDSON.