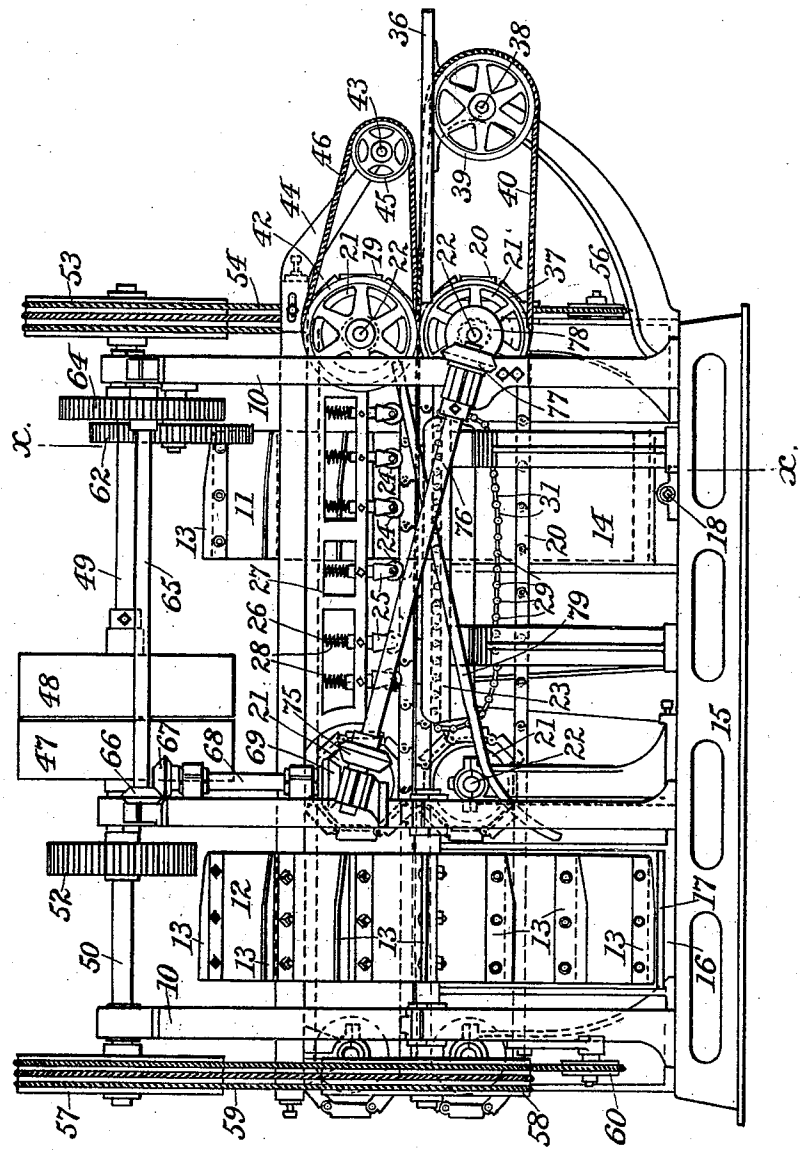
(No Model.) 4 Sheets—Sheet 1.

J. C. TODD.

FIBER PREPARING MACHINE.

No. 538,754. Patented May 7, 1895.

Fig. 1.



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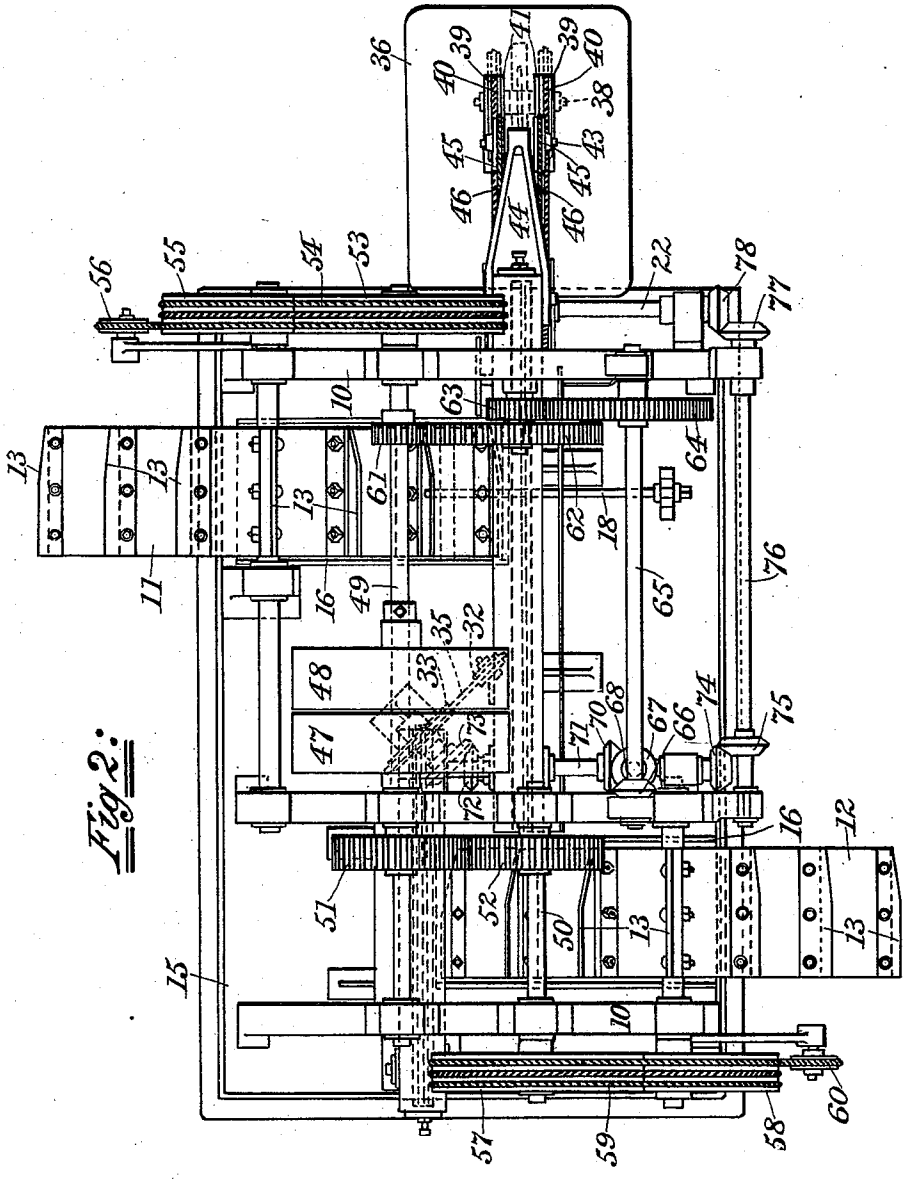

Fig 2.

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Fig 3:

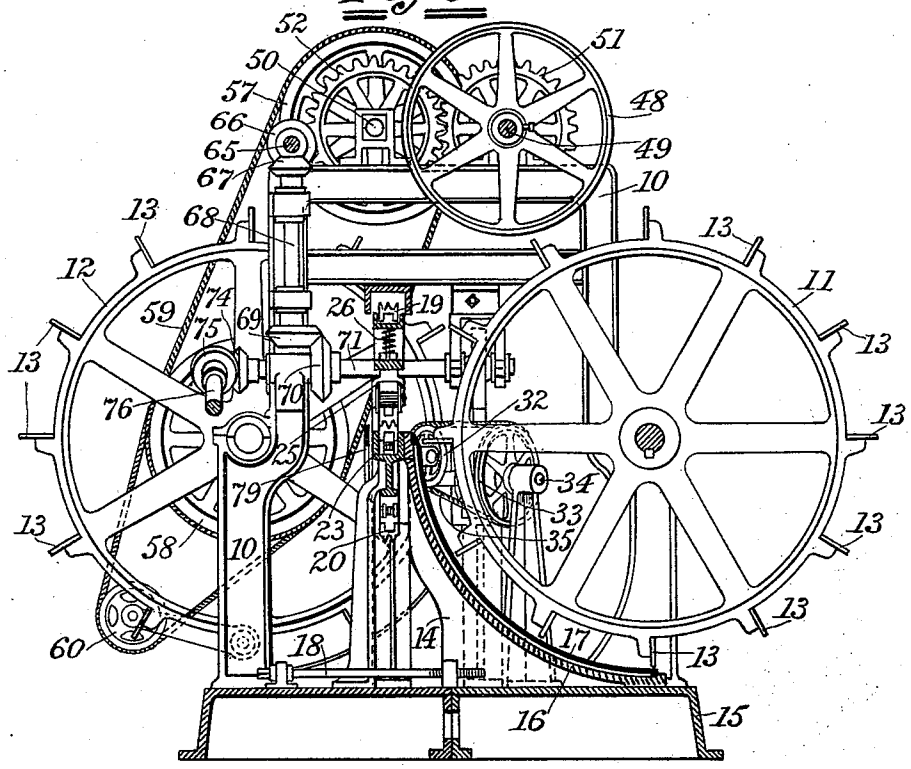

Fig 4:

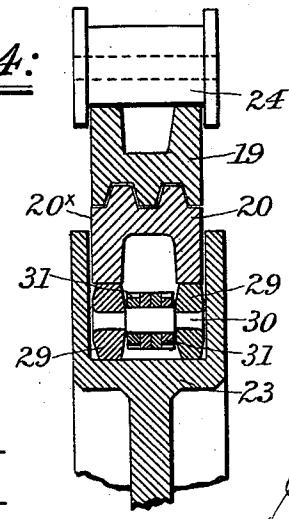

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Fig 5:

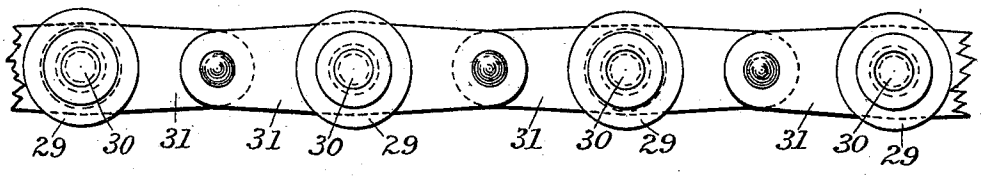


Fig 6:

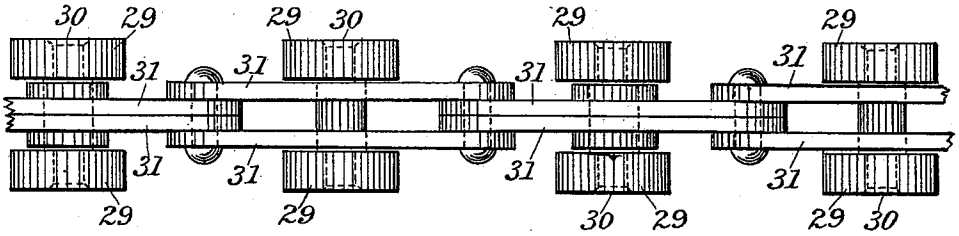
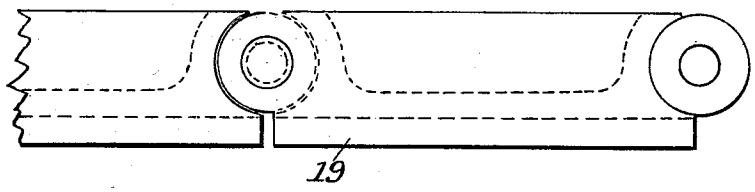


Fig 7:



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UNITED STATES PATENT OFFICE.

JOSEPH C. TODD, OF PATERSON, NEW JERSEY.

FIBER-PREPARING MACHINE.

SPECIFICATION forming part of Letters Patent No. 538,754, dated May 7, 1895.

Application filed June 5, 1894. Serial No. 513,564. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH C. TODD, of Paterson, in the county of Passaic and State of New Jersey, have invented certain new and useful Improvements in Fiber-Preparing Machines; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

This invention relates in general to machines which are intended for removing the pulp from the fibers of sisal and other leaves of like character and particularly to the machine which is shown in Letters Patent of the United States, granted to J. L. Acosta November 8, 1892, and numbered 485,903. Machines of this description are necessarily very heavy and some of the working parts thereof are subject to great pressure. The machines therefore require considerable power to drive them and it is desirable on this account, as well as to prevent the stripping of gears and the like, to relieve the friction upon the working parts as much as possible. In the machine shown in the patent referred to the leaves are held and carried forward for the action of the scraping wheels by two endless chains, the adjacent members of which move in the same direction and hold the leaves between them. Great pressure upon the chains is necessary in order to enable them to retain the leaves and fibers while they are being acted upon by the scraping wheels and consequently, in the machine referred to, great friction was developed between the chains and their supports, with a corresponding consumption of power. In addition to this the driving gears were frequently stripped of their teeth. I have sought to overcome this difficulty and have accomplished the desired result by the means hereinafter described. Incidentally to the improvement just referred to and with the same object in view I have rearranged and improved the means for driving the several working parts of the machine from the main driving shaft. I have also sought to improve the feeding-in devices with the object not only of reducing the danger to the attendant but also of enabling the feeding to be effected more regularly and more rapidly.

In the accompanying drawings, Figure 1 is a side elevation of the improved machine. Fig. 2 is a plan view of the same. Fig. 3 is a transverse section on the line *x x* of Fig. 1. Fig. 4 is an enlarged detail in transverse section through the adjacent members of the holding-chains and the supporting-cloth therefor. Fig. 5 is an enlarged detail view, in side elevation, of a portion of the antifriction chain. Fig. 6 is a plan view of the same. Fig. 7 is an enlarged detail view, in side elevation, of a portion of one of the holding-chains.

The frame 10 of the machine is adapted to receive and support in suitable bearings the two cleaning or scraping wheels 11, 12, which are peripherally armed with suitable blades 13, the edge of each blade being inclined outwardly from its forward end nearly to its middle point. The said wheels are offset from each other with their axes in parallel planes, the peripheries slightly overlapping. The leaves or fibers to be cleaned are supported for the action thereon of each wheel 11, 12, by a suitable shoe or concave which is supported by standards 14 which rest upon the base 15 of the machine. The standards 14 and body plate 16 may be cast in one piece and the concave of the body plate is preferably lined with a plate 17 of brass. The whole shoe or concave is adjustable upon the base 15 toward or from its corresponding wheel in order to take up wear or to regulate the action of the machine. For the purpose of effecting the adjustment a screw-threaded shaft 18 is provided, as represented in Fig. 3.

The leaves or fibers to be cleaned are held for the action of the first wheel 11 by a pair of holding chains 19, 20, which are mounted one over the other upon suitable carrying wheels 21, 21, said wheels being mounted upon shafts 22 supported in suitable bearings on the main frame. The upper member of the lower chain is supported and held in place by a grooved bar 23 and the lower member of the upper chain is pressed down upon it by rollers 24. Each roller is mounted in a yoke 25 the stem 26 of which is guided in a suitable frame 27, while a stiff spiral spring 28 forces the roller down and thereby causes the chain 19 to be pressed firmly against the chain 20. If the upper member of the chain

20 rested directly upon the bar 23 the friction would be excessive and it therefore becomes necessary to provide means whereby the friction at this point may be reduced.

Anti-friction rollers supported in the usual manner in stationary bearings will not meet the requirements of this particular machine because, under the great pressure not only is the friction on the bearings considerable but the bearings themselves are soon cut down, making it necessary to renew the grooved supporting bar and the rollers. For this reason I have so arranged the anti friction wheels that they may roll upon the supporting bar and may support the holding chain upon their peripheries. To this end the anti-friction wheels 29 are mounted upon short shafts or axles 30 which are supported in the links 31 of an endless chain which lies in the groove of the supporting bar and is led from end to end beneath the same, the wheels 29 rolling upon the bottom of the groove. The links $20^{\times}$ of the holding chain 20 are formed with a straight rear or under edge so that they may travel smoothly over the wheels 29 and so that the latter shall be caused to roll from end to end of the supporting bar. The adjacent faces of the two chains 19 and 20 are preferably formed with interlocking, longitudinal tongues and grooves, as represented in Figs. 4 and 7, so that a firm grasp may be had upon the leaves or fibers to hold them against the section of the scraping or cleaning wheels 11, 12.

I have confined the description above to that pair of folding chains which co-operates with the first cleaning wheel, but it will be obvious without further explanation that the same description applies equally to that pair of holding chains which co-operate with the second cleaning wheel 12. The two pairs of bolding chains are offset so that the portion of the leaves or fibers which lies between the chains of the first pair may be exposed to the action of the second wheel 12, the second pair of holding chains grasping the fibers where they have been cleaned by the first wheel 11. In order that the fibers may be transferred properly from the first pair of holding chains to the second pair I have arranged between the two pairs of chains, with their axes obliquely disposed, two grooved wheels 32, 33. See Figs. 2 and 3. The wheel 32 is an idler while the second wheel 33 is fixed to a shaft 34 which is mounted in suitable bearings and to which rotation is imparted as is hereinafter more particularly described. An endless rope 35 is carried by the wheels 32, 33 and is caused to travel in the proper direction to present the free ends of the fibers projecting from the first pair of chains to the second pair of chains in order that they may be grasped thereby.

The means for feeding the leaves into the grasp of the first pair of chains have been improved in such a manner as to remove the possibility of the hands or clothing of the operator being caught while at the same time it is easier than in the former machine to feed the leaves forward into the grasp of the holding chains regularly and rapidly. In front of the first pair of chains and on a level with the bite thereof is fixed a table 36 upon the outer end of which the leaves to be cleaned may be laid. On each end of the shaft 22 which supports the lower front chain wheel is fixed a pulley 37 and upon each end of a shaft 38 which is journaled in a bearing below the outer end of the table 36 is fixed a pulley 39. The pulleys 37, 39 carry a pair of endless rope-bands 40 and the pulleys are so disposed or proportioned that the upper members of the bands rise from a point below the level of the upper surface of the table through inclined slots 41 in said table, thus bringing more and more of the thickness of the rope above the table. Upon the shaft 22 which supports the front chain-wheel are secured pulleys 42 which correspond to the pulleys 37 below and upon a shaft 43 journaled in the end of an adjustable arm 44 are fixed pulleys 45. The said pulleys 42 and 45 carry endless rope bands 46 and are so disposed or proportioned that the lower members of the endless bands are inclined downward from a point above the table where they leave the pulleys 45 into the same plane with the ropes 40 as they pass on to the pulleys 42. The pulleys 42 and the pulleys 45 are closer together than the pulleys of the corresponding pairs below them so that the bands 46 stand between the bands 40. By this arrangement the leaves to be cleaned may be pushed easily and rapidly by the hands of the operator from the outer end of the table to a point where the lower bands 40 rise sufficiently through the table to move the leaves along. At the same time the upper bands 46 approach near enough to the lower bands to grasp the leaves firmly and so feed them forward and deliver them to the holding chains. By this arrangement it is possible to spread the leaves much more uniformly and to lay them much more rapidly than if toothed feeding chains were employed.

The driving mechanism in the present machine has been re-arranged so that the strains may be more evenly divided than in the old machine and that there may be in consequence less wear upon certain parts and less danger of breakage. The driving pulley 47 and its corresponding loose pulley 48, if one be used, are mounted upon the main shaft 49 which is journaled in bearings on the top of the frame of the machine. A second shaft 50 is likewise journaled in bearings on the top of the frame and is driven from the first by gears 51, 52. The shaft 49 has upon its end a band wheel 53 from which power is transmitted through an endless band 54 to a second band wheel 55 on the shaft of the first cleaning wheel 11, the band tightening pulley 56 being provided to keep the band 54 taut. The second cleaning wheel 12 is driven by a similar arrangement of band wheels 57 and 58, endless bands 59, and

tightening pulley 60 from the second shaft 50. Through a train of gears 61, 62, 63, 64, power is transmitted from the shaft 49 to a shaft 65 and from the latter power is transmitted by bevel gears 66 and 67, vertical shaft 68, and bevel gears 69, 70, to a cross shaft 71. The latter has fixed thereto the upper rear chain wheel of the first pair of chains and the upper front chain wheel of the second pair of chains. The lower rear shaft 22 of the first pair of chains drives through bevel gears 72, 73, the transfer band 35. From the shaft 71 power is also transmitted through the bevel gears 74, 75, inclined shaft 76 and bevel gears 77, 78, to the lower front shaft 32 of the first pair of holding chains.

As the uncleaned portions of the leaves projecting from the side of the first pair of holding chains opposite to the cleaning wheel 11 are more or less stiff it is necessary that they should be bent downward so that they may enter properly between the second cleaning wheel 12 and its concave. For this purpose a bar 79 is supported with its forward end above the bite of the chains and with its rear end so bent down near the wheel 12 and its concave so that the projecting ends are guided properly to said wheel 12.

The general operation of machines of this character is well understood and need not be further described herein.

I claim as my invention—

1. In a fiber preparing machine, the combination with a cleaning wheel and a pair of holding chains adapted to grasp between them the leaves or fibers, of a grooved supporting bar, an endless chain of rollers adapted to rest upon the bottom of the groove and to support the adjacent member of one holding chain upon their peripheries, means to apply pressure upon the adjacent member of the other holding chain, and means to impart movement to said holding chains, substantially as shown and described.

2. In a fiber preparing machine, the combination with a cleaning wheel and a pair of holding chains adapted to grasp between them the leaves or fiber, of a grooved supporting bar, an endless chain laid in the groove of said bar and passing from end to end outside of the same, studs supported by the links of said chain, wheels mounted on said studs and adapted to roll on the bottom of the groove and to support upon their peripheries one member of one of the chains, means to apply pressure upon the adjacent member of the other chain, and means to impart movement to said holding chains, substantially as shown and described.

3. In a fiber preparing machine, the combination with a cleaning wheel and a pair of holding chains, of a feed table having slots inclined from the under to the upper side, a pair of endless bands passed through said slots from the under to the upper side of the table whereby the bands are brought gradually into operative position, pulleys to support said bands, a second pair of bands above the first, and pulleys to support the last named bands with their operative portions brought gradually into operative relation with the lower bands, substantially as shown and described.

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

JOSEPH C. TODD.

Witnesses:
C. L. MALCOLM,
W. B. GREELEY.