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PATENTED MAY 9, 1905.

M. G. McLANE.

MACHINE FOR SEPARATING AND CLEANING HEMP FIBERS, &c.

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Fig. 1.

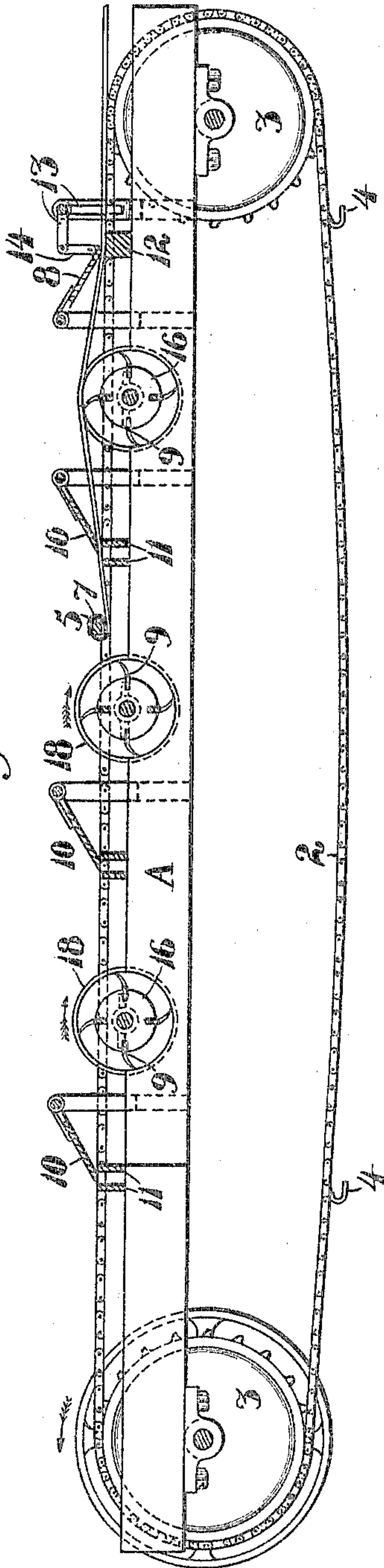


Fig. 2.

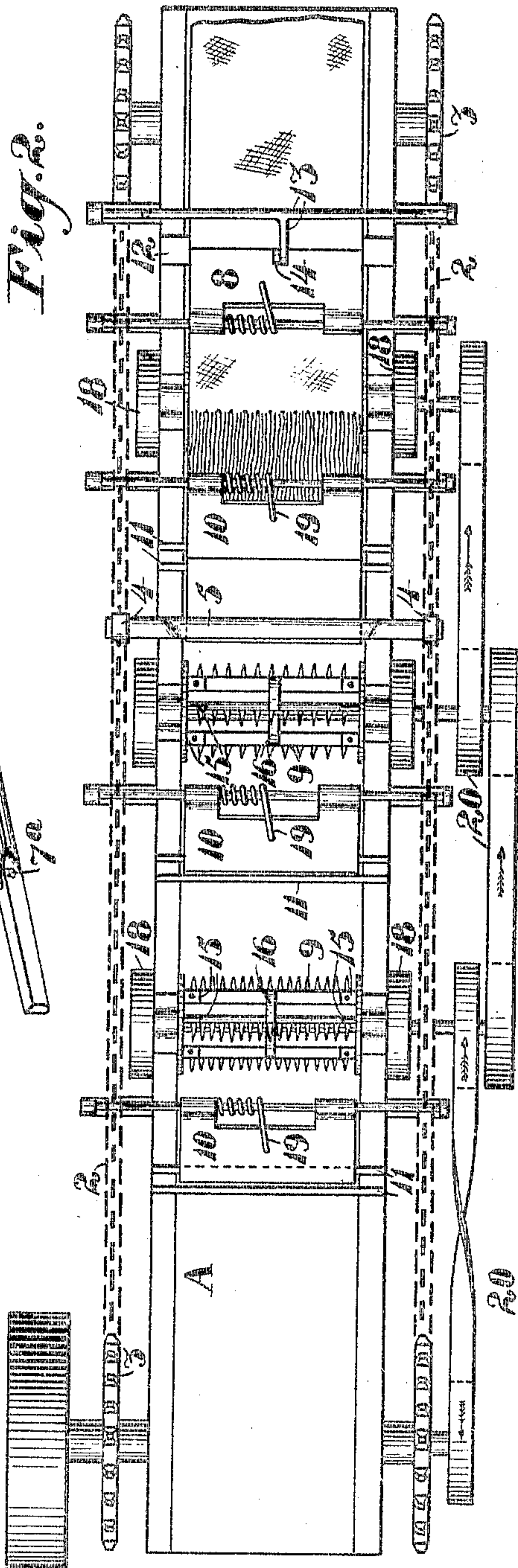
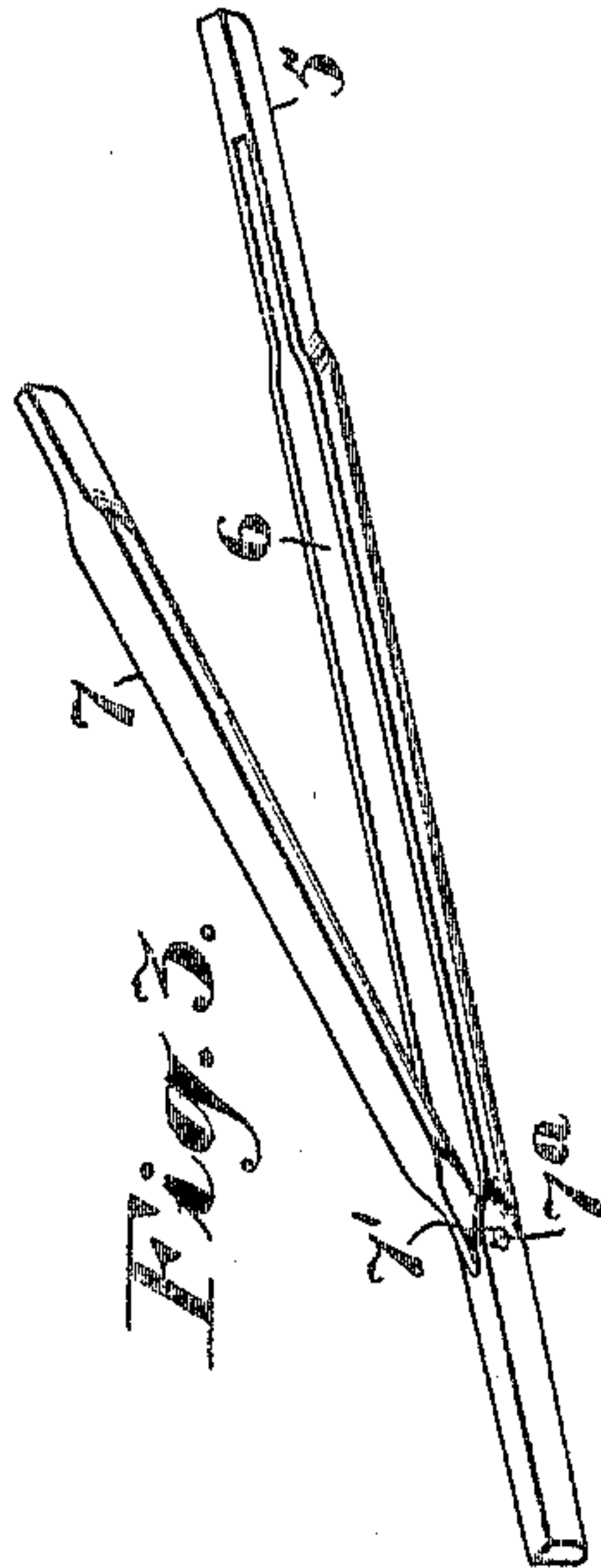


Fig. 3.



Witnesses:-

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UNITED STATES PATENT OFFICE.

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MACHINE FOR SEPARATING AND CLEANING HEMP FIBERS, &c.

SPECIFICATION forming part of Letters Patent No. 789,504, dated May 9, 1905.

Application filed November 5, 1904. Serial No. 231,562.

To all whom it may concern:

Be it known that I, MICHAEL G. McLANE, a citizen of United States, residing at the city and in the county of San Francisco and State of California, have invented new and useful Improvements in Machines for Separating and Cleaning Hemp Fibers and the Like, of which the following is a specification.

My invention relates to an improved machine for separating and cleaning the fibers of decorticated or partially-decorticated hemp, ramie, and like fibrous plants.

The invention consists of the parts and the construction and combination of parts, as hereinafter more fully described and claimed, having reference to the accompanying drawings, in which—

Figure 1 is a longitudinal vertical section of my apparatus. Fig. 2 is a plan view of same. Fig. 3 is a detail of the holder.

A represents a suitable framework, and 2 an endless carrier traveling around sprockets 3, journaled at the ends of the frame. The carrier is of the link variety and is provided at intervals with the hooks 4 to receive the holders by which the raw material to be treated is drawn through the machine. These holders are shown in Fig. 3 and comprise a bar 5 of a length equal to or a little greater than the width of the carrier and having a longitudinal notch 6 intermediate of its ends, in which notch the clamp member 7 is pivoted at one end.

A bunch of hemp which has been decorticated, or partially so, is spread in a comparatively thin layer and an end of the bunch gripped between the clamps 5 7 comprising the holder and the latter turned over once to wrap the fibers about the holder and prevent its opening. The bar 7 is slotted transversely, as shown at 7^a, to receive the pivot-pin and allow the two bars to remain substantially parallel even with a bunch of fiber gripped between them, thus insuring an even hold on all the fibers. This holder, with its layer of hemp, is then placed on the carrier and the ends of the holder engaged with a pair of hooks 4, these hooks being arranged in pairs at suitable intervals on the carrier, depending

on the length of the fiber material undergoing treatment. The hooks or sockets 4 open in the direction of travel and inclose each a polygonal space to receive a correspondingly-shaped end of the holder, and so prevent the latter turning to unwind the hemp and release the latter accidentally. The holders are laid in the hooks or sockets with the fibers underneath, so as to bring the latter close to the carrier. With the carrier in continuous motion the bar as soon as engaged with the sockets 4 moves forward, dragging its charge of hemp first under a hinged scraper 8, then up and over the rotary combs 9, then down again beneath a hinged scraper and tension device 10, across vertical stationary scrapers 11, up again over a second rotary combing device, and so on similarly through the machine.

The number of the combing devices 9 may vary according to conditions. As here shown there are three, and they revolve in a direction opposite to the direction of travel of the carrier for the purpose of keeping the fibers from becoming entangled with the comb-teeth.

The scraper 8 points in the direction whence the hemp-holder approaches and comprises a plate hinged above the carrier and having its lower edge in juxtaposition to but arranged so as not to bind on a part 12 on the bed-frame. As the holder approaches the scraper it engages a forked bell-crank lever 13, having its forks pendent in the path of the holder and its other member connected by a link 14 with the scraper 8. The lever 13 is so hung that any pressure against its pendent members in the direction of travel of the carrier lifts the scraper 8 to allow the holder to pass beneath. As soon as pressure is released on the part 13 scraper 8 falls and bears lightly on the top of the traveling hemp or fibrous bark or other material to clean it, removing excrescences, adhering bits of pulp, and the like.

The combs or whippers have backwardly-turned teeth, as shown, to prevent the fibers winding up and are revolved in a direction opposite to the direction of travel of the hemp

and carrier, so as always to whip and comb the latter out straight and not wind it around the combs.

The combing devices each consist of end disks mounted on an axle journaled in the frame driven as shown, for instance, in Fig. 2. The disks have radially-disposed lugs 15 on their adjacent surfaces, to which the comb-backs are bolted or screwed.

The comb-backs may be supported intermediate of their ends by means of the radially-slotted disk 16, keyed to the comb-axle. The comb-backs fit in the slots in disk 16 and are rigidly supported.

In order to carry the holders out of contact with the combs, but still cause the fiber to be subjected to the full force of the combs, the holders are directed up and over and down again around the combs without actually contacting with them. Preferably a loose or idle roller 18, concentric with each set of radially-disposed combs and of a little larger diameter than the combing devices, is journaled at each end of said devices, so as to be turnable freely and independently of the combs. These loose or idle rollers 18 are in the path of the ends of the holders, and when the latter come almost to a set of combs the holder engages a pair of rollers and rides up over the latter and then down again under a hinged scraper and tension device 10, pivoted to swing upward in the direction of travel of the carrier. The successive scrapers 10 are adapted to bear down on the surface of the traveling fibers to cause them to assume a more or less sinuous path. The vertical stationary scrapers 11 may be arranged on the frame between the combing devices and are adapted to cooperate with the hinged scrapers 10 to further clean and strip the fibers of foreign matters. The tension of the scrapers may be increased or rendered uniform by means of the springs 19.

Power from any suitable source may be applied to the axles of one or the other sets of end sprockets 3 to drive the carrier, the combs being driven by suitable connections 20 from the axle, as shown.

In operation with the carrier traveling in the direction of the arrow, Figs. 1 and 2, and the combs or whippers turning rapidly in the opposite direction a holder with its load of fibrous material to be whipped out is placed on the carrier in the path of a pair of hooks or sockets 4 and is then carried under the scraper 8 up over the first set of combs and then down under and over successive scrapers and combing devices through the machine. The fibers being made to travel in a sinuous path and being held down when between the combs by means of the scrapers or tension devices 10, the material is subjected in the fullest extent to the action of the combs.

The first set of combs is comparatively coarse, having the teeth separated, and is de-

signed to perform the initial whipping and separation of the fibers. The succeeding combs become gradually finer until the last one will act to separate, whip out, and clean each individual fiber.

By turning the teeth backward, as shown, there is less danger of the fibers being broken or entangled than if the teeth stood out straight.

It is possible that various modifications in my invention may be made without departing from the principle thereof, and I do not wish to be understood as limiting myself to the specific construction as herein shown and described.

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

1. A machine for separating the fibers of various plants consisting of a suitable support, an endless carrier mounted on said support, fiber-holding means carried by said carrier, a series of alternately-arranged rotary combing devices and tension devices in the path of the material carried.

2. A machine for separating the fibers of various plants consisting of a suitable support, an endless carrier mounted on said support, fiber-holding means carried by said carrier, a series of alternately-arranged rotary combing devices and tension devices in the path of the material carried, said combing devices turnable in a direction opposite to that of the carrier and having rearwardly-curved teeth.

3. A machine of the character described comprising a suitable support, an endless carrier thereon, means for supporting the ends of fibrous material to be treated on said carrier, rotary combing devices in the path of the material carried, and means for revolving the combing devices opposite to the direction of travel of the carrier.

4. A machine of the character described comprising a suitable support, an endless carrier thereon, means for supporting the ends of fibrous material to be treated on said carrier, rotary combing devices in the path of the material carried, means for revolving the combing devices opposite to the direction of travel of the carrier, means for causing said material to travel in a sinuous path over and between the combing devices.

5. A machine of the character described comprising an endless carrier, means for holding the ends of fibrous material to be treated thereon, said holding means comprising clamp members between which the ends of the fibrous material are gripped and combing and scraping devices in the path of said holding means.

6. A machine of the class described comprising an endless carrier, hook members arranged in pairs on said carrier, holders for

the material to be treated engageable by said hooks and rotary combing devices arranged in the path of said holders.

7. A machine of the class described comprising an endless carrier, hook members arranged in pairs on said carrier, holders for the material to be treated engageable by said hooks, rotary combing devices arranged in the path of said holders, said combing devices each comprising a plurality of radially-disposed comb members having backwardly-turned teeth, and means for rotating said devices in a direction opposite to the travel of the carrier.

8. In a machine of the class described, a carrier consisting of two endless parallel spaced chains, a holder for gripping an end of the fibrous material to be treated, means on the chains engageable with said holder to carry the latter and the material through the machine and a series of successively-arranged rotary combing devices disposed between the chains and in the path of the holder.

9. In a machine of the class described, a carrier consisting of two endless parallel spaced chains, a holder for gripping an end of the fibrous material to be treated, means on the chains engageable with said holder to carry the latter and the material through the machine, a series of successively-arranged rotary combing devices disposed between the chains and in the path of the holder, means for rotating said combing devices opposite to the direction of movement of the carrier, means for directing the holder around said combing devices and out of engagement therewith and means interposed between the combing devices engaging the fibrous material to cause it to travel in a sinuous path.

10. In a machine of the class described, the combination of an endless carrier, a holder for the material to be treated engageable with the carrier, a series of successively-arranged rotary combs in the path of material on the carrier and a series of scrapers and tension devices alternating with the combing devices over which latter and beneath said scrapers the material is adapted to travel in sinuous path.

11. In a machine of the class described, a carrier comprising parallel spaced endless chains, a series of successively-arranged combing devices between the chains, said combing devices comprising each a plurality of radially-disposed combs having backwardly - turned teeth, and means for revolving the combing devices in a direction opposite to the travel of the carrier.

12. In a machine of the class described, a

carrier comprising parallel spaced endless chains, a series of successively-arranged combing devices between the chains, said combing devices comprising each a plurality of radially-disposed combs having backwardly - turned teeth, means for revolving the combing devices in a direction opposite to the travel of the carrier and hinged tension members arranged above the carrier and between the combing devices, a bar having a pivoted grip member adapted to be engaged by the chains and extending across the carrier and means for carrying it around and out of contact with the combing devices.

13. In a machine of the class described, an endless carrier, means for holding the ends of fibrous material to be treated supported on said carrier, hinged presser members and rotary comb devices in the path of said holding means, and means for directing said holding means around and out of engagement with the said combing devices.

14. In a machine of the class described, an endless carrier, a fiber-holder supported on the carrier, a rotary comb member comprising a plurality of radially-disposed combs in the path of said holder, means for directing the holder around and out of contact with said comb member and means on either side of the comb member to bend the fiber over said member.

15. In a machine of the character described, an endless carrier, fiber-holding means supported on the carrier, a series of successively-arranged rotary combs in the path of said holding means, said combs revolving in a direction opposite to the travel of the carrier, the teeth of succeeding combs growing gradually finer.

16. In a machine of the character described, an endless carrier, fiber-holding means supported on the carrier, a series of successively-arranged rotary combs in the path of said holding means, said combs revolving in a direction opposite to the travel of the carrier, the teeth of succeeding combs growing gradually finer, means for directing the holder over, around and out of contact with the combs and presser members between the combs to maintain the material to be treated taut and cause it to travel in sinuous path through the machine.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

MICHAEL G. McLANE.

Witnesses:

S. H. NOURSE,

HENRY P. TRICOU.