(No Model.) 2 Sheets—Sheet 1.

McCLINTOCK YOUNG.

MACHINE FOR DISINTEGRATING FIBROUS SUBSTANCES.

No. 541,648. Patented June 25, 1895.

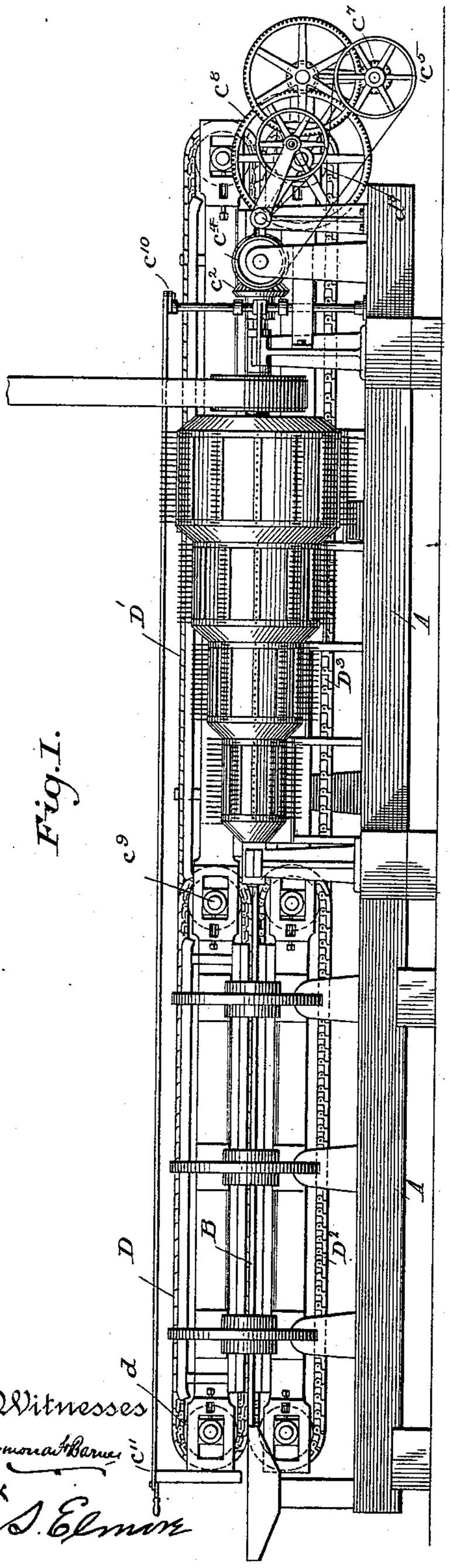


Fig. 1.

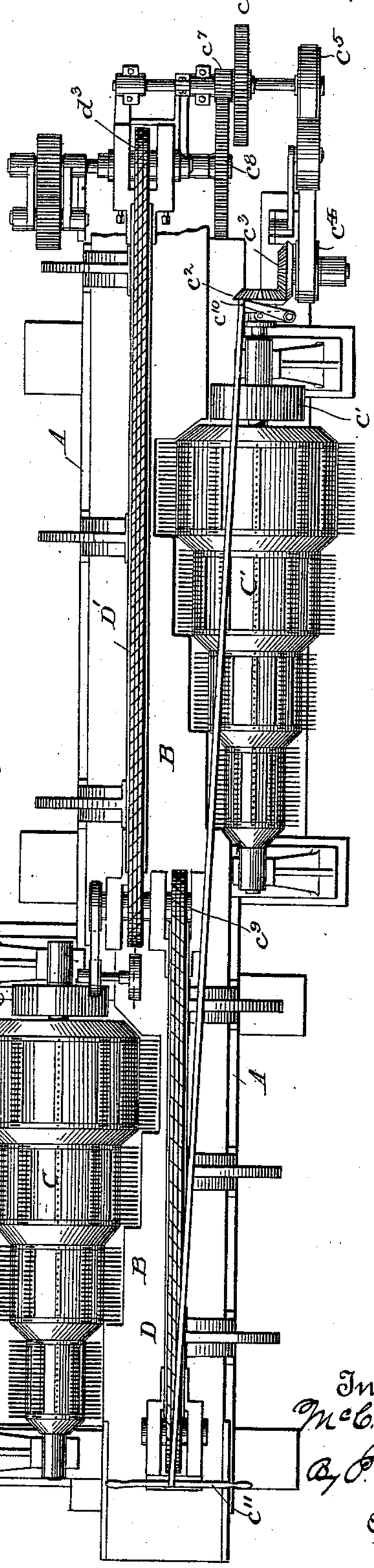


Fig. 2.

Witnesses
Raymond A. Barnes
F. S. Elmore

Inventor
McC. Young
By C. F. Dodge
Attorney

(No Model.) 2 Sheets—Sheet 2.

McCLINTOCK YOUNG.

MACHINE FOR DISINTEGRATING FIBROUS SUBSTANCES.

No. 541,648. Patented June 25, 1895.

Fig. 4.

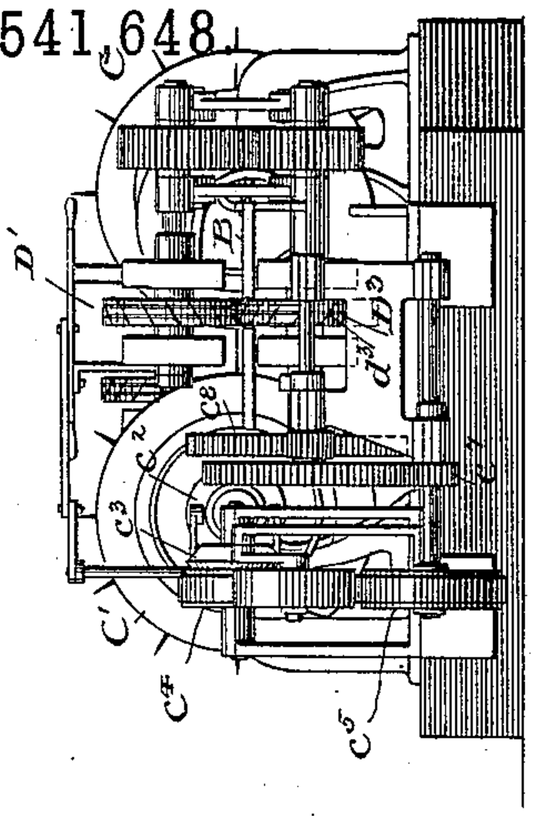


Fig. 6.

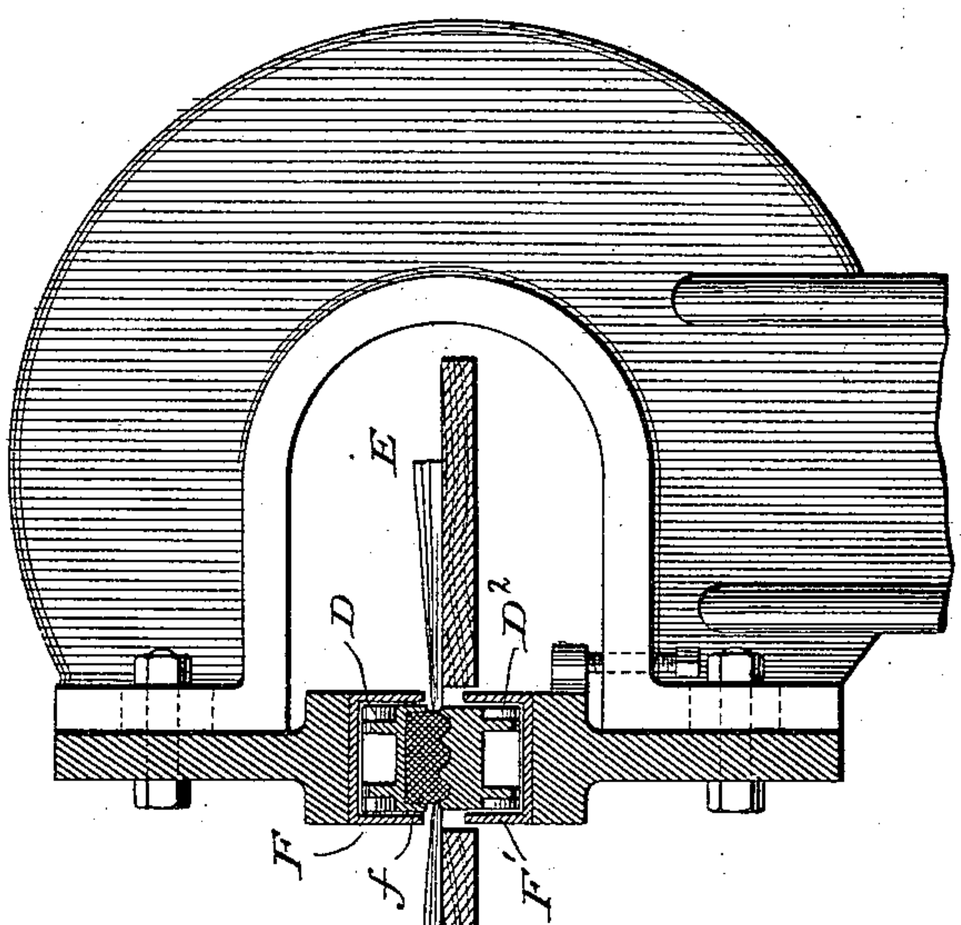


Fig. 7.

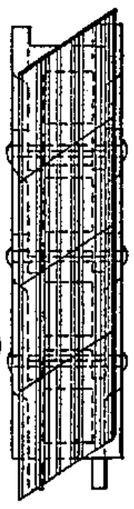


Fig. 8.

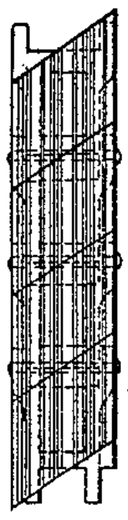
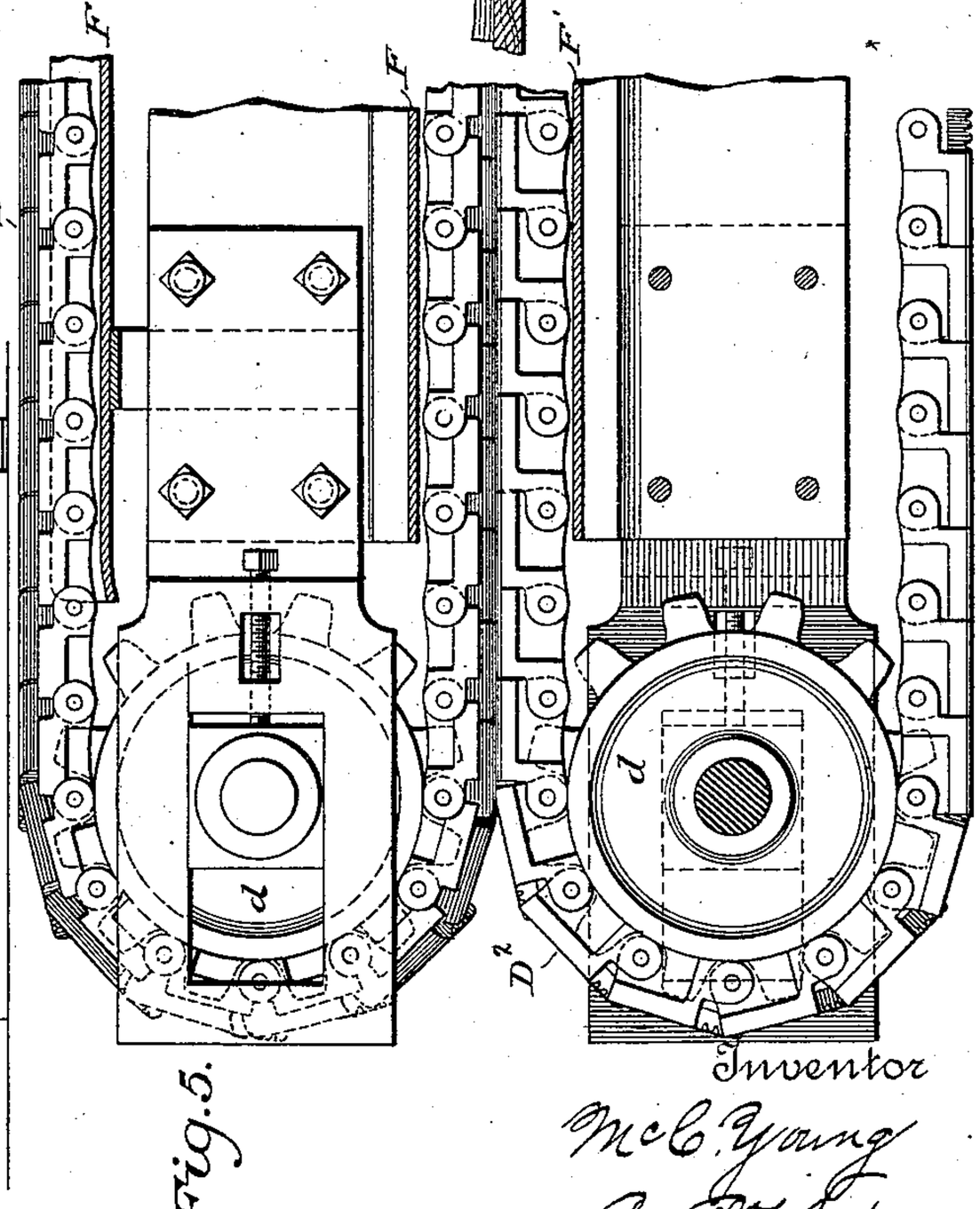


Fig. 3.

Fig. 5.



Witnesses

Raymond L. Barnes.

F. S. Elmore

Inventor

McC. Young

By F. Y. Lodge

Attorney

UNITED STATES PATENT OFFICE.

McCLINTOCK YOUNG, OF FREDERICK, MARYLAND.

MACHINE FOR DISINTEGRATING FIBROUS SUBSTANCES.

SPECIFICATION forming part of Letters Patent No. 541,648, dated June 25, 1895.

Application filed February 10, 1894. Serial No. 499,807. (No model.)

To all whom it may concern:

Be it known that I, McCLINTOCK YOUNG, of Frederick, county of Frederick, and State of Maryland, have invented a new and useful Improvement in Machines for Disintegrating Fibrous Substances, of which the following is a specification.

This invention has reference to a machine for the purpose of hackling or disintegrating the fiber of the palmetto boot, in order to adapt the same for use in the manufacture of brushes and for similar purposes.

The machine is intended to deal with the large pieces of the bark or boot which have been crushed or otherwise treated to partially loosen the fiber.

The machine is based upon the combination of a support for the boot, with rotary cylinders armed with protruding hackling teeth.

In its preferred form, intended to treat automatically the mass of fiber presented to it, the machine consists of a supporting table, endless feeding chains between which the boot is grasped and moved along, and two cylinders located on opposite sides of the feed chains so that their teeth may act endwise on the exposed boot. The cylinders are each made of increasing diameter from one end toward the other, or in other words, composed of a series of short cylinders of different diameters, arranged end to end so that the teeth of the different sections will act successively and to different depths into the boot.

In the accompanying drawings, Figure 1 is a side elevation of my machine. Fig. 2 is a top plan view of the same. Fig. 3 is an elevation of the receiving end. Fig. 4 is an elevation from the opposite or delivery end. Fig. 5 is a side elevation on an enlarged scale, showing two of the co-operating feed-chains, the frame being shown in vertical section. Fig. 6 is a vertical cross-section on the line 6 6. Figs. 7 and 8 are detail views of the feed-chains.

Referring to the drawings, A represents a rigid main frame, the construction of which may be varied at will, provided only it is adapted to give support to the various operative parts.

B is a horizontal table extending through the frame from one end to the other, to assist in giving support to the fiber under treatment.

C and C′ are the two hackling cylinders arranged horizontally on opposite sides of the table, their shafts mounted at their ends in suitable bearings on a level with the table or substantially so. These cylinders while mounted in the same horizontal plane are out of line with each other, one being arranged at one side of the table and the other at the opposite side, as shown in Fig. 2, and they are to be rotated in opposite directions so that both will turn inward or toward the table. Each of these cylinders increases in diameter step by step from one end to the other, and each of the sections is provided with a series of projecting teeth of steel wire or other suitable material. The teeth of the cylinders revolve closely past the edges of the table, which are stepped or cut away to correspond with the varying diameter of the cylinders.

D, D′, D^2, and D^3 represent four horizontal feed chains arranged in pairs to carry the material between them past the hackling cylinders and in such proximity thereto as to subject it to the action of the same. The first pair of chains D and D′, are mounted to travel around supporting pulleys *d*, at their ends, one lying below and the other above the table, which is slotted longitudinally in a line passing between them, so that the upper surface of the under chain and the under surface of the upper chain may co-operate and grasp firmly between them, the fiber boot E lying crosswise of the table, as shown at Fig. 6. The active sides of the chains are supported and guided in stationary channeled plates F, F′, bolted to the main frame, the upper plates being sustained by overhanging arms forming part of the main frame, as shown in Fig. 6, in order to leave an unobstructed space for the passage of the fiber over the table.

The chains are made up of a series of articulated plates or links, such as shown in Figs. 6 and 7, corrugated longitudinally and joined at their ends on lines oblique to the line of travel, so that the surfaces of the chains will afford a continuous support for the transverse fiber, and prevent it from falling into the joints between them. The corrugations of the chain plates enable them to grasp the fiber the more firmly between them, so that it may not be drawn endwise or other-

wise displaced by the action of the hackling teeth.

I prefer, in order to prevent the cutting of the fiber, or any injurious crushing of the same, to provide one or both of the chains with a facing of rubber or equivalent elastic material *f*. (See Fig. 6.)

On reference to Fig. 2 it will be observed that the larger sections of the two cylinders overlap each other. This is for the purpose of enabling the material to be hackled, disintegrated, or separated, throughout its entire length, each cylinder operating beyond the midlength. It will also be observed that the two pairs of chains whereby the material is carried past, and presented to the action of, the respective cylinders are out of line with each other so that they will respectively grasp and hold the material at opposite sides of its midlength. Thus the chains D^2, D^3, when they receive the material from the chains D, D′ grasp the hackled or disintegrated portion and present the unhackled end to the cylinder C′ which, as before stated, overlaps the cylinder C, whereby the whole of the material is presented to the action of the two cylinders and is disintegrated throughout its length.

The first pair of chains is intended to carry the fiber over the table from the receiving end past the first cylinder C, which acts to disintegrate the boot from one end to, or slightly past the middle. The second pair of chains, D^2 and D^3, receives the partly hackled boot from the first pair and carries it forward over the remaining portion of the table subject to the action of the second cylinder, which, acting at the opposite end, completes the disintegration of the boot.

Motion may be communicated to the various parts above described by any suitable driving gear.

In the machine shown the hackling cylinders are each provided with a driving pulley *c′*, to which the driving belt may be directly applied.

The feed chains receive motion as follows: The shaft of the cylinder C′ is provided with a miter wheel c^2, driving gear c^3, on a shaft carrying pulley c^4 which is belted to a pulley c^5 on a shaft which also carries a gear wheel c^6 and pinion c^7. The last named pinion drives the gear c^8 on a shaft carrying the supporting pulley d^3. Motion is communicated through intermediate pinions to the upper chain of this pair. The carrying pulleys at the delivery end of the forward chains D, D′ are mounted on the same shaft c^9, as the carrying pulleys for the forward ends of the second chains, and thus it is that the second chains communicate motion to the first.

In order that the operator may stop the motion of the feed chains at will, the miter pinion c^2 is connected with its carrying shaft by a clutch, controlled by an ordinary shifting lever c^{10}, from which a controlling rod c^{11}, extends to the front of the machine within convenient reach of the operator.

While I have described a complete and automatic machine adapted to treat the two ends of the boot in its course therethrough and to feed the fiber automatically, it is to be understood that any other feed mechanism may be employed and that the machine may be constructed with a single cylinder and the fiber treated first at one end and after being reversed, treated at the other end by the same cylinder.

Provision is made for adjusting the tension of the chains and for raising and lowering their guides, but these features are not deemed of special importance.

Having thus described my invention, what I claim is—

1. In a machine for disintegrating the palmetto boot the combination of a fixed rigid table adapted to give support to the boot while being acted on, a cylinder adjacent to the table provided with hackling teeth, and a feeding mechanism independent of the table and adapted to grasp the boot and advance the same along the table longitudinally thereof and in a direction transversely of the length of the boot with the end of the latter presented to the cylinder over the edge of the table; whereby a support is given to the portion of the boot not acted on, independently of the feeding mechanism, which latter acts simply to advance the boot along the table.

2. In a machine for disintegrating the palmetto boot the combination of a table or support formed with two longitudinal slots or openings out of line with each other, two hackling cylinders located on opposite sides of the table opposite said slots, and two feeding mechanisms located respectively in said slots, one of said feeding mechanisms arranged to receive the boot from the other after it has been presented to the first hackling cylinder and advance the same along the second hackling cylinder; whereby a support is given the two ends of the boot independent of the feeding mechanism as the boot is successively presented to the action of the two cylinders.

3. In a machine for disintegrating the palmetto boot the combination with a hackling cylinder comprising a series of cylindrical sections of successively increasing diameters, of a feeding mechanism for advancing the boot in a direction transversely of its length from the smaller to the larger sections composing the cylinder.

4. In a machine for disintegrating the palmetto boot the combination of a hackling cylinder comprising a series of cylindrical sections of successively increasing diameters, a table arranged at the side of the cylinder with its edge stepped to conform to the varying diameters of the cylinders, and a feeding mechanism arranged and adapted to advance the boot along the same with its end presented

to the cylinder; whereby the support for the boot afforded by the table gradually shortens as it is presented to the successively increasing portions of the hackling cylinder thereby enabling the various sections of the cylinder to act on additional portions of the boot as it advances.

In testimony whereof I hereunto set my hand, this 8th day of January, 1894, in the presence of two attesting witnesses.

McCLINTOCK YOUNG.

Witnesses:

MARSHALL FOUT,

CHAS. C. SMITH.