

(No Model.)

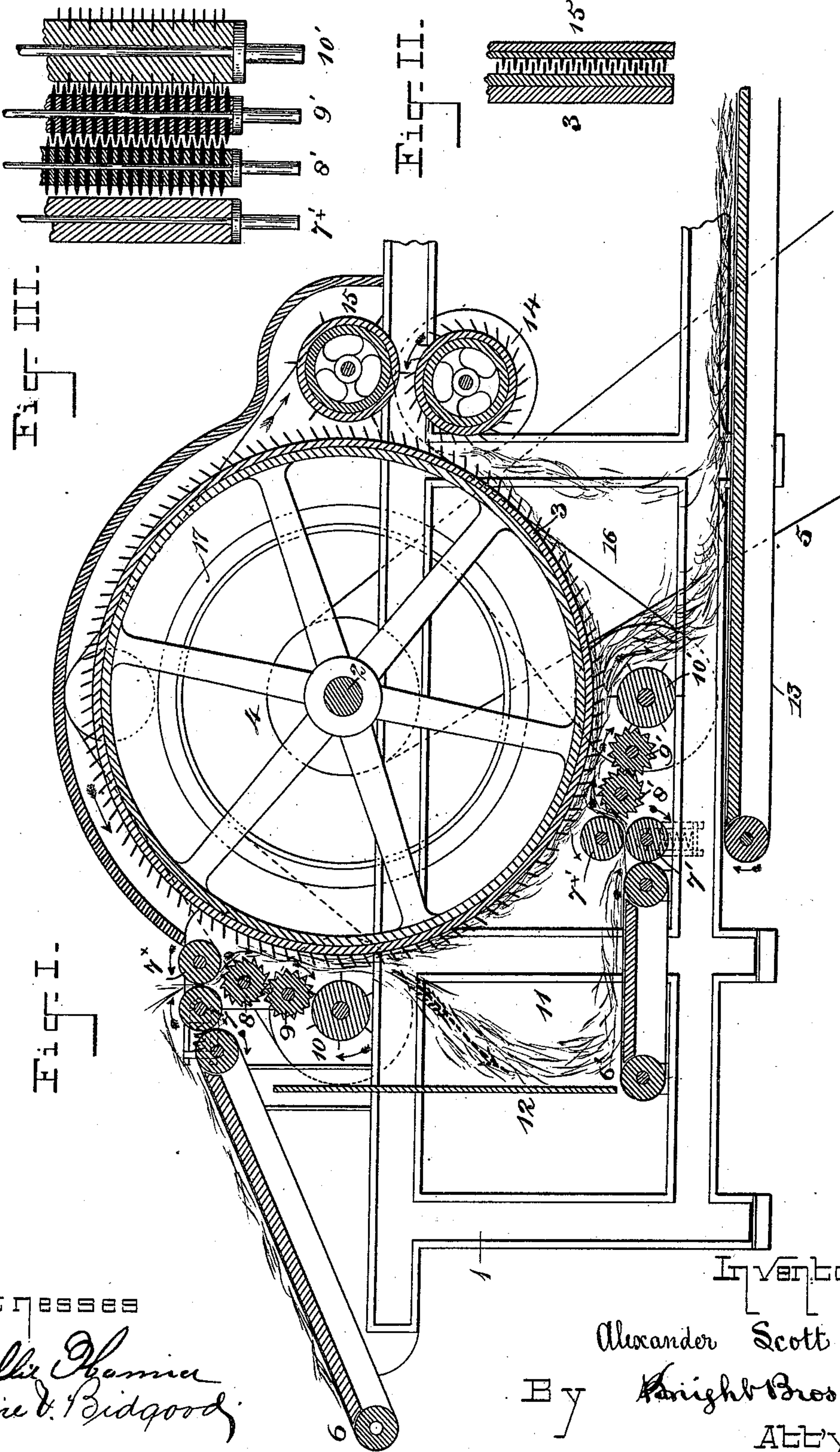
2 Sheets—Sheet 1.

A. SCOTT.

MACHINE FOR FIBRILLATION OF PINE NEEDLES.

No. 447,206.

Patented Feb. 24, 1891.



Witnesses

*Lilla Thann
Mazie D. Bidgood*

Inventor

Alexander Scott

By *Knight Bros.*

Attys.

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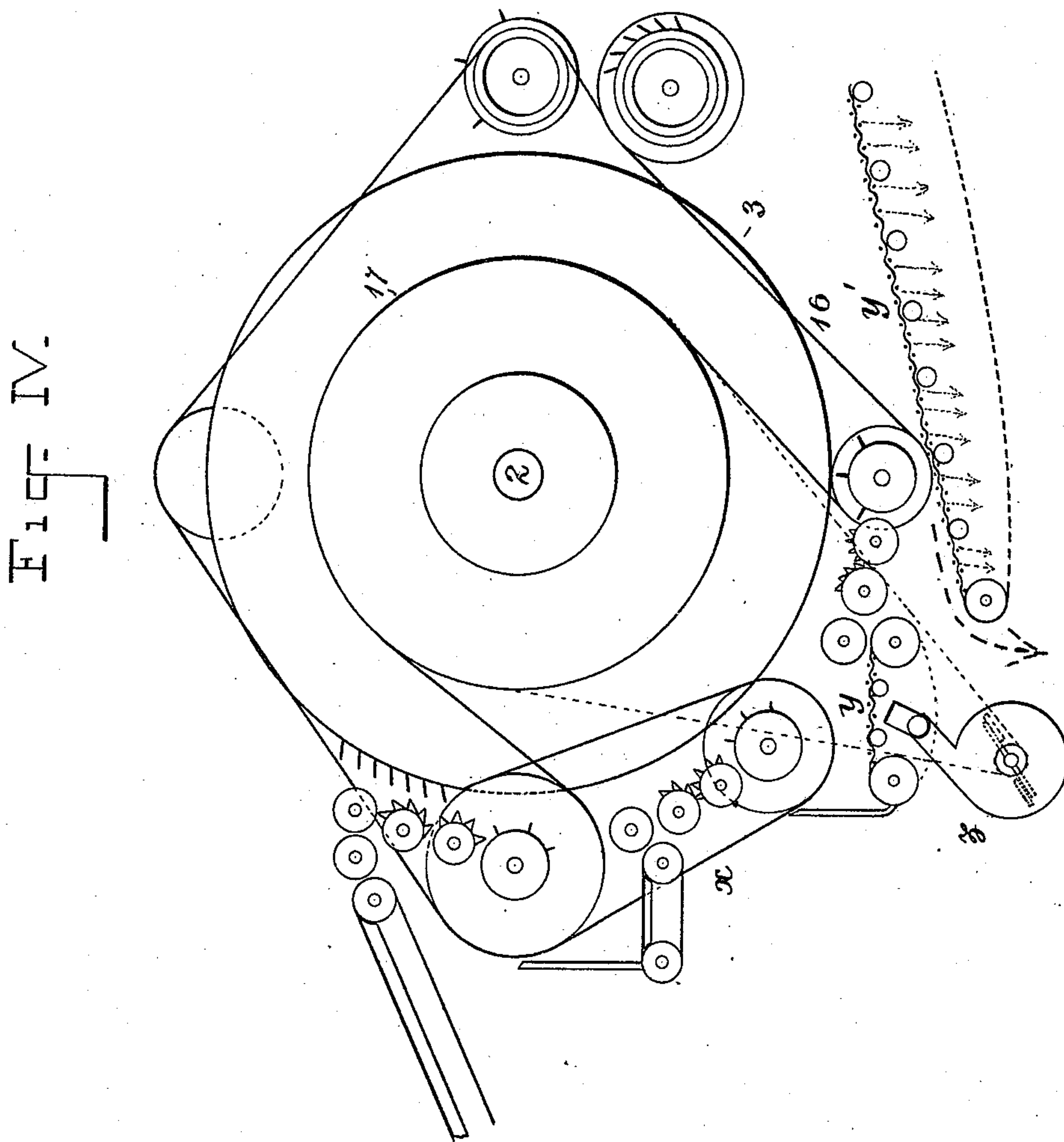
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UNITED STATES PATENT OFFICE.

ALEXANDER SCOTT, OF CRONLY, NORTH CAROLINA.

MACHINE FOR FIBRILLATION OF PINE-NEEDLES.

SPECIFICATION forming part of Letters Patent No. 447,206, dated February 24, 1891.

Application filed May 12, 1890. Serial No. 351,488. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER SCOTT, a subject of the Queen of Great Britain and Ireland, residing at Cronly, county of Columbus, State of North Carolina, have invented a new and useful Machine for Fibrillation of Pine-Needles, of which the following is a specification.

The invention relates to a device for separating for use in the arts the fibrous portions of the leaves or foliage of pine and other coniferous trees, commonly known as "pine-needles." The crude "needles" having been softened and partially disintegrated by being rubbed, rolled, and kneaded in a fiber-rubbing machine such as described in my patents, Nos. 315,666, dated April 14, 1885, and 425,006, dated April 8, 1890, the thus treated material is reduced to a marketable staple by the device hereinafter described.

The processes for fibrillating pine-needles and the mechanism by which those processes are carried out have necessarily some features analogous to those employed in the treatment of jute and other fiber-yielding plants. Such devices, however, so far as known to me, are useless for the purposes of my invention, owing, chiefly, to the large amount of mucilaginous and resinous matter present in coniferous foliage, and which necessitate provisions for catching and refeeding to the carding or picking machinery the masses of imperfectly-separated fiber such as characterize my present invention.

Referring to the accompanying drawings, which form a part of this specification, Figure I is a vertical section of a fibrillating-machine embodying my invention. Fig. II is a longitudinal section through portions of the carding-cylinder and the final cleaner. Fig. III is a longitudinal section through one of the feed-rolls and through the splitters and the cleaner of the refeeding attachment. Fig. IV represents a modification of my device.

The operative parts are supported and have their journal-bearings in a frame or casing 1, which also prevents the escape of the fibers by other outlet than by the delivery-apron. The direction of rotation of each operative part is indicated by an arrow, and said rotation is brought about by any suitable transmitting mechanism outside the casing.

2 is a shaft, to which the card-cylinder 3 is keyed, and which may also carry the pulley 4 for driving-belt 5, by which the machine is driven.

6 is the feed-apron by which the crude material is conveyed to the feed-rolls 7 7', which conduct it to the hackling mechanism 8 9 10, whence it is by the agency of the first splitter 8 cast onto the card-cylinder, whose teeth coact with the spurs of the splitter to detach the fibers from one another and from the "gum," "hauhm," and other refuse. The feed-roll peripheries are preferably of india-rubber. Each splitter is composed of a series of circular steel saws or serrated disks, which are separated the longitudinal distance of the card-teeth by means of washers upon a shaft to which the said disks are firmly keyed. Each cleaner consists of a cylinder whose periphery is armed with spikes arranged in circumferential planes of the same longitudinal distance as the card-teeth, so as to revolve between them. The material next passes under the action of the second splitter 9, from whose spurs it is disengaged by the first cleaner 10, which projects the material again upon the card-cylinder. The gummy and more or less adherent masses with portions of the fibers still imprisoned in them (having much greater inertia relatively to their superficies than the more fibrillated portions) are projected (see dotted arrow) by centrifugal force into bin 11 and are deflected by plate 12 onto the second or refeeding apron, whence they are, by forwarding-apron 6', conveyed to the action of a second set or train of rolls, which consists of the splitting and cleaning members 7' 7'' 8' 9' 10'' of identical construction, arrangement, and operation to the above-described members 7 7' 8 9 10. From the second cleaner 10' the main bulk of the now fibrillated staple drops onto the delivery-apron 13. Fiber still remaining entangled in the card-cylinder is removed therefrom by the joint actions of the teeth of the stripper 14 and the pins of the final cleaner 15 and cast down upon the delivery-apron, which discharges it into any suitable bin or receptacle or directly into a drier when necessary, or the delivery-apron may feed into a second machine of like construction.

The various rotary members which coact in the manner described with the card-cylinder may be driven by any suitable transmitting devices—such, for example, as by belt-and-pulley connection 16 17 with the shaft 2.

The right is reserved to carry out the principles of the invention by modifications or elaborations of the form here selected for illustration. For example, by employing a cylinder of sufficient diameter (see Fig. IV) one or more additional refeeding and resplitting trains X, Fig. IV, may be employed. One or more of the aprons (see *y* and *y'*, Fig. IV) may be of open net-work, and the aprons may be placed at such an angle (see the delivery-apron, Fig. IV) as to discharge the "sand" and other heavy refuse—that is to say, so that the finer sand or grit will sift through the meshes of the apron, (see light dotted arrows, Fig. IV,) and so that the coarser refuse will escape over the heel of the apron. (See heavy dotted arrow, Fig. IV.) Air-blasts (see *z*, Fig. IV) may be employed to assist in separating the lighter from the heavier particles—that is to say, so as to blow away the impalpable dust and to project against the rehackling machinery only the fibrous portions free from the woody and gritty impurities. Each succeeding hackling, picking, or fibrillating train may be more finely dentated and move at a higher peripheral velocity. (See Fig. IV.)

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. In a machine for fibrillation of pine-needles, &c., the combination, with a card-cylinder and with feeding and splitting rolls, of one or more groups or trains of refeeding and resplitting members, substantially as set forth.

2. In a machine for fibrillation of pine-needles, &c., the combination, with a card-cylinder and an initial train of hackling or splitting rolls and a cleaning-roll, of one or more additional trains, consisting of deflecting-plate 12, forwarding-apron 6', and train of refeeding, resplitting, and recleaning rolls 7 7' 8' 9' 10', substantially as set forth.

3. In a machine for fibrillation of pine-needles, &c., the combination, with a card-cylinder and with initial feeding and hackling members, of one or more sets of deflecting, refeeding, rehackling, and recleaning members, a final cleaner and stripper, and a delivery-apron, substantially as and for the purpose set forth.

ALEXANDER SCOTT.

Witnesses:

T. G. REGISTER,
W. W. THIGPEN.