

E. E. HORINE.
FIBER SCUTCHER.

APPLICATION FILED JUNE 13, 1905.

2 SHEETS—SHEET 1.

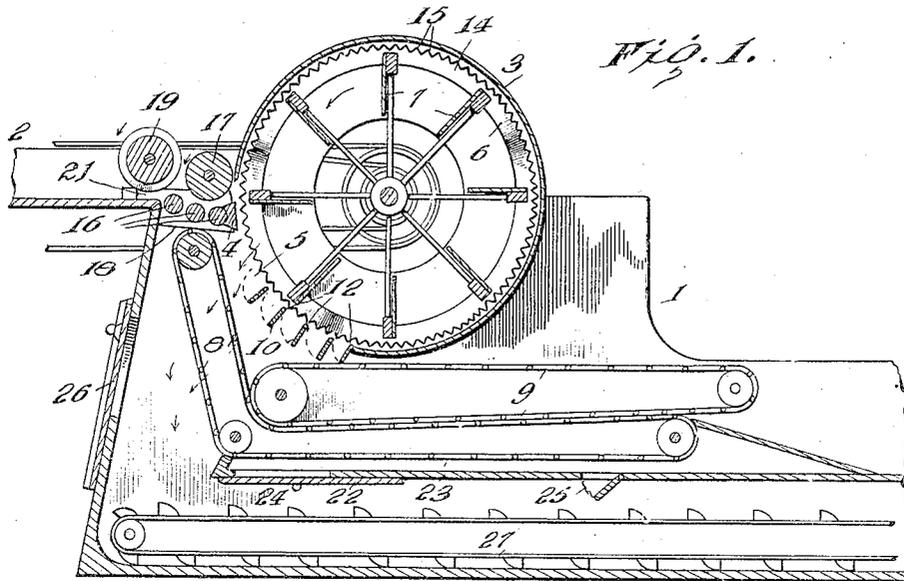


FIG. 1.

FIG. 2.

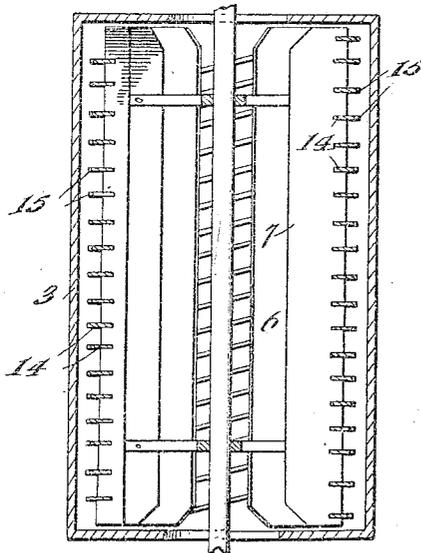


FIG. 3.

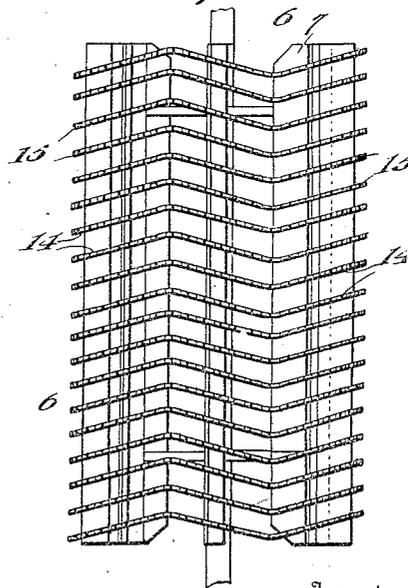
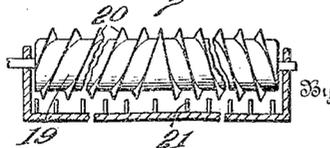


FIG. 6.



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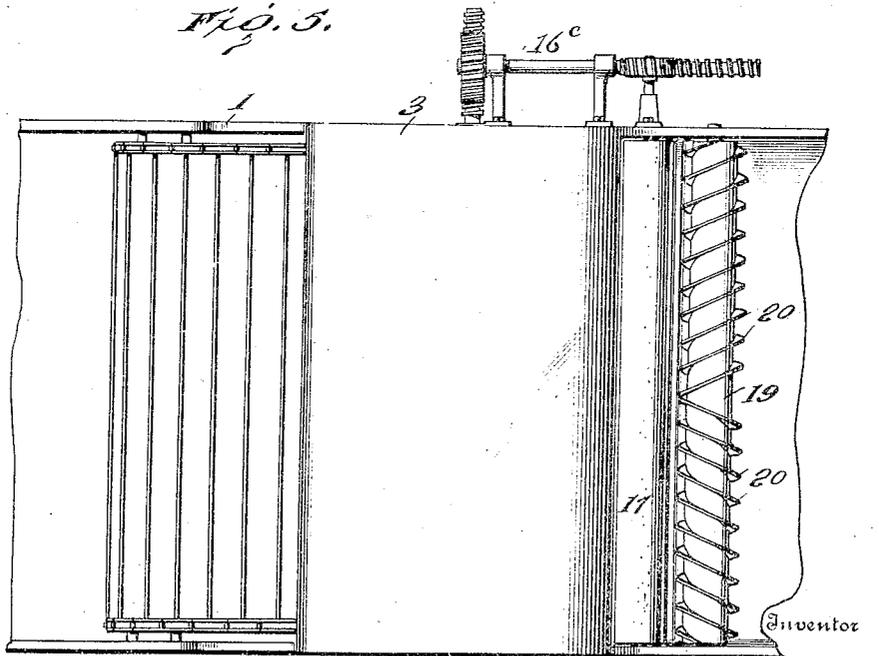
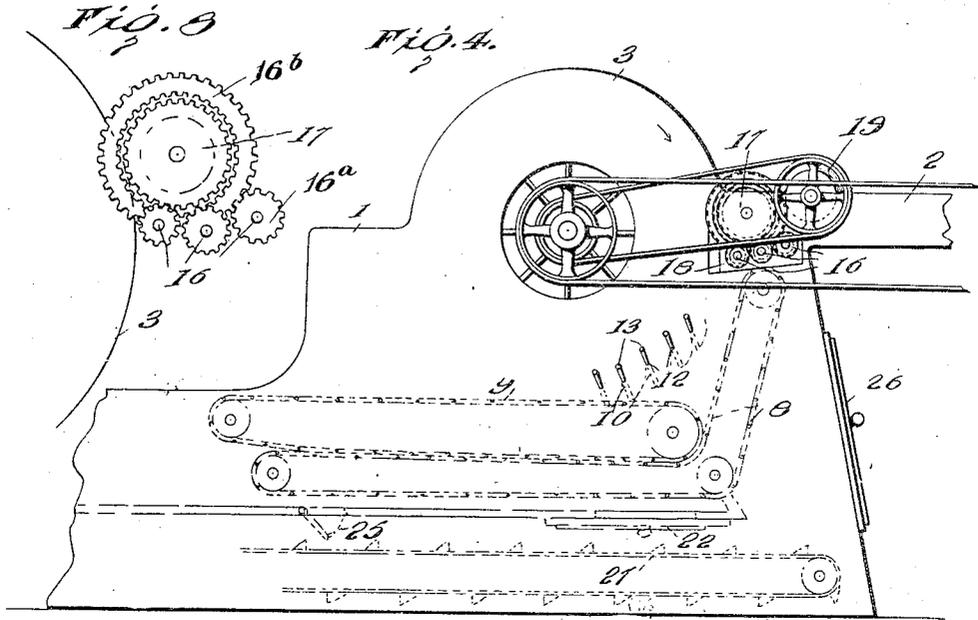
Inventor
Edmund E. Horine

by *J. Notams Gill*
 Attorney

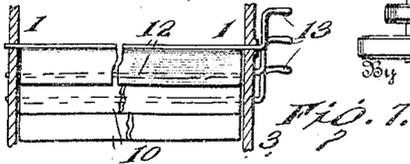
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2 SHEETS—SHEET 2.



Witnesses
 L. R. Martin
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Inventor
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UNITED STATES PATENT OFFICE.

EDMUND E. HORINE, OF NICHOLASVILLE, KENTUCKY, ASSIGNOR OF ONE-HALF TO ROSCOE HORINE WELCH, OF LEXINGTON, KENTUCKY.

FIBER-SCUTCHER.

No. 810,280.

Specification of Letters Patent.

Patented Jan. 16, 1906.

Application filed June 13, 1905. Serial No. 265,102.

To all whom it may concern:

Be it known that I, EDMUND E. HORINE, of Nicholasville, in the county of Jessamine and State of Kentucky, have invented certain new and useful Improvements in Fiber-Scutchers; 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 appertains to make and use the same.

The objects of this invention are to provide in a fiber-separating machine improved means for disintegrating the pith or chaff without injury to the fiber, to insure the complete separation of the chaff and all other refuse from the fiber, to prevent the latter from being drawn out of its proper course of travel by the suction or reaction of the fan; to provide for uniformly feeding the stalks to the machine, to so hold and crush the same as to insure perfect action of the scutchers, and to insure the passage of the fiber in straight lines regardless of the direction of introduction of the stalks.

The invention will be hereinafter fully set forth, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a vertical sectional view illustrating my improvement. Fig. 2 is an enlarged horizontal sectional view of the scutcher and its inclosing casing. Fig. 3 is an enlarged view of the scutcher. Fig. 4 is a side elevation. Fig. 5 is a plain view. Fig. 6 is a view of the stalk-distributing feed-roll. Fig. 7 is a face view of the air-outlet doors of the fan-casing, parts being broken away. Fig. 8 shows the gearing of the feed-rolls.

Referring to the drawings, 1 designates the frame, 2 the feed-table, and 3 a cylindrical casing fixedly mounted within the frame and having a central air-inlet opening. The casing 3 is closed permanently the greater part of its circumference, but is cut away to form an inlet-opening about on a plane with the top of feed-table 2, a stationary bar 4 forming the bottom of such opening. An outlet-opening 5 is also formed in casing 3 beneath bar 4 to allow the fiber and chaff to pass from the casing under the action of fan 6. This fan is concentrically mounted within casing 3 and is equipped with a series of blades 7. The fan forces the fiber and chaff outwardly through opening 5 onto a conveyer 8, so constructed as

to allow of the free passage of the pith, chaff, or other refuse through both flights of the upright leg. It is against the downward-moving flight that the fiber first engages, and it is then carried down beneath a second co-operating conveyer 9, extending over the horizontal leg of the conveyer 8. Each of these conveyers is preferably composed of spaced-apart cross-rods united by bands or belts, passed around suitable wheels or pulleys in such manner that conveyer 8 will have an upward and downward flight in addition to the horizontal flights. The upper horizontal flight of the conveyer 8 co-operates with the lower horizontal flight of conveyer 9 in conveying the fiber from the machine. These conveyers may be operated by any suitable means (not shown) applied to any one of the several pulley-shafts thereof.

As it sometimes transpires that the suction or reaction of the fan tends to draw inwardly some of the fiber at the lower end of opening 5, I form casing 3 with a series of doors 10, the opening of which serves to increase the area of the outlet-opening 5, and aside from allowing a greater outlet for the blast the danger of the fiber being drawn inwardly is lessened or entirely removed by reason of the doors being positioned at substantially right angles to the fan-casing. In some instances only one of the doors 10 may be opened, while in others all of them need be. Each door is swung on a separate pivot-rod 12, mounted in the sides of frame 1, each rod at one end being equipped with an operating-handle 13.

14 designates the scutchers, which consist of plates mounted in zigzag form around the fan, being preferably set in grooves in the outer edges of the blades thereof. These plates are formed on their edges with saw-like teeth 15 and are so arranged as to constantly change their direction, being carried diagonally through the several blades, the angularity being such that the plane of the innermost portions of each scutcher-plate will intersect the outermost portions of the next adjacent plate. In this way all the stalks are uniformly acted upon, and contact is had with every portion of the projecting edge of each stalk, and even if the stalks be presented at an angle to their entrance the fiber will be forced down on straight lines.

Between the feed-table 2 and the bar 4 are

three revolving feed-rollers 16, against which the stalks are held by an upper revolving feed-roller 17, which crushes and holds the stalks so tightly that any deflection thereof as they are being acted upon by the scutcher-teeth is impossible. Preferably the series of rollers 16 and the bar 4 are mounted at their ends in adjustable plates 18, so as to regulate the position of bar 4 relatively to the scutcher. The several rollers 16 are preferably driven at differential speeds and for this purpose are equipped with gear-pinion 16^a, which mesh with gear-wheels 16^b, as shown in Fig. 8. The several gear-wheels 16^b, are shown as carried by the roller 17, which, as shown in Fig. 5, is operated by a counter-shaft 16^c, driven by the shaft of the fan.

19 designates a distributing-roll located on feed-table 2 in close proximity to rollers 16 and 17. This roller 19 is formed with a right and left hand spiral 20, with the convolutions carried in opposite directions from the center, said spirals working just above plates 21, projecting upwardly from the bottom of feed-table 2. By this means the stalks will be equally distributed throughout the width of the feed-table and fed onto rollers 16, where they will be caught and compressed by roller 17 as they pass over the stationary bar 4 during the cutting or sawing operation.

If it be found necessary to admit air against the fiber as it travels over the horizontal leg of conveyer 8, a sliding door 22 in the top 23 of the outlet-trough 24 may be opened for this purpose, and to prevent the fiber from adhering to the conveyer 9 on the return flight thereof I provide in top 23 a screen-covered air-outlet opening 25. A sliding door 26 is also formed in the upright portion of frame 1 for the purpose of allowing access to the interior of the machine and also to permit any excess of air to pass out through the opening covered by this door. A conveyer 27 for the refuse may be located in trough 24.

In practice the fan is rotated at a high rate of speed, and the rollers 16, 17, and 19, as well as the conveyers, are driven at such speeds as conditions may require and by such means as may be found best suited for the purpose, the conveyers 8 and 9 traveling at a greater speed than the feed-rolls so as to exert a pull on the fibers. The stalks after being placed on feed-table 2 are equally distributed by roller 19 over the feed-rollers 16 and held tightly to place by the pressure-roller 17. The ends of the stalks projecting over the bar 4 are acted upon by the scutcher-plates 14, which plates serve to thoroughly break up the woody matter, pith, or chaff, leaving the fiber intact, and the centrifugal action of the fan will force the fiber, together with the chaff and other refuse, out through opening 5 against the downwardly-moving flight of the upright leg of conveyer 8, the chaff passing through

such conveyer down into the outlet-trough 24, where it is taken up by the conveyer 27 and discharged out of the way, while the fiber remains in contact with the conveyer and is drawn thereby and carried over the horizontal leg thereof in contact with the second conveyer 9, and as it leaves the machine it is free of all refuse. The conveyers 8 and 9 exert a constant pull on the fiber. As before stated, should any of the fiber tend to be drawn backwardly into casing 3 the area of opening 5 may be increased by the opening of doors 10, such doors when opened standing outwardly from the casing at substantially right angles thereto, so as to serve as deflectors and prevent the fiber from being drawn backwardly into the casing.

The advantages of my invention will be apparent to those skilled in the art. I have found in actual practice that a machine constructed in accordance therewith effects thorough and complete disintegration and separation of the chaff and other refuse from the fiber, allowing the latter to be delivered from the machine in lengths corresponding to the lengths of the original stalks and in a much straighter condition than it was on being fed to the machine. The output of the machine is very great, all of the fiber being recovered, and the parts being extremely simple are not liable to readily get out of order or be deranged. It will be noted that the scutcher-plates extend around the fan concentrically therewith and that they are arranged with such angularity as to insure the engagement of the teeth with every portion of the projecting ends of the stalks, thereby insuring the breaking up and removal of the woody or pithy substances in very fine pieces without disintegrating the fiber.

I claim as my invention--

1. A fiber-separating machine comprising a stationary casing having an inlet-opening, and an outlet-opening below the inlet-opening, a rapidly-revolving fan mounted in said casing, scutcher-plates mounted concentrically on said fan and having teeth in their outer edges, and a conveyer passing in close proximity to said outlet-opening for receiving the fiber therefrom, such conveyer being so constructed as to permit the chaff and other refuse being forced therethrough by the blast from the fan.

2. A fiber-separating machine comprising a stationary casing having an inlet-opening, and an outlet-opening below the inlet-opening, a rapidly-revolving fan mounted in said casing, scutcher-plates mounted concentrically on said fan and having teeth in their outer edges, said plates being arranged in zigzag form, with the apexes of the angular portions thereof intersecting a common plane perpendicular to the axis of rotation, and a conveyer moving in close proximity to said outlet-opening.

3. A fiber-separating machine comprising a casing having an inlet-opening, a fixed bar forming the bottom of such opening, a series of feed-rollers adjacent to said bar, a pressure-roller for holding and crushing the stalks against said series of rollers, said casing having an outlet-opening beneath said bar, a rapidly-rotating fan mounted in said casing, a series of scutcher-plates arranged concentrically on said fan and having teeth in their outer edges, and a conveyer in close proximity to said outlet-opening.

4. A fiber-separating machine comprising a stationary casing having an inlet-opening, and an outlet-opening beneath said inlet-opening, a rapidly-revolving fan within said casing, scutcher-plates mounted on said fan, and means for preventing the fiber from being drawn inwardly through said outlet-opening by the suction or reaction of the fan.

5. A fiber-separating machine comprising a stationary casing having an inlet-opening, and an outlet-opening beneath said inlet-opening, a rapidly-revolving fan within said casing, scutcher-plates mounted on said fan, and a series of deflectors mounted on said casing beneath said outlet-opening for preventing the fiber from being drawn through said outlet-opening by the suction or reaction of the fan.

6. A fiber-separating machine comprising a stationary casing having an inlet-opening, and an outlet-opening beneath said inlet-opening, a rapidly-revolving fan within said casing, scutcher-plates mounted on said fan, and a series of doors for increasing the area of said outlet-opening, said doors when opened being at substantially right angles to said casing and acting as deflectors for preventing the fiber from being drawn inwardly through said outlet-opening by the suction or reaction of the fan.

7. A fiber-separating machine comprising a circular casing having an inlet-opening, a fixed bar forming the bottom of such inlet-opening, an outlet-opening beneath such bar, means for increasing the area of such outlet-

opening, a conveyer movable in close proximity to such outlet-opening, a rapidly-revolving fan mounted in said casing, a series of scutcher-plates mounted at the periphery of such fan and encircling the latter, such plates being arranged in zigzag form and having teeth in their outer edges, a series of feed-rollers adjacent said fixed bar, and a pressure-roller mounted above said feed-rollers.

8. A fiber-separating machine having a feed-table, a rotary scutcher, means for holding the stalks while they are being acted upon by the scutcher, a roller mounted above the feed-table and means cooperating with such roller for equally distributing the stalks to said holding means.

9. A fiber-separating machine having a feed-table, a rotary scutcher, means for holding the stalks while they are being acted upon by the scutcher, and a roller mounted above said table having a right and left hand spiral extending from its center to each end.

10. A fiber-separating machine having a feed-table, a rotary scutcher, means for holding the stalks while they are being acted upon by the scutcher, a roller mounted above said table having a right and left hand spiral extending from its center to each end, and guide-plates extending upwardly from the bottom of the feed-table beneath said roller.

11. In a fiber-separating machine, a casing having an inlet-opening, feed-rollers, an upper roller for holding and crushing the stalks against said rollers, scutcher-plates rotating in the direction of their lengths, a fan, and conveyers traveling at a higher speed than the feed-rollers for exerting a pull on the fiber.

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

EDMUND E. HORINE.

Witnesses:

EMMA HORINE,
FRANCIS S. MAGUIRE.