C. T. DRAKE.

MACHINE FOR TREATING FIBROUS MATERIALS.

APPLICATION FILED DEC. 6, 1906.

986,624. **Patented Mar. 14, 1911.**

3 SHEETS—SHEET 1.

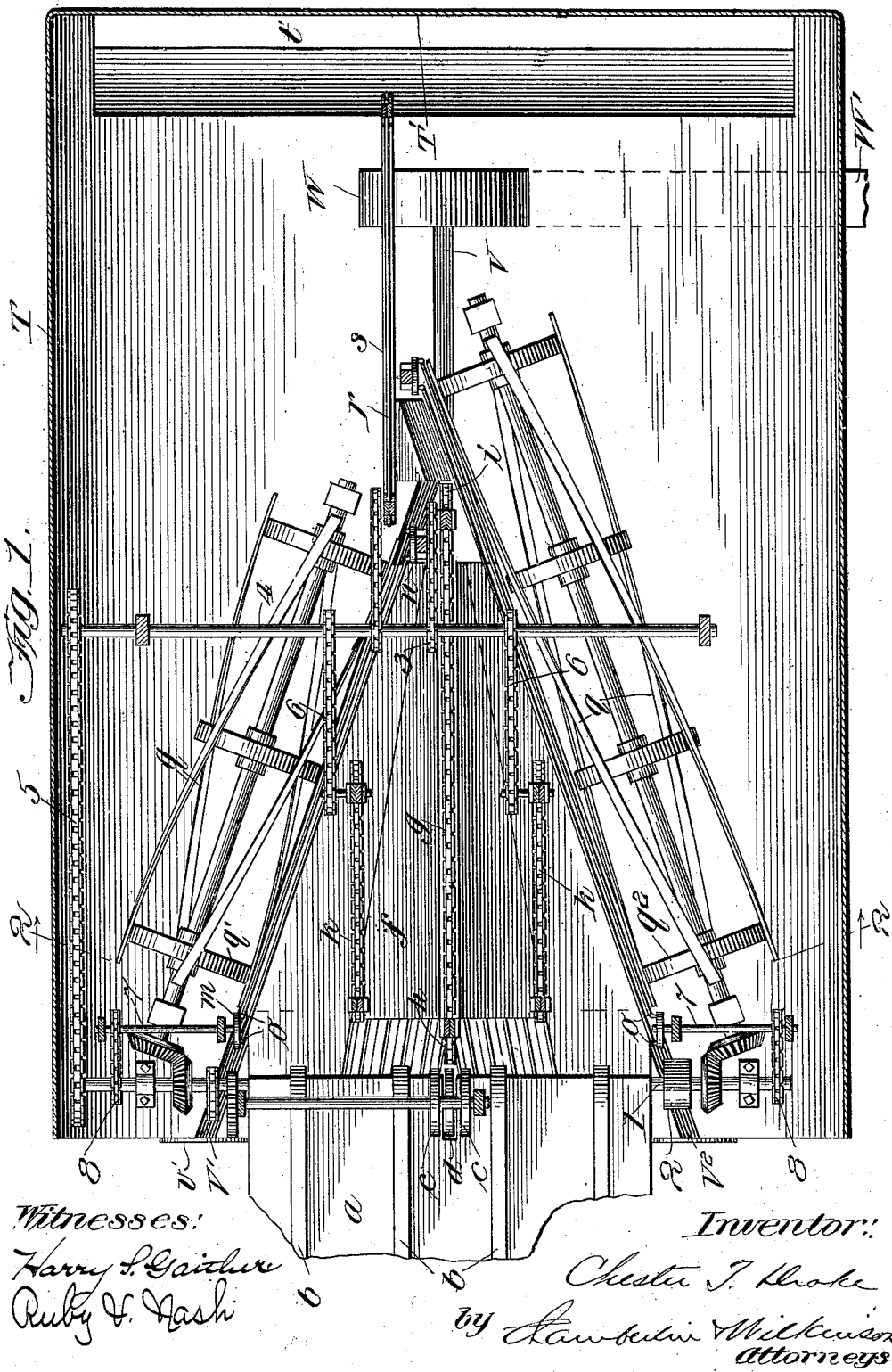


Fig. 1.

Witnesses:
Harry L. Gaither
Ruby V. Nash

Inventor:
Chester T. Drake
by Lambertin & Wilkinson
Attorneys

C. T. DRAKE.

MACHINE FOR TREATING FIBROUS MATERIALS.

APPLICATION FILED DEC. 6, 1906.

986,624. Patented Mar. 14, 1911.

3 SHEETS—SHEET 2.

Fig. 2.

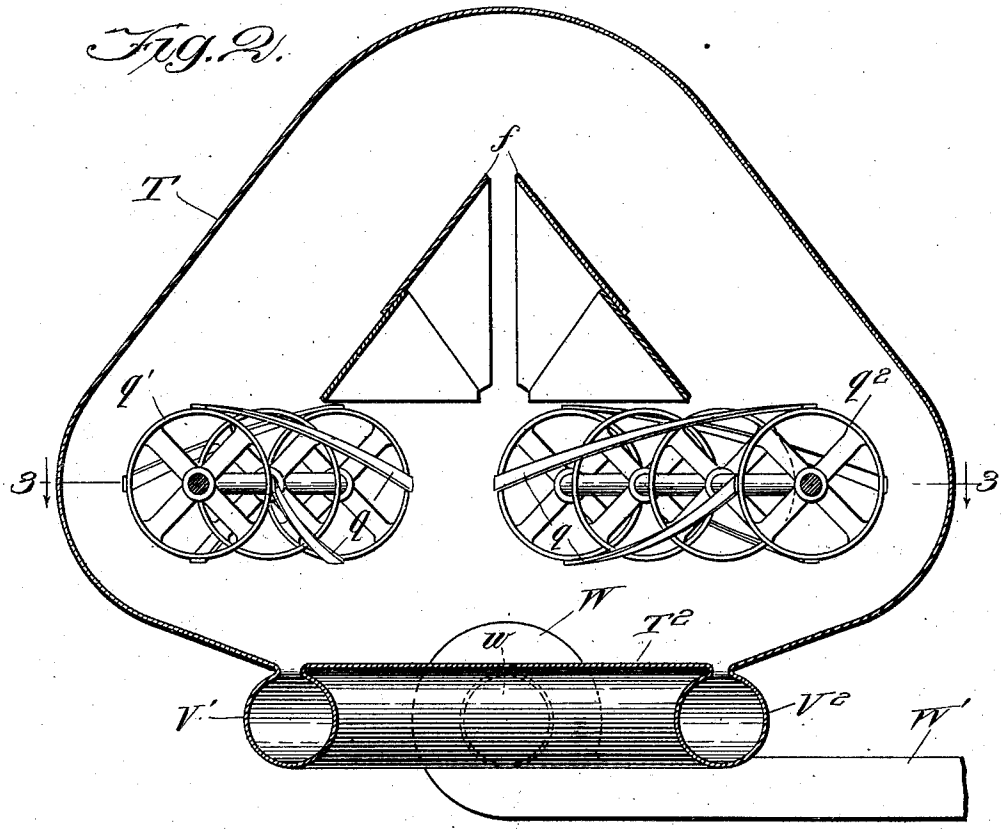
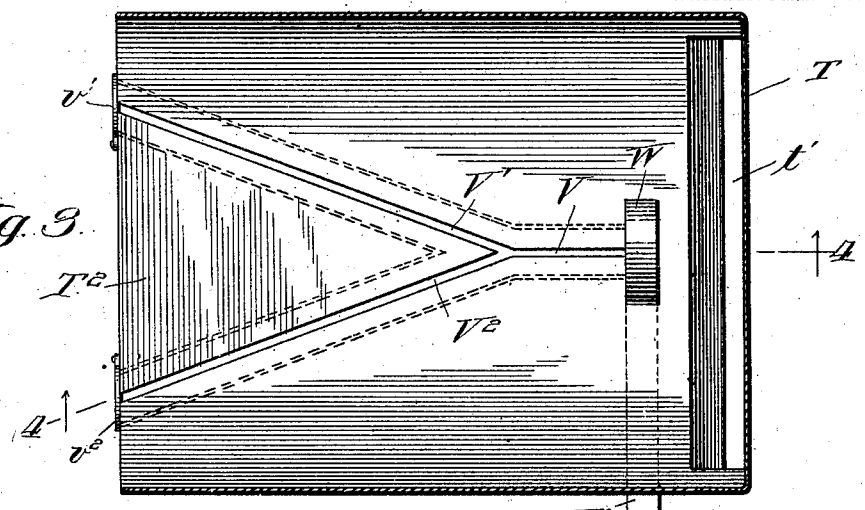


Fig. 3.



Witnesses:

Harry L. Gaither

Ruby V. Nash.

Inventor:

Chester T. Drake

by Lauderlin & Wilkinson

Attorneys.

C. T. DRAKE.

MACHINE FOR TREATING FIBROUS MATERIALS.

APPLICATION FILED DEC. 6, 1906.

986,624. Patented Mar. 14, 1911.

3 SHEETS—SHEET 3.

Fig. 4.

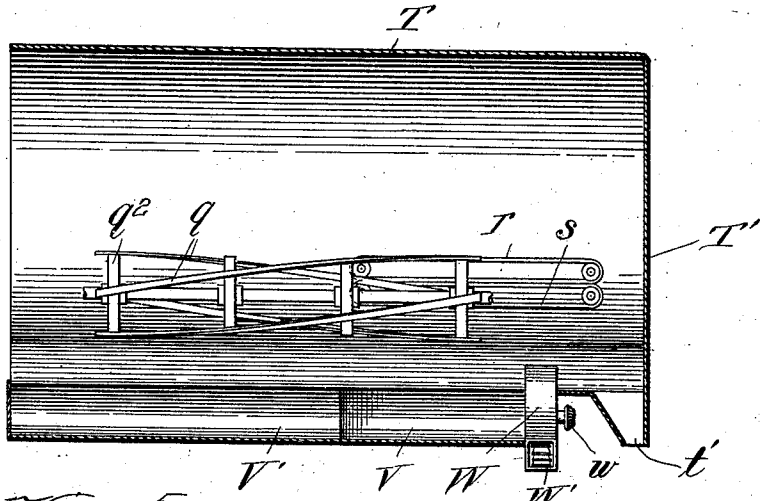


Fig. 5.

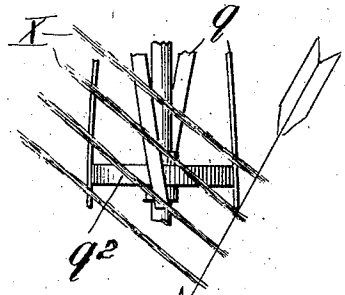


Fig. 6.

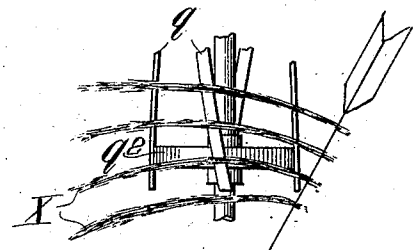


Fig. 7.

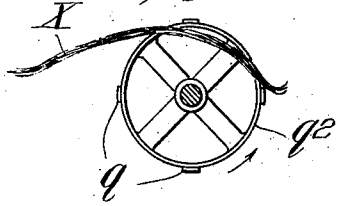
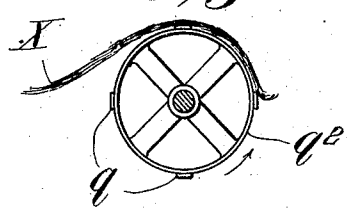


Fig. 8.



Witnesses:
Harry L. Gaither
Ruby V. Nash.

Inventor:
Chester T. Drake
by Lawrence Kilpatrick
Attorneys

UNITED STATES PATENT OFFICE.

CHESTER T. DRAKE, OF CHICAGO, ILLINOIS, ASSIGNOR TO LAWRENCE HAYWORTH, OF CHICAGO, ILLINOIS.

MACHINE FOR TREATING FIBROUS MATERIALS.

986,624. Specification of Letters Patent. **Patented Mar. 14, 1911.**

Application filed December 6, 1906. Serial No. 346,519.

To all whom it may concern:

Be it known that I, CHESTER T. DRAKE, a citizen of the United States, residing at Chicago, county of Cook, State of Illinois, have invented a certain new and useful Improvement in Machines for Treating Fibrous Materials, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates in general to machines for treating fibrous materials, and more particularly to improvements especially adapted for use in connection with the machines, such as covered by the U. S. patents granted to W. A. and A. M. Shely on May 3, 1904 Numbered 759,197, 759,198 and 759,199.

In the operation of machines of the character referred to fibrous material, such as hemp, is so treated as to remove the woody or cellular matters from the fibers, the cellular matters, or herds, being discharged from the machine while the fibers are delivered in a clean condition. In the operation of the machines it is necessary that the fibers should travel along and off of the revolving breaking cylinders in planes transverse to the axes of rotation of the cylinders in order that the fibers may not become tangled around the shafts of the cylinders.

The primary object of my invention is to provide improvements in the class of machines above referred to by means of which the cellular and other waste matters will be effectively discharged, and by means of which the fibers will lie transversely across the revolving breaking cylinders and thereby prevented from becoming wound around the shafts of the cylinders.

A further object of my invention is to provide machines for treating fibrous materials with improvements whereby the waste matters, or herds, will be pneumatically discharged and at the same time the fibers arranged by the action of the air so as to be drawn through the machine and delivered therefrom without choking the machine and thereby impeding its operation.

A still further object of my invention is to provide improvements for machines for separating the fibers from the waste matters of fiber-yielding plants, by means of which the operation of the machine will be improved and the separation of the fibers effected more perfectly than heretofore possible.

My invention may be generally described as comprising a casing surrounding a machine for treating fibrous materials, such as the machines covered by the patents above referred to, conduits located at the bottom of the casing, and arranged parallel with the breaking cylinders of the machine, in which the herds are received, an exhaust fan with which the conduits communicate and by means of which the herds are withdrawn from the conduits and ejected from the casing, the casing having an outlet opening through which the fibers are delivered, the position of the fibers relatively to the breaking cylinders being so controlled by the action of the air exhausted from the casing by the fan, that they will pass through the machine without becoming tangled with the mechanism thereof.

My invention will be more fully described hereinafter with reference to the accompanying drawings in which the same is illustrated in connection with a machine of the type covered by the patents to Shely above referred to, and in which—

Figure 1 is a top plan view, the casing being shown in horizontal section; Fig. 2 a diagrammatic representation of a vertical section throug the machine and casing; Fig. 3 a horizontal sectional view through the casing on line 3—3 Fig. 2, the scale being somewhat reduced; Fig. 4 a vertical sectional view through the casing on line 4—4 Fig. 3; Fig. 5 a plan view of an end of one of the breaking cylinders showing the position the fibers would normally occupy; Fig. 6 a view similar to Fig. 5 showing the positions which the fibers assume relatively to the breaking cylinder owing to the action of the air; Fig. 7 an end view looking upwardly on Fig. 5; and Fig. 8 an end view looking upwardly with respect to Fig. 6.

The same reference characters are used to designate the same parts in the several figures of the drawings.

The construction and operation of the machine for treating the fibrous materials are fully set forth in the patents to Shely above referred to, and therefore need only be briefly outlined herein in order that the

operation of my improvements may be fully understood.

The stalks of fiber-yielding plants, such as hemp, are placed transversely on a table *a* and are fed laterally by carriers *b*, *b*, between co-acting disks *c* and *d*, and thence on to the feed platform *f* which is triangular in cross-section and provided with rearwardly inclined and converging side walls. The stalks having been centrally broken between the co-acting disks conform to the shape of the platform *f* and their opposite halves or end portions hang naturally down upon the oppositely inclined sides thereof. A central carrier *g* engages the stalks and moves them rearwardly, such movement being facilitated by the shape of the platform and assisted by intermediate carriers *k*, *k* and auxiliary gyrating feed bars *o*, *o*. The ends of the stalks, as soon as their lengths permit, pass beneath the gyrating feed bars O and are engaged and deflected upwardly by the breaking and scutching blades *q* on the rotating reels *q'* and q^2 respectively. Owing to the convergence of the bars *o* and the cylindrically arranged breaking blades *q*, as the stalks move rearwardly they project farther and farther over the cylindrically arranged breaking blades, whereby they are broken and scutched progressively toward their centers, while their projecting portions are continuously whipped or combed out lengthwise by the revolving blades *q*. When the stalks reach the rear end of the platform *f*, they are broken and cleaned throughout excepting their small central parts which have not been engaged by the breaking blades. The coöperating belts *r* and *s* grasp the fibers as they pass from the platform *f* at the cleaned portions thereof passing from the shorter breaking and scutching blades *q* on the reels *q'*, and carry them rearward so that they are engaged by the extended portion of the longer breaking and scutching blades *q* on the reels q^2, which act upon the central uncleaned parts of the stalks.

My improvements which I apply to a machine such as that above briefly described, comprise a casing or housing T made of any suitable material, such as sheet metal, and surrounding the machine. The rear end of the housing is closed by a wall T' at the lower edge of which is provided a discharge opening *t'* through which the clean fibers are discharged. The front end of the housing T is open and surrounds the end of the table *a*.

Conduits V' and V^2 which converge rearwardly and communicate with a single conduit V, are located beneath the bottom wall T^2 of the housing and are adapted to receive the herds which have been removed from the stalks. The conduits V' and V^2 communicate with the interior of the housing through restricted openings, such openings lying parallel with and below the converging lower edges of the side walls of the platform *f*, so that the waste materials removed from the stalks will pass into the conduits.

W indicates a casing within which is located an exhaust fan, such casing being arranged transverse to and at the end of the conduit V with the opening *w'* in the casing of the exhaust fan communicating with the conduit V.

W' designates a conduit leading from the exhaust fan through which the herds are discharged. Any suitable means may be provided for rotating the exhaust fan, such for instance as a bevel gear *w* which may receive rotary motion from any source of power.

In order that the suction through the conduits V' and V^2 may be regulated, the open ends thereof are provided with oscillating disk valves *v'* and v^2 which may be so adjusted as to open to a greater or less degree the ends of the conduits which terminate at the front edge of the housing.

The operation of my improvement is as follows: The exhaust fan draws the herds through the conduits V' and V^2 into which they fall from the platform *f* and revolving breaking blades, into the conduit V and thence discharge the same through the conduit W' leading to the exterior of the housing. Owing to the inclined positions of the cylindrically arranged breaking blades *q'* and q^2 the ends of the fibers would normally extend over the blades in planes at right angles to their direction of movement. In Fig. 5 I have diagrammatically indicated the direction of movement of the stalks by the arrow, and by reference character X the positions which the fibers would occupy relatively to the breaking blades. Such inclined positions of the fibers relatively to the breaking blades would result in the ends of the breaking blades passing above the fibers as they leave the blades as indicated in Fig. 7. This would result in the fibers being wound around the shaft upon which the reels supporting the blades are fixed, and also around the ends of the blades, thereby choking the machine and interfering with its operation. The action of the exhaust fan results in the ends of the fibers which overlie the cylindrically arranged breaking blades, being drawn rearwardly so that the fibers occupy positions transversely with respect to the axes of rotation of the blades, as shown in Fig. 6. The fibers consequently pass from the ends of revolving blades in planes parallel with the ends of the blades, thereby preventing the ends of the blades from passing over fibers which are still overlying some of the blades. The fibers therefore pass off of the breaking blades without being tangled

and without choking the revolving blades. The fibers after passing from the revolving breaking blades, are carried by the conveyers *s* and *r* to a position above the delivery chute *t'* and there discharged so that they will pass through the chute to the exterior of the casing.

From the foregoing description it will be observed that I have invented improvements in machines for treating fibrous materials whereby the action of air is utilized to discharge the herds and to simultaneously so locate the fibers with respect to the breaking blades as to prevent their becoming tangled with the breaking mechanism.

While I have described more or less precisely the details of construction, I do not wish to be understood as limiting myself thereto, as I contemplate changes in form, the proportion of parts, and the substitution of equivalents, as circumstances may suggest, or render expedient without departing from the spirit of my invention.

Having now fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. The combination with a machine for treating fibrous stalks comprising mechanism for separating the fibers, from the waste matters, of a casing inclosing said mechanism, said mechanism including means for feeding the stalks toward one end of said casing, a wall closing the end of the casing toward which the stalks are moved, conduits located at the bottom of said casing for receiving the herds, and pneumatic exhaust mechanism with which said conduits communicate for withdrawing the herds from said conduits and discharging the same, there being a discharge outlet for the fibers through the bottom of the casing adjacent to said wall.

2. The combination with a machine for treating fibrous stalks comprising cylindrically arranged rotating blades for separating the fibers from the waste matters, of a casing inclosing said machine, said mechanism including means for feeding the stalks toward one end of said casing, a wall closing the end of said casing toward which the stalks are moved, conduits located at the bottom of said casing to receive the waste matters, an exhaust fan with which said conduits communicate, whereby the waste matters are withdrawn from said conduits and the fibers simultaneously arranged in lines transverse to the axes of rotation of the breaking blades, there being a discharge outlet for the fibers through the bottom of the casing adjacent to said wall.

3. The combination with a machine for treating fibrous stalks comprising two series of rotating breaking blades, the axes of the series of blades converging rearwardly, a casing inclosing said machine, said mechanism including means for feeding the stalks toward one end of said casing, a wall closing the end of said casing toward which the stalks are moved, rearwardly converging conduits located at the bottom of said casing beneath said series of rotating blades, an exhaust fan with which said conduits communicate, said exhaust fan serving to discharge the waste matters, and also to arrange the fibers in transverse lines relatively to the axes of rotation of said blades, and a discharge chute adjacent the rear wall of said casing through which the fibers are delivered.

4. In a machine for treating fibrous stalks, the combination with two series of rotating breaking blades, the axes of the series of blades converging rearwardly, of mechanism for delivering the stalks to the series of breaking blades, and mechanism for pneumatically ejecting the waste matters and for simultaneously arranging the ends of the fibers in lines substantially at right angles to the axes of rotation of the two series of breaking blades.

5. In a machine for treating fibrous stalks the combination with two series of rotating breaking blades, the axes of the series of blades converging rearwardly, of a table intermediate of the converging series of breaking blades, mechanism for delivering the stalks to said table and moving them into positions to be engaged by the series of blades, and mechanism for pneumatically ejecting the waste matters which fall from said table and simultaneously arranging the ends of the fibers in lines approximately at right angles to the axes of rotation of the breaking blades.

In testimony whereof, I sign this specification in the presence of two witnesses.

CHESTER T. DRAKE.

Witnesses:

GEO. L. WILKINSON,

HARRY S. GAITHER.