(No Model.) 2 Sheets—Sheet 1.

E. D. EMERSON.

MACHINE FOR TREATING MOTES, WASTE, AND SCRAPINGS.

No. 458,229. Patented Aug. 25, 1891.

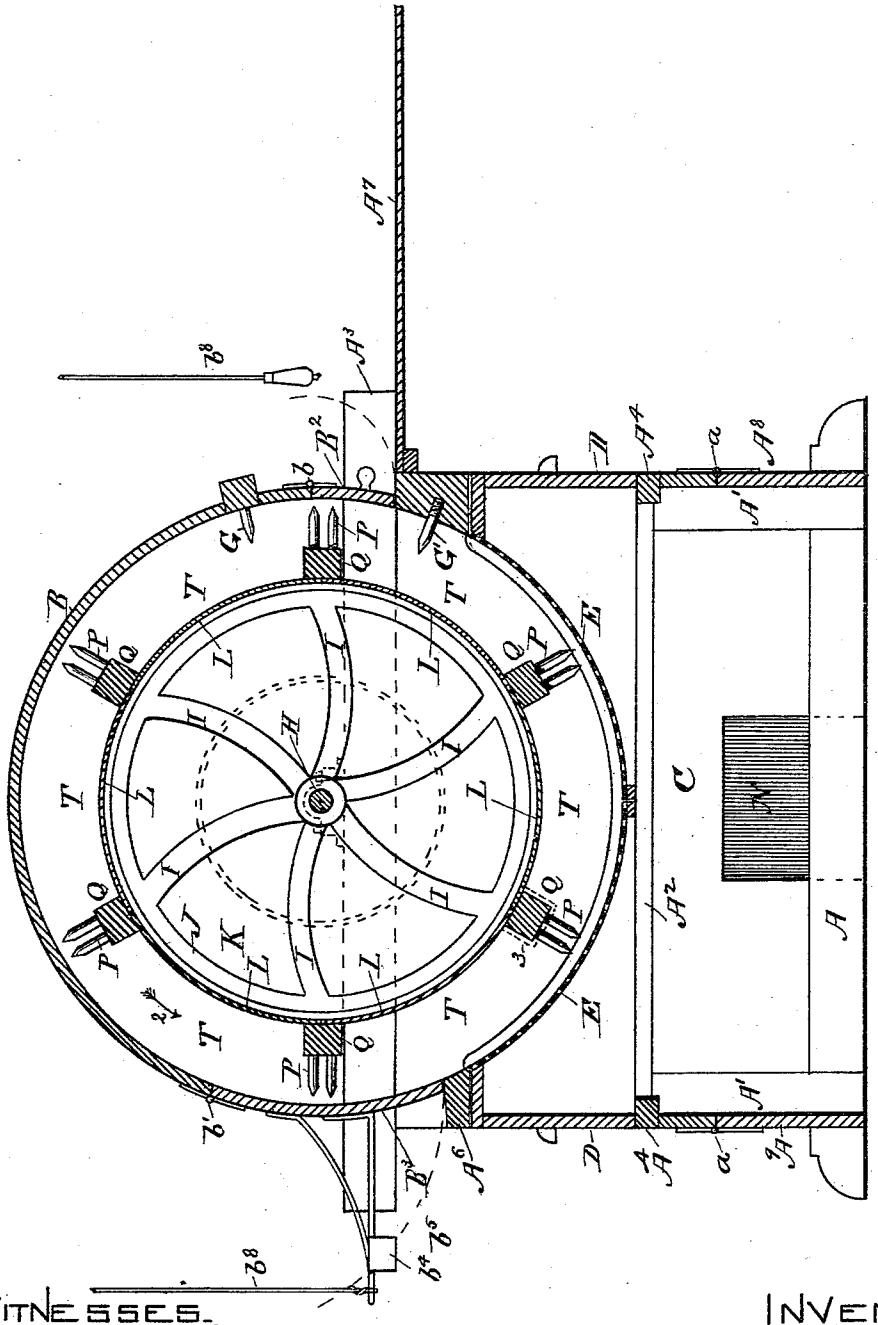


Fig. 1.

WITNESSES.
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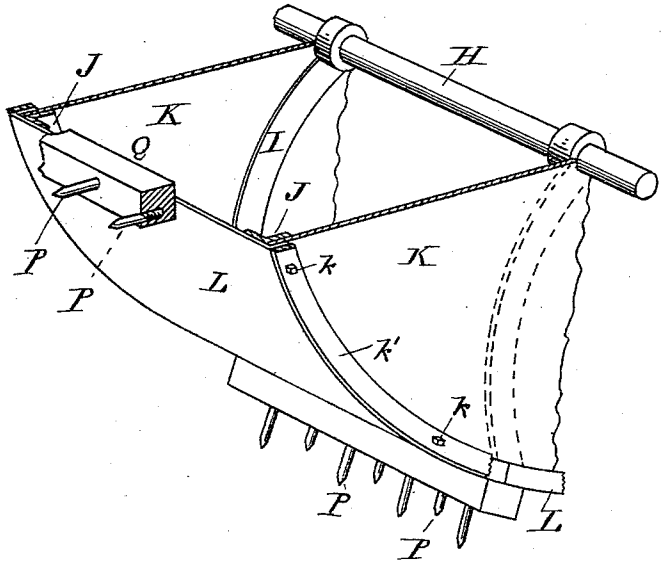


Fig. 2.

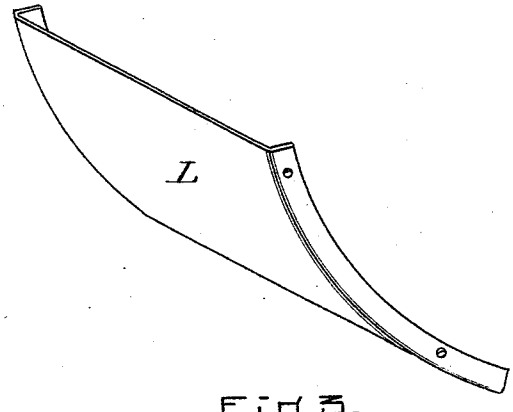


Fig. 3.

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UNITED STATES PATENT OFFICE.

EDWARD D. EMERSON, OF WALTHAM, MASSACHUSETTS.

MACHINE FOR TREATING MOTES, WASTE, AND SCRAPINGS.

SPECIFICATION forming part of Letters Patent No. 458,229, dated August 25, 1891.

Application filed August 13, 1888. Serial No. 282,558. (No model.)

To all whom it may concern:

Be it known that I, EDWARD D. EMERSON, of Waltham, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in a Machine for Treating Motes, Waste, and Scrapings, of which the following description, in connection with the accompanying drawings, is a specification.

There are three kinds of refuse material containing more or less cotton, which prior to my invention have not been practically or profitably utilized—viz., first, what is called "motes," or the refuse from the cotton-gin, it containing many leaf specks and small knots or bunches of short staple; second, what is called "waste," it including the droppings from the gin-table and the waste about the gin and store houses which does not pass through the gin, but is soiled, and, third, what is called "scrapings," or cotton soiled in the field or other place and in the boll more or less open. The aggregate annual loss of fiber by these three sources is very great, and it is therefore a great desideratum to be able to utilize the valuable fiber in the motes, waste, and scrapings. By a careful study of this class of fiber and much experiment I have devised a simple apparatus or machine in which the class of fiber referred to may be treated or cleansed sufficiently to convert it into utilizable and valuable fiber, thus making it possible to save annually millions of tons of fiber. In order to save the fiber from this class of material, it has been found necessary to subject it for a longer period of action than heretofore commonly practiced when opening and cleaning dry fiber, for in cotton-gins, pickers, &c., it is customary to introduce the material continually at one side of a toothed cylinder and discharge it continually from the other side thereof; but such treatment I have found insufficient for the proper cleansing of the class of fiber which it is the object of this invention to utilize, it being necessary in accordance with my invention to subject portions of the material to the action of beaters, and a grid in a closed chamber for many revolutions of a carrying-cylinder, the grid-chamber separated from the cylinder-chamber being in communication with an exhaust, as will be described. The cylinder which I find it necessary to employ is not composed simply of heads and arms or disks mounted on a shaft and connected longitudinally by means of bars provided with teeth, the fiber being free to fall or enter practically to the shaft of the cylinder; but, on the contrary, the cylinder employed by me, in combination with other parts, which, taken together, have been found by me to produce the results which I have aimed to produce, has its surface or periphery closed or bridged over, so that the material rests on the periphery of the cylinder in a series of pockets which I have provided for such purpose between series of strong teeth, the said pockets serving to carry about with the cylinder the fine fiber which is in small lumps and knots matted together or not laid with its individual fibers parallel, or substantially so, as in regular merchantable cotton. The employment of the pockets between the rows of teeth appears to keep the volume of cotton carried about in the case by the cylinder for many revolutions of the latter in more uniform condition as to thickness than when the periphery of the cylinder is truly circular and provided with teeth without pockets. The pockets form a sort of dead-air chamber, which enables the cotton to remain better under the control of the entire surface of the cylinder and travel with it in a more uniform layer, which, however, is being continuously agitated violently and separated and subjected to a sifting or screening action in a chamber from which the dust and dirt are being exhausted by a fan.

Figure 1 in vertical section shows a machine embodying my invention. Fig. 2 is a perspective view, partly in section, of a part of the cylinder removed from the machine. Fig. 3 shows a portion of the periphery of the cylinder detached.

My improved apparatus herein shown consists of a substantial frame-work A A′ A^2 A^3 A^4 A^6, inclosed below the feed-table A^7 to form a case or box and leave a refuse-chamber, as C, which may be entered through the doors A^8 A^9, hinged at *a*, the said case being also opened at its front and rear ends, as herein shown, for the reception of slides D, provided at their upper sides for a portion of their length (see Fig. 1) with concave screening-surfaces E, the said screening-surfaces being

interposed between the rotating cylinder, to be herein described, and the refuse-chamber C, the upper part of the frame-work being provided with a cylindrical top, as B, so as to form between it and the said screening-surface a cylindrical chamber in which may rotate the cylinder. The casing referred to has a feed-door B^2 hinged thereto at b and a discharge or delivery door B^3 hinged to the casing at b' at the rear of the said machine. The door B^2 may be opened when desired for the insertion of the material to be cleaned, it being pushed into the casing from the feed-table A^7.

The door B^3, as herein shown, is provided with a bracket or arm b^5, upon which is mounted a weight b^4, which normally keeps the door B^3 closed; but the said door may be opened, when desired, by overcoming the weight either by a direct engagement therewith or by a cord, as b^8, extended upwardly over a suitable pulley and then down to the operator at a point preferably near the front of the machine.

The casing forming the chamber in which the cylinder rotates is provided with, as herein shown, two sets of strong teeth, as G G', somewhat separated from each other and extended from one to the other side of the machine, as best shown in Fig. 1, the said teeth being represented as located one set below and the other set above the feeding-door B^2.

The cylinder herein shown is composed of a shaft H, from which extend suitable arms, as I, which receive against them suitable disks or plates, as K, the arms I being joined together by a flanged rim J, preferably formed integral with the said arms I. The periphery of the cylinder is shown as made up of a series of metal segments L, flanged at their ends and made to overlap the arms or plates referred to, constituting the ends of the cylinder, the flanges of the segments receiving through them bolts, as k, which also extend through a ring, as k', and into the flange J, as best shown in Fig. 2, the said ring k' traveling, preferably, close to the inner side wall of the casing.

The cylinder referred to has at its periphery a series of pockets, as T, herein shown as formed between the segmental plates L and the cleats or blocks Q Q, which may be of wood, firmly secured to the cylinder, the said cleats or blocks having firmly held in them the series of teeth, as P, the said teeth being sufficiently separated to pass close to the teeth G G' in the rotation of the cylinder, the teeth being preferably staggered or set in a zigzag line to thus secure a greater number of them than would otherwise be possible. The shaft H of the cylinder so constructed will in practice be mounted in suitable bearings located upon the longitudinal girts A^3 of the frame-work of the case, the ends of the shafts being extended through the inclosing casing, one end of the shaft receiving upon it any suitable driving-belt by which to revolve the cylinder at high speed. The teeth P referred to are shown as pointed.

In practice the cylinder will be revolved in the direction of the arrow 2, Fig. 1. The machine having been started, the delivery-door B^3 being closed, I open the receiving-door B^2 and feed into the casing a sufficient quantity of the cotton or fibrous material to be cleaned to constitute a charge, which is immediately caught by the rapidly-moving teeth P, and immediately thereafter the feeding-door is closed. In the rotation of the cylinder in the direction stated the teeth P immediately catch the fibrous material and carry it rapidly past the teeth G, each series of teeth P in succession causing the fiber in front of it, in the direction of the rotation of the cylinder, to pass successively the teeth G and G', the material carried about by the cylinder during each rotation thereof being also carried over the screening-surface E, which may be either of wire-cloth or of perforated sheet metal. The casing has an opening N, with which is connected a pipe extended to an exhaust-fan of any usual construction, which tends to take the air, dust, dirt, &c., floating therein from the refuse-chamber C below the screening-surface E, so that as the fibrous material is carried over the screening-surface, it having been torn apart or untangled by blows between the teeth P and G G', the loose dirt in small particles, together with dust and dirt, is drawn or exhausted from the mass of fibrous material which is being carried rapidly around, rotation after rotation, in the casing. The pockets at the surface of the cylinder described act to retain in a measure, and thus carry with the cylinder and at the speed of the cylinder a larger quantity of fibrous material than could be carried were the teeth P inserted directly into the segmental plates L, the said plates being segments of cylinders.

I do not desire to limit this invention to the exact method of forming the pockets at the surface of the cylinder, as the pockets between the rows of teeth P might be made in various ways—as, for instance, if desired, the segmental plates may be so flanged as to rise and form projections, as represented by the dotted lines at 3, Fig. 1, thus forming raised lips to hold the teeth or partially to cover the ribs Q. The pockets or spaces at the periphery of the cylinder and between the rows of teeth P increase the carrying capacity of the cylinder—that is, they permit a considerable quantity of the loose and rather heavy fibrous material to be taken by the cylinder and to be kept in motion therein, so as to be gradually subjected to the action of the teeth and screens, and so, also, by reason of the said pockets I believe that the fiber mats and rolls together less or has less tendency to form wads than were the said pockets omitted. The segmental plates or surfaces at the periphery of the cylinder act to hold the fibrous material up to the interior of the casing and up to the action of the teeth P

and G G′, so that the refuse in the material is thoroughly broken up and the fiber separated from it, the separation of the non-fibrous material from the fibrous being completed by many rotations of the cylinder, after which the discharge-door B^3 is thrown open and the cleaned flaky fiber is discharged, the cotton being in condition to go upon any usual lapper.

I do not broadly claim a cylinder-case having teeth, nor do I broadly claim a rotating cylinder having teeth, for each of said things has been employed in other machines; but prior to my invention I am not aware that a machine substantially as herein described has been constructed, by which material such as motes, waste, and scrapings containing fibrous material could be operated upon in such manner as to save and utilize the fibers of the cotton.

I claim as new and of my invention—

1. The cylindrical case or chamber having inlet and discharge openings and means for closing them, a refuse-chamber partially surrounding the casing, a screen between the said chambers, and a series of teeth extended from the casing inwardly into the said cylindrical chamber, combined with a rotating cylinder having a closed periphery and provided with pockets, substantially as described, and a series of teeth carried by the said cylinder, the combination being and operating substantially as set forth.

2. A machine having a cylindrical chamber and a refuse-chamber and a screen between the chambers and inwardly-projecting teeth, and combined therewith a rotating cylinder constructed with a series of rows of radially-projecting teeth and a pocket on the advance side of each of such rows of teeth.

3. The combination of a closed cylindrical chamber provided with feed-door and discharge-door, a row of teeth above the feed-door and another row of teeth below the feed-door, and a screen on one side between the two doors, with a closed revolving cylinder constructed with a series of longitudinal rows of radially-projecting teeth and a series of depressed smooth surfaces between the rows of teeth, and a series of radially-projecting surfaces contiguous to the teeth and to the depressed surfaces of the cylinder.

EDWARD D. EMERSON.

Witnesses:

EDWARD W. POPE,

CHARLES F. JOY.