May 13, 1924. 1,493,578

E. D. WALEN ET AL

FIBER SEPARATING MACHINE

Filed Nov. 23, 1922 3 Sheets-Sheet 1

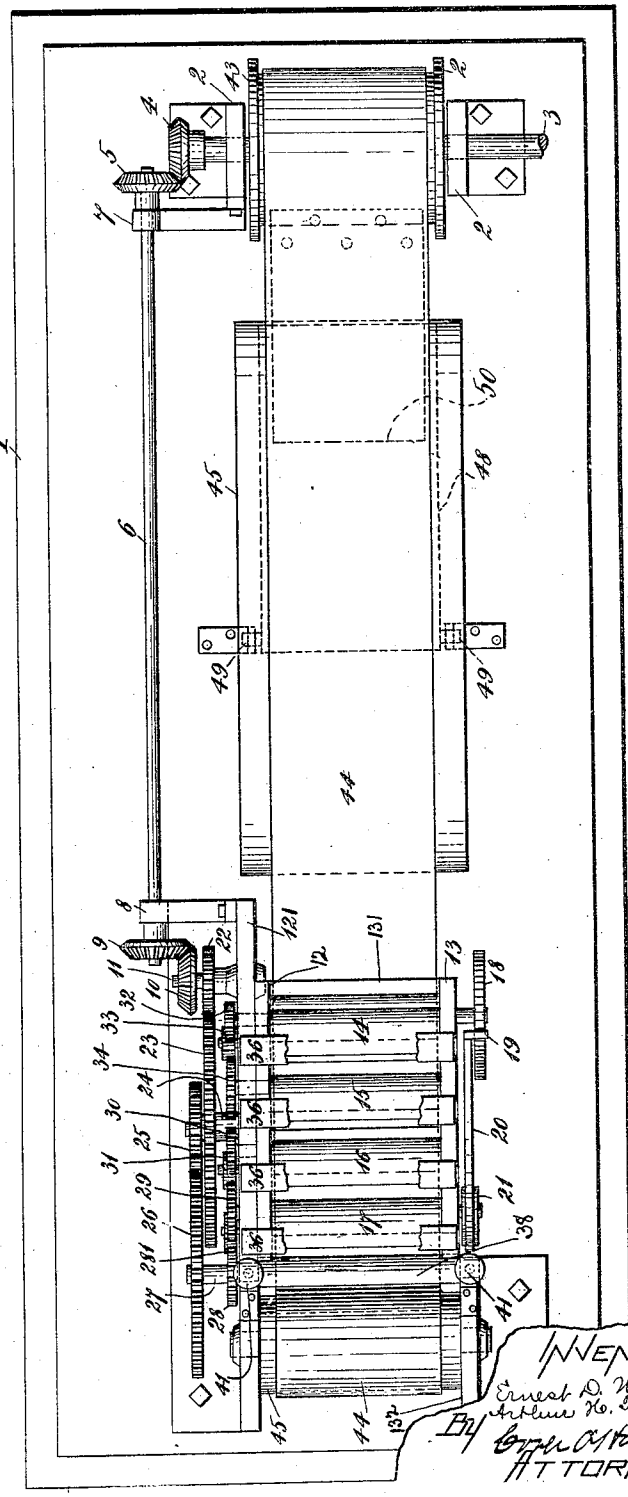


Fig. 1.

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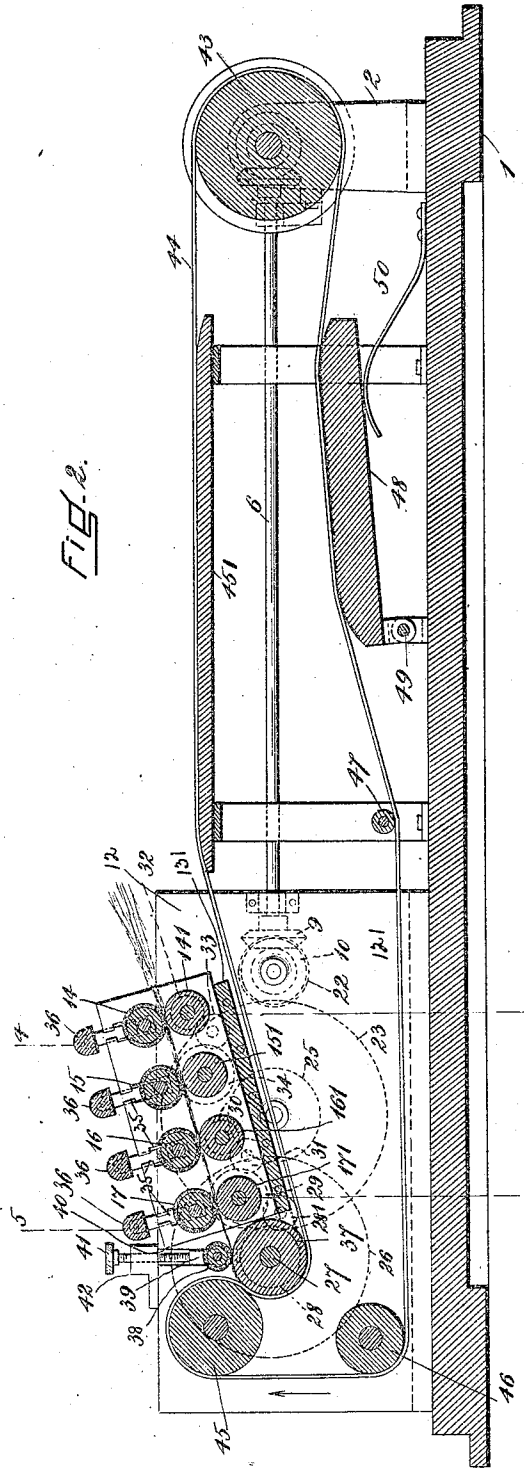


Fig. 2.

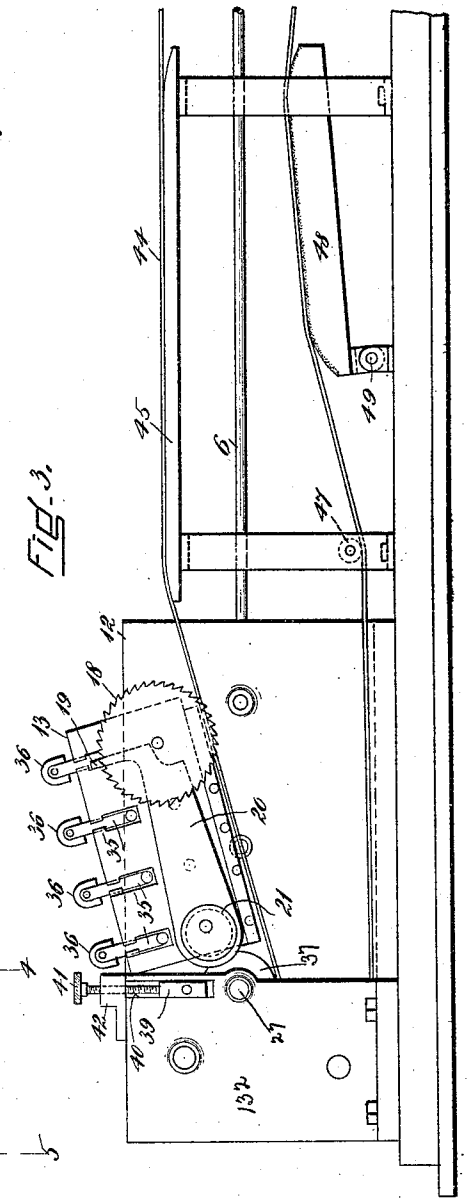


Fig. 3.

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FIBER SEPARATING MACHINE

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Fig. 4.

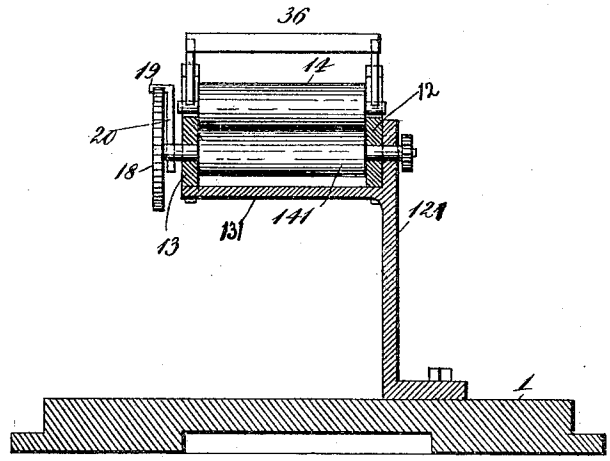
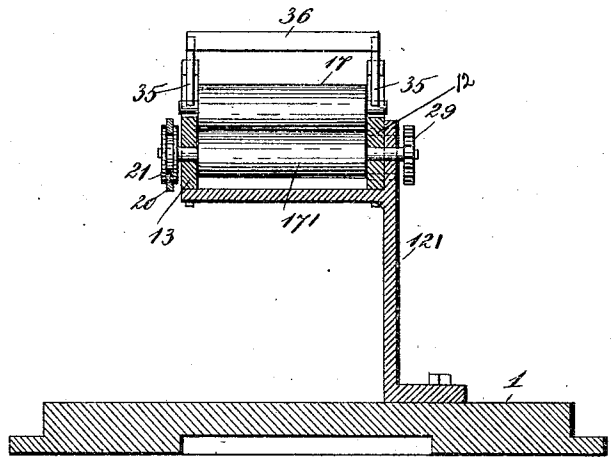


Fig. 5.



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UNITED STATES PATENT OFFICE.

ERNEST D. WALEN, OF WATERTOWN, AND ARTHUR H. PARSONS, OF GLOUCESTER, MASSACHUSETTS.

FIBER-SEPARATING MACHINE.

Application filed November 23, 1922. Serial No. 602,910.

To all whom it may concern:

Be it known that we, ERNEST D. WALEN, of Watertown, in the county of Middlesex and State of Massachusetts, and ARTHUR H. PARSONS, of Gloucester, in the county of Essex, in said State, have invented a new and useful Improvement in Fiber-Separating Machines, of which the following is a specification.

Our invention relates to means for enabling one to determine the average lengths of fibers in a lap. While heretofore there has been an attempt to accomplish this by machines which will lay the fibers according to their lengths on a velvet band so that the lap is separated into fibers of different lengths, such machines have not proved satisfactory because they do not lay the fibers straight and in such a manner that they may be accurately measured individually.

We have found the machine below described useful for the purpose of laying out fibers for measurement in that the lap is fed regularly to a separating mechanism which draws out the fibers, brushes them straight and lays them in such position that they are measurable and the general or average length of the fibers in a particular lap determined, and hence the character of the lap determined.

The invention will be understood by reference to the drawings in which it is shown in its preferred form.

Figure 1 is a plan,

Fig. 2 a longitudinal section,

Fig. 3 a side elevation, and

Figs. 4 and 5 sections on lines 4—4, 5—5 of Fig. 2.

1 is a table on which the various parts are mounted. On standards 2, 2 is carried a shaft 3 by which power is applied to the machine, the shaft for this purpose carrying at one end a bevel gear 4 meshing with a similar gear 5 on the end of a countershaft 6. This shaft 6 is mounted in bearings 7 and 8 suitably supported from the table and carries at its further end a bevel gear 9 meshing with a similar gear 10 on stud 11 mounted on a vertical support or wall 121 carrying one side 12 of a frame 12, 13, the wall being mounted on the table 1. 131 is a bottom piece connecting said sides 12 and 13 of the frame. 14, 15, 16 and 17 are rolls each mounted on its own shaft which is carried between the sides 12 and 13 of the frame. Beneath each of these rolls is a feed roll 141, 151, 161 and 171, each mounted on its own shaft and also carried between the sides 12 and 13 of the frame. The shaft carrying the roll 141 has at one end a ratchet 18 operated by a pawl 19 carried on the end of a connecting plate 20 mounted on eccentric 21 on the shaft of roll 171. Power is applied to this shaft by means of a gear 22 on stud 11 mounted to turn with gear 10 and meshing with a gear 23 on a shaft 24, also mounted on the frame. The shaft 24 also carries a smaller gear 25 in mesh with a gear 26 on shaft 27. The shaft 27 also carries a gear 28 which meshes with an idler 281 meshing with a gear 29 on the shaft of roll 171. The shaft of roll 161 also carries a gear 30 in mesh with an idler 31 which is also in mesh with the gear 29 so that the rolls 161 and 171 are rotated in the same direction. The shaft of roll 141 carries a gear 32 in mesh with an idler 33 which is in mesh with a gear 34 on the shaft of roll 151.

It will be seen that by this means the rotation of the shaft 3 acting through the shaft 6 will give a motion to the gear 26 and its shaft 27 and by means of the gear 28 to the gear 29 on shaft of roll 171 and through it to the roll 161 by means of the idler 31.

Also the rotation of the shaft 171 turning the eccentric 21 will give an intermittent motion to the ratchet 18 and its shaft so that the roll 141 will be given an intermittent motion and will impart a similar motion to the roll 151.

The rolls 14, 15, 16 and 17 each are mounted in bearings 35 which slide approximately vertically in ways mounted in the sides 12 and 13 of the frame so that they may conform to the thickness of fiber passing over the feed rolls. These sliding bearings are elongated upwards and carry at their upper ends weights 36 of such character that the rolls 14, 15, 16 and 17 will rest upon the fiber causing it to contact with the rolls 141, 151, 161 and 171 so that they will be properly fed through the machine.

The shaft 27 also carries a roll 37 which serves as a feed roll to feed the fibers after they come from the separating mechanism to the velvet band by which they are carried away. To keep them in proper contact

with this roll we provide a top roll 38 mounted in bearings 39 which slide vertically in guides 40 in walls 121, 132, which bearings may be adjusted as to pressure by means of a screw 41 which passes down through threaded blocks 42 mounted on top of the walls 121, 132.

To cause the travel of the endless velvet band 44 the shaft 3 carries a roll 43 around which the velvet band passes. From the under side of the roll 43 the band 44 passes over a tension device comprising a rest 48 hinged at one end as at 49 to the table 1 and supported at the other end by a leaf spring 50 mounted on the table 1. By this means proper tension may be given to the band.

From the rest 48 the band passes under guide rolls 47, 46 and 45 and under and against the driven roll 37 and from then over the table 451 to roll 43. The table 451 provides a flat level surface over which the band 44 runs, thus affording a convenient place for inspecting the fibers. This band may be made of velvet or other like material of brushlike character.

In the operation of the machine, the lap is fed to the rolls 14, 141 which have an intermittent motion and impart intermittent motion to the rolls 15, 151. The rolls 14, 141 pull out tufts of fibers from the supply which may be fed thereto in any convenient way and feed the tufts to the rolls 15, 151 which are driven at a slightly higher speed than rolls 14, 141, and draw the fibers out more or less from the tuft held by the rolls 14, 141. These fibers are fed intermittently to the constantly-rotating rolls 16, 161, and from thence are fed to the rolls 17, 171 which are also constantly rotating and at a speed slightly greater than the rolls 16, 161. The rolls 17, 171 feed the fibers between the rolls 37 and 38 to a position where they are seized by the velvet band 44 which moves at a faster speed so that it brushes the fibers straight while the tuft is still more or less held by rolls 17, 171, and carries them over the table 451 where they may be inspected.

The desired differing speed of the several feed rolls may be secured by using gears of different diameters in a way well known. The rest 48 should have a rough surface over which the surface of the velvet carrying the fibers should be drawn so that the velvet may be cleaned of its fibers.

This embodiment of our invention is simple to construct and operate. It draws and presents the fibers for inspection in such a way as to enable the inspector to determine the character of the cotton or other fibrous material under consideration.

The invention may be otherwise embodied as will be clear to one skilled in the art. It embodies means for withdrawing fibers from the lap intermittently in such a way that the tufts drawn therefrom are fed to a brushing mechanism to straighten them and are then laid out for inspection.

What we claim as our invention is:—

1. A fiber-separating machine comprising intermittent means for drawing a tuft of fibers from a lap, means for feeding said tuft to a brushing mechanism, and said brushing mechanism, said brushing mechanism being adapted to straighten the fibers in said tuft and carry them in a plane past a point of inspection.

2. A machine of the kind described comprising an intermittent tuft-drawing mechanism, means for feeding each tuft separately to a brushing mechanism whereby the fibers of each tuft may be straightened and presented for inspection, and said brushing mechanism comprising an endless moving belt adapted to brush out the fibers in each tuft separately and carry them in brushed condition to a point of inspection.

3. A fiber-separating machine comprising intermittent means for drawing a tuft from a lap, means for feeding said tuft to a brushing mechanism, and said brushing mechanism, said brushing mechanism comprising an endless belt conveyor having a roughened carrying surface adapted to engage and straighten out fibers presented thereto, and means for moving a portion of said belt carrying said tuft in a horizontal direction whereby the fibers of said tuft may be inspected.

4. A fiber-separating machine comprising intermittent means for drawing a tuft from a lap, means for feeding said tuft to a brushing mechanism, and said brushing mechanism, said brushing mechanism comprising an endless belt conveyor having a roughened carrying surface adapted to engage and straighten out fibers presented thereto, means for moving a portion of said belt carrying said tuft in a horizontal direction whereby the fibers of said tuft may be inspected, and means operable thereafter to brush said tuft from said band.

5. In a machine of the kind described, intermittent means for drawing tufts of fibers from a source of supply, and means for feeding said tufts separately to a moving band, said feeding means having a more rapid movement than said intermittent means whereby successive tufts will be separated from each other in their movement through the machine.

6. In a machine of the kind described, intermittent means for drawing tufts of fibers from a source of supply, feeding means for drawing said tufts from said intermittent means, and a band mechanism having a brushing surface, said band mechanism having a more rapid movement than said intermittent means and said band mechanism

having a constant movement at a more rapid rate than the speed of rotation of said feeding means whereby successive tufts will be separated in their movement through the machine to said brushing surface and said brushing surface will move through fibers held more or less by said feeding means and will brush and straighten them.

7. In a machine of the kind described, a series of power-driven rolls comprising rolls intermittently driven and rolls constantly driven and weighted rolls mounted to cooperate with said driven rolls, said rolls being located with relation to each other to feed tufts of fiber from one pair thereof to the other, in combination with means for giving said power-driven rolls differing speeds whereby a tuft may be drawn from a supply and separately fed through said rolls at increasing speeds.

8. In a machine of the kind described, a series of power-driven rolls comprising rolls intermittently driven and rolls constantly driven and weighted rolls mounted to cooperate with said driven rolls, said rolls being located with relation to each other to feed tufts of fiber from one pair thereof to the other, in combination with means for giving said power-driven rolls differing speeds whereby a tuft may be drawn from a supply and separately fed through said rolls at increasing speeds, and means for moving it at a speed greater than that of the last pair of rolls in series and with a feeding and brushing belt located with relation to the last of said rolls in series and traveling at a greater speed than said last pair of rolls whereby a tuft in passing between said last pair of rolls will be brushed and straightened and fibers therefrom will be drawn out and carried off from said tuft.

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