Oct. 24, 1933. R. W. WEBB 1,932,095

COTTON FIBER SORTING APPARATUS

Filed Nov. 11, 1931 2 Sheets-Sheet 1

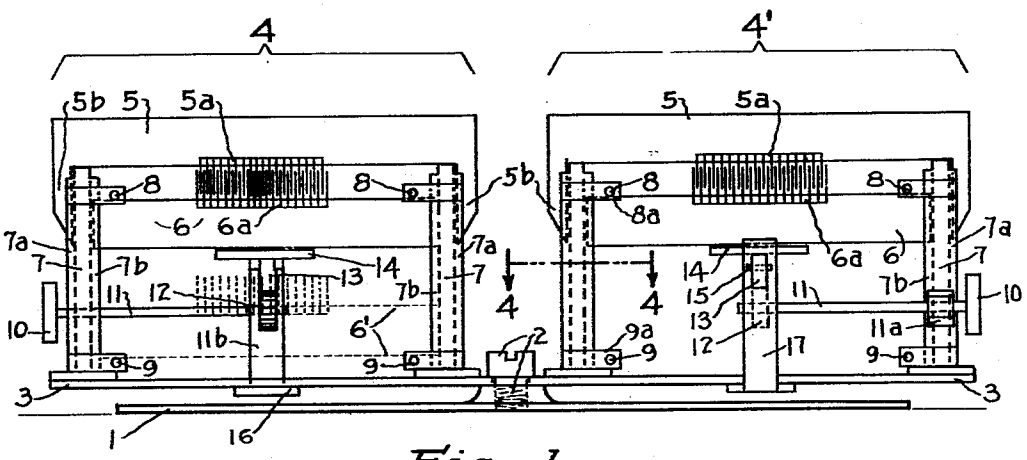


Fig. 1

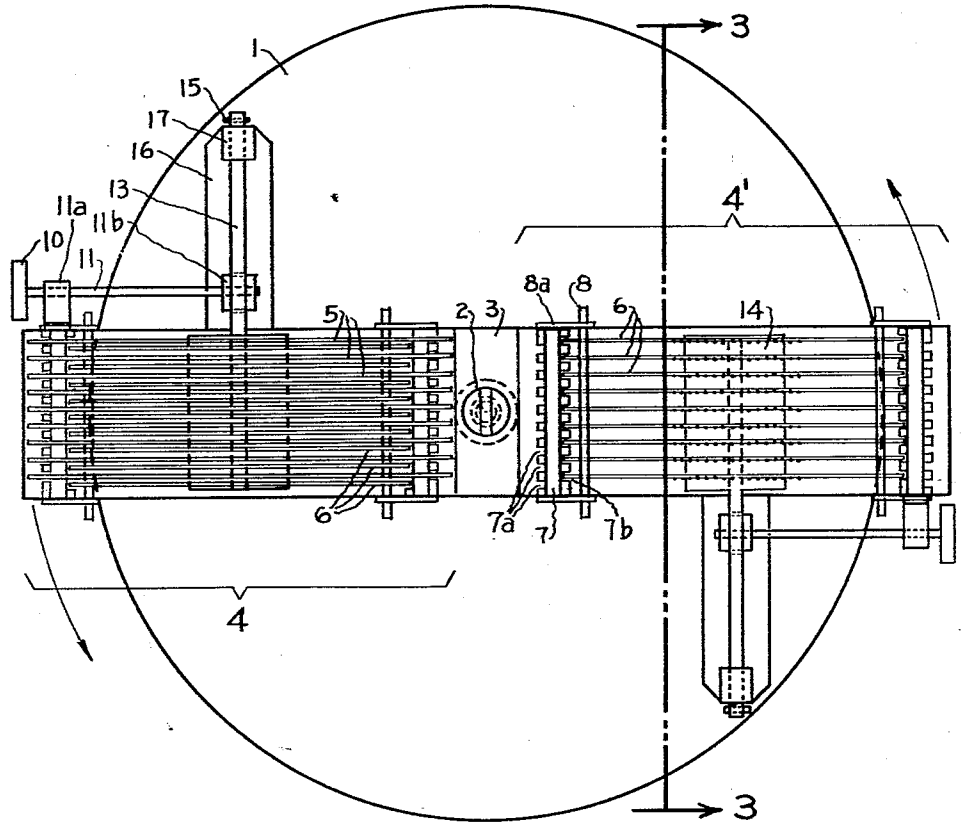


Fig. 2

Witnesses

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COTTON FIBER SORTING APPARATUS

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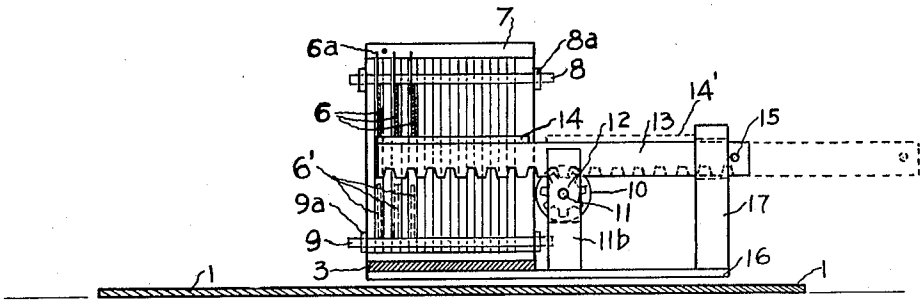


Fig. 3

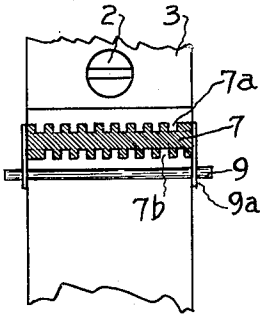


Fig. 4

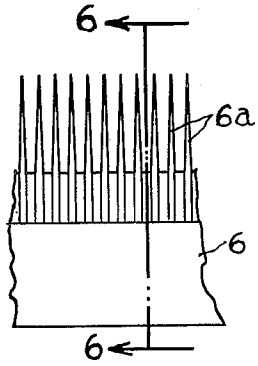


Fig. 5

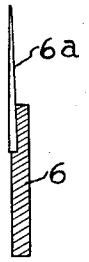


Fig. 6

Witnesses
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UNITED STATES PATENT OFFICE

1,932,095

COTTON FIBER SORTING APPARATUS

Robert W. Webb, Washington, D. C., dedicated to The Government and the People of the United States of America

Application November 11, 1931
Serial No. 574,433

5 Claims. (Cl. 19—65)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

This application is made under the act of March 3, 1883, as amended by the act approved April 30, 1928, and the invention herein described, if patented, may be manufactured and used by or for the Government for governmental purposes without payment to me of any royalty thereon.

I hereby dedicate the invention herein described to the free use of the public to take effect upon the granting of a patent to me.

The principal object of my invention is to improve the technique and expedite the sorting of cotton fibers and the like, for the purposes of making scientific arrays thereof in the determinations of fiber characteristics such as lengths, modal lengths, percentages of weights and lengths, etc., secured prior to my invention only by a tedious and laborious routine.

A further object of my invention is to provide a duplex apparatus positioned upon a single base, in lieu of various individual sorting units heretofore used; my duplex apparatus facilitating virtually every phase of fiber sorting, and enabling the operator to accomplish transfers, transpositions, impositions, reversals, removals, cleanings, and other operations with greater speed and precision.

A still further object of my invention is to provide an economical fiber sorting apparatus having a comparatively shorter row of needles upon each fiber comb than have heretofore been used, without sacrificing or affecting other desirable features such as the depth of the entire field or number of top combs available.

I accomplish these objects by means of my new and improved duplex cotton fiber sorting apparatus illustrated in the accompanying drawings, in which:

Figure 1 is an elevation of the apparatus;

Figure 2 is a top or plan view of the apparatus, in which a number of the top combs have been omitted from part of the view in order to make the delineation more understandable;

Figure 3 is a section taken along the section line 3—3 delineated in Figure 2;

Figure 4 is a section taken along the section line 4—4 delineated in Figure 1;

Figure 5 is a partial elevation, magnified, of one of the combs; and

Figure 6 is a section taken along the section line 6—6 in Figure 5.

Similar numerals refer to similar parts throughout the several figures and views in the drawings.

Referring to the drawings, it will be seen that my apparatus comprises a stationary bed-plate 1, an axis or stationary center-pin 2, a revolvable base-plate 3 centered by center-pin 2, and duplex assemblies of combing devices 4, 4' thus indicated in their entirety for convenient reference and nomenclature.

Each of the assemblies 4, 4' comprises a set of top combs 5, a set of bottom combs 6, a pair of guide members 7, a pair of upper stop pins 8, a pair of lower stop pins 9, a thumb-nut 10, a drop-shaft 11, a pinion 12, a rack 13, a comb-shoe 14, a rack-pin 15, a clevis-arm 16, a clevis 17 and other minor parts hereinafter shown, described and enumerated.

The revolvable base-plate 3 is secured to the stationary bed-plate 1 by means of the stationary center-pin 2 in such a manner as to be substantially vibrationless, permitting free rotation of the base-plate 3 in a horizontal plane, without rocking, tilting or excessive vertical play.

The duplex assemblies 4, 4' are symmetrically disposed upon the base-plate 3 with reference to the center-pin 2, so that rotation of the base-plate 3 through 180° arc will always front one assembly toward the operator and face the other assembly away from the operator, it being immaterial to which hand the duplex assemblies 4, 4' are secured upon the base-plate 3.

Duplex assemblies 4, 4' are secured to the base-plate 3 at point of junction of said base-plate 3 with the guide members 7 by any suitable means.

Figures 1 and 2 in the drawings delineate the arrangement of the duplex assemblies 4, 4' preferred by right hand operators, but it is to be understood that suitable means may be provided for the transposition of said duplex assemblies 4, 4' in order to readily achieve a duplex apparatus for left-handed operators.

The top combs 5 of the duplex assemblies 4, 4' are readily removable vertically, being positioned by external fins 5*b* which have a sliding fit in the external slots 7*a* of the guide members 7, said top combs 5 being also aligned horizontally by resting upon the horizontal top of the guide members 7.

The bottom combs 6 are removable vertically from the assemblies 4, 4' by removal of the pair of upper stop pins 8. The bottom combs 6 are positioned by the internal slots 7*b* of the guide members 7, said bottom combs 6 being aligned horizontally in a working position when supported by the broad upper surface of the comb-shoes 14.

The upper stop pins 8 are positioned by the bearing clamps 8*a* which are suitably attached to the guide members 7 by any suitable means.

The bottom stop pins 9 are positioned by the bearing clamps 9*a* which are attached to the guide members 7 by any suitable means.

The comb-shoes 14 are movable horizontally within the limits shown by the solid and dotted positions, 14 and 14', as delineated in Figure 3. Travel of the comb-shoes 14 throughout these limits permits each bottom comb 6 to be dropped successively by gravity along the internal slots 7*b* to a position of rest 6' indicated by dotted lines in Figures 1 and 3.

Travel of the comb-shoes 14 is secured by rotating the thumb-nut 10. Thumb-nut 10 is attached by suitable means to the outer end of drop-shaft 11 which is free to rotate without end-play in bearings 11*a* and 11*b* which are attached by suitable means to the guide members 7 and the clevis-arm 16. The pinion 12 is attached by suitable means to the in-board end of the drop-shaft 11 and is aligned with the rack 13 so that a turn of the thumb-nut 10 will produce movement of the rack 13. The comb-shoe 14 is secured by suitable means to the rack 13 which is maintained in alignment by the clevis 17, the pinion 12 and bearing 11*b*. Rack 13 is free to move only in line horizontally within the limits defined by point of contact between rack-pin 15 and clevis 17, and point of contact between the heel of comb-shoe 14 and front face of bearing 11*b*. The length of the comb-shoe 14 is such that when the rack-pin 15 contacts with the clevis 17 the forward edge or toe of the comb-shoe 14 is substantially flush with the front face of the first bottom comb 6.

The top combs 5 and the bottom combs 6 are provided with similar pairs of needles 5*a* and 6*a* which are usually positioned within a milled recess located on one edge of the comb as delineated in Figures 5 and 6, said needles 5*a* and 6*a* being rigidly attached to said combs 5 and 6 by any suitable means, such as brazing, welding, or soldering. In order to make the drawings clear the size of the needles has been shown to be much greater than would be actually used in practice.

The guide members 7 may be either of laminated construction or may be constructed of a single piece of material with slots suitably milled thereon as delineated in the drawings.

Referring to the operation of my duplex cotton fiber sorting apparatus, it will be seen from the drawings that the top combs 5 of the assembly 4' may be all removed, leaving the bottom combs 6 in position upon their comb-shoe 14 to receive such fibers as may be placed upon said combs 6. The first operation in cotton fiber sorting with my apparatus, therefore, is to place the bundle of cotton fibers into the field of combs of the assembly 4, which is done by removing the top combs 5 therefrom, placing the bundle of cotton fibers upon the needles 6*a* of the bottom combs 6 and then replacing the top combs 5 in the assembly 4, so that the needles 5*a* form an interlocking clamp upon the fiber bundle without interfering with the removal of individual fibers therefrom. The cotton fibers are placed in the field of combs in parallel relation to each other and at right angles to the comb needles, that is to say, perpendicular to a straight line parallel to the combs. It is to be understood that the top combs 5 may be omitted in part or in their entirety when certain types of cotton fibers are to be handled.

By means of tweezers or forceps the operator then transfers all protruding fibers from the assembly 4 to the field of needles 6*a* on the bottom comb 6 of the assembly 4'. In transferring these fibers from one field of needles to another they are placed upon each succeeding field of needles in parallel relation to each other, at right angles to the comb needles and the ends of the fibers grasped by the tweezers are deposited in the field of needles in line with one another, in practice, using the front line of needles as a guide. Operation of the thumb-nut 10 then moves the rack 13 and the comb-shoe 14 back sufficiently to allow the leading bottom comb 6 to drop into the dotted position 6' delineated on Figures 1 and 3 without disturbing the fibers in the bundle. The accompanying mate or top comb 5, if used, is then lifted out of assembly 4 and the fiber transfer of protruding fibers is again accomplished as heretofore described. This operation is repeated by consecutive removals of fibers, dropping of bottom combs 6, and removal of top combs 5 until all fibers have been transferred to the awaiting field of needles 6*a* on the combs 6 of the assembly 4'. The combs 5 and 6 of the assembly 4 are then all cleaned and the base-plate 3 is rotated through an arc of 180° so that the bundle of fibers is again brought in front of the operator. The bottom combs 6 of the assembly 4 which have thus been transposed into the former position of assembly 4', will again be placed in position and alignment upon the comb-shoe 14 and a second transfer of the cotton fibers will then be made in the same manner as has previously been explained.

Upon the completion of this second transfer of the fibers top combs 5, if used, are again inserted into the assembly so as to form the series of interlocking clamps with the bottom combs 6; and the base-plate 3 is then rotated again through an arc of 180°, returning it to its original position at the beginning of the operations. From this original position the operator then makes his fiber transfers in groups to the receiving surface of velvet or other laboratory apparatus, each group being composed of fibers of the same length.

It will be understood that changes or modifications in the different parts of my duplex cotton fiber sorter may be effected and that combinations or operations in the sorting of cotton fibers upon this duplex sorter may be effected without departing from the spirit of my invention as above described.

I claim:

1. A cotton fiber sorting apparatus of the character described comprising complete unit cotton fiber sorters in duplex arrangement, a base attached and common to said unit cotton sorters, a bed plate and means by which said base is center pivoted upon said bed plate.

2. A cotton fiber sorting apparatus of the character described comprising two complete unit cotton fiber sorters, a base attached and common to said unit cotton sorters, a fixed bed plate to which is pivoted said common base at the center of such base and means for rotating said common base through an arc of 360° in a horizontal plane.

3. A cotton fiber sorting apparatus of the character described comprising two complete unit cotton fiber sorters having top and bottom combs, a base attached and common to said sorters and means for dropping the bottom combs of said sorters in slotted guides.

4. A cotton fiber sorting apparatus of the character described comprising two complete

unit cotton fiber sorters, a base common to said sorters, such unit sorters having four groups of nested needle combs extending horizontally and positioned in slotted guides, said combs of the two complete unit sorters being adapted to be removed vertically and the two groups of lower combs being adapted to drop vertically into a position beneath the horizontal level of the needle field.

5. A cotton fiber sorting apparatus of the character described comprising a fixed bed plate, a base loosely pivoted at its center to said bed plate, two complete unit cotton fiber sorters having the needle fields of each unit sorter disposed substantially upon the same horizontal plane in a symmetrical position about the vertical axis of said base, said base being attached and common to such unit sorters, said unit sorters having four groups of nested needle combs extending horizontally and positioned in slotted guides, the combs of the wto complete unit sorters being adapted to be removed vertically from the sorters, the lower combs being adapted to drop vertically into a position beneath the horizontal level of the needle fields, said lower and upper combs when in position forming an interlocking clamp upon the fiber bundle, and means for rotating said base through an arc of 360° in a horizontal plane.

ROBERT W. WEBB.