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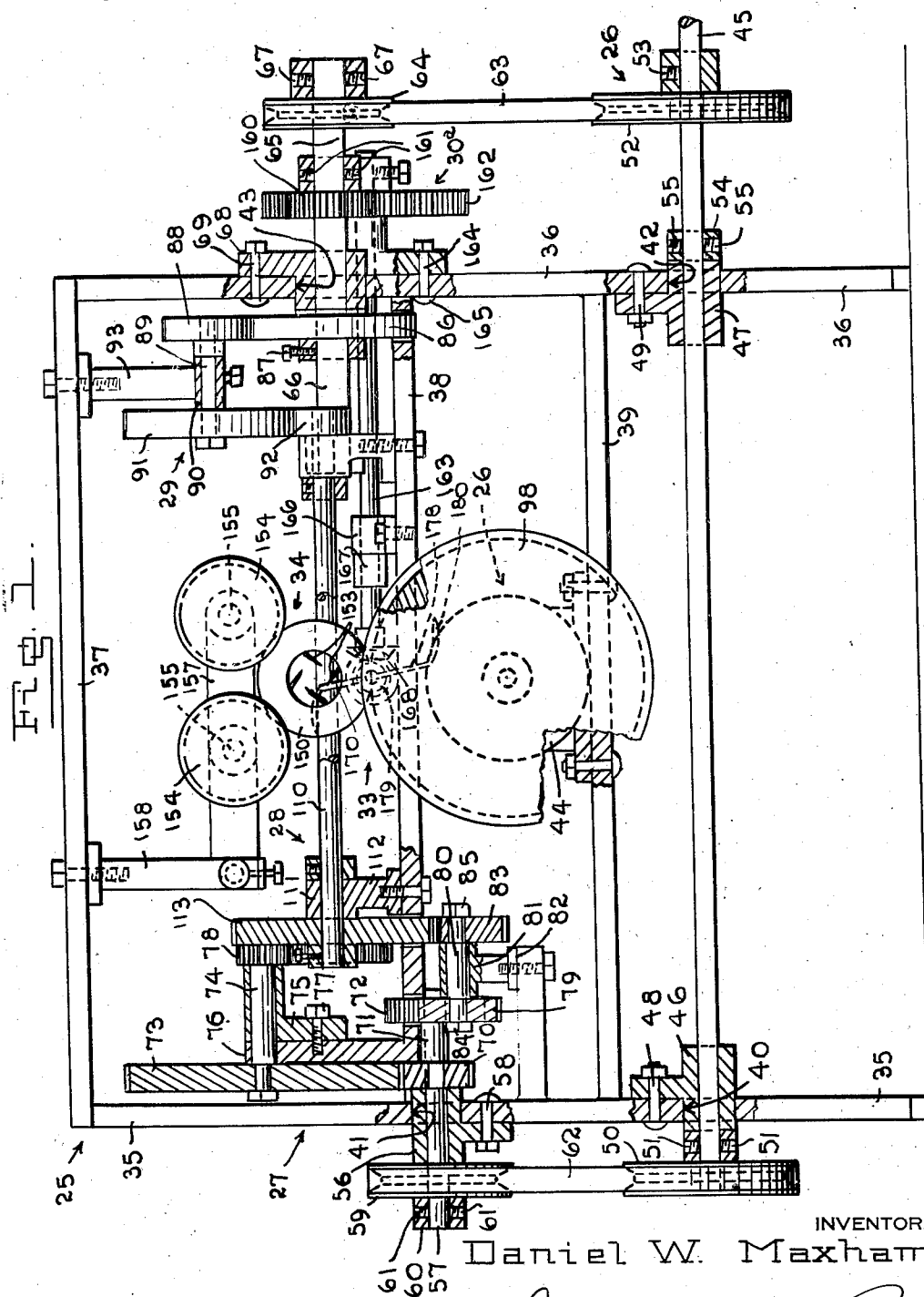
D. W. MAXHAM

2,453,802

SPINNING MACHINE

Filed Sept. 6, 1945

5 Sheets-Sheet 1



INVENTOR.

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BY

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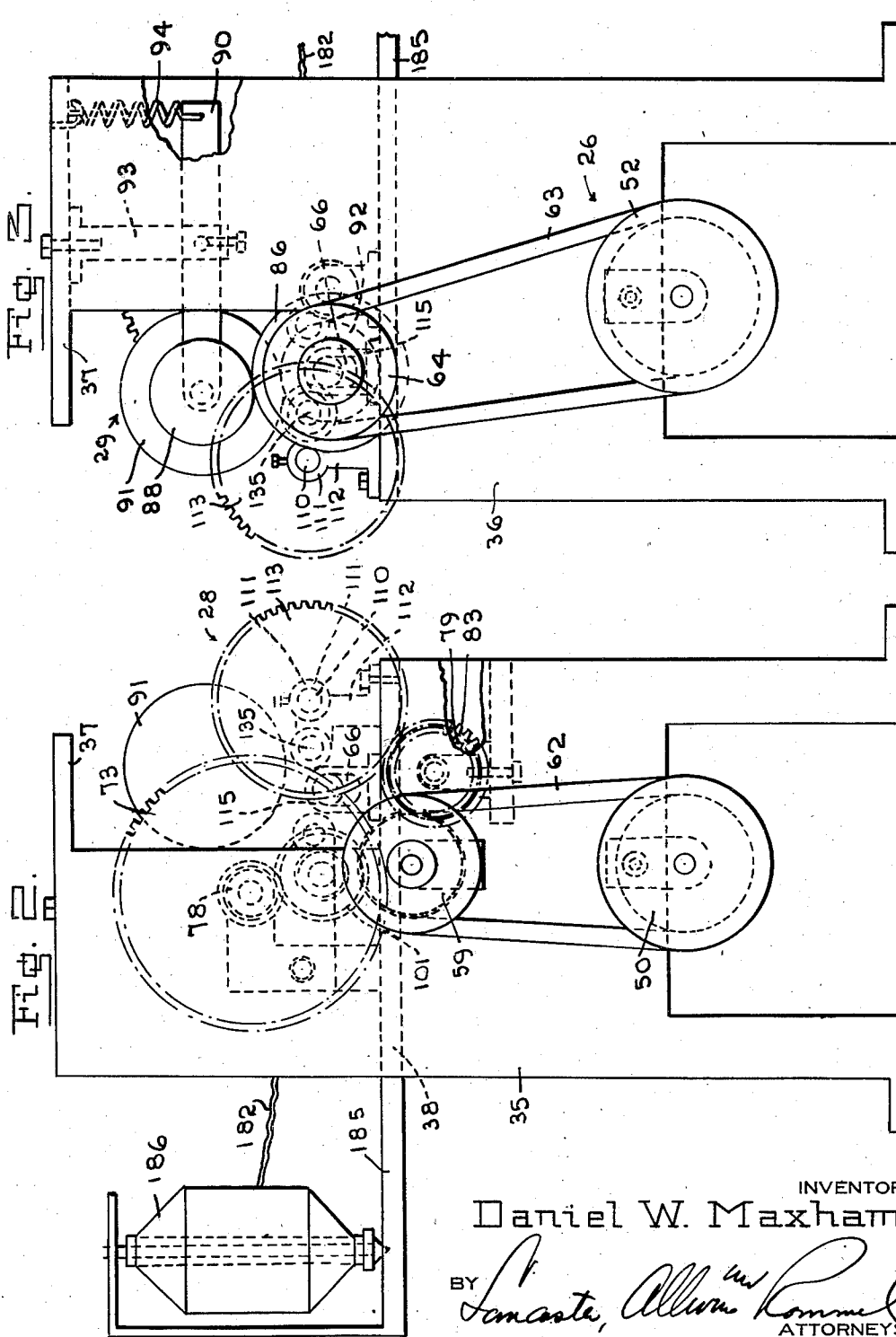
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Fig. 4.

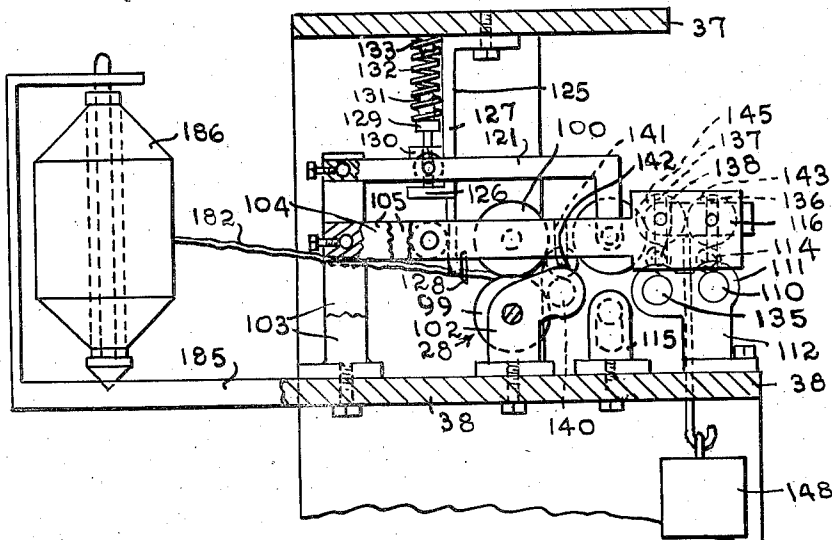


Fig. 5.

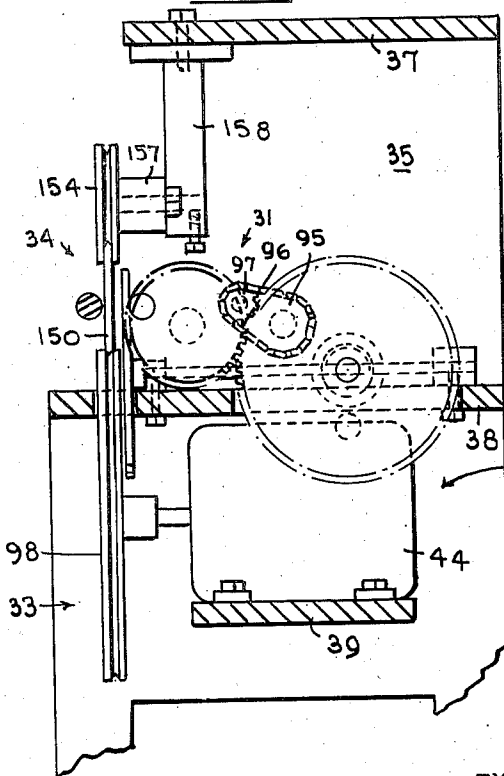
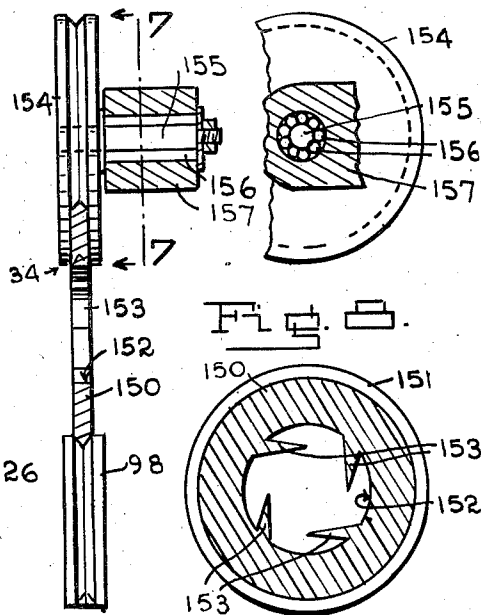


Fig. 6. Fig. 7.



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Fig. 9.

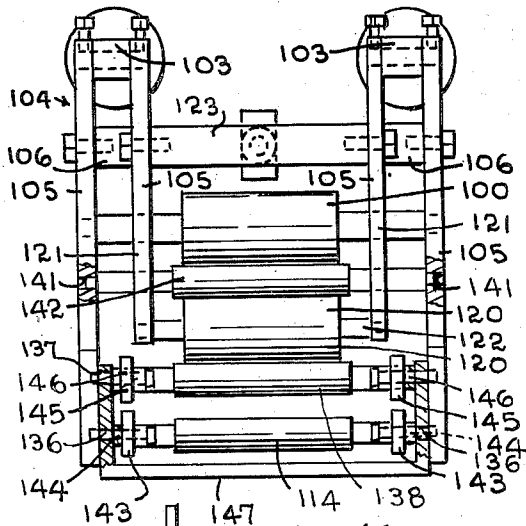


Fig. 10.

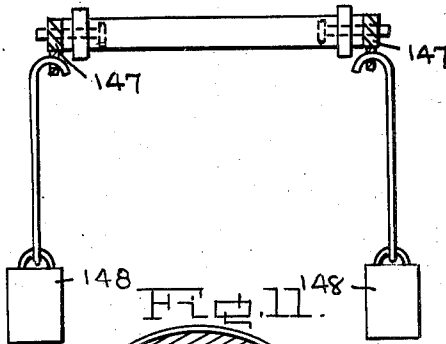


Fig. 11.

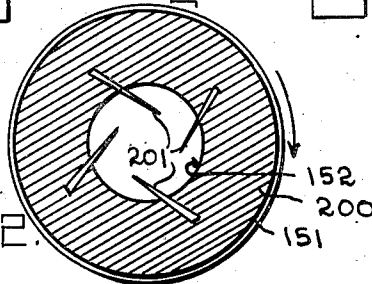


Fig. 12.

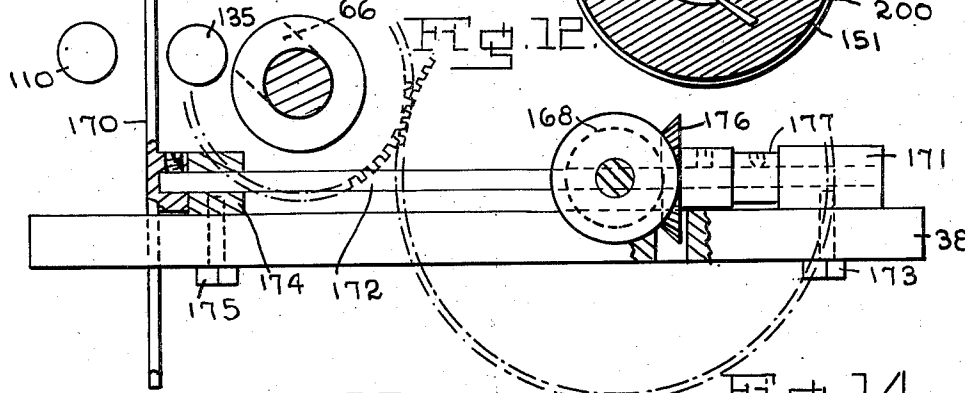


Fig. 13.

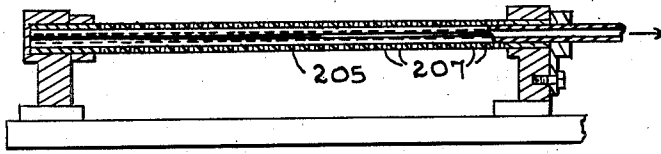


Fig. 21.

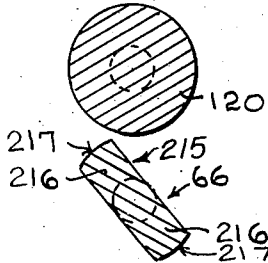
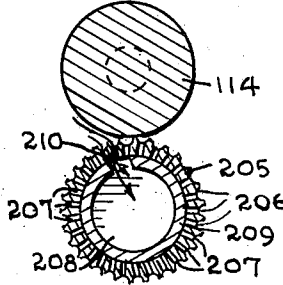


Fig. 14.



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Fig. 15.

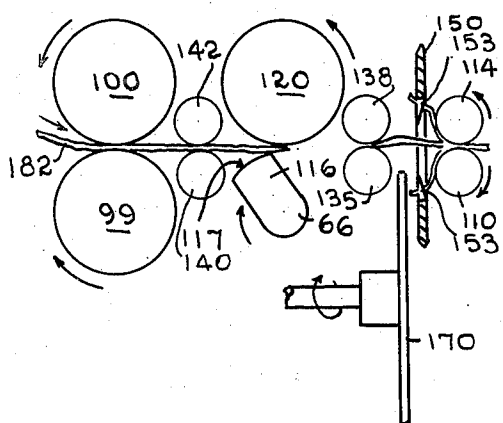


Fig. 16.

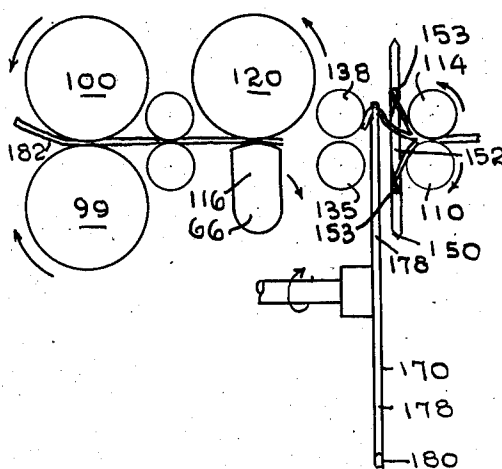


Fig. 17.

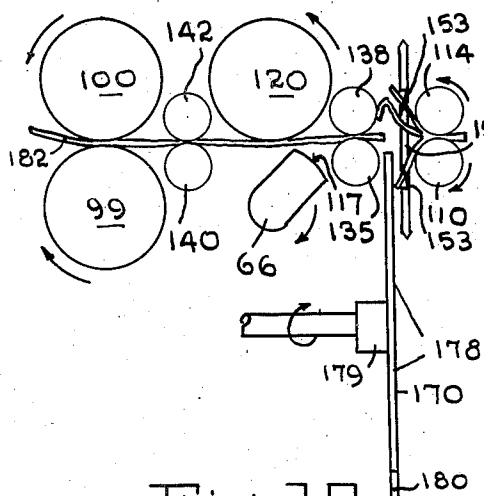


Fig. 18.

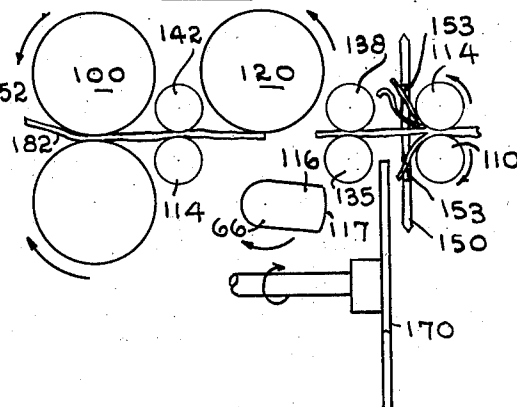


Fig. 19.

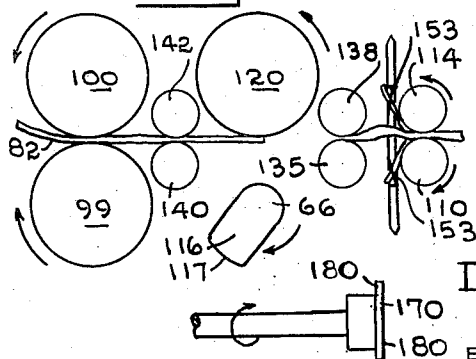
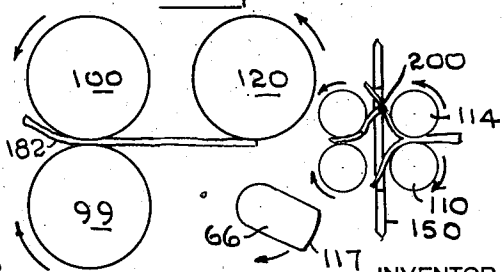


Fig. 20.



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UNITED STATES PATENT OFFICE

2,453,802

SPINNING MACHINE

Daniel W. Maxham, Hogansville, Ga.

Application September 6, 1945, Serial No. 614,642

10 Claims. (Cl. 57—36)

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This invention relates to the textile industry, and more particularly to spinning apparatus for uniformly arranging fibers and providing a twist.

According to the major feature of the invention the fibers to be twisted are plucked out of the source of supply and passed forward where other fibers are twisted about and together with these fibers.

An important object of the invention is to provide an especially efficient and high-speed machine or apparatus for this purpose.

A still further object of the invention is to provide a spinning machine which will arrange fibers in a uniform manner and insert twist in the pre-arranged fibers at a high speed.

Another object of the invention is to provide a spinning machine which spins yarn of continuous length.

A further object of the invention is to provide an apparatus for spinning, arranged so that the yarn may go directly to the next machine or apparatus with no handling of the yarn.

Another object of the invention is to provide a machine that will draft out roving and put twist in this roving.

A still further object of my invention is to provide an apparatus that will spin a smooth high-tensile yarn.

Yet another object of the spinning machine is to provide an apparatus that will require a minimum amount of attendant's time.

Other objects and advantages of the invention will become apparent from the drawings and following detailed description of the invention and in which drawings:

Figure 1 is a front elevation of the novel apparatus, with certain parts in vertical section so as to better illustrate portions of the construction.

Figure 2 is one end elevation thereof.

Figure 3 is the other end elevation.

Figure 4 a view, mostly in vertical transverse section, of the upper portion of the apparatus adjacent the end shown in Figure 2.

Figure 5 is a view, partly in vertical, transverse section, of the upper portion of the apparatus, adjacent the end shown in Figure 3, and including a placer.

Figure 6 is an enlarged, fragmentary view, partly in section, of a portion of the structure in the left hand portion of Figure 5.

Figure 7 is a view upon substantially the line 7—7 of Figure 6.

Figure 8 is a face view of a twister which may be employed in the apparatus.

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Figure 9 is a top plan view of a roll assembly, forming a part of the apparatus.

Figure 10 is a front elevation of a top roll weighting means, associated with the assembly of Figure 9.

Figure 11 is a longitudinal section of a modification of the twister of Figure 8.

Figure 12 is a view, somewhat like Figure 5 illustrating drive of the placer.

Figure 13 is a view, partly in longitudinal section of a modification of one of the rolls (the bottom front roll) forming a part of the apparatus.

Figure 14 is a transverse section thereof and of an associated roll.

Figures 15 to 19 are diagrammatic views, illustrating steps in the progression of the material being handled and of the twisting of the fibers.

Figure 20 is a diagrammatic view, illustrating a modified step, differing from that of Figures 15 to 19.

Figure 21 is a diagrammatic view, illustrating a modification of a plucking roll forming a part of the novel machine.

In the drawings, for the purpose of illustration is shown a preferred embodiment of the invention with several modifications of portions of the apparatus, and therein, similar reference characters designate corresponding parts throughout the several views.

The novel apparatus includes a frame 25; motive means 26; drive 27 for the back and front roll means 28, drive 29 for the plucking and carrier roll means 30 as well as for the placer means 30a; drive 31 for the control draft roll means 32; and drive 33 for the twister means 34.

Referring to Figures 1, 2 and 3, the frame 25, includes paralleling end uprights 35 and 36, joining a horizontally-disposed upper support 37, a horizontally-disposed intermediate or roller stand support 38, and a horizontally-disposed lower support 39. It will be noted, particularly in Figures 2 and 3, that the upper portions of the uprights 35 and 36, from the intermediate support 38 to the upper support 37, are narrowed, and the upper support 37 juts outwardly beyond these narrowed portions. Upright 35 may be provided with a pair of substantially circular bearing-accommodating openings 40 and 41, one preferably directly above the other, and upright 36 may have two bearing-accommodating openings 42 and 43.

As to the motive means 26 for the apparatus, the means 26 may include a conventional electric motor 44 secured to the lower support 39, intermediate its ends, supplemented by any suitable

engine or the like (not shown), operatively connected to the drive shaft 45, which is supported by bearings 46 and 47, extending through the openings 40 and 42 respectively, which bearings may be secured to their respective uprights 35 and 36, as by bolts 48 and 49, preferably below the lower support 39. This drive shaft 45 extends across the frame 25 and projects from both uprights. Preferably, outwardly of the upright 35, the shaft 45 carries a drive pulley 50, fixed to the shaft, as by the set screws 51. Preferably, along the shaft 45, where it projects from the upright 36, there is a drive pulley 52, secured to the shaft as by a set screw 53. A collar 54 or like means, may be secured to the shaft 45, as by set screws 55, and abut the bearing 47, preventing undesired longitudinal movement of the shaft in one direction and, since it is preferred that the hub of the pulley 50 abuts the bearing 46, the shaft cannot move, accidentally, longitudinally in the other direction.

Extending through the opening 41 is a bearing 56, supporting a shaft 57, and secured to the upright 35, as by the bolt 58. The shaft 57 carries a pulley 59 and a collar 60, so that, the pulley 59 is disposed between the collar or projection 60 and bearing 56 against longitudinal movement along the shaft 57, but the collar may be removably secured to the shaft as by set screws 61. Extending from pulley 50 to pulley 59 is a belt 62. Extending from the drive pulley 52 is a belt 63 to a pulley 64, adjustably secured adjacent one end 65 of a plucking roll 66 (to be more fully described) as by set screws 67. The plucking roll 66 may be supported at its end 65 as by a bearing 68 secured to the upright 36 as by bolt 69.

Now as to drive 27 for the back and front roll means 28 mostly disposed adjacent the upright 35, or at the left-hand end of the apparatus. Upon the shaft 57, which extends through the upright 35 as described, is secured a first gear 70, which abuts the bearing 56 at one side and abuts a sleeve 71, upon the shaft 57, at its other side, so that a second gear 72, fixed upon the shaft 57 is spaced from the gear 70. The shaft 57 terminates just beyond the second gear 72 and may be screw threaded, with a nut thereon, adapted to press second gear 72 against sleeve 71 and the latter against first gear 70. Of course the intermediate horizontal support 38 may be slotted to accommodate the gears 70 and 72.

As for the specific drive for the back rolls: meshing with the first gear 70 is a, preferably, larger-diametered gear 73, fixed upon a short shaft 74 which may extend through a bearing 75, supported by a bracket 76 and secured thereto, as by the screw 77. At the end of the short shaft 74, opposite its end carrying the gear 73, is fixed a small gear 78, which is the one driving the back roll gear 101, to be subsequently described.

As for the specific drive for the front roll: meshing with the gear 72 is a small gear 79 fixed upon a short shaft 80 carried by a bearing 81 supported by a bracket 82 projecting inwardly from and secured to the upright 35 below the gear 70. The shaft 80 also carries the small gear 83 which is the one driving the front roll gear, to be subsequently described. Nuts 84 and 85 at the ends of shaft 80 press the gears 79 and 83 against the bearing 81.

Now, as for the drive 29 for the plucking and carrier roll means 30, mostly disposed adjacent upright 36, or at the right-hand end of the ap-

paratus. To the plucking roll 66 is secured a first friction disc 86, as by set screw 87, the support 38 being slotted to accommodate the disc 86. Disc 86 is in frictional contact with the periphery of a second friction disc 88, which is secured to one end of a short shaft 89, supported by a bearing 90. Secured to the other end of the shaft 89 is a third friction disc 91 in peripheral frictional contact with a fourth or carrier roll friction disc 92.

Referring to the bearing 90 and Figure 3, it will be seen that the bearing is, in part, a normally horizontally-disposed arm, extending rearwardly of the apparatus and pivoted, intermediate its ends to a bracket 93 depending from the upper support 37 and provided at its free end with an equalizing or balancing means, as a contraction coil spring 94, secured at one of its ends to this free end, and to the support 37 at its other end. This assembly tends to retain friction discs 88 and 91 in good, sustained frictional contact with their associated discs 86 and 92.

As for the drive 31 for the control draft roll means 32; in Figure 5 it will be seen that a larger sprocket wheel 95 carries a chain 96 which extends over a smaller sprocket wheel 97. The larger wheel 95 is mounted upon the shaft of back roll 100, to be described, and rotates therewith, and the smaller wheel 97 is mounted upon the control draft roll, to be subsequently described. Therefore, rotation of the back roll 100 imparts rotation to the control draft roll.

The drive 33 for the twister means 34, shown more particularly in Figures 5 and 6, includes a friction disc 98 fixedly mounted upon the shaft of the motor 44, this disc having, preferably, a V-shaped peripheral groove.

As for the back and front roll means 28, the two back rolls 99 and 100 are shown more specifically in Figure 4 and the top back roll 100 is also shown in Figure 9. The drive connection between the small gear 78 and the bottom back roll 99 is through a back roll gear 101 fixed to the shaft of the bottom back roll. This shaft is carried by spaced-apart, substantially like bearings 102, one being shown in Figure 4.

The top back roll 100 is disposed directly above the roll 99 but supported differently as may be seen in Figures 4 and 9. Preferably its support, includes a pair of spaced-apart uprights 103 rigidly secured to the intermediate support 38 at the rear of the apparatus. Pivotaly supported by these uprights, intermediate their lengths, is a yoke or stand 104 which may be termed the top back roll stand. This comprises two side bars 105 secured together by a brace 106, and supported by pivot pins to the uprights 103 at the rear ends of the bars 105. Journalled in the bars 105 are the stub axles of the top back roll 100.

As for the front roll 110, which is one of two front rolls, this is supported by a pair of like, spaced-apart bearings 111 supported by brackets 112 secured to the support 38 and disposed at adjacent the front edge of the latter. The front roll 110 is provided with a gear 113 which meshes with the small gear 83 heretofore described. The top front roll 114 is also supported by the stand 104 as will be further on described.

The plucking roll means includes a pair of spaced-apart supports 115 for the plucking roll 66, which is one of two plucking rolls. The preferred peripheral contour of the roll 66 is shown best in Figures 15 to 19 inclusive, and the roll 66 has an

enlargement or projection 116 extending longitudinally of the roll and provided with an arcuate face 117. Drive connection with this roll has been described. The substantially cylindrical plucking roll 120 is substantially like the top back roll 100. It is rotatably carried by a yoke or top plucking roll stand 121 across which its shaft 122 extends. The stand 121 includes a pair of spaced apart substantially L-shaped bars with their longer ends pivotally carried at adjacent the upper part of the uprights 103 which also support the top back roll means as described. A brace 123 joins the bars to complete the stand or yoke 121. The top plucking roll 120 is so disposed, with relation to the plucking roll 66, that the latter frictionally contacts the former only during a part of the revolution of the latter and this frictional contact is sufficient to drive the top plucking roll 120 at substantially the peripheral speed of the plucking roll 66.

For the purpose of proper adjustment of roll 120 with respect to roll 66 there is provided an adjustment means embodying a depending bracket or stand 125, secured to the upper support 37 provided with a substantially horizontally-disposed shoulder 126 projecting toward the rear of the apparatus intermediate the length of the vertical portion 127 of the bracket 125. The lower end of this portion 127 carries a conventional trumpet 128. A vertically-disposed cap screw 129 extends through the intermediate portion of the brace 123, with the free end of this screw 129 abutting the shoulder 126. From this, it is apparent that, by screwing the cap screw 129 downwardly, the front portion of stand 121 and the top plucking roll 120 carried thereby will be raised, and various vertical adjustments may be made so that it will be in frictional contact with the face 117 of the projection 116 of the plucking roll 66, and drops only a few thousandths inch when out of contact therewith. When the proper adjustment has been made, a lock nut 130 on the screw 129 may be tightened to fix the adjustment of the screw. This screw 129 has a projection 131 projecting upwardly from its head which functions as the retainer for the lower end of an expansion coil spring 132 while a somewhat similar projection 133 extends downwardly from the upper support 37 to retain the upper end of the spring. Of course, the ends of the spring abut the head of the screw 129 and the inner face of the upper support 37 respectively. The spring 132 tends to force the top plucking roll 120 into good frictional contact with the plucking roll 66 (although the weight of the former tends to provide such contact, in part).

As for the carrier roll means, the same spaced apart brackets 112 carrying the bearings 111 for the front roll 110 also support, for rotation, the lower carrier roll 135 which is preferably disposed just back of the front roll 110 and spaced therefrom. The carrier roll mounts the fourth or carrier roll friction disc 92. At the front portion of the top back roll stand or yoke 104 are two sets of slots 136 and 137 at opposite sides of the same. One set of slots accommodate the ends of the top front roll 116, and the other set accommodate the ends of the top carrier roll 138.

As for the control draft roll means 32, the same bearings 102 which support the bottom back roll 99 also rotatably support the lower control draft roll 140, and the same top back roll stand 104 has a third set of slots 141 intermediate the ends of the side bars to accommodate the ends or spindles of the top control draft roll 142 which is self-weight-

ed and adapted to apply only light pressure to fibers.

In Figure 9 it will be noted that a pair of pulleys 143 are provided for free rotation on stub axles 144, and a pair of pulleys 145, freely rotatable on stub axles 146, and these axles are carried by and project inwardly from the top front stand 147. It is preferred that these pulleys are accurately balanced in order to permit high R. P. M. Their function will be subsequently explained.

In Figure 10, weights 148 depend from the stand 147. As has been stated, the shafts of the top front roll 114 and top carrier roll 138 fit into slots and this construction tends to retain the top front roll 114 and top carrier roll 138 in their relative positions. Weights 148 cause the pulleys 143 to press down upon the top front roll 114 and pulleys 145 to press down upon the top carrier roll 138. This, in turn, causes the top front roll 114 to be in good frictional contact with the associated front roll 110 and roll 138 to be in good frictional contact with the associated carrier roll 135, so that motion imparted to the bottom rolls 110 and 135 will be imparted to the associated top rolls 114 and 138.

Referring now to the twister means 34 shown especially in the central portion of Figure 1, and in Figures 5 to 8 inclusive. The friction disc 98, mounted upon the shaft of the motor 44, should be well balanced to be rotated at high R. P. M. This disc 98 is adapted to carry and rotate the twister 150. This is of novel construction and is a disc like body with its circular edge portion chamfered as at 151 which fits into the V-groove of the disc 98. The central portion of the twister is open as at 152 and into the opening project a plurality of twist pins 153, being somewhat V-shaped in plan and are non-radially disposed, although spaced equidistantly apart as in Figure 8. In the example shown, there are four such twist pins.

The chamfered edge portion of the twister body is also in contact with a pair of discs 154 shown in Figure 1 and one being shown in Figure 6. These discs have V-shaped grooves to accommodate the chamfered edge portion mentioned. Each disc 154 is mounted on a shaft 155 which may be supported by suitable bearings, as ball bearings 156, carried by a normally horizontal arm 157 which is adjustably supported by a bracket 158 carried by the top support 37. The connection between the arm 157 and bracket 158 is a pivot pin. The weight of the arm 157 and discs 154 retain the latter in contact with the twister 150 and, of course, the latter in contact with the disc 98. There is, as may be seen, no shaft connection with the twister, which is retained, for rotation and in a vertical position by the three discs 98 and 154.

This arrangement permits a nice balance, for all three discs 98 and 154 rotate in the same vertical plane and carry the twister 150 for rotation in this same vertical plane.

As to that portion of the drive for the placer means 30a, being associated with the plucking and carrier roll drive means, it will be noted in Figure 1 that a spur gear 160 is fixed to the plucking roll 65 as by Allen set screws 161. This gear 160 meshes with and drives spur gear 162 which is fixed to shaft 163. It is preferred to drive the placer (to be described) at $\frac{1}{2}$ the R. P. M. of the plucking roll 65, so the spur gear 162 has twice as many teeth as has the spur gear 160. Shaft 163 extends longitudinally of the machine, is supported adjacent its outer end by the bearing 164

secured to the upright 36 as by the bolt 165, and adjacent its inner end by a bearing 166 secured to the support 38. Collar 167 is fixed to shaft 163 and prevents longitudinal movement of the shaft in one direction while gear 162 prevents longitudinal movement in the other direction. At the inner end of shaft 163 is a bevel gear 168.

Referring to Figure 12, which contains portions of the preferred structure, including the placer 170, rear bearing 171 for the shaft 172 of placer 170 is secured to the support 38 as by cap screw 173, and front bearing 174 is likewise secured, as by cap screw 175. Upon shaft 172, which extends transversely of the machine, is mounted a bevel gear 176 meshing with bevel gear 168 both being of substantially similar size. The placer 170 and a collar 177 on shaft 172 prevent side play thereof.

Placer 170 includes a pair of arms 178 extending radially from a hub portion 179 (substantially 180° apart) and these arms terminate, at their free ends, in offsets 180 which preferably form, with their respective arms 178, obtuse angles. One offset 180, when the arms are substantially vertical, extends to the left, while the other offset 180 extends to the right, as may be seen in Figure 1. The timing of the placer 170 will be explained in the description of the operation of the machine.

The machine may be provided with a support 185, extending substantially horizontally rearwardly from the roller stand support 38, for rotatably supporting, a vertically-disposed bobbin 186, carrying material 182, such as roving.

Figure 11 contains a vertical section through a modified twister 200. The only difference between this twister 200 and twister 150 is that the former contains inserted twist pins 201.

Figures 13 and 14, illustrate a modification of the front roll assembly. Therein, the bottom front roll 205 is hollow, peripherally fluted with the flutes 206 running longitudinally of the roll, and has a plurality of, spaced-apart small mouths 207 between the flutes 206, and extending to the hollow or chamber 208 within the roll 205. Within this chamber 208 is a fixed, hollow, cylindrical member 209, having a longitudinally-extending slot 210. The position of this slot 210 is shown in Figure 14 where it is disposed closed to the periphery of the associated upper or top front roll 114, so that as the modified bottom front roll 205 rotates air will be drawn through the mouths 207. The member 209 may be a pipe, slotted as described, with the slot, of course, being wholly within the front roll 205, the pipe being closed at its outer end and leading to a suitable vacuum pump (not shown) at its other end. Drive means for the front roll 205 is substantially the same as that for the front roll 110.

The air drawn into the mouths 207 will tend to draw the front ends of the fibres into the grip of the top and bottom front rolls 114 and 205.

In the operation of the machine, referring particularly to Figures 15 to 19 inclusive, it will be seen (in Figure 15) that the back rolls 141 and 147 have gripped the material (roving or the like) 182 and urged it toward the control draft rolls 149 and 142 which have gripped it and urged it toward the plucking rolls 66 and 120. The bottom plucking roll 66 has nearly contacted the material 182 which has advanced to directly below the top plucking roll 120. The back rolls 99 and 180 wind off the material 182 at a substantially constant speed, and the high speed with which the plucking rolls 66 and 120 and carrier rolls 135

and 138 rotate, cause the material to advance directly to the front rolls 110 and 114 without lapping up on any of the rolls. The disposition of the material, as in Figure 15, associated with the twister 150, placer 170 and front rolls 110 and 114 will be subsequently described in a future step in the operation.

In Figure 16, the lower or bottom plucking roll 66 has contacted the material and in Figure 17 has urged it forward but has broken contact therewith. Subsequent rotative positions of the roll 66 are shown in Figures 18 and 19.

In Figure 17 the material is in the rotative grip of the top and bottom carrier rolls 138 and 135 and in Figure 18 the latter have urged the material 182 to the front rolls 110 and 114 through the central opening 152 in the twister 150.

Referring back to Figure 15, the material 182 to the right of the plucking rolls 66 and 120 is that advanced in one revolution of the plucking roll 66. The front rolls 110 and 114 have a grip on the material, and the placer 170 has rotated to a position out of contact with the material.

In Figure 16, the placer 170 has rotated so that its arms 178 are substantially vertical and its offsets 180 are pushing the fibres of the material 182 into the paths of the twist pins 153 of the twister 150.

In Figure 17, the placer 170 has rotated from the path of the material but the fibres still have the momentum imparted to them and are moving toward the twist pins 153, while in Figure 18 the fibres have reached the front rolls 110 and 114 and the rear extremities of the fibres are almost in the path of the twist pins. They are not now connected with the source of supply.

In Figure 19 some of the fibres have been caught by the twist pins and are being twisted around others of the fibres in the axial portion of the twister 150 and the front rolls are still functioning to draw the twisted strand forward. The arms of the placer 170 are now substantially horizontal.

Returning to Figure 15, some fibres are being twisted about others in and by the twister 150 (the placer 170 being out of the way) and the twisted strand is in the grip of the rotating front rolls 110 and 114.

From the foregoing, it will be seen that as the material 182, moves forward, fibres are being continuously plucked out of the material, are pieced up with the delivered fibres and, at the same time, a twist is being made in all the fibres, to form the yarn.

In Figure 20 is shown a diagrammatic modification, for twisting fibres of a wiry character. Plucking roll 66 plucks fibers out of the material in the same manner as previously explained. On account of the reduction of the surface speed between the carried rolls and the front rolls the fibers will bow as at 200 in Figure 20. These are in the grip of the front rolls and also in the grip of the carrier rolls. Just before the carrier rolls have delivered the ends of the fibers, the bow in these fibers becomes great enough for twist pins in twister 150 to catch the fibers. When the twist pins catch the fibers, due to wind resistance and the inertia resistance of the fibers, they will slide up the pins. The twister is so designed that, when the fibers are held by the twist pins, the back ends of the fibers are clear of the delivering end of the carrier rolls. The twister 150 is designed so as to rotate at very high R. P. M., and the carrier rolls 135 and 138 also rotate at

high R. P. M. The momentum of the fibers prevents these fibers from lapping up on the rolls.

If desired, the bottom plucking roll, which is preferably exactly like the plucking roll 66 heretofore described, except that the bottom plucking roll 215 of Fig. 21 may be provided, as in Figure 21, with a pair of enlargements or projections 216, 180° apart, whereby there are two arcuate faces 217, and contact of the bottom plucking roll with the top plucking roll 120 occurs twice in one rotation of the former.

What is claimed is:

1. In a spinning machine, strand fibre twisting means, including a rotatable member having a central opening and spaced-apart twist pins projecting into said opening; placer means to project fibres from strand material into the paths of said twist pins and disposed closely adjacent said twister means; carrier means to convey a strand material to said placer means; plucking means to intermittently urge strand material to said carrier means, and means to steadily urge strand material to said plucking means.

2. In a spinning machine, strand fibre twisting means, including a rotatable member having a central opening and spaced-apart twist pins projecting into said opening; placer means to project fibres from strand material into the paths of said twist pins and disposed closely adjacent said twister means; carrier means to convey a strand material to said placer means; plucking means to intermittently urge strand material to said carrier means, including a roll having a portion projecting from its periphery and with said portion having an arcuate face adapted to intermittently contact said strand material upon rotation of said roll; and means to steadily urge strand material to said plucking means.

3. In a spinning machine, a twister including a body having a substantially circular outer periphery, an open center and a plurality of spaced-apart twist pins projecting into said open center; means for supporting said twister, including a rotatable support member and a rotatable drive member, both having substantially circular outer peripheries in frictional contact with the outer periphery of said twister, at least one of said peripheries being grooved; means to feed fibrous strand material to said open center; means to project fibres from said material into the path of said twist pins; and means to draw material, acted upon by said twist pins, from said twister.

4. In a spinning machine, a twister including a disc having a grooved periphery and a central substantially circular opening with a plurality of spaced apart twist pins extending into said opening toward the axis of rotation of said disc; means for supporting said twister, including a rotatable support disc with its periphery within said groove, a pivot pin for said support member and a drive disc, with its periphery within said groove and in frictional contact with the walls thereof; means to feed fibrous strand material to said central opening; means to project fibres from said strand material into the path of said twist pins; and means to draw material, acted upon by said twist pins, from said twister.

5. In a spinning machine, a twister including a body having a substantially circular outer periphery, an open center and a plurality of spaced-apart twist pins projecting into said open center; means for supporting said twister, including a rotatable support member, and a rotatable drive member, both having substantially circular outer peripheries in frictional contact with

the outer periphery of said twister, at least one of said peripheries being grooved; means to feed fibrous strand material to said open center; means to project fibres from said material into the path of said twist pins comprising a rotatable placer having a hub, a pair of arms projecting radially therefrom, and an offset at the free end of each arm, said arms forming with their respective offsets, obtuse angles, said rotatable placer being disposed with axis of rotation substantially paralleling the axis of rotation of said body and so that said arms, upon rotation of said placer, will intersect said axis; and means to draw material, acted upon by said twist pins, from said twister.

6. In combination with spinning machine twister means comprising a rotatable disc having an opening and twist pins extending into said opening, a placer comprising a hub portion, an arm extending radially from said hub portion and an offset extending from the free end of said arm, said placer being disposed, closely adjacent said twister, and so that said arm, upon rotation of said hub portion, will intersect the axis of said opening and said offset will describe a circular path around said axis.

7. In combination with spinning machine twister means comprising a rotatable disc having an opening and twist pins extending into said opening, said twist pins being disposed non-radially with respect to said disc and with their free ends spaced substantially an equal distance apart, a placer comprising a hub portion, an arm extending radially from said hub portion and an offset extending from the free end of said arm, and forming an obtuse angle with said arm, said placer being disposed, closely adjacent said twister, and so that said arm, upon rotation of said hub portion, will intersect the axis of said opening and said offset will describe a circular path around said axis.

8. In a spinning machine, two plucking rolls, comprising a substantially cylindrical top roll and a bottom roll, said bottom roll having a projection extending longitudinally thereof, said projection having an arcuate face, adapted to contact said top roll upon rotation of said bottom roll; means to rotate said bottom roll; means to adjust the position of said top roll with respect to the face of said face upon rotation of said bottom roll; including a first support, a bracket carried thereby and having a substantially horizontally-disposed shoulder, a second support, a yoke pivoted to the second support, said yoke having a brace portion and bearings with the ends of the top plucking roll disposed in said bearings, a cap screw extending through the intermediate portion of said brace, with the free end of said screw abutting said shoulder, and an expansion coil spring bearing upon the head of said cap screw and upon said first support; means to feed fibrous strand material to between said plucking rolls; and means to receive and convey strand material from said plucking rolls.

9. In a fibre twisting machine, a twister; means to deliver roving to said twister; means to receive twisted rovings from said twister, including a first roll and a second roll, the first being tubular, exteriorly longitudinally fluted and having a plurality of air inlets extending from the flutings to the central portion of said tubular roll; means to rotate said rolls, and a fixed air tube extending into said tubular roll and in intimate and sliding contact with the interior surface thereof, said air tube having a longitudinally-extending slot,

within said tubular roll, disposed in close proximity to the second roll, said rolls being in contact longitudinally.

10. In a fibre twisting machine, a twister; means to deliver rovings to said twister; means to receive twisted rovings from said twister, including a first roll and a second roll, the first being tubular, exteriorly longitudinally fluted and having a plurality of air inlets extending from the flutings to the central portion of said tubular roll; means to rotate said rolls, and a fixed air tube extending into said tubular roll and in intimate and sliding contact with the interior surface thereof, said air tube having a longitudinally-extending slot, within said tubular roll, disposed in close proximity to the second roll, said rolls being in contact longitudinally and said first roll being disposed below said second roll.

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