March 31, 1964 R. RULON-MILLER ETAL 3,126,587

MEANS FOR WEIGHTING THE ROLLS OF A DRAFTING APPARATUS OR THE LIKE

Filed Sept. 22, 1960

3 Sheets-Sheet 1

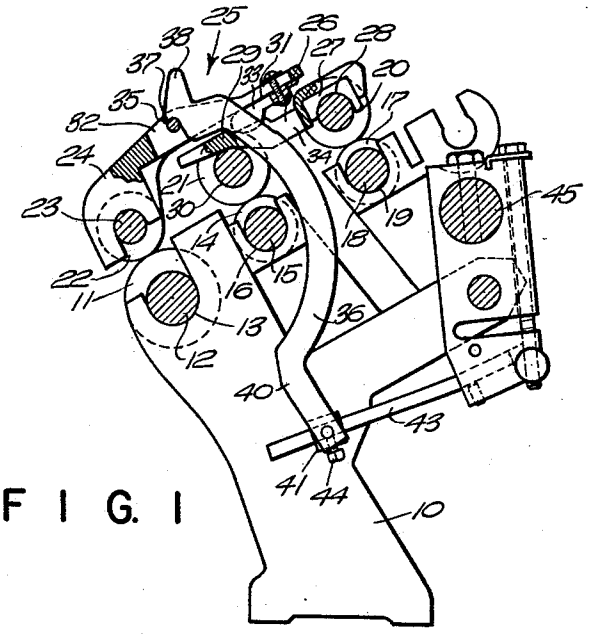


FIG. 1

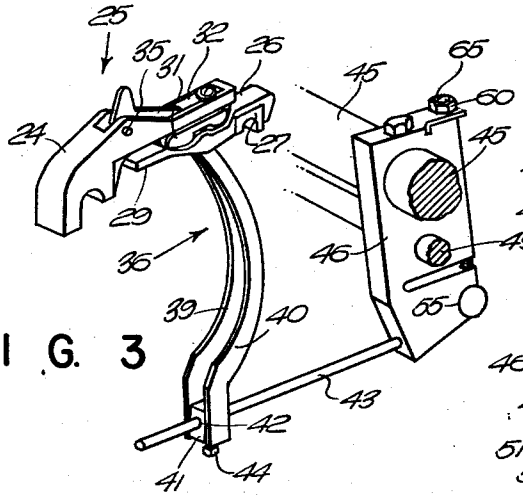


FIG. 3

FIG. 2

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3 Sheets-Sheet 2

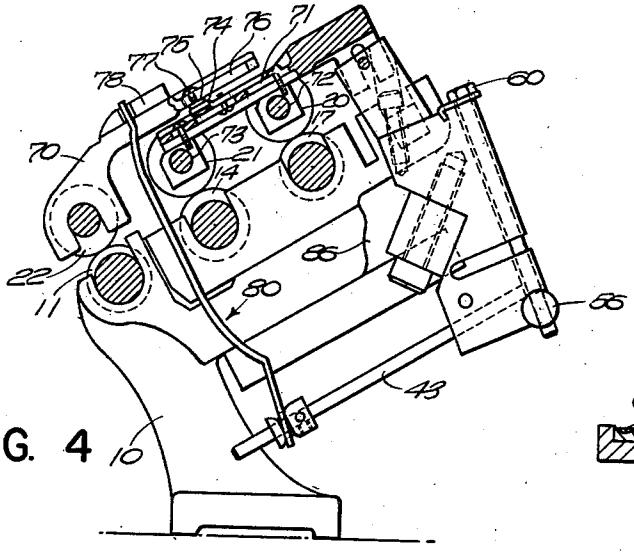


FIG. 4

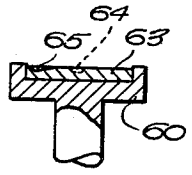


FIG. 7

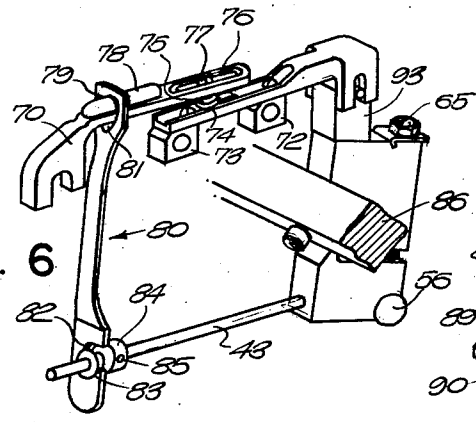


FIG. 6

FIG. 5

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3 Sheets-Sheet 3

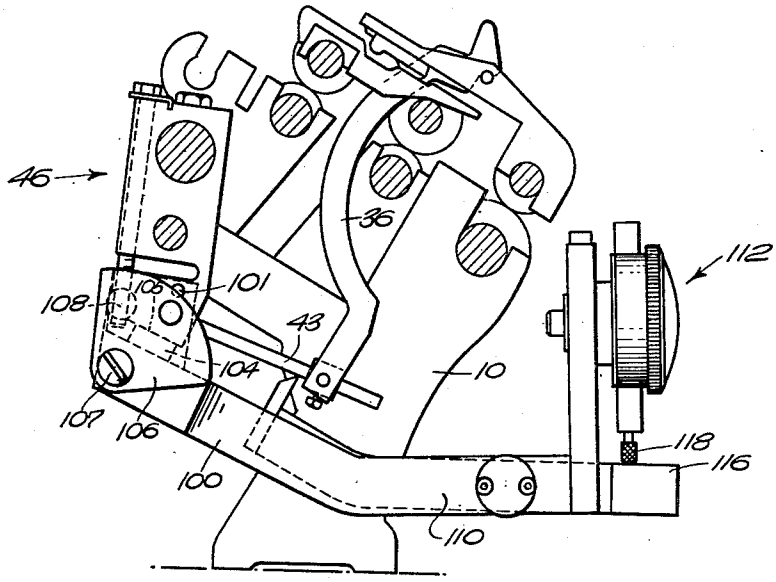


FIG. 8

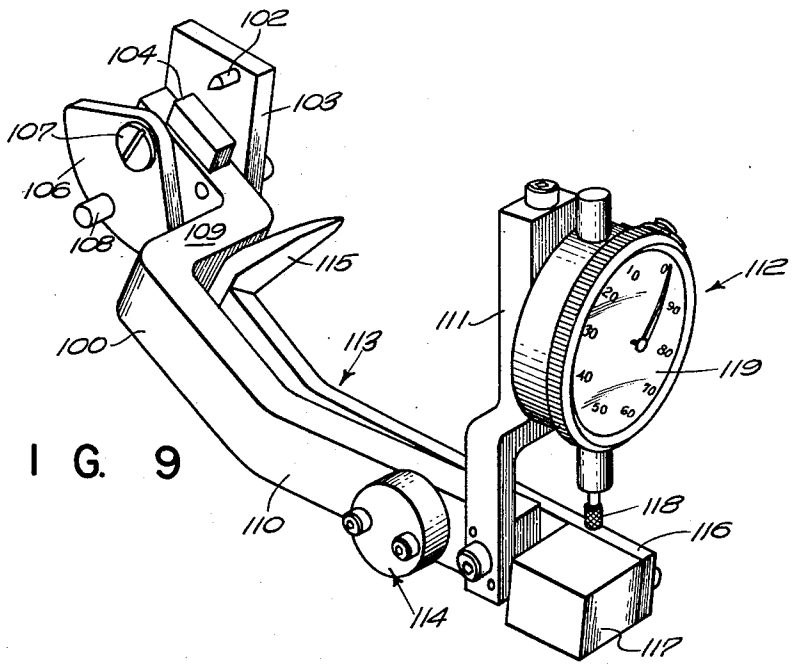


FIG. 9

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3,126,587

MEANS FOR WEIGHTING THE ROLLS OF A DRAFTING APPARATUS OR THE LIKE

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2 Claims. (Cl. 19—274)

This invention relates to a strand handling apparatus more particularly to a drafting apparatus for spinning frames. The invention centers about the application of pressure to one roll of a pair of rolls to move it toward the other roll frequently referred to as "weighting of the rolls."

In a drafting apparatus for textile strands in order that there may be a grip on the strand provided at the nip of a pair of rolls, pressure is applied upon one of the rolls, usually the top roll, to move it toward the bottom roll so that this nip or grip on the strand may be had. Weights with some leverage mechanism frequently has been applied for accomplishing this pressure which is desired between the pair of rolls. Such weighting is clumsy and provides much mechanism to collect lint and other fly from the work or strand.

One of the objects of this invention is to apply pressure on the rolls by a more compact means than heretofore used.

Another object of the invention is to apply pressure on the rolls by a means which may be easily adjusted to very the pressure from one amount to another.

Another object of the invention is to utilize the inherent tendency of a metal bar to return to normal position when sprung out of that position to apply the pressure desired to the roll.

Another object of this invention is to provide an arrangement so that the pressure which is applied may be readily determined and this pressure similarly applied at all other locations along the roll stand.

Another object of this invention is to apply pressure on the rolls by a new and unique method of operation.

Another object of the invention is to accurately measure the pressure applied to the rolls.

Another object of the invention is to measure the pressure applied by a flexed bar from a completely relaxed no tension position in proportion to the flexure thereof.

Another object of the invention is to apply a comparatively hard tension to better control the remaining strand of a pair of strands operated on by two companion top rolls should one of the pair of strands lap its roll.

Another object of the invention is to provide for adjustment of the pressure applied on the rolls while the apparatus is in operation.

With these and other objects in view, the invention consists of certain novel features of construction as will be more fully described and particularly pointed out in the appended claims.

In the accompanying drawings:

FIGURE 1 is a sectional view showing the roll stand and a plurality of draft rolls in section and illustrating our new means of weighting the upper of the rolls of the pairs of rolls;

FIGURE 2 is a sectional view on a larger scale of the mounting for the tension bar;

FIGURE 3 is a perspective view of the tension bar, its mounting bracket, the stirrup and the saddles for the rolls;

FIGURE 4 is a sectional view similar to FIGURE 1 of a modified form of the invention;

FIGURE 5 is a sectional view similar to FIGURE 2 of a different mounting bracket for the tension bar;

FIGURE 6 is a perspective view of the mounting bracket, a portion of the frame, the saddle, and the tension bar and stirrup connecting the two;

FIGURE 7 is a sectional view of a fragmental portion of the adjusting screw;

FIGURE 8 is a sectional view looking from the opposite direction from that shown in FIGURES 1 and 4 and illustrating a measuring means for the tension on the tension bar;

FIGURE 9 is a perspective view showing the gauging means and its assembly.

In proceeding with this invention we have mounted on a connection between roll stands a bracket and on this bracket there is supported a one piece tension bar. A stirrup connects the tension bar with the saddles for the rolls and the arrangement is such that by flexing the tension bar through a manipulation of the bracket pressure may be applied through the stirrup to move the rolls of a pair toward each other. Also by a gauging device the amount of pressure which is applied may be easily determined.

With reference to the drawings 10 designates one of the several roll stands along the frame which provide bearings for the lower rolls of the pairs of rolls of the drafting apparatus. The front roll 11 has its reduced portion 12 in a bearing 13 at the forward portion of the roll stand. The middle or intermediate roll 14 has its reduced portion 15 in a bearing 16 in the roll stand while the back roll 17 has its reduced portion 18 in a bearing 19 in the roll stand. These bottom rolls 11, 14 and 17 are all driven from one end of the frame which is not shown in this drawing.

The back upper roll 20 and the middle upper roll 21 are provided in pairs and their reduced shafts have bearings in cap bars in a usual manner. The front top roll 22 is provided as a pair of cots with the shaft extending between, but this shaft does not have bearings in cap bars as do the middle and back top rolls. The shaft 23 of the front top roll between the cots has a bearing in the forward portion 24 of the saddle designated generally 25 while the back portion 26 of this saddle carries a bearing 27 for the shaft 28 between the cots 20 of the top back roll and this back portion of the saddle also has a bearing 29 to engage the shaft 30 between the cots 21 of the middle top roll. The forward portion of the saddle 24 adjustably carries a foot 31 which may engage the back saddle 26 at some point depending upon its adjustment.

Both saddle parts 24 and 26 as well as the foot 31 are centrally slotted as at 32 in part 24, 33 in foot 31 and 34 in back part 26 of the saddle 25. A pin 35 extends across the slot 32 in the forward saddle part 24. A stirrup designated generally 36 is provided with a hook 37 and handle portion 38 so that this hook may be easily engaged or disengaged from this pin 35 at its upper end. This stirrup 36 at its lower end is provided with two spaced legs 39 and 40 between which there is a block 41 having a bore 42 which receives the tension bar 43 of one piece of material which is held in adjusted position along this bar by a set screw 44.

A connecting rod 45 extends from one roll stand to another and is fixed or rigid with the roll stands. Upon this rod 45 we mount a bracket 46 by reason of a hole 47 through the bracket to receive the rod 45 while a screw 48 (FIGURE 2) extends down through the top of the bracket and through the rod 45 so as to firmly mount the upper portion of the bracket on the rod 45. A second rod 49 also a fixed part of the frame extends through the bracket so as to assist in preventing the bracket from moving on the rod 45. This bracket 46 is deeply slotted as at 50 so that the portion 51 acts as a hinge. The lower portion 52 of this bracket below

the slot 50 has a bore 53 which receives the tension bar 43 above mentioned which is held in adjusted position in this bore 53 by a set screw 54. An arcuate recess 55 is provided in the lower back corner of the lower portion 52 of this bracket and receives a cylindrical nut 56 having a threaded bore 57 extending across its diameter and seating in the arcuate recess 55 of substantially the same radius. The rear edge 58 of this bracket is recessed so as to loosely receive the adjusting screw 59 therein, this screw is supported by its head 60 engaging a hardened member 61 hooked into the upper edge of the bracket as at 62. Upon rotation of this screw 59 by means of its hexagonal head 60 the portion 52 of this bracket may be swung about its hinge 51 so as to flex the elastically flexible or resilient rod or bar 43 to the desired amount, such being exaggeratedly shown by dotted lines in FIGURE 2.

A disk 63 (FIGURE 7) carrying a marker 65 may be adjustably mounted on the upper end of the head 60 of the screw 59 by means of a spanner wrench engaging a pair of openings 64 so that one may see the amount of rotation which has been given to the screw 59 for swinging the part 52 about its hinge. When the desired weight is applied, all markers 65 may be similarly set so that thereafter by like rotation of the screws 59 like increase or decrease of the tension may be had.

In FIGURES 4, 5, and 6 a spinning frame of slightly modified construction is illustrated, there being here shown a roll stand 10 with front, intermediate, and back pairs of rolls as heretofore described. In this case, however, a slightly modified form of saddle is shown, there being here illustrated the front saddle part 70 and rear saddle part 71. The rear saddle part carries adjustable bearings 72 and 73 for the shafts of the back and intermediate rolls between the cots and also carries an adjustable recess or cup 74 into which there extends a partially spherical pressure point 75 which is adjustable along the slot 76 by means of the screws 77.

A raised portion 78 of the forward part 70 of the saddle is slotted as at 79 to receive a modified form of stirrup 80 which has an opening 81 to receive this raised portion 78 and is of a sufficient thickness so as to drop into the slot 79 and be connected to the saddle in this manner. This stirrup 80 has a side opening recess 82 at its lower end with a hook 83 at the lower portion of the opening, the arrangement being such that it may engage, by a sidewise motion, the spool-like member 84 which is adjustably held upon the tension rod 43 by means of the set screw 85, thus disconnection from the tension bar 43 may be had by unhooking and swinging the stirrup laterally of the tension bar.

Another variation occurs in this form of construction shown in FIGURES 4, 5, and 6 in that at the rear portion of the roll stand there is a square bar 86 which is a fixed part of the frame and in this case the bracket designated generally 87 has a right angular notch 88 to fit this bar 86 while a screw 89 having a head 90 extends through the bar and is in threaded engagement with the opening 91 of the bracket to hold the bracket in place. A screw 92 holds block 93 in place on bracket 87 by engaging threaded recess 94. Adjustment of the block by screw 92 is had to assure it being perpendicular to the line of the bottom steel rolls 11, 14, and 17. This bracket 87 is similar to the bracket 46 heretofore mentioned in that it has the deep slot 50 with a hinge at 51, the arcuate recess 55 receiving the nut 56 threaded as at 57 with the bolt 59 having head 60 with indicia 65 thereon.

The stirrup in FIGURES 4, 5 and 6 may be disconnected at the bottom while the stirrup in FIGURES 1, 2, and 3 may be disconnected at its upper end. However, in both cases it is the flexing of the bar 43 by which tension is applied through the stirrup to apply pressure on the upper of the rolls of the drafting apparatus.

The tension applied by the flexing of bar 43 is proportionate to the amount of flexure. Tension is set by mounting the tension meter (FIGURE 9) on the tension block 87 or 46 by means of hole 101 in the block and pin 102 on the meter. The tension bar 43 should be fully relaxed by disconnecting the stirrup 80 at its end 82 or stirrup 36 at its end 37. The dial of the tension meter 119 is turned so the pointer is at zero as shown. This relaxed "zoned out" starting position is important as it eliminates variations in all parts combined. Thus the tension bar 43 can be at varying angles from position to position in the relaxed position. When flexing his bar by use of the releasing tool or wrench to hook up the stirrups, we measure on the meter the amount of flex from the "at rest" or relaxed position. By turning the head 60 of the adjusting screw 59, the accurate and desired weight can be applied using the meter to make sure the deflection of the bar 43. Initially this must be done individually to each position. Any wear of any of the parts will affect the weight applied on any weighting system. Wear of roll stands 13, the top roll cots 22 or bearings 72 and 73 will lower the whole unit and thus relax bar 43 slightly. Using the meter it is possible for the first time to check the weight from position to position or from year to year and adjust for any changes involved. To increase or decrease weight in each position, the adjusting screw can be turned to show the change in one position and then each adjusting screw can be turned the same amount by using the indicator 63.

For the determination of the pressure applied by the bar 43, the device shown in FIGURES 8 and 9 is utilized. This consists of an arm 100, one end of which may be secured to the lower portion of bracket 46 in which there is a hole 101 for the reception of the pin 102 on the wing 103 which is in fixed relation to the bracket 100. A block 104 engages the end 105 of the bracket 46 as the pin 102 enters the opening 101. Gate 106 pivoted on screw 107 may be swung from the position shown in FIGURE 9 to the position shown in FIGURE 8 by handle 108 so as to lock the arm 100 to the lower portion 52 of the bracket 46. This arm 100 is offset as at 109 to provide a forwardly extending portion 110 from which there is a standard 111 extending upwardly which mounts gauge 112 on this standard. A lever designated generally 113 is pivoted on the arm part 110 on axis 114 and has a finger 115 which will engage the tension bar 43 adjacent to its connection with the stirrup while at the other end 116 of this lever there is a weight 117 and this portion of the lever engages the feeler finger 118 of the gauge 112.

This device is clamped in position and the gauge is set so that it will read zero just before any flexure of the bar 43 is had. Then as the screw 59 is turned and the bar 43 is flexed, the amount of flexure will be transmitted through the lever 113 to the feeler finger 118 which in turn will register on the dial 119 of the gauge which may be calibrated in pounds or any other system of measurement so as to be read as to the amount of pressure which is being applied to the stirrup and in turn to the rolls.

From the foregoing it will be apparent that we may calibrate or set the pressure applied as above described and by reason of the indicia 65 we may change the pressure applied throughout the length of the frame without using this device such as shown in FIGURE 9 inasmuch as all bars 43 have been similarly set and all indicia 65 have been similarly set so that like turning of screws 59 will give like deflection of tension bars and thus like pressures on the stirrups. Further this change of pressure may be done while the machine is in operation.

For detaching either end of the stirrup a wrench having a tubular socket to fit over the tension bar 43 is provided with sufficient length of handle to provide a substantial leverage and then by lifting on the end of such a device or tool the bar 43 may be flexed to relieve the strain on the stirrup so that it may be detached either

from the upper end as shown in FIGURE 1 or from the lower end as shown in FIGURE 4.

By the use of a hard tension such as is provided by a single piece bar, should one of the strands of a pair of strands which extend through companion top rolls break and lap about the top roll, this roll by being lifted due to the excess fiber lapping around the roll will cause the spring tension in the bar to be increased somewhat and apply a still greater tension on the companion roll so that it will grip or provide a nip on the drawn strand and prevent it from being poor quality until the repair has been mended.

We claim:

1. In a strand handling apparatus, a plurality of pairs of rolls between which the strand travels, means for applying pressure to urge the rolls of said pairs toward each other, comprising a saddle above the top rolls, a stirrup extending from the saddle through the rolls to below the bottom rolls and an elastically resilient single piece bar extending beneath the rolls, means to swingably secure one end of the bar, means to swing the secured end of the bar, and means to connect said bar to said stirrup along its length at an infinitely adjustable single location spaced from the swingable end of the bar.

2. In a strand handling apparatus, a plurality of pairs of rolls between which the strand travels, a frame for supporting said rolls, an elastically resilient single piece bar, a bracket mounting one end of said bar on said frame, a saddle engaging said rolls, a stirrup engaging said saddle and engaging said bar at a point spaced from its mounting on said frame and adjacent its other end whereby flexing of the bar with its inherent tendency to return to normal applies pressure on said saddle, said bracket having a slot therein providing relatively movable portions connected by a hinge with one portion fixed to the frame and the other mounting said bar and means to relatively move said bracket portions to flex the bar comprising a screw threadedly connected to the bar mounting portion and held against axial movement in the portion fixed to the frame.

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