Dec. 23, 1958 L. M. COTCHETT ET AL 2,865,057

TOP ROLL GUIDES

Filed Dec. 24, 1952 3 Sheets-Sheet 1

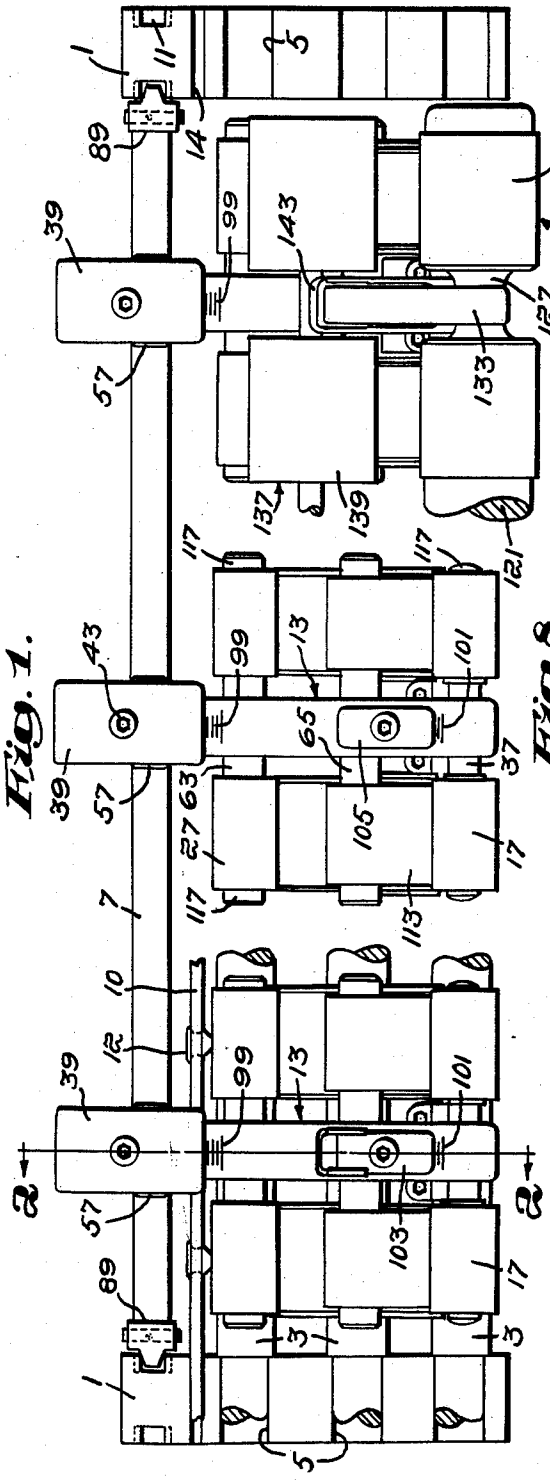


Fig. 1.

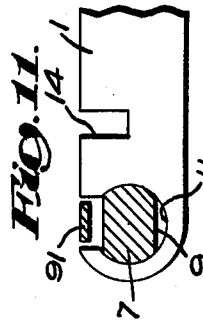


Fig. 11.

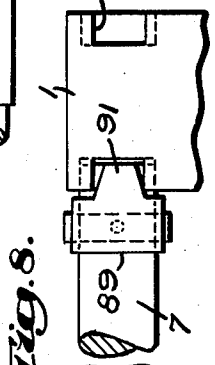


Fig. 8.

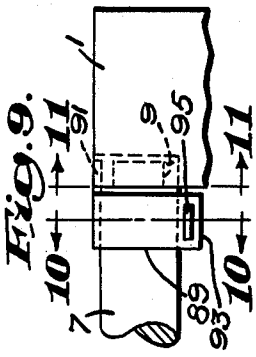


Fig. 9.

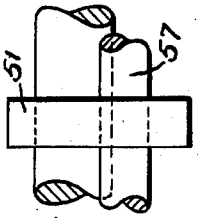


Fig. 10.

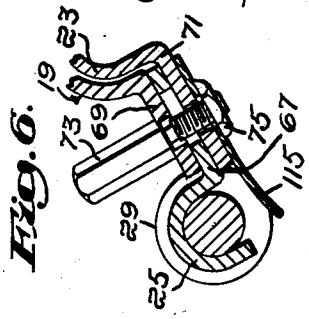


Fig. 6.

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Fig. 2.

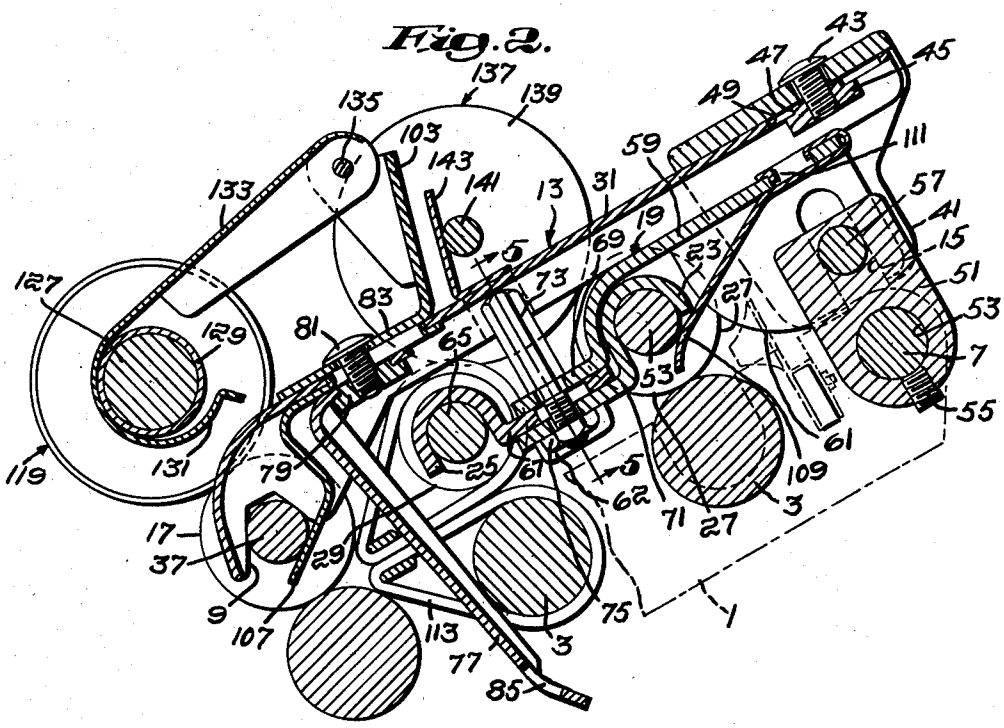
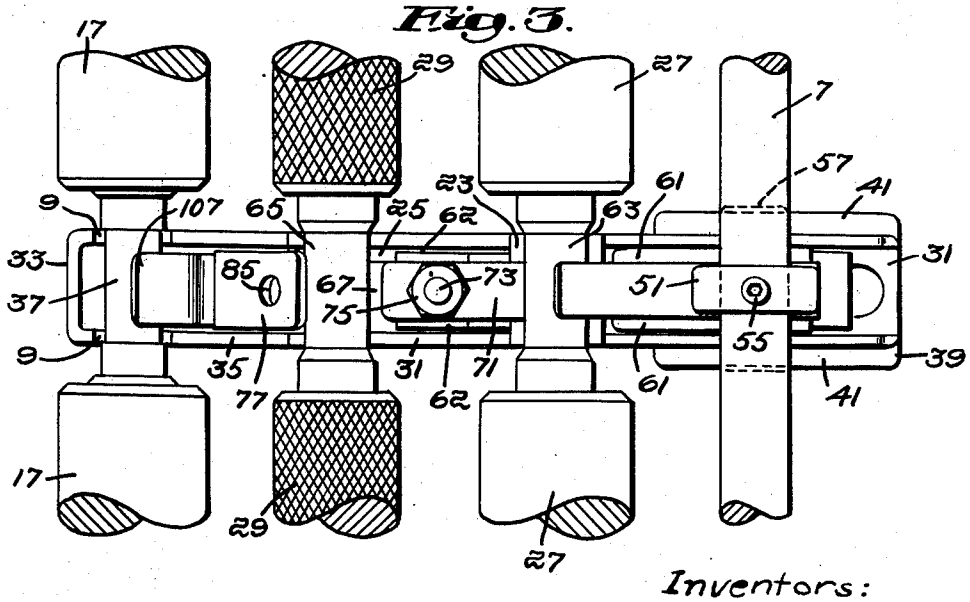


Fig. 3.



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Fig. 4.

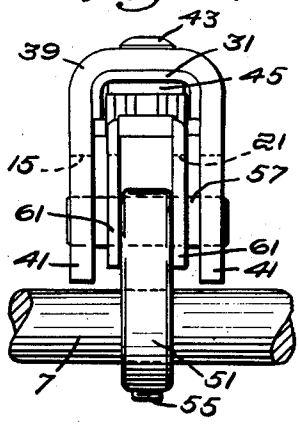


Fig. 5.

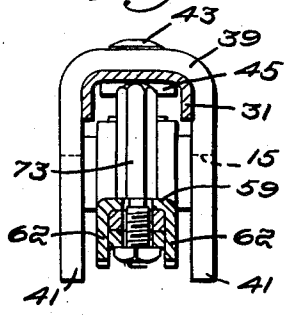


Fig. 12.

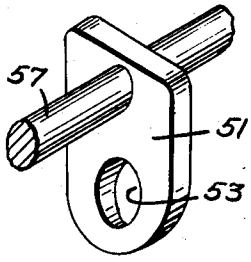


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TOP ROLL GUIDES

Louis M. Cotchett and Richard K. Butler, Whitman, Mass., assignors, by mesne assignments, to Textile Engineering Corporation, Whitman, Mass., a corporation of Massachusetts

Application December 24, 1952, Serial No. 327,822

41 Claims. (Cl. 19—137)

This invention relates to spinning, roving and drawing frames, and has as its object the provision of novel and improved means for mounting the top rolls of the drawing roll systems of such machines in cooperative relation with the bottom rolls thereof.

The long-standing method of mounting the top rolls has been to provide pintles on the ends of solid top rolls, or extensions at the ends of the axles of shell type rolls, which are received in slots in cap bars mounted on the roll stands. This familiar structure has numerous well known drawbacks and inconveniences. In using solid rolls, the necessity for adequate oiling, with the resultant accumulation of lint on the pintles and bearings and escape of the oil to cause injury to the working surfaces of the rolls and to the stock being worked, are a continuing source of trouble and expense. Separate means in the form of saddles bearing down on the necks of the top rolls, also requiring lubrication in the case of solid rolls, have to be provided to weight the rolls. But among the numerous added limitations of this standard type of top roll mounting, an outstanding one has been the fact that the piecing-up of the ends of yarn or roving is an operation calling for manual dexterity and skill acquired by prolonged practice, and beside the fact that poor piecings impede the subsequent use of the yarn and impair the quality and the value of the fabric made therefrom, there is the practical impossibility of piecing up at front roll speeds of over 200 R. P. M. Thus this usual manner of roll mounting is a limiting factor in the rate of production of these machines.

Doing away with the cap bars makes it possible to leave the outward ends of the bosses of each top roll free and accessible so that the piecing up can be effected by entering the bobbin yarn sidewise and axially of the front rolls into the nip thereof while held taut and oblique to the roll axes so as to cross over and thus make contact with the strand already in the nip. This contact results unfailingly in a piecing which is certain and strong and can be made uniform, which requires little or no skill and training, and, most important, which can be made at any roll speed at which the frame can be run. This piecing is made behind the front rolls, whereas all other piecing is effected in front of the front rolls.

Efforts have been made to realize the advantages offered by eliminating the cap bars and holding the top rolls in working relation by their necks alone, but the structures proposed heretofore have possessed one or more practical drawbacks which prevented their general adoption. To be commercially successful, the top rolls must be positively held in exact parallel with their respective bottom rolls. Reliance upon any natural tendency of the top rolls to align themselves with their bottom rolls has proved illusory, since the correcting forces arising when the opposed rolls of a pair get out of parallel merely result in swinging or "hunting" which introduces continuous variation in the density of the strand being drawn. Likewise, equal pressure on both bosses

of each top roll must be maintained, to produce uniform yarn or sliver. The distance between the top rolls must be capable of easy and accurate adjustment to conform to the required roll settings for the specific work in hand. The top rolls must be easily removable from their holders for cleaning, buffing, or other servicing. The distribution of load (weighting) of the three or more top rolls must be accurately adjustable within the limits required for the particular work being done. The device should not compel the use of the more costly anti-friction top rolls throughout, in place of solid rolls.

Additionally, the roll guiding and weighting structure should be capable of being installed in existing spinning, roving, and drawing frames, as well as on new machines, and the installation procedure should be simple, with no alteration of present frame components being required, apart from the elimination of the cap bars.

The invention attains the advantages derived from mounting the top rolls without the use of cap bars, and satisfies the foregoing conditions required for practical utility, by the use of top roll guides which support the top rolls in working relation with the bottom rolls solely through engagement with the necks between the bosses of the top rolls, such guides also applying the weighting force to the rolls and thus simultaneously performing the function of the saddles used heretofore. The guides are positioned through elements mounted on the usual back bars fixed in the roll stands, but are supported by the top rolls, and thus are in full floating relation with the back bars or the elements carried thereby and other fixed parts of the machine frame. The floating mounting of the roll guides or saddles is achieved by slotting the rearward portion of each guide to straddle the element fixed on the back bar, with such a precise fit as to maintain the guides in exact right-angle relation to the axes of the bottom rolls and thus prevent any swinging, while the neck of each top roll is received either in V-shaped notches spaced far enough apart, or in a half-bearing of sufficient length, to hold each top roll in precise right-angle relation to the guide and thus in true parallel relation to its opposing bottom roll. Suitable weighting means are applied to the guides to cause them to function as saddles in weighting the rolls. In brief, the invention comprises primarily top roll saddles which are held in exact right-angle relation to the bottom roll axes, and alone maintain the top rolls in precise parallel relation with the bottom rolls, i. e., "position" the top rolls as expressed in the claims appended hereto.

Other features of the invention and their manner of construction and operation to satisfy the required conditions and attain the aims outlined, are as set forth hereinafter.

An illustrative embodiment of the invention is shown in the accompanying drawings, in which

Fig. 1 is a view from above, taken perpendicularly to the course of the strands being drawn, of the main parts of a roll stand section of a conventional long draft spinning frame, showing the novel top roll guides.

Fig. 2 is a vertical section on line 2—2 of Fig. 1.

Fig. 3 is a bottom view of the parts of Fig. 2, omitting the clearer rolls, belt, and traverse rail.

Fig. 4 is a rear view of the parts forming the top roll guides, showing how they are positioned on the back bar.

Fig. 5 is a section on line 5—5 of Fig. 2.

Fig. 6 is a view in vertical section of an alternative manner of mounting the middle top roll.

Fig. 7 is a perspective view of the top roll guides of Fig. 2.

Figs. 8 and 9 are views in plan and side elevation of a portion of the back bar, showing the means used to mount it non-rotatably in the roll stands.

Fig. 10 is a section on line 10—10 of Fig. 9.

Fig. 11 is a section on line 11—11 of Fig. 9.

Fig. 12 is a perspective view of one of the brackets which are applied to the back bar to position the top roll guides.

Referring to the drawings, one roll stand section of a conventional spinning frame using a double apron long draft cotton drafting system is shown in Fig. 1, in which roll stands 1 support the bottom rolls 3 in open bearings 5, and a back bar 7 has its slabbed-off extremities 9 held in key-hole slots 11 in the rear ends of such roll stands, as usual in many instances. A traverse bar 10 equipped with trumpets 12 reciprocates in guides 14 in the roll stands.

In accordance with the invention, the usual cap bars holding the top rolls by their pintles are dispensed with and eliminated. The novel top roll guiding means for each set of three double boss top rolls seen in this figure is shown separately in Fig. 7, and comprises a composite member 13 having forks or slots 15 whereby it is hooked over a part carried by the back bar 7 and V-shaped notches 9 which engage the neck of the front top roll 17 to hold it in its working position in rolling contact with the front bottom roll 3; also a second composite portion indicated generally by 19 having a rear end portion forked or slotted at 21 likewise to hook over the part on the back bar 7 and having half-bearings 23, 25 to receive and hold the necks of the rear top roll 27 and the middle top roll 29 and thus to position these two rolls similarly in working relation with their respective bottom rolls 3. The guide 13 for the front top roll has its main portion or shank 31 made as a stamping of heavy sheet metal of inverted U-section as shown in Figs. 4 and 5, rounded downwardly at its frontward end 33 and having its flanges which depend adjacent its front end as shown at 35 provided with the said V-shaped notches 9 which straddle the spacer or neck 37 of an anti-friction or other type of loose-boss top roll 17. The V-shaped seats formed by the notches 9 are precision machined so as to stand in exact transverse alignment with each other with respect to the median line of guide 31, so that when the neck 37 is firmly seated in such notches in non-rotating relation the axis of the front top roll 17 will be maintained rigidly at exact right angles to the length of guide 31. The rear portion of front top roll guide 13 is formed of a separate member 39 also conveniently stamped from heavy sheet metal, of inverted U-section each leg 41 of which is slotted to form the forks or slots 15. The member 39 fits upon the shank 31 with a close sliding or telescoping fit, being adjustably affixed thereto by a screw 43 threaded into a nut 45 which has a hub 47 received in a slot 49 provided therefor in the top web of shank 31. The slots 15 in legs 41 of member 39 are precision machined to be in exact alignment with each other transversely of member 39.

To mount this front top roll guide, and the associated roll guide 19 for the middle and back top rolls of this set, in fixed working position in the frame, the back bar 7 is provided, at locations midway between the members of each pair of bosses of the back bottom rolls 3, with brackets 51 drilled at 53 to receive the back bar and mounted thereon in fixed longitudinal and angular position by set screws 55. Each of these brackets 51 is provided with a short rod or stud 57 fixed therein in precisely parallel relation to back bar 7, and these parts form a sort of auxiliary back bar assembly, Fig. 12. The slots 15 in legs 41 of each member 39 are accurately formed to straddle these rods or studs 57 with the closest possible freely sliding fit, since it is the bearing of the forked legs against the sides of stud 57 which holds front top roll 17 against deviation out of parallel with front bottom roll 3 as well as determining this top roll's spaced relation from the middle top roll and its riding point on the front bottom roll.

The roll guide 19 for the middle and back top rolls comprises a main portion 59, also preferably of heavy sheet metal, having downturned flanges 61 defining an inverted U-shaped section, closely fitting the thickness of bracket 51, in which flanges are formed the slots 21 which likewise are precision machined to be exactly opposite each other transversely of the length of member 59, and to fit as closely as possible but still slidably over stud 57. The front part of portion 59 is curved downwardly and then bent into parallel with its original extent, the end part having a central hole and lugs 62 which are bent downward into spaced and parallel relation. Between the lugs are received the shanks of the two half-bearings 23, 25 which receive and fit accurately the necks 63, 65, respectively of the back and middle top rolls 27, 29. Shank 67 of the middle roll bearing is slotted as shown at 69, and shank 71 is provided with a hole, through which hole and slot extend the shank of a screw 73 passed through the hole in the front end of portion 59 and held by nut 75. The fit of the side edges of shanks 67 and 71 within the channel between the lugs 61 is very close, so that when nut 75 is tightened the axes of half-bearings 23, 25, and of the necks 63, 65, of the back and middle top rolls are maintained precisely at right angles to the longitudinal center line of portion 59. These half-bearings 23, 25, are held to very close tolerances with respect to their fit upon the neck diameters and the perpendicularity of their axes to the guide edges of shanks 67, 71. This is for the purpose of ensuring that the middle and back top rolls will be held exactly parallel to each other and to their respective bottom rolls.

The front top roll 17 is preferably of anti-friction type, for best work at this critical location in the drafting. The middle and back top rolls will normally be of the less expensive solid roll type, instead of ball bearing type, without impairing the quality of the work done, thus effecting an important economy. The half-bearings for the middle and back top roll have far more area of bearing surface in contact with the necks of the rolls than in prior known means of weighting of top rolls, thereby attaining low bearing pressure for each unit of bearing area. The necks of the solid rolls preferably are made of or sheathed with materials of inherently low coefficients of friction, such as nylon, Teflon, and other substances of similar characteristics, thus eliminating or greatly reducing the need for lubrication. If it is desired to use a solid type of front top roll, a half-bearing similar to 23, 25 will be substituted for the V-notches 9.

The mid-portion of the length of the neck or spacer of each top roll is reduced slightly to produce shoulders receiving between them the depending flanges 35 or the ends of half-bearings 23, 25, thus preventing axial movement of the top rolls in their guides.

The only point of connection of the guides 13 and 19 with the frame components is at the studs or auxiliary back bars 57 mounted on the back bar 7.

The front top roll guide 13 is provided with a stirrup 77 of mainly channel section whose upper end is bent at an acute angle and bored to receive the hub of a shouldered nut 79 on a screw 81 which is adjustably positioned in a slot 83 in the shank 31 of such guide. The lower end of stirrup 77 has a hole 85 into which the hook 87, Fig. 7, of the weighting system (not shown) is hooked. The point at which hook 87 engages the rim of the hole is located in the line of stress passing through the axis of screw 81.

It is to be noted that the stud 57 which determines the position of the guides 13 and 19 and thus of the top rolls does not bottom in the slots 15, 21 in the forked members 39, 61 which are hooked over it. Instead, the weighting load applied to front top roll guide 13 by the stirrup is borne in part by the front top roll 17 and for the rest by screw 73, which has a very long head engaging with the under side of guide 13 at mid-width of the channel therein, as shown in Figs. 2 and 5. The pressure on the head of this screw weights the middle and back top rolls 27, 29 through the half-bearings 23, 25 engaging their necks

63, 65. Thus both guides 13 and 19 are mounted in full floating relation upon the stud 57 carried by the back bar 7, with full freedom to rise and fall as well as to rock about their longitudinal axes, and independently of each other, being held only from movement along and at right angles to the path of the strands being drawn, and from swinging. That is, they are confined to movement in a vertical plane and to rocking about axes parallel to such plane. Hence the front top roll is free at all times to equalize the respective pressures of its two bosses against its bottom roll and the strands passing between. The middle and back top rolls are free to rise and fall without effect on the front top roll or on each other, and to tilt as needed to equalize the pressure between the bosses.

Thus the guides 13, 19, act in precisely similar manner to the standard saddles, since they are supported wholly by the rolls alone, this in addition to their function as guides positioning and controlling the top rolls with respect to the bottom rolls. The linkage retains the advantages of distributing the weighting force through leverage in the traditional manner with which operators are familiar, instead of through springs of varying unreliable or unknown pressure. The leverage and resulting weighting can be accurately predicted and displayed graphically on the parts themselves, and easily and quickly duplicated or altered at will, while retaining full adjustability of the relative position of the top rolls to each other and to the bottom rolls.

The weighting of the front top roll is adjusted by shifting the position of screw 81 along slot 83 in shank 31 of guide 13. The balance of the weighting load, transmitted to guide 19 by screw 73 which serves as the fulcrum point, is distributed between back top roll 27 and middle top roll 29 by loosening nut 75 and shifting the shank 67 of bearing 25 forward or backward by reason of the slot 69 in the shank. Where it is necessary or desirable to make the pressure distribution between the middle and back top rolls variable to a greater extent, this is done by slotting the shank 71 of the rear top roll bearing where screw 73 passes through it.

To set the top rolls in accordance with the roll setting required for the particular work in hand, the position of studs 57 throughout the roll stand section is first established. For this purpose, the brackets 51 are first set in identical angular relation about the axis of the back bar 7 of each roll section. Since these back bars are rotatable in their key-hole slots 11 in the roll stands 1 as the frame is initially constructed, a clamp 89 is provided on each end of each back bar having a wedge-shaped tongue 91 to enter and wedge tightly in the mouth of each slot 11. The legs 93 of each clamp are slotted and joined by a yoke 95 extending through such slots, in which yoke is threaded a clamping screw 97 bearing against back bar 7. These clamps thus fix the back bar 7 non-rotatably and without end-play in the roll stands, and the studs 57 in fixed position coaxial with each other and parallel to the bottom rolls. The riding point of back top roll 27 upon its bottom roll is thus established by the angular position of stud 57 about the axis of back bar 7, i. e., by the slant of bracket 51. This is usually a permanent setting. Then middle top roll 29 is adjusted into position by first freeing screw 73. Finally front top roll 17 is set by loosening screw 43 and sliding shank 31 through member 39 for the proper distance in the desired direction.

It will be noted that a scale 99 is inscribed on this shank, which is read against the front edge of member 39 as an index. With care taken to set up all the brackets 51 at exactly the same slant throughout the entire frame, and thus with studs 57 all in coaxial relation, as by using a gage or jig, it becomes possible to set all the front top rolls alike throughout the entire frame by reference to the scale 99 on each shank 31, without the use of roll gages, once the proper setting is determined for a single front top roll. This effects a very great saving in the time and effort required to change the roll settings for a different character of work.

Reference lines (not shown) are further provided on the top surface of shank 67, forming a scale to be read against the end of portion 59 of guide 19, similarly to enable the relative spacing of the middle and back top rolls, when once ascertained, to be duplicated throughout the frame without resort to roll gages applied to each set of rolls.

Likewise, a scale 101 is inscribed on the front end of shank 31 to be read against the front edge of a clearer roll bracket 103 to be described, or an index plate 105 substituted therefor where this bracket is omitted, as in Fig. 7. Stirrup screw 81 passes through a close-fitting hole in such bracket or index plate so that once the desired weighting has been found for one set of rolls the screws 81 of all the other sets of rolls can be set to give identical leverage and top roll weighting through setting this index edge on each guide 13 at the same point in scale 101 throughout the rest of the guides 13 in the frame, with great economy of time and effort.

Thus full adjustability of the relative positions of the rolls and of their relative weighting is provided.

It will be seen that the front top roll guide 13 and the roll guide 19 for the middle and back top rolls can be lifted up and entirely removed with no further manipulation than to unhook the stirrup hook 87. For ease and speed in handling, a leaf spring 107, Figs. 2 and 3, is provided to press the spacer or neck 37 of front top roll 17 into notches 9 and thus to support and hold the front top roll in place therein when the guide 13 is lifted. This spring clip has a slot registering with slot 83 formed in guide 13 for stirrup screw 81, tongues at the ends of the slot in the spring being turned up into slot 83 to hold the spring in place. Similarly a leaf spring 109 is provided to pick up rear top roll 27 when guide 19 is lifted, this spring clip being held out of engagement with neck 62 of such roll by contact with the rear edge of bearing 23, to avoid frictional drag on such roll when of the solid roll type as usual in this location. However, when the guide is lifted and the roll sags down its neck is prevented from escaping from the bearing by striking the end of spring 109. The rear end of such spring is folded over on top of member 59 and anchored by a pair of tongues struck down from the re-curved portion of the spring and received in a hole 111 in the rear end of member 59. Both springs 107, 109, are easily deflected to allow the necks of their respective rolls to be entered into or removed from their seats in the guides.

Since the particular frame shown herein is of long-draft type employing double aprons 113 carried in the usual cradle (not shown) mounted on the bottom rolls, the middle top roll 29 is allowed to stay in place when the guides are lifted. However, if the frame is not of this type, and uses a middle top roll directly engaging the strand being drawn, a third leaf spring 115, Fig. 6, is employed to pick up and hold such top roll in analogous manner. Such spring has a hole whereby it is mounted on screw 73 beneath nut 75 and lugs at its rear end embracing the side of shank 71 of the back top roll's bearing 23.

Provision is made for holding one or both of the guides 13 and 19 along with their top rolls in elevated position for cleaning, clearing lap-ups, removal or inspection of the top rolls, or other reasons. To this end, the rear prong which defines one side of each slot 15 on the front top roll guide and of each slot 21 of the middle and back top roll guide, is made narrow enough to enter the space between stud 57 and back bar 7. Thus when the guides are swung upwardly about stud 57 as a pivot, these prongs can be slid in between the stud and the back bar to hold the guide or guides elevated at an angle of approximately 90° from that shown in Fig. 2, giving full access to all the rolls. Not only are the top rolls held safely against falling and being damaged when the

guides are raised, but the guides themselves are held out of the operator's way with the top rolls in place therein and the parts ready for instant return to work by a single motion. The operator has both hands free to do the clearing, with no problem of where to lay the rolls on a running frame while so occupied. The spring clips hold them parallel to the bottom rolls in both vertical and horizontal planes, that is, keep them from gyrating about an axis extending lengthwise of the guide **13**, or from skewing around at an angle thereto, and they return to their proper seat against the bottom rolls without manipulation when the guide or guides are again lowered to resume work.

Important benefits are attained by positioning the top roll guides by the elevated studs **57**, instead of by the back bar **7**. By so doing, the point of restraint holding the guides and their sets of rolls from moving downhill is raised slightly (¼" or so), above the plane in which the strands of yarn travel through the rolls. Thus the whole unit is prevented from rocking forward under application of the weighting load through the stirrup, to upset the roll setting. Also, as the guides assume different angles or elevations with respect to the plane of the bottom rolls, depending on the diameter of the top rolls, the position of the nip of the aprons **113** with relation to the nip of the front rolls remains unchanged. The device is thus rendered indifferent to variations in top roll diameters resulting from re-finishing and other causes.

As its most significant commercial advantage, the novel structure permits piecing up of broken ends of yarn or roving by merely holding the end portion of the bobbin yarn taut and obliquely across the path of the strand while allowing it to enter the nip of the rolls at the extreme end of the top roll boss, the operator's grip on the yarn being released as soon as this is done. The recoil of the twist in the bobbin yarn causes it to ensnare the fibers of the traveling strand, instantly and unfailingly effecting a perfect piecing, since the twisted yarn extends back of the nip. With a minimum of care on the operator's part as to the length of the excess bobbin yarn released behind the front rolls, the piecings will be of uniform size and length every time. Since the speed of travel of the front rolls imposes no obstacle whatever to the ease and certainty and uniformity of such piece-ups, the old limitation to a maximum of 200 R. P. M. front roll speed imposed by the difficulty of proper piecing with the method compelled when the top rolls are mounted by their pintles in cap bars no longer prevails. Thus on lightly and medium twisted ring-spung yarns, where traveler speeds are low, especially on the lower counts of yarn sizes, the device permits an increase of production by both machine and operator of 25% or more over that possible in the same machine using cap bars.

Preferably the top rolls used in this device will be made without pintles, as shown in Fig. 1, since pintles no longer have any function in the improved structure. The top rolls shown are merely equipped with short hubs **117** to hold the rolls during buffing. However, the standard type rolls having pintles or end caps may equally well be used when already on hand.

Revolving top roll clearers of novel form and mounting are provided as shown in Figs. 1 and 2. The clearer roll **119** comprises a wooden roll **121** of generous diameter having felt cots **125** fixed thereon at intervals to engage the respective bosses of the several front top rolls of each roll stand section. This roll is reduced in diameter at points matching the distance between the two guides **13** nearest the ends of the roll stand section, to provide necks **127** which are fitted with nylon or other suitable bushings **129** and loosely held in the hook-shaped resilient end portions **131** of arms **133** pivoted at **135** on brackets **103** mounted by screws **81** on the outermost guides **13**. When access is wanted to the front top roll for piecing up, clearing, or other purpose, the clearer roll is merely swung up and over its pivots **135** without removing it from hooks **131**, to rest on clearer roll **137** which rides on and cleans the rear top roll **27** and the top apron **113** (or the plain middle top roll, as the case may be). When thus swung back, the front clearer roll **119** takes this position whether the guides and rolls are down in working position as shown in Fig. 2, or stand in raised position as described. Thus mounted, the front clearer roll leaves both the operator's hands free to piece up or to do whatever else is needed, without raising any problem or where to put the clearer roll when removed from its working position in contact with the cots of top roll **17**.

Clearer roll **137** comprises a plurality of cylinders **139** fixed on a metal arbor **141** which rests against stops **143** mounted on the outermost guides **13** of each roll stand section. Such stops have bases of inverted U-shape the legs of which merely engage frictionally with the side flanges of the shanks **31** of guides **13**. The stops are positioned lengthwise of the latter so that one of the felt-covered cylinders **139** will engage and clear lint from each cot of the rear top rolls and simultaneously from its associated top apron **113**.

Since no clearer roll supports are needed on the middle guide **13** in the roll stand section, the bracket **103** used on the guides at either side thereof is replaced by a flat slot cover **105**, which as noted serves as an index to be read against scale **101** in setting the front top rolls.

A further advantage of the novel structure is that the reduced number of parts forming each roll stand section present less surface for the collection of lint, and such surfaces are more easily cleaned and cleared of lint than the prior devices having cap bars and saddles.

While we have illustrated and described certain forms in which the invention may be embodied, we are aware that many modifications may be made therein by any person skilled in the art, without departing from the scope of the invention as expressed in the claims. Therefore, we do not wish to be limited to the particular forms shown, or to the details of construction thereof, but

What we do claim is:

1. A roll guide for maintaining the necked top rolls of a textile drafting apparatus in position over the bottom rolls thereof, consisting of a member engaging a fixed part of the apparatus and thereby confined to bodily movement solely in a vertical plane and having a forwardly extensible portion holding the front top roll by the latter's neck, and a second member engaging a fixed part of the apparatus and likewise confined to bodily movement solely in a vertical plane and holding the rear top roll by its neck, and having a forwardly extensible portion holding the middle top roll by its neck.

2. A roll guide according to claim 1 which includes roll weighting means depressing the first member and through the latter the second member also.

3. Apparatus for drafting textile fibers including bottom rolls, top rolls each having two bosses and an intervening neck, a member in fixed position extending parallel to the bottom rolls, and roll guide means engaging this member in full floating relation and also the necks of the top rolls and holding the latter with their axes in fixed parallel relation to such member.

4. Apparatus according to claim 3, having means pulling the roll guide means toward the bottom rolls to weight the top rolls.

5. Apparatus for drafting textile fibers including bottom rolls, top rolls each having two bosses and an intervening neck, a member extending parallel to the bottom rolls, and roll guide means comprising a part engaging the neck of the front top roll and thus holding the latter in co-engaging relation to the front bottom roll and against endwise movement and a second part engaging the necks of the middle and back top rolls and thus holding the latter top rolls in co-engaging relation with the middle and back bottom rolls and against endwise move-

ment respectively, both parts engaging with the said member and being rendered thereby movable solely about their own axes and in a dimension perpendicular to the bottom rolls.

6. Apparatus for drafting textile fibers including bottom rolls, top rolls each having two bosses and an intervening neck, a member extending parallel to the bottom rolls, and roll guide means comprising a part hooked over such member in full floating relation and engaged with the neck of the front top roll in fixed right-angle relation to the axis thereof, and a second part also hooked over such member in full floating relation and engaged with the neck of another top roll in fixed right-angle relation to the axis thereof, such parts being confined by their engagement with such member to movement solely toward and from the bottom rolls and relatively to each other and about their own axes.

7. Apparatus for drafing textile fibers including bottom rolls, top rolls each having two bosses and an intervening neck, a rod running parallel to the bottom rolls, and a roll guide comprising a plurality of members hooked over the rod one above another, engaging the necks of the top rolls, and having co-engaging surfaces transmitting a roll-weighting pressure from one to another of such members.

8. Apparatus for drafting textile fibers including bottom rolls, top rolls each having two bosses and an intervening neck, a rod fixed in the apparatus and running parallel to the bottom rolls, a roll guide forming the sole means positioning the top rolls with respect to the bottom rolls and having one or more slots receiving the rod and at least one bearing receiving the neck of a top roll, and means preventing the rod from bottoming in the slot or slots.

9. Apparatus according to claim 8, including means detachably holding the neck in such bearing.

10. Apparatus for drafting textile fibers including in combination bottom rolls, top rolls each having two bosses and an intervening neck, a rod fixed in the apparatus and running parallel to the bottom rolls, and a member hooked over the rod having an extensible rigid and rigidly attached portion engaging the neck of at least one top roll and forming the sole means used to guide and position such roll with respect to its cooperating bottom roll.

11. Apparatus according to claim 10 in which the member bears calibrations indicating the spaced relation between the rod and the neck of the top roll.

12. Apparatus according to claim 10 in which a second member is also hooked over the rod and engages the neck of at least one top roll and is pressed down upon its top roll by the first member.

13. Apparatus for drafting textile fibers including in combination bottom rolls, top rolls each having two bosses and an intervening neck, a rod parallel to the bottom rolls, and a pair of members hooked over the rod in full floating relation thereto and one on top of the other, each having a rigidly attached portion engaging the neck of at least one top roll, both members having capacity for rocking movement about axes at right angles to the rod independently of each other.

14. Apparatus for drafting textile fibers including bottom rolls, top rolls each having two bosses and an intervening neck, a roll guide holding the top rolls in place by their necks alone, the roll guide being of inverted U-section with lateral flanges having obliquely related surfaces receiving the neck of a top roll between them with a wedging fit, and a fixed abutment in spaced relation to the bottom rolls, the guide having one or more parallel-sided slots fitting in floating relation over the abutment and of substantially the same width as the diameter of the portion of the abutment spanned by the slots.

15. Apparatus for drafting textile fibers including bottom rolls, top rolls each having two bosses and an intervening neck, a rod in fixed position in the apparatus and running parallel to the bottom rolls, a plurality of roll guides engaging the necks of the top rolls, and having slots receiving the rod, the roll guides being arranged one on top of the other and supported by the necks of the top rolls in a manner preventing engagement of the rod with the end of the slots.

16. Apparatus for drafting textile fibers including bottom rolls, top rolls each having two bosses and an intervening neck, a rod running parallel to the bottom rolls, a member hooked over the rod holding the neck of the back top roll and having an extensible portion holding the neck of the middle top roll, and another members engaging with the rod and with the first member and holding the neck of the front top roll, such member being extensible to vary the spaced relation between the front and middle top rolls.

17. Apparatus for drafting textile fibers including bottom rolls, top rolls each having two bosses and an intervening neck, a rod running parallel to the bottom rolls, a roll guide resting on the necks of the middle and back top rolls and engaging the rod, a second roll guide resting on the neck of the front top roll and the first guide and also engaging the rod, means weighting the second roll guide, and means providing for shift of the point of mutual contact where the second roll guide rests on the first roll guide.

18. Apparatus for drafting textile fibers including bottom rolls, top rolls each having two bosses and an intervening neck, a rod running parallel to the bottom rolls, a roll guide resting on the necks of the middle and back top rolls and engaging the rod, and a second roll guide resting on the front top roll and the first roll guide and also engaging the rod, and weighting means applied to the second roll guide and through it to the first roll guide, the ends of the top rolls being free from guides.

19. Apparatus for drafting textile fibers arranged in strand form, including bottom rolls, top rolls each comprising two bosses and an intervening neck, roll guides holding the top rolls by their necks alone, and fixed abutment means providing spaced surfaces parallel to the bottom rolls, each roll guide having a plurality of slots fitting closely but slidably over the spaced surfaces and engaging therewith at points thereon spaced apart in a direction transversely of the strand.

20. Apparatus for drafting textile fibers arranged in strand form, including bottom rolls, top rolls each comprising two bosses and an intervening neck, roll guides holding the top rolls by their necks alone, a back bar, and means extending laterally therefrom holding the roll guides in their working position, the roll guides alternatively and optionally engaging the back bar and being thereby held in raised inoperative position upon occasion.

21. Apparatus for drafting textile fibers in strand form including bottom rolls, top rolls each having two bosses and an intervening neck, a rod mounted in fixed position above the path of the strand, a member having a forked rear end portion hooked over such rod and having a front end portion of U-section, members having saddles fitting the necks of the rolls and tangs fitting the U-section, and means clamping the tangs in the U-section portion with capacity for varying the spaced relation of the saddles from each other.

22. Apparatus for drafting textile fibers including bottom rolls, top rolls each comprising two bosses and an intervening neck, roll guides holding the top rolls in place by their necks alone, a clearer roll, and holding means for the latter pivotally mounted on the roll guides, and permitting the clearer roll to be swung up and over the pivots while retained in the holding means.

23. Apparatus for drafting textile fibers including bottom rolls, top rolls each comprising two bosses and an intervening neck, roll guides holding the top rolls in place by their necks alone, a clearer roll, holding means for the latter pivotally mounted on the roll guides, and having U-shaped portions partly encircling and retaining the

clearer roll while it is swung up and over the pivots of the holding means.

24. Apparatus for drafting textile fibers including top rolls each comprising two bosses and an intervening neck, roll guides holding the top rolls by their necks alone, a top roll clearer, and clearer guides encircling intermediate portions of the length of the clearer and pivotally mounted on the roll guides and permitting the clearer to be swung up and over the pivots of the clearer guides while still encircled by the guides.

25. Apparatus for drafting textile fibers including top rolls each comprising two bosses and an intervening neck, roll guides holding the top rolls by their necks alone, a top roll clearer having intermediate portions of its length of reduced diameter, clearer guides encircling such portions, and means pivotally mounting such guides on the roll guides so that the clearer may be swung up and over the pivots of the clearer guides while retained in these guides.

26. Apparatus for drafting textile fibers arranged in strand form, including bottom rolls, front, middle and back top rolls, and roll guides holding the top rolls in engagement with the bottom rolls and alternatively holding the front top roll elevated out of engagement with the bottom front roll while maintaining the middle and rear top rolls in engagement with their cooperating bottom rolls.

27. In a drawing or roving frame having bottom rolls disposed in a common plane, three top drawing rolls, and a single weighting means for all three top rolls, in combination, roll-holding linkage means for adjustably positioning the three top drawing rolls by engagement with their necks alone, such means holding the top rolls in adjustable spaced relation to each other, in parallel relation to the planes of the axes of the bottom rolls, and from longitudinal movement along such axes, such linkage assembly being articulated about a fixed center line in the frame parallel with the said axes permitting bodily motion of each top roll in a dimension exclusively perpendicular to the common plane of the bottom rolls, and distributing the weighting force to the several top rolls in desired varying amounts through adjustable proportionate leverage independent of roll spacing.

28. The combination according to claim 27 in which the roll-holding linkage comprises a plurality of links each holding at least one top roll, and the single weighting means applies pressure to one link and such link in turn transmits pressure to a second link.

29. Apparatus for drawing textile fibers including bottom rolls, top rolls each having two bosses and an intervening neck, a regular back bar, an auxiliary back bar supported thereby in parallel relation to the axes of the bottom rolls, top roll guides, one thereof overlying the other, positioning the top rolls with respect to the bottom rolls by engagement with the top rolls solely at the necks thereof, and weighting means engaging the upper guide between the front and middle top rolls, at least one of the guides having slots fitting the auxiliary back bar and being confined thereby to movement in a vertical plane and to rocking about axes parallel to such plane.

30. The combination according to claim 29 in which means in connection with the said back bars engage the guides and prevent shift of the guides axially of the back bars.

31. A linkage for positioning and weighting the several pressure rolls used in yarn-drafting processes and for simultaneously and variably distributing the weight on such rolls, having in combination a system of levers, and a single reference shaft common to all such levers on which the levers are mounted in slidable and pivotal relation for bodily movement only in a dimension vertical to the common plane of the said rolls and for rotation about their own axes,

32. A linkage forming the sole means for positioning and weighting the several top or pressure rolls of a spinning or roving frame having in combination a front roll positioning and weighting link, means for applying weighting pressure to such link, a second roll positioning and weighting link common to the back and middle rolls, and means adapted to distribute the said weighting pressure proportionately and adjustably between the front roll and the second positioning and weighting link, the latter being adapted to distribute the resultant pressure proportionately and adjustably between the back and middle rolls.

33. A linkage according to claim 32 in which the several links are adjustably extensible to alter the angular set of each of the several top rolls positioned thereby about the axis of its respective cooperating bottom roll upon which such top roll rests.

34. Linkage according to claim 32 including links of inverted channel section arranged one within the other and each having slots in its parallel depending webs which slots are precisely opposite each other, one pair of slots in each link engaging a fixed part of the frame and at least one link having another pair of slots engaging the neck of a roll.

35. A linkage according to claim 32 including links each comprising members at least one of which is of inverted channel section and adapted to fit within one another in axial alignment with variation of the link's effective length, one member having in connection therewith concavities receiving the neck of a pressure roll and the other member having concavities straddling a fixed part of the frame.

36. A linkage according to claim 32 in which a link is composed of elements arranged in overlapping and relatively extensible relation, and means are provided which fix such elements in parallel relation and against relative movement.

37. A linkage according to claim 32 in which at least one of the links is adapted to hold the neck of a loose-boss roll in non-rotating relation.

38. A linkage according to claim 32, in which at least one of the top rolls has shoulders on its neck, and the link cooperating therewith has portions engaging with such shoulders and preventing relative axial movement of the top roll.

39. Apparatus for drafting textile fibers including in combination bottom rolls, top rolls each having two bosses and an intervening neck and no pintles, a rod fixed in the apparatus and running parallel to the bottom rolls, a member hooked over the rod and having depending side flanges and a top portion extending from one flange to the other, a second member within the first member which is rigid and rigidly attached to the first member in extensible and retractable relation thereto engaging the neck of at least one top roll, and a single weighting means transmitting downward pressure to one of the members to weight the top rolls.

40. Apparatus for drafting textile fibers including in combination bottom rolls, top rolls each having two bosses and an intervening neck and no pintles, a rod fixed in the apparatus and running parallel to the bottom rolls, a member embracing the rod and having a top portion and side flanges defining an inverted U-shaped channel, a rigid member fixed within and extending out from the U channel with capacity for adjustment toward and from the bar and engaging the necks of a pair of top rolls, and a single weighting means transmitting downward pressure to such member to weight the top rolls.

41. Apparatus for drawing textile fibers including bottom rolls, top rolls each having two bosses and an intervening neck, a regular back bar, an auxiliary back bar, supporting means gripping the latter, screw means clamping the supporting means to the regular back bar with capacity for shift about the axis of the back bar, and roll guide means having slots engaging the auxiliary

back bar in full floating relation, the roll guide means also engaging the necks of the top rolls and holding the latter with their axes in fixed parallel relation to the auxiliary back bar.

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