Nov. 3, 1953 P. B. TARBOX ET AL 2,657,434

DRAWING MECHANISM FOR SPINNING AND ROVING FRAMES

Filed Oct. 20, 1951 2 Sheets-Sheet 1

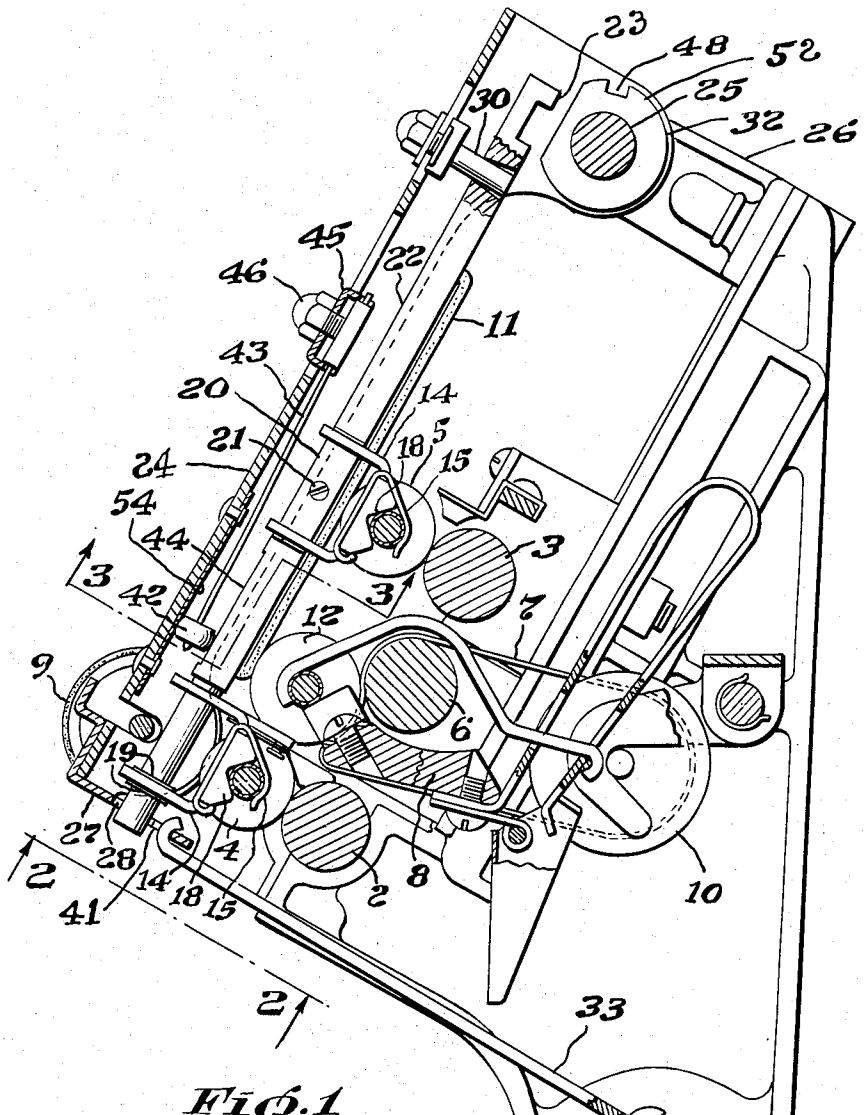


Fig. 1

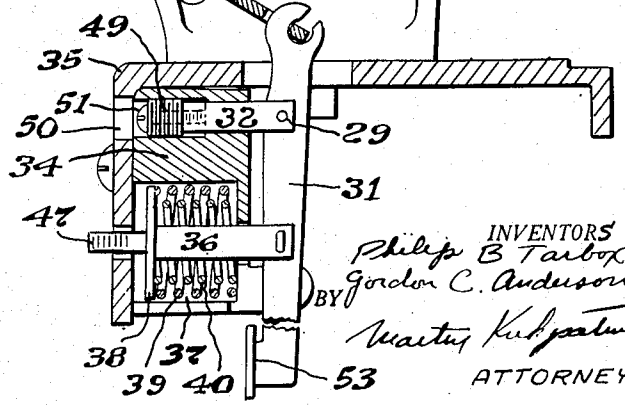
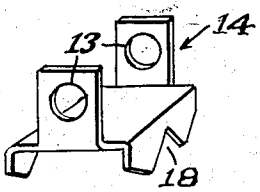


Fig. 4



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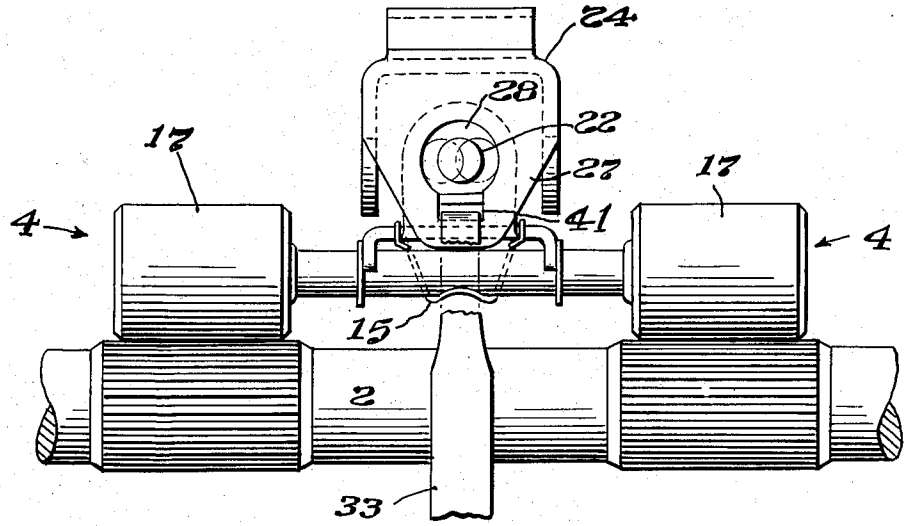

Fig. 2

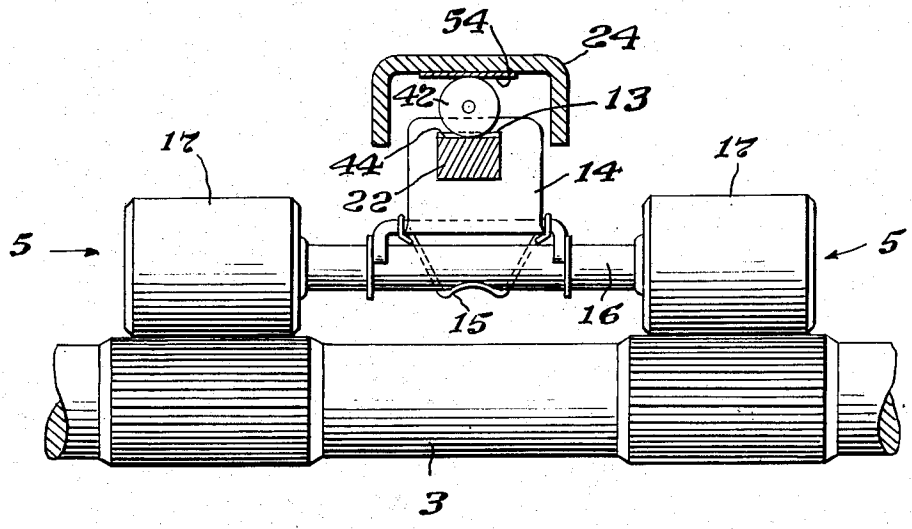

Fig. 3

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DRAWING MECHANISM FOR SPINNING AND ROVING FRAMES

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7 Claims. (Cl. 19—135)

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This invention relates to drawing mechanisms of the type used in spinning and roving frames but more particularly to drawing mechanisms having a roll weighting arm overlying drafting rolls, such a mechanism for example being shown in Gwaltney et al. U. S. Patent No. 2,565,228.

In any mechanism of this type a major problem is the manner of maintaining the top rolls in proper parallel alignment with their cooperating bottom rolls so that each top roll cover or cot will bear on the corresponding fluted section of its respective bottom roll for substantially the entire length of the cover, except in so far as that contact may be modified by the presence of the sliver being drafted. When this paralleled relationship is disturbed to such an extent that the axis of the top roll and the bottom roll no longer lie in a common plane, then the contact between the two rolls, which theoretically is approximately a line contact, becomes shortened, due to the shift from a parallel to an angular relationship. If this parallel relationship is seriously disturbed, then the drafting operation becomes erratic, and highly unsatisfactory.

Another problem arises from the necessity of uniformly weighting the overlying weighting arm and the roll supporting bar, particularly since the arm and the bar must render freely back and forth relative to one another, and yet the weighting arm must be weighted to provide at the same time a uniform pressure on the drafting rollers.

Accordingly, the present invention is directed to a drafting mechanism of the overlying weighting arm type for spinning and roving frames in which the weighting arm and roll supporting bar are allowed freely to render back and forth, yet one in which the weighting pressure will be at all times uniform. It is a feature of the invention that uniform weighting will be provided in spite of variations in the mechanism employed.

The nature of the invention will be readily understood from the following description when read in connection with the accompanying drawings, and the novel features will be particularly pointed out in the appended claims.

In the drawings:

Fig. 1 is a view, mainly in vertical section, showing a drafting mechanism embodying this invention;

Fig. 2 is a front elevation of the mechanism shown in Fig. 1;

Fig. 3 is a front sectional elevation of the mechanism shown in Fig. 1; and

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Fig. 4 is a view of a part of the mechanism of Fig. 1.

Referring to the drawings, the construction there shown comprises bottom front and rear rolls 2 and 3 respectively, top rolls 4 and 5 cooperating with said respective bottom rolls to perform the drafting operation, and an intermediate control mechanism including a bottom roll 6 driving an apron 7, the latter being guided over an apron bar 8 and held stretched by a tensioning roll 10. Resting on the apron 7 is a top roll 12. Suitable clearers, front top roll clearer 9, and intermediate and back roll clearer 11, are provided.

The top rolls with which the present invention is mainly concerned consists of the front and rear drawing rolls 4 and 5. The front roll 4 and back roll 5 each comprise an arbor 16 on which are rotatably mounted two roll bodies 17—17, thus providing two connected roll sections closely adjacent to each other and in coaxial relationship. Respective holders 14, best shown in Fig. 4, having upturned end portions with holes 13 therein, and downturned side portions with notches 18, are provided for holding rolls 4 and 5. The rolls 4 and 5 are each supported in its respective holder 14 by a spring 15 which holds the arbor 16 against V-notches 18 in the lower portion of said holder. The holder for front rolls 4 is supported on supporting bar 22 for axial movement about said bar, since said bar passes through holes 13 in said holder, while the holder 14 for the rear roll may have square holes fitting the square rear portion of bar 22. The holders are each maintained in position along bar 22, forward holder 14 by flanges 19 on said bar and rear holder 14 by a clamp 20 having a set screw 21 to permit adjustment of said holder along said bar.

The supporting bar 22 for the rolls is itself loosely supported in a weighting arm 24 which is pivotally mounted on a fixed rod 25 mounted on a series of roll stands like that shown at 26 so that the arm 24 can be swung from its normal position into an upward inoperative position, said bar 22 being generally parallel to the arm 24. A lug 23 at the end of bar 22 is adapted to fit into a notch 48 on a washer 52 fixed on rod 25 releasably to retain said arm and bar in inoperative raised position by engagement of said lug in said notch. The rear end of bar 22 is slidable along pivot pin 30 so that the lug 23 can be moved into and out of notch 48 simply by raising the rear end of bar 22 with respect to the arm 24.

The loose supporting connections between the

bar 22 and the arm 24 include a down turned forward end 27 of the arm having a hole 28 therein through which the bar 22 extends, the hole 28 being materially larger than the bar. Thus the end 27 of arm 24 connecting together the arm and underlying bar, by reason of the enlarged hole 28 at the lower end thereof, permits either or both rocking and lateral movement of the bar relative to the arm as well as serving when necessary to lift the bar with its associated top rolls by means of the arm when the latter is elevated. At its rearward end the bar is secured to the arm somewhat loosely by means of a pin 30.

The weighting pressure is applied to the arm 24 by a spring pressed lever mechanism including a lever 31 pivoted at 29 on an adjustable pivot member 32, the upper end of said lever 31 being connected to the down-turned forward end 27 of arm 24 by a link 33 hooked to the upper end of lever 31 and into a hole 41 in the lower portion of down-turned end 27 below the hole 28 retaining bar 22. The connecting link 33 is forward of the front rolls 2 and 4 and hence entirely out of the way of the drafting rolls, yet is easily accessible to the operator. The adjustable pivot member 32 is retained in adjusted position in a block 34 attached to the rear vertical face of the roller beam 35 by a set screw 49 which fits the tapped hole in block and bears against pivot member 32. The roller beam has a hole 50 therein to permit adjustment of pivot member 32. A clamping screw 51 extends through a hole in set screw 49 into a tapped hole in pivot member 32 to provide a means for clamping the set screw 49 in adjusted position. A spring retaining rod 36 is attached to lever 31 below said pivot member 32, said rod extending through a recess 37 in the block 34 and having a disk 38 attached thereto to retain coil springs 39 and 40 between said disk and the rear end of said recess. The forward end of rod 36 which extends through a hole in roller beam 35 is provided with suitable indicia for easy visual alignment with the flat vertical surface of roller beam 35, such indicia, for instance may take the form of circumferential lines 47 on an extended forward portion of rod 36.

Thus, the pressure exerted by the springs will tend to move lever 31 about the pivot 29 on pivot member 32 in a clockwise direction to exert downward pressure on weighting arm 24. The extreme lower end of lever 31 may be provided with a flat portion 53 to permit easy manual release of weighting so that the link 33 may be quickly unhooked from lever 31 by an operator, the forward position of link 33 making it easily accessible to be unhooked from said lever.

In order to adjust the weighting mechanism to provide for minor inaccuracies in manufacture, the pivot member 32 is adjusted by moving it in or out until the desired line 47 on the end of spring retaining rod 36 is in alignment with the vertical face of roller beam 35, the vertical face providing an index for setting the lines 47 on said rod. Thus the distance between the upper end of lever 31 and the arm 24 may be set to a uniform distance in spite of mechanical variations. Similarly, the index lines 47 may correspond to defined pressures, so that the weighting of top rolls 4 and 5 may be easily and quickly varied from one known weight to another whenever such is desirable.

Transmission of the pressure from the arm 24 to the roll supporting bar 22 takes place through a roller 42 having its axis between the arm and the bar, said roller being rotatably mounted on a spring wire 43 which extends generally parallel to the axis of the bar between the arm and the bar. The wire is mounted on the arm 24 at a point well behind and spaced from said roller, such wire mounting permitting substantial bodily lateral movement of the roller 42 relative to both the arm 24 and bar 22 as the arm and bar are moved relatively to one another, and with surprisingly low friction even though no lubricant—which might be picked up by the fibers being drafted—is necessary. The roller 42 bears against the flat hardened plate 54 attached to the flat under surface of arm 24 and against a flattened upper surface 44 on bar 22, providing free relative lateral movement between said flattened surfaces on said arm and said bar. Distribution of this pressure between the rolls 4 and 5 can be varied by adjusting the roller 42 lengthwise of the bar 22. For this purpose the roller wire 43 is fixed in a holder 45 slidably mounted on the arm 24 and can be locked in any adjusted position by the screw 46.

Some freedom of movement of each top roll in the plane passing through its axis and that of its respective bottom roll is necessary in order to enable both cots to bear equally on the two strands of sliver which customarily are fed simultaneously between the two top roll sections and their respective bottom roll sections. Provision for this rocking movement is made by permitting front roll holders 14 to rock freely around the bar 22, since said bar is circular at the forward portion thereof and the holes in said front holder 14 are also circular. The bar has a limited freedom of rocking movement around a longitudinal axis by virtue of the pivot pin 30, fitting rather loosely in the conical hole formed through the rearward end of the bar.

Thus front top rolls 4 can rock around the axis of the bar 22 to adjust themselves evenly to their respective bottom rolls and to equalize the pressure of both cots of each top roll on the bosses of its bottom roll. However, the mounting of the bar 22 is provided not only for the purpose just described but, more importantly, in order to enable the top rolls automatically to remain in proper alignment with their respective bottom rolls. That is, if the top rolls are misaligned with reference to their bottom rolls, such misalignment will correct itself automatically if the mounting of the top rolls is such as to permit such correction. It is for this self-aligning purpose that the pivotal connection has been provided between the bar 22 and the pivot pin 30 at the rearward end of the bar. While this construction permits the forward end of the bar to swing laterally far enough to carry the front top roll 4 out of alignment with its bottom roll 2, it also permits it to swing back again into correct alignment, and the action of one roll on the other tends to maintain them automatically in properly aligned relationship. If, for example, the top roll is deliberately misaligned by swinging it transversely out of the plane common to the axes of the two rolls while the machine is running, the interaction of one roll on the other will restore the top roll to its correctly aligned relationship to the bottom roll.

The novel spring wire mounted roller, together with the novel adjustable spring weighting applied to the forward end of the weighting arm is believed new, and provides a much simpler and more friction-free arrangement than heretofore, and hence one in which the weighting is much

more uniform, particularly as provided by the adjustable weighting lever device which affords easy adjustment of the weighting pressure, so that all of the drafting mechanisms mounted on a spinning or roving frame may be easily and quickly adjusted to uniform pressure.

While we have herein shown and described a preferred embodiment of our invention, it will be evident that the invention may be embodied in other forms, and may be applied to drawing mechanisms, differing from that shown, without departing from the spirit or scope of the invention.

We claim:

1. In a drawing mechanism for spinning and roving frames, the combination with a plurality of pairs of top and bottom drawing rolls positioned to act successively on a sliver, a weighting arm mounted for swinging movements in a vertical plane toward and from a position overlying said bottom rolls, a bar supported in a generally parallel relationship to said arm, means loosely connecting together the forward end of said bar with said arm, a plurality of holders mounted on said bar and supporting said respective top rolls, means for applying roll weighting pressure to said arm, and an antifriction roller interposed between said arm and said bar for transmitting the pressure of said arm through said bar to said top rolls, said roller being mounted for substantial bodily lateral movement relative to both said arm and said bar.

2. A drawing mechanism as claimed in claim 1 in which said roller is rotatably mounted on a spring wire.

3. A drawing mechanism as claimed in claim 1 in which said bar has a lug on the rear portion thereof adapted to engage a fixed notch to releasably retain said bar and said arm in raised position.

4. In a drawing mechanism for spinning and roving frames, the combination with a plurality of pairs of top and bottom drafting rolls positioned to act successively on a sliver, roll weighting lever means pivotally mounted at the rear end thereof for swinging movement in a vertical plane to carry top rolls toward and from a position overlying said bottom rolls, and means for applying roll weighting pressure to a forward portion of said lever means including and connected thereto a spring pressed lever having a bodily adjustable pivot.

5. A drawing mechanism as claimed in claim 4 including a link between said spring pressed lever and the forward end of said weighting means.

6. A drawing mechanism as claimed in claim 5 in which said link is releasably mounted on the forward end of said weighting means.

7. In a drawing mechanism for spinning and roving frames, the combination with a plurality of pairs of top and bottom drafting rolls positioned to act successively on a sliver, roll weighting lever means pivotally mounted at the rear end thereof for swinging movement in a vertical plane to carry top rolls toward and from a position overlying said bottom rolls, and means for applying roll weighting pressure to a forward portion of said lever means including and connected thereto a coil spring-pressed lever having a bodily adjustable pivot, and also including spring-retaining means having visible indicia for adjustably setting the same.

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