June 16, 1942. F. K. HENDRICKSON 2,286,616

ROLL TENSION DEVICE

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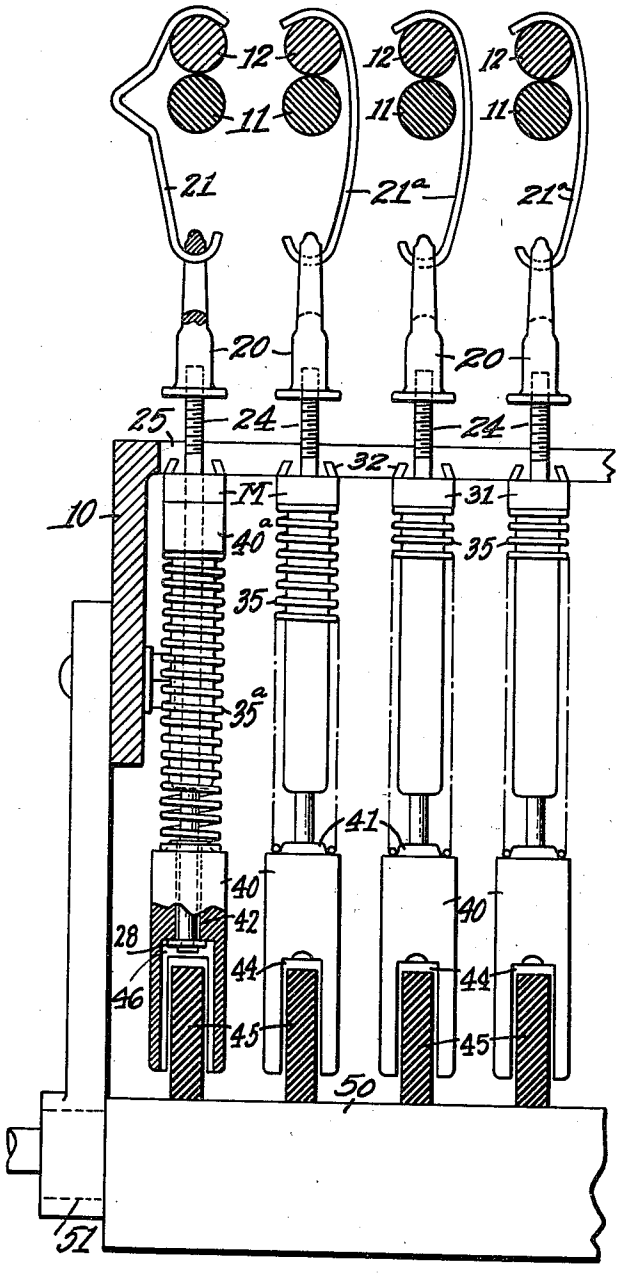


Fig. 1.

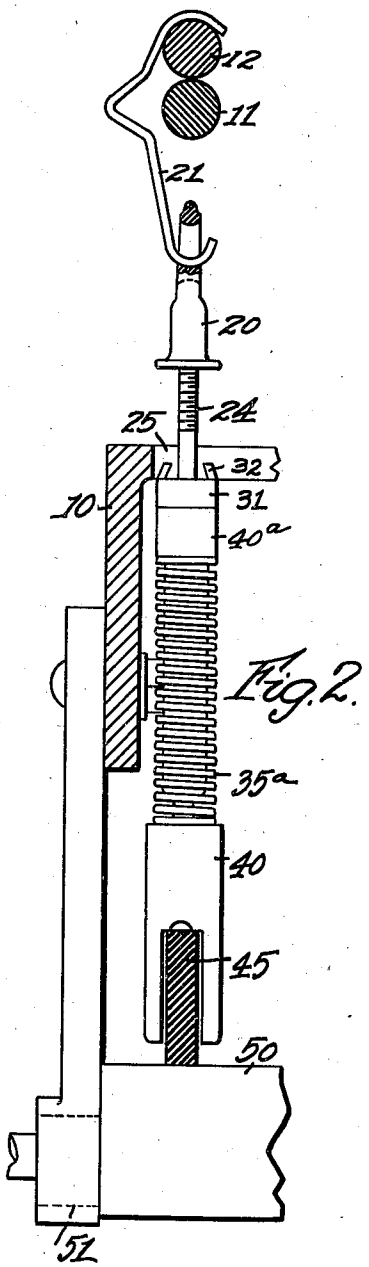


Fig. 2.

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Fig. 3.

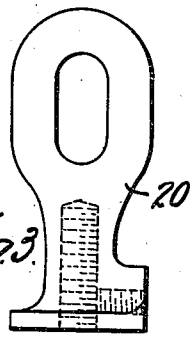


Fig. 4.

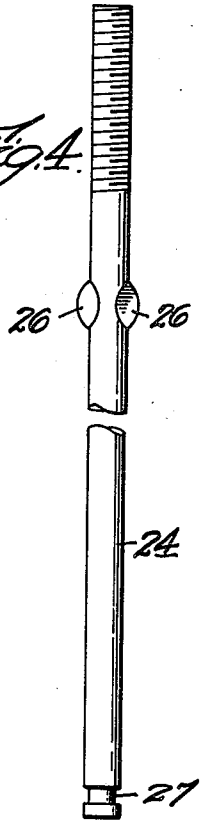


Fig. 7.



Fig. 5.

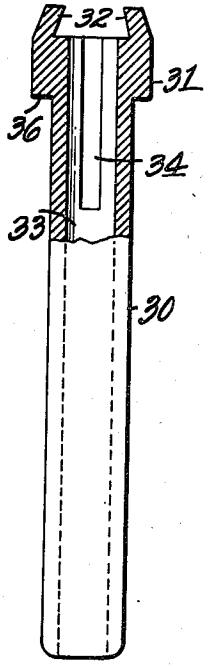


Fig. 6.

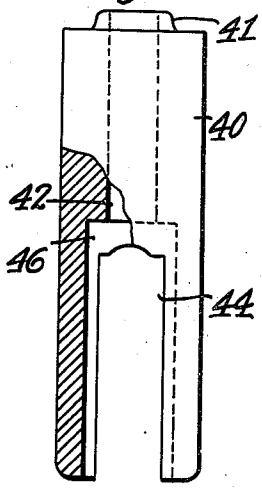
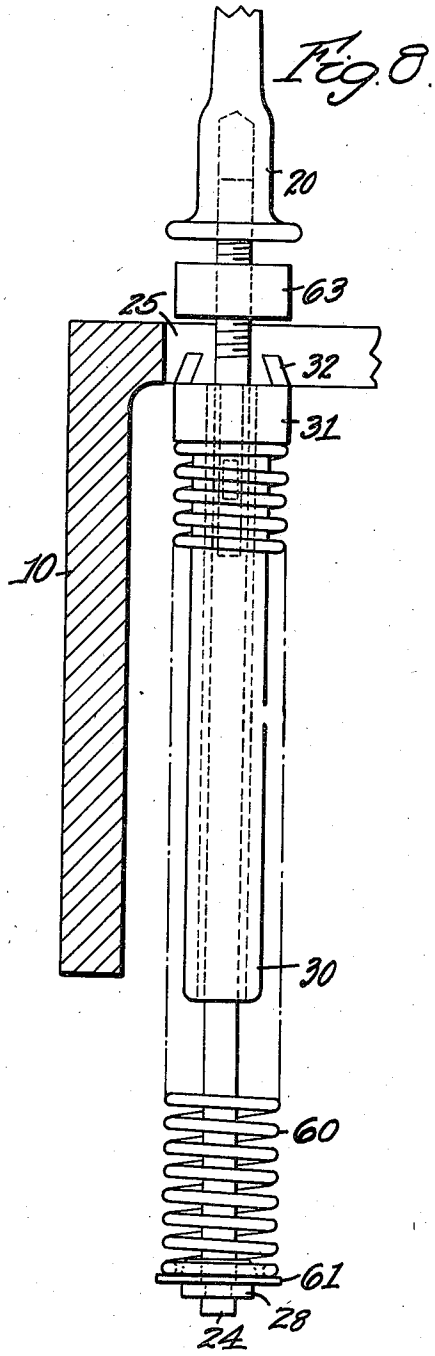


Fig. 8.



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UNITED STATES PATENT OFFICE

2,286,616

ROLL TENSION DEVICE

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Application April 21, 1941, Serial No. 389,577

3 Claims. (Cl. 19—135)

This invention relates to drawing frames in which textile fibers are drafted preparatory to forming rovings therefrom. In such drawing frames, it is customary to provide a separate tension device for each top roll, with the tension commonly applied by separate weights, each suspended by a hook or hanger from one of the top rolls.

It is the general object of my invention to provide an improved roll tension device in which a self-contained spring tension unit supplies the tension, and in which the tension may be accurately adjusted and predetermined before the unit is placed in the drawing frame.

A further object is to provide a spring tension unit which may be easily rendered inoperative whenever desired. I also provide improved connections to the hook or hanger, which connections are longitudinally adaptable to top rolls at different elevations.

My invention further relates to arrangements and combinations of parts which will be hereinafter described and more particularly pointed out in the appended claims.

Preferred forms of the invention are shown in the drawings, in which

Fig. 1 is a sectional side elevation of parts of a drawing frame embodying my improvements;

Fig. 2 is a sectional side elevation of one of the tension units in inoperative position;

Figs. 3 to 7 are side elevations of different elements forming parts of my improved tension unit; and

Fig. 8 is a sectional side elevation of a slightly modified form of my invention.

Referring to Fig. 1, I have shown portions of the base or frame 10 of a drawing frame having a plurality of bottom rolls 11 and top rolls 12 mounted in the usual roll supports (not shown). Two separate spring tension units M are provided for each top roll 12, and these units M each have a top member or cap 20 connected by a hook or hanger 21 (or 21a) to the associated top roll 12.

Each top member or cap 20 is threaded on the upper end of a rod 24 which extends downward through a slot 25 in the upper surface of the base or frame 10. Each rod 24 has a pair of lugs 26 struck up therein near the upper end of the rod 24, and has an annular groove or recess 27 in its lower end to receive a slotted washer 28 (Fig. 7).

The rod 24 extends downward through a sleeve 30 (Fig. 5) having an enlarged upper end 31 abutting the under side of the top plate of the frame 10, and also has end lugs 32 extending into the slot 25 and preventing rotation of the sleeve 30.

An axial opening 33 through the sleeve 30 loosely receives the rod 24, and short recesses 34 receive the lugs 26 and limit downward movement of the rod 24 in the sleeve 30.

A coil spring 35 is loosely mounted outside of the sleeve 30 and at its upper end commonly engages the lower surface 36 of the enlarged end portion 31 of the sleeve 30. In some cases, however, the spring engages a spacing collar 40a mounted below the end portion 31 for a purpose to be described.

At its lower end, each spring 35 engages the upper end of a block 40 and is centered by an annular projection 41 thereon. The block 40 has a longitudinal opening 42 to loosely receive the rod 24 and also has a recess 44 extending substantially upward from its lower end and adapted to receive a lifting bar 45. The block 40 has an additional annular recess 46 somewhat wider and deeper than the recess 44 and adapted to receive the washer 28, when said washer is mounted in the groove 27 at the lower end of the rod 24.

The parts are assembled by placing the rod 24 in the sleeve 30, mounting the spring 35 outside of the sleeve 30, placing the block 40 on the rod 24 and against the lower end of the spring 35, and forcing the block far enough on to the rod 24 so that the groove 27 projects through the block 40 to a position in which the washer 28 may be mounted in the groove.

When pressure is thereafter released, the parts assume the relation shown in Fig. 1, with the spring 35 compressed between the shoulder 36 and the upper end of the block 40, which parts are spaced apart at a definite distance predetermined by the washer 28. The compressed length of each spring 35 is thus definitely fixed. By using springs of established strength, the tensions of the different units may be made substantially uniform and the parts may be assembled with the springs under such uniform tension before they are placed in the drawing frame.

It is sometimes desirable that the front drawing rolls have greater tension than the other rolls, and for this purpose the spacing collar 40a may be inserted to shorten the space which receives the spring 35a and to correspondingly increase its pressure. A different size of wire may be used for the spring 35a if so desired.

The lifting bars 45 are of a usual construction and are supported at their ends on shafts

50 having eccentric bearing portions mounted in fixed bearings. One of the shafts 50 is shown in Figs. 1 and 2.

As shown in Fig. 1, the shaft 50 is in its lowest position and the bars 45 do not extend to the upper ends of the slots 44. The springs 35 are thus permitted to exert pressure through the caps 20 and hooks 21 on the top rolls 12.

In cases where the top rolls are covered with leather or other cushion material, it is desirable to release the pressure on the rolls when the machine is to stand idle for any length of time. This is easily accomplished by turning the shafts 50 to their raised positions, as indicated in Fig. 2, in which positions the lifting bars 45 engage the lower ends of the rods 24 and lift the top members or caps 20 away from the hooks 21, so that no pressure is applied to the rolls.

Variations in the elevation of the top rolls 12 above the frame 10 are easily taken care of by screwing the caps 20 upward or downward relative to the rods 24.

In some cases the top rolls are all metal and have no cushion surface and it is unnecessary to release the pressure when the machine is stopped. Under these conditions, the lifting bars 45 and the eccentric shafts 50 may be omitted, along with the blocks 40, and the simpler construction shown in Fig. 8 may be substituted.

In this construction, the lower end of the spring 60 rests on a dished washer 61, which in turn engages the slotted washer 28 on the lower end of the rod 24. This provides a support for the lower end of the spring 60 at a predetermined distance from the upper end of the sleeve 30.

A stop collar 63 is threaded on the upper end of the rod 24 below the cap 20. This collar provides a stop to engage the top surface of the frame 10 and holds the associated tension device in position when the hooks or hangers 21 are removed from the caps 20 to permit replacement of a roll. Spacing collars 40a may also be used in this construction, as previously described.

The modified tension unit shown in Fig. 8 has the same advantage as the first form in providing for complete assembly before being placed in the machine, with the exception of the stop collar 63 and cap 20, which are applied to the upper end of the rod 24 after the rod is inserted in the slot 25.

This modified structure is not specifically claimed herein, however, as it is disclosed and claimed in my copending application, Serial No. 375,141, filed January 21, 1941.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claims, but what I claim is:

1. In a drawing frame having top rolls, in combination, a spring tension unit for each top roll comprising a sleeve member abutting a fixed surface below the top rolls and having an axial opening, a rod slidable in said opening and connected at its upper end to one of said top rolls, said rod having upset lateraly enlargements intermediate its length and said sleeve having internal longitudinal slots in its upper end portion to receive said enlargements and to thereby limit downward movement of said rod in said opening, a coil spring mounted on said sleeve, means on said rod to support the lower end of said spring, and means to engage and lift said rod and to thereby relieve the spring tension on the associated top roll.

2. In a drawing frame having top rolls, in combination, a spring tension unit for each top roll comprising a sleeve member abutting a fixed surface below the top rolls and having an axial opening, a rod slidable in said opening and connected at its upper end to one of said top rolls, means to limit downward movement of said rod in said opening, a coil spring mounted on said sleeve, a block slidable on said rod and engaged by the lower end of said spring, means to limit downward movement of said block on said rod, the lower end of said block being slotted, a lifting bar vertically movable in said slotted end, and means to simultaneously engage a plurality of said bars and to lift said bars to raise said rods and to thereby simultaneously relieve the spring tension on a plurality of associated top rails.

3. In a drawing frame having top rolls, in combination, a spring tension unit for each top roll comprising a sleeve member abutting a fixed surface below the top rolls and having an axial opening with short lateral recesses at its upper end, a rod slidable in said opening and having lugs seating against the lower ends of said recesses and connected at its upper end to one of said top rolls, a coil spring mounted on said sleeve, a block slidable on said rod and engaged by the lower end of said spring, means to limit downward movement of said block on said rod, the lower end of said block being slotted, a lifting bar vertically movable in said slotted end, and means to lift said bar in said slotted end to engage and raise said rod and to thereby relieve the spring tension on the associated top roll.

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