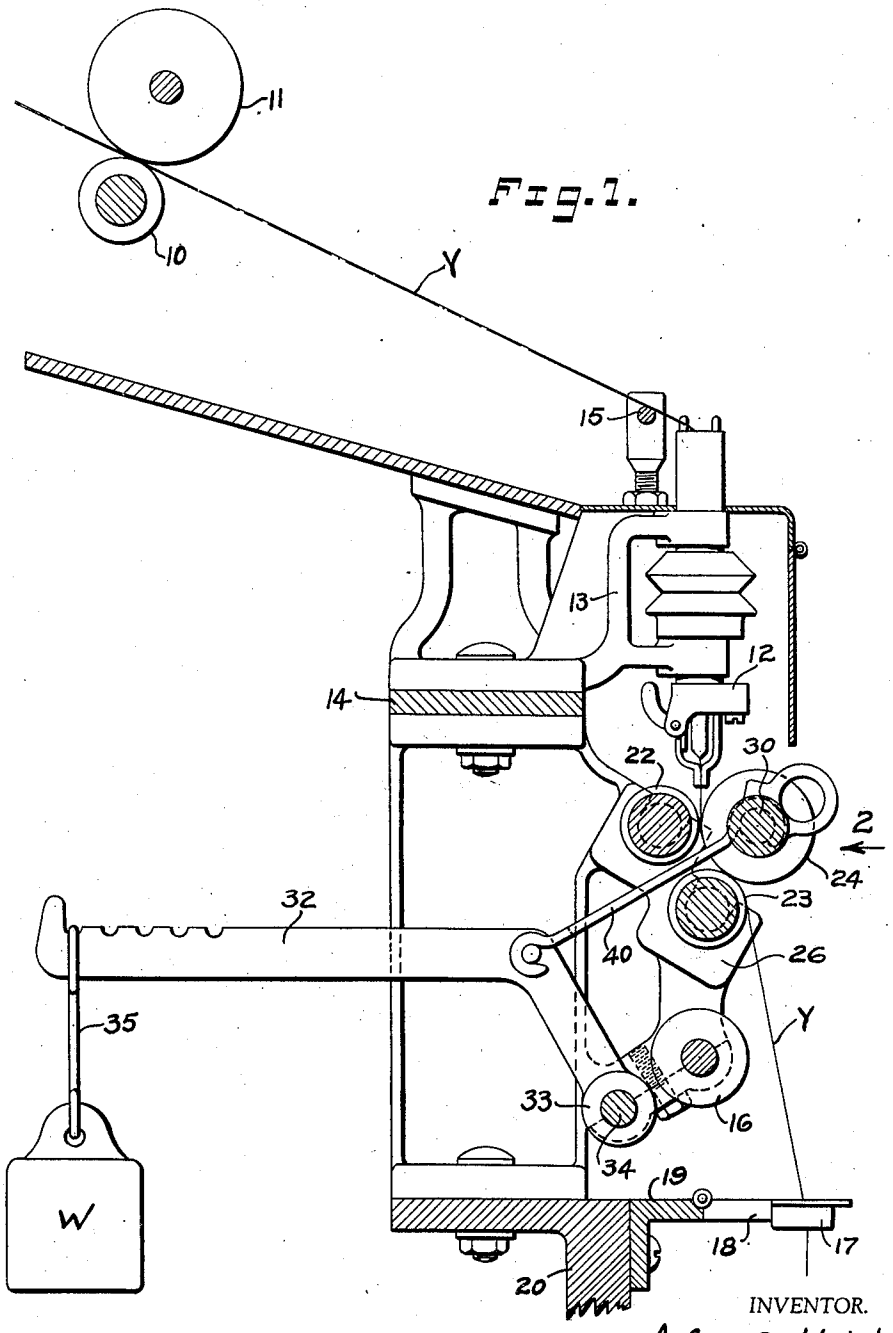
Sept. 11, 1934. J. A. KOOISTRA 1,973,534

DRAWING MECHANISM FOR WOOL SPINNING FRAMES

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Fig. 1.



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Fig. 2.

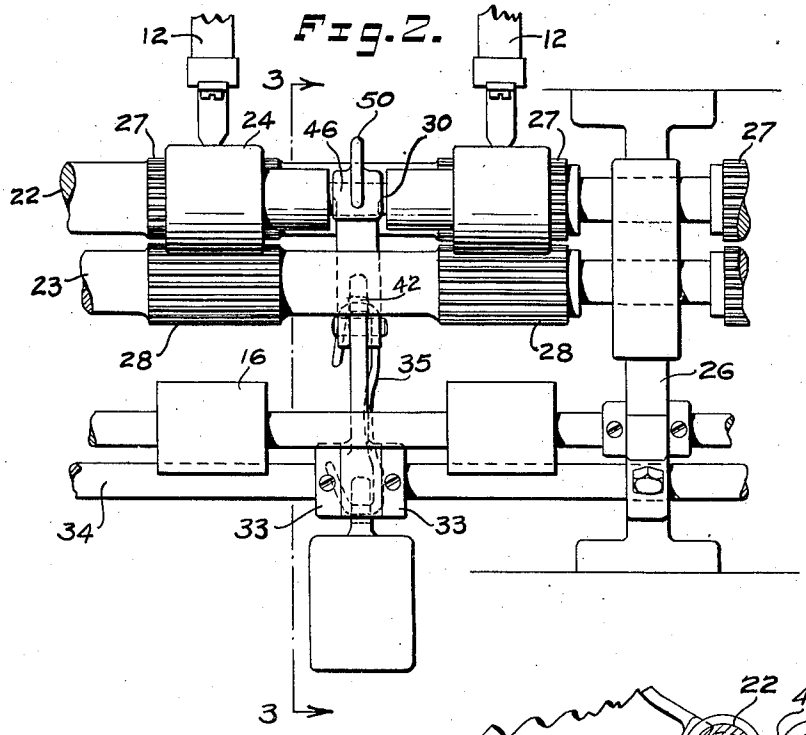
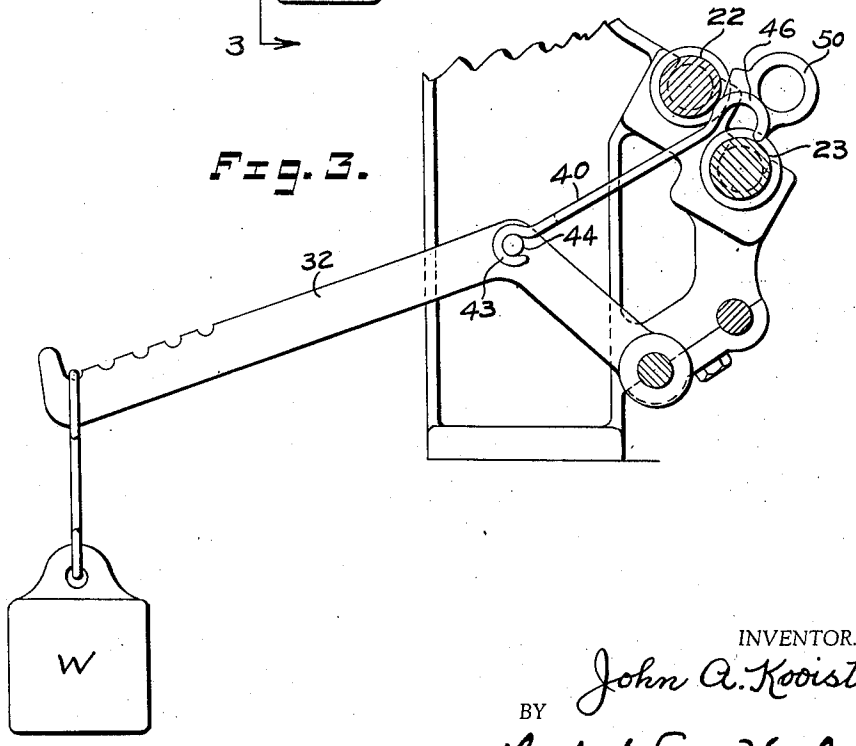


Fig. 3.



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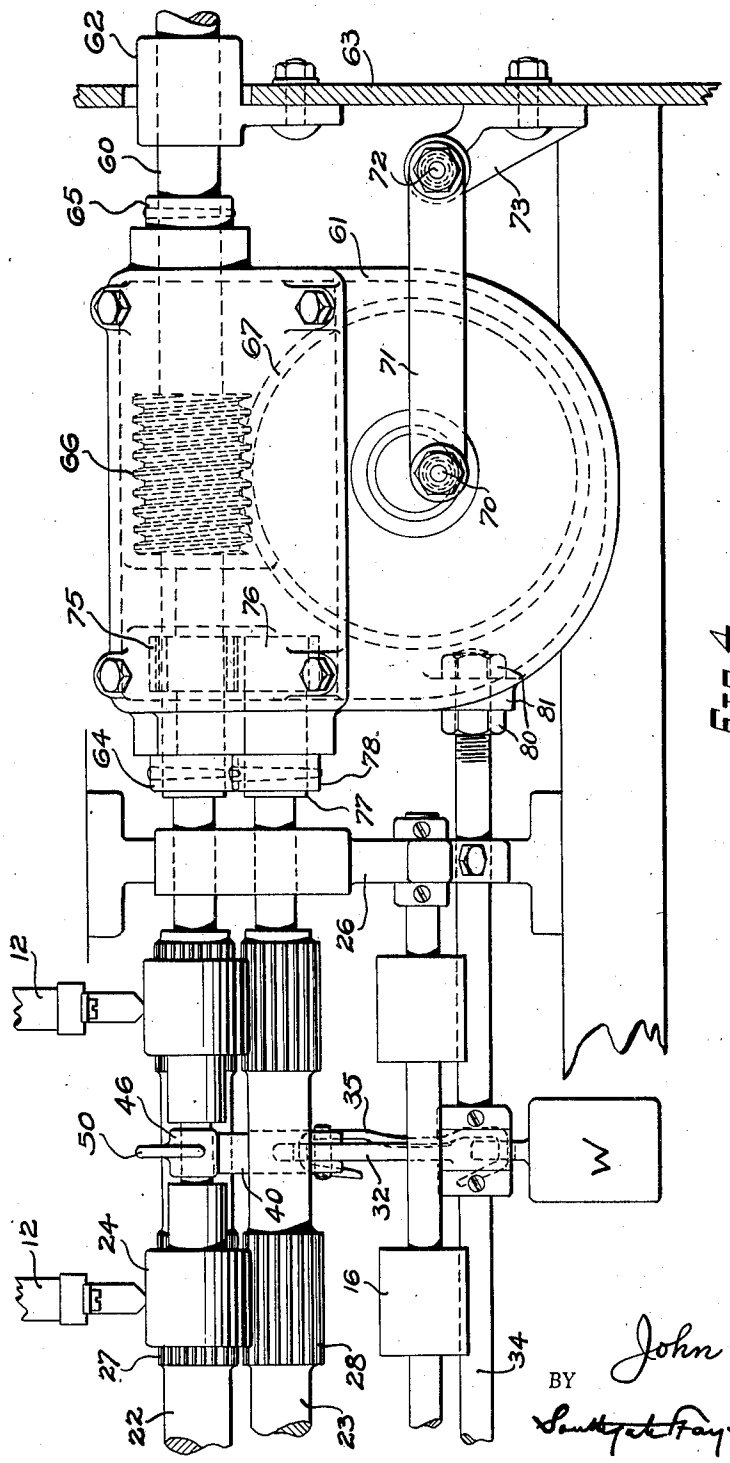


Fig. 4.

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1,973,534

DRAWING MECHANISM FOR WOOL SPINNING FRAMES

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Application March 7, 1932, Serial No. 597,121

3 Claims. (Cl. 19—130)

This invention relates to machines for spinning textile fibres and particularly to wool spinning frames.

It is the object of my invention to improve the construction of such machines as heretofore built to the intent that they may be more effective and reliable in operation and more convenient for the operator.

In furtherance of my invention, I provide an improved arrangement of drawing rolls by which a more effective draft of heavy yarn is made possible, and I also provide improved means for applying tension to the movably mounted drawing roll or top roll.

Another feature of my invention relates to the provision of means for axially reciprocating the drawing rolls and the top roll weighting devices relative to the twister heads and spindles.

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

A preferred form of the invention is shown in the drawings, in which

Fig. 1 is a sectional end elevation of a portion of a wool spinning frame embodying my improvements;

Fig. 2 is a partial front elevation, looking in the direction of the arrow 2 in Fig. 1;

Fig. 3 is a sectional end elevation, taken along the line 3—3 in Fig. 2 but showing the parts in a different position, and

Fig. 4 is a front view of the mechanism for axially reciprocating the rolls and weighting devices.

Referring to the drawings, I have shown certain parts of a commercial wool spinning frame including a yarn delivery roll 10, a delivery top roll 11, a series of twister heads 12 rotatable in brackets 13 secured to a twister head rail 14, a guide or deflector rod 15 mounted above the twister heads, a scavenger roll 16, and a thread guide 17 mounted in a thread board 18 hinged to a support 19 which is secured to the frame 20 of the machine. All of the parts thus far described may be of the usual construction and in themselves form no part of my present invention.

In place of the two draft rolls heretofore commonly used in wool spinning frames, I provide upper and lower driven rolls 22 and 23 and movable or top rolls 24. The driven rolls 22 and 23 are mounted in spaced bearings in roll stands 26, which stands also provide bearings for the scavenger roll 16.

Suitable driving mechanism is provided for rotating the rolls 22 and 23 at the same surface speed, which speed is in the desired draft relation to the surface speed of the delivery roll 10. The rolls 22 and 23 extend lengthwise of the machine and are provided with fluted portions 27 and 28, as indicated in Fig. 2, spaced axially to correspond to the spacing of the twister heads 12.

The movable or top rolls 24 are commonly of such length that each top roll serves two adjacent twister heads. The top rolls 24 are each provided with a reduced intermediate or bearing portion 30. Levers 32 (Fig. 1) are loosely mounted between collars 33 on rods 34 supported in the roll stands 26. Weights W are connected by links 35 to the levers 32 and may be adjusted along the levers to vary the effective tension.

A link 40 is provided for each lever 32 and its associated top roll 24. At its inner end, each link 40 is slotted, as indicated at 42 (Fig. 2), and is provided with hook-shaped portions 43 engaging a cross-pin 44 in the lever 32.

At its forward or outer end, each link 40 is provided with a hook-shaped bearing portion 46 adapted to be seated on the connecting portion 30 of the associated top roll 24, and is also provided with a forwardly extending ring or handle portion 50.

The normal position of the parts is as indicated in Figs. 1 and 2, with the weight W acting through the lever 32 and its link 40 to apply tension to the movable top roll 24 by engagement of the bearing portion 46 of the link 40 with the connecting portion 30 of the roll 24. The movable top roll is thus permitted to adjust itself to equally engage the fluted portion 27 of the upper drawing roll 22 and the corresponding fluted portion 28 of the lower drawing roll 23.

The yarn Y is thus grasped firmly between the upper drawing roll 22 and the top roll 24, and is also grasped between the lower drawing roll 23 and the top roll 24. This firm engagement of the yarn at circumferentially spaced points greatly reduces the possibility of yarn slippage between the rolls when drawing heavy yarn, such as carpet yarn, and correspondingly increases the uniformity of the yarn.

If it is desired to remove the top roll, the operator grasps the link 40 by the ring or handle portion 50 and draws the link forward far enough to release the roll 24. After the roll is removed, the link 40 may be allowed to seat itself in the position shown in Fig. 3, in which it engages only the unfluted connecting portions of the

rolls 22 and 23, by which it is firmly held in position until the top roll is restored.

There is thus no displacement of the weights W, the levers 32 or the links 40 when the top rolls are removed, but these parts are retained substantially in working position, so that the top rolls may be replaced with the least amount of labor.

It is desirable, in order to avoid grooving the rolls, that provision be made for traversing the rolls and weighting devices relative to the twister heads 12 and to the spinning or twisting spindles.

Suitable mechanism for thus traversing the rolls and weighting devices is shown in Fig. 4, in which the drawing roll 22 is shown as extending into a socket in the end of a worm shaft 60, rotatable in bearings in a casing 61, and also rotatable in an outer bearing 62 fixed on the end frame 63 of the machine.

The shaft 60 is held from axial movement relative to the casing 61 by collars 64 and 65 pinned to said shaft 60 at each side of the casing 61. A worm 66 is mounted on the shaft 60 and engages a worm gear 67 rotatably mounted in bearings in the side walls of the casing 61. A crank-pin 70 rotates eccentrically with the worm wheel 67 and is connected by a link 71 to a stud 72 in a fixed bracket 73.

Consequently rotation of the shaft 60, which is a driven shaft, causes corresponding rotation of the worm gear 67 and crank-pin 70, and as the stud 72 is fixed, the casing 61 and shaft 60 are necessarily reciprocated.

As the pin through the collar 64 also passes through the end of the drawing roll shaft 22, the shaft 22 is also reciprocated. The shaft 22 is provided with sufficiently wide journal portions in the bearing brackets 26 to permit such axial sliding movement.

A pinion 75 on the shaft 60 through an intermediate gear drives a pinion 76 of equal size and having a hub portion 77 rotatable in a bearing in the casing 61. A collar 78 is pinned to the outer end of the hub 77 and also to the end of the drawing roll shaft 23. Consequently the roll shafts 22 and 23 rotate simultaneously and in the same direction, and are also simultaneously moved longitudinally with the casing 61.

The rod 34 on which the weight levers 32 are pivoted is likewise slidable in its bearings in the brackets 26 and is secured by clamping nuts 80 to a lug 81 on the casing 61. Consequently the rod 34 and the weighting devices mounted thereon are also reciprocated axially with the casing 61 and shafts 22 and 23 and relative to the twister heads 12.

As the top rolls 24 are supported entirely by the fluted portions 27 and 28 of the drawing rolls 22 and 23 and are engaged by the upper ends of the links 46, the top rolls 44 also reciprocate relative to the twister heads 12. Consequently the wear of the yarn is distributed and grooving of the top rolls or drawing rolls is effectively prevented.

It will thus be seen that I have provided an improved arrangement of drawing rolls by which more positive drawing action is obtained and slippage of heavy yarn is avoided. I have also provided very convenient and effective means for applying tension to the movable or top roll and for releasing the tension thereon, and I have further provided means for traversing the drawing rolls and weighting devices relative to the twister heads, thereby avoiding grooving of the rolls.

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 spinning frame, a series of twister heads, upper and lower drawing rolls mounted below said twister heads, means to drive said rolls at substantially equal surface speeds, a series of top rolls engaging and jointly supported by said upper and lower drawing rolls, and weighting devices effective to press said top rolls simultaneously against said upper and lower drawing rolls, and means to simultaneously reciprocate said upper and lower drawing rolls and said weighting devices.

2. In a spinning frame, a series of twister heads, upper and lower drawing rolls, a series of top rolls simultaneously engaging both of said drawing rolls, a weighted lever for each top roll, a supporting bar on which said levers are pivoted, a link for each weighted lever extending outward between said drawing rolls, each link being connected at its inner end to its weighted lever and each link at its outer end having a bearing portion engaging a reduced portion of the associated top roll, and means for simultaneously reciprocating said upper and lower drawing rolls and the supporting bar for said levers relative to said twister heads.

3. In a spinning frame, upper and lower drawing rolls, a top roll simultaneously engaging and positioned by both of said drawing rolls, a weighted lever, a pivotal support for said lever, and a link extending outward between said drawing rolls, said link being connected at its inner end to said weighted lever and said link at its outer end having a bearing portion engaging a reduced portion of said top roll and forcing said top roll substantially equally against said two drawing rolls, the transverse dimension of the bearing portion of the link being greater than the greatest distance between the drawing rolls, said link extending between and engaging said drawing rolls when the top roll is released therefrom and said link supporting the weighted lever by such engagement.

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