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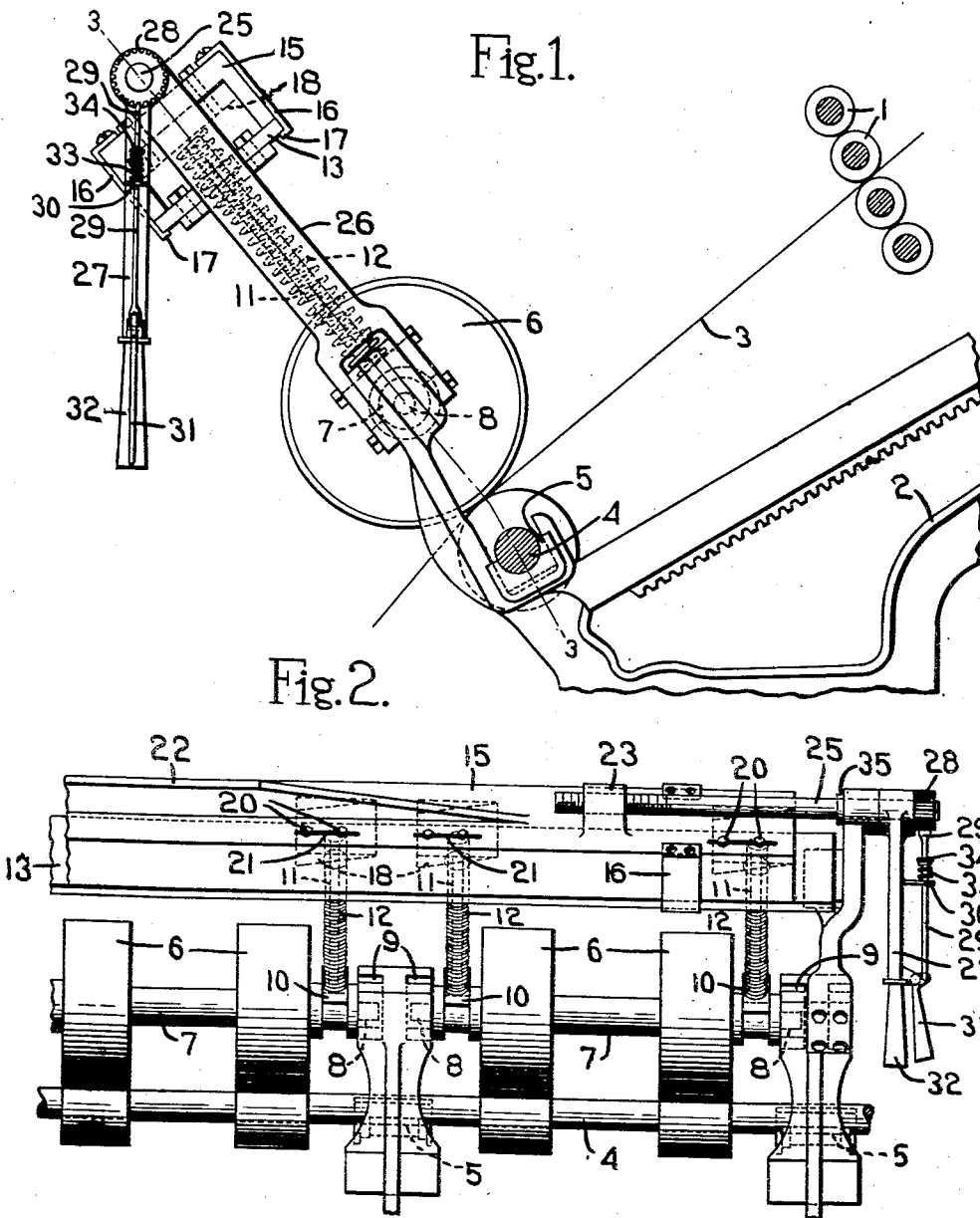
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DRAWING FRAME DRAFT ROLL SPRING TENSION ADJUSTMENT

Filed May 2, 1931

2 Sheets-Sheet. 1



Inventor.
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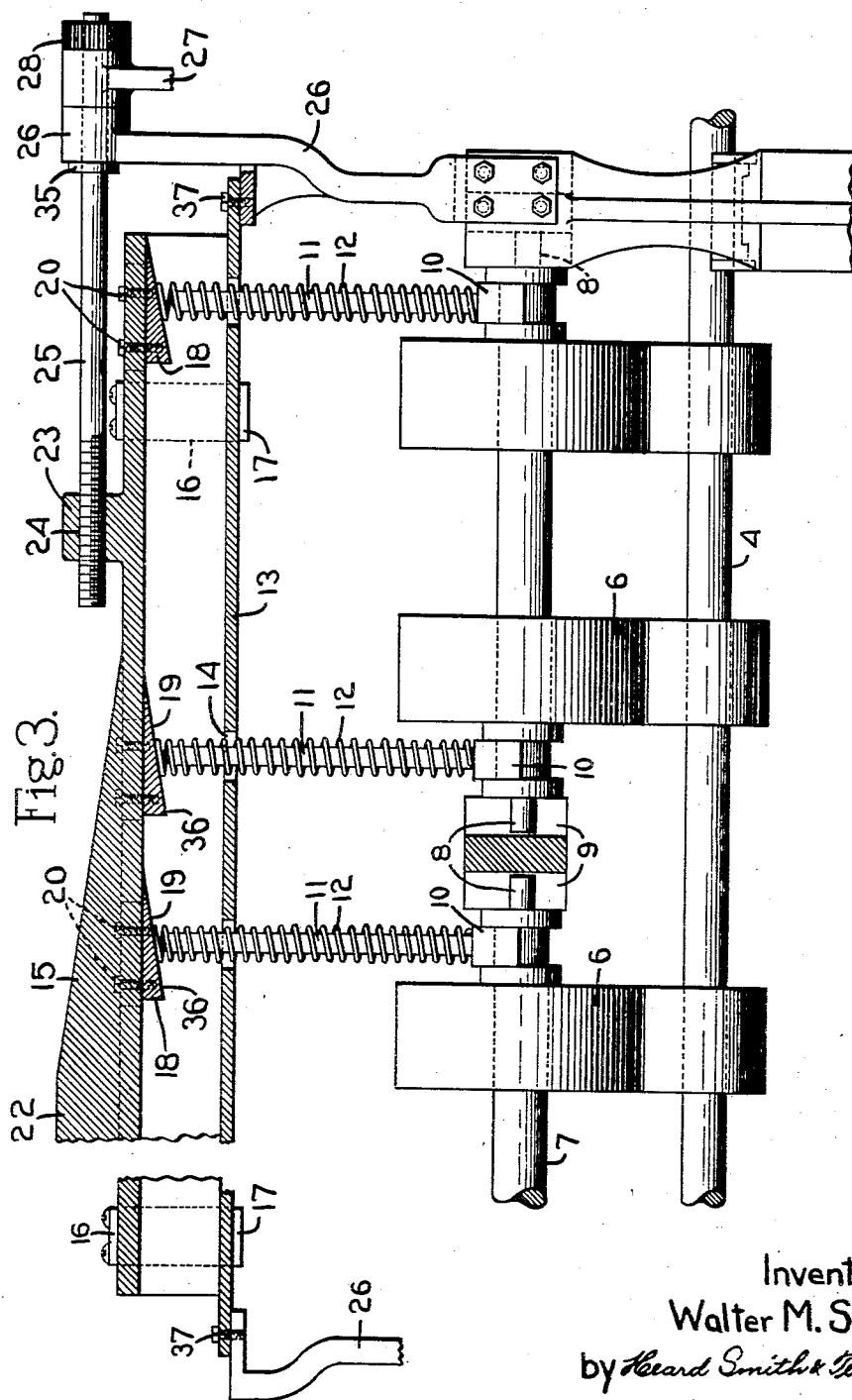
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UNITED STATES PATENT OFFICE

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DRAWING FRAME DRAFT ROLL SPRING
TENSION ADJUSTMENTWalter M. Spring, Springvale, Maine, assignor
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tion of Maine

Application May 2, 1931. Serial No. 534,487

6 Claims. (Cl. 19—135)

The present invention relates to improve-
ments in apparatus for drawing a sliver pre-
paratory to spinning.

In the art of spinning the quality of the yarn
is determined very largely by the uniformity of
the product, while the uniformity of the yarn
is dependent to a large degree upon the proper
drawing of the sliver preparatory to the spin-
ning operation. In producing a high grade
yarn not only must one run of yarn be uniform
throughout its length, but each run of yarn
produced from a multiple spindle spinning de-
vice must be uniform with respect to the other.

It is the general purpose of this invention to
provide a mechanism which will accomplish the
drawing operation with uniformity and pre-
cision.

A further object of the invention is to pro-
vide a mechanism for drawing slivers in which
the pressure exerted upon each sliver as it
passes between the drawing rolls may be ad-
justed simultaneously and uniformly.

A further object of the invention is to pro-
vide a drawing mechanism in which the pres-
sure on each sliver at the drawing rolls may be
individually adjusted, and thereafter such pres-
sure may be uniformly and simultaneously var-
ied or released.

A further object of the invention is to pro-
vide a drawing mechanism which may be read-
ily and rapidly adjusted to the production of
different classes of material.

A further object of the invention is to pro-
vide a drawing mechanism having drawing
rolls which are faced with cork or other similar
material in which ready means are provided to
release the pressure between the upper and
lower drawing rolls when the machine is idle.

Other objects and features will more fully
appear from the following description in con-
nection with the accompanying drawings, and
will be particularly pointed out in the claims.

A desirable form of the invention comprises
briefly a horizontal shaft rotatably mounted in
the frame of the machine being fixed against
axial movement, and having screw threaded en-
gagement with a lug upon an adjusting bar
which extends throughout the length of and is
movable longitudinally in the frame. The ad-
justing bar has mounted thereon wedge shaped
projections which have their tapered faces ar-
ranged longitudinally of the bar, which faces
are engaged by the outer ends of a plurality of
springs. The other ends of the springs bear
against pressure applying shoes which ride upon
short sections of shafting carrying one or more
pressure or upper drawing rolls which are pref-
erably faced with cork or other similar mate-
rial. The short shafts are mounted loosely in
the frame to permit rotation and bodily move-

ment of the pressure rolls into engagement with
a driven draft roll. The sliver ends to be spun
pass between the driven draft roll and the pres-
sure rolls which act to draw the sliver as it is
fed by the usual feed rolls from a suitable source
of supply.

By varying the position of the adjusting bar
the relative position of the ends of all of the
springs with relation to the wedge shaped pro-
jections is changed thereby varying the tension
in all of the springs simultaneously. By rotat-
ing the horizontal shaft in the proper direction,
the tension in the springs can be adjusted or
may be entirely released.

In the drawings:

Fig. 1 is an end elevation of a portion of a
drawing frame embodying the invention.

Fig. 2 is a plan view of the parts shown in
Fig. 1.

Fig. 3 is a longitudinal section on line 3—3,
Fig. 1.

A drawing mechanism of the character to
which the present invention is applied is usu-
ally combined with some form of spinning ap-
paratus. It will not be necessary herein to il-
lustrate or describe the spinning apparatus since it
forms no part of the invention.

The usual feed rolls 1 are mounted rotatably
in the frame 2 of the machine and are driven
in any suitable manner not shown. The feed
rolls function to draw the sliver 3 from a card-
ing machine or other source of supply not
shown. The feed rolls herein referred to are
known also in the trade as back rolls. The
sliver 3 passes from the feed rolls to and be-
tween the drawing rolls from which point the
sliver 3 passes to a spinning device or to some
other preparatory mechanism. The drawing
rolls comprise a driven draft roll 4 extending
throughout the length of the frame and driven
in the usual manner, being supported in jour-
nals 5, and a plurality of cooperating pressure
rolls 6 which preferably are mounted in groups
of two upon short sections of shafting 7. The
phrase "length of the frame" is to be understood
as referring to the length of the entire frame
or of any frame section of a plurality of groups
of pressure rolls.

The shaft sections 7 carrying the pressure
rolls 6 are supported in the frame of the ma-
chine by means of their gudgeon ends 8 which
project into the slots 9 in the frame of the ma-
chine extending substantially radially from the
axis of the driven draft roll 4. The shafts 7
are, therefore, free to rotate and move bodily
toward and from the driven draft roll 4 thereby
permitting the pressure rolls 6 to have yielding
engagement with the driven draft roll 4. The
pressure rolls 6 are faced desirably with a layer
of cork or other material of like character. The

ends of the shafts 7 are reduced desirably in diameter for a short section of their length to form an annular recess to receive pressure applying shoes 10, the lower faces of which are shaped partially to encircle the shaft. The shoes 10 are provided with extensions 11 which project upwardly substantially radially from the axis of the shaft 7 and have mounted thereon springs 12, the lower ends of which bear upon the shoes 10. A guide bar 13 extends throughout the length of the frame and is mounted upon the brackets 26 secured to the frame as by the screws 37. This guide bar extends adjacent the upper ends of the springs 12 and is provided with apertures 14 in which are slidably received the extensions 11 and the springs 12.

An adjusting bar 15 extends throughout the length of the frame and is guided to move longitudinally therein. Any desired method may be employed to guide the adjusting bar 15. A desirable method, however, is herein shown whereby the guide bar 13 serves as a support and guide for the adjusting bar 15. The adjusting bar 15 is of general channel shape in cross section, and is positioned with the open end of the channel toward the upper face of the guide bar 13, the lower edges of the sides of the channel sliding upon the guide bar 13. To maintain the adjusting bar 15 in contact with the guide bar 13, a plurality of brackets 16 are secured to the bar 15 and are provided with laterally bent lip portions 17 which engage the lower face of the bar 13.

The adjusting bar 15 is provided with a plurality of cam shaped projections 18 having their tapered faces disposed longitudinally of the adjusting bar 15 and in position to be engaged by the upper ends of the springs 12. The projections 18 are adjustable longitudinally of the guide bar 15. Such adjustments may be obtained in any desired manner. As herein shown the projections 18 are provided with threaded apertures to receive the ends of the screws 20. The screws 20 pass through a longitudinal slot 21 in the adjusting bar. To adjust the projections 18 the screws 20 are loosened thereby permitting the projection to be moved into the desired position after which the screws are again tightened until the under faces of their heads engage the upper face of the guide bar. The adjusting bar 15 is reenforced to resist the pressure of the springs 12 by a vertical rib 22.

The adjusting bar 15 may be moved longitudinally in any desired manner. One practical method is shown herein in which the bar 15 is provided with a lug 23 having a horizontal screw threaded aperture 24 therein which receives the screw threaded end of a horizontal shaft 25, which is supported rotatably at its other end in one of the brackets 26. The shaft 25 projects outwardly beyond the bracket 26 and has mounted thereon a lever 27 freely rotatable about the shaft. A wheel 28 is fixed to the shaft 25 adjacent the lever 27, and is provided with a plurality of notches in its peripheral face. The lever 27 is provided with a latch 29 by means of which the movement of the lever 27 may be transmitted to and rotate the shaft 25. The latch 29 is guided at its end adjacent the notched wheel 28 by a boss 30 projecting from the side of the lever 27, and in which it may move longitudinally. The lower end of the latch 29 has pivoted connection with an auxiliary lever 31 pivoted upon the lever 27 and situated adjacent the handle portion 32 of the lever. The upper

end of the latch 29 is held normally in one of the notches in the wheel 28 by means of a spring 33 surrounding the latch 29, and bearing at one end against the boss 30, and at its other end against a collar 34 fixed to the latch 29. By alternately pressing the lever 31 to release the latch 29 from engagement with the wheel 28 and swinging the lever through the desired arc of its circle and releasing the lever 31 to permit engagement of the latch 29 with the wheel 28, and subsequently rotating through substantially the same arc of its travel in the other direction, the shaft 25 may be rotated. By actuating the lever 27, therefore, the adjusting bar 15 may be moved in either direction since the shaft 25 is held against longitudinal movement by the collar 35.

The upper ends of the extensions 11 of the shoes 10 extend to a point slightly below the high point 36 of the projections 18, and serve as a lateral support for the free upper ends of the springs 12. When the guide bar 15 is moved toward the right in Fig. 3, the ends of the springs 12 traverse the adjacent faces of the projections 18, and are pressed downwardly thereby increasing the tension of the springs upon the shoes 10 which results in creating a greater pressure between the pressure rolls 6 and the draft roll 4. By moving the guide bar 15 toward the left the tension in the springs is decreased, and if the motion is continued in the same direction, the tension may be released entirely therefrom.

The foregoing presents a simple, preferred and good embodiment of the broad invention involved, and by means of which the pressure exerted upon each sliver as it passes through the drawing rolls may be separately and individually adjusted, and thereafter uniformly and simultaneously varied, released and restored, all as required in the operation of the machine.

The individual adjustment of each pressure shoe, as required in assembling the machine or by any subsequent change in condition is readily effected by shifting the corresponding cam shaped projection 18 on the adjusting bar 15. The simultaneous and uniform adjustment of all the pressure shoes is readily made at any time required by shifting the adjusting bar 15 longitudinally of the machine as by means of the rotatable shaft 25, and the entire release of the pressure of all the shoes is readily effected, as for example, when the frame is to be left standing, by shifting the adjusting bar 15 and in the same manner the pressure is accurately and uniformly restored by shifting the guiding bar 15 when the frame is to be again set into operation.

The invention thus eliminates the tedious and expensive adjustment of the pressure of each one of the pressure shoes heretofore required when the operation of the frame was suspended and restored as when repair or replacement of parts was necessary or as when the frame was left standing overnight or over a week-end.

In the type of frame in which this invention is particularly applicable, the upper or pressure rolls of the drawing rolls are usually made of wood covered with a peripheral face of cork or similar material as heretofore pointed out. If the frame is left standing for any material length of time with the pressure applied, a flat place forms in the cork surface of the pressure rolls which if left in, causes thin places in the yarn thus injuring the quality of the yarn. If these thin places are removed, it can only be done by removing the facing throughout the en-

tire periphery to maintain the circular form of the roll. This in turn means that the rolls have to be more frequently refaced but each time a pressure roll of this kind is refaced with cork or similar material, the wooden body has to be refinished thus reducing its diameter.

By the use of the present invention there is no occasion for these flat places being formed in the pressure rolls, and thus not only the quality of the yarn is maintained but the expense of refinishing and recovering the rolls is materially reduced, and furthermore whenever any roll has to be recovered, the individual adjustment required for the pressure shoes need only be made with respect to a single roll unit.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is:

1. A drawing frame for preparing slivers to be spun comprising a supporting frame, feed rolls, a driven draft roll rotatably mounted in and extending throughout the length of the frame, a plurality of pressure rolls mounted on short shafts which are in turn loosely mounted in the frame to permit rotation and bodily movement toward the draft roll, of the pressure rolls, a plurality of spring actuated pressure inducing members acting yieldingly to move the pressure rolls into engagement with the draft roll, cams cooperating respectively with the spring-actuated pressure-inducing members, independent means for independently adjusting each of said cams to adjust independently the pressure exerted by each pressure inducing means, and means operable to move the said cams simultaneously and uniformly thereby to adjust, release, or restore the pressure exerted by each pressure-inducing member simultaneously and uniformly.

2. A drawing frame for preparing slivers to be spun comprising a supporting frame, feed rolls, a driven draft roll rotatably mounted in and extending throughout the length of the frame, a plurality of pressure rolls mounted on short shafts which are in turn loosely mounted in the frame to permit rotation, and bodily movement toward the draft roll, of the pressure rolls, a plurality of springs acting yieldingly to move the pressure rolls into engagement with the draft roll, a movable abutment extending throughout the length of the machine disposed adjacent the ends of said springs, a plurality of cams mounted on said abutment engaging said springs, means independently to adjust the pressure exerted by each cam and means operable to vary simultaneously and uniformly the pressure thus established upon all of the pressure inducing members and simultaneously to release such pressure therefrom by bodily movement of said abutment.

3. A drawing frame for preparing slivers to be spun comprising a supporting frame, feed rolls, drawing rolls cooperating therewith to produce draft in the sliver, said drawing rolls comprising a driven roll rotatably mounted in and extending throughout the length of said frame, and a plurality of pressure rolls mounted upon a plurality of short shafts which are in turn loosely mounted in the frame to permit rotation, and bodily movement into and out of engagement with the driven roll, of the pressure rolls, pressure inducing shoes riding upon the pressure

roll shafts and having extensions, springs mounted upon said extensions bearing at one end upon said shoes, a fixed guide bar having apertures loosely to receive the outer ends of the springs to permit longitudinal movement thereof, an adjusting bar extending throughout the length of the frame and longitudinally movable therein, cam shaped projections upon the bar with their tapered faces engaging the outer ends of the springs, means to move the bar relatively to the ends of the springs thereby simultaneously and uniformly varying or releasing the tension of the springs with a resulting variation of pressure between the pressure rolls and the draft roll.

4. A drawing frame for preparing slivers to be spun comprising a supporting frame, feed rolls, drawing rolls cooperating therewith to produce draft in the roving, said drawing rolls comprising a driven roll rotatably mounted in and extending throughout the length of the frame and a plurality of cork faced pressure rolls mounted upon a plurality of short shafts which are in turn mounted in the frame to permit rotation, and bodily movement into and out of engagement with the driven roll, of the pressure rolls, pressure inducing shoes riding upon the pressure roll shafts and having extensions, springs upon said extensions bearing at one end upon said shoes, a fixed guide bar having apertures loosely to receive the outer ends of said springs and permit longitudinal movement therethrough, an adjusting bar extending throughout the length of the frame and longitudinally movable therein, cam shaped projections upon said bar having their tapered faces engaging the outer ends of said springs, means to adjust the position of said cam shaped projections along said bar whereby the tension of each spring may be adjusted independently and manually operated means to move the bar longitudinally thereby causing relative movement between said projections and the ends of said springs whereby the tension of all the springs may be varied or released uniformly and simultaneously.

5. A drawing frame for preparing slivers to be spun comprising a supporting frame, feed rolls, a driven draft roll rotatably mounted in and extending throughout the length of the frame, a plurality of pressure rolls mounted on short shafts which are in turn loosely mounted on the frame to permit rotation and bodily movement thereof toward and from the draft roll, a plurality of springs acting upon the pressure roll shafts to move the pressure rolls against the draft roll, wedge-shaped cams of similar contour engaging respectively the said springs, and means to move the said cams simultaneously equal amounts relatively to the springs thereby to effect a uniform change in spring pressure between each pressure roll and said draft roll, thereby simultaneously and uniformly to adjust, release, or restore the pressure exerted by said pressure rolls upon the draft roll.

6. A drawing frame for preparing slivers to be spun having the construction defined in claim 5, together with independent means for adjusting independently the relative positions between each spring and its cooperating cam, thereby accurately to equalize the pressure exerted by all of said springs.

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