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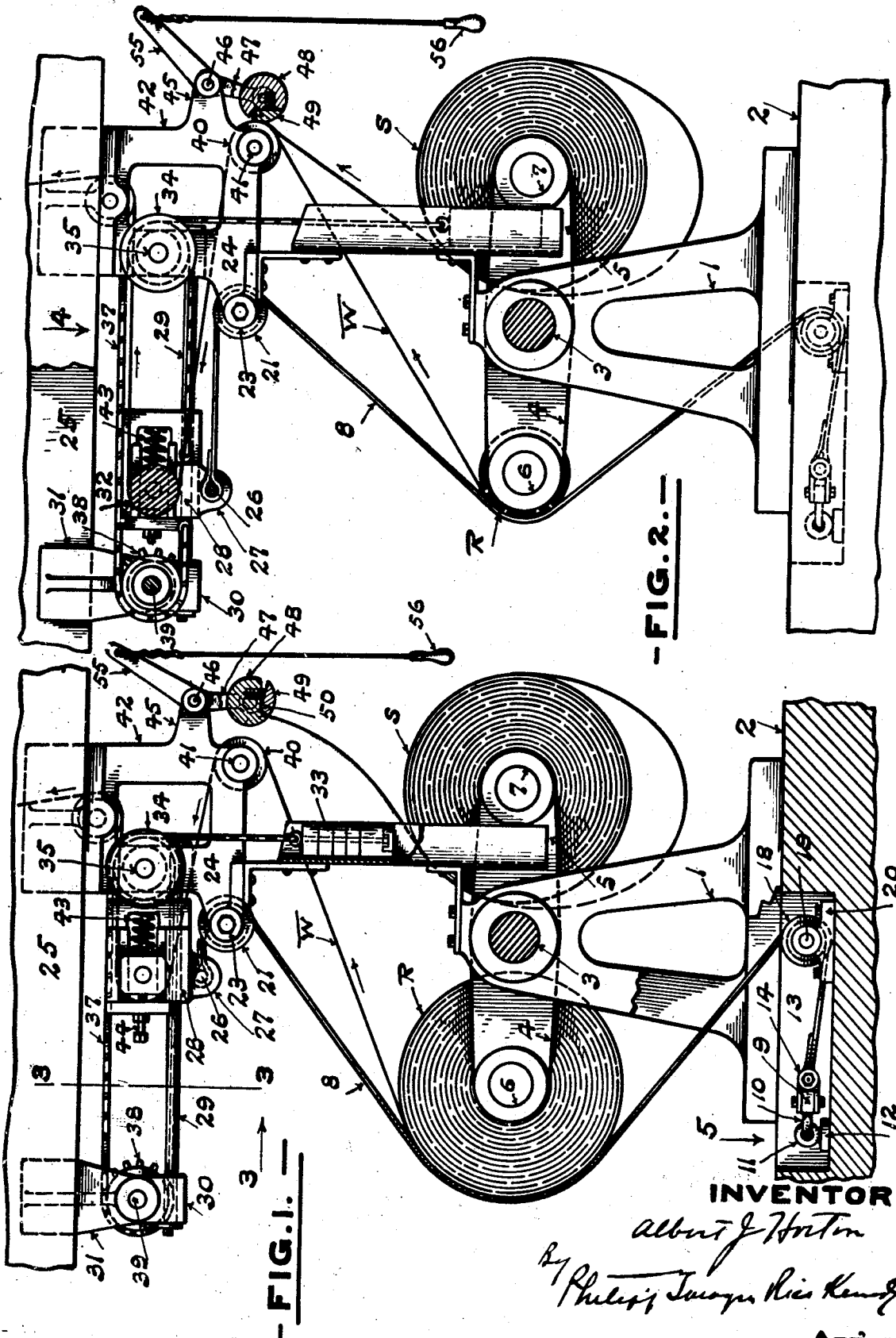
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WEB ROLL CONTROLLING MECHANISM

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2 Sheets-Sheet 1



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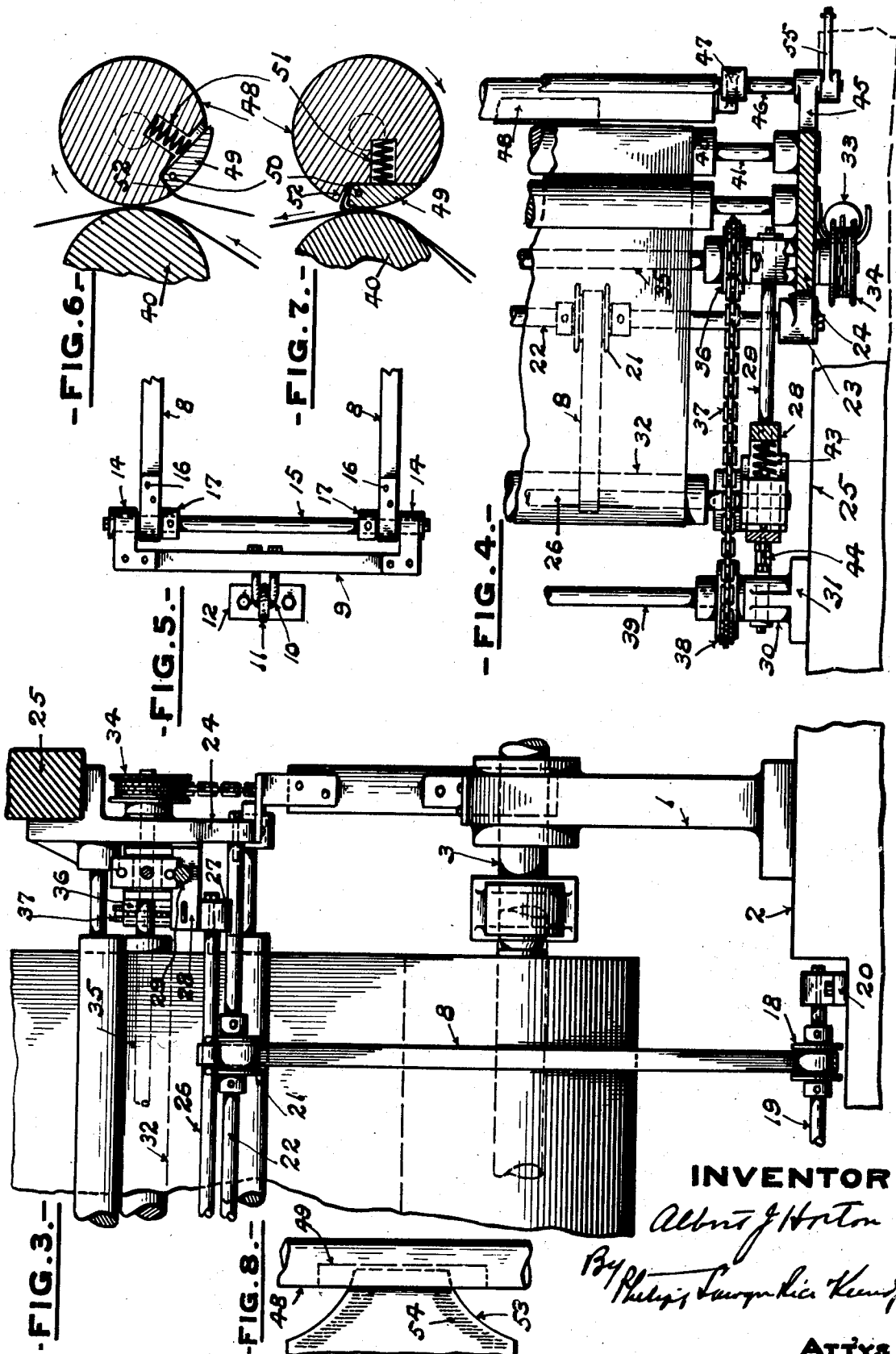
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UNITED STATES PATENT OFFICE

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WEB ROLL CONTROLLING MECHANISM

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18 Claims. (Cl. 242—75)

This invention relates to certain improvements in web roll controlling and changing mechanisms.

It is the especial object of the present invention to produce an improved tension device, particularly for controlling a web roll while it is unwinding, in which a controller is employed engaging the web and movable in a horizontal direction on variations in web tension, the controller mechanism being arranged above the support for the web rolls, so that but a small movement of the controller is required to effect the desired operation of the tension device.

It is a further object of the invention to arrange the tension device on one side of a rotary support capacitated to support a running roll and a spare roll, so that by the rotation of the support the rolls may be successively moved from loading position to running position in contact with the tension device.

It is a further object of the invention to produce an improved tension device and roll splicing or pasting device which may act to splice or paste the web of a spare roll to a running web while under the control of the tension device.

It is a further object of the invention to produce such a construction of simple form and of few parts, so that it can be readily employed in press rooms where the space about the press is limited or confined.

With these and other objects not specifically referred to in view, the invention consists in certain novel parts, arrangements and combinations which will be described in connection with the accompanying drawings and the novel features pointed out in the claims hereunto appended.

In these drawings,—

Figure 1 is a side elevation, partly in section and partly broken away, of the improved tension and roll splicing devices, the web from the roll at the left hand side being shown feeding to the press;

Figure 2 is a similar view with the left hand roll nearly exhausted and the web of a spare roll being pasted to the running web;

Figure 3 is a side elevation, partly broken away and partly in section, of the mechanism shown in Figures 1 and 2, the view being taken in the direction of arrow 3 of Figure 1, on line 3—3;

Figure 4 is a plan view of the construction shown in Figure 2, looking in the direction of arrow 4 of that figure;

Figure 5 is a detail view showing the means for securing tension belts or straps at one end;

Figures 6 and 7 are detail views of an improved paster roller, Figure 6 showing the parts in posi-

tion before the paste and Figure 7 during the paste, and

Figure 8 shows an end view of the web from the spare web roll prepared with adhesive preparatory to making the paste.

Referring now to these drawings, the machine chosen to illustrate the invention is a mechanism capacitated to support a running roll and a spare roll, in which there is shown a rotary support for supporting a spare roll and a running roll. While this arrangement is of importance, it will be understood that as to certain features of the invention roll supports other than rotary may be used, and the invention is not to be restricted to the rotary type of web roll support.

The roll support includes a pair of similar standards, one of which is shown, marked 1, rising from a base or other suitable foundation 2. These standards form bearings for rotatably supporting a shaft 3, which is driven from a motor, or in any other suitable manner, not illustrated. Mounted on this shaft are oppositely extending arms 4, 5, these arms being duplicated on the other side of the machine. These arms, at their outer ends, are formed with bearings 6, 7 capacitated to support a running roll R and a spare roll S.

In accordance with the invention, an improved tension device is provided for controlling the rotation of the running web roll, this tension device being operated to apply more or less tension by means of a controller which is actuated on variations in the tension of the running web. The tension device may be of various characters, but in the preferred construction will be in the form of belts or straps, one or more of these straps being provided as desired, and these straps will be so arranged with respect to the roll support that they may be positioned in confined spaces, so that they will not interfere with the changing of the web rolls for web renewal. While the particular construction and arrangement of these parts may be somewhat varied, in the construction illustrated the tension devices are in the form of narrow belts 8, two of these belts being shown, these belts engaging the surface of the roll and acting to exert a tension or pressure on the roll surface so as to properly control the unwinding of the roll as it goes to the press.

These straps are fixedly secured at one end, and at the other end are connected to the controller mechanism hereinafter referred to. The particular means for securing or anchoring the fixed ends of the straps may be somewhat varied. A convenient means, however, is that shown in Figure 5, in

which there is provided a bar 9 secured by staples 10, 11 to an anchor plate 12 secured in a recess 13 in the base 2, before referred to. The bar 9 is provided with bearings 14 to support a rod 15, around which the ends of the straps are looped and secured by rivets 16, or in any other suitable manner, collars 17 being provided for keeping the straps in proper position on the bar. These straps pass over guide sheaves 18 on a cross-shaft 19 suitably mounted in blocks 20 secured in the recess 13, before referred to.

The belts or straps are, as shown, located at the left hand side of the roll support and engage with the surface of the running roll R. Above the roll support, the straps pass over guide sheaves 21 on a shaft 22 supported in bearings 23 on brackets 24 depending from the press frame 25. The other ends of the belts are secured to a rod 26 supported in ears 27 secured to sliding boxes 28, which have a straight line sliding movement in a horizontal direction, these boxes being guided on ways in the form of rods 29 supported at one end in hangers 30 secured to brackets 31, which in turn depend from the press frame 25, before referred to, the rods at their other ends being supported in the brackets 24, before referred to.

In accordance with the invention, there is provided a controller which engages the web and is actuated on variations in web tension to vary the tension or pressure of the tension belts or straps. While the particular form of this controller may somewhat vary, in the particular construction illustrated it is in the form of a roll 32 mounted in the sliding boxes 28, the web W passing around this roll on its way to the press, this roll being in effect a floating roll.

Means are provided for holding the controller roll in such relation to the web that it will exert a tension on the web while the web is running from the roll. While this may be effected in various ways, in the particular construction illustrated the sliding boxes are connected with weights, indicated by the numeral 33, which are supported from one end of a chain which passes over a drum 34 on a shaft 35 suitably supported in the brackets 24, before referred to. This shaft 35, inside the brackets, is provided with a sprocket 36, over which passes a chain 37, this chain also passing over a sprocket 38 on a shaft 39 suitably supported in the brackets 31, before referred to, it being understood that these chains are provided on each side of the machine. The sliding boxes 28 are secured to the chain 37, so that a movement of the chains causes a horizontal movement of the boxes and consequently of the controller roll.

It will be observed that motion of the roller 32 is communicated to the sliding boxes 28, guided positively by sliding on guide rods 29, thence to the chain 37 and sprocket 36 which is secured to the shaft 35. Inasmuch as these parts are duplicated and similarly supported on the opposite side of the machine, they constitute a constraining means which compels both sliding boxes to move to an equal extent when the roller 32 is moved, thereby maintaining the roller in parallelism with other rollers in the path of the web. This is particularly important when half width webs are being used, in which case the pull of the web would be adjacent one end of the roller and the roller would be deflected out of parallelism.

In the operation of the mechanism so far described, the weights 33, through the operation of the chains and sprockets, tend to draw the floating controller roll toward the left, as shown in

the figures, which results in tightening the tension straps or belts engaging the surface of the running roll, so that, if the web slackens or there is a break, the controller roll acts, through the connections described, to increase the tension or pressure exerted by the tension straps. Conversely, if the web tightens up, the sliding boxes and the controller roll are moved toward the right, which raises the weights and reduces the tension or pressure exerted by the tension straps on the running web roll.

In the best constructions, the web from the roll runs over a guide roll 40, this guide roll being supported on a shaft 41 mounted in an extension 42 of the bracket 24, before referred to, this guide roll being positioned, for a purpose hereinafter referred to, somewhat beyond the controller mechanism described. In the best constructions, means are provided to permit a slight movement of the controller roll independently of the sliding boxes to allow for any inequality in the winding of the running web roll. While this may be effected in various ways, in the particular construction illustrated the bearings for the controller roll are shown as engaged by springs 43 which hold the bearings in their seats, the bearings of the roll being adjustable against these springs by set screws 44. Of course, it will be understood that the bearings for the controller roll could, if desired, be rigid and one of the other rolls, as the guide roll 40, be spring mounted to effect the same result.

With the construction so far described it will be seen that a very compact arrangement has been provided for exerting the proper tension on the tension straps in which but a small movement of the parts is required, and in which the control is effected wholly by variations in the tension of the running web. The parts, furthermore, are so arranged that they can be positioned beneath the press, taking up but a small space, and do not in any way interfere with the changing or the renewal of the web rolls, which is particularly important where a rotary type of roll support is used, as in the present instance.

Mechanisms constructed in accordance with the best practice will include improved devices for securing the web of the spare roll to the expiring web from the running roll while the latter is under the control of the friction belts or straps, these means being such that the paste or splice may be made while the web is running, the mechanism being so arranged as to be out of the way of the tension straps or the controller mechanism for controlling the tension of the straps. While this may be effected in various ways, the guide roll 40, before referred to, is mounted so as to be in a convenient position for effecting the paste, the paste being made against this roll by a co-operating pasting mechanism which will now be described.

While this may be of various characters, in the particular construction illustrated the brackets 42 are provided with extensions 45 in which is mounted a rock-shaft 46. Depending from this rock-shaft are arms 47 in which is secured a pasting roll 48. This pasting roll is formed with a movable section 49 which is pivoted in a cut away portion of the roll on a pivot 50, the section being outwardly pressed by a spring 51, this construction providing a gripping jaw, indicated at 52. The end of the web of the spare roll is reduced, as shown at 53 in Figure 8, and has adhesive, indicated at 54, applied to the side edges of the reduced portion. The end of the reduced

portion is gripped in the jaws formed by the section 49 of the roll 48 until it is desired to unite the spare web with the expiring web. When this is to be done, the press is slowed down and the pasting roll 48 is moved, by means of an arm 55 and an operating handle 56, from the position shown in Figure 1 to the position shown in Figure 2. The pressure of the roll 48 against the roll 40 moves the pivoted section 49 inwardly, opening the jaw and releasing the web. The new roll S will be started by the operator by rotating it by hand, and the old web severed by a breaking stick or by hand in the usual manner. When the web of the old roll has been severed, the floating controller roll will remain stationary until the roll support has been rotated to bring the new roll into running position, when the roll will be moved to the position shown in Figure 1 and effect the proper tension of the straps on the new running roll. When the parts are in this position, the press can then be again accelerated to its running speed.

While the invention has been shown and described in its preferred form, it will be understood that various changes may be made in the specific construction and arrangement of the parts without departing from the invention as defined in the appended claims.

What I claim is:

1. Web roll controlling mechanism having in combination a rotatable support for supporting a running web roll and a spare web roll, friction means for controlling the rotation of the running roll, a controller engaging the web and movable with a straight line movement on variations in the web tension, and mechanical connections between the controller and the friction means for operating the latter.

2. Web roll controlling mechanism having in combination a rotatable support for supporting a running web roll and a spare web roll, friction means for controlling the rotation of the running roll, a controller engaging with the web arranged above the roll support and movable in a horizontal direction on variation in the web tension, and mechanical connections between the controller and the friction means for operating the latter.

3. Web roll controlling mechanism having in combination a rotatable support for supporting a running web roll and a spare web roll, friction means for engaging the surface of a running roll arranged at one side of the support and with which the web rolls may successively engage by the rotation of the support, a controller engaging the web and movable with a straight line movement on variations in the web tension, and mechanical connections between the controller and the friction means for operating the latter.

4. Web roll controlling mechanism having in combination a support for a running web roll, a friction belt or strap engaging a substantial area circumferentially of the surface of the web roll, a controller roll mounted above the support engaging the web and movable in a horizontal direction on variation in web tension, connections between the controller roll and the belt, and tension means connected with the controller roll for tensioning the belt.

5. Web roll controlling mechanism having in combination a support for a running web roll, a friction belt or strap engaging a substantial area circumferentially of the surface of the web roll, a controller roll mounted above the support engaging the web and movable in a horizontal di-

rection on variation in web tension, sliding supports for the controller roll, connections between the sliding support and the belt or strap, and a weight for causing a tensioning of the belt.

6. Web roll controlling mechanism having in combination a support for a running web roll, a friction belt or strap engaging a substantial area circumferentially of the surface of the web roll, a controller roll engaging the web and movable on variations in web tension, sliding boxes in which the controller roll is mounted, springs for the boxes of the controller roll, connections between the sliding support and the belt or strap, and tension means connected with the controller roll for tensioning the belt.

7. Web roll controlling mechanism having in combination a support for a running web roll, a friction belt or strap engaging the surface of the web roll, a controller roll engaging the web and movable on variations in web tension, sliding supports in which the controller roll is mounted having a horizontal movement and connecting the controller roll and one end of the belt, a pair of sprockets, sprocket chains, passing over the sprockets and connected to the supports, a shaft for one of the sprockets, and a weight tending to turn the sprocket shaft.

8. Web roll controlling mechanism having in combination a support for a running web roll, a friction belt or strap engaging the surface of the web roll, a controller roll engaging the web and movable on variations in web tension, connections between the controller roll and the belt, a support to which one end of the belt or strap is secured, an anchor, and a swivel connection between the support and the anchor.

9. Web roll controlling mechanism having in combination a support for a running web roll, a friction belt or strap engaging the surface of the web roll, a controller roll engaging the web and movable on variations in web tension, connections between the controller roll and the belt, a rod to which one end of the belt is secured, a bracket carried by the rod, an anchor, and a swivel connection between the bracket and the anchor.

10. In a web tension controlling device operating in response to variations in the pull of a web being drawn from a roll, a roller running in a loop of the web and movable by variation in the pull thereof, bearing means for rotatably supporting the roller, a pair of sliding supports arranged to resiliently carry the bearing means and to press the roller against the web, a guide for each sliding support, and constraining means compelling equal movement of both supports along the guides when the roller is moved.

11. In a web roll controlling device operating in response to variations in the pull of a web being drawn from a roll, a roller running in a loop in the web and pressed in a direction opposite to the pull thereof, bearing means for rotatably supporting the roller, a pair of sliding supports for the bearing means, a guide for each sliding support, constraining means restricting each support to equal movement along its guide when the roller is moved, and a strap bearing against the roll and having one end connected to the sliding supports and the other end secured to an anchorage.

12. In a web roll controlling device operating in response to variations in the pull of a web being drawn from a roll, a roller running in a loop in the web and pressed in a direction opposite to the pull thereof, bearing means for rotatably supporting the roller, a pair of sliding sup-

ports for the bearing means, means for adjusting a bearing means with respect to a sliding support, a guide for each sliding support, constraining means restricting each support to equal movement along its guide when the roller is moved, and a strap bearing against the roll and having one end connected to the sliding supports and the other end secured to an anchorage.

13. A web roll controlling device operating in response to variations in the pull of a web being drawn from a roll, a roller running in a loop in the web and pressed in a direction opposite to the pull thereof, bearing means for rotatably supporting the roller, a pair of sliding supports with resilient means for yieldingly supporting the bearing means, a guide for each sliding support, constraining means restricting each support to equal movement along the guide when the roller is moved, and a strap bearing against the roll and having one end connected to the sliding support and the other end secured to an anchorage.

14. A web roll controlling device operating in response to variations in the pull of a web drawn from a roll, a roller running in a loop in the web and pressed in a direction opposite to the pull thereof, bearing means for rotatably supporting the roller, a pair of sliding supports with resilient means for yieldingly supporting the bearing means, means for adjusting a bearing means with respect to a sliding support, a guide for each sliding support, constraining means restricting each support to equal movement along the guide when the roller is moved, and a strap bearing against the roll and having one end

connected to the sliding support and the other end secured to an anchorage.

15. Web controlling mechanism including in combination, means for rotatably supporting a web roll, a plurality of friction straps pressed into engagement with the periphery of the web roll to tension the web drawn therefrom and means interconnecting said straps for equalizing their pressure against the roll.

16. Web controlling mechanism including in combination means for rotatably supporting a web roll, a plurality of friction straps engaging the periphery of the web roll, means for pressing the straps against the web roll with a uniform tension as the web roll wears down, and interconnecting means between the straps and a stationary support for equalizing the pressure between them.

17. Web controlling mechanism including in combination means for rotatably supporting a web roll, a plurality of friction members yieldingly pressed into engagement with the periphery of the web roll and means interconnecting said members for equalizing their pressure against the roll.

18. Web controlling mechanism including in combination means for rotatably supporting a web roll, a plurality of friction straps pressed into engagement with the periphery of the web roll to tension the web drawn therefrom and a roll pressure equalizing device connecting said friction straps and comprising a bar to which each of said straps is secured, and a swivel mounting for said bar between said straps.

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