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J. J. HALLIWELL

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PAPER ROLL CONTROL

Filed Aug. 21, 1926

4 Sheets-Sheet 1

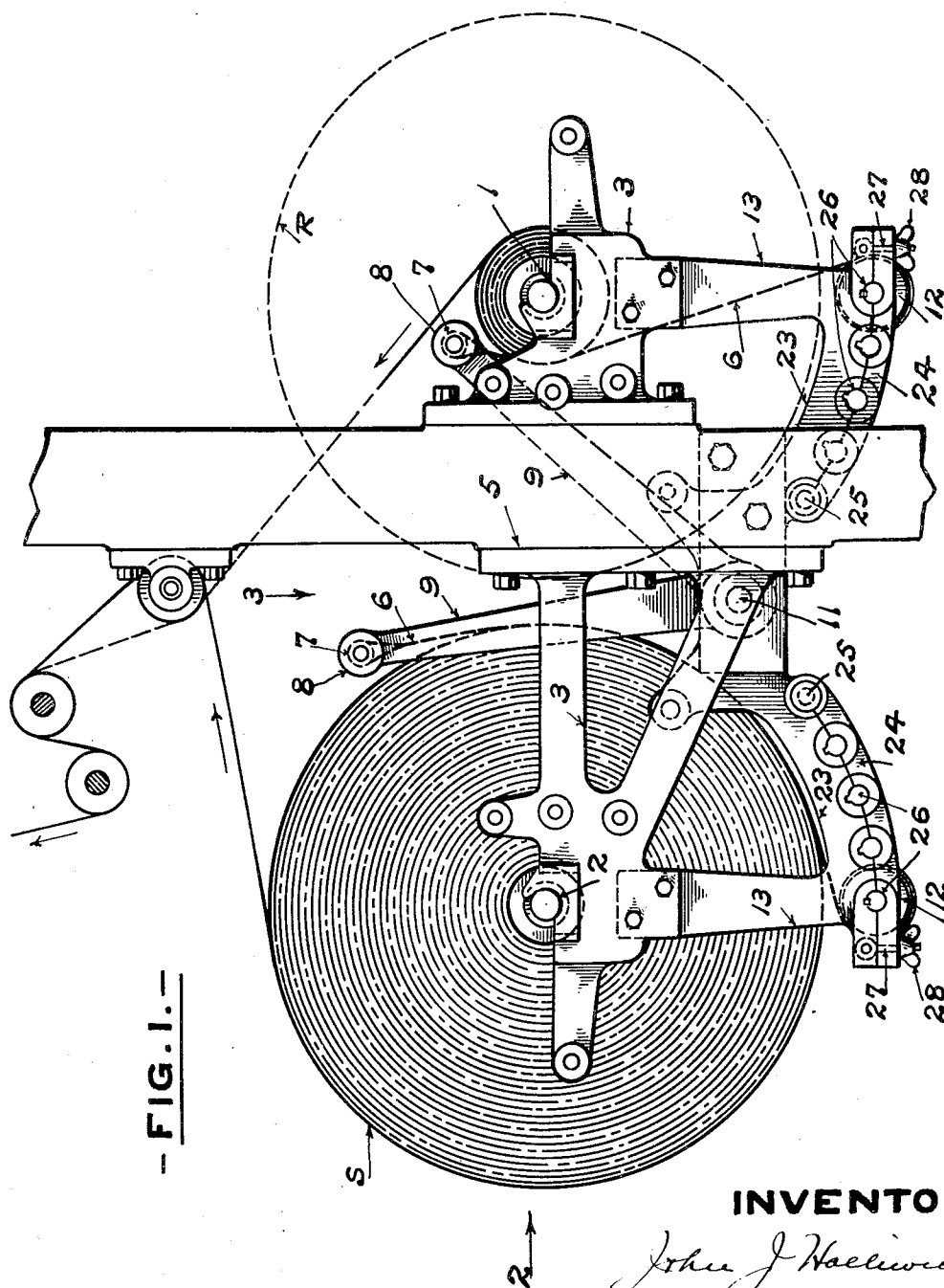


FIG. 1.—

INVENTOR

John J. Wallace
By Philip Sawyer Lincoln

ATT'YS.

Jan. 10, 1933.

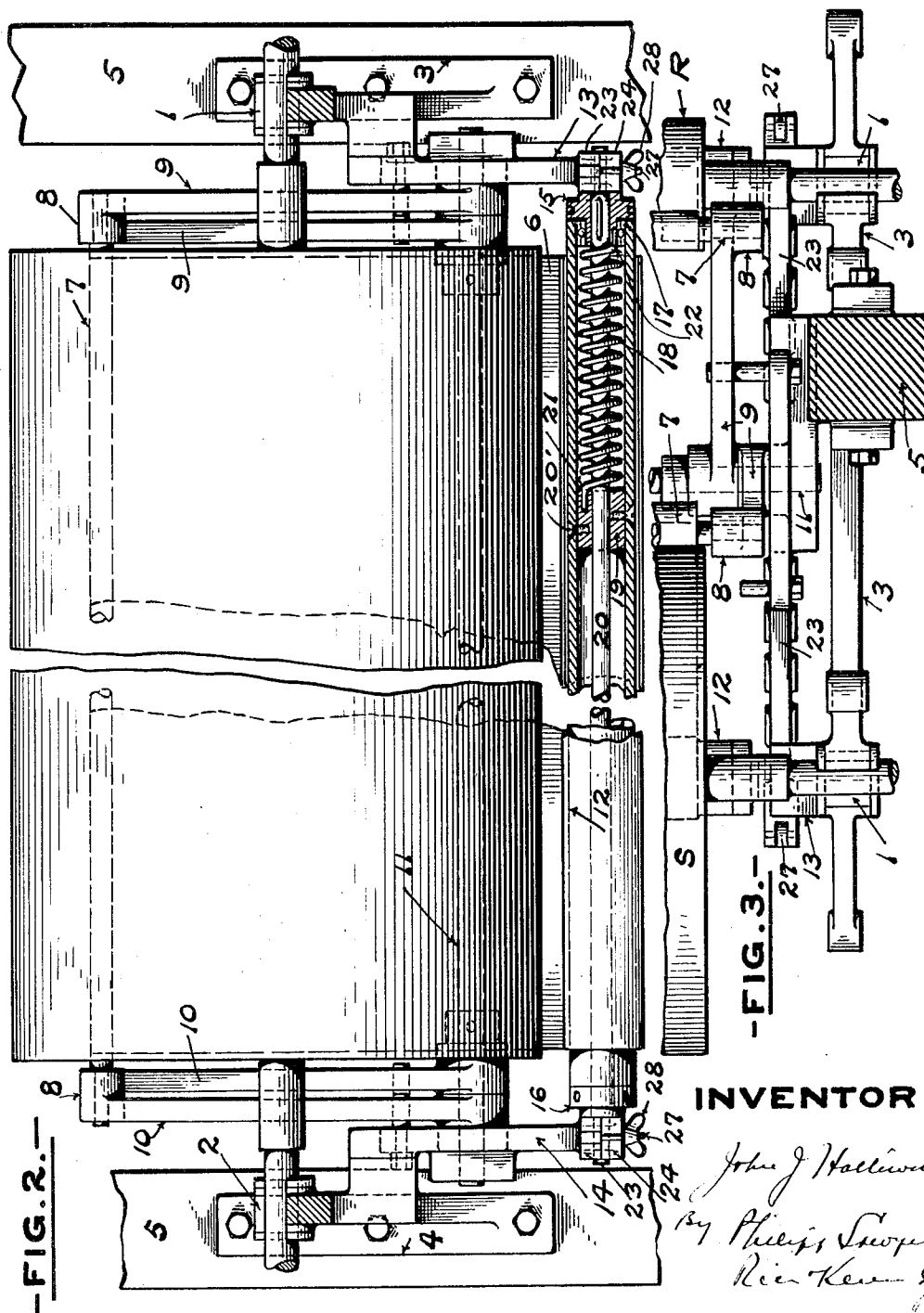
J. J. HALLIWELL

1,893,891

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4 Sheets-Sheet 2



INVENTOR

John J. Halliwell
By Philip S. Snover
Ric. Kern &

ATT'YS.

Jan. 10, 1933.

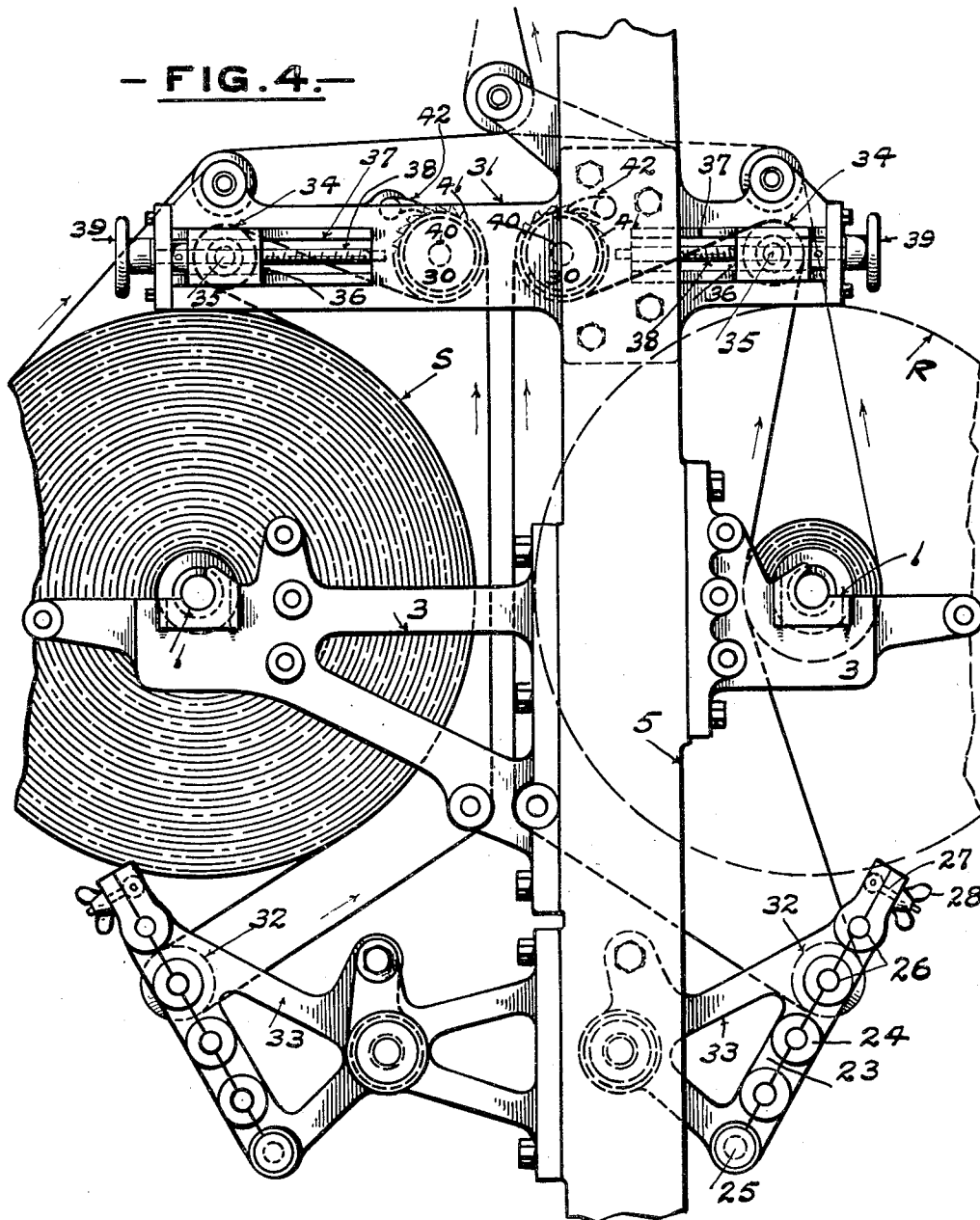
J. J. HALLIWELL

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4 Sheets-Sheet 3



INVENTOR

John J. Halliwell
By *Philip S. Lowry*
Rice Keen &

ATT'YS.

Jan. 10, 1933.

J. J. HALLIWELL

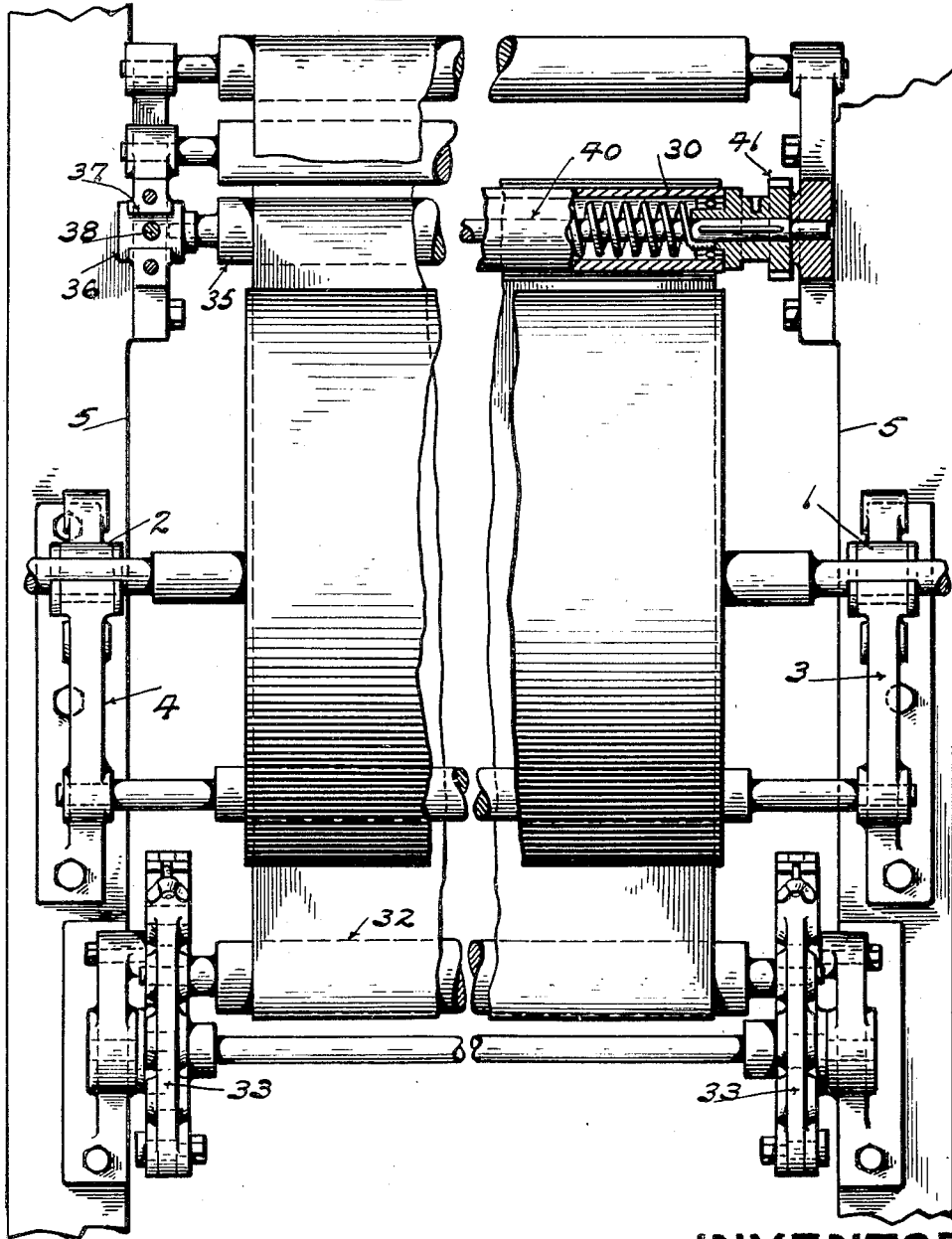
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4 Sheets-Sheet 4

-FIG.5.-



INVENTOR

John J. Halliwell
By Philip S. Sawyer, Ric. Howard

ATT'YS.

UNITED STATES PATENT OFFICE

JOHN J. HALLIWELL, OF TUCKAHOE, NEW YORK, ASSIGNOR TO R. HOE & CO., INC., OF
NEW YORK, N. Y., A CORPORATION OF NEW YORK

PAPER ROLL CONTROL

Application filed August 21, 1926. Serial No. 130,590.

This invention relates to certain improvements in controlling devices for controlling the unwinding of the web rolls used in web printing machines.

It is the especial object of the invention to provide an improved friction means engaging the surface of the web roll for controlling the unwinding of the roll and the tensioning of the web, these means being adjustable so that the tension may be varied within considerable limits and in a simple and quick way.

With this 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 annexed.

In these drawings,—

Figure 1 is an end view of a web roll support showing the improved controlling mechanism in position;

Figure 2 is a side view of the construction shown in Figure 1 looking in the direction of arrow 2 of that figure, the view being partly broken away and partly in section;

Figure 3 is a sectional broken plan view of one side of the mechanism shown in Figure 1;

Figure 4 is an end view, and

Figure 5 is a side view of a modified construction which may be used.

Referring to these drawings and first to Figures 1 to 3, the invention has been shown as applied to a roll construction in which means are provided for supporting a spare roll and a running roll, but it will be understood that the invention may be used with but a single roll and with a roll support of any desired character.

Referring to these drawings, in the construction shown there is provided roll supports for a running roll R and a spare roll S, these rolls being supported in suitable bearings 1, 2, located in brackets 3, 4, suitably supported from framing 5 of any suit-

able character, it being understood that a pair of these brackets is provided for each of the rolls.

In accordance with the invention, a friction means is provided of improved character which engages the surface of the web roll as it unwinds and means are provided for adjusting the friction devices to vary the pressure applied to the roll surface. While the particular character of the friction devices and the adjusting mechanism may be varied within considerable limits, in the particular construction shown these friction devices are in the form of belts 6 which are arranged so as to engage the surface of the roll, it being understood that one of these belts is provided for each of the rolls. While these belts have been shown as extending substantially the width of the roll, it will be understood that under some circumstances a plurality of narrow belts suitably disposed along the roll surface may be employed.

In the particular construction shown, one end of the belt or strap 6 is secured to a rod 7 which extends across the roll and is supported in hubs 8 on a pair of arms 9, 10, pivoted on a shaft 11 suitably supported from the side frames before referred to, it being understood that this construction is duplicated for the other roll. The other end of the belt or strap 6 is wound around a roller 12 supported in a pair of hanging brackets 13, 14, which are supported, in the particular construction shown, from the brackets 3, 4, before referred to. This roll 12 is kept under tension so as to produce the desired tension on the belt and in consequence the desired pressure of the belt against the roll. As shown, the roll 12 is a hollow roll held between two heads 15, 16, which are preferably provided with ball bearings 17 and in this roll is located a coil spring 18, this spring being located between one of the heads, as the head 15, and a block 19 loose on a rod 20

mounted in the heads 15, 16, before referred to, this block being held fast in the roll by screws 20'.

In the best construction means is provided for tensioning of this spring. While these means may be varied, in the particular construction shown one end of the spring, as 21, is fast in the block 19 and the other end of the spring 22 is fast in the head 15. By rotating this head, therefore, the tension of the spring may be varied as desired. With this construction, therefore, the pressure exerted by the belts against the rolls may be varied as desired.

In constructions embodying the invention in its best form means are provided for varying the wrap of the belt on the roll surface, that is, varying the amount of contact area between the belt and the surface of the roll.

While these means may vary somewhat in construction, a simple and convenient arrangement is that shown in which the brackets 13, 14, which support the roll 12, are provided with a plurality of bearings for the roll, these bearings being arranged so that as the roll shaft is positioned in one or the other of them, more or less of the belt is brought into surface engagement with the roll. As shown, the brackets 13, 14, are made in two sections 23, 24, pivoted together at 25 and these brackets are provided with a plurality of roll bearings 26 arranged at suitable intervals to each other, four such bearings being shown in the construction illustrated. These brackets are held together by suitable clamping bolts 27 and thumb nuts 28 by which they can be tightly clamped together.

With this construction, therefore, it will be seen that both the wrap or the contact area of the belt and the pressure exerted by the belt against the roll surface can be varied within desired limits.

As the running roll expires, such as the roll R of Figure 1, it is seen that its diameter decreases and this decrease in diameter requires a change in the action of the friction devices. This is effected by so arranging the parts that as the roll decreases in size the wrap or contact area of the belt with the roll is decreased and this is effected by pivoting the arms 9, 10, before referred to, so that these arms carrying the fixed end of straps follow the roll as it decreases in size and automatically maintains the correct wrap or contact of the belt with the roll surface.

In Figures 4 and 5 there is illustrated a modification of the device which may be employed under some circumstances if desired. In the construction here illustrated both ends of the belt or strap are secured around a spring roller 30 similar to the spring roll before described, the roller in this instance, however, being mounted in a fixed bracket 31 secured to the side frames before referred

to, the belt passing over a roll 32 mounted in the divided bracket 33 similar to that already described and also passing over a tension roll 34 on a shaft 35 carried in a block 36 moving in guides 37 in the bracket 31 before referred to, this block being provided with an adjusting screw 38 operated by a hand wheel 39. The shaft 40 of the spring roll 30 is or may be, in this modification, provided with a ratchet 41 with which co-operates a holding pawl 42.

In this construction it will be observed that the adjustment of the contact area or wrap of the belts on the roll may be effected by shifting the roll 32 in the split bracket 33 and the tension or pressure and contact area of the roll may also be adjusted by the screw rod and hand wheel 39. The pressure may be regulated by adjusting the spring of the spring roll, as before described, and may also be adjusted by manipulating the ratchet 41.

In the construction shown in Figures 4 and 5, the wrap or contact area of the belt is automatically lessened as the roll decreases in size by so positioning the rolls 32 and the tension roll 34 that at the start of the unwinding operation, they exert the greatest wrap on the roll, but as the roll decreases in size the belt drops away from the roll, as indicated at the right hand side in Figure 4, the rolls 32 and 35 being positioned substantially vertically above and below the axis of the unwinding roll.

With the construction shown and described, it will be seen that a very simple and efficient construction has been provided for effecting the control of the pressure of the friction devices on the roll surface, and while the invention has been shown and described in its preferred forms, it will be understood that various changes may be made in the form of the friction devices and the means for adjusting them, and the other details of the construction, without departing from the construction as defined in the appended claims.

What I claim is:

1. In a web controlling mechanism, the combination of means for supporting a web roll while unwinding, friction means engaging the roll surface, and means for adjustably supporting the friction means at a plurality of points with respect to the roll so arranged that as one or another of the supporting points is employed the contact area of the friction means on the roll is varied.

2. In a web controlling mechanism, the combination of means for supporting a web roll while unwinding, friction means engaging the roll surface, means for adjustably supporting the friction means at a plurality of points with respect to the roll so arranged that as one or another of the supporting points is employed the pressure of the friction means on the roll is varied, and additional

means for varying the pressure of the friction means on the roll surface.

3. In a web controlling mechanism, the combination of means for supporting a web roll while unwinding, a strap engaging the roll surface, and means for supporting the strap at a plurality of different points with respect to the roll and so arranged that as one or another of the supporting points is employed the pressure and contact area of the belt on the roll surface is varied.

4. In a web controlling mechanism, the combination of means for supporting a web roll while unwinding, a strap engaging the roll surface, means for supporting the strap at a plurality of different points with respect to the roll and so arranged that as one or another of the supporting points is employed the pressure and contact area of the strap on the roll surface is varied, and additional means for varying the pressure of the strap on the roll surface.

5. In a web controlling mechanism, the combination of means for supporting a web roll while unwinding, friction means engaging the surface of the roll and so arranged that the contact area of the means with the roll decreases as the roll decreases in size, and means for adjustably supporting the friction means at a plurality of points so arranged that as one or another of the supporting points is employed the pressure of the friction means on the roll is varied.

6. In a web controlling mechanism, the combination of means for supporting a web roll while unwinding, friction means engaging the surface of the roll and so arranged that the contact area of the means with the roll decreases as the roll decreases in size, means for adjustably supporting the friction means at a plurality of points so arranged that as one or another of the supporting points is employed the pressure of the friction means on the roll is varied, and additional means for varying the pressure of the friction means on the roll surface.

7. In a web controlling mechanism, the combination of means for supporting a web roll while unwinding, friction means engaging the roll surface, means for adjustably supporting the friction means at a plurality of points so arranged that as one or another of the supporting points is employed the pressure of the friction means on the roll is varied, and spring means acting on the friction means and providing an additional means for varying the pressure of the friction means on the roll surface.

8. In a web controlling mechanism, the combination of means for supporting a web roll while unwinding, a friction strap engaging the roll surface, means for supporting the strap at one end at a plurality of points so arranged that as one or more of the supporting points is employed the pressure and

contact area of the strap on the roll is varied, and spring means acting with the strap and providing an additional means for varying the pressure of the strap on the roll surface.

9. In a web controlling mechanism, the combination of means for supporting a web roll while unwinding, a friction strap engaging the surface of the web roll, means to which both ends of the strap are secured, a roll over which the strap passes, and a support for the latter roll having a plurality of bearings arranged at different points relatively to the unwinding web roll.

10. In a web controlling mechanism, the combination of means for supporting a web roll while unwinding, a friction strap engaging the surface of the web roll and held at both ends, a roll over which the strap passes, a support for the latter roll having a plurality of bearings arranged at different points relatively to the unwinding web roll, and a spring actuating the strap to apply a pressure to the web roll surface.

11. In a web controlling mechanism, the combination of means for supporting a web roll while unwinding, a friction strap engaging the surface of the web roll and held at both ends, a roll over which the strap passes, a support for the latter roll having a plurality of bearings arranged at different points relatively to the unwinding web roll, and a spring roll around which the strap passes for causing the belt to exert a pressure on the web roll surface.

12. In a web controlling mechanism, the combination of means for supporting a web roll while unwinding, a friction strap engaging the surface of the web roll and held at both ends, a spring roll around which the strap passes, and a support for the spring roll having a plurality of bearings arranged at different points relatively to the unwinding web roll whereby the pressure and contact area of the strap on the web roll surface may be varied.

13. In a web controlling mechanism, the combination of means for supporting a web roll while unwinding, a friction strap engaging the surface of the web roll, means to which both ends of the strap are secured, a roll over which the strap passes, a split bracket having a plurality of bearings arranged at different points relatively to the unwinding roll, and means for clamping the strap roll in adjusted position in the brackets.

14. In a web controlling mechanism, the combination of means for supporting a web roll while unwinding, a friction strap engaging the surface of the web roll, a pair of pivoted arms, means for securing one end of the strap in the arms, a roll to which the other end of the strap is secured and over which it passes, and a support for the latter roll having a plurality of bearings arranged at differ-

ent points relatively to the unwinding web roll.

15. In a web controlling mechanism, the combination of means for supporting a web roll while unwinding, a friction strap engaging the surface of the web roll, a pair of pivoted arms, means for securing one end of the strap in the arms, a strap roll to which the other end of the strap is secured and over which it passes, and a split bracket for the latter roll having a plurality of bearings for the latter roll, and means for clamping the strap roll in adjusted position in the bearings.

16. In a web controlling mechanism, the combination of means for supporting a web roll while unwinding, a friction strap engaging the surface of the roll, a pivoted support, means for securing one end of the strap to the support, a spring roll to which the other end of the strap is secured and around which it passes, a split bracket for the roll having a plurality of bearings, and means for securing the strap roll in adjusted position in the bracket.

17. A web roll controlling mechanism having in combination a support for the unwinding roll, a spring actuated friction means engaging the roll surface, and rotary means independent of the web roll for permitting a bodily movement of the friction means for varying the contact area of the friction means relatively to the roll surface.

18. A web roll controlling mechanism having in combination a support for the unwinding roll, a friction strap engaging the web roll surface, means to which each end of the strap is secured, a roll over which the strap passes, means independent of the web roll for permitting a bodily movement of the roll for varying the contact area of the strap with the surface of the unwinding web roll, and spring means cooperating with the strap.

19. A web roll controlling mechanism having in combination a support for the unwinding web roll, a friction strap engaging the roll surface, means to which each end of the strap is secured, a spring roll over which the friction strap passes, and means for permitting a bodily movement of the spring roll for varying the contact area of the strap with the surface of the unwinding roll.

20. In a web controlling mechanism the combination of a support for a web roll while unwinding, a friction strap engaging the surface of the roll, a pair of arms to which one end of the strap is secured and pivoted to follow the web roll as the latter decreases in size, and a tension roll around which the other end of the strap is wound.

21. Web roll controlling mechanism having in combination a support for the unwinding roll, a flexible friction device engaging the roll surface and held at one end, a wind-up roll around which the other end

of the friction device is wound, a spring within the roll acting to rotate the roll and hold the friction device under constant tension, means for adjusting the spring tension to vary the pressure of the friction device on the roll, means for adjusting the initial lap of the friction device on the roll, and means for automatically varying said lap as the roll decreases in size.

In testimony whereof, I have hereunto set my hand.

JOHN J. HALLIWELL.

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