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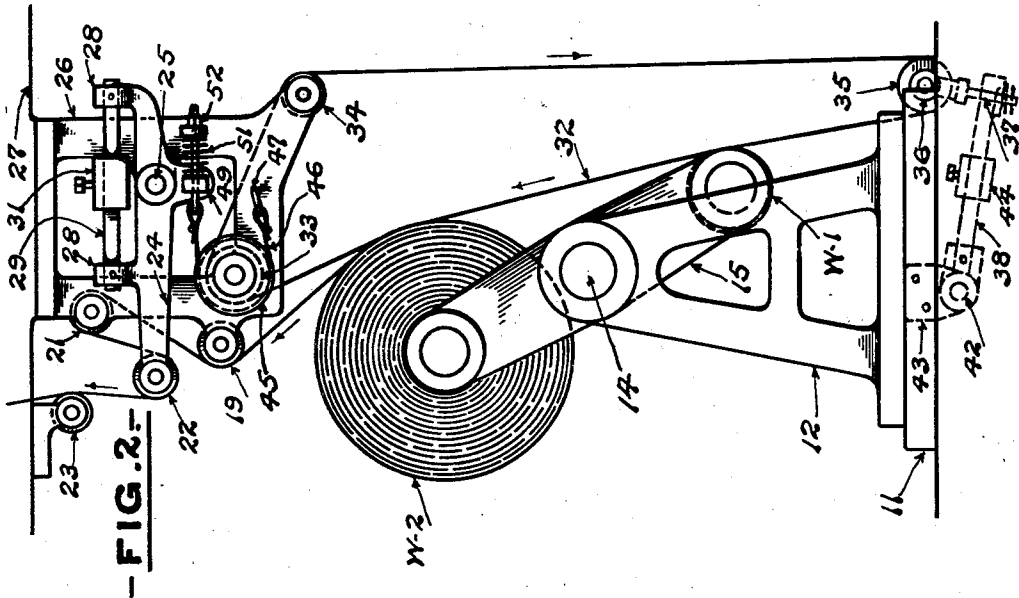
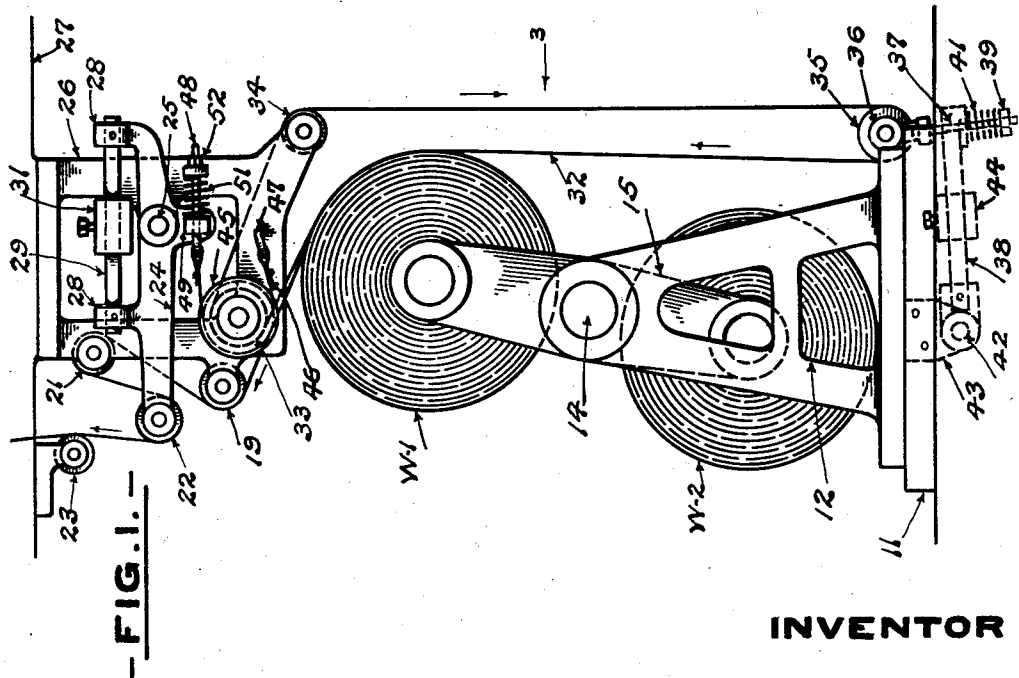
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WEB ROLL CONTROLLING MECHANISM

Filed Oct. 3, 1930

4 Sheets-Sheet 1



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May 21, 1935.

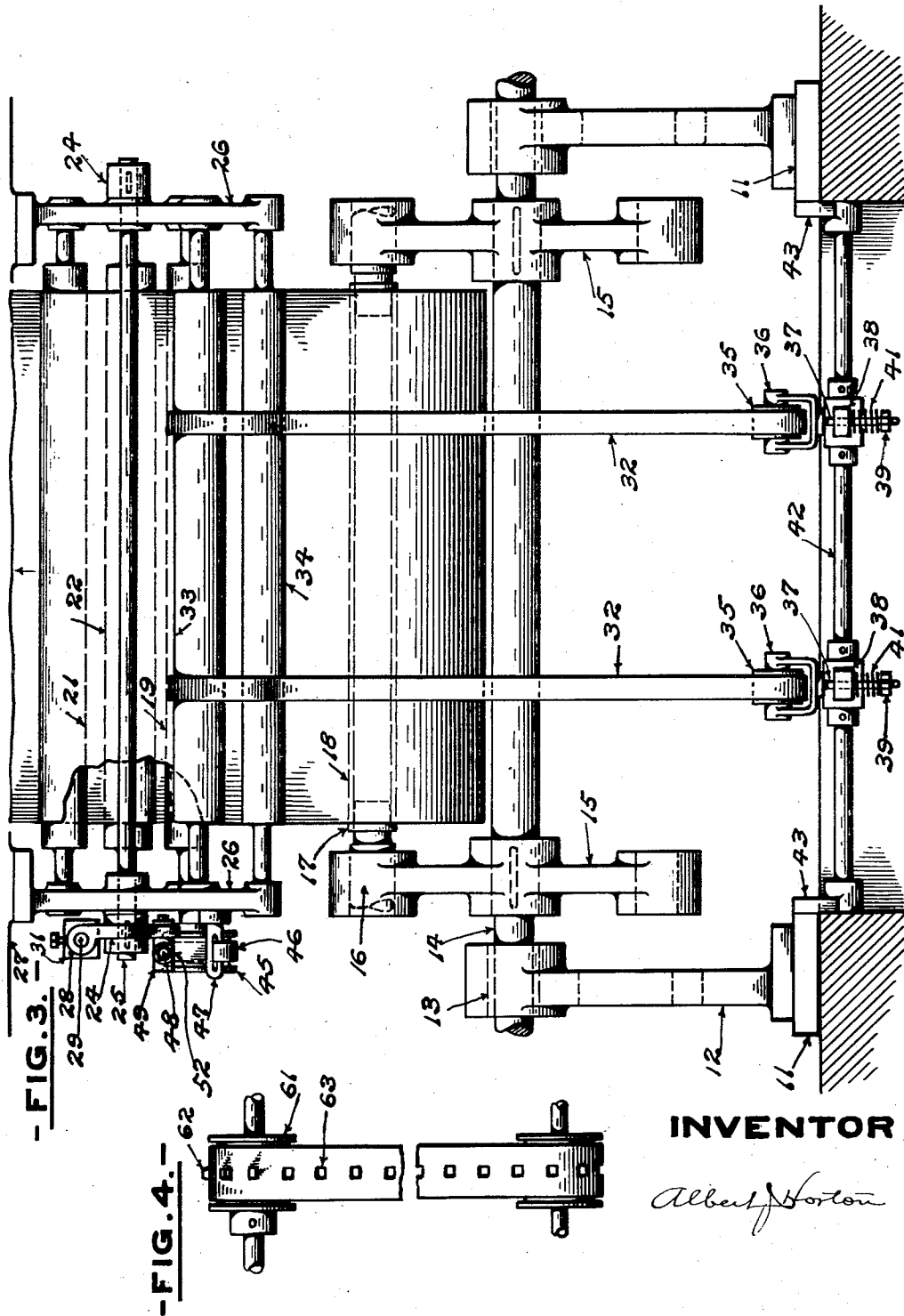
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WEB ROLL CONTROLLING MECHANISM

Filed Oct. 3, 1930

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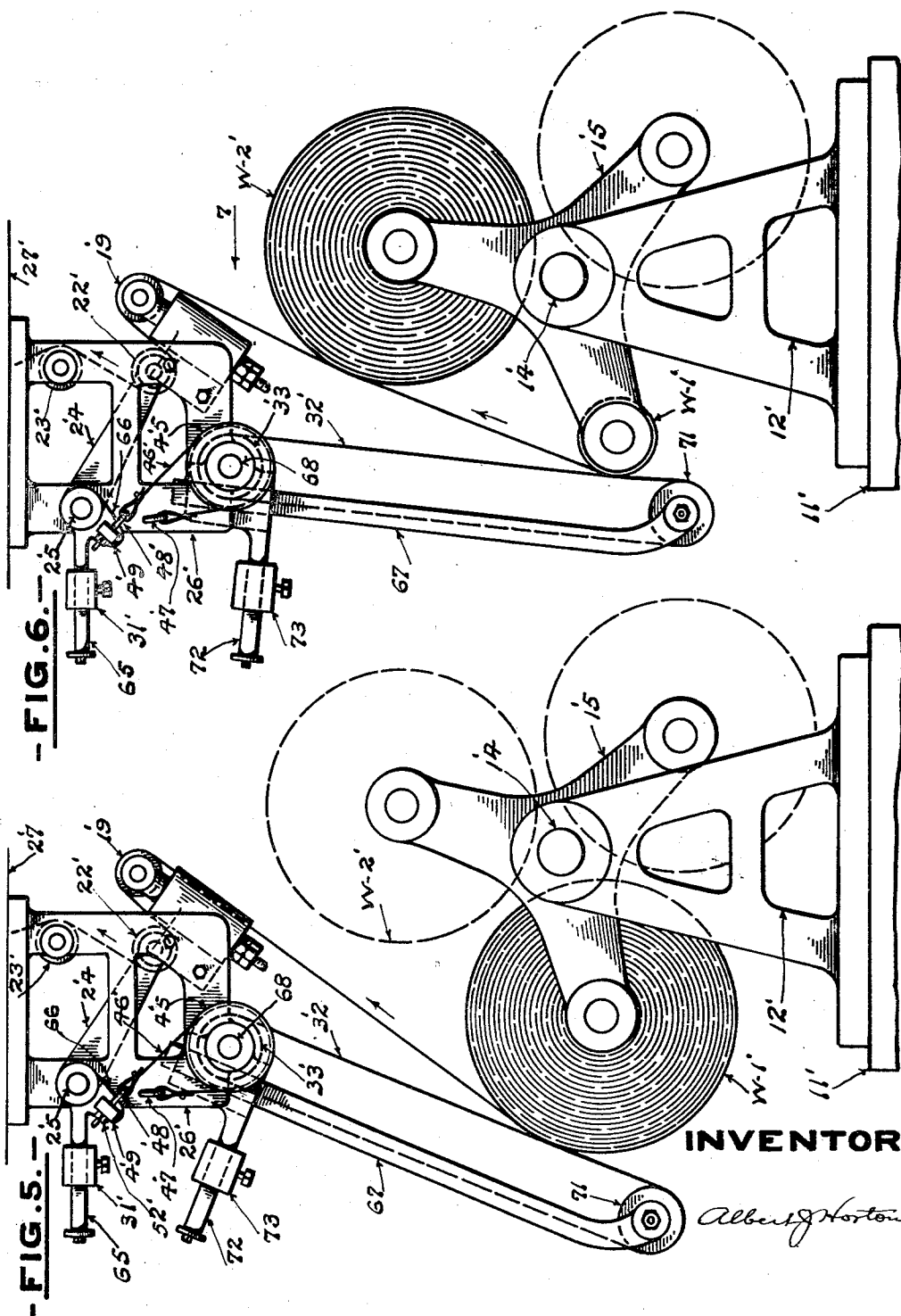
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WEB ROLL CONTROLLING MECHANISM

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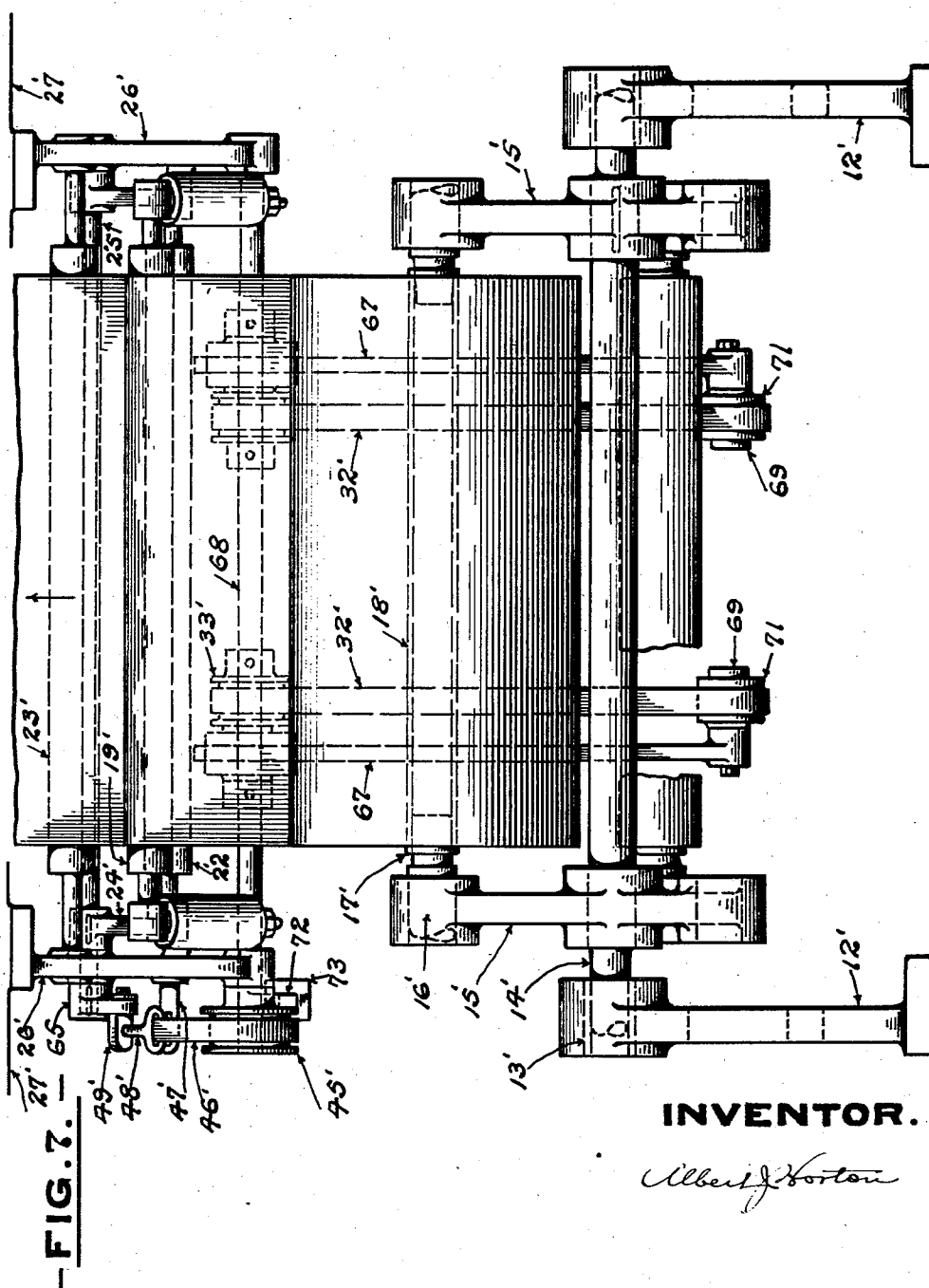
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WEB ROLL CONTROLLING MECHANISM

Filed Oct. 3, 1930

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UNITED STATES PATENT OFFICE

2,002,011

WEB ROLL CONTROLLING MECHANISM

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Application October 3, 1930, Serial No. 486,090

11 Claims. (Cl. 242—75)

This invention relates to web roll controlling mechanism for use with printing machines, especially machines having supports adapted to hold a plurality of web rolls which are successively moved into feeding position.

An object of the invention is to provide a mechanism for so controlling the rotation of a web roll that the web may be fed therefrom to a printing machine under a practically constant tension that is automatically maintained.

Another object of the invention is to provide a roll controlling mechanism that will act to maintain a practically constant braking action on the roll during normal running conditions and that will automatically increase the braking action when the machine is decelerated rapidly.

It is also an object of the invention to provide a web roll controlling mechanism of generally improved construction, whereby the device will be simple, durable and relatively inexpensive in construction, as well as convenient, practical, serviceable and efficient in its use.

With the foregoing and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts, and in the details of construction hereinafter described and claimed, it being understood that various changes in the precise embodiment of the invention herein disclosed may be made within the scope of what is claimed without departing from the spirit of the invention.

Two embodiments of the invention are illustrated in the accompanying drawings, wherein Figures 1, 2 and 3 show the web roll controlling device as adapted to a support arranged to hold two web rolls, and Figures 5, 6 and 7 show controlling mechanism in accordance with the invention, as adapted to control web rolls carried in a support arranged to hold three rolls.

Figure 1 is a side view showing the controlling mechanism in connection with a two roll support in which one full roll is in the loading position and another full roll is in the running or feeding position;

Figure 2 is a view similar to Figure 1 except that it shows the running roll approaching exhaustion, and the support turned to bring the full roll into the position in which the web from the expiring roll is to be broken and the feed transferred to the full roll;

Figure 3 is a front view of the mechanism disclosed in Figures 1 and 2, the view being taken in the direction of arrow 3 of Figure 1;

Figure 4 is a detail view showing a form of tension belt for controlling the rolls;

Figure 5 shows the controlling mechanism as adapted to a support arranged for holding three web rolls, the view showing one full roll in feeding position and two full rolls, indicated in outline, one in the loading position and one in reserve;

Figure 6 is a view similar to Figure 5 but showing the running roll approaching exhaustion and the support turned to bring a full roll into the position where the lead of the web may be transferred from the exhausting roll to the full roll; and

Figure 7 is a front view of the mechanism shown in Figures 5 and 6, the view being taken in the direction of arrow 7 of Figure 6.

In the drawings, 11 indicates a base that may be supported on any suitable foundation, and a pedestal is shown at 12, having bearings 13 adapted to rotatably support a shaft 14, to which arms 15 are slidably secured and provided with a suitable locking device to hold them in position. Spindles 16 are suitably held in the arms 15 and are fitted with rotatable caps 17 adapted to engage a hollow core 18 of the web rolls. Web roll W1 is shown in normal running position in Figure 1. In Figure 2, the support comprising the shaft 14 and the arms 15, has been turned to bring the roll W1 to the lower position, and the roll W2 which is shown in the loading position in Figure 1, is raised to the pasting position in Figure 2, at which point the end of the web of the roll to which paste has previously been applied, is pressed against the web from the roll W1, to which it adheres and is carried forward to the printing machine, the web from the roll W1 meanwhile having been severed in any convenient manner. The web from the running roll is carried around guide rollers 19 and 21, thence under a floating roller 22, around guide roller 23, and thence to the printing cylinders, not shown. The floating roller 22 is rotatably supported in arms 24 that are secured to a shaft 25, rotatably supported in bearings formed in the hanging frames 26 that are secured to the main frame of the printing machine indicated at 27, it being understood that the printing cylinders and other parts of the press are preferably carried above the frame 27, in accordance with the usual practise.

One of the arms 24 is formed with lugs 28 to which a shaft 29 is secured that is adapted to support an adjusting weight 31, provided with means for securing it in any desired position on the rod. Endless belts 32 are supported on rollers

33 and 34, rotatably supported in the frames 26, and on pulleys 35 which are rotatably supported in brackets 36, having rods 37 which slide in suitably formed holes in arms 38. Collars 39 are secured to the rods 37 and hold the springs 41 under tension. The arms 38 are pivotally supported on a shaft 42 that is held in brackets 43 secured to the base frames 11. Weights 44 are arranged to slide on the arms 38 and thereby vary the pull exerted on the belts 32.

It will be seen that the support can be turned to bring the web roll into engagement with the belts in varying degree and thereby increase or diminish the arc of contact over which the belts engage the surface of the roll, and when this arc of contact is sufficient to provide the necessary traction, the rotation of the roll will cause a corresponding movement of the belts around the pulleys. The shaft of the roller 33 is extended beyond one of the frames 26, and a sheave 45 is secured thereto. A brake band 46 is fastened to a fitting 47, secured to the frame 26. The brake band extends around the sheave 45 and is connected to a rod 48 which passes through a poppet 49, rotatably supported on one of the arms 24. The rod 48 is extended and carries a spring 51 and an adjusting nut 52. It will be understood that when the web is being fed from the roll in running position as shown in Figure 1 that the weight of the floating roller 22 will exert a continual pull on the brake band 46 thereby resisting movement of the belts 32 which in turn tend to retard the rotation of the web roll. The pull on the brake may be regulated by shifting the weight 31. If there is any tendency for the momentum of the roll to unwind the web faster than it is taken by the press, as would be the case when the press is decelerated quickly, this will tend to form a slack in the web and allow the floating roller 22 to descend thereby increasing the braking action on the sheave 45 and effecting a retardation of the roll.

In starting the machine, the initial pull of the web acts to raise the floating roller 22 thereby releasing the brake and allowing the roll to start without resistance. When it has been started, the floating roller 22 assumes its normal running position maintaining a braking action that produces a substantially constant tension on the web.

For some applications the modified form of tension strap shown in Figure 4 may be found desirable. In this form, the roller 33 is replaced by a suitable number of sheaves as shown at 61 in Figure 4, these sheaves being formed with projections or teeth 62 arranged to engage openings 63 that are formed in the tension belts. By this means, the belt is prevented from slipping on the sheave carrying the brake mechanism.

In the form of the invention shown in Figures 5, 6 and 7, certain parts of the mechanism that are identical with the parts shown in Figures 1 to 3, are indicated by the same numerals primed. In this form, the floating roller 22' is supported in arms 24' secured to the shaft 25', and a two-arm lever having a long arm 65 is secured to the shaft 25', the long arm 65 being adapted to slidably support the weight 31' and the short arm 66 is arranged to support a poppet 49' through which the brake rod 48' passes. In this embodiment of the invention, the belts 32' are carried on swinging arms 67 that are pivotally supported on a shaft 68, rotatably supported in the frames 26'.

Sheaves 33' are secured to the shaft 68 as is also the brake sheave 45'. The extremities of the

swinging arms 67 are provided with studs 69 which serve to rotatably support sheaves 71, adapted to carry the belts 32'. The arms 67 are formed with members 72, adapted to support weights 73, which may be moved along the arms 72 and locked in any desired position, thereby varying the effective pressure of the belts 32' against the running web roll.

It will be understood that effecting a change in the lead of the web from an exhausting web roll to a new roll is accomplished by placing the support in such position that the web from the expiring roll is brought in contact with the surface of the full roll. This action is shown in Figure 6 and is substantially the same as that previously described in connection with Figures 1 and 2. Likewise, the floating roller 22' will assume a position governed by the pull of the web and thus control the retarding action on the web roll.

It will be seen that a simple mechanism has been provided whereby the tension on a web running from a web roll carried on a support adapted to hold a plurality of rolls, may be automatically controlled and the roll prevented from unwinding excess paper in case the printing machine is decelerated quickly, and that the mechanism automatically becomes effective on succeeding rolls as they are brought into running position.

What I claim is:

1. In a web roll controlling device for a printing machine, an endless belt supported on rotatable members and bearing against the roll, a brake acting on one of the members, means on the member on which the brake acts for preventing slippage of the belt relative to the said member, and a floating roller supported by a loop in the web and arranged to tighten the brake when the length of the loop increases.

2. In a web roll controlling device for a printing machine, a support arranged to move rolls successively into running position, an endless belt supported to bear against the periphery of a web roll in running position and arranged to be driven by said roll, a controlling mechanism acting in response to variation in the pull of the running web, and a friction brake mechanically connected to said controlling mechanism and adapted to impede the motion of said belt to control the tension of the web and quickly check the rotation of the running roll when the machine is decelerated rapidly.

3. In a device for controlling a running web roll from which a web is fed to the printing machine, an endless belt bearing against the roll and supported on rotatable members, a friction brake adapted to resist the movement of the belt, a floating roller bearing against the web running from the roll, and a mechanical connection arranged directly between the floating roller and the brake whereby the brake pressure is varied in response to movement of the floating roller.

4. In a web roll controlling device for a web printing machine, an endless belt, rotatable members adapted to support said belt in running contact with the roll, a friction brake acting directly on one of the members, a floating roller supported by a loop in the web, and a mechanical connection between the floating roller and the brake whereby the brake pressure is applied by the weight of the floating roller and varied by its movement.

5. In a web roll controlling device for a web printing machine, an endless belt, rotatable rollers adapted to support said belt in running

contact with the roll, a brake sheave rotatable by one of said rollers, a brake for said sheave, a floating roller rotatably supported in arms and running in a loop in the web, and a mechanical connection between one of the arms and the brake, whereby brake pressure is applied by the weight of the floating roller and varied by its movement.

6. In a web roll controlling device for a printing machine, a support adapted to hold a plurality of web rolls and to move them successively into running position, a pair of rollers rotatably supported in fixed bearings, a pulley rotatable in yieldingly supported bearings, an endless belt extending about said rollers and said pulley, a brake sheave rotatable by one of said rollers, a brake for said sheave, a floating roller rotatably supported in arms and running in a loop in the web, and a mechanical connection between one of the arms and the brake, whereby brake pressure is applied by the weight of the floating roller and varied by its movement.

7. In a web roll controlling device for a printing machine, a support adapted to hold a plurality of web rolls and to move them successively into running position, a pair of rollers rotatably supported in fixed bearings, a pulley yieldingly supported on an adjustably weighted member, an endless belt extending about said rollers and said pulley, a brake sheave rotatable by one of said rollers, a brake for said sheave, a floating roller rotatably supported in arms and running in a loop in the web, and a mechanical connection between one of the arms and the brake, whereby brake pressure is applied by the weight of the floating roller and varied by its movement.

8. In a web roll controlling device for a printing machine, a support adapted to hold a plurality of web rolls and to move them successively into running position, a pair of rollers rotatably supported in fixed bearings, a pulley rotatable in yieldingly supported bearings, an endless belt extending around said rollers and said pulley, a brake sheave rotatable by one of said rollers, a brake for said sheave, a floating roller running in a loop in the web, supports for the floating roller adapted to permit movement transversely to its axis in response to variations in the length

of the loop, and a yielding connection between the floating roller supports and the brake, whereby the brake pressure is regulated by the tension of the web and the floating roller is allowed a degree of free movement without substantially affecting the brake pressure.

9. In a web roll controlling device for a printing machine, a support adapted to hold a plurality of web rolls and to move them successively into running position, a pair of rollers rotatably supported in fixed bearings, a pulley, an endless belt extending around said rollers and said pulley, bearings for said pulley movably supported and biased in a direction to tighten the belt, means for regulating the biasing force, a brake sheave rotatable by one of said rollers, a brake for said sheave, a floating roller running in a loop in the web, supports for the floating roller adapted to permit movement transversely to its axis in response to variations in the length of the loop, and a yielding connection between the floating roller supports and the brake whereby the brake pressure is regulated by the tension of the web and the floating roller is allowed a degree of free movement without substantially affecting the brake pressure.

10. Tension control means for material traveling from a roll, comprising endless means and movable means whereon the same travels to have an arced contact with the roll and be driven thereby, weighted pulley means carried by said endless means for producing a slight retarding effect of the latter upon the roll, and normally inactive brake means adapted to operate automatically on said movable means and stop it and the roll upon tearing of the material.

11. Tension control means for material traveling from a roll, comprising endless means and movable means whereon the same travels to have an arced contact with the roll and be driven thereby, weighted pulley means carried by said endless means for producing a slight retarding effect of the latter upon the roll, and brake means adapted to operate automatically on said movable means and stop it and the roll upon tearing of the material.

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