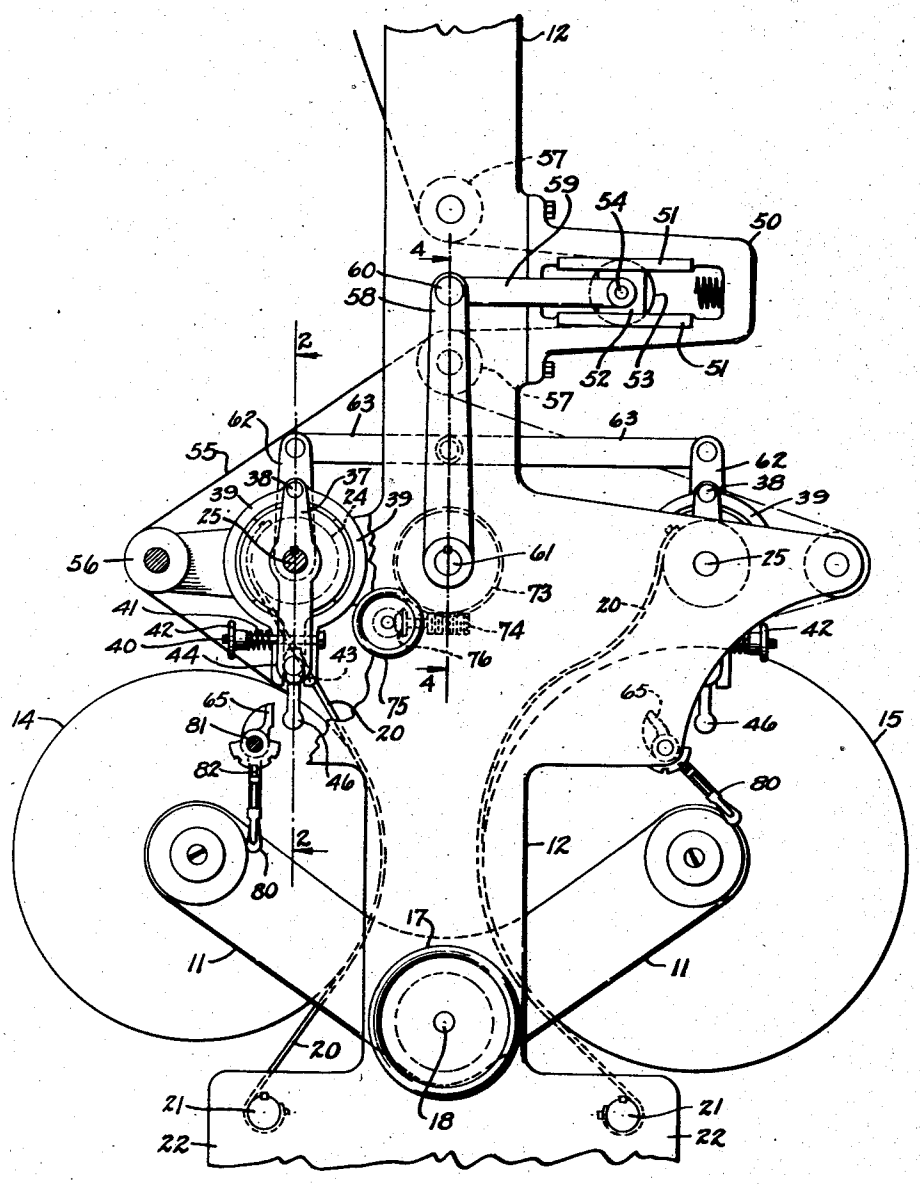
Feb. 7, 1933. C. J. RICHTER 1,896,802

WEB CONTROLLING MECHANISM

Filed Dec. 14, 1929 3 Sheets-Sheet 1

Fig 1



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WEB CONTROLLING MECHANISM

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Fig 2

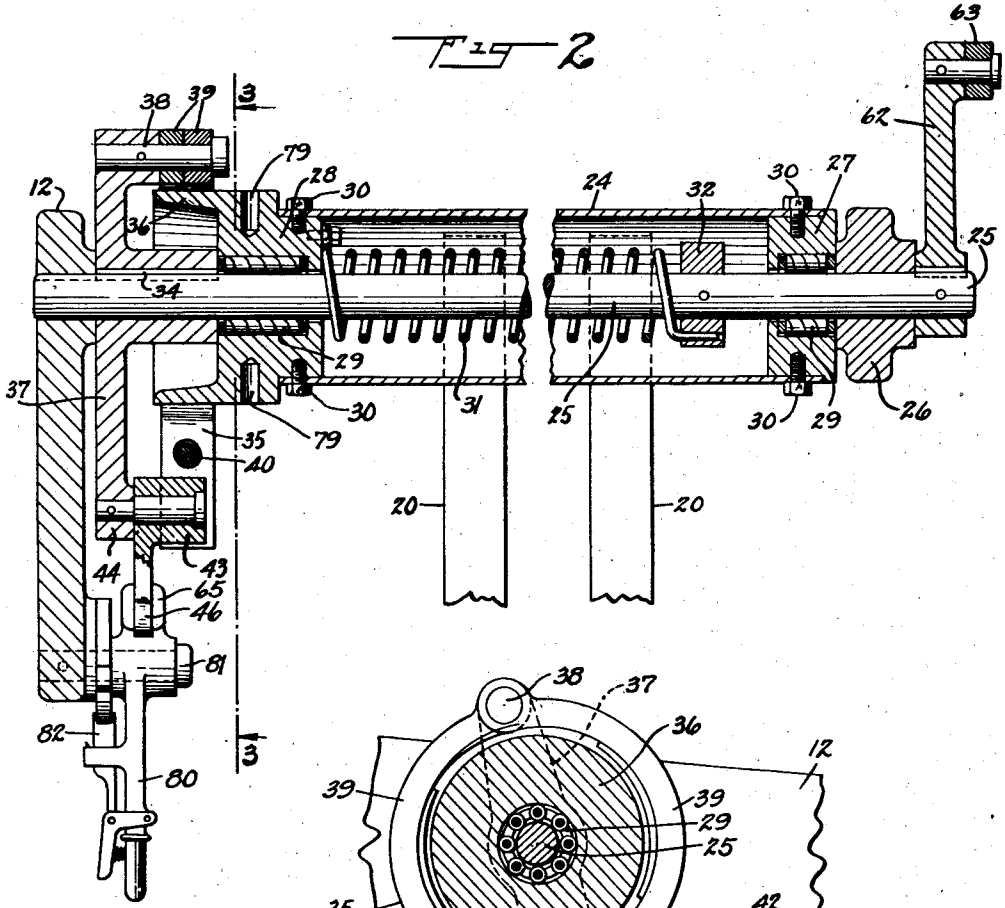
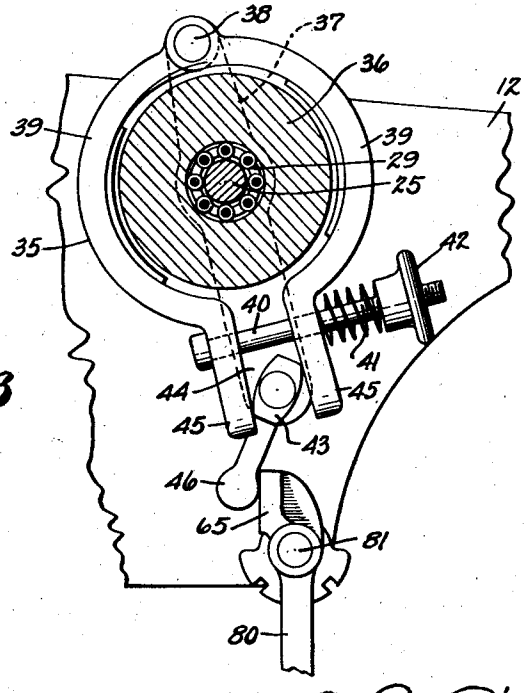


Fig 3



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WEB CONTROLLING MECHANISM

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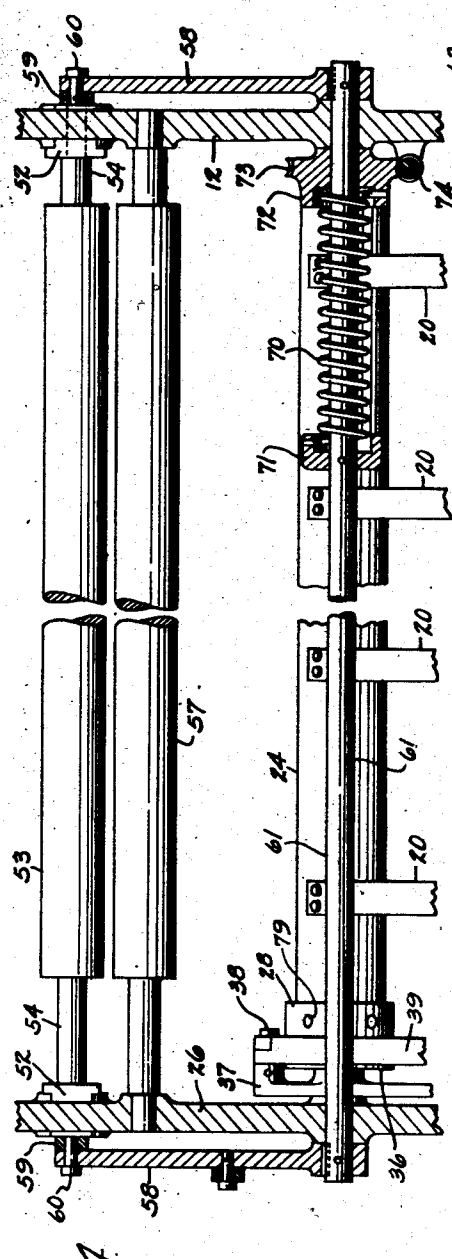


Fig. 4.

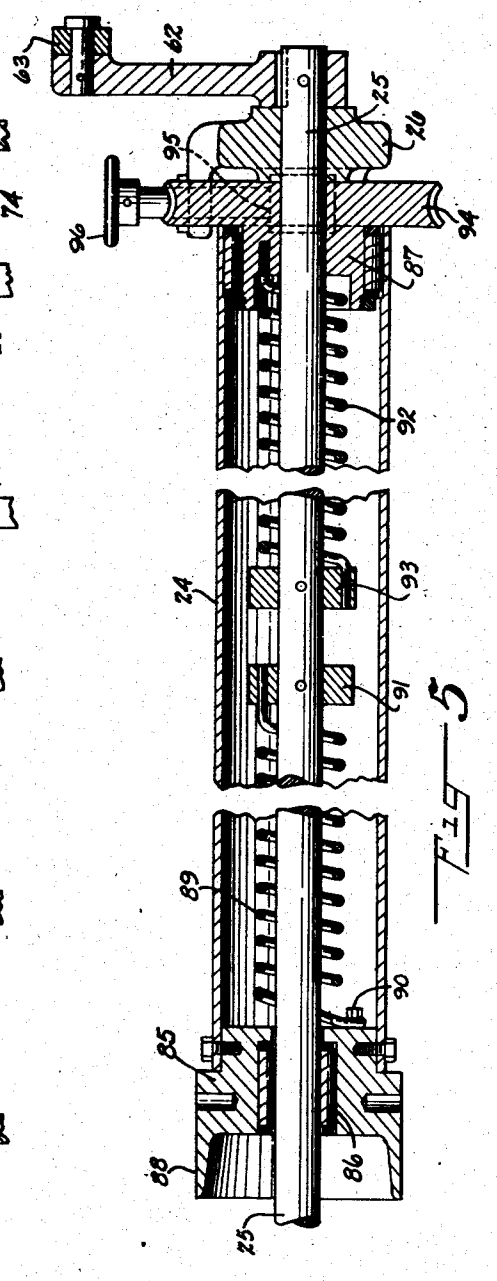


Fig. 5.

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UNITED STATES PATENT OFFICE

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WEB CONTROLLING MECHANISM

Application filed December 14, 1929. Serial No. 414,122.

The present invention relates to a new and useful web controlling mechanism and more particularly to such a mechanism for use in connection with high-speed rotary printing presses such as are commonly employed for the printing of newspapers.

Objects and advantages of the invention will be set forth in part hereinafter and in part will be obvious herefrom, or may be learned by practice with the invention, the same being realized and attained by means of the instrumentalities and combinations pointed out in the appended claims.

The invention consists in the novel parts, construction, arrangements, combinations and improvements herein shown and described.

The accompanying drawings, referred to herein and constituting a part hereof, illustrate one embodiment of the invention, and together with the description, serve to explain the principles of the invention.

Of the drawings:

Figure 1 is an end elevation of one embodiment of a web controlling mechanism illustrative of the present invention, with certain parts broken away;

Figure 2 is a fragmentary detailed vertical section taken on the line 2—2 of Figure 1;

Figure 3 is a detailed section taken on the line 3—3 of Figure 2;

Figure 4 is a fragmentary vertical section taken on the line 4—4 of Figure 1; and

Figure 5 is a detailed section of a modified form of the roller shown in Figure 2.

The present invention has for its object the provision of a web controlling mechanism for use in connection with high speed rotary printing presses, for maintaining the tension of the web substantially constant under normal conditions of operation, and for quickly stopping the rotation of the web roll to prevent fouling of the press when the press is shut down or there is a break in the web as it is fed to the printing press. Another object of the invention is the provision of a web-controlling mechanism for controlling the rotation of one or more web rolls, as well as the provision of a web controlling mechanism that is simple and requires substantially no attention on the part of the operator. The invention also provides a web controlling mechanism by which the tension of the web can be maintained substantially constant at substantially any desired tension and can thus be easily varied to meet the requirements of the press.

According to the present preferred embodiment of the invention, means are provided for rotatably supporting a web roll, from which a web of paper is drawn off and led to a web using machine, such as a rotary printing press. The tensioning means, coacting with the web roll to tension the web as the web is drawn from the web roll by the printing press, preferably comprises a plurality of spaced-apart friction belts which are movable into engagement with the periphery of the web roll and are pressed into contact with the web roll to oppose the rotation of the web roll and produce the necessary tension on the web, and these friction belts are preferably periodically moved by spring means to maintain them in contact with the web roll as the web roll gradually diminishes in diameter. The action of the spring on the belts, as it maintains them in contact with the periphery of the web roll, is preferably controlled by a pilot roller moved by the tension of the web drawn from the web roll and periodically releases the spring allowing it to act on and move the belts.

For minutely controlling the tension of the web and maintaining it more nearly constant, and for reducing the frequency of operation of the spring means moving the belts, the pilot roller is preferably directly connected with the belts and moves them as the web roll diminishes in size, thereby maintaining the pressure necessary between the belts and the web roll to effect substantially constant web tension. Means are also provided, in the preferred embodiment, for varying the tension which is maintained on the web and for this purpose, means are provided for varying the force with which the pilot roller is held against movement by the web tension.

Other means are preferably provided for rendering inoperative the spring means act-

ing to move the belts into contact with the web roll, thereby facilitating the operation of replenishing the web rolls as they become exhausted, and permitting one of the web roll supporting means to be supplied with a new web roll, while the other supporting means supports an active web roll, and other means are provided permitting the belts to be pressed into contact with the web roll with the maximum pressure, independently of the pilot roller which normally controls this movement.

It will be understood that the foregoing general description and the following detailed description as well, are exemplary and explanatory of the invention but are not restrictive thereof.

Referring now in detail to the present preferred embodiment of the invention, illustrated by way of example in the accompanying drawings, the web roll supporting means preferably comprises a pair of web roll supporting arms 11 at either end of the web rolls and preferably extending at either side of the side frames 12 of the press by which they are supported, thereby providing a support for an active web roll 14, and a reserve web roll 15. These web roll supports may be of any convenient or desired construction and, as they form no part of the present invention, are not shown in detail in the accompanying drawings. The web rolls are supported in these arms 11 by suitable shafts passing through the axial aperture of the web roll, the shafts being rotatably journaled near the upper, or outer ends of the supporting arms 11. Means are also preferably provided for moving the web rolls and the supporting arms 11 transversely of the webs to register the webs with the cylinders of the printing press to which the web is fed, and for this purpose any suitable means may be provided, such as a hand wheel 17, cooperating with a threaded end 18 of the shaft by which the web roll supporting arms 11 are mounted in the side frames 12 of the press.

For controlling the rotation of the web roll and tensioning the web as it is drawn from the web roll by the printing press, there are provided a plurality of flexible friction belts 20 spaced along the width of the web roll and maintained in contact with the periphery of the web roll, to oppose rotation of the roll and create the necessary web tension. As embodied, these friction belts 20 are attached at their lower ends to a rod 21 extending from one of the lower reaches 22 of the side frames of the press to the other side frame, and are substantially directly beneath the corresponding web roll, while the upper ends of these friction belts are securely fastened to the outer surface of a roller 24 rotatably journaled above the web roll by means of a shaft 25 extending across the press frame and supported in the side frames 12, 26 of the press. In the embodied form, four friction belts 20 are employed and these are spaced substantially equal distances, one for each page width of the web roll, so that when partial width web rolls are employed, one belt will be used for each quarter width.

For maintaining the belts in contact with the surface of the web roll and for moving them to compensate for the constantly decreasing diameter of the web roll, spring means are provided for turning the roller to which the belts are fastened and for winding the belts on the surface of the roller, thereby taking up the slack in the belts. As embodied, and as most clearly shown in Figure 2 of the drawings, the belt roller 24 is hollow and is rotatably supported on shaft 25 by means of heads 27, 28 which are provided with roller bearings 29 and fitted over the shaft. Each of these heads 27 and 28 is securely fastened to the hollow roller 24 by means of cap screws 30. A helical spring 31 surrounding the shaft 25, and having one end fastened to block 32 which is pinned to shaft 25, has its other end looped and fastened to the inner face of the head 28. This spring acting on the roller 24, tends to keep the belts pressed against the periphery of the web roll as it winds the belts around the roller.

The tension of the spring 31 is preferably greatly in excess of that needed to produce the desired tension of the web, and is amply sufficient to quickly stop rotation of the web roll, when this is necessary. For the purpose of preventing the continuous action of the spring on the belts 20, so as to maintain only the necessary degree of web tension, means are provided for normally preventing operation of the spring 31, thereby holding the roller 24 against rotation under influence of the spring. As embodied, at one end of the roller 24, and securely fastened to the roller shaft 25 by means of key 34, is a brake 35 cooperating with a brake drum 36 formed as an extension of the head 28 of the belt roller 24. This brake 35, preferably comprises an anchoring piece 37 which is keyed to the shaft 25, as described, and provided at one end with an anchoring pivot pin 38 to which the brake shoes 39 are pivoted, and a tie bolt 40, spring 41 and hand wheel 42 press the brake shoes 39 towards each other and into contact with the brake drum 36 with sufficient force to hold the belt roller 24 against rotation relatively to its shaft 25. For releasing the brake and permitting the roller 24 to rotate relatively to the roller shaft 25, and for winding the belts 20 on the roller, there is provided a brake operating cam 43 pivotally mounted on an extension 44 of the anchoring piece 37, and preferably diametrically opposite the anchoring pin 38, and between the outwardly extending ends 45 of the brake shoes 39, and this operating cam 43 is rigidly connected with an outwardly

extending lever 46 fastened to the cam 43, so that as the lever 46 is turned the brake shoes 39 are spread apart, against the tension of spring 41, thereby releasing the roller 24 and permitting it to rotate on its shaft to wind up the slack in the belts 20, increasing the pressure between the belts and the web roll, or to maintain the belts in contact with the periphery of the web roll.

For periodically releasing the brake and taking up the slack in the friction belts, and thereby controlling the tension of the web drawn from the web rolls by maintaining the friction belts in contact with the periphery of the web rolls, there is provided a pilot roller, around which the web is looped as it is drawn from the web roll to the printing press, and this pilot roller is moved back and forth by the tension of the web, and causes a corresponding movement of the brake releasing lever, to cause the brake to be periodically released. As embodied, at one side of each of the upright frame members 12, 26 there are provided horizontally apertured brackets 50, provided with upper and lower guides 51 between which are mounted journal blocks 52, slidable in the guideways at either side of the press frame, and rotatably supporting the pilot roller 53 by the projecting ends of its shaft 54. In passing to the press, the web 55 is drawn over guide roller 56, and is looped over the pilot roller between guide rollers 57, these guide rollers being rotatably journaled at their ends in the side frames of the press.

For transmitting movement of the pilot roller to the brake operating means for periodically releasing the brake and allowing the spring to rotate the belt roller, pilot roller 53 is connected with arms 58, at either side of the frame, and preferaby on the outside of the press frame, by means of links 59, one at either end of the pilot roller 53, which are apertured at one end to receive and be moved by the ends of the pilot roller shaft 54, and are connected by means of pivot pins 60 at their other ends with the arms 58. Arms 58 are preferably keyed to a shaft 61 extending from one side of the press frame to the other, and thus prevent the pilot roller from moving out of alinement with the web.

The brake mechanism is connected with the pilot roller by means of a lever 62 securely fastened to one end of roller shaft 25, which is rotatably journaled in the side frames of the press, and at its upper end, lever 62 is pivoted to one end of link 63, and link 63, in turn, is pivotally connected with one arm 58. As the pilot roller moves back and forth, is causes a corresponding movement of the roller shaft 25 and brake 35 and brake releasing lever 46, and an extreme movement of the pilot roller to the right (Figure 1) will cause the lower end of releasing lever 46 to engage the operating stop 65, thereby causing a displacement of the cam 43 from its normal position and opening the brake shoes 39 to release the brake and move the belts into contact with the web roll. As the belts are moved into contact with the web roll, the tension of the web will be increased causing a reverse movement of the pilot roller and a corresponding reverse movement of the brake and releasing lever 46, thereby again applying the brake and holding the belt roller 24 against movement relative to its supporting shaft 25. If desired, the brake operating stop 46 may be positioned very close to the normal position of the cam lever, so that a slight movement of the pilot roller will be sufficient to allow the spring 31 to operate on the belts 20, although it is preferably to so position the operating stop that the brake is released only on relatively great movements of the pilot roller.

Means are also provided, according to the illustrative embodiment of the invention, for tensioning the pilot roller and applying to it the necessary force to oppose its movement by the tension of the web passing over it, and preferably these means comprise means for variably tensioning the pilot roller so that the normally uniform tension of the web can be varied as desired and in accordance with the operating conditions of the press, and particularly can be varied for different widths of web rolls. As embodied, there is provided a helical spring 70 surrounding shaft 61 to which arms 58 moved by the pilot roller 53 are fixed, and this spring is attached to shaft 61 at one end by means of collar 71, pinned to the shaft 61, while the other end of the spring is held by collar 72 freely rotatable on shaft 61. For holding collar 72 in a fixed position, and for variably tensioning the helical spring to vary the tension maintained on the web, the outer portion of collar 72 is formed as a worm gear 73 and meshes with a worm 74, rotatably mounted on the inner side of the press frame 12. Spring 70 tends to turn shaft 61, in a clockwise direction (Figure 1) to move the pilot roller to the right and against the tension of the web. For facilitating the tensioning of the spring, and for enabling the tension of the spring to be changed readily while the press is in operation, worm 74 is geared to a hand wheel 75, mounted on the side frame of the press, by bevel gears 76.

Further in accordance with the present invention, and as illustrated by the accompanying drawings, the tension of the web is preferably continuously controlled and maintained constant by the pilot roller 53, and movement of the pilot roller as the tension of the web varies serves to vary the pressure of the belts against the web roll to compensate for the change in tension of the web, thereby to maintain the tension of the web constant. The pilot roller also serves to control the pressure between the belts and the web roll during the intervals between successive movements of

the belts by the spring which serves to maintain the belts in contact with the web rolls, and thus reduces the necessity for frequent operation of the spring 31 on the belts, greatly reducing wear on the brake and rendering the tension of the web more nearly constant.

In the present embodiment, as above set forth, the pilot roller is moved by the tension of the web against the tension of the spring 70 and pilot roller 53 is connected with the belt roller 24 by means of link 63, lever 62, shaft 25 and brake 35, so that movement of the pilot roller is transmitted to the belt roller and serves to wind or unwind the belts on the belt roller, thereby varying to a relatively small degree the pressure between the belts and the web roll, and consequently the tension of the web drawn from the web roll, and at the same time winding the belts on the belt roller as the web roll wears down. Immediately after each movement of the belt roller 24 relative to its supporting shaft 25 the pilot roller 53 begins to move to the right (Figure 1), due to the continually diminishing diameter of the web roll, and the consequent taking up of the slack in the belts by action of the pilot roller spring 70, and continues to move to the right, until it reaches a point where the brake releasing lever 46 is displaced from its normal position to a sufficient extent to sufficiently release the brake to allow the belt roller to turn relatively to the roller shaft 25, thereby applying the force of the spring 31 to rotate the belt roller 24 and simultaneously rotating shaft 25 to move the pilot roller to the left, as well as turning the brake 35 and brake releasing lever 46 a sufficient distance to again apply the brake to the roller and prevent relative movement between the roller and shaft 25. In this manner the web tension is periodically controlled by the spring 31, always acting under the influence and control of the pilot roller 53, and during the intervals between these operations the tension is controlled directly by the pilot roller.

For facilitating the replenishing of the web roll, means are provided for loosening the belts and allowing them to be held slack, and for this purpose the head 28 fixed to the belt roller 24 is provided with a plurality of sockets 79 into which a bar may be inserted permitting the operator to gain sufficient leverage to turn the roller with ease. In order to turn the roller 24, however, the brake must be released during the turning operation, and for this purpose brake releasing stop 65 is preferably so constructed that it can be moved to several different positions. As embodied, the stop 65 is provided with a handle 80, pivoted on the side frame by pivot pin 81, and is provided with a releasable latch 82 for setting and holding it in any one of its positions. As shown at the left of Figure 1, the handle may be moved to the left to move the stop towards the brake operating lever 46, and in this position holds the brake shoes 39 open permitting the roller to be easily turned against the tension of spring 31. After the belts 20 have been sufficiently loosened, the handle is moved to its extreme right hand position removing the stop from possible contact with the brake cam operating lever 46 and allowing the belts to remain in slackened condition until the reverse web roll has been secured in running position. On changing web rolls, and making the reserve web roll the active web roll, the handle 80 is moved to its central position while the corresponding handle for the other brake is moved to the inoperative position until that web roll is renewed.

Although the tension controlling mechanism has been described in detail for only one web roll (that shown at the left of Figure 1) the web controlling mechanism will be generally employed in connection with two web rolls, and the tension controlling mechanism for the other web roll will be a substantial duplicate of that already described, and for that reason need not be described in detail. Preferably, however, the belts for each web roll are controlled by a single pilot roller over which the web from either web roll is looped as it is led to the printing press.

As the press is stopped, or in case the web breaks as it passes through the press, the web continues to be unrolled from the web roll faster than it is drawn from the press, with the result that the tension on the web is suddenly reduced to substantially nothing, and great quantities of paper would be accumulated between the web roll and the press, or in the press, resulting in the fouling of the press unless the rotation of the web roll were quickly stopped. Under either of these conditions, the sudden reduction in web tension causes the pilot roller to be quickly moved to the right (Figure 1) by reason of the pressure of spring 70, moving the brake operating lever 46 into contact with the brake releasing stop 65, and causing brake shoes 39 to be entirely released from the brake drum 36, thereby applying the full force of the spring 70 and 31 to press the belts into contact with the surface of the web roll with greatly increased pressure, quickly stopping the rotation of the web roll, and after only a small amount of paper has been unrolled. This relatively great pressure between the web roll and the belts may then be removed, after the web roll has been brought to a dead stop, and before the press is started again, by inserting a bar in one of the sockets 79 in the head 28 of the belt roller and turning the roller to unwind the belts. The brake releasing stop 46 may then be moved to inoperative position until the press has been started.

Referring now in detail to the modification shown by way of example in Figure 5 of the drawings, the spring means for pressing the pilot roller against the web and for opposing the tension of the web acting on the pilot roller need not be formed as separate units, but may be inclosed within the belt roller, and this construction will be found particularly advantageous where only a single web roll is to be controlled. As embodied, the belt roller 24 is rotatably mounted on shaft 25 rotatably journaled in the side frames of the press, to which shaft 25, and at one end thereof, is rigidly fixed the lever 62 which is linked to the arms 58 connected with the pilot roller 53. Roller 24 is preferably rotatably mounted on shaft 25 by means of the head 85, at one end of the roller, which is supported on the shaft by means of roller bearings 86, and at its other end is rotatably supported on a collar 87. The head 85 is preferably formed with a brake drum 88 extending outwardly from the roller, and adapted to cooperate with the brake shoes 39 to hold the roller against rotation on its supporting shaft. For turning the roller on its supporting shaft for winding the belts on the surface of the roller when the brake is released, there is provided a helical spring 89, surrounding the roller shaft 25 and extending for a considerable distance therealong, one end of this spring being attached to the head 85 by means of cap screw 90 while the other end is held fast to the shaft by means of collar 91 to which the end of the spring is fastened.

Means are also provided within the roller, according to this modification of the present invention, for tensioning the pilot roller 53 and imparting to it the force necessary to oppose the tension of the web, and preferably these means comprise a variably tensionable spring, which can be wound to substantially any desired tension, thereby permitting the value at which the tension is held constant to be changed at any time and as required by the operating conditions of the press. As embodied, there is provided a second helical spring 92 surrounding the roller shaft 25, one end of the spring being fastened to the shaft by means of collar 93, pinned to the shaft, while the other end of the spring is securely fastened to the collar 87 which is rotatably mounted on the shaft 25 and rotatably supports the belt roller 24. At its outer end collar 87 is provided with an enlarged portion formed as a worm gear 94 which meshes with and may be turned by a worm 95 rotatably mounted on the inner side of the press frame 26. Worm 95 is preferably connected with a hand wheel 96 by which it may be easily turned to vary the tension of the spring 92, as desired, and worm 95 locks and holds the worm gear 94 and spring in any position.

The invention in its broader aspects is not limited to the specific mechanisms shown and described but departures may be made therefrom within the scope of the accompanying claims without departing from the principles of the invention and without sacrificing its chief advantages.

What I claim is:—

1. Web controlling mechanism including in combination a web roll support, friction belts engaging the surface of the web roll, a roller to which the belts are fastened, a pilot roller for moving the roller to wind the belts on the roller, a brake normally movable with the roller, a spring for moving the belt roller relatively to the brake to wind the belts on the roller, and means for releasing the brake and allowing the spring to move the roller on extreme movement of the pilot roller.

2. Web controlling mechanism including in combination a web roll support, friction belts engaging the surface of the web roll, a roller to which the belts are fastened, a pilot roller for moving the roller to wind the belts on the belt roller, a spring for moving the belt roller independently of the pilot roller to wind the belts on the belt roller, and means preventing movement of the belt roller relative to the pilot roller except on extreme movement of the pilot roller.

3. Web controlling mechanism including in combination a web roll support, friction belts engaging the surface of the web roll, a roller to which the belts are fastened, a pilot roller for moving the roller to wind the belts on the belt roller, a spring for winding the belts on the belt roller independently of the pilot roller, means normally preventing movement of the pilot roller relative to the belt roller, and means permitting movement of the pilot roller relative to the belt roller on movement of the pilot roller to an extreme position

4. Web controlling mechanism including in combination a web roll support, friction belts engaging the surface of the web roll, a roller to which the belts are fastened, a pilot roller for moving the roller to wind the belts on the roller, a brake mounted on the belt roller shaft and movable therewith, a spring for moving the belt roller relative to the pilot roller and independently thereof, brake-releasing means, and means for operating said brake-releasing means on an extreme movement of the pilot roller and brake, whereby the belt roller and pilot roller are periodically moved by the spring as the web roll wears down, and the belts are maintained in contact with the web roll to produce a constant web tension.

5. Web controlling mechanism including in combination a web roll support, friction belts engaging the surface of the web roll, a roller to which the belts are fastened, a pilot roller for moving the roller to wind the

belts on the roller, a spring for moving the roller to wind the belts on the roller, a brake normally preventing movement of the belts by the spring, and means controlled by the pilot roller for periodically releasing the brake, whereby the tension of the web is controlled by the periodic movement of the belts by the spring and by the movement of the pilot roller.

6. Web controlling mechanism including in combination a web roll support, friction belts engaging the surface of the web roll, a roller to which the belts are attached, a pilot roller, connecting means directly mechanically connecting the pilot roller and belt roller and moving the belt roller by changes in web tension, said connecting means including means for releasing the direct mechanical connection upon a predetermined movement of the pilot roller and means for moving the belt roller when released to wind the belts on their rollers.

7. Web controlling mechanism including in combination a web roll support, friction belts engaging the surface of the web roll, a roller to which the belts are attached, a pilot roller to move the first roller to wind the belts thereon, spring means also serving to wind the belts on their roller and means controlled by the pilot roller for rendering the spring means operative whereby the belts are kept in contact with said roll and the tension of the web is maintained constant.

8. Web controlling mechanism including in combination a web roll support, friction belts engaging the surface of the web roll, a roller to which the belts are attached, spring means to maintain the belts in contact with the surface of the web roll and a pilot roller moved by the tension of the web for moving the first roller to maintain the tension of the web constant, and means controlled by the pilot roller for periodically applying said spring means to said belts.

9. Web controlling mechanism including in combination a web roll support, friction belts engaging the surface of the web roll, a roller to which the belts are attached, a pilot roller for winding the belts on the first roller to maintain the pressure between the web roll and the belts constant and thereby maintain a constant web tension and means controlled by said pilot roller for periodically winding said belts on said roller including spring means acting on the belt roller to maintain the belts in contact with the surface of the web roll.

10. Web controlling mechanism including in combination a web roll support, friction belts engaging the surface of the web roll, a roller to which the belts are attached, a pilot roller for winding the belts on the first roller and constantly acting to maintain the web tension constant, variably tensionable spring means opposing movement of the pilot roller for varying the tension of the web and means controlled by said pilot roller for periodically winding said belts on said roller including spring means acting on the belt roller to maintain the belts in contact with the surface of the web roll.

11. Web controlling mechanism including in combination a web roll support, friction belts engaging the surface of the web roll, roller means to which the belts are attached, spring means for winding the belts on the roller means to maintain the belts in constant contact with the surface of the web roll and for increasing the pressure between the belts and the web roll when the web breaks to stop rotation of the web roll, and means for periodically rendering said spring means operative.

12. Web controlling mechanism including in combination a web roll support, friction belts engaging the surface of the web roll, a roller to which the belts are attached, a pilot roller moved by the web as it is drawn from the web roll and directly mechanically connected with the first roller for winding the belts on the roller and maintaining the web tension constant under normal conditions, and means brought into operation by extreme movement of said pilot roller for stopping the rotation of the web roll when the web breaks.

13. Web controlling mechanism including in combination a web roll support, friction belts engaging the surface of the web roll, a roller to which the belts are attached, a pilot roller connected with the roller and moved by the tension of the web to wind the belts on the roller, said means cooperating to maintain the tension constant under normal operating conditions, and a separate source of power for greatly increasing the pressure between the belts and the web roll when the web breaks.

14. Web controlling mechanism including in combination a web roll support, friction belts engaging the surface of the web roll, a roller to which the belts are attached, a pilot roller moved by the tension of the web for moving the first roller to maintain the tension of the web constant under normal operating conditions, spring means to maintain the belts in contact with the surface of the web roll and for greatly increasing the pressure between the belts and the web roll when the web breaks and means for periodically rendering said spring means operative.

15. Web controlling mechanism including in combination a web roll support, friction belts engaging the surface of the web roll, a roller to which the belts are attached, a pilot roller to move the roller to wind the belts on the first roller and maintain the tension of the web constant, spring means to wind the belts on the roller to maintain the belts

in contact with the periphery of the web roll as the web roll wears down and for pressing the belts against the web roll with greatly increased pressure to stop the web roll when the web breaks, said spring means operating independently of but under control of said pilot roller.

16. Web controlling mechanism including in combination a web roll support, friction belts engaging the surface of the web roll, a movable support to which the belts are attached, and means controlled by the pilot roller for periodically taking up said belts on said movable support including spring means acting on the belt roller to maintain the belts in contact with the surface of the web roll.

17. Web controlling mechanism including in combination a web roll support, friction belts engaging the surface of the web roll, a movable support to which the belts are attached, a pilot roller connected with the belts and moved by the tension of the web for moving the belts relatively to the roller, spring means for periodically moving said support, said means cooperating to maintain the tension of the web constant and means operated by said pilot roller for rendering said spring means operative in certain positions of said pilot roller.

18. Web controlling mechanism including in combination a web roll support, friction belts engaging the surface of the web roll, a movable support to which the belts are attached, spring means to maintain the belts in contact with the surface of the web roll, a pilot roller for moving the support and constantly acting to maintain the tension of the web constant and variably tensionable spring means opposing the action of the pilot roller for varying the tension of the web and means operated by said pilot roller for rendering said spring means operative in certain positions of said pilot roller.

19. Web controlling mechanism including in combination a web roll support, friction belts engaging the surface of the web roll, a movable support to which the belts are attached, a pilot roller to move the support to maintain the web tension constant, normally inoperative spring means to move the belts to maintain them in contact with the surface of the web roll as the web roll wears down and for pressing the belts against the web roll with greatly increased pressure to stop the web roll when the web breaks and means for rendering said spring means operative.

In testimony whereof, I have signed my name to this specification.

CHARLES J. RICHTER.