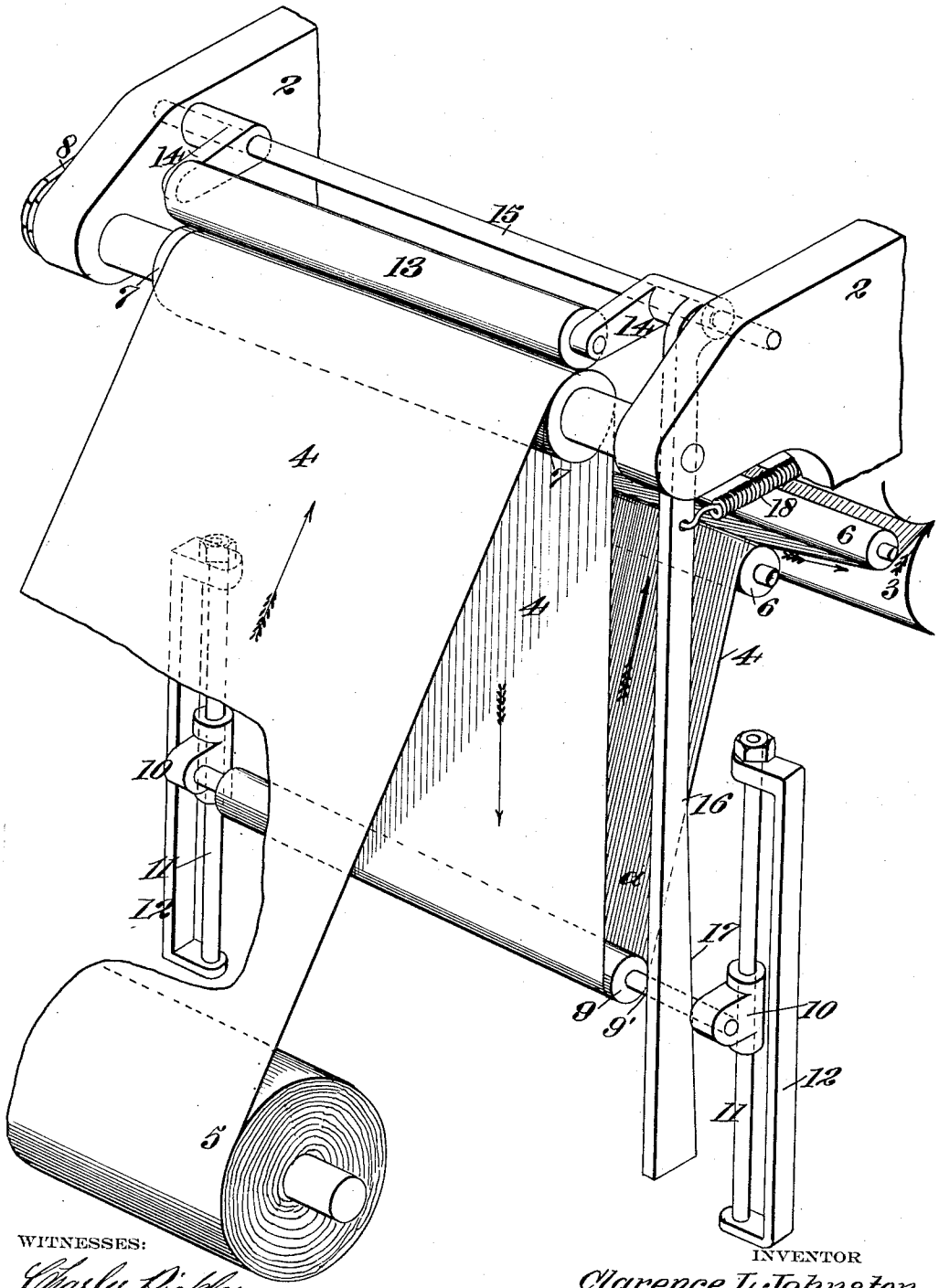
C. L. JOHNSTON.

AUTOMATIC TENSION CONTROL FOR PRINTING PRESSES, COATING MACHINES, REWINDERS, &c.

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1,115,828.

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WITNESSES:

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AUTOMATIC TENSION CONTROL FOR PRINTING-PRESSES, COATING-MACHINES, REWINDERS, &c.

1,115,828 Specification of Letters Patent. **Patented Nov. 3, 1914**

Application filed May 7, 1913. Serial No. 766,070.

To all whom it may concern:

Be it known that I, CLARENCE L. JOHNSTON, a citizen of the United States, residing at Oakland, in the county of Alameda and State of California, have invented new and useful Improvements in Automatic Tension Control for Printing-Presses, Coating-Machines, Rewinders, &c., of which the following is a specification.

This invention relates to paper or web-feeding mechanism for printing presses, coating machines, re-winders, etc.

The object of the present invention is to provide a mechanism for controlling the speed and tension of the paper, or other web, to printing presses, coating machines, re-winders, etc., so as to automatically effect an even feed and speed of paper to the machine, and control the quantity of paper derived from a roll or source of supply.

The invention consists in combination with a web machine, of a feed and tension control involving an automatic device for compensating an excess supply or a deficiency of supply during the continuous feed of the paper or web into the machine, and which device is adapted for automatically controlling the speed of the feed supply.

The invention consists of the parts and the construction and combination of parts, as hereinafter more fully described and claimed, having reference to the accompanying drawings, in which the figure is a perspective of the control as applied to a printing press; although manifestly the invention is applicable to a variety of uses.

2 indicates a portion of a web press having the usual printing cylinder 3, to which a continuous web of paper or other material 4 is delivered from a source of supply or roll, indicated at 5; said web passing over suitable guide rollers 6 in the press.

Considerable difficulty is at present encountered in practice in controlling the speed and quantity of the infeeding strip or web, and it is my purpose to eliminate the uncertainty of the feed and produce a regular tension in the web passing to the cylinder of the press, and to automatically control the speed and consequently the amount of paper coming from the roll in exact proportion to the requirements of the press cylinder.

In the present invention the web 4 is first run from the supply roll 5 upwardly and over a driven feed roller 7, to which power is imparted by a suitable driving gear or mechanism 8 of the press; the peripheral speed of the feed roller 7 preferably being in excess of the surface feed of the printing cylinder 3. Between rollers 7—6 the paper web makes a loop *a* in which rests the loose floating take-up or compensating roller 9, which is made to ride up and down on the paper and regulate the paper feed as follows: The spindle 9′ of roller 9 projects from each end and is turnably supported in bearings 10 slidable vertically upon rigid guides 11, attached to a convenient part of the frame of the press, as indicated at 12, movable toward and from feed roller 7 to effect the proper feed of the paper. The roller 13 is mounted upon arms 14 secured to a rock shaft 15, journaled in frame 2. Shaft 15 has a crank arm 16 provided with a vertical cam face arranged in the path of a projecting end of the spindle 9′ of roller 9. As roller 7 is run at constant speed, it is obvious that as the pressure of roller 13 is varied, there will be a proportionate variation of feed of the web 4 between the feed rollers 7—13. Hence, if temporarily a rapid feed should be required, then the variable pressure roller 13 must be made to press harder on the web 4, which latter in time being pressed upon the driven roller 7, would cause a faster movement of the paper 4; and conversely if a reduced quantity of paper or lessened speed is desired, then the pressure of the roller 13 upon the web 4 must necessarily be lessened, permitting the driven roller 7 to revolve at a speed greater than the movement of the paper. Too fast a speed of paper to the printing cylinders would choke or clog the press and too slow a feed would result in tearing the paper. Both these objections are avoided by my device.

In operation, with the parts in the position indicated in the drawings, the pressure roll 13, resting with its entire weight on the feed roller 7 and roller 9 being lifted consequently so as not to engage cam 17 on crank arm 16, the paper will feed at maximum speed. The moment however, that the amount of paper fed over the roller 7 is in excess of the requirement of the press cylinder 3, so as to lighten the loop *a* between the

rollers 7—6, roller 9 drops, keeping the paper taut all the while. If the roller 9 drops until its spindle 9′ strikes and presses against cam 17, it will move arm 16 outwardly and slightly raise the roll 13 thereby lessening the pressure of said roll on the paper. If the feed of paper slows beyond the requirements of the press, the roller 9 is lifted by the shortening of the loop *a* and lets pressure roller 13 bear heavier on the paper and so speeds up the feed again. A spring 18 accelerates the gravity of the roller 13. The weight of the roller 9 of course is proportioned to the strength of the paper web and to the weight of the pressure roll 13.

It is manifest that shaft 15 and arm 14 form a simple carriage frame or carrier for moving the pressure roller 13 toward and from the centrally driven roller 7; the latter as before stated, having a normal speed in excess of the speed of the printing cylinder, so that there can never be any unnecessary lag in the paper feed.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. In a web tension control, the combination with a stock roll, of a feed roller driven at constant speed and drawing the web from the roll, a coacting presser roller between which and the feed roller the web is fed, a carrier for the presser roller by which the latter is moved toward and from the feed roller to vary its pressure on the web, guide means for the web succeeding the feed roller, between which guide means and feed roller the web forms a loop, a floating tension roller in and supported by the loop, and actuating connections between the tension roller and said carrier.

2. In a web tension control, the combination with a stock roll of web, of a pair of coacting feed rollers by which the web is fed forward, a pivoted frame for one roller by which it is moved toward or from the other to vary pressure on the web, a guide roller between which and the feed rollers the web makes a loop, a gravity-actuated tension device supported in said loop and freely movable within the limitations of the loop, and an arm on the rock frame operable by the tension device to increase the pressure of the shiftable roller to cause the web to feed faster when the loop is shorter and to decrease pressure to feed slower when the web lengthens.

3. A web feeding mechanism regulator for printing presses, comprising the combination of paper feeding means and a web roll, a freely floating tension roller supported on a loop of the web between the paper feeding means and press mechanism, and a lever operated on by said roller for controlling the paper feeding means whereby on the lengthening and shortening of the loop and the corresponding fall and rise of the tension roller the pressure of the feeding mechanism in the web is automatically varied.

4. In a web tension control, the combination with a stock roll of web, of a pair of feed rolls between which the web passes, means for varying the pressure of said rolls upon the web traveling therebetween, feed and guide mechanism in subsequent relation to the feed roll, and means supported by the web and actuated by gravity in one direction and oppositely by the web for controlling said pressure varying means.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

CLARENCE L. JOHNSTON.

Witnesses:
CHAS. N. CRAMPTON,
HORACE P. BROWN.