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F. W. ROLLAND, JR.

DOCTOR FOR REGULATING AND CONTROLLING THE FEED OF PAPER TO PRINTING PRESSES.

APPLICATION FILED AUG. 13, 1903.

NO MODEL

Fig. 1.

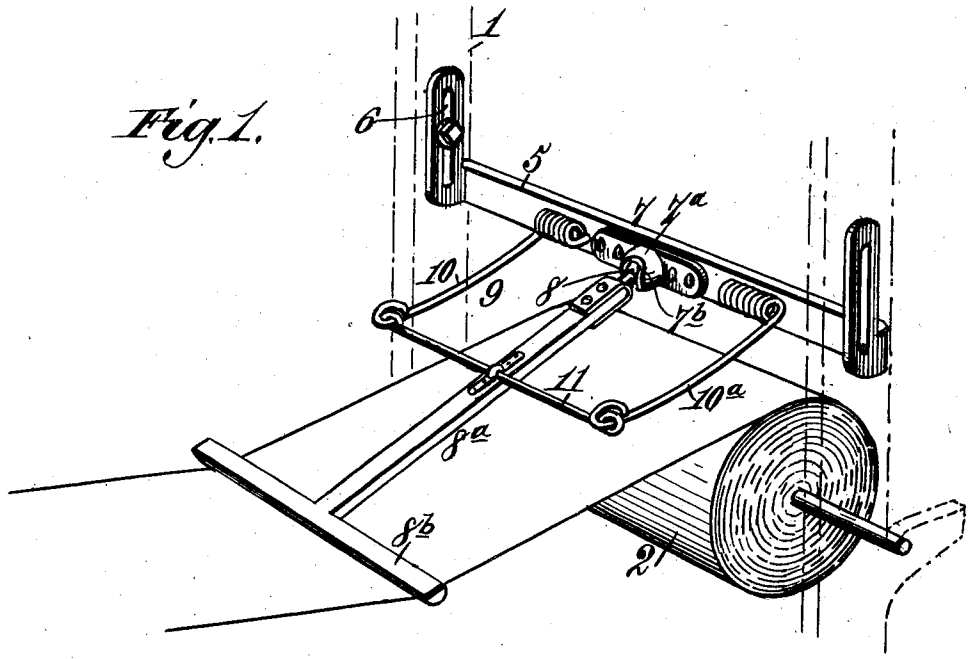


Fig. 2.

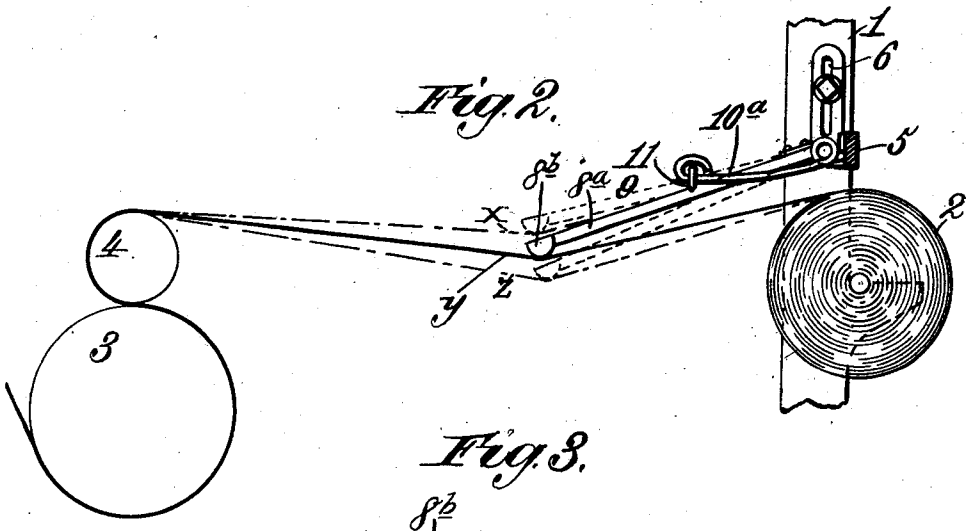
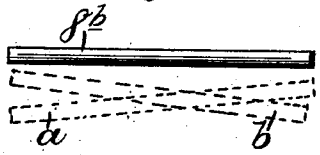


Fig. 3.



Witnesses.
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No. 745,240. Patented November 24, 1903.

UNITED STATES PATENT OFFICE.

FREDERICK W. ROLLAND, JR., OF CHICAGO, ILLINOIS.

DOCTOR FOR REGULATING AND CONTROLLING THE FEED OF PAPER TO PRINTING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 745,240, dated November 24, 1903.

Application filed August 13, 1903. Serial No. 169,370. (No model)

To all whom it may concern:

Be it known that I, FREDERICK W. ROLLAND, Jr., a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Doctors for Regulating and Controlling the Feed of Paper to a Printing-Press, of which the following is a specification.

My invention relates to and has for its object to provide an improved doctor for regulating or controlling the feed of paper to a printing-press by automatically compensating for irregularities of the paper web or the roll of paper.

Experience has shown that frequently the rolls of paper from which the web is fed to the printing-press are imperfect or irregular in various particulars, by reason whereof the web of paper is often snapped or broken and by reason whereof also the paper passes to the printing-press improperly. Frequently the roll upon which the paper is wound and from which it is delivered to the printing-press is not truly cylindrical, sometimes having a flattened part and sometimes having greater weight in one radial direction than in other radial directions. As a result of these imperfections there exists between the roll of paper and the place where it enters the printing-press a slackage which the elements of the printing-press that draw the paper from the roll take up with suddenness, resulting frequently in the breaking of the paper.

As an example of the imperfections referred to and the result thereof, let it be assumed that the roll of paper as an entity has a preponderance or excess of weight in a given radial line. In the rotation of the roll of paper this radial line of preponderating weight is drawn with difficulty on the ascending side. On the descending side, however, its movement is accelerated, resulting in the first-named instance in a tautness of the web of paper between the roll of paper and the paper-drawing elements of the printing-press and in the other in a looseness or slackness of the paper, the ultimate effect of which is a series of jerks, which frequently result in the web of paper becoming disrupted or broken. Frequently, also, the two opposite edges of the paper are of unequal length because of some imperfection in the cut or manufacture thereof, which imperfection results in a state of slackage at one side or edge of the paper as compared with the other side or edge thereof, the effect of which would be an imperfect feeding of the paper to the printing-press.

The improved doctor arrangement of my invention serves to take care of or compensate for the illustrated examples of such and other imperfections.

To the end stated my invention consists of a paper-feed doctor or corrector attachment for printing-presses, as hereinafter set forth and claimed, reference being made to the accompanying drawings, in which—

Figure 1 is a perspective view illustrating my invention attached to that part of the frame of a printing-press which carries the paper-roll and which may be of any known construction, varying with the different types of printing-presses, and which is therefore shown in a conventional manner only for the purpose of illustration of the application of my invention. Fig. 2 is a vertical sectional view showing graphically by dotted and full line positions of the doctor the action thereof under certain circumstances. Fig. 3 is a detail diagrammatic view illustrating the varied capacity of action of my improved doctor.

In the said drawings the reference-numeral 1 designates a fragment of the frame of a printing-press, which, as stated, may be of any known type and which will vary with different types of printing-presses.

The numeral 2 designates a roll of paper supported in any usual way in such frame.

The numerals 3 and 4 designate, respectively, the type-cylinder and pressure-roll of the printing-press, and which may be of any known construction, to and around which impression-roll the paper is caused to pass, and by which, either alone or in connection with other known auxiliary elements, the paper is drawn from the paper-roll during operation of the printing-press.

The numeral 5 designates a support which carries the hereinafter-described doctor or feed-correcting mechanism, and which is ad-

justably connected to the frame 1 in any suitable way, as by the slot-and-bolt connection 6. Mounted in this support is a doctor arranged to yieldingly press against the web of paper. This doctor, as shown, is mounted in said support substantially intermediate the ends thereof by means of a ball-joint 7, having a ball 8, which fits in an approximately cylindrical socket 7^a, provided with an elliptic mouth 7^b, whereby an up-and-down and oscillatory or swiveling movement of the doctor is provided for, and at the same time it is "centered," so to speak, in such a way that undesirable lateral movement thereof is prevented in order that the doctor may at all times be in a position to yieldingly engage the web of paper throughout the width of the latter and compensate for inequality in the length of the opposite edges of the web of paper without disturbing the path of movement of the web of paper, or, in other words, without laterally shifting the paper. By reason of the ball-joint connection of the doctor with the support it is capable of practically universal movement—that is to say, it is capable of assuming all positions which in practice it is required to assume to compensate for the irregularities in the paper or the paper-roll.

My improved doctor, as shown in the drawings, consists of an arm 8^a, projecting from the support 5, intermediate the ends of the latter, connected thereto by a ball-joint and provided at its active end with a cross-head 8^b, attached at its middle to said arm and the length of which may be varied, but is preferably approximately equal to the width of the web of paper. Said doctor in the example of my invention as shown in the drawings is normally and automatically held against the web of paper as it passes from the roll 2 to the printing-press by a spring-presser 9, composed of two spring elements 10 and 10^a, mounted on the support 5 and engaging in the suitably-formed ends of a connecting element 11, secured to the arm 8^a of the doctor. It is obvious that the spring-pressure which holds the doctor in engagement with the web of paper can be exerted differently, that shown in the drawings being preferential only.

Describing the principle of operation of my invention, reference will be had to the particular embodiment thereof shown in the drawings.

My improved attachment is connected to the frame of a printing-press in the manner as shown in the drawings or any other suitable manner and adjusted thereon so that the cross-head 8^b rests lightly on the web of paper as it passes from the paper-roll to the printing-press. If by any fault in the roll of paper the feed thereof is greater than that needed by the press, resulting in a slackage between the roll of paper and the printing-press, such as illustrated by the dotted lines z in Fig. 2 of the drawings, the doctor will automatically follow up the slackage, and as the machine continues to take the web of paper will yield, as shown in the full-line position y and the dotted-line position x in Fig. 2 of the drawings, thus modifying the action of the paper-taking-up elements of the printing-press, preventing the liability of the paper becoming broken by sudden and violent taking up of this slackage, as before explained, and avoiding the jerky action hereinbefore referred to, insuring a constantly even or smooth feed of the paper. If by reason of any imperfection or fault in the cutting of the web of paper or otherwise in the manufacture thereof one edge should be longer than the other, it is obvious that there would be a slack at one side or edge of the paper, and the paper would pass to the impression-roller of the printing-press improperly, and, furthermore, this slackage at one side or edge of the paper would result in the jerky action hereinbefore set forth and the liability of the paper becoming broken or disrupted. In the event of the occurrence of this fault my improved doctor, by reason of its capacity for varying movement, will correct the fault by taking up the objectionable slack, passing, for instance, in this case from the full-line position in Fig. 3 to the dotted lines a in said figure. If a slack occurs on the other side of the web of paper, it will be taken care of by the corresponding side of the doctor, as illustrated by the dotted lines b in said Fig. 3. It will be obvious that if the slack occurs alternately on opposite sides of the web of paper the doctor will act alternately in manner described to compensate therefor.

By reason of the fact that the cross-head is attached at its middle to the arm element of the doctor and the latter is arranged substantially coincident with the longitudinal median line of the web of paper compensation for inequalities in the length of the opposite edges of the web of paper is accomplished by the oscillation of the cross-head without laterally shifting or disturbing the line or path of movement of the web of paper.

The doctor by reason of its capacity for universal operative movement will always bear evenly on the web of paper throughout the width of the latter and wherever any slack occurs will follow the slack, compensate therefor, and pass the paper onto the printing-press in a smooth taut condition, obviating the liability of breakage of the paper, as hereinbefore explained.

My improved attachment for printing-machines may, if desired, be arranged beneath the web of paper and caused to press upward against the same.

I have hereinbefore described, and illustrated in the drawings, as the statute requires, the best known form of my invention; but I do not wish to be understood as limiting myself to the details of construction or arrangement of parts or to the specific com-

bination of elements set forth otherwise than as may be specifically set up in the following clauses of claim, and then only for the purposes of those particular clauses.

I have illustrated my invention as applied to an attachment for printing-presses. I desire it understood, however, that thereby I do not restrict my invention to attachments for this class of machines, but wish to claim my invention in all the uses to which it is adapted.

Having thus described my invention, what I claim is—

1. A doctor for controlling or regulating the feed of paper to a machine, consisting of an arm mounted in a position coincident with the longitudinal median line of a web of paper and having an oscillatory or swiveling and up-and-down movement, a cross-head attached at its middle to said arm, and means for holding said cross-head in engagement with the web of paper, substantially as described.

2. A spring-pressed doctor for controlling or regulating the feed of paper to a machine, comprising an arm mounted in a position coincident with the longitudinal median line of a web of paper and having an oscillatory or swiveling and up-and-down movement, and a cross-head attached at its middle to said arm, substantially as described.

3. A doctor for controlling or regulating the feed of paper to a machine, consisting of an arm mounted by means of a ball-joint in a position coincident with the longitudinal median line of a web of paper and having an oscillatory or swiveling and up-and-down movement, a cross-head attached at its middle to said arm, and means for holding said cross-head in engagement with the web of paper, substantially as described.

4. A spring-pressed doctor for controlling or regulating the feed of paper to a machine, comprising an arm mounted by means of a ball-joint in a position coincident with the longitudinal median line of a web of paper and having an oscillatory or swiveling and up-and-down movement, and a cross-head attached at its middle to said arm, substantially as described.

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

FREDERICK W. ROLLAND, JR.

Witnesses:
JOHN J. SEMMERS,
CLAUDE READ.