

April 28, 1936.

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2,039,236

ALL SIZE ROTARY WEB PRESS

Filed Jan. 2, 1935

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UNITED STATES PATENT OFFICE

2,039,236

ALL SIZE ROTARY WEB PRESS

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Application January 2, 1935, Serial No. 125

3 Claims. (Cl. 101—128)

This invention relates to rotary presses, and the object is to provide a web press which will print on the web an immediate succession of impressions of less length than the circumference of the printing cylinder. Thus, for example, in the case of plate printing, if the cylinder is $4\frac{1}{2}$ inches in diameter or 14.92 inches in circumference and carries a plate ten inches long, every ten inches of the web may carry an impression; if it carries two plates each four inches long, every eight inches may carry two impressions, the "sheet length" being in the first instance ten inches and in the latter instance four inches. A desired margin between actual impressions may be provided. The web thus may be completely printed without waste and be cut into sheets of correspondingly short length, folded or otherwise disposed of as may be desired. I attain this result by the use of a particular arrangement for feeding the web. My invention will be well understood by reference to the following description of an illustrative embodiment thereof shown by way of example in the accompanying drawing, wherein:

Fig. 1 is a diagrammatic view in side elevation illustrating the principal parts of a press embodying my invention;

Fig. 2 is a plan of a feed roll with parts broken away;

Fig. 3 is a section on the lines 3—3 of Fig. 2 and Fig. 5;

Fig. 4 is a plan view of a portion of the feed roll developed in a plane with parts omitted; and Fig. 5 is a section on the line 5—5 of Fig. 3.

Referring to the drawing, I there show a printing couple of the rotary type embodying a cylinder 7 carrying plates 9 and cooperating with an impression cylinder 11.

The web W is drawn from a suitable supply seen at the left of Fig. 1; passes through a pair of feed rolls 13; over a loop or dance roll 14 through a feeding couple comprising a main feed roll 15, hereinafter to be more particularly described, and a cooperating presser roll 17 driven therefrom, herein frictionally through the web; thence through the printing couple; through a pair of feeding-out rolls, comprising a roll 19 rotating in synchronism with roll 15, being herein shown as driven therefrom by means of chain 21, and a cooperating presser 23; over a dance roll 25 and through a pair of feed rolls 27 driven in synchronism with the feed rolls 13 by chain 29.

While printing is being effected by the cylinder 7, obviously the linear speed of the web passing through the couple must be the same as the sur-

face speed of the cylinder. If, however, the plate cylinder and the impression cylinder do not pinch the web between them throughout the entire circumference of the former, if the web were constantly being fed at this speed succeeding impressions would be spaced apart with a resultant waste of paper which would increase as the length of the impressions being made for a given job decreased. I herein provide novel means for permitting the paper to be forwarded during the printing operation at a speed equal to the surface speed of the printing couple and for retracting the same between successive impressions so that the algebraic sum of the movements will be equivalent to the length of the impression thus giving immediately successive impressions upon the web.

The feeding of the web is herein effected primarily through feed roll 15, which may be considered a master feed roll controlling the movements of the web, which roll 15 is loose on shaft 31 and is provided in one end with a lug 33 adapted to be received with freedom for circumferential play in a circumferentially elongated slot 35 in a collar 37 disposed at one end thereof and keyed to the shaft. A spring 39 interposed between abutments on the lug 33 and the collar 37 normally tends to rotate roll 15 counterclockwise viewing Fig. 3 to maintain lug 33 against the shoulder 41 of the notch at the left hand side thereof, viewing that figure.

The shaft 31 may be driven by means of the change gears 43 diagrammatically indicated in Fig. 1 at a suitable speed such that by the driving action of the shoulder against lug 33 it will rotate roll 15 in the interval between the beginning of one printing operation and the next, a distance equal to the desired length of sheet, that is, the length of the actual impression plus any desired margin, and therefore ordinarily at a speed substantially less than the surface speed of the printing cylinder. During the actual printing operation, however, the traction of the printing couple on the web will draw it forwardly and will move roll 15 at said surface speed rotating it clockwise viewing Fig. 1 against the spring 39 and drawing lug 33 away from the rear shoulder 41 of the notch. The paper, during this movement, will draw up the dance roll 14 and will be fed out by rolls 19 and 23 which are driven by chain 21 gearing with the sprocket 45 carried by roll 15 and fed thereby into the loop of the dance roll 25. The feed couple 13 and through it feed couple 27 may

be driven from shaft 31 as by the bevel gearing shown in Fig. 1 and their surface speed is such as to forward a "sheet length" for each printing operation.

5 When the grip of the printing couple on the paper is released, roll 15 will be released to the compressed spring 39 which will rotate it counterclockwise, viewing Fig. 3, returning lug 33
10 against the shoulder 41 which is being advanced at uniform speed by the gearing 43 and roll 19 will likewise be reversed. The paper is thus retracted from the loop of dance roll 25 and fed into the loop of dance roll 14. The algebraic sum of the movements of roll 15 obviously is the
15 same as the movement would have been had the lug never left the driving shoulder and the roll had been driven throughout by means of collar 37. The net movement of the sheet therefore is that of the collar as determined by the
20 change gear and is equivalent to the desired length of sheet. Succeeding impressions therefore follow immediately with desired margins, one after that just printed independently of the circumference or speed of the cylinders of
25 the printing couple.

I am aware that the invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and I therefore desire the present embodiment to be considered in all respects as illustrative and not restrictive; reference being had
30 to the appended claims rather than to the foregoing description to indicate the scope of the invention.

35 I claim:

1. An all-size rotary web press comprising in

combination with a rotary printing couple, means for delivering the web thereto comprising a feed roll and a cooperating presser roll, a driving means adapted to turn said feed roll at a
5 determined surface speed less than the surface speed of the printing couple and resilient means connecting said driving means to the roll permitting the latter to gain on the former under traction on the web by the printing couple.

2. An all-size rotary web press comprising in
10 combination with a rotary printing couple, means for delivering the web thereto comprising a feed roll and a cooperating presser roll, a driving means adapted to turn said feed roll at a determined surface speed less than the surface
15 speed of the printing couple, resilient means connecting said driving means to the roll permitting the latter to gain on the former under traction on the web by the printing couple, and a dance roll in advance of the feed roll.

3. An all-size rotary web press comprising in
20 combination with a rotary printing couple, feeding-in and delivery means operating to forward a determined sheet-length for each impression, looping devices between said means
25 and the couple, and feeding-in roll and a delivery roll between said looping devices and the couple, a one way driving connection for the feeding-in roll adapted to turn the same at a speed corresponding to that of the first men-
30 tioned feeding-in means, said roll having a connection to said driving means resiliently yieldable in the forward direction and means for driving the delivery roll in synchronism with the feeding-in roll.

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