

No. 648,399.

Patented May 1, 1900.

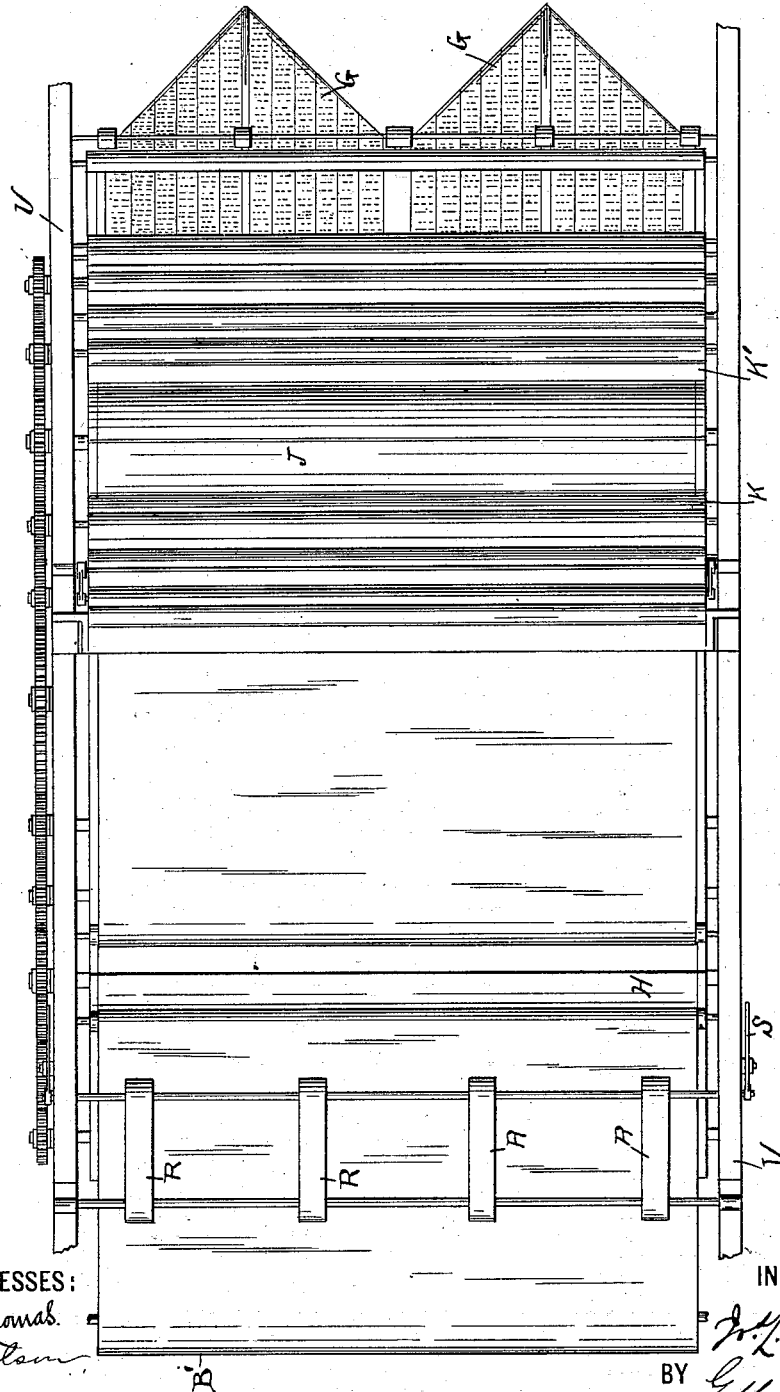
J. L. FIRM.
ROTARY PRINTING PRESS.

(Application filed Jan. 31, 1898.)

(No Model.)

2 Sheets—Sheet 2.

Fig. 2.



WITNESSES:

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JOSEPH L. FIRM, OF JERSEY CITY, NEW JERSEY.

ROTARY PRINTING-PRESS.

SPECIFICATION forming part of Letters Patent No. 648,399, dated May 1, 1900.

Application filed January 31, 1898. Serial No. 668,520. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH L. FIRM, a citizen of the United States, and a resident of Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Rotary Printing-Presses, of which the following is a specification.

Figure 1 is a longitudinal section of mechanism adapted for printing two webs and longitudinally folding them. Fig. 2 is a plan view of the same. Figs. 3, 4, 5, and 6 are details. Fig. 7 is a perspective of a portion of the gripper belt or apron, on an enlarged scale, showing the manner of forming the grippers.

A A' and B B' represent rolls or webs of paper set in their different bearings to be used on the different sets of printing mechanisms, as follows: The web A passes over the rollers 1 and 2 to impression-cylinder C and is printed by the plates on form-cylinders D and D' on one of its sides. It then passes over roll 4 and under roll 5 to impression-cylinder E and is printed by the plates on form-cylinders F and F' on its opposite side. It then passes under the rolls 6 and 7 and over 8 to the longitudinally-folding frame or former G, to be folded and delivered in any manner desired. The web B passes over the rolls 10 and 11 to impression-cylinder H and is printed by the plates on form-cylinders I and I' on one of its sides. It then passes over roll 12 and under roll 13 to impression-cylinder J and is printed by the plates on form-cylinders K and K' on its opposite side. It then passes under the roll 14 and between the rolls 8 and 9, where it meets the web A and is folded longitudinally with it on the former G, being, when required, slit by the slitte L, which projects from roll 9 into a groove in the roll 8.

The plates on the different form-cylinders may be four abreast with columns running circumferentially, as shown in detail at d' d'' d^3 d^4 in Fig. 6.

The mode of operation between each impression-cylinder and its form-cylinders may be understood from the following description of one of them. Taking the cylinder C, for example, c and c' are the quadrants, which act as impression-surfaces for the forms d

on form-cylinder D, each of which is one-quarter of the surface of cylinder C. The intermediate quadrants c^2 and c^3 act as impression-surfaces for the form d^5 on form-cylinder D'. d is a form extending over half the circumference of form-cylinder D, the other half, d^6 , being of smaller diameter. d^5 is a form extending one-half the circumference of form-cylinder D', the other half, d^{12} , being of smaller diameter. The circumference of D and D' is each shown as one-half the circumference of C; but this is merely preferable, since similar results can be obtained, providing the circumference of C be any even multiple of the circumference of D and D', respectively. For each rotation of cylinder C the form d will make two impressions on the web, one against that quadrant of the impression-surface lettered c and the other against that quadrant of the impression-surface lettered c' . Likewise the form d^5 will make two impressions; but the impressions from form d^5 will alternate with the impressions from form d . As the spaces d^6 and d^{12} are passing the cylinder C there will be no impression contact, so that the impression contacts between the impression-cylinder and each form-cylinder are intermittent, occurring twice for each rotation of the cylinder C, and each continuing during one-quarter rotation of the same. The semi-circumference, as d^6 , of each form-cylinder, which is on the opposite side of the cylinder from the form, as being of slightly-reduced diameter, does not come in contact with the web. Therefore this surface d^6 may be used as an ink-table cooperating with the ink-rollers d^7 and d^8 . The ink-rollers, or such as contact with the surface d^6 , may have either a stationary axle or be movable to and from said surface by the use of any suitable means—as, for instance, such as is shown in Patent No. 546,136, issued to me September 10, 1895. d^9 and d^{10} are ink-rollers cooperating with the form d . d^{11} is the ink-cylinder supplying ink to the rollers d^9 and d^{10} .

The above-described new mode of operation secures a greater economy and better distribution of ink than heretofore.

The times of contacting and freeing the web by the various form-cylinders vary, so

that no web is at any time completely freed, and there is a continuous and positive forward impulse given thereto. Moreover, the webs pass about such a large portion of the impression-cylinders with which they are in uninterrupted contact that this alone would cause sufficient friction to secure uninterrupted feeding of the web.

Offset webs $a a'$ and $b b'$ pass, respectively, around the impression-cylinders E and J. They are unwound, respectively, at a' and b' and rewound, respectively, at a and b .

The webs after leaving the folding frames or formers G G may be passed through any suitable folding and cutting mechanism.

In Fig. 1, 40 and 41 in dotted lines represent a form and impression cylinder which may be employed for printing on one side of web B in colors. Each form will extend circumferentially entirely around cylinder 40. In Fig. 1 are also shown webs A' and B', which are held in separate frames O and P. Q and R represent sprocket and gripper belt mechanism—such, for instance, as are shown in United States Patents No. 374,355 or No. 176,401, issued to me, respectively, on December 6, 1887, and April 18, 1876. The object of this mechanism is to thread the machine without stopping the press and while it is in motion. For example, the web A' is pasted and led by hand to a gripper Q¹ on the gripper-belt Q², when the roll A is nearly exhausted. The sprocket Q³ is lowered into contact with the roller 1 by the lever S, thereby attaching the pasted web A' to the face of web A. The two webs are then carried together through the machine until the slit or end of A is reached, after which the web A' takes the place of A. The sprocket Q³ is then lifted to its first position, and thus moved out of contact with the roller 1, but ready to be used again when required. The web B may be replaced by a web B' in a similar manner by the use of a gripper mechanism R, mounted and operated in the same way as the mechanism Q.

The mechanism for raising and lowering the sprocket-roller, as above described, is shown in Figs. 6 and 7. Lever mechanism S is pivoted to the frame V at s and carries the shaft q of sprocket-roller Q³, there being of course

duplicate sprocket belt and rollers on opposite sides of the machine.

When the press is running at a very fast rate of speed, I prefer to slow down to some extent before making the change of webs, as this will insure their action more positively.

The paper of the mill-roll is slit at one of its edges, as shown at A² in Fig. 5. This is done when the winding of it on its core or stock is started. This insures an easy tearing or separating of it from its core or stock when the end is reached.

I claim—

1. In a rotary printing-press, in combination, the printing mechanism, a guide, as 1, past which the web is led to the printing mechanism, a web-holder adapted to hold the end of a new web and mechanism whereby said web-holder may be operated to bring the end of said new web in contact with the web passing said guide, substantially as described.

2. In a rotary printing-press, in combination, two form-cylinders, an impression-cylinder which is substantially twice the circumference of each form-cylinder, the form on each form-cylinder occupying substantially a semicircumference thereof of greater radius than the opposite semicircumference, bearings whereby the axes of said three cylinders are held in substantially the same plane, all substantially as described, whereby alternate impressions are produced upon the web by said form-cylinders and each form-cylinder operates against opposite quarter-circumferences of said impression-cylinder.

3. In a rotary printing-press, in combination, the printing mechanism, a guide, as 1, past which the web is led to the printing mechanism, a web-holder adapted to hold the end of a new web and mechanism whereby said web-holder may be operated to bring the end of said new web in contact with the web passing said guide; said web-holder consisting of a traveling gripper mechanism, substantially as described.

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Witnesses:

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