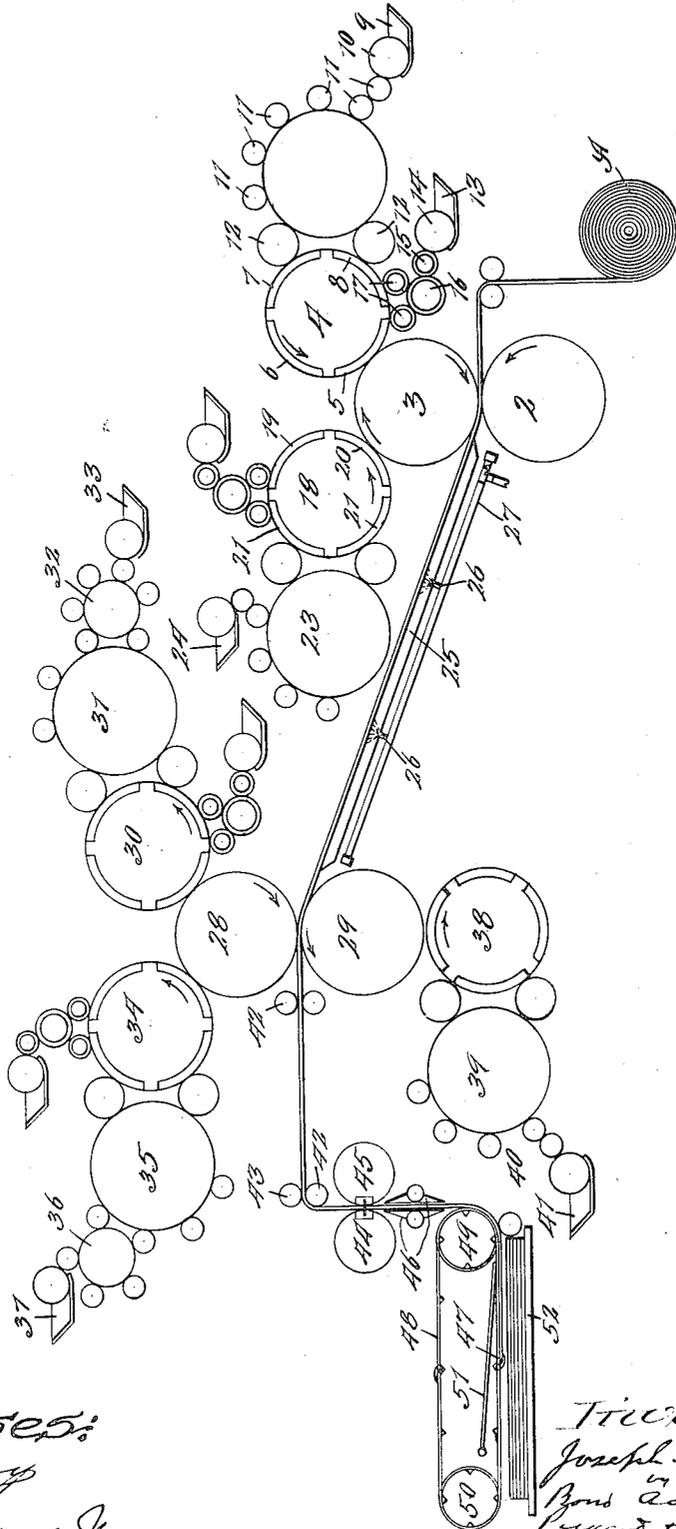


J. L. FIRM.
 MULTICOLOR WEB PERFECTING PRINTING PRESS.
 APPLICATION FILED JUNE 29, 1911.

1,052,473.

Patented Feb. 11, 1913.



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UNITED STATES PATENT OFFICE.

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MULTICOLOR WEB-PERFECTING PRINTING-PRESS.

1,052,473.

Specification of Letters Patent.

Patented Feb. 11, 1913.

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To all whom it may concern:

Be it known that I, JOSEPH L. FIRM, a citizen of the United States, residing at Berwyn, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Multicolor Web-Perfecting Printing-Presses, of which the following is a specification, reference being had to the accompanying drawing.

My invention relates to multi-color web-perfecting presses, and particularly to lithograph multi-color web-perfecting presses, and its object is to provide a new and improved printing mechanism by which a traveling web may be printed upon one side with a plurality of colors and upon the other side with a single color, and thus perfected. Further objects of my invention will be hereinafter and in the claims specifically pointed out.

In the accompanying drawing,—the figure is a diagrammatic side elevation of such of the essential parts of a multi-color press as relate to my present invention.

Referring to the drawing,—A represents the roll of paper which passes through the press and is perfected as hereinafter described.

2 represents an impression cylinder, and 3 a set-off cylinder, which is adapted to receive colors from the mechanism hereinafter described.

4 indicates a plate-cylinder adapted to carry on its surface a plurality of plates. In the form in which my invention is shown it is of a circumference equal to four plates; that is to say, it carries four plates 5, 6, 7 and 8 circumferentially around it, and of course may be of any desired length, and the columns may be arranged either circumferentially of the cylinder or parallel, as may be desired, inasmuch as my present invention contemplates the flat delivery. In the form in which my invention is embodied, the plates 5 and 6 are designed to print one paper and 7 and 8 the succeeding paper, duplicates of each other. These plates, whether in the form of lithograph or other plates, are so made as to be adapted to receive ink only on such portions of them as are designed to print one color, and for illustration we will suppose that this cylinder prints yellow from yellow ink. The ink is supplied to the plates 5, 6, 7 and 8 from an ink-trough 9 of any ordinary form through

an ink-fountain roll 10, and the other usual rolls 11 and 12 by means of which the ink is taken from the ink-fountain 9 and supplied to the plates on cylinder 4, which may be of any approved construction, as of itself it forms no part of my present invention.

13 indicates a water-trough from which by suitable rollers, as 14, 15, 16 and 17, the surfaces of the plates are moistened after the ink has been transferred to the set-off cylinder 3 and before they receive their next impression in order that the plate may receive ink only on the portions designed to receive it. The set-off cylinder 3 is provided with a surface of rubber, or similar material designed to take the ink from the plates 5, 6, 7 and 8.

18 indicates a second plate cylinder provided with plates 19, 20, 21 and 22, which are of the same number as the plates on the plate-cylinder 4, which, when in the form of lithograph plates, or otherwise, are constructed to receive the ink only on such portions as are to receive another color of the design to be printed. For the sake of illustration, we will suppose that the cylinder 18 is to print blue ink. The ink is supplied by another inking mechanism 23 taking blue ink from trough 24 so as to ink the plates on cylinder 18 in the same manner as those on cylinder 4. The plates 4 and 18 rotate in the direction indicated by the arrows, in contact with the set-off cylinder 3. It will be readily understood that by the interaction of cylinders 4 and 18 yellow and blue ink are transferred to the surface of the set-off cylinder 3, thus producing upon the cylinder 3 such portions of the design as appear in yellow or in blue, or by superposing the two, green ink. The web, passing between the set-off cylinder 3 and impression cylinder 2, is, of course, printed upon one side with these colors.

25 indicates a saddle, over which the web A passes. The saddle is heated by burners, as 26, from a gas-pipe 27 in order to dry the web as it passes over it.

28 indicates a set-off cylinder bearing against the web, which passes between it and set-off cylinder 29 upon the other side of the web. The set-off cylinders 28 and 29 are provided with surfaces of rubber, or other suitable material, to receive ink from the plate cylinders hereinafter described.

30 indicates a plate-cylinder provided

with the same number of plates and of the same size as the other cylinders and so formed as to receive ink for only such portions of the design as are intended to be printed in still a different color, as, for instance, red. The plates are inked by an ink-drum 31 receiving ink through suitable interposed ink mechanism 32 from an ink-trough 33 adapted to contain ink of a suitable color, in this instance red.

34 indicates a plate-cylinder provided, like the other cylinders, with the same number of plates of the same size and so constructed as to receive only ink of another color. In this case we may suppose that it is black ink for the letter-press and other parts of the design. The ink is supplied to cylinder 34 through an ink-drum 35 with suitably interposed inking mechanism 36 from a trough 37 adapted to contain black ink in the case supposed. The cylinders rotate in the direction indicated by the arrows. It will be obvious that the red ink will be supplied to the designs upon the plates on cylinder 30 from the trough 33 and the designs in the red ink transferred to the set-off cylinder 28. At the same time and in the same manner the black portions of the design are transferred from cylinder 34 to cylinder 28, and from cylinder 28 they are impressed upon the upper side of the web—that is to say, upon the same side as the colors impressed from cylinder 3. The set-off 29 is supplied with ink from plate-cylinder 38 containing plates like the other cylinders and receiving ink through the interposition of an ink-drum 39 and suitable inking mechanism 40 from still another trough 41. The ink is transferred or set off from plate-cylinder 38 to set-off cylinder 29 and from thence to the other side of the paper, where the web is perfected, passing through lead-rolls 42—43, the paper passes downward through cutting cylinders 44—45 of the ordinary type, where it is severed into sheet lengths, and passing downward between guides 46 the sheets are engaged at their lead edge by grippers 47 on sprocket-tapes 48 carried over sprocket-wheels 49—50, and as the sheets are released from the grippers, which are operated by any suitable mechanism (not shown), they are knocked by the striker-bar 51 operating in any well-known and approved manner and deposited flat upon table 52. The cutting cylinders and delivery mechanism form no part of my present invention and may be of any approved character, and are only indicated rather than illustrated and described for the purpose of completely explaining my invention in so far as it is believed to be necessary.

It is, of course, understood that all the parts above described are mounted in a suit-

able framework and are driven properly by suitable gearing. As the framework will vary according to the somewhat variable positions of the parts and may be of any approved form of construction and as the gearing, of course, may be of any approved type and will be readily understood, I have not illustrated either, as it is believed the diagrammatic view fully illustrates my invention, and it would only be encumbered with unnecessary drawing and description to illustrate the framework and gearing.

The operation of the above-described devices will be readily understood but may be recapitulated.

The web of papers first passes between cylinders 2 and 3. As already described, the set-off cylinder 28 receives from plate cylinders 4 and 18 inks of two different colors—in the above description supposed, for illustration, to print blue and yellow—and the blue and yellow impressions are placed upon one side of the web as it passes between cylinders 2 and 3. Passing up over the saddle 25, the sheet is dried. It then passes between cylinders 28 and 29. The cylinder 28, having received inks of two other colors—in this case supposed to be red and black—from cylinders 30 and 34 placed upon the same side of the web, has made the black and red impressions, the parts being so placed and operated as to place the cylinders upon the web in proper impression. At the same time the web is perfected—that is to say, is printed upon the other side from set-off cylinder 29 which has received a set-off impression from plate cylinder 38. The web then passes between the cutters, where it is severed into sheets, and to the delivery mechanism, where it is delivered flat.

What I claim as my invention and desire to secure by Letters Patent is,—

1. In a web-perfecting multi-color press, in combination, an impression cylinder, a co-acting set-off cylinder in operative relation with said impression cylinder, and between which and said impression cylinder a web of paper may pass, plate cylinders in cooperative relation with said set-off cylinder, each adapted to receive a separate color and transfer the same to said set-off cylinder, means for supplying ink to said plate cylinders, a pair of set-off cylinders in operative relation to each other and adapted to have the web pass between them, a plurality of plate cylinders adapted each to receive ink of a different color and to transfer the same to one of said pair of set-off cylinders, means for inking said plates, another plate cylinder in operative relation with the other one of said pair of set-off cylinders and adapted to ink the same with one color, and inking mechanism adapted to supply ink to said last-named plate cylinder.

2. In a web-perfecting multi-color press,

in combination, an impression cylinder, a co-acting set-off cylinder in operative relation with said impression cylinder, and between which and said impression cylinder a web of paper may pass, plate cylinders in cooperative relation with said set-off cylinder, each adapted to receive a separate color and transfer the same to said set-off cylinder, means for supplying ink to said plate cylinders, a pair of set-off cylinders in operative relation to each other and adapted to have the web pass between them, a plurality of plate cylinders adapted each to receive ink of a different color and to transfer the same to one of said pair of set-off cylinders, means for inking the same, another plate cylinder in operative relation with the other one of said pair of set-off cylinders and adapted to ink the same with one color, inking mechanism adapted to supply ink to said last-named plate cylinder, and drying mechanism interposed between said first-named set-off cylinder and said pair of set-off cylinders adapted to dry the web as it passes therealong.

3. In a web-perfecting multi-color press, in combination, an impression cylinder, a co-acting set-off cylinder in operative relation

with said impression cylinder, and between which and said impression cylinder the web passes, plate cylinders in cooperative relation with said set-off cylinder, each adapted to receive a separate color and transfer the same to said set-off cylinder, means for supplying ink to said plate cylinders, a pair of set-off cylinders in operative relation to each other and adapted to have the web pass between them, a plurality of plate cylinders adapted each to receive ink of a different color and to transfer the same to one of said pair of set-off cylinders, means for inking the same, another plate cylinder in operative relation with the other one of said pair of set-off cylinders and adapted to ink the same with one color, inking mechanism adapted to supply ink to said last-named plate cylinder, a saddle interposed between said first-named set-off cylinder and said pair of set-off cylinders, along which saddle the web is adapted to pass, and means for heating said saddle.

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Witnesses:

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