No. 724,459. PATENTED APR. 7, 1903.

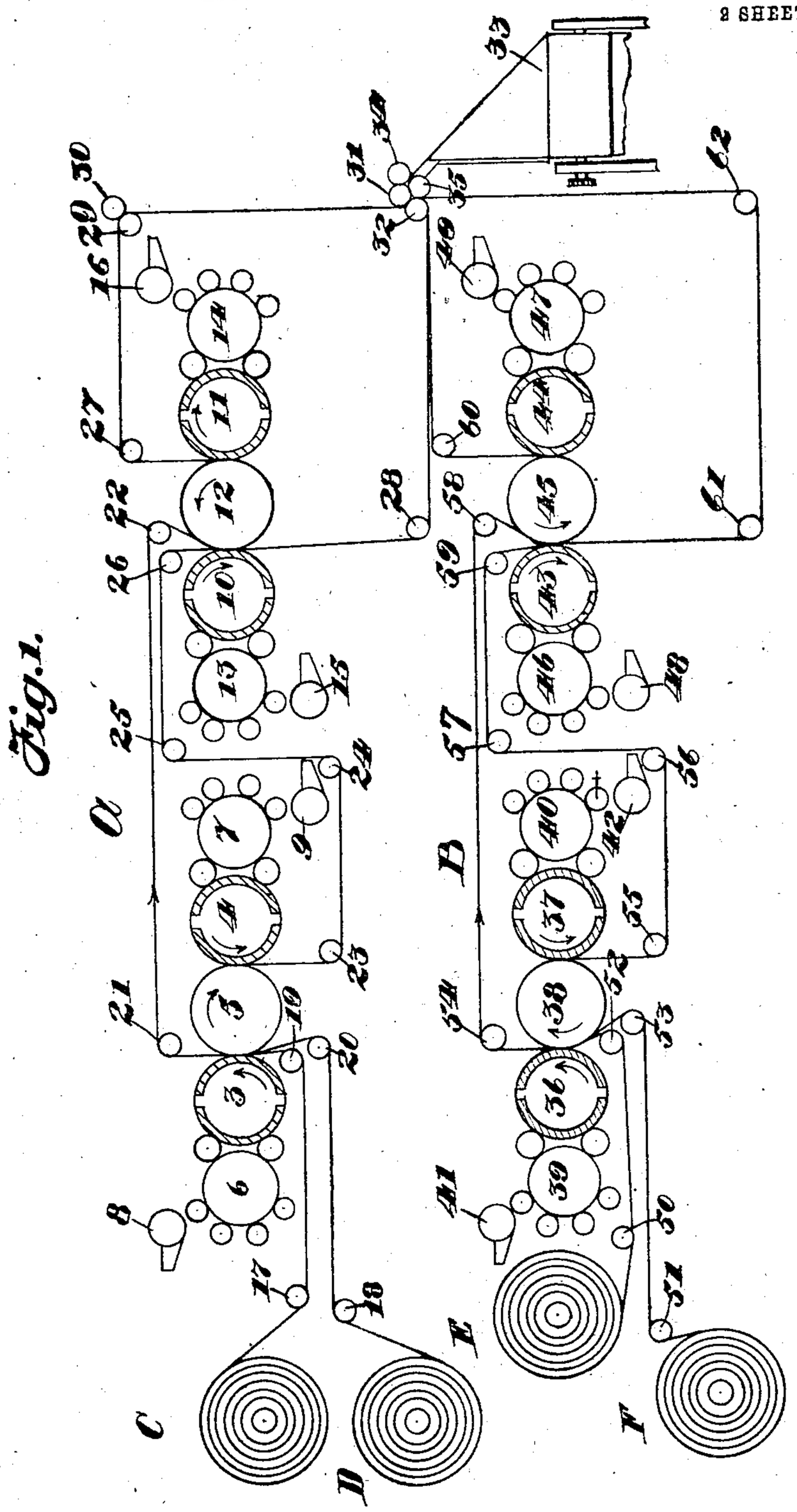
J. L. FIRM.

PRINTING PRESS.

APPLICATION FILED JUNE 27, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.



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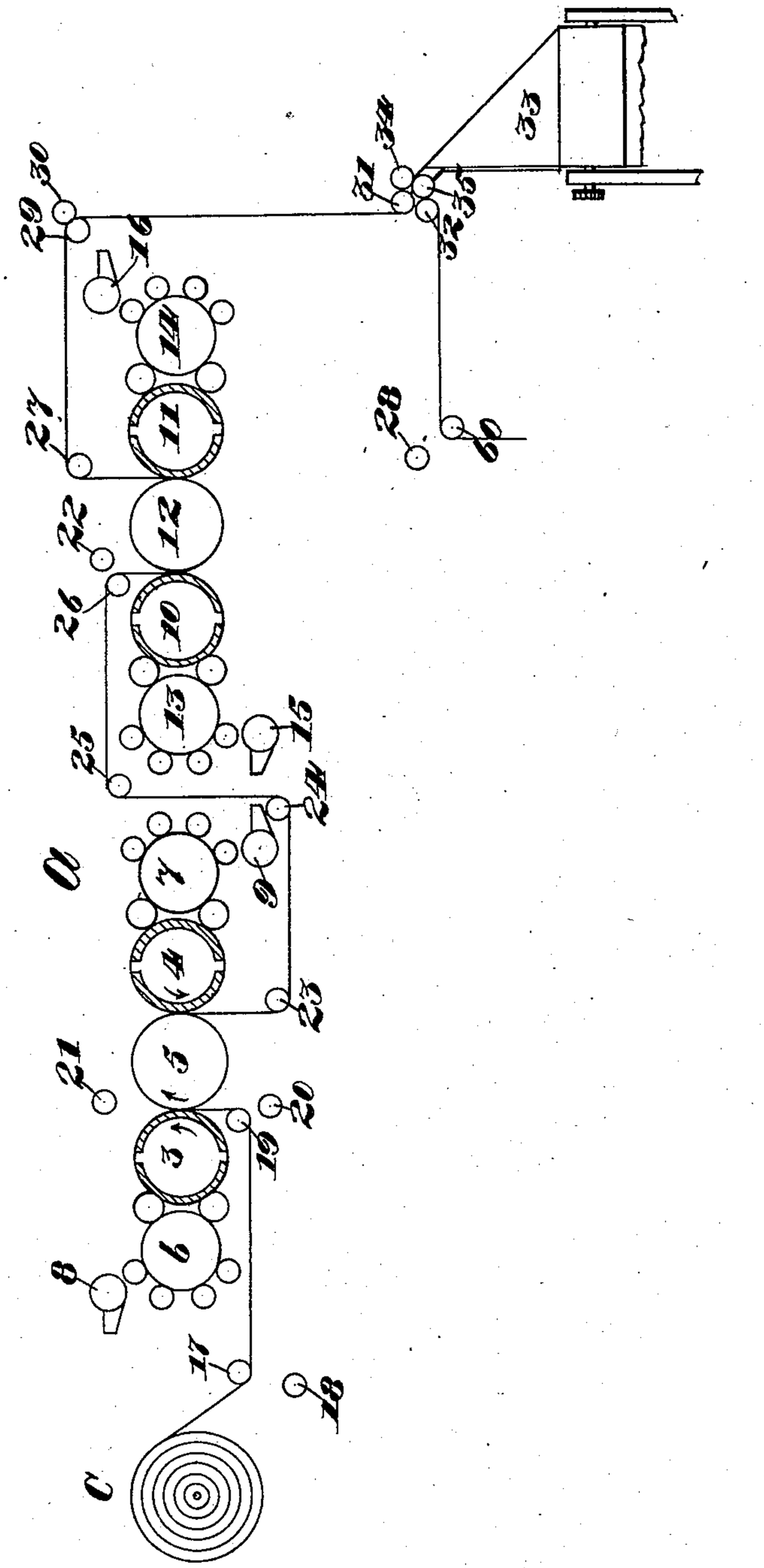
NO MODEL. 2 SHEETS—SHEET 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

JOSEPH L. FIRM, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE GOSS PRINTING PRESS COMPANY, OF CHICAGO, ILLINOIS.

PRINTING-PRESS.

SPECIFICATION forming part of Letters Patent No. 724,459, dated April 7, 1903.

Application filed June 27, 1902. Serial No. 113,477. (No model.)

To all whom it may concern:

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

My invention relates to rotary web-perfecting presses; and its object is to produce a press for perfecting a plurality of rolls of paper, and particularly to provide a new and improved press in which each deck of form and impression cylinders arranged in a novel manner will either perfect simultaneously two rolls or print one roll on both sides in two colors.

In the drawings, Figure 1 is a diagrammatic side elevation of a press; and Fig. 2 is a diagrammatic side elevation of the upper deck of the press shown in Fig. 1, showing a single web of paper led through the printing mechanism, so as to print two colors upon each side.

As illustrated in the drawings, my invention is embodied in a press consisting of two decks A and B. A represents the upper and B the lower deck.

In deck A, 3 and 4 indicate form-cylinders, and 5 an impression-cylinder located between and adapted to coact with form-cylinders 3 and 4. 6 7 indicate inking mechanisms which are supplied with ink, respectively, from ink-fountains 8 9 and which respectively supply ink to form-cylinders 3 4. The inking devices may be of any well-known and approved form of construction. 10 11 indicate form-cylinders. 12 indicates an impression-cylinder located between and adapted to coact with form-cylinders 10 11. 13 14 indicate inking mechanisms which are supplied with ink respectively from ink-fountains 15 16 and which supply ink respectively to the form-cylinders 10 11.

The several form and impression cylinders above described are arranged with their axes on the same horizontal plane.

17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 indicate guide-rollers around which the webs hereinafter described are led in their progress through the printing mechanism.

33 indicates a longitudinal folding and delivery mechanism which is adapted to fold the printed webs, sever them into sheets, and deliver them. The folding and delivery mechanism may be of any approved form and construction and needs no further description here.

34 35 indicate the usual guide-rollers located at the top of the well-known V-shaped former or guide of a longitudinal folding mechanism and operate to feed the printed webs of paper downward over the folder in the well-known manner.

C and D indicate two rolls of paper. Web C passes under the guide-rollers 17 and 19 between form-cylinder 3 and impression-cylinder 5, where it is printed upon one side by the form-cylinder 3. It then passes over guide-rollers 21 and 22 down between form-cylinder 10 and impression-cylinder 12. It is kept from contact with form-cylinder 10 by web D, which, as hereinafter described, passes between web C and the form-cylinder 10. Web C then passes downward around impression-cylinder 12 and upward between impression-cylinder 12 and form-cylinder 11, where it is printed upon the reverse side by form-cylinder 11. The web thus perfected passes upward over roller 27, between guide-rollers 29 and 30, under roller 31. From thence it passes between rollers 34 35 into the folding and delivery mechanism. Web D passes over roller 18, under roller 20, upward between web C and impression-cylinder 5, being prevented by the interposition of web C from being printed upon by form-cylinder 3. It passes over and around impression-cylinder 5, downward between impression-cylinder 5 and form-cylinder 4, where it is printed upon one side by form-cylinder 4. The web then passes downward under rollers 23 24, upward over roller 25, over roller 26, and downward between web C and form-cylinder 10, where it is printed upon the other side by form-cylinder 10. It then passes downward under roller 28, under roller 32, between rollers 34 35, where it meets web C in proper register and passes downward over the folding and delivery mechanism 33.

Referring to deck B, 36 37 indicate form-cylinders. 38 indicates an impression-cylin-

der which coacts with form-cylinders 36 37. 39 40 indicate inking mechanisms which are respectively supplied with ink from ink-fountains 41 42 and which supply ink, respectively, to form-cylinders 36 37. 43 44 indicate form-cylinders. 45 indicates an impression-cylinder which coacts with form-cylinders 43 44. 46 47 indicate inking mechanisms which are supplied with ink, respectively, from ink-fountains 48 49 and which supply ink to form-cylinders 43 44, respectively.

50 51 52 53 54 55 56 57 58 59 60 61 62 indicate guide-rollers adapted to feed the webs through the printing mechanisms, hereinafter described.

E and F indicate two rolls of paper. The web E passes under guide-rollers 50 and 52, upward between form-cylinder 36 and impression-cylinder 38, where it is printed upon one side by form-cylinder 36. The web then passes upward over rollers 54 and 58, downward between form-cylinder 43 and impression-cylinder 45, where it is protected from being printed upon by form-cylinder 43 by the interposition of web F, hereinafter described. It then passes downward around impression-cylinder 45, upward between impression-cylinder 45 and form-cylinder 44, where it is printed upon the second side by form-cylinder 44. The web then passes upward over roller 60, under roller 32, where it meets web D from deck A, and between rollers 34 and 35, where it meets web C, all in proper register. The webs thus superposed pass downward into the folding and delivery apparatus 33. Web F passes over roller 51, under roller 53, upward between impression-cylinder 38 and web E, being prevented by the interposition of said web E from being printed upon by form-cylinder 36. Web F passes thence over impression-cylinder 38 and downward between it and form-cylinder 37, where it is printed upon one side by form-cylinder 37. It then passes downward under rollers 55 and 56, upward over roller 57, over roller 59, and downward between web E and form-cylinder 43, where web F is printed upon the other side by form-cylinder 43. Web F then passes downward under rollers 61 62, upward between rollers 32 and 35, where it meets the other webs in proper register and is folded and delivered with them.

Fig. 2 illustrates, as was said above, deck A of the printing mechanism and shows the method in which that deck may be used to print only one web, printing in two colors upon each side of the web. In this case one of the rolls of paper is not used. As illustrated in Fig. 2, web C is made use of. The web C passes under rollers 17 and 19, upward between form-cylinder 3 and impression-cylinder 5, where it is printed upon the first side either in black or with a color. It then passes over impression-cylinder 5 and downward between impression-cylinder 5 and form-cylinder 4, where it is printed upon the same side with a second color. The web then passes downward under rollers 23 and 24, upward over roller 25, over roller 26, and downward between form-cylinder 10 and impression-cylinder 12, where the web is printed upon the second side with black or a color. The web then passes under impression-cylinder 12, upward between impression-cylinder 12 and form-cylinder 11, where it is printed with a second color upon the second side by form-cylinder 11. The web then passes over rollers 27 and 29, downward under roller 31, where it meets with the product of the lower press.

I have shown in Fig. 2 for convenience of illustration the upper press arranged to print upon both sides of a web with two colors upon each side. It will of course be understood that deck B may be used in the same way, deck A being employed to print two webs, as above described, or, if desirable, both deck A and deck B may be used to print a single web with two colors upon each side and the products associated together.

I have also shown my invention as embodied in a press two decks high and adapted to print upon and perfect four rolls of paper in one color or to perfect two rolls in one color and one roll upon each side in two colors. It is obvious, however, that the number of decks might be increased and the capacity correspondingly increased, and I do not, therefore, confine myself to a press consisting of two decks.

By means of the devices and arrangement above described I construct a printing-press in which four webs of paper may pe perfected simultaneously without giving the press a greater height than an ordinary two-deck press. At the same time a great saving of length and of floor-space is effected by reason of doing away with two impression-cylinders in each deck, producing a press which is of large capacity and can be made to occupy a compact space.

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

1. In a printing-press, the combination with two sets of printing-couples, each set consisting of two form-cylinders and one coacting impression-cylinder, of mechanism adapted to lead two webs superposed between one form-cylinder and the impression-cylinder of the first set, whereby one of said webs will be printed upon one side, thence to lead the other of said webs between the other form-cylinder and the impression-cylinder of the first set, whereby the said web will be printed upon one side, thence to lead the two webs superposed between the first form-cylinder and the impression-cylinder of the second set, whereby the second web will be printed upon the other side, thence to lead the first web between the form-cylinder and the other impression-cylinder of the same

set, whereby it will be printed upon the second side, and thence to bring such webs together, superposed, whereby both webs will be printed upon both sides in one color, and mechanism adapted to lead a single web successively through said sets of printing-couples and print the same upon each side in two colors, substantially as described.

2. In a printing-press, the combination with two sets of printing-couples, each set consisting of two form-cylinders and one coacting impression-cylinder, all of said form and impression cylinders being arranged upon substantially the same horizontal plane, of mechanism adapted to lead two webs superposed between one form-cylinder and the impression-cylinder of the first set, whereby one of said webs will be printed upon one side, thence to lead the other of said webs between the other form-cylinder and the impression-cylinder of the first set, whereby the said web will be printed upon one side, thence to lead the two webs superposed between the first form-cylinder and the impression-cylinder of the second set, whereby the second web will be printed upon the other side, thence to lead the first web between the form-cylinder and the other impression-cylinder of the same set, whereby it will be printed upon the second side, and thence to bring such webs together, superposed, whereby both webs will be printed upon both sides in one color, and mechanism adapted to lead a single web successively through said sets of printing-couples and print the same upon each side in two colors, substantially as described.

3. In a printing-press, the combination with a plurality of superposed decks of printing-couples, each deck consisting of two sets of printing-couples consisting each of two form-cylinders and one coacting impression-cylinder, of mechanism adapted to lead two webs superposed between one form-cylinder and the impression-cylinder of the first set, whereby one of said webs will be printed upon one side, thence to lead the other of said webs between the other form-cylinder and the impression-cylinder of the first set, whereby the said web will be printed upon one side, thence to lead the two webs superposed between the first form-cylinder and the impression-cylinder of the second set, whereby the second web will be printed upon the other side, thence to lead the first web between the form-cylinder and the other impression-cylinder of the same set, whereby it will be printed upon the second side, and thence to bring such webs together, superposed, whereby both webs will be printed upon both sides in one color, and mechanism adapted to lead a single web successively through said sets of printing-couples and print the same upon each side in two colors, substantially as described.

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