

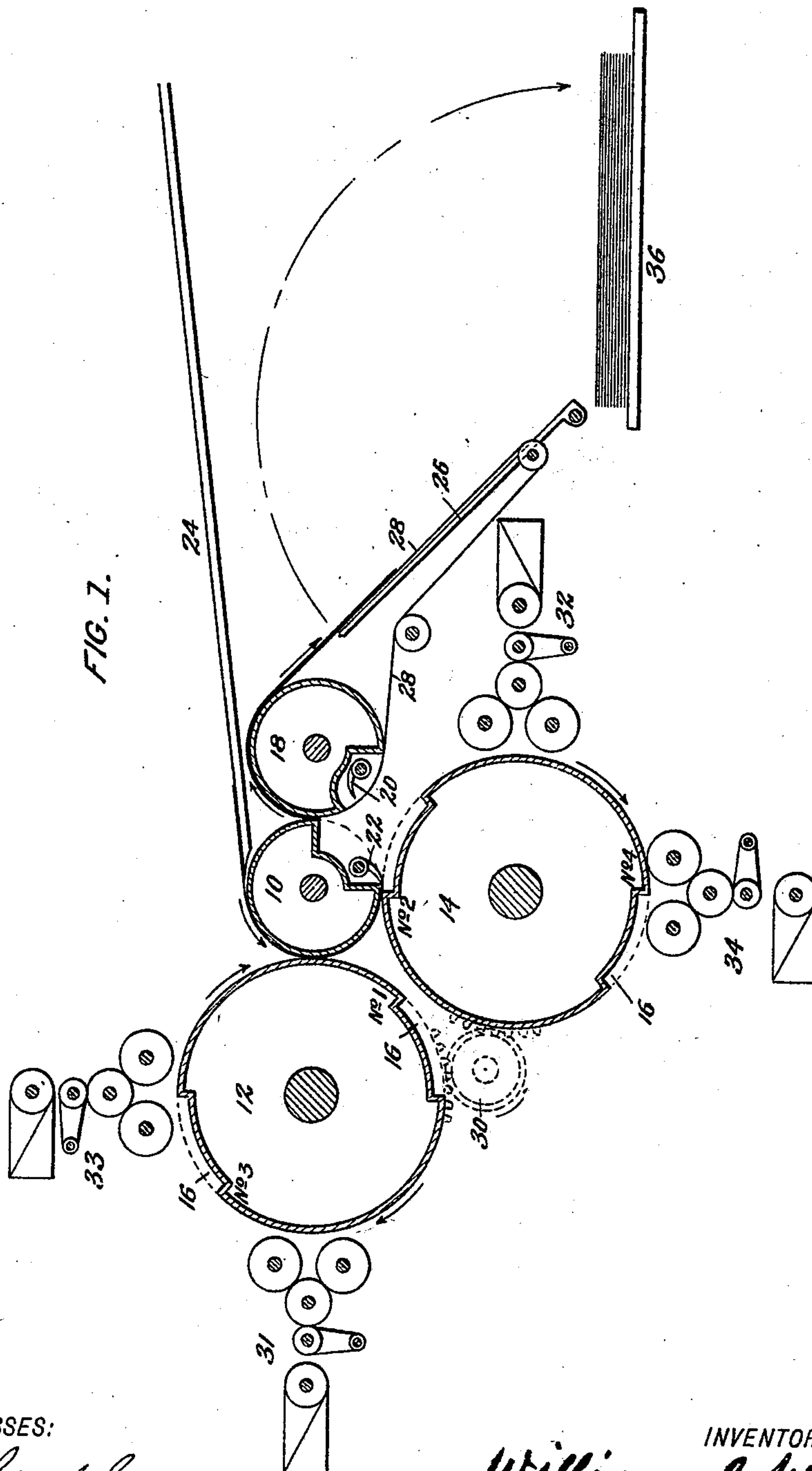
(No Model.)

2 Sheets—Sheet 1.

W. C. WENDTÉ.
MULTICOLOR PRINTING PRESS.

No. 519,462.

Patented May 8, 1894.



WITNESSES:

W. D. Blondel
Fred Otto

INVENTOR

William C. Wendt

BY

J. W. Asbury
ATTORNEY.

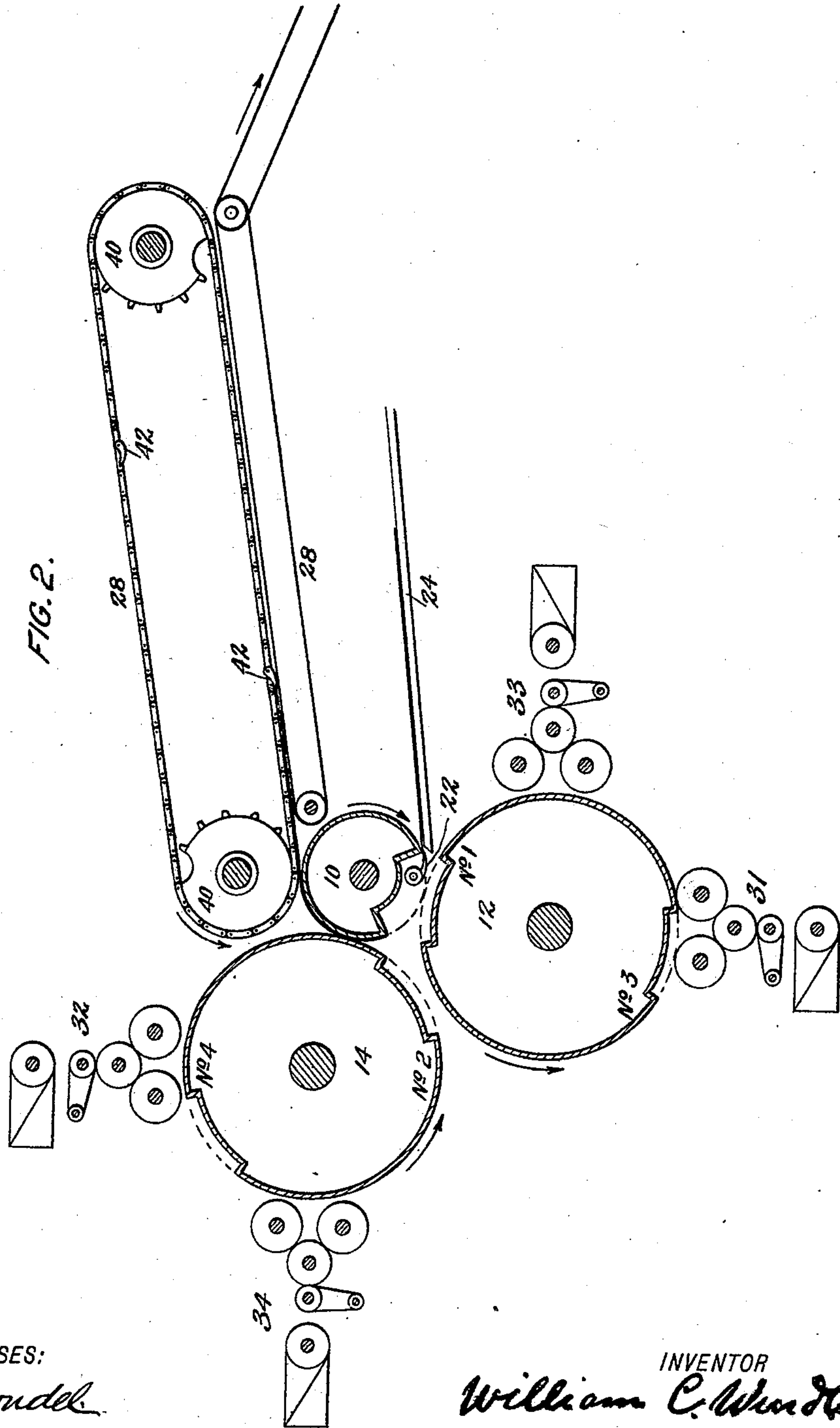
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UNITED STATES PATENT OFFICE.

WILLIAM C. WENDTÉ, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO EMMA L. FORBES, OF SAME PLACE.

MULTICOLOR-PRINTING PRESS.

SPECIFICATION forming part of Letters Patent No. 519,462, dated May 8, 1894.

Application filed June 30, 1893. Serial No. 479,282. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM C. WENDTÉ, a citizen of the United States, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Multicolor-Printing Presses, (designated Case B,) of which the following is a specification.

This invention is related to an important class of printing machines intended for the production of pictures and ornamental delineations in two or more colors; and more specifically to those adapted to print on sheets of paper, and on the same side of each sheet, a number of superimposed impressions each with an ink of such a color as in the aggregate will produce the desired design at every complete revolution of the press.

In the press which forms the subject matter of the present invention, the sheet of paper to be printed upon is fed to the impression-cylinder, where it is taken hold of by grippers and then carried to two form-cylinders with both of which the impression-cylinder is connected by gearing. These form-cylinders are of equal size and are provided with an equal number of form-supporting surfaces. The impression-cylinder after having presented the leading edge of the sheet upon it to a form on one cylinder, presents it then to the second form in the series on the other cylinder, and to the third upon the first cylinder, and so alternately from one cylinder to the other till the forms are all printed.

In the drawings which are part of this specification, Figure 1 shows diagrammatically the printing press I have invented adapted for four colors. Fig. 2 is the same arrangement of parts with a modified delivery.

In the figures 10 is the impression-cylinder. 12 is the first form-cylinder; 14 the second. The gap-spaces on both the latter are marked 16 and the forms on the same, marked Nos. 1, 2, 3, and 4, near their leading edges, are the forms for the several colors. Except for the gap-spaces which correspond in length to the gap on the impression-cylinder, the whole surface of the form-cylinders is covered with its forms.

18 is a delivery-cylinder and 20 its grippers, while 22 is the grippers on the impres-

sion-cylinder 10. In the drawings the feed-boards are marked 24, the tapes 28, and the driving pinion in every case is 30.

My invention in its simplest construction is shown in Fig. 1. In this press four curved forms, each printing a different color, are arranged on suitable form-supports; they are numbered Nos. 1, 2, 3, and 4, and these numbers are placed at the leading edge of the forms which are divided between the two cylinders, two on each. When a sheet is fed to the grippers 22 the impression-cylinder carries it to the first form-cylinder 12, which latter is angularly adjusted therewith through the gearing on both, so that the leading edge of the form and the leading edge of the sheet on the impression-surface meet at the point of contact. This has taken place already in the position shown, the leading edge having met that of the form No. 1, and gone forward to that of form No. 2, on the second form-cylinder 14. This state of things is indicated in Fig. 1, by the heavy line representing the sheet of paper, which is still partly on the feed-board and half round the impression-cylinder, receiving the impression from form No. 1, and just about to receive that from form No. 2. As the rotation of the impression-cylinder continues the printing of the second color is begun, before the conclusion of which the sheet is presented to form No. 3 on the first, and finally to form No. 4 on the second form-cylinder. After this, when the grippers reach the delivery-cylinder 18 they are thrown open, and the edge of the sheet is grasped by the grippers 20, and transferred by the apparatus shown with a sheet upon it, to the tapes 28, from which the fly 26 throws it over on the delivery-board 36, placed to receive the pile of work. The four sets of inking apparatus used for this press are marked 31, 32, 33, and 34. In Fig. 1 only one set of form-rollers has dropped upon the work, namely that marked 34, which inks the fourth form; all the others are at the time inactive; but forms Nos. 1 and 2 have been inked already.

In this machine it is apparent that the productiveness is very great, for, in the press shown, four superimposed designs are printed on the same sheet of paper for every two revolutions of the impression-cylinder, which

rapid rate is due to the fact that one or other of the forms is always being printed as long as the press works, and that two forms are being printed simultaneously, except while the four gap-spaces 16 are passing the impression-cylinder.

In Fig. 1 the delivery of the sheet is accomplished by apparatus consisting of a delivery-cylinder 18, with tapes 28, and in consequence the sheet runs upon the latter face down, and is then lifted by the fly and thrown over on the pile of sheets in the well known way. This procedure, as experience has shown, is satisfactory when only a few colors have been printed on the paper; but when many superimposed colors cross each other the accumulated quantity of wet ink renders it difficult to carry the sheet on tapes face down and lift it therefrom as explained, without smearing.

I modify the usual methods of feeding and delivery to overcome this difficulty when it is thought desirable to do so, as shown in Fig. 2. In this drawing the relative position and dimensions of the form- and impression-cylinders are the same as in Fig. 1, and the number of forms (four) remains also unchanged. But the direction of revolution is changed and the first form-cylinder 12 is where the second 14 is in the preceding press. Under feeding is also resorted to in this case. The feed-board 24 conducting the sheets to the lower side of the impression-cylinder where the grippers seize it and carry it to form No. 1 on 12, then to No. 2 on 14; and so on in alternating sequence till, after Nos. 3 and 4 are printed in part, the delivery begins. For this purpose I use what I will call a belt-delivery by which the sheet is carried away, in a direction which may be nearly horizontal, from the upper part of the impression-cylinder by grippers moving in a right line at the proper speed, and then dropped on tapes 28 which convey it away face up. The belt for this purpose may consist of non-extensible material of many kinds; of steel bands, or of two parallel chains 38 as shown in Fig. 2, running on sprocket wheels 40 and connected by cross bars at intervals, with grippers 42 on certain of the latter provided at proper distances apart, which close upon the leading edge of the sheet when the grippers 22 on the impression-cylinder, having reached their highest point in the second revolution (for a four color press) are thrown open. The grippers on the endless chain 38 holding the end of the sheet, travel with it parallel to the endless tapes 28 directly over the latter, both at a surface speed which is the same as that of the impression-cylinder. When the distance to which the sheet has been drawn out by this delivery apparatus is sufficient to insure its onward motion, it is let go by the grippers holding it and the sheet falls upon the tapes and goes forward to its destination, still at the same speed. When the next set of grippers 42 pass the impression-cylinder they find another printed sheet ready to be

drawn off the impression-cylinder, and the process above described is repeated.

In this press, looked at from a practical and economic point of view, it will be seen, that the delivery apparatus plays an important part, for through its use the removal of the printed sheet within the interval available is rendered possible, and in the case of the belt delivery, with its face up. The amount of effective work of which the press is capable, bearing in mind the smallness of the whole machine, is very great, due to the short periods of its comparative inactivity.

In this specification, when reference is made to the "length" of a form, or form-support, or impression-surface, gap or gap-spaces, the extension of the same circumferentially in the direction of the run of the press, and at right angles to the axes of its cylinders, is always meant.

By the term "gap-space," that depression in the face of the impression-cylinder is meant which is necessary for the accommodation of the grippers and reel-rods, and likewise similar depressions in the face of a form-cylinder made for purposes of correspondence with the impression-cylinder gap, or to contain requisite straining- and clamping-bars, &c.

Having fully described my invention, I wish it to be understood, that I do not confine myself specifically to the embodiment of the same herein shown, being well aware that substitute appliances can be devised without departing from the principle involved.

What I claim is—

1. In a multicolor press adapted for printing sheets; an impression-cylinder having its entire periphery occupied by an impression surface and a gap containing grippers, in combination and in operative contact with two form-cylinders of equal size, and with one or more form-supports separated by gap-spaces upon each, one gap-space and one form-support being equal in length to the circumference of the impression-cylinder; and with an endless delivery-belt of flexible material carrying grippers, and adjusted and timed to seize and carry the printed sheet face up from the impression-cylinder to the delivery-tapes pending a partial revolution of the impression-cylinder; substantially as described.

2. In a multicolor press adapted for printing sheets; consisting of two form-cylinders of equal size covered with forms and with gaps between the forms and driven in the same direction; in combination and in operative contact with an impression-cylinder having an impression-surface and gap, together equal in length to a form and gap-space on the form-cylinder, and adjusted angularly, to receive upon the leading edge of the impression-surface the leading edges of the several forms, first from one form-cylinder and then from the other in alternating sequence; substantially as described.

3. In a multicolor press for printing sheets,

two form-cylinders of equal size provided and covered each with one or more forms separated by the necessary gaps; in combination and in operative contact with an impression-cylinder having its entire periphery occupied by an impression-surface and a gap containing grippers, and arranged to make one revolution for each form on one of the form-cylinders only, pending the printing of all the colors by the two form-cylinders and all the forms and the delivery of the sheet bearing said impressions from the press; substantially as described.

4. A multicolor printing press for printing sheets, consisting of two form-cylinders each

of size sufficient to carry half the number of forms to be printed; an impression-cylinder having its entire periphery occupied by an impression surface and a gap containing grippers arranged to make one revolution for each form on one of the form-cylinders pending the complete printing and delivery of a sheet, with inking apparatus for each of the forms, and means for elevating and depressing said apparatus to ink or avoid any particular form as it passes; substantially as described.

WILLIAM C. WENDTÉ.

Witnesses:

SELWYN Z. BOWMAN,
EDITH M. HOWE.