

No. 629,914.

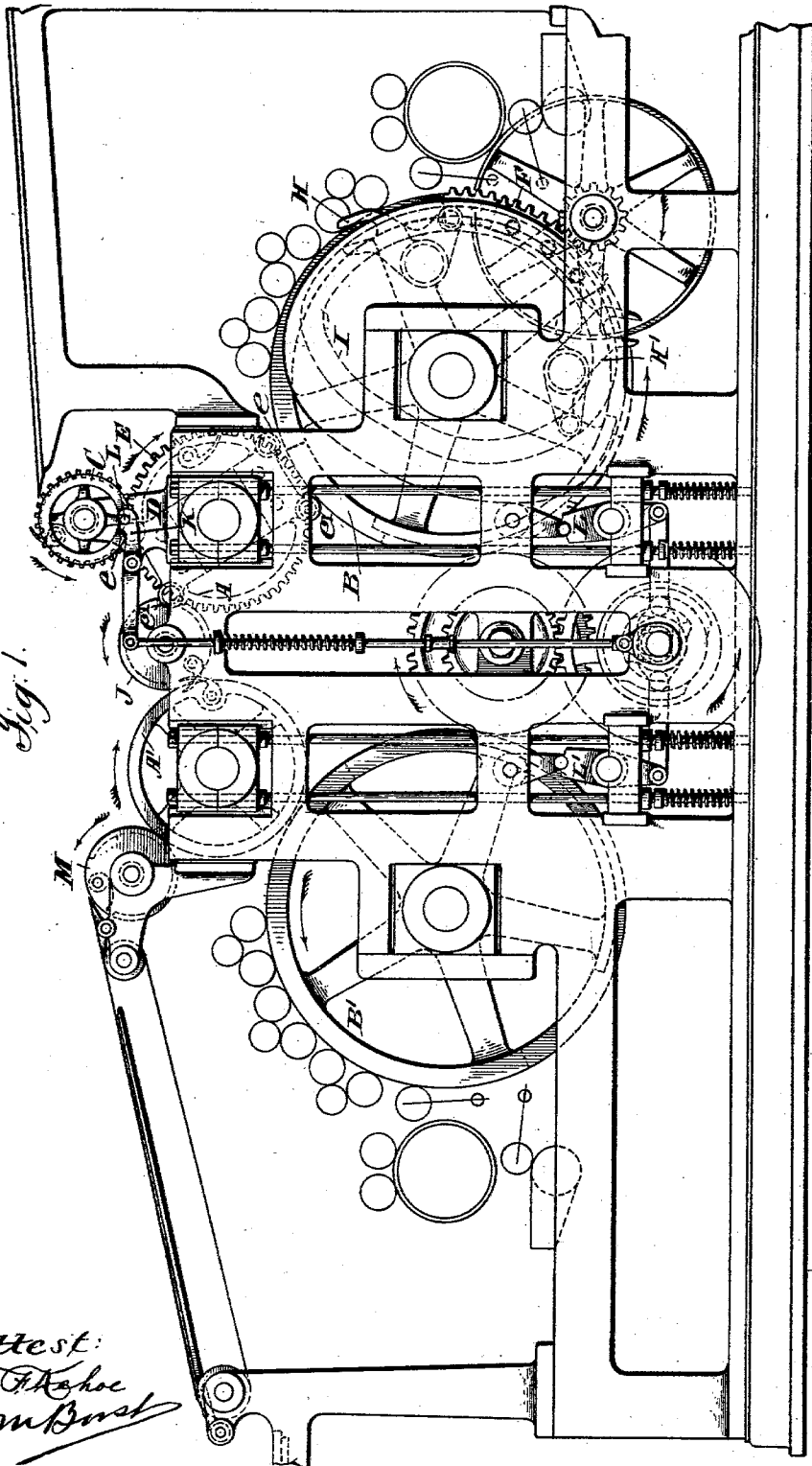
Patented Aug. 1, 1899.

T. M. NORTH.
PRINTING PRESS.

(No Model.)

(Application filed Dec. 22, 1897.)

2 Sheets—Sheet 1.



Attest:
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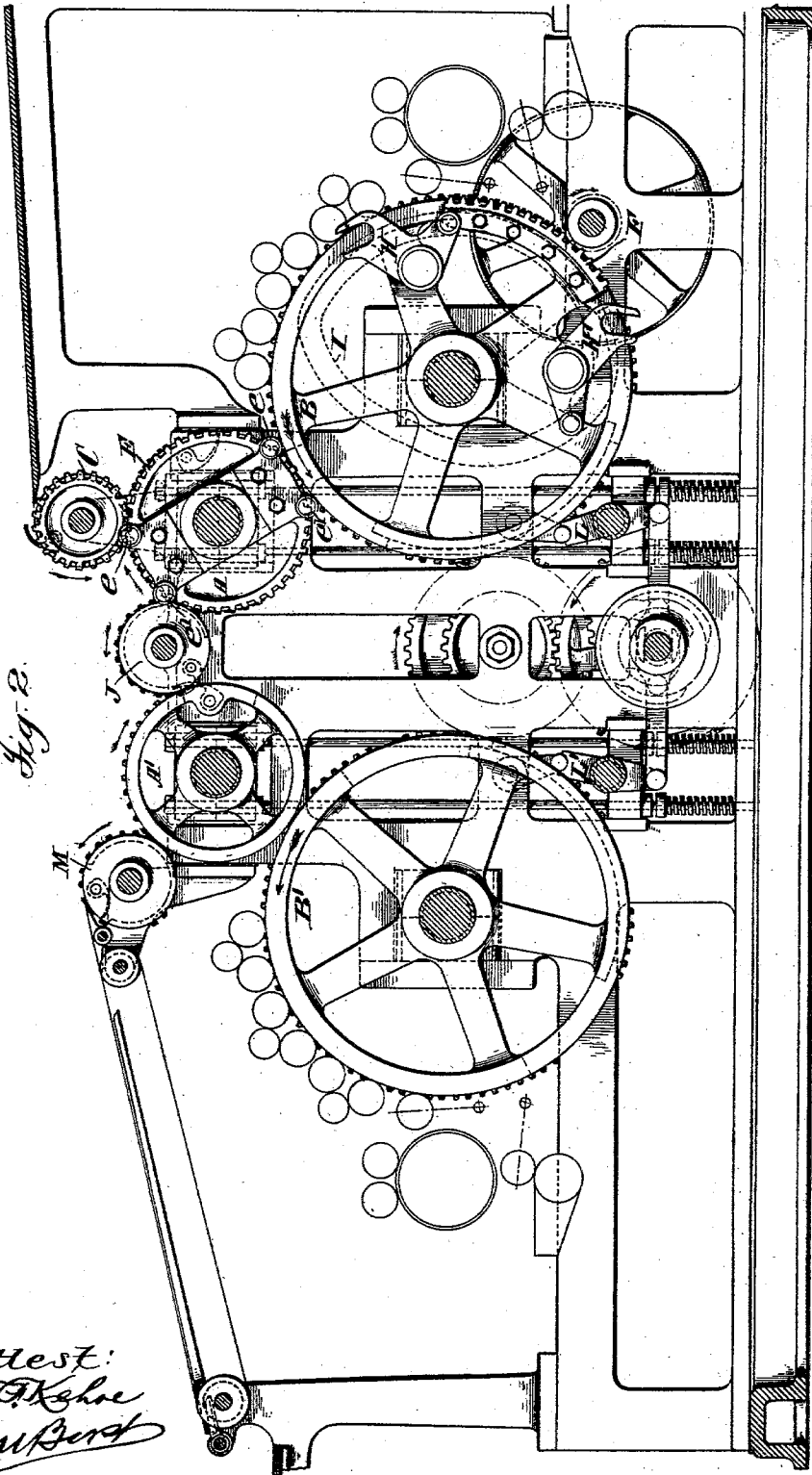
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2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

THOMAS M. NORTH, OF NEW YORK, N. Y., ASSIGNOR TO ROBERT HOE, THEODORE H. MEAD, AND CHARLES W. CARPENTER, OF SAME PLACE.

PRINTING-PRESS.

SPECIFICATION forming part of Letters Patent No. 629,914, dated August 1, 1899.

Application filed December 22, 1897; Serial No. 663,002. (No model.)

To all whom it may concern:

Be it known that I, THOMAS M. NORTH, a British subject, residing at New York, (Brooklyn,) county of Kings, and State of New York, have invented certain new and useful Improvements in Printing-Presses, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The invention relates especially to rotary multicolor-presses. In such presses it has been usual heretofore to gear the impression-cylinder so that it will revolve continuously. A disadvantage of this press is that the sheets are presented to the impression-cylinder while the latter is in motion, and therefore inaccuracy of feed results, which is detrimental to good printing.

The invention includes means for permitting the sheets to be fed to the printing mechanism while that portion of said mechanism which receives the sheet is at rest, and to that end there is provided a receiving-cylinder to which the sheet is fed and which carries the sheet to the impression-cylinder, this receiving-cylinder coming to rest to receive each sheet. The sheet is delivered by the receiving-cylinder to the impression-cylinder and receives therefrom its first impression. It is then transferred to a second impression-cylinder, by which it is received printed side out, and the second impression-cylinder cooperates with a second plate-cylinder to give a second impression to the already once-printed side of the sheet. The printed sheet then passes to the delivery mechanism.

The invention also includes means for gradually accelerating the speed of the receiving-cylinder in starting and for gradually retarding the speed of the receiving-cylinder in stopping and mechanism for locking the receiving-cylinder in its position of rest in which it receives the sheets. Both impression-cylinders are continuously rotated and may be provided with mechanism for lifting them out of contact with the ink-plates of the plate-cylinders. In the mechanism herein shown and described the receiving-cylinder is moved through connections with the first plate-cylinder and the mechanism for establishing this connection, as shown, is similar

to the mechanism shown in my application, Serial No. 618,024, filed January 5, 1897, for making the connection between the plate-cylinder and the impression-cylinder in that application. It will, however, be understood that the invention is not limited to this mechanism for giving rotation to the receiving-cylinder, but mechanism independent of the plate-cylinder may be employed for this purpose or mechanism depending for its operation upon the rotation of the plate-cylinder, but of a different construction from that herein shown and described.

The invention also includes other details of construction, which will be hereinafter fully described, and pointed out in the claims.

In the drawings annexed hereto and forming a part of this specification, Figure 1 is a side view of a press embodying my invention; and Fig. 2 is a sectional elevation of the same, showing the ends of the impression and form cylinders.

Referring to said drawings, A is the first and A' the second impression-cylinder; B, the first and B' the second plate or form cylinder. The receiving-cylinder C is preferably mounted upon brackets D, rising from the boxes of the impression-cylinder A. Loosely mounted on the shaft of the impression-cylinder is a gear-wheel E, which meshes with a gear upon the end of receiving-cylinder C. This gear also meshes with a segment F on the plate-cylinder B. The wheel E is provided with two sets of studs or rollers *e e e' e'*, with which engage coupling-levers H H', pivoted to the end of the plate-cylinder and provided with guide-rollers which move in the path of cam I, fixed to the frame of the machine. The operation of this coupling mechanism is substantially that of the mechanism described and claimed in my application, Serial No. 618,024, dated January 5, 1897, the coupling-lever H acting to gradually accelerate in starting the gear-wheel E and the coupling-lever H' acting to gradually retard in stopping said wheel. This coupling mechanism differs from that described in said application only in the fact that the segment F is shorter and the wheel E is provided with two sets of studs or rollers *e e* and *e' e'* instead of one set, as is the case in said application, for the reason that

the receiving-cylinder is given but one revolution during each revolution of the plate-cylinder, and consequently as the wheel E has double the number of teeth as the receiving-cylinder it is only necessary to cause the wheel E to revolve once during each revolution of the plate-cylinder.

In order to stop the receiving-cylinder accurately in its receiving position and hold it there firmly during the time it is intended to remain stationary, a stop-lever K is provided, engaging with a stop-pin L on the receiving-cylinder, the lever K being operated by a cam on the cam-shaft N.

The sheet to be printed is carried by the receiving-cylinder C to a position within the grasp of grippers on the impression-cylinder A. After receiving one impression from plate-cylinder B it is caught by grippers on transfer-cylinder J and by it delivered to the second impression-cylinder A', printed side out. A second plate-cylinder B' coöperates with plate-cylinder A' to give the sheet a second impression, whereupon it is caught by grippers on delivery-cylinder M.

In order to prevent contact of the impression-cylinders with the inking-plates of the plate-cylinders, provision is made for lifting the impression-cylinders at the proper time by means of the cam-actuated toggle-levers L' L'', said levers being actuated from cams on the cam-shaft.

Instead of raising and lowering the cylinders A A' by means of throw-off mechanism these cylinders may be mounted in fixed bearings. In this case the ink-plates on the cylinders B B' will be mounted so as to be nearer the axis of the cylinders than the form-carrying surfaces, and means will be provided for moving the form-rollers to and away from said plates as the cylinder revolves. It is of course obvious how the ink-plates may be mounted, and the mechanism for controlling the form-rollers may be similar in construction to that shown in my application, Serial No. 698,847, filed December 10, 1898. Again, when the cylinders A A' are mounted in fixed bearings the ink-distributing plates on the cylinders B B' may, if desired, be omitted, in which case the ink will be delivered directly from the ink-distributing cylinder to the form-rollers. This modification being obvious, it is not illustrated.

What I claim is—

1. In a printing-machine, the combination with two members one of which is a member of the printing-couple, of means for intermittently driving the members in unison, means for varying the speed of one member with relation to the other, a feeding member driven from the member having the variable speed, and a second couple printing on the same side of the sheet as the first couple, substantially as described.

2. In a printing-machine, the combination with two members one of which is a member of the printing-couple, of means for intermit-

tently driving the members in unison, means for varying the speed of one member with relation to the other, said means consisting of engaging surfaces carried by the members, a feeding member driven from the member having the variable speed, and a second couple printing on the same side of the sheet as the first couple, substantially as described.

3. In a printing-machine, the combination with two members one of which is a member of the printing-couple, of means for intermittently driving the members in unison, means for varying the speed of one member with relation to the other, said means consisting of engaging surfaces and one of said surfaces being inclined to its path of movement, means for varying the degree of inclination of said surface, a feeding member driven from the member having the variable speed, and a second couple printing on the same side of the sheet as the first couple, substantially as described.

4. In a printing-machine, the combination with a printing-couple having a constantly-rotating member, of a second rotating member, means whereby the speed of the second member is varied with respect to the constantly-rotating member, a feeding member driven by the member having the variable speed, and a second couple printing on the same side of the sheet as the first couple, substantially as described.

5. In a printing-machine, the combination with a constantly-rotating printing-couple, of a member intermittently driven in unison with one member of the couple, means whereby the speed of said member is varied with respect to the rotation of the couple, a feeding member driven from said second member, and a second couple printing on the same side of the sheet as the first couple, substantially as described.

6. In a printing-machine, the combination with a constantly-rotating printing-couple, of a member intermittently driven in unison with the couple, means for varying the speed of said member with relation to the couple, said means consisting of engaging surfaces carried by the member and one member of the couple, means for giving one of said surfaces a movement independent of its rotating movement, a feeding member driven from the member having the variable speed, and a second couple printing on the same side of the sheet as the first couple, substantially as described.

7. In a printing-machine, the combination with a constantly-rotating printing-couple, of a gear carried on the shaft of one member of the couple, means whereby said gear is intermittently driven in unison with the couple, a feeding-cylinder driven from said gear, a second couple and means for transferring a sheet from the first to the second couple with the printed side out, substantially as described.

8. In a printing-machine, the combination with a printing-couple, of a gear mounted on

the shaft of one member of the couple, means whereby the gear is intermittently driven in unison with the couple, means for varying the rotation of the gear with respect to the movement of said member, said means consisting of engaging surfaces carried by the gear and one member of the couple, one of said surfaces being inclined to its path of movement, a feeding-cylinder driven by the gear, a second couple and means for transferring a sheet from the first to the second couple with the printed side out, substantially as described.

9. In a printing-machine having two printing-couples, the combination with a member intermittently driven in unison with one member of one of the couples, of means for varying the movement of said member with relation to the member of the couple, said means consisting of engaging surfaces having paths of movement corresponding to those of said members, a feeding member driven from the member having the varying movement, and means for transferring a sheet from one couple to the other with the printed side out, substantially as described.

10. In a printing-machine, the combination with a printing-couple of a member, of means moving with the member and one member of the couple whereby said member has its speed gradually increased until it is intermittently driven in unison with the member of the couple and then gradually decreased until it comes to a stop, said means consisting of two pairs of engaging surfaces, means for giving one surface of each pair a movement independent of the movement which it has when driven in unison with the member of the couple, a feeding-cylinder driven from said member, a stopping mechanism for holding the feeding-cylinder in its position of rest, a second couple and means for transferring a sheet from the first to the second couple with the printed side out, substantially as described.

11. In a printing-machine, the combination with a constantly-rotating printing-couple, of a member, means carried by the member and one member of the couple for gradually increasing the speed of said member until it is driven in unison with the member of the couple and then gradually decreasing its speed until it comes to a position of rest, a feeding-cylinder driven from said member, a second couple and means for transferring a sheet from the first to the second couple with the printed side out, substantially as described.

12. In a printing-machine, the combination with two constantly-rotating printing-cou-

ples, of a gear carried on the shaft of one member of one of the couples, means carried by the gear and a member of that couple for gradually increasing the speed of the gear until it is driven in unison with said couple and then gradually decreased until it is brought to a position of rest, a feeding member driven from said gear, a stopping mechanism for holding said feeding-cylinder in its position of rest, and means for transferring a sheet from one couple to the other with the printed side out, substantially as described.

13. In a printing-machine, the combination with two constantly-rotating printing-couples, of a member, means for intermittently driving said member in unison with one member of one of the couples, means for varying the speed of said member with relation to the couple, a feeding member driven from the member having the variable speed, and means for transferring a sheet from one couple to the other with the printed side out, substantially as described.

14. In a printing-machine, the combination with a printing-couple having a constantly-rotating member, of a second rotating member, means whereby the speed of the second member is varied with respect to the constantly-rotating member of the printing-couple, a feeding member driven by the member having a variable speed, a second printing-couple having a constantly-rotating member, and means for transferring a sheet from the first couple to the second with the printed side out, substantially as described.

15. In a printing-press, the combination of a sheet-receiving cylinder, an impression-cylinder, means for rotating the receiving-cylinder intermittently so that it shall carry the sheets to the impression-cylinder and stop to receive each sheet, a plate-cylinder, means for transferring the sheet from the receiving to the impression cylinder, a second impression-cylinder, a second plate-cylinder cooperating therewith, means for transferring the printed sheet from the first impression-cylinder to the second impression-cylinder printed side out, and means for lifting the two impression-cylinders to clear the ink-plates, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

THOMAS M. NORTH.

Witnesses:

G. M. BORST,
T. F. KEHOE.