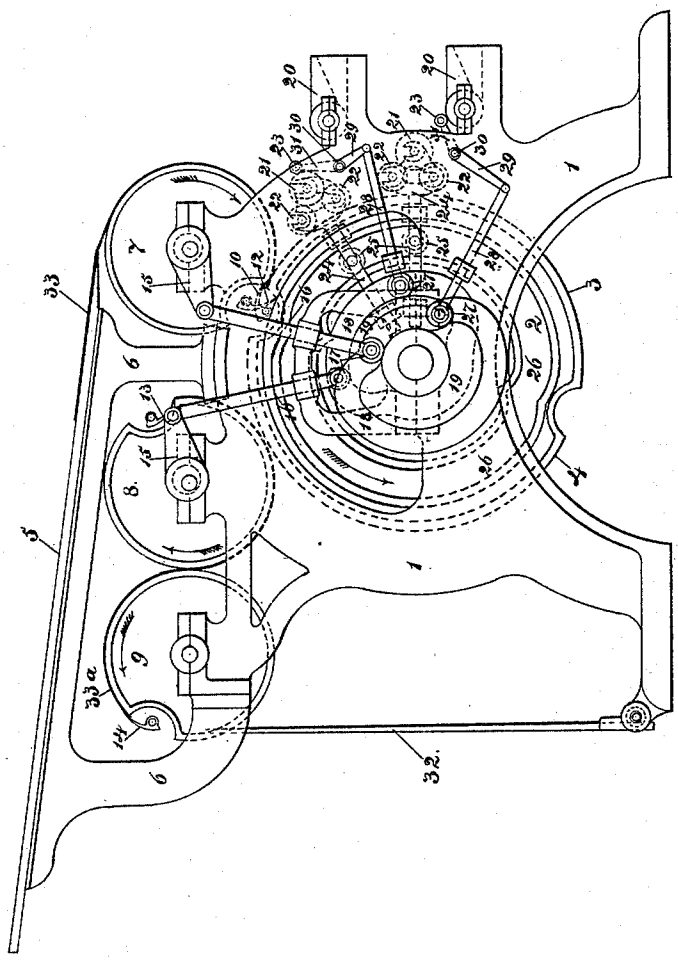
(No Model.) 2 Sheets—Sheet 1.

J. T. HAWKINS.

ROTARY CHROMATIC PRINTING MACHINE.

No. 456,539. Patented July 21, 1891.

Fig. 1



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3

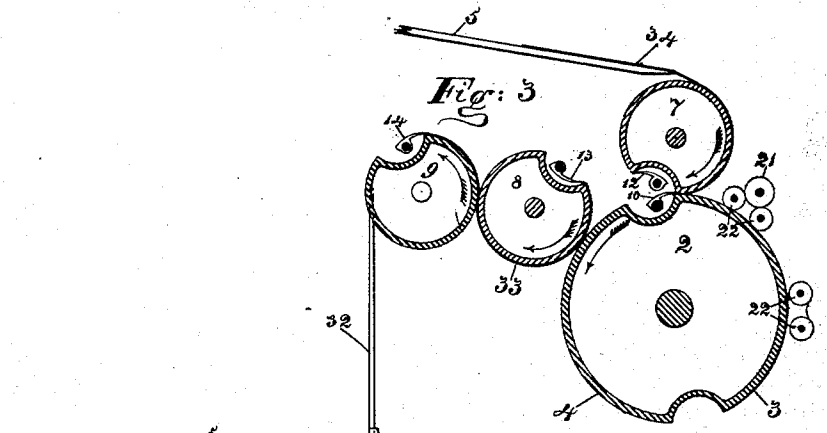


Fig. 2

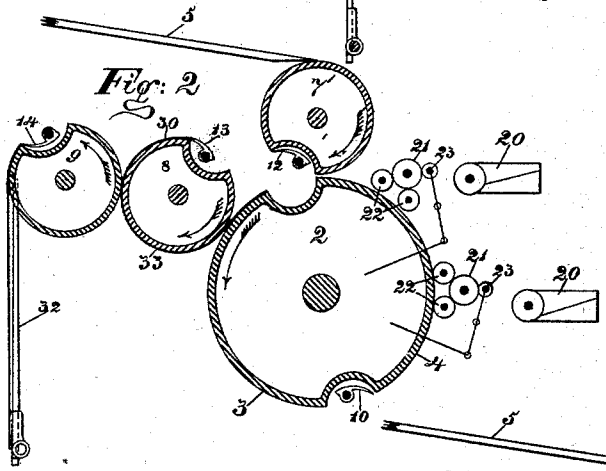
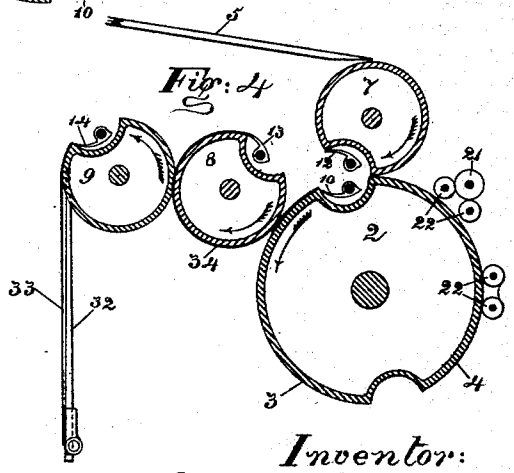


Fig. 4



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UNITED STATES PATENT OFFICE.

JOHN T. HAWKINS, OF TAUNTON, MASSACHUSETTS.

ROTARY CHROMATIC-PRINTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 456,539, dated July 21, 1891.

Application filed November 12, 1890. Serial No. 371,206. (No model.)

To all whom it may concern:

Be it known that I, JOHN T. HAWKINS, of Taunton, in the county of Bristol and State of Massachusetts, have invented a new and useful Rotary Chromatic-Printing Machine for Printing in Two Colors, which invention is fully set forth and illustrated in the following specification and accompanying drawings.

The object of this invention is to provide a machine for printing from rotating curved or cylindrical printing-surfaces in two colors or impressions in compact form and of comparatively inexpensive construction.

The invention will first be described in detail, and then particularly set forth in the claim.

In the accompanying drawings, Figure 1 is a side elevation illustrating a machine for printing in two colors or impressions on the same side of the sheet at one feeding with some of the details—such as driving mechanism, part of the inking mechanism, the gripper-operating mechanism, fly-operating mechanism, &c.—omitted, the details omitted being capable of construction and application to this machine in several well-known ways, as applied to other machines. This illustration therefore sufficiently illustrates the invention to enable any one skilled in the art to construct such a machine without resort to additional views. Figs. 2, 3, and 4 are diagrammatic elevations showing the relative positions of parts at different stages of the passage of the sheet through the machine.

In said figures the several parts are respectively indicated by reference-numbers as follows:

1 indicates one of the main frames, in which the several moving members are journaled and carried; 2, the plate or form cylinder carrying the cylindrically-surfaced forms or printing-plates 3 and 4, and 5 a feed-board carried on brackets 6, secured to the main frames 1.

7 and 8 indicate impression-cylinders, each half the diameter of the form-cylinder 2, and 9 indicates a delivery-cylinder of the same diameter as said impression-cylinder. The cylinders 2, 7, 8, and 9 each carry spur-gears on their axes, omitted for clearness, as well understood, whose pitch-lines correspond with their respective peripheries. The gear upon the axis of form-cylinder 2 engages the gears on the axes of impression-cylinders 7 and 8, and the gear of the latter cylinder engages also the gear carried on the axis of delivery-cylinder 9. Motion may be imparted to the whole by any suitable connection of gearing with the spur-gear on the axis of form-cylinder 2 in any of the well-known ways.

The form-cylinder 2 is provided with a set of grippers 10, closing upon the head of form 3, and the impression-cylinders 7 and 8 and delivery-cylinder 9 are each provided with one set of grippers, respectively, 12 13 14. The impression-cylinders 7 and 8 are journaled in eccentric-boxes 15, which, through their arms articulated to rods 16, carrying rollers 17 on their ends engaging suitably-formed grooves 18 in cams 19, secured to the axis of form-cylinder 2, raise and lower said impression-cylinders from and into contact with their respective forms as they pass.

20 indicates the ink-fountains; 21, the distributers; 22, the form-rollers, and 23 the ductor-rollers. The distributer-rollers 21 and form-rollers 22 are carried in a well-known arrangement of sliding rods 24, which, through rollers 25, engaging cams 26, secured to form-cylinder 2, operate to raise and lower each set of form-rollers from the opposite and into contact with their own form as they pass. The ductor-rollers 23 are similarly operated through cams 18, engaging rollers 27, carried on sliding rods 28, articulated to levers 29, operating through studs 30 and arms 31 inside the frames which carry the ductor-rollers 23.

A large part of the inking apparatus being between the frames 1 is shown in broken lines; but its several parts described are numbered the same as though in full lines.

A well-known oscillating fly 32 receives the sheets from the delivery-cylinder 9 and deposits them upon a suitable receiving-board. (Not shown.)

The machine, as shown, is constructed to print from separate sheets fed from the feed-board 5; but it is to be understood that any of the well-known devices for feeding a continuous web and cutting the same into sheets

may be attached to and used in connection with this invention, so that the machine may be self-feeding and be run at high speeds.

The operation of the machine is as follows: A sheet 33 being fed from the feed-board 5 is (as shown in Fig. 1, the arrows indicating the directions in which the several cylinders revolve) carried around by the grippers 12 of impression-cylinder 7 and printed first on form 3, the impression-cylinder being lowered into contact with said form. The grippers 10 of form 3 are operated to close upon and the grippers 12 of impression-cylinder 7 to release the sheets simultaneously. The sheet is then carried partly around form-cylinder 2 in contact with form 3 until the head of the sheet reaches impression-cylinder 8, when the grippers 13 of impression-cylinder 8 close upon and grippers 10 of form 3 release the sheet, which is then carried once around impression-cylinder 8 while out of contact with form 3. At the completion of the first revolution the impression-cylinder 7 is raised to escape form 4. At the next revolution of impression-cylinder 8 said cylinder is lowered into contact with form 4, which it will then meet, and be printed in the second color or impression. The grippers 13 of impression-cylinder 8 now retain the sheet until meeting delivery-cylinder 9, when the grippers 13 of impression-cylinder 8 release and the grippers 14 of delivery-cylinder 9 secure the sheet, which is thus conveyed thereby to and delivered upon the fly 32, as shown by sheet 33^a, Fig. 1, just about to enter on the fly 32, which latter at the proper time is oscillated to lay the sheet upon the receiving-board. Passing from the position shown in Fig. 1 to that shown in Fig. 2, the impression-cylinders 7 and 8 having made one revolution from the position shown in Fig. 1, the sheet 33 will surround the impression-cylinder 8 and be already printed by cylinder 7 in its first color or impression on form 3. Passing to Fig. 3, a new sheet 34 will have been taken from feed-board 5, and sheet 33 will have been transferred at its head to delivery-cylinder 9 and be nearly printed in the second color or impression on form 4, as with sheet 33^a, Fig. 1. Passing to Fig. 4, the second sheet 34 will surround impression-cylinder 8 and have been printed on form 3, and sheet 33 will be on the fly 32.

Having thus fully described my said invention, I claim—

In a rotary printing-machine for printing in two colors or impressions on the same side of the sheet, the combination of a plate or form cylinder, as 2, carrying two forms and one set of grippers, as 10, closing upon the head of the first form, two impression-cylinders, as 7 and 8, each carrying grippers and operated to print each upon one of the forms, and a delivery-cylinder, as 9, carrying grippers arranged to receive the printed sheet from the last-named impression-cylinder and deliver it to a fly or other suitable delivery mechanism, whereby the sheet to be printed is carried partly around the first impression-cylinder, printed upon the first form, and carried partly around the form-cylinder, thence transferred to the second impression-cylinder, carried once around said second impression-cylinder, then printed on the second form, and thence transferred to a delivery-cylinder for such further transfer as may be desired, substantially as and for the purposes set forth.

JOHN T. HAWKINS.

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