(No Model.) 2 Sheets—Sheet 1.

C. W. CRONK & C. C. CURRIER.

ROTARY CHROMATIC PRINTING MACHINE.

No. 343,299. Patented June 8, 1886.

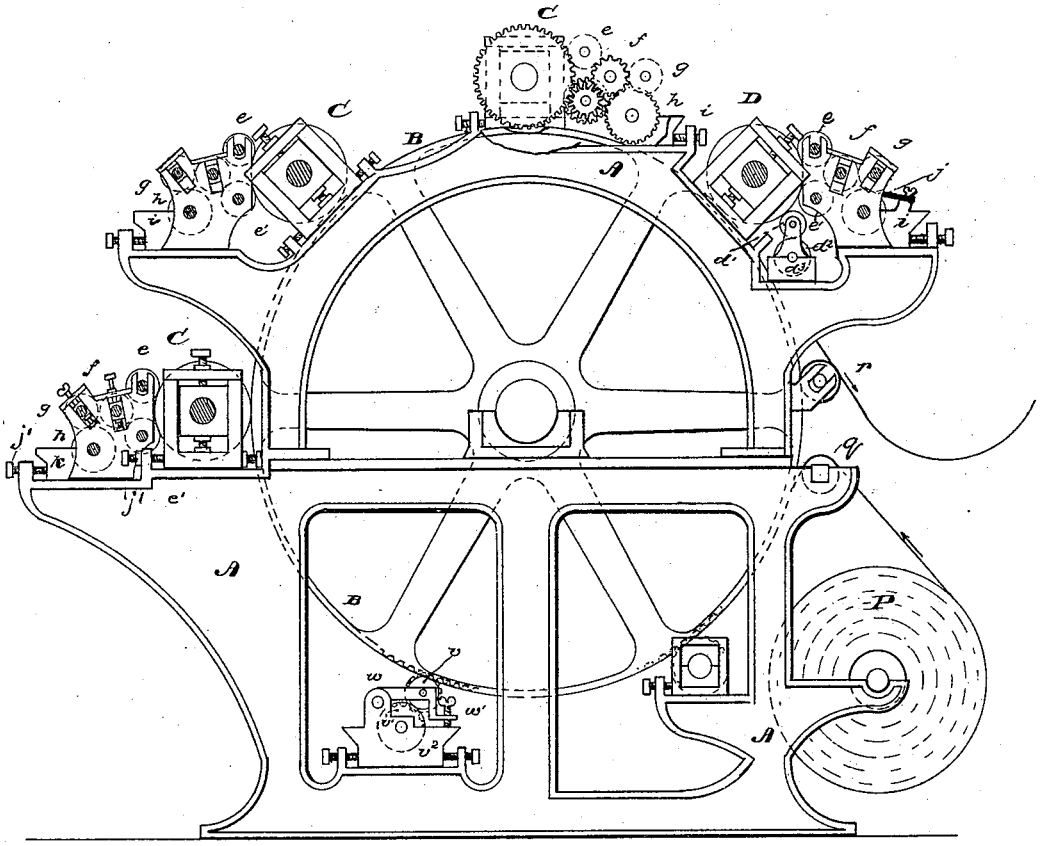

Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

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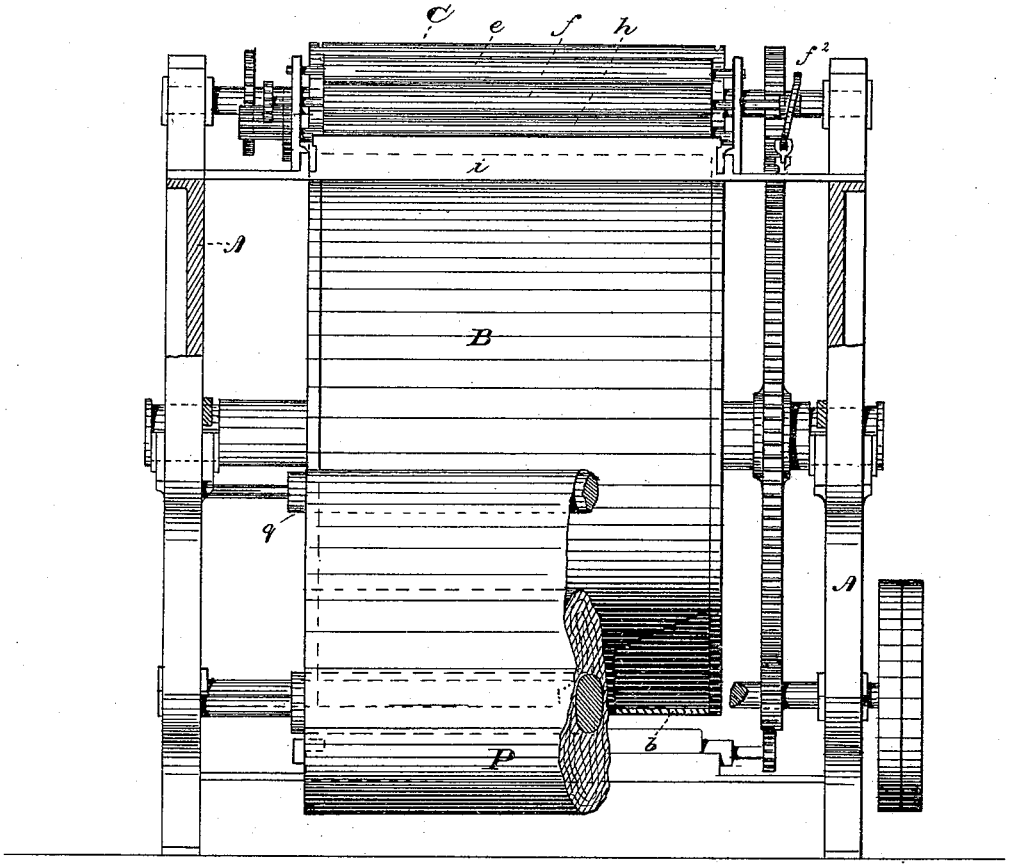

Fig. 2.

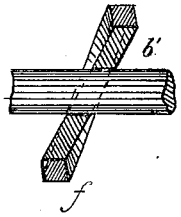

Fig. 3.

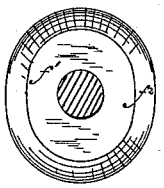

Fig. 4.

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UNITED STATES PATENT OFFICE.

CHARLES W. CRONK AND CYRUS C. CURRIER, OF NEWARK, NEW JERSEY.

ROTARY CHROMATIC-PRINTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 343,299, dated June 8, 1886.

Application filed March 5, 1885. Serial No. 157,732. (No model.)

To all whom it may concern:

Be it known that we, CHARLES W. CRONK and CYRUS C. CURRIER, citizens of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Rotary Chromatic-Printing Machines; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in rotary chromatic-printing machines, and is intended to more economically, perfectly, and rapidly perform the work common to such machines and to provide certain improved operations, which will be hereinafter specifically described.

The invention consists in the combination of parts, substantially as illustrated in the drawings, and described and claimed hereinafter.

In the drawings, embodied in two sheets, Figure 1 is a side elevation of a chromatic-printing press illustrating our invention. Fig. 2 is a rear elevation of the machine shown in Fig. 1, with the paper-roll and the rolls and shafting connected therewith broken away; also the lithographic mechanism removed to show the gearing of the top typographic-printing rolls or forms. Fig. 3 is a sectional view illustrating the cam which vibrates the distributing-roll, and Fig. 4 is a front elevation of the said cam.

Similar reference-letters indicate corresponding parts in each of the several figures.

In said drawings, A is the standard of the press; B, the impression-cylinder; C, the typographic, and D the lithographic, printing-forms.

e e' are the inking-rolls; *f*, the vibrating distributing-roll; *g*, the receiving-roll, and *h* the fountain-roll, which takes up the ink from the fountain *i*, which is transferred through the rolls *h*, *g*, *f*, *e*, and *e'* to the printing-forms.

The inking-rolls in the typographic and lithographic printing mechanism are similar in construction and operation, as indicated in Fig. 1.

j, Fig. 1, is a plate which presses upon the fountain-roll, and serves, according to its pressure, to regulate the amount of ink which is transferred to the receiving-roll.

The gearing for operating the printing-forms and inking-rolls is shown on the top of the press only. That for actuating the other rolls, being the same, is removed to show the rolls and side bearings, the journals being sectionized.

To distribute the ink evenly upon the rolls *e e'*, that ink the printing-forms, a roll, *f*, having a vibratory motion, is provided, which takes the ink from the roll *g* and transfers it to the rolls *e e'*.

The vibratory action of the distributing-roll is effected by the cam shown in Figs. 2, 4, and 5, which consists of the plate *f'*, keyed at an angle upon the shaft which rotates within the ring f^2, secured at the bottom thereof, as indicated in Fig. 2. It will be noticed that the distributing-roll does not spread the ink directly upon the printing-form, but upon the inking-rolls *e e'*, which in turn transfer the evenly-distributed ink in the proper quantity and with great regularity over the printing-form. This insures a more perfect distribution of ink than is obtained by using the distributing or vibrating roll directly upon the printing-form.

In the press illustrated in the drawings but three typographic-printing forms and one lithographic form are shown; but a greater or less number may be employed, according to the work required. The lithographic mechanism is placed upon the press so as to act upon the design after being printed upon the typographic forms, to provide a lithographic finish, and it consists of the printing-form D, inking-rolls *e*, *e'*, *f*, *g*, and *h*, and dampening mechanism, as shown in Fig. 1. The dampening or wetting apparatus consists of a roll, *d'*, which is kept damp by the roll d^2, revolving in the fountain d^3.

In addition to the typographic and lithographic printing forms and apparatus connected therewith, an attachment for varnishing the printed material is employed in connection with the same impression-cylinder, being arranged under the cylinder, as indicated in Fig. 1. The impression-cylinder B has a continuous surface, into which is countersunk

a bed of elastic material, *b*, Fig. 2, made, preferably, of rubber vulcanized to the requisite degree of firmness to provide a surface sufficient to secure a good impression, and yet elastic enough to prevent any injury to the printing-forms. The said rubber bed, being molded on the peripheral surface of the impression-cylinder, is immovably secured thereto, and cannot slip either around the cylinder or laterally, because of the raised edges of the recess in which the rubber is countersunk.

P represents a continuous roll or web of paper, enameled cloth, or other material, which passes up over the roll *q*, then around the impression-cylinder, and finally under the roll *r*, when employed as a tension-roll, or over the same, as shown in Fig. 1, when the said roll is covered with carding-cloth. The use of the carding-cloth is preferred, as the contact of the printed material with the roll is liable to mar or destroy the design.

The mode of operation is to first print the design upon the cloth and apply the lithographic finish in one passage of the cloth around the impression-cylinder, then "back off" the typographic and lithographic apparatus by means of the adjusting-screws *j'*, and move the varnishing-roll close to the impression-cylinder, so that as the cloth, after being printed, dried, and ruled, is again passed through the press it will receive a coating of varnish of the thickness desired. The varnishing-roll *v* is journaled in the lever *w*, capable of adjustment by means of the thumb-screw *w'*, whereby the thickness of the coating of varnish may be varied, the roll *v* receiving the varnish from the feed-roll *v'*, which is contained in the trough v^2.

As thus constructed and operating, the several processes of printing, both typographically and lithographically, and varnishing are rapidly and economically accomplished upon a continuous web of cloth in a single press having a cylinder with a continuous impression-surface.

The varnishing apparatus is adapted to be used upon or in connection with any printing or other press to provide a varnished surface; hence its use is not confined to the mechanism herein illustrated.

In our improved construction every portion of the impression-surface is available for printing, the forms being grouped around the cylinder and placed close together, allowing a greater number and variety of colors than has been possible under the usual methods of construction.

While rubber properly vulcanized is the preferred material, still any material that possesses the requisite properties may be used in lieu thereof.

Having thus set forth the invention, what we desire to claim is—

1. The combination, in a rotary chromatic-printing press, with an impression-cylinder, of a varnishing apparatus consisting of a varnish receptacle or trough, a feed-roll journaled in said trough, a distributing or varnishing roll arranged between the feed-roll and the impression-cylinder, said distributing-roll being journaled in pivoted arms provided with a set-screw working in said arms and engaging with the trough, by means of which the varnishing-roll is adjusted in relation to the impression-cylinder to apply a thinner or thicker film of varnish, substantially as and for the purposes set forth.

2. A rotary chromatic-printing press having an impression-cylinder provided with a continuous peripheral surface of elastic material, adjustable typographic and lithographic printing forms or rolls, and an adjustable varnishing-roll, each of said typographic and lithographic forms being provided with suitable ink-feeding mechanism, and the varnishing-roll with varnish-feeding mechanism, substantially as and for the purposes set forth.

In testimony that we claim the foregoing we have hereunto set our hands this 26th day of February, 1885.

CHARLES W. CRONK.
CYRUS C. CURRIER.

Witnesses:
FREDK. F. CAMPBELL,
CHARLES H. PELL.