

(No Model.)

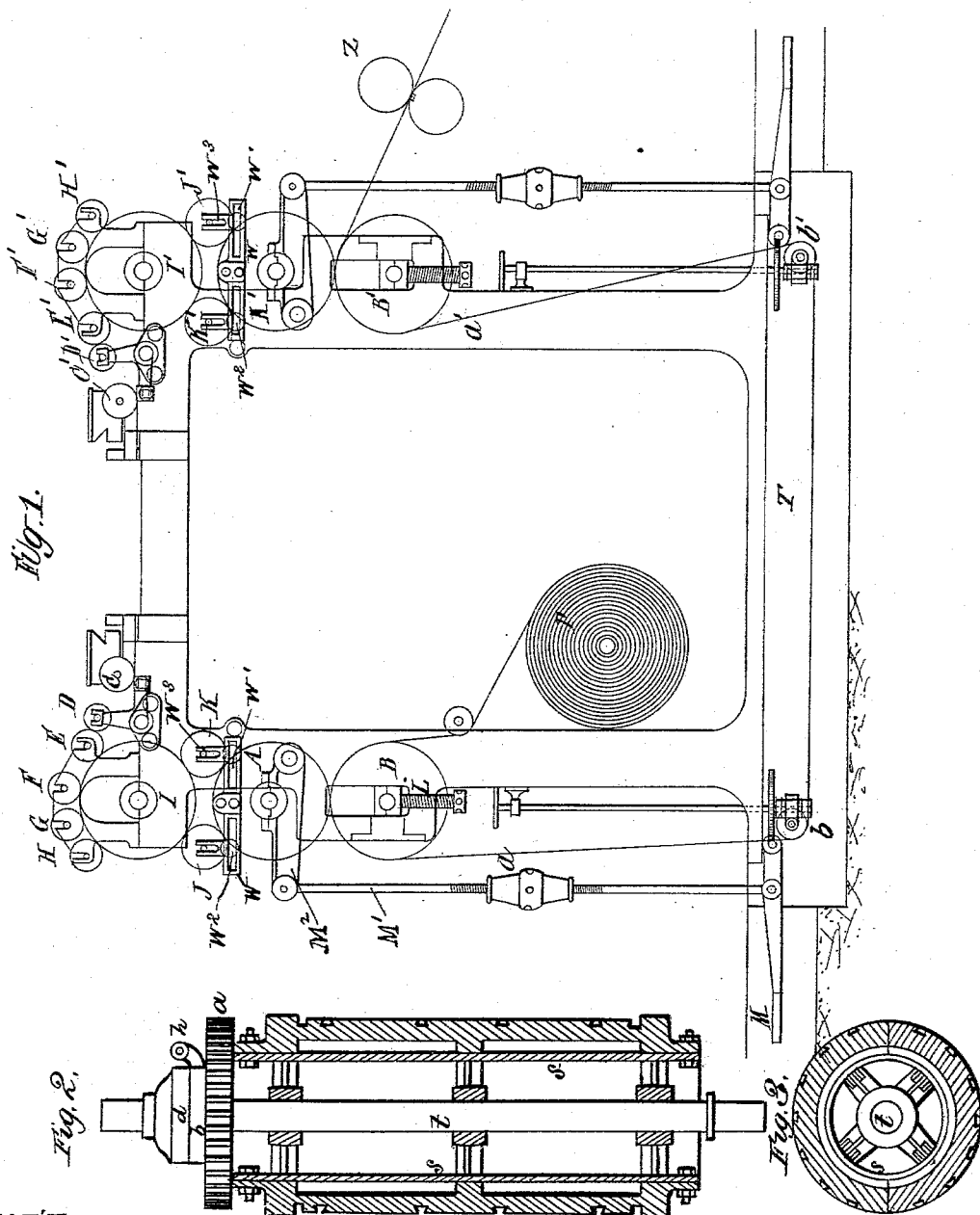
2 Sheets—Sheet 1.

P. F. AUGUSTE-GODCHAUX.

PRINTING MACHINE.

No. 373,733.

Patented Nov. 22, 1887.



Witnesses  
*J. A. Rutherford*  
*Robert Emmett*

Inventor  
*Paul F. Auguste-Godchaux*  
By *James L. Norris*  
Atty.

(No Model.)

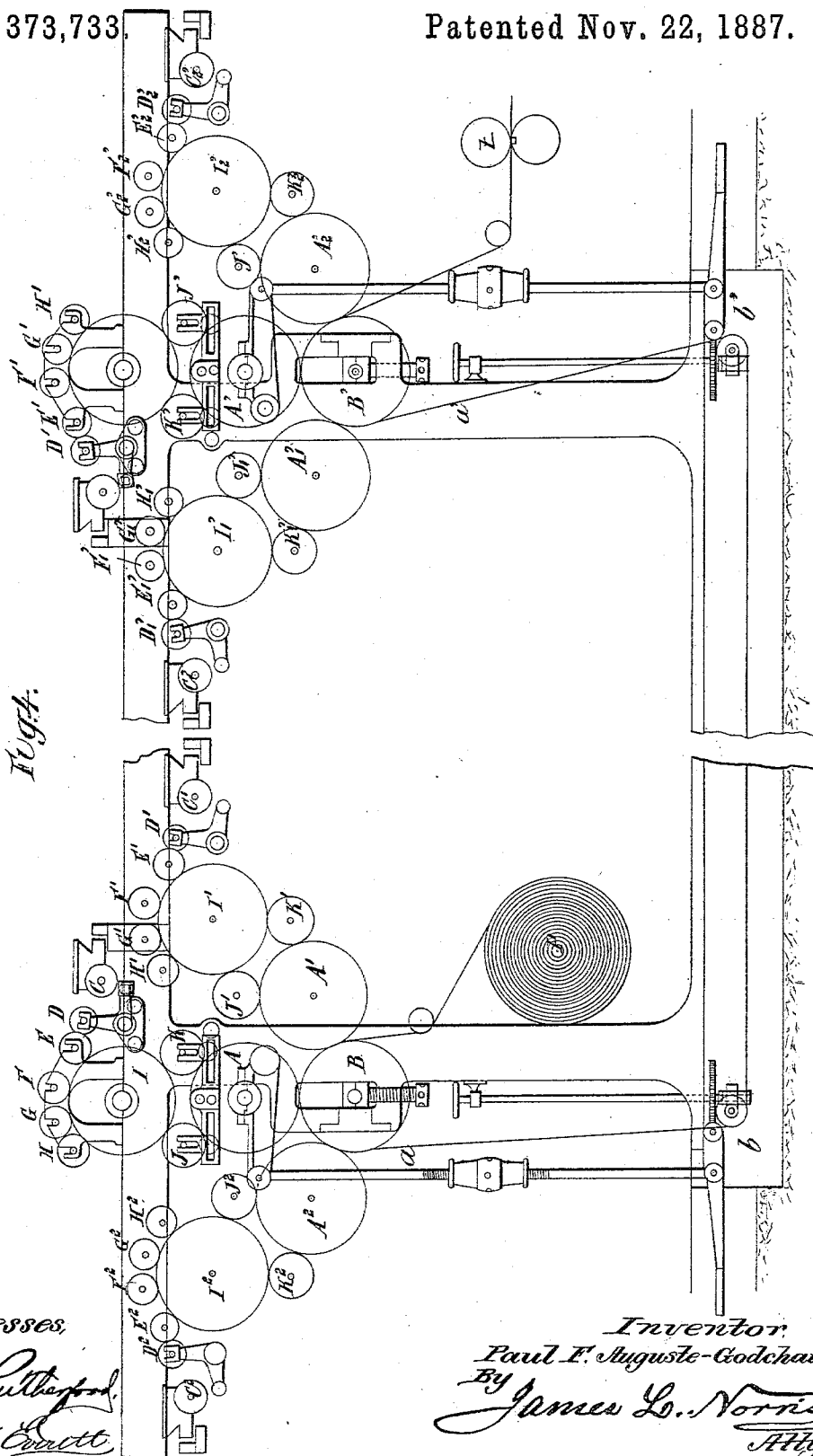
2 Sheets—Sheet 2.

P. F. AUGUSTE-GODCHAUX.

PRINTING MACHINE.

No. 373,733.

Patented Nov. 22, 1887.



Witnesses

J. A. Rutledge  
Robert Crockett

Inventor

Paul F. Auguste-Godchaux.  
By James L. Norris  
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# UNITED STATES PATENT OFFICE.

PAUL FERNAND AUGUSTE-GODCHAUX, OF PARIS, FRANCE.

## PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 373,733, dated November 22, 1887.

Application filed February 21, 1887. Serial No. 228,421. (No model.) Patented in France December 2, 1886, No. 180,045.

*To all whom it may concern:*

Be it known that I, PAUL FERNAND AUGUSTE-GODCHAUX, a citizen of the Republic of France, and a resident of Paris, France, have invented new and useful Improvements in Printing-Machines, (for which I have obtained a patent in France, No. 180,045, bearing date December 2, 1886,) of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to rotary printing-machines for printing in one or more colors; and it comprises the improvements hereinafter described.

In the accompanying drawings, Figure 1 is an end elevation of a cylinder printing-machine adapted to print in one color upon both sides of a continuous web of paper. Fig. 2 is a longitudinal sectional view of a type or form cylinder made in several parts. Fig. 3 is a cross-section of said type-cylinder. Fig. 4 represents the machine arranged for printing in colors.

In the machine shown in Fig. 1, A A' represent the type-cylinders, and B B' the impression-cylinders.

P is the roll of paper which is to be printed upon. After the paper leaves the roll P it passes between the cylinders A and B, where it is printed on one side. It then descends and follows the course *a b b' a'*, and then passes between the type-cylinder A' and the impression-cylinder B', where it is printed on the second side. As the paper leaves the second pair of cylinders it is conducted to rollers Z, by which it is cut into pieces of the desired length. The pieces severed from the web may be collected by any desirable mechanism adapted to the requirements and to the rapidity of the impressions.

At the lower part of the frame, between the rollers *b* and *b'*, the paper, printed on one side only, passes through a hot chamber, T, heated by gas or otherwise, to be well dried.

If, in lieu of printing the two sides of the sheet, only one side is to be printed, the paper, instead of being caused to follow the course *a b b' a'*, is conducted directly to a cutting de-

vice as it passes out of contact with the cylinders A and B.

The type-cylinder A is provided with inking apparatus composed of an ink-trough, C, distributing-rollers D E F G H, an ink-table, I, and two inking-rollers, J K, touching the type or form cylinder. Similar inking apparatus is applied to the type-cylinder A'.

The distance between the type-cylinder A and the impression-cylinder B can be regulated by means of the screw L. The pressure between these two cylinders can likewise be increased or diminished by placing more or less weight at the extremity of the lever M, which is connected by rods M' with a pivoted frame, M'', in which the form or type cylinder is mounted.

The impression-cylinder B may be composed of cast-iron and made hollow, or it may be formed of wood; and it is surrounded by india-rubber, gutta-percha, cloth, or any other suitable material.

The rollers *b* and *b'* serve to direct the course of the paper, and they can be disposed as indicated in the drawings.

With the machine described I can make the type-cylinder of any required diameter for the purpose of varying the length of paper printed at each rotation of the said cylinder, according to requirements. The diameter of the impression-cylinder can be correspondingly varied. The preferable mode of construction, however, is that shown in Figs. 2 and 3, which represents a type or form cylinder whose diameter can be increased or diminished without removing its shaft or journals from the bearings in the machine. To attain such result the interior part of the cylinder, comprising the shaft *t* and the shell S, is of invariable size, while the outer part or casing, U, is made more or less thick, according to the diameter required for the type-cylinder. This outer casing or shell, U, is made of two longitudinally-divided parts having end flanges for bolting the same to the inner shell, S. Grooves or recesses are also provided in said outer shell, U, for the reception and retention of type or stereotype-plates.

Instead of using two-part rollers, the outer part or casing of which is of variable thickness, I sometimes make the rollers themselves of variable diameters. In this case, however, it is necessary to have a roller for each size of sheet to be printed, and the cost is considerably augmented, while by employing an internal roller of invariable size I can fix any of the different casings which I employ according to the size of the sheets to be printed.

In order to enable the inking-rollers J K to be used with type and impression cylinders of different diameters, I mount the said rollers on a special support, W. (Represented in Fig. 1 of the accompanying drawings.) This support permits the axes of the said rollers to be displaced in vertical and horizontal directions, so that the rollers always remain in contact with the ink-table and with the type-cylinder, whatever may be the diameter of the latter. The support W comprises a bracket which is secured to the frame-work of the machine and has two longitudinal slots, W'. Blocks W<sup>2</sup>, fitted in these slots and capable of being adjusted therein, have vertical slotted or forked arms W<sup>3</sup>, which receive the gudgeons or journals on the distributing-rollers J K and allow said rollers to be moved up and down, according to the diameter of the type-cylinder.

On reference to the drawings it will be observed that the two ends of my machine are almost symmetrical. The parts indicated by the same letters are of the same nature and have the same object.

By dividing the machine into two parts a single machine can be made, with which one side only of the paper can be printed.

Instead of placing the ink-trough above the printing-roller, as shown, I can place it on one side and increase the number of distributing-rollers to enable a perfect inking to be obtained for the clearest impressions.

To adapt the machine for printing in several colors, I place two, three, or more type-cylinders around the impression-cylinder. I preserve, however, the principles of the machine hereinbefore described. As shown in Fig. 4, three type-cylinders, A A' A<sup>2</sup> and A' A<sub>1</sub> A<sub>2</sub>, are arranged around the impression-cylinders B B', respectively. Each type-cylinder is provided with an inking apparatus similar to that which I have described for the preceding machine. The type-cylinders A A' A<sup>2</sup> must have exactly the same diameter as the impression-cylinder B, so that, theoretically, I can place six type-cylinders around the impression-cylinder; but this number is necessarily reduced, owing to the difficulties presented in practice.

The paper passing from the reel P is first printed in one color (for example, black) by the type-cylinder A'; then in another (for example, red) when passing the cylinder A, and in a third (for example, blue) when passing

the cylinder A<sup>2</sup>. The paper (which is as yet printed on one side only) then follows the path *a b b' a'*, and is printed upon the second part of the machine and the other side of the sheet, as described. Between the rollers *b b'* the paper passes through a hot chamber, T.

The number of the colors printed by the machine can be increased by dividing the ink-trough into two, three, or more parts (equal or unequal) in the direction of its axis. Supposing the ink-trough of the roller A is divided for two colors, the inking-table must also be divided into two parts, so that the type-cylinder will be inked with two inks of different colors.

The machine which I have described enables me to print in several colors simultaneously.

Instead of making the machine in two symmetrical parts, as represented, I can construct a machine composed of, say, the left-hand part only, so that the paper is printed on one side only. This arrangement for printing on one side only is susceptible of many applications in practice—such as for printing postage-stamps, labels, and the like, which have to be gummed on one side. For certain important work it may also often be very advantageous to print only on one side.

I have not represented in the drawings the means for actuating the cylinders and rollers, as these can be set in motion either by toothed wheels, by pulleys, by pulleys and toothed wheels combined, or by any other desirable means. What is required is that the motion shall be perfectly regular and that all the type-cylinders shall have precisely the same velocity.

For printing in several colors, the impression-cylinder can have a diameter which is equal to or a multiple of that of the type-cylinders. Thus by making the impression-cylinder double or treble the diameter of the type-cylinders I can place around it a greater number of type-cylinders than otherwise. The operation will be similar to that already set forth, it being sufficient to modify the actuating-gearing to obtain the regular motion.

What I claim is—

1. In a printing-machine, the combination, with the form or type cylinder having an attachable and detachable outer shell and the impression-roller, of the bracket-support W, provided with longitudinal slots W', the sliding blocks W<sup>2</sup>, having forked arms W<sup>3</sup>, the distributing-rollers J K, journaled in said forked arms, and the ink-trough and ink-distributing rollers, substantially as herein set forth.

2. In a printing-machine, the combination of the weighted lever-frame, the type or form cylinder mounted therein, the vertically-adjustable impression-cylinder, the vertically

and horizontally adjustable inking-rollers, with the ink-table and ink-distributing rollers, substantially as herein set forth.

3. In a printing-machine, the combination,  
5 with the single vertically-adjustable impression-cylinder, the plurality of type or form cylinders arranged at the sides thereof, and the upper vertically-movable type or form cylinder, of three sets of inking devices adapted

to distribute different colors, substantially as is herein set forth.

In testimony whereof I have hereunto signed my name in the presence of two subscribing witnesses.

PAUL FERNAND AUGUSTE-GODCHAUX.

Witnesses:

EDWARD P. MACLEAN,

EMILE BERTTS.