No. 705,142. Patented July 22, 1902.

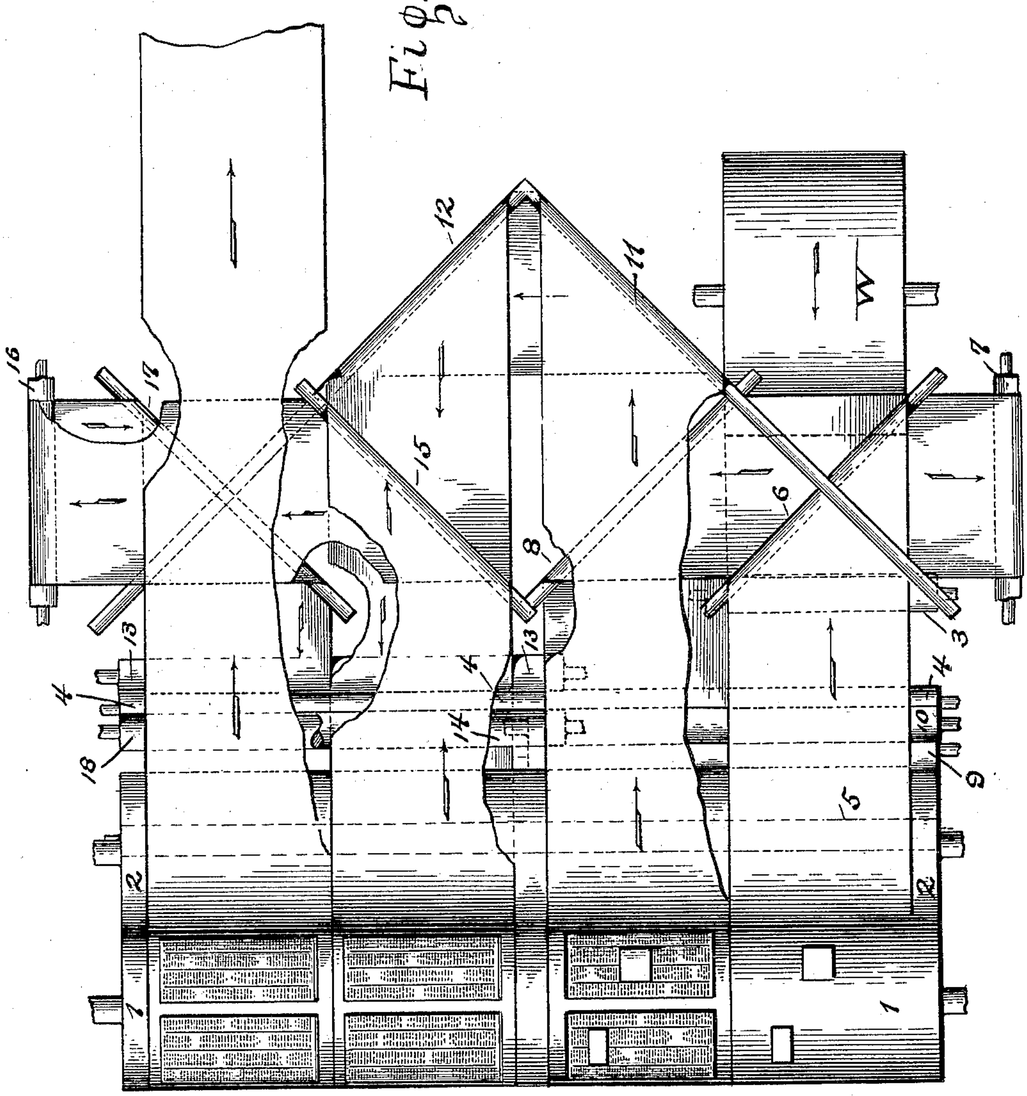
G. F. READ.

WEB PRINTING MACHINE.

(Application filed Nov. 27, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.



Attest:
O. F. Kehoe
J. A. Graves

Inventor.
George F. Read
by Philipp Sawyer. Rice & Kennedy
Attys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 705,142. Patented July 22, 1902.

G. F. READ.

WEB PRINTING MACHINE.

(Application filed Nov. 27, 1901.)

(No Model.) 2 Sheets—Sheet 2.

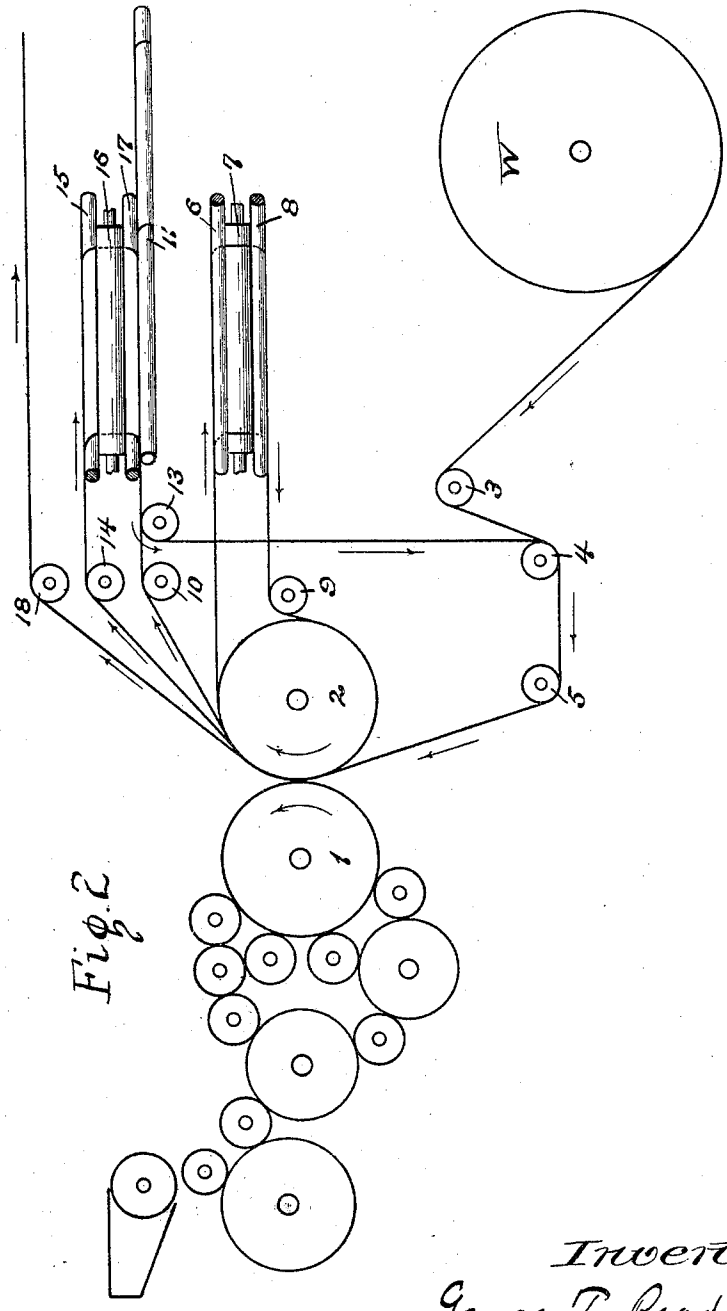


Fig. 2.

Witnesses:
P. G. Kehoe
J. A. Graves

Inventor:
George F. Read
by Philipp, Sawyer, Rice & Kennedy
Attys

UNITED STATES PATENT OFFICE.

GEORGE F. READ, OF NEW YORK, N. Y., ASSIGNOR TO ROBERT HOE, OF NEW YORK, N. Y.

WEB-PRINTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 705,142, dated July 22, 1902.

Application filed November 27, 1901. Serial No. 83,823. (No model.)

To all whom it may concern:

Be it known that I, GEORGE F. READ, a citizen of the United States, residing at New York, county of Kings, and State of New York, have invented certain new and useful Improvements in Web-Printing Machines, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to certain improvements in printing-machines.

Printing-couples of the kind known as "double-enders" are commonly used in printing-machines, said couples operating to print a web on one end, the web thereafter being transferred laterally and caused to pass between the other end of the couple to receive a second impression.

It is the object of this invention to produce an improved printing-machine embodying the double-ender principle which shall be adapted to print in colors or to perfect as may be desired.

With this and other objects in view the invention consists in certain constructions and in certain parts, improvements, and combinations, as will be hereinafter fully described and then specifically pointed out in the claims hereunto appended.

Referring to the accompanying drawings, in which like characters of reference indicate the same parts, Figure 1 is a plan view of so much of a printing-machine as is necessary to an understanding of the invention. Fig. 2 is a diagrammatic side elevation of the construction shown in Fig. 1.

Referring to the drawings, 1 indicates the form, and 2 the impression-cylinder, of a double-ender printing-couple, each end of the couple being capacitated to print a double-wide web once or to print upon a single-wide web twice, as may be desired. As shown, the couples are arranged to print upon a single-wide web, which is indicated at W. After leaving the web-roll the web is led over suitable guides, as 3, 4, and 5, between the members of the couple at one end, after which it passes over suitable guides. When, as in the present case, it is desired to give the web two printings on the same side, these guides, which may be varied widely in construction, will be arranged to shift the web laterally, but to return it to the couple at the same side with its printed side toward the form-carrying member, so that it may receive a second impression on the same side. As shown, these guides include an angle-bar 6, a roll 7, and an angle-bar 8, the web running from the couple over the angle-bar 6, then outward to and over roll 7, then inward to and over the bar 8, which directs it back to the couple with the printed side toward the form-carrying member. A guide 9, which may be a roll, if desired, receives the web from the bar 8 and directs it to the couple. After being printed a second time by the same end of the couple which gave it its first printing the web is shifted laterally by suitable web-directing means and is again sent between the members of the couple, but at the other end. The web-directing means employed may be varied widely in construction and will vary according to the product which it is desired to produce. Preferably, however, these web-directing means will so be constructed as to guide not only the single-wide web referred to, but also a double-wide web. Furthermore, when, as in the present case, it is desired to give the web-printings upon opposite sides the web-directing means will be constructed to turn the web over. As shown, the web-directing means include a pair of angle-bars 11 and 12, these bars in the construction shown forming a triangle. After the web has received its final printing from that end of the members of the couple which first operate upon it it runs in the construction shown over a suitable bar 10, then over the bar 11, then under both bars 11 and 12, and over the bar 12. After leaving the bar 12 the web runs over a guide 13, which may be a roll, and then over the guides 4 and 5 and from them between the members of the couple. In its passage over the bars 11 and 12 the web has been turned over, so that the side which has been twice printed is toward the impression member of the couple. The end of the couple between which it is now passing, therefore, delivers an impression on the side of the web opposite to that which was first printed. After having received this printing from the couple the web passes over

guides, which again direct it between the members of the couple at this end for a final printing. These guides may be variously constructed. In the construction shown the web is designed to receive the final printing on the same side as the last printing, so that the completed web receives two impressions on each side. The guides referred to are accordingly constructed to shift the web laterally without turning it over. As shown, the web after leaving the couple passes over a suitable guide-roll 14, after which it runs to the guides referred to, which in the construction illustrated include a pair of bars 15 and 17 and an intermediate roller 16. After leaving the roll 14 the web runs to the bar 15 and then outward and downward over the roll 16. From the roll 16 it runs inward to and over the bar 17, and after leaving this bar it passes over the guide 13. From the guide 13 it runs over the guides 4 and 5 and then passes again between the ends of the couple. At it emerges from the couple it may run over a suitable guide 18, from which it may be directed by any of the well-known agencies to any of the usual delivery mechanisms.

When it is desired to print a double-wide web, the guides 6, 7, and 8 and the guides 15, 16, and 17 will not be used. The course of the web will be from the roll over the guides 3, 4, and 5 to the couple, which will give it a printing on one side. When it is desired to perfect the web, as will be the case in the construction shown, it will be led from the couple over the guide 10 to the bars 11 and 12, which, it will be remembered, are long enough to accommodate it. In passing over the bars 11 and 12 the web has of course been turned over, and after leaving the bars it goes by way of the guide-rolls 13, 4, and 5 again to the couple and receives its printing on the other side. As it emerges from the couple it is directed by the roll 18 to any suitable device which may dispose of it in any of the usual ways.

Variations and changes may be made in the illustrated construction without departing from the invention. The invention is not, therefore, to be limited to the specific features of construction which have been hereinbefore described.

What is claimed is—

1. In a printing-machine, the combination with a pair of double-wide cylinders, of means for leading a single-wide web twice between the cylinders at one end thereof and twice between the cylinders at the other end thereof, and means for leading a double-wide web once between the cylinders at each end, substantially as described.

2. In a printing-machine, the combination with a pair of double-wide cylinders, of means for leading a single-wide web twice between the cylinders at one end with the same side up and twice between the cylinders at the other end with the other side up, and means for leading a double-wide web once between the cylinders at each end, substantially as described.

3. In a printing-machine, the combination with a pair of double-wide cylinders, of means for leading a single-wide web twice between the cylinders at one end with the same side up, and twice between the cylinders at the other end with the other side up, and means for leading a double-wide web once between the cylinders at one end, reversing it and leading it between the cylinders at the other end, substantially as described.

4. In a printing-machine, the combination with a pair of double-wide cylinders, of web-guides coöperating with one end of the cylinders whereby a single-wide web may be led twice therethrough, web-guides coöperating with the other end of the cylinder whereby said web may be led twice therethrough, and directing means for guiding the web from one end of the cylinder to the other end, said directing means being constructed to also guide a double-wide web from one end of the cylinders to the other, substantially as described.

5. In a printing-machine, the combination with a pair of double-wide cylinders, of web-guides coöperating with one end of the cylinders, web-guides coöperating with the other end of the cylinders, and web-directing means operating to lead the web from one end of the cylinder to the other, the construction being such that a single-wide web may be led twice between the cylinders at one end and twice between the cylinders at the other end, or a double-wide web may be led by said web-directing means once between the cylinders at each end, substantially as described.

6. In a printing-machine, the combination with a pair of double-wide cylinders, of web-guides coöperating with one end of the cylinder and constructed to lead a web twice therethrough the same side up, of web-directing means for leading said web from one end of the cylinder to the other, and web-guides cooperating with the other end of the cylinders to lead said web twice therethrough the same side up, said web-directing means being constructed to also lead a double-wide web from one end of the cylinders to the other, substantially as described.

7. In a printing-machine, the combination with a pair of double-wide cylinders, of web-guides coöperating with one end of the cylinder and constructed to lead a web twice therethrough the same side up, of web-directing means for turning the web over and leading said web from one end of the cylinder to the other, and web-guides coöperating with the other end of the cylinders to lead said web twice therethrough the same side up, said web-directing means being constructed to also lead a double-wide web from one end of the cylinders to the other and turn it over between the ends of the cylinders, substantially as described.

8. The combination with a pair of double-wide cylinders, of a set of guides operating to

receive a single-wide web from one end of the cylinders, transfer it laterally and deliver it to the same end of the cylinders with its printed side toward the form-carrying cylinder, a set of web-guides coöperating in the same manner with the other end of the cylinders, and a pair of angle-bars over which the web runs as it passes from one end of the cylinders to the other, said bars being constructed to also receive a double-wide web from one end of the cylinders, turn it over, and deliver it to the other end of the cylinders, substantially as described.

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

GEORGE F. READ.

Witnesses:
F. W. H. CRANE,
L. ROEHM.