

No. 687,282.

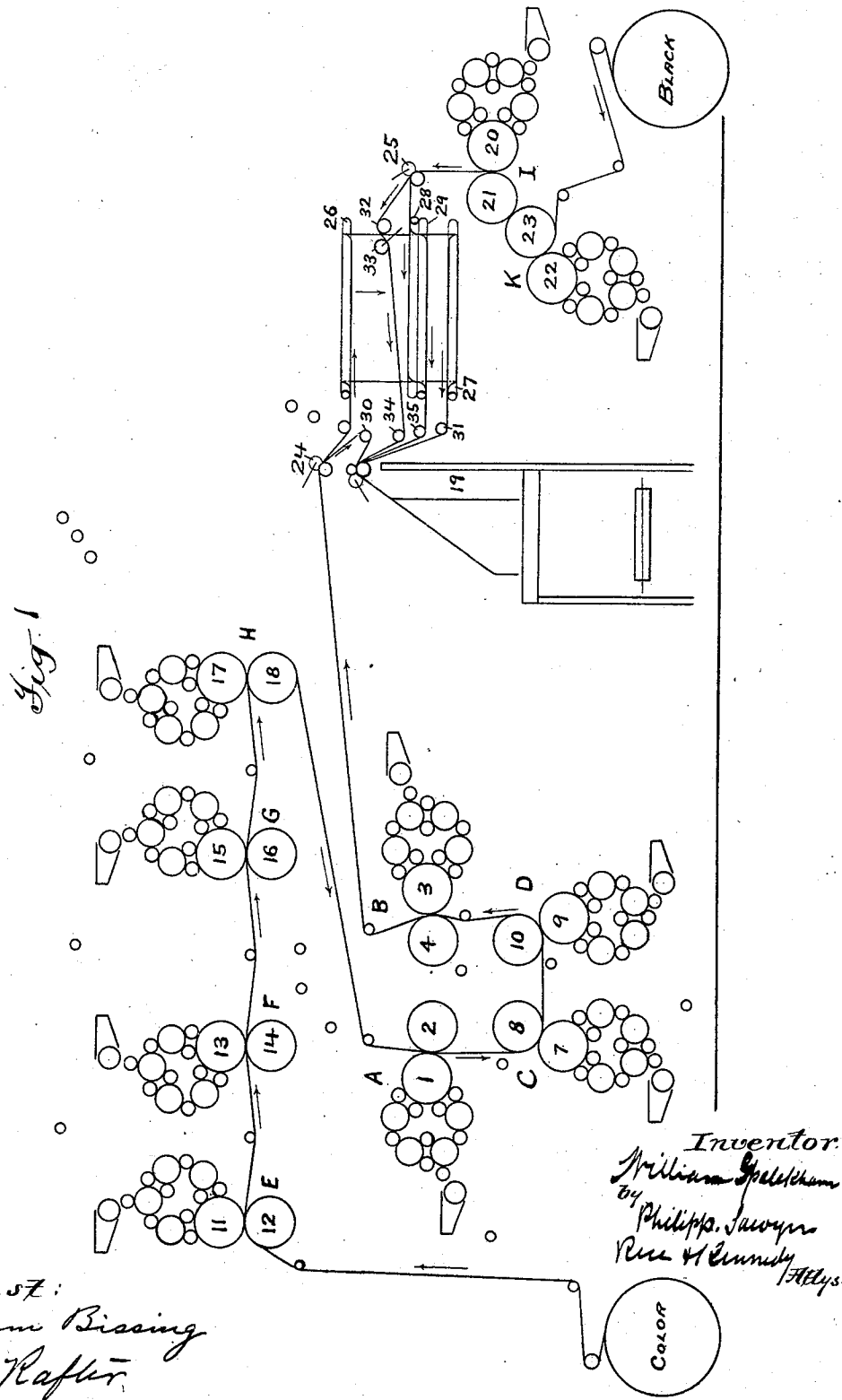
Patented Nov. 26, 1901.

W. SPALCKHAVER.
ROTARY PRINTING MACHINE.

(Application filed Apr. 12, 1901.)

(No Model.)

4 Sheets—Sheet 1.



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G.A. Rafter

Inventor
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by Phillips Sawyer
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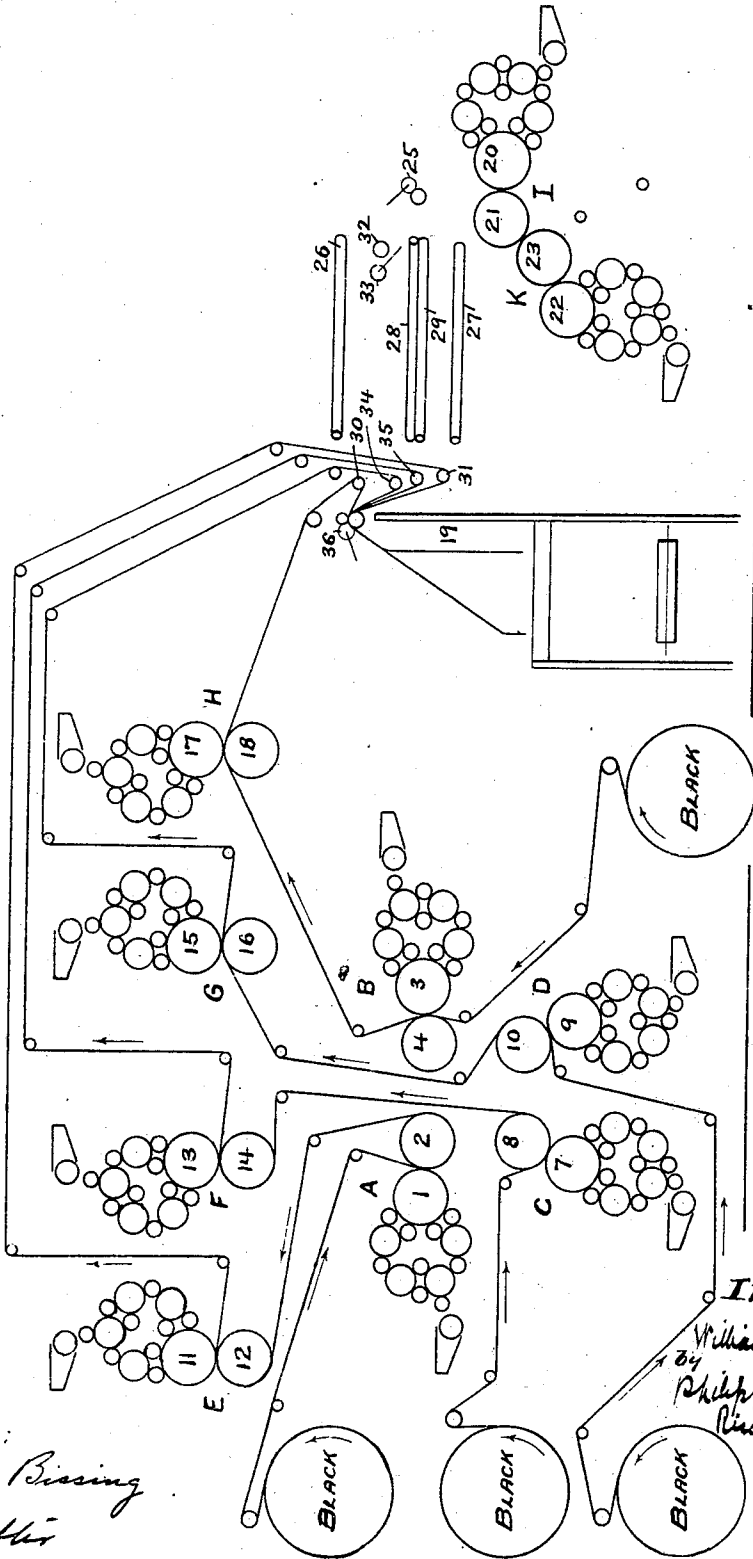
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4 Sheets—Sheet 2.

Fig. 2.



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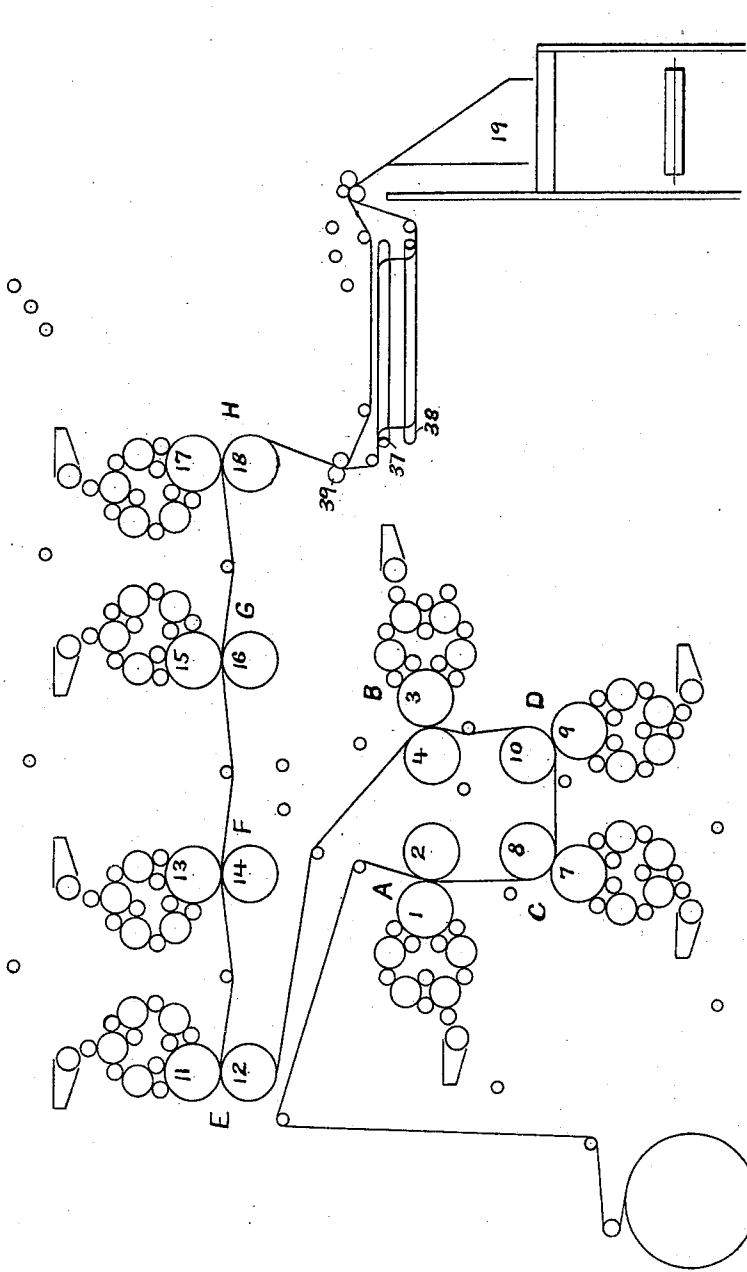
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4 Sheets—Sheet 3.

Fig. 3.



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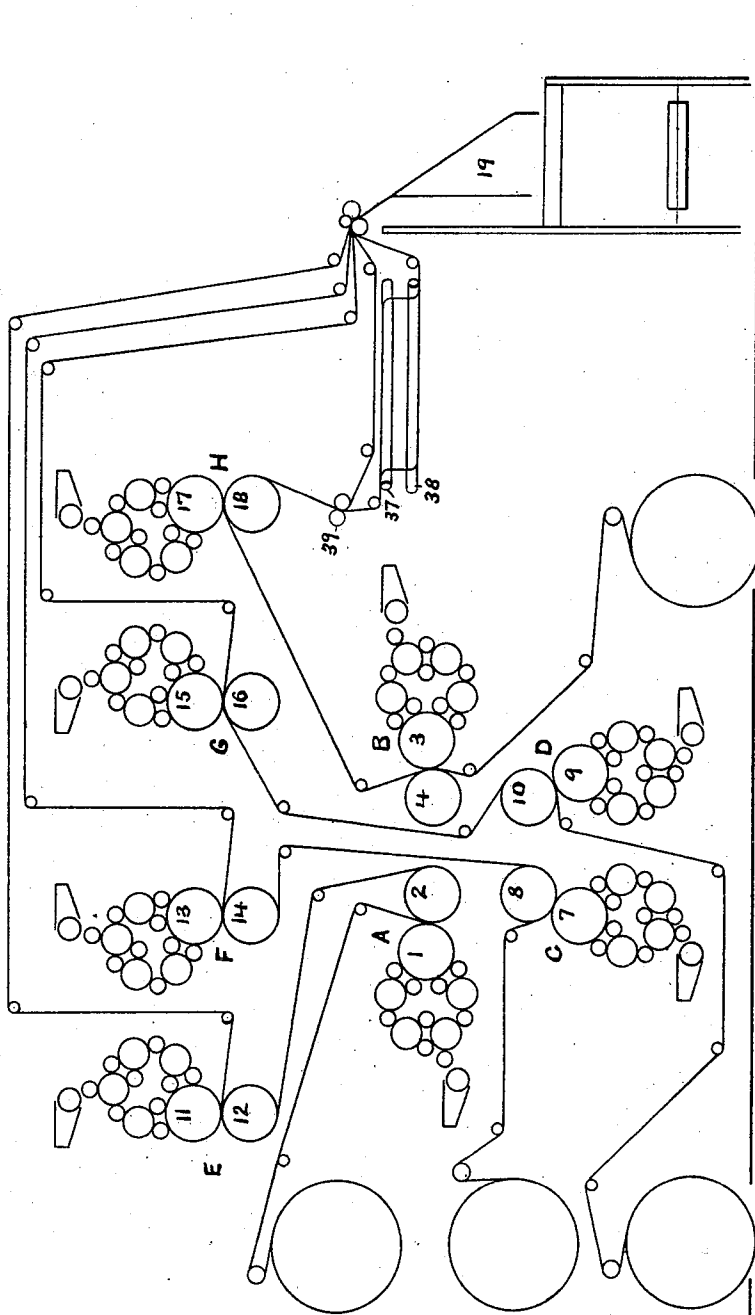
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4 Sheets—Sheet 4.

Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM SPALCKHAVER, OF NEW YORK, N. Y., ASSIGNOR TO ROBERT
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ROTARY PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 687,282, dated November 26, 1901.

Application filed April 12, 1901. Serial No. 55,580. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM SPALCKHAVER, 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 Rotary 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 of the rotary type.

The invention has for its object to produce an improved fast printing-machine of the rotary type which may be used to produce products printed in colors or products printed in black or products printed both in colors and in black, said machine being constructed so as to produce a large variety of products with a minimum number of printing-couples.

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

Referring to the drawings which form part of this specification, and in which like characters of reference indicate the same parts, Figure 1 is a diagrammatic view of a printing-machine constructed in accordance with the invention, the machine being arranged to produce a product printed both in colors and in black. Fig. 2 is a diagrammatic view of the machine shown in Fig. 1 arranged to print a product in a single color, part of the machine being thrown out of operation. Fig. 3 is a diagrammatic view of a machine similar to the machine shown in Fig. 1, but with a delivery mechanism and employing a less number of couples. Fig. 4 is a diagrammatic view of the machine shown in Fig. 3 arranged to produce a different product.

Referring to the drawings, which illustrate one embodiment of the invention, 1 2 indicate the form and impression cylinders, respectively, of a pair of printing-couples A, and 3 4 indicate the form and impression cylinders of a pair of printing-couples B. These couples are provided with any usual form of inking mechanism and are arranged, as shown, with the impression-cylinders 2 and 4

between the form-cylinders. These couples are also arranged so that the impression-cylinders are spaced apart in order to give ready access to the cylinders for the purpose of "making ready" and for another reason which will be hereinafter referred to.

A pair of form and impression cylinders 7 8 is located beneath the cylinders 1 2, and another pair of form and impression cylinders 9 10 is located beneath the cylinders 3 4, these cylinders forming couples C D, respectively. Above the couples which have just been referred to is a row of couples E F G H, the form-cylinder of the couple E being marked 11 and its impression-cylinder 12, the form-cylinder of the couple F being marked 13 and its impression-cylinder 14, the form-cylinders of the couple G being marked 15 and its impression-cylinders 16, and the form-cylinders of the couple H being marked 17 and its impression-cylinders 18. The couples E F G H, which form the row, are spaced apart, the form-cylinders being all arranged on one side of the run of the web and the impression-cylinders being arranged on the other side of said run, so that this row forms or may form a color-deck. The couples A B C D are also arranged so that a web may be led through the couples A C D B in the order named, in which case these couples will all print on the same side of the web and may also form a color-deck.

With the couples arranged as before described a web may be led through the couples E F G H and receive a printing in four colors upon one of its sides. From the couple H the web may be led through the couples A C D B and receive four printings on the opposite side. After being printed in the manner described the web is led to a suitable delivery mechanism. In the preferred form of the construction this delivery mechanism will consist of a longitudinal folding mechanism, said mechanism being indicated at 19. The machine is also preferably provided with an additional pair of couples, one of these couples I having its form-cylinder marked 20 and its impression-cylinder 21 and the other couple K having its form-cylinder marked 22 and its impression-cylinder 23. The delivery mechanism, which, as be-

fore stated, preferably consists of a longitudinal folding mechanism of the usual type, is preferably arranged, as shown in Fig. 1, to face the color-decks before referred to—
 5 that is, with its back to the additional couples. When the webs printed upon are more than single wide, suitable slitting mechanisms are employed, one being shown at 24 for the product coming from the couples which
 10 have been referred to as the "color-deck" and one at 25 for the product coming from the additional couples.

In producing a product made up partly of sheets printed in colors and partly of sheets
 15 printed in black it is desirable to have the black sheets folded inside the color-sheets. To effect this result in the present machine, a transferring mechanism 26 27 is employed for the product coming from the couples
 20 which have been referred to as the "color-decks," and another transferring mechanism 28 29 is or may be used in connection with the product coming from the additional couples.

25 Assuming that the machine is arranged as shown in Fig. 1 and is printing on a double-wide web, the operation is as follows: A web is first led between the couples E F G H, receiving four printings on one side. From the
 30 couple H it is led between the couples A C D B, receiving four printings on the opposite side. From the couple B it is led through the slitter 24, and one half of it is then led over a suitable guide 30 to the folder. The
 35 other half of the web is led through the transferring mechanism 26 27 and then over a suitable guide 31 to the folder. The product coming from the couples I K, which has been printed and perfected by these couples,
 40 is led through the slitter 25, after which one half of it is led, by means of suitable guides 32, 33, and 34, to the folder, and the other half is transferred laterally by means of the transferring mechanism 28 29 and transferred by a suitable guide 35 to the folder.
 45 By this arrangement it will be seen that a sixteen-page paper is produced, consisting of two four-page sheets, each printed in four colors, and two four-page sheets printed in
 50 black, the black sheets being arranged between the color-sheets. By throwing out the transferring mechanisms and assuming that the longitudinal folding mechanism 19 comprises two folders it is possible with the same
 55 arrangement of couples to produce two eight-page papers, each consisting of an outside sheet printed in four colors and an inside sheet printed and perfected in black. It will be noted that the arrangement of the
 60 longitudinal folding mechanism with reference to the several couples in the machine brings the black sheets next the folder, so that the color-sheets are folded on the outside.

65 If it be desired to produce a product printed and perfected in a single color, the machine may be arranged as shown in Fig. 2. In this arrangement of the machine the cou-

ples A E act together as a single printing-machine to print and perfect a web. The couples C and F act as a single machine, as do
 70 the couples D and G and the couples B and H. It will be noted that by reason of the spacing apart of the impression-cylinders of the couples A B the webs which pass through
 75 the couples C D can be led between these impression-cylinders, and so directed to the cooperating couples F G. With this arrangement of the machine and assuming that the couples are double wide and have a suitable
 80 slitting mechanism 36 two sixteen-page products may be produced, the additional couples I K being cut out, or if a twenty-page product be desired these couples may be run, the product being delivered to the longitudinal
 85 folding mechanism, with the webs coming from the other couples. The same construction may be used to produce an eighteen-page paper by running single-wide webs on all the couples, including the additional couples.

A somewhat different arrangement of machine employing the same general principle
 90 is shown in Figs. 3 and 4. In this machine the folding mechanism 19 is turned around so that its back is toward the color-decks, and the additional couples are omitted. The
 95 transferring mechanism 37 38 is located between the couples and the folding mechanism, and a suitable slitting mechanism 39 is employed. In this machine, in order to produce a product printed in colors, the web may
 100 be led, as shown in Fig. 1, through the couples A C D B in succession and then through the row of couples E F G H in succession. This will produce, assuming that the couples
 105 are double wide and the slitting and transferring mechanisms are employed, an eight-page product printed in colors. By running the webs as shown in Fig. 4, the webs passing through the couples A E C F D G being
 110 single-wide webs and the web passing through the couples B H being a double-wide web and being led from couple H through the slitting and transferring mechanism, a twenty-page
 115 product can be produced. By running a single-wide web through the couples B H and cutting out the transferring mechanism a sixteen-page product can be produced, or by running
 120 double-wide webs on all the couples and cutting out the transferring mechanism two sixteen-page products can be produced. It will be observed that by arranging the couples A B C D in the manner already described
 125 and by arranging the couples E F G H so that there is a space between them it is not only possible to get at all the couples for the purpose of making ready when it is desired to
 130 print in colors and also to put on and take off the plates, but the various runs of the web already described are made possible. It will further be noticed that the various products referred to are all produced without reversing the direction of rotation of any of the couples.

The gearing by which the several couples

are operated can be readily supplied by any person skilled in the art to which this invention relates, and, as it is not in any way material to the invention, an illustration and description of it are deemed unnecessary. It will be further understood that the invention is not to be limited to the precise arrangement of the couples hereinbefore described, as variations may be made in the arrangement without departing from the essential features of the invention.

What is claimed is—

1. In a printing-machine, the combination with a pair of printing-couples arranged with the impression-cylinders between the form-cylinders, said impression-cylinders being spaced apart, of a second pair of printing-couples located beneath the first pair and arranged with respect thereto so that a web may be led successively through the couples, the first couple of the first pair giving the web its first printing and the second couple of the first pair giving it its last printing, and so that separate webs may be led through the couples of the second pair and between the impression-cylinders of the first pair, and a row of couples arranged over the pairs of couples, the couples of said row being spaced apart, substantially as described.

2. In a printing-machine, the combination with a pair of printing-couples arranged with the impression-cylinders between the form-cylinders, said impression-cylinders being spaced apart, of a second pair of printing-couples located beneath the first pair and arranged with respect thereto so that a web may be led successively through the couples, the first couple of the first pair giving the web its first printing and the second couple of the first pair giving it its last printing, and so that separate webs may be led through the couples of the second pair and between the impression-cylinders of the first pair, and a row of couples arranged over the pairs of couples, the couples of said row being spaced apart, and an additional pair of couples located at one side of the above-mentioned couples, substantially as described.

3. In a printing-machine, the combination with a pair of printing-couples arranged with the impression-cylinders between the form-cylinders, said impression-cylinders being spaced apart, of a second pair of printing-couples located beneath the first pair and arranged with respect thereto so that a web may be led successively through the couples, the first couple of the first pair giving the web its first printing and the second couple of the first pair giving it its last printing, and so that separate webs may be led through the couples of the second pair and between the impression-cylinders of the first pair, a row of couples arranged over the pairs of couples, the couples of said row being spaced apart, an additional pair of couples located at one side of the above-mentioned couples, and a delivery mechanism located between the ad-

ditional pair of couples and the other couples, substantially as described.

4. In a printing-machine the combination with a pair of printing-couples arranged with the impression-cylinders between the form-cylinders, said impression-cylinders being spaced apart, of a second pair of printing-couples located beneath the first pair and arranged with respect thereto so that a web may be led successively through the couples, the first couple of the first pair giving the web its first printing and the second couple of the first pair giving it its last printing, and so that separate webs may be led through the couples of the second pair and between the impression-cylinders of the first pair, a row of couples arranged over the pairs of couples, the couples of said row being spaced apart, an additional pair of couples located at one side of the above-mentioned couples, and a longitudinal folding mechanism arranged between the pair of additional couples and the other couples, said mechanism having its back toward the additional couples, substantially as described.

5. In a printing-machine, the combination with a pair of printing-couples arranged with the impression-cylinders between the form-cylinders, said impression-cylinders being spaced apart, of a second pair of printing-couples located beneath the first pair and arranged with respect thereto so that a web may be led successively through the couples, the first couple of the first pair giving the web its first printing and the second couple of the first pair giving it its last printing, and so that separate webs may be led through the couples of the second pair and between the impression-cylinders of the first pair, a row of couples arranged over the pairs of couples, the couples of said row being spaced apart, a delivery mechanism, and suitable transferring mechanism, substantially as described.

6. In a printing-machine the combination with a pair of printing-couples arranged with the impression-cylinders between the form-cylinders, said impression-cylinders being spaced apart, of a second pair of printing-couples located beneath the first pair and arranged with respect thereto so that a web may be led successively through the couples, the first couple of the first pair giving the web its first printing and the second couple of the first pair giving it its last printing, and so that separate webs may be led through the couples of the second pair and between the impression-cylinders of the first pair, a row of couples arranged over the pairs of couples, an additional pair of couples located at one side of the above-mentioned couples, a slitting mechanism for the product coming from the additional pair of couples, a slitting mechanism for the product coming from the other pairs of couples, and transferring mechanisms for each product, substantially as described.

7. In a printing-machine, the combination

with a pair of printing-couples arranged with the impression - cylinders between the form-cylinders, said impression - cylinders being spaced apart, of a second pair of printing-couples located beneath the first pair and arranged with respect thereto so that a web may be led successively through the couples, the first couple of the first pair giving the web its first printing and the second couple of the first pair giving it its last printing, and so that separate webs may be led through the couples of the second pair and between the impression-cylinders of the first pair, a row of couples arranged over the pairs of couples, the couples of said row being spaced apart, an additional pair of couples located at one side of the above-mentioned couples, a delivery mechanism located between the additional pair of couples and the other couples, a slitting mechanism for the product coming from the additional couples, and a slitting mechanism for the product of the other couples, and suitable transferring mechanisms for each product, substantially as described.

8. In a printing-machine, the combination with a pair of printing-couples arranged with the impression - cylinders between the form-cylinders, said impression - cylinders being spaced apart, of a second pair of printing-

couples located beneath the first pair and arranged with respect thereto so that a web may be led successively through the couples, the first couple of the first pair, giving the web its first printing and the second couple of the first pair giving it its last printing, and so that separate webs may be led through the couples of the second pair and between the impression-cylinders of the first pair, a row of couples arranged over the pairs of couples, the couples of said row being spaced apart, an additional pair of couples, a longitudinal folding mechanism arranged with its back toward the additional couples, a slitting mechanism for the product coming from the additional couple, a slitting mechanism for the product coming from the other couples, and a transferring mechanism for the products of the additional couple and the other couples, said transferring mechanism being located behind the longitudinal folder, substantially as described.

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

WILLIAM SPALCKHAVER.

Witnesses:

F. W. H. CRANE,

L. ROEHM.